New Zealand Agricultural and Resource Economics Society (Inc.)

Migration, Household Composition, and Child Welfare in Rural Northeast Thailand

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Paper presented at the 2005 NZARES Conference
Tahuna Conference Centre – Nelson, New Zealand. August 26-27, 2005.

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Abstract

In many developing countries the composition of rural households is influenced by the migration of adult household members to urban locations in search of employment. Children may be left in the care of their mother alone, or in the care of grandparents when both parents have migrated. Using representative data from a household survey conducted in rural Northeast Thailand in 2003, this paper investigates whether household composition has any effect on the welfare of children, as measured by anthropometric measurements including height-for-age, weight-for-age, and weight-for-height. Our findings suggest that household types other than nuclear families result in some significantly worse child nutritional outcomes. The implication is that governments should protect the welfare of the children of migrants, either through targeted programs or through increased opportunities for employment in rural areas.

JEL: I31, O15, O18
Keywords: migration, household composition, children, Thailand

1. Introduction

To date, there have been several studies on the effects of various socioeconomic factors on child nutrition. However, there have been few studies of the long-run effects of migration on children, in particular comparing children who remain in rural areas. We are unaware of any studies of the effects of migration on children's health at all in Thailand. This paper addresses two significant gaps in the literature. First we study the effects of migration and household composition on child nutritional outcomes in rural Thailand. Second we draw inferences about the minimum effects of AIDS-related mortality on child welfare due to the similarities in its effect on household composition.

We will consider the impact of four main household types, in comparison with a nuclear family – extended families where both parents are present, extended families where one parent is present, single parent or grandparent families, and other household types (which are dominated by extended families with no parents present, or grandparents raising grandchildren alone). As a measure of the long-run welfare of children, we use child height-for-age, weight-for-age, and weight-for-height. The resilience of these nutritional outcomes to the effects of temporary shocks (e.g. see Stillman & Thomas, 2002) suggests that they provide a good measure of long-run child welfare and may be suitable for studying the implications of household composition. After accounting for genetic variation and socioeconomic characteristics, we find that child weight-for-height is significantly negatively affected by household types other than nuclear families.

The paper proceeds as follows. Section 1 presents a short history of migration in Thailand, with a particular focus on migration from the rural Northeast. Section 2 summarises previous studies on the effects of migration on child welfare. Section 3 presents the methodology and data used in the analysis. The results are presented in section 4 and discussed in section 5. Section 6 concludes the paper.

1.1 Migration from Northeast Thailand

Since the mid-20th Century, growth in the rural population resulted in the use of increasingly marginalised land, particularly in the North and Northeast regions. Clearing of forest and the increased planting of cassava as a cash crop depleted the soil, reducing rice yields. The Thai government also artificially deflated the market price of rice in order to reduce inflationary pressure on urban wages. Falling rice income and rice output per capita, increasing indebtedness and landlessness, and the increasing use of expensive inputs such as tractors and fertiliser created the need for a ready source of alternative cash income (Porpora & Lim, 1987).

Thus migration became a major coping strategy of rural households, as they sought to take advantage of greater economic opportunities (Ritchey, 1976). These migrants would then support their rural family through remittances. By the late 1980s, migrants accounted for about 30 per cent of the population of Bangkok, and most originated from the Northeast, the poorest and most agriculturally-disadvantaged region (Falkus, 1993; Richter, Guest, Boonchalaksi, Piriyathamwong, & Ogena, 1997). From 1985-1990, the

Northeast region experienced a net migration loss of 554 000 people (Sussangkarn, 1995).

Migrants are attracted to Bangkok not only by the prospect of higher wages, but also because of perceived gains in social status and the opportunity to engage themselves in the desirable 'modern' urban culture (Porpora & Lim, 1987). Most of these workers are recruited before they migrate, often through social networks such as friends or relatives already working in the urban centre (Fuller, Kamnuansilpa, & Lightfoot, 1990). They are often employed in the construction, transport or manufacturing sectors, where they can be offered lower wages than their urban peers. Despite higher-paying urban jobs many rural-urban migrants may find, when faced with higher costs of living, that they have very little spare money to remit to their families.

Thailand also experiences large-scale rural-rural population mobility due to the seasonality of demand for agricultural labour. The surplus of labour outside of the traditional planting and harvesting times is especially apparent in the Northeast region (Richter et al., 1997). The seasonal cycle permits Thais to migrate in search of income opportunities while maintaining their farming household.

1.2 Migration and the Domestic Cycle in Northeast Thailand

Lux (1969) provides an excellent description of the traditional Thai family system and domestic cycle in Northeast Thailand. His description applies well to the family types we will use in our analysis. There is an initial phase, where the household is occupied by a nuclear family. As the children of the household head reach maturity, they marry. Young men leave the household, while daughters successively bring their new husbands into the household until such time as the next daughter is married. Finally, the youngest daughter remains in the household and her family eventually assumes control of the household on the death of her parents. The household might then traditionally move from a nuclear family, to an extended family with both parents, and then return eventually a nuclear family.

Increased migration of young adults from the Northeast to Bangkok (as described in section 1.1) changes the domestic cycle considerably. Now, as the children of the household head reach maturity, they might migrate in search of employment. Eventually they might return to their origin household to have children. Sometimes after the children have been weaned they might migrate again, possibly leaving the children in care of the household head, the children's grandparents.

Migration probably results in a different cycle of family structures, where one (or both) parents leave the household. If we begin with a nuclear family, if one parent migrates (often the father), then the household becomes a single-parent household. When the migrant returns, the household returns to a nuclear family. Alternatively, the household might begin as an extended household and one (or both) parents migrate, changing the household structure either to an extended family with no parents, or to a grandparent-grandchildren household (both included in our description of other household types).

The importance of migration's effect on the domestic cycle becomes clear when the similarity with the effects of the death of an HIV-infected parent are considered. Both migration and AIDS-related mortality are concentrated among young adults, typically parents. However, the key difference is that when a parent migrates they are likely to both remit some portion of their income to the origin household, and to later return to that household. Obviously, neither of these positive effects is present in the case of AIDS-related mortality. Therefore by studying the effects of migration on child welfare, we might be able to draw an inference on the minimum effects of AIDS-related mortality on child welfare.

2. Previous Studies of the Long-Run Effects of Migration on Child Welfare

There have been surprisingly few studies on the long-run effects of migration on children, and no such studies in Thailand, or Southeast Asia in general. Hildebrandt and McKenzie (2005) investigated the impact of international migration on child health outcomes in Mexico. They found that children in migrant households had lower rates of infant mortality, and higher birth weights. While they did not specifically study the effect of household composition, and they clearly focused on children who migrated with their parents rather than those that remained in the origin household which is a quite different situation from that observed in Northeast Thailand, their results are interesting nonetheless. Frank and Hummer (2002) studied Mexican migrant and non-migrant households and found that membership in a migrant household reduced the risk of low birth weight, largely through the receipt of remittances. Conversely, Kanaiaupuni and Donato (1999) found higher rates of infant mortality in origin migrant communities that experienced intense Mexico-U.S. migration. This effect was confounded somewhat by a significant positive effect of migrant remittances.

In Thailand, a large-scale migration survey was undertaken in 1992 (see Richter et al., 1997), but the effects on children were not discussed in detail. Using the same data, Chamrathrithirong and DeJong (1999) investigated the consequences of migration on quality of life, but again did not address the effects on children.

3. Methodology

3.1 Data Collection and Transformation

A representative household survey was conducted in two districts (Ban Phai and Phon) in southern Khon Kaen province from June to October 2003. All non-municipal sub-districts in both districts (ten in Ban Phai, and twelve in Phon) were included in the sampling frame. Three villages were selected for the sample from each sub-district, using weighted random sampling. The village sizes (in terms of number of households) from the Basic Minimum Needs Survey 2002 undertaken by the Ministry of Interior were used to provide a-priori weights for sampling. This provided a village sample of 66 villages. In each village, all households were enumerated using the procedures

recommended by the World Bank (Grosh & Munoz, 1996). After enumeration was completed, a sample of ten households was selected by random sampling. This provided an overall sample of 660 households which, when appropriately weighted (as detailed in Deaton (1997)), is representative of the two districts surveyed.

Three teams of interviewers were recruited locally and trained in data collection methods and interview technique. Recruitment of local interviewers ensured that interpretations and language used for the survey were consistent with those in use in the survey area. Each household was visited twice during the survey period, two weeks apart. On the first visit, detailed data were also collected about on who lived there, their characteristics, what they did for income, migration data, health data, and agricultural data. The second visit collected additional data which are not used in this study.

Anthropometric measurements of all household members including children were taken once on each visit, and the results were averaged. Child height and weight for all children aged under ten years were then standardised by the mean height of a well-nourished child of the same age and sex, using the World Health Organisation's international reference data tables (Dibley, Goldsby, Staehling, & Trowbridge, 1987; Dibley, Staehling, Nieburg, & Trowbridge, 1987). This transformed the height and weight data into z-scores of height-for-age, weight-for-age, and weight-for-height. This standardisation accounts for the different ages and sex of all children in the sample, thereby allowing data from all children to be pooled for analysis (Waterlow et al., 1977).

Several explanatory variables for child health outcomes have been suggested. For this study, we have limited the explanatory variables to (i) household type; (ii) parental education; (iii) wealth; and (iv) remittances. In addition to the other explanatory variables, we account for genetic variation in child nutritional outcomes by using the average height and average body mass index of adult household members as an additional explanatory variable. We evaluate the child health outcomes with reference to the five different household types shown in table 1. Of the 660 households in the whole sample, 311 had children aged under ten years, and in total there were 424 such children in those households. 'Other household types' mainly includes extended family households where neither parent was present.

Table 1: Household types with sample sizes

	Sample Size	% of total households	% of households with children (under age 10)
Total sample	**660**	**100**	–
Nuclear family	65	9.8	20.9
Extended family with both parents	103	15.6	33.1
Extended family with one parent	72	10.9	23.2
Single parent/grandparent	19	2.9	6.1
Other household types	52	7.9	16.7
Households with no children (under age 10)	349	52.9	–

Parental education was measured in years of schooling, including post-secondary schooling. Wealth is measured by the natural log of the total value of all household assets. Other wealth measures were used initially but did not perform well. Remittances are evaluated on a binary basis, taking a value of one where remittances were received from migrant former household members within the last year.

The summary statistics for the dependent and explanatory variables are presented in table 2. As can be seen, the data are highly variable, especially the dependent variables. Outliers in the z-scores for height-for-age, weight-for-age, and weight-for-height were attributed to measurement error, and the data was truncated at a maximum z-score of +3.0 and a minimum z-score of -5.0.

Table 2: Summary statistics for dependent and explanatory variables

	n	Mean	Std. Dev.	Min	Max
Father's education	424	7.27	3.35	0	17
Mother's education	424	6.79	2.93	0	16
Total Household Assets (baht)	424	81509	142370	0	1548000
Remittances (1 = yes)	424	0.286	0.452	0	1
Average adult height	424	159.3	5.0	144	176.5
Average adult BMI	424	23.0	2.5	17.5	30.7
Height-for-age z-score	371	-0.9449	1.6753	-4.9152	2.8599
Weight-for-age z-score	392	-0.8545	1.3579	-4.8454	2.8124
Weight-for-height z-score	400	-0.4635	1.5255	-4.3236	2.9941

4. Results

The results of a weighted multiple regression of child height-for-age z-scores, using a vector of explanatory variables including household type, log of wealth, receipt of remittances, parents' education, and average height and body mass index of adult household members, is presented in table 3.

Table 3: Multiple regression results for height-for-age z-scores

	Coefficient	Std. Error	t	P>|t|
Nuclear family	–	–	–	–
Extended family with both parents	0.1064	0.2391	0.45	0.657
Extended family with one parent	0.0880	0.2807	0.31	0.754
Single parent/grandparent	0.6582	0.4020	1.64	0.102
Other household types	0.3944	0.3127	1.26	0.208
Log assets value	0.1917	0.0717	2.67	0.008
Remittances	0.1434	0.2130	0.67	0.501
Father's education	0.0197	0.0318	0.62	0.537
Mother's education	-0.0150	0.0389	-0.39	0.700
Average height	0.0490	0.0190	2.58	0.010
Average BMI	0.0630	0.0364	1.73	0.085
Constant	-12.4679	3.2760	-3.81	0.000

In this model, wealth provides a plausible and significant marginal effect on child height-for-age, as do the genetic variables average height and average body mass index. Surprisingly parental education does not have a significant effect on child height-for-age, and although all household type coefficients are positive, none are significant suggesting that household type has no effect of child height-for-age. Further, a Wald test cannot reject that the coefficients on all household type variables are zero in this model ($p=0.4748$).

Table 4 presents the same model applied to child weight-for-age. Unlike height-for-age, mother's education provides a significant positive marginal effect on child weight-for-age. For the genetic variables, average adult body mass index is significant and positive but adult height is not significant. The receipt of remittances is also positive and weakly significant. An extended family with both parents present provides significantly worse child weight-for-age z-scores compared to a nuclear family. This may be due to both household composition and nutritional outcomes being determined simultaneously by the same socioeconomic factors. Another reason may be that nutritional resources are spread more thinly in a larger extended family, although adding household size or the proportion of household members who are children under age 10 to the model do not show significant marginal effects (data not shown).

Table 4: Multiple regression results for weight-for-age z-scores

	Coefficient	Std. Error	t	P>|t|
Nuclear family	–	–	–	–
Extended family with both parents	-0.3409	0.1886	-1.81	0.072
Extended family with one parent	-0.0754	0.2199	-0.34	0.732
Single parent/grandparent	0.0239	0.3196	0.07	0.940
Other household types	-0.2159	0.2470	-0.87	0.382
Log assets value	0.0759	0.0571	1.33	0.185
Remittances	0.2778	0.1670	1.66	0.097
Father's education	-0.0192	0.0243	-0.79	0.431
Mother's education	0.0857	0.0290	2.96	0.003
Average height	0.0090	0.0148	0.61	0.545
Average BMI	0.0765	0.0282	2.72	0.007
Constant	-5.2015	2.5439	-2.04	0.042

Table 5 presents the same model applied to child weight-for-height. The results show that mother's education has a significant positive effect on child weight-for-height. All alternatives to the nuclear family household type provide significantly worse child weight-for-height z-scores. Average adult height in the household is strongly associated with lower child weight-for-height. This may represent genetically taller children being taller but not necessarily heavier than their shorter cohorts. However, adult body mass index is not significant. Unsurprisingly, adding height-for-age z-score as an additional explanatory variable makes all other explanatory variables insignificant, with the exception of mother's education and extended families with both parents (data not shown).

Table 5: Multiple regression results for weight-for-height z-scores

	Coefficient	Std. Error	t	P>|t|
Nuclear family	–	–	–	–
Extended family with both parents	-0.7818	0.2123	-3.68	0.000
Extended family with one parent	-0.4222	0.2469	-1.71	0.088
Single parent/grandparent	-0.7032	0.3526	-1.99	0.047
Other household types	-0.6901	0.2747	-2.51	0.012
Log assets value	-0.0156	0.0624	-0.25	0.803
Remittances	0.1577	0.1852	0.85	0.395
Father's education	0.0006	0.0279	0.02	0.984
Mother's education	0.0826	0.0340	2.43	0.015
Average height	-0.0345	0.0165	-2.10	0.037
Average BMI	0.0462	0.0329	1.40	0.161
Constant	4.0479	2.8557	1.42	0.157

5. Discussion

Our results suggest that child height-for-age is unaffected by migration or household composition, once other explanatory variables are taken into account. This may however be due to the significant variation in the data. Child weight-for-age is negatively impacted by extended family households where both parents are present, though the association is only weakly significant. This may be due to differences in the intra-household allocation of nutritional resources to children where the household contains a large number of adults.

Child weight-for-height is significantly negatively affected by all household types when compared with nuclear family households. The marginal effects were large for extended families with both parents present, which is consistent with child weight-for-age. If only one parent was present, and presuming that the other parent has likely migrated to work elsewhere, the marginal effects were less negative. If both parents had migrated, as shown by 'other household types' the marginal effects become larger again. It is possible that where both parents have migrated, and left the children with relatives to raise, the altruistic intergenerational ties to their children might be less strong. This might also be reflected in the decision to migrate in the first place.

Single parent (or single grandparent) households provide the largest negative marginal effects on child weight-for-height. Where only one adult is responsible for caring for and providing for the children, it is possible that they are unable to do so to the same standard as a multiple-adult household. Receipts of remittances from former migrant household members provide a positive marginal effect on child weight-for-height, but this effect is not significant.

Using these results, we can draw inferences about the effects of AIDS-related mortality on child nutritional outcomes. As noted in section 1.2, the effect of migration on household composition is very similar to the effect of AIDS-related mortality on household composition. Provided migrant remittances and the eventual return of migrants to the household provide for better outcomes, due to higher income, then the results presented above represent an upper-bound of the results that would be obtained from a study of AIDS-related morbidity on child welfare. If this follows, then the nutritional outcomes of children affected by the AIDS-related death of a parent will be significantly adversely affected by the resulting change in household composition.

These results suggest several policy implications. If children remaining in the origin household while one or both of their parents migrate are significantly negatively affected, then the government should consider two alternative policies. First, they could facilitate the movement of children with their parents, by providing low-cost childcare services in Bangkok and other destination communities. Second, they could consider facilitating the movement or urban jobs, including manufacturing, to rural areas. These rural development projects offer improved income generation opportunities for rural people, and reduce the incentives for migration. Either policy alternative would allow

children to remain in the significantly better nuclear family or extended family with both parents present.

5.1 Comparison with other literature

Thomas et al (1990) studied the impact of household characteristics on child survival and height-for-age in Brazil, and found significant positive income and parental education effects, as well as significant positive genetic factors (measured by parents' height). We also found significant positive genetic and wealth effects on child height-for-age. However, our finding that child height-for-age is apparently unrelated to household type is in line with the findings of Wingerd and Schoen (1974), who found in a study of over 3700 U.S. children that parental height accounted for over 88 per cent of the variation in child height at age five.

Cochrane et al (1982) summarised the literature on parental education and child health and found that mother's education had a significant positive effect on child health outcomes including weight-for-age and height-for-age. This is in line with our results for weight-for-age and weight-for-height, but in height-for-age mother's education had a negative but insignificant effect in our analysis.

Our results for child weight-for-height are similar to the findings of Kanaiaupuni and Donato (1999), who found higher rates of infant mortality in origin migrant communities in Mexico. While they did not study subsequent nutritional factors for children, the child health outcomes are similarly negative for migration-affected children. This corroborates our finding that alternative household types, which exclude one or more parents, result in significantly worse child weight-for-height outcomes.

5.2 Caveats

The sample size for this study was rather small, including 660 households in two districts in Khon Kaen province, Northeast Thailand. However, only 311 of those households had children under age ten, and only 424 children were included in the sample. The small sample size makes the results especially sensitive to the presence of outliers. Once outliers were excluded, the remaining sample sizes were only approximately 400.

The calculation of z-scores for the long-run nutritional outcomes of children in our study relied on a reference sample drawn from a developed country. There is therefore a bias towards negative values, as identified by the mean z-scores in table 2. It is difficult to determine whether this downward bias has any effect on our results, and the use of a Thai reference sample to calculate the z-scores may results in better results. To our knowledge no such Thai reference sample for child anthropometrics exists.

It is entirely probable that household composition (or household type) is not independent of the decision to migrate, or independent of the nutritional outcomes for children. It is possible that parents who choose to migrate do so as a result of the same economic conditions that result in poor nutritional outcomes. Also, we have not taken account of the length of time that children have experienced the household type they were in at the

time of interview. It may be that children who have only recently experienced a change of household type are significantly less affected. These problems arose partly because the data collected was not originally intended to study the effects of migration on child health. Several methods could be employed to overcome these problems, including the use of repeated cross section or panel data.

5.3 Suggestions for future research

The results of this paper suggest several avenues for future research. First, our results should be treated as preliminary in that the data collection was not specifically focused on the collection of data to examine the effects of migration on child health outcomes. Future research should employ a larger sample size and more focused questions on migration history, and changes in household composition. A comparison between children who migrated with their parents and children who did not might also provide informative analysis, and the use of panel or repeated cross section data would allow for differences over time to be adequately analysed.

Also, if AIDS-related mortality has similar effects on household composition to migration, then child welfare is also affected in similar ways. Future research should focus on estimating the specific effects on AIDS-related mortality on child health and other welfare measures, and develop policies to mitigate the effects of parental mortality on children.

It is also possible that the relationships between the explanatory and dependent variables are not stable across the distribution of child nutritional indicators. Quantile regression should be employed to determine where the marginal effects of different explanatory variables are significant.

6. Conclusion

Among other effects, migration results in changes in household composition. Our results from a representative sample of children in Khon Kaen province in Northeast Thailand suggest that household structures other than a nuclear family have a significantly negative effect on child welfare, as measured by child weight-for-height, but have no significant effect on child height-for-age. To the extent that the effects of migration on household composition are similar to the effects of AIDS-related mortality on household composition, these results suggest a lower bound to the effect of AIDS-related mortality on children's nutritional outcomes. More focused research in this area is required, to determine whether these effects are robust to the interaction between the decision to migrate and nutritional outcomes.

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