Migration and Children's Health: Evidence From Rural China

Shu Zhang[*][†]

University of Houston

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Abstract

This paper intends to identify the impact of migration on children's health in sending household using CHNS data. Facing increased household income from remittances and increased mother's bargaining power due to the absence of father, children's health condition is expected to be better-off according to children's health production function and Household Non-Unitary Model. The measurements of children's health outcome are Height,Weight, Weight-for-Height, and Height-For-Age Z-score and empirical strategy that used is the method of Difference-in-Differences.

1 Introduction

Children's Health Problem causes a lot of concern in both developed and developing countries. In developed countries, children are better feeded and protected by various private health insurance and public support. For example, US governments have many public programs (TANF, Medicaid, SCHIP and etc.) to help uninsured and low-income children with better health coverage and nutrition. However, in many developing countries, completed public health system is absent. The main resource of children's health inputs is from parents and extended family, and this situation is more severe in rural area. As a result, this paper aims at children's health condition in rural China. By using China Health and Nutrition Survey (CHNS) Data, I want

to find out how children's health would change with respect to increased household income and mother's bargaining power caused by migrant father. The natural experiment I will look at is China's Household Registration System Reform and the consequent rural-urban migration since mid-1980.

Before reform, *Hokou* System, i.e. the Chinese Household Registration System, restricted population flows between regions, and private intra-region migration was officially forbidden. people who have "agricultural *Hukou*" can not leave their land and move to urban area. This system was initially designed to keep people on land and ensure sufficient agricultural products provided to urban Manufacture Industry. As another result, this system segregated urban and rural labor markets, enlarge the income gap between urban workers and rural farmers. Since the late 1970's, Chinese central government has conducted market-oriented reform. The restriction on population flow between regions was gradually released and new individual registration system, i.e. ID Card, replaced the old one. Individual who is issued ID card can move to any place where he can find a job. Therefore, a farmer who use to hold agricultural *Hukou*, now can choose to go to urban places for higher wage and apply for Urban Temporary Resident Permit with ID card (Brauw and Giles, 2008, Bao et.al. 2009). On the other side, the increased rural-urban income gap and new industrial demand for labor motivate large scale of rural-urban migration.

There are more literature concerning the welfare of sending household and community in the context of international migration rather than domestic rural-urban migration. Hildebrandt and McKenzie (2005) using IV method find that the Mexico-US migration has significantly positive effect in lowering morality and raising birth weight of sending areas. Antman (2010)'s work focuses on the Children's education attainment with Mexican out-migrant parent (father) and argues the impact on years of schooling is significant for young girls, rather than boys. In the context of China, there are relatively less work done on the well-being of sending household. Brauw and Giles(2008) examine the impact of migrant remittances on household consumption and they find that with increased remittance income, poor households are more likely to increase non-durable consumption and durable assets investment (like houses). There are even fewer literature concerning children's welfare, Chen et.al.(2009) compare children's education performance in migrant and non-migrant household by using data from rural China and find that child's test score improves if father out-migrates.

According to Children's Health Production Function (Grossman 1972) and Household Non-Unitary Model, there may be three channels through which migration affects children's health: 1. improved nutrition input caused by higher household income; 2. the absence of one parent increases children's housework time (Chen 2009); 3. if father is the migrant, then mother's bargaining power would increase as well as children's health input. Channel 1 and 3 have positive impact on children's health, while Channel 2 is assumed negatively correlated to health. As a result, we have to keep in mind that estimated impact of migration on children's health is total effect, not partial one.

But, the migration decision is endogenous and negatively selective, those people who decide to leave family for higher income are more likely to be poorer than those who don't. As a result, the simple comparison of children's health outcomes between migrant and non-migrant household wouldn't give us consistent and reliable estimates, even controlling for observable individual, household and community characteristics. Alternatively, I plan to use Height, Weight, "Weight-for-Height" and "Height for Age" (Duflo 2003) as the measurement of children's health and employ Differences-in-Differences method as identification strategy. "Height-For-Age" Z-score is an indicator of children's health accumulation since very early childhood. Many researches find that nutrition supply in early stage of life has long lasting consequence in child height and adult health, as well as economic status(Barker 1990, Case and Paxson 2008, Sharon and Yang 2009). The "height for age" Z-score increases quickly in the first 12-24 months of age (age 0-2), then becomes stable until the adolescence(around age 12-14, earlier for girls). But the possibility of catch-up skeletal growth after episode of low growth in infancy is limited(Ashworth 1969). Therefore, children's health input of early life plays a very important role.

With migration, children are assumed to be healthier because of the two sources stated above. Meanwhile, less housework time are imposed on child under age 6 or even younger. So, if we restrict our research to children who experience household member migration at very early stage of their life (below certain age) and children who experience it when they get older, then the comparison of different height-for-age Z-scores between young children and old children in migrant and non-migrant household(a Diff's-in-Diff's method), can provide more reliable effect. The underlying assumption is that in the absence of father's migration, the difference of Z-score between younger children and older ones both in migrant and non-migrant household should be

the same. The treated group are young children whose dad migrate at their early childhood or infancy and control group are old ones. Also, I want to look at if this impact differs by gender. If girls are ignored and worse cared than boys, than the increased family income and mother's family income would improve girls' nutrition supply.

This paper will be organized as follow: section 2 introduces the historic background on Chinese economic reform and household registration system reform; Section 3 focuses on the theory of children's health function and Household Non-Unitary model; Section 4 provides detailed information on data and empirical strategy; and Section 5 concludes.

2   Background: Origins of Chinese Rural-Urban Migration

China's Household Registration System, i.e. *Hokou* system, is the central policy on population management since 1958. Each household receives a household booklet–*Hokou Book* from local government, which records the information of each HH resident and relationships between them. Households are divided into two categories by their registration status: Agriculture *Hukou* and Non-Agriculture *Hukou*. Agriculture Hukou holders consisting 83% of total population (1980 Data from Mallee 1995), are mostly rural farmers who are provided collective land and have annual grain procurement obligation. Meanwhile, Non-agriculture *Hukou* holders are urban residents with various occupations and have official grain rationing coupon of regular food supply. The rural-urban population flow is strictly restricted and controlled by central and local government, only few channels of moving are officially permitted (University and College admission, Military and Urban Enterprise recruitment, Marriage) (Chan and Zhang 1999). So, most population flows from village to cities and counties are temporary (Medical treatment, family visit). Under the central-planned economy and collective production system, this system was designed to keep peasants on their land in order to sufficient agricultural product provided to manufacture industries and infrastructure construction in urban regions. In long run, the rural and urban connection are cut off and two separated economy gradually formed.

Since the series of economic reforms starting 1978, an integrated labor market has gradually emerged and intra-province migration grows as follow:

2.1 Supply Side

The Institutional Reform initialed in Agricultural sector enhanced the production motivation for individual farmer. The Household Responsibility System (HRS) replacing Collective Production-Team System, becomes the main pattern of agricultural production. More important, market and price mechanism are introduced which correlated personal income with personal labor input. As a result, agriculture output are largely increased during 1978-1984 (Lin 1988, 1992; McMillan et.al. 1989). As another result of increased production efficiency and agriculture output, more and more labor are left out from agriculture sector and move to urban areas(near township, big cities and metropolitan). Almost during the same period, local government gradually released the restriction on population mobility: since mid-1980, a new individual identification and registration system –*ID card*, was officially introduced and gradually replaced the traditional *Hukou* System. Citizens could travel around China without showing a *Hukou* and related document (Brauw and Giles 2008). For example, a rural farmer who was issued ID card, is able to move to urban area and find a job there. Additionally, grain rationing coupons– food stamps only issued to non-agricultural *Hukou*holder, were abolished in early 1990, which means agricultural *Hukou* holders can buy food from market if they go to urban region and stay there.

2.2 Demand Side

The long-time economic and demographic separation enlarged the income gap between rural farmers and urban workers. According to Bao et.al (2009)'s work, the estimated urban-rural income difference was 391.94RMB per month, almost half of rural farmer's monthly income (in 1979 prices). After the registration system reform, intra-region labor mobility, especially rural-urban labor flow is officially permitted. From the other side, urban industries are in great need of labor (mostly low skilled labor) because of the development of township and village enterprises (TVE) and urbanization. In addition, under the background of globalization-FDI and domestic fix-asset investment have increased quickly and also create more employment opportunities for those rural left-out labor. As a direct result, the migration population rises sharply: In 1982 Census, about 6.6 million people (0.65% of total population) are counted as long-term migrations, in 1990 Census, this number has grown to 22 million (1.8%) (Mallee 1995). Based on 2000 Census, estimated intra- and interprovincial migration from 1995-2000 totaled

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over 144 million (Bao et al. 2009).

3   Conceptional Framework

According to Grossman(1972) model of health production, the health status H_i of child i at particular point of time can be written as:

$$H_i = h(M_i, T_i, K_i, B_i, \varepsilon_i),$$

Where M_i represents the medical and nutrition inputs into the health of child i, T_i encompasses the time inputs of the parent; K_i is parental health knowledge; B_i represents biological endowments such as genetic factors; and ε_i means random shock.(Hildebrandt and McKenzie 2005). So, if migration of one parent could increases the family income and consumption, then M_i would increase as a result of health investment. In the context of Non-Unitary Model, if the absence of one parent(like father is the migrant), then the other parent's bargaining power(mother in this context) would increase and she becomes the main person to decide resource allocation among children's health related expenditure and others. Especially, if we assume mother cares girls more, or treat her children more equally, then increased bargaining power would lead more resource allocated to girls relative to before. If this is the case, then we could expect there is positive impact of migration on children's health.

In particular, if children are better feeded and cares since early stage of their lives, this positive effect would produce long lasting effect and sustain until adulthood. There are large numbers of literature focusing on the long term effect of children's health and many empirical evidences have shown that the in-utero, infancy and early childhood health supply and disease environment significantly influence adult health condition, education attainment, labor supply and social economic status(Case and Paxson 2008a, 2008b; Maccini and Yang 2008; Meng and Qian 2009). Because the healthy and nutrient condition of early life, to some extent, determines the body constitution and cognitive ability(Case and Paxson 2008a) as well as their adult labor outcomes and social economic status.

Hoverer, T_i in Grassman's function will also be influenced in the context of migration. First, children have to undertake more housework to make up the reduced adult labor force; second, the

migrant parent would spend much less time with children, which would be negatively associated with children's physical and mental health. Some researches have found that children growing in single mother family are more likely to be more inferior in labor outcome and self-cognition relative to those who grow up in normal family. As a result, the effect of migration on children's health condition is not *prior* obvious, the estimates we get will be an overall impact, rather than a partial one.

4 Data and Empirical Strategy

4.1 Data Description

In order to study connection between migration and nutrition outcomes, we use 2000 China Health and Nutrition Survey(CHNS), conducted by University of North Carolina at Chapel Hill. The CHNS data set is a longitude survey covering nine provinces that vary substantially geography, economic development, health indicator and access to public resources. For this study, we use height, weight, weight-for-height(WFH) and height-for-age Z score as measurements of child health outcomes. The CHNS has the advantage that they are measured by the surveyor and hence avoid measurement problems from self-reported data. Because we are examining migration effect on younger and older children, we restrict to rural households with children aged under 14.

The summary of statistic description is shown in table 1. We can see that children in migrant household are on average shorter and lighter than children in non-migrant household. This is quiet consistent with our intuition that those poorer household with less assets stock are more likely to leave their home for higher wages.

4.2 Empirical Strategy

Our strategy exploit cross household and cohort variation in migration impact. We specify a reduced form regression of migration and health outcome. Consider child i in household h at cohort group t, his or her weight status can be expressed by:

$$HealthOutcomes_{iht} = \alpha + \beta(Migration_h \times Young_t) + \gamma_t + \varepsilon_{iht},$$

And the Diff-in-Diff equation is:

Table 1: Descriptive Statistics(2000 CHNS)

Variables	Migrant Household (1)	Non-migrant Household (2)
Height	132.67	133.38
	(13.76)	(12.91)
Weight(kg)	29.35	30.30
	(9.29)	(10.07)
Weight-For-Height	0.221	0.230
	(0.40)	(0.56)
Numbers of Obs.	123	640

Note: All standard deviations are in brackets,

$$HealthOutcomes_{iht} = \alpha + \beta_0 Migration_h + \beta_1(Migration_h \times Young_t) + \beta_2 Young_t + \gamma_t + \varepsilon_{iht},$$

The children's health outcomes can be expressed as a function of: a constant α; the interaction term of a dummy variable for whether the child's father has migrates before the survey date, and a dummy variable indicating whether this child is under age 6, i.e. in the young cohort; cohort fixed effect γ_t. Children aged 7-14 are reference group. We do not choose children aged 6+ as control group because we don't know the cutoff age after which migration and improved health supply would have less effect on their outcome. As a result, in order to address this concern, we compare young cohort age under 6 and 7-14.

Before we come to empirical regression result, we need two assumptions hold:

- Children in migrant sending household are more affected relative to those children who live in non migrant household.

- Children who were younger when their parent first migrate have long time of their childhood are under the effect of migration.

5 Results Discussion and Conclusion

5.1 Empirical Results

The regression results are shown in table 2. First three columns are results from simple OLS regression, and column (4) and (5) are results from DID regression. In this table, coefficients on migration are mostly negative but not significant, which there is no significant impact of migration on children health in sending household.

Table 2: Regression of Migration on Children's Health outcomes by Ages

Explanatory variables	Weight (1)	Height (2)	WFH (3)	Weight(DID) (4)	Height(DID) (5)
Constant	1.8238	86.22	7.395	0.064	85.094
	(1.596)	(1.656)	(0.144)	(1.887)	(1.961)
$Migration_h \times Young_t$	-0.5154	-2.651	0.269	-1.699	-3.677
	(4.73)	(4.913)	(0.426)	(5.162)	(5.366)
$Migration_h$				-8.30	-0.257
				(1.724)	(1.792)
$Young_t$				2.774	1.776
				(1.593)	(1.656)
γ_t	2.9152	4.833	-0.278	3.082	4.938
	(0.1599)	(0.166)	(0.014)	(0.185)	(0.193)

note: All standard errors are in brackets

5.2 Conclusion

In this paper, we have explored the relationship between migration and children health condition using a cross sectional data in rural China. From the regression results, we found no significant effect of father migration on children's nutrition status if father first migrates when child is under age 6. As suggestive explanation for these findings, we argue that migration of father would bring more household income, but at the same time, the influence of father absence would cancel out this effect. And one explanation could be that role of complete family setup is more important for children's well being during their early childhood based on our findings. Their health outcomes would be worse off if they experience migration of father at early stage of their lives. However, the effect we try to address is only in terms of short run. In the absence of complete migration history, we could not separate out the pure effect of migration on long run child health. The future effort can be made if better data is collected and more observations on migration side and household characteristics. The long run effect of migration on children's health condition and how lasting these effects will be is still needed to be explored.

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