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Migration Activities, Household Characteristic and Child Health in Indonesia

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Abstract

This paper investigates the impact of household characteristics on child health outcomes in Indonesia using Indonesian family Life Survey. This paper using birth wage, infant mortality and Z score to represent child health. Using Random effect method and random effect probit method, this paper found sending migrant household have larger amount of infant mortality case than non-sending migrant household. According to the findings, we know that sending migrant household dominated by families with low incomes. However, we also find food consumption have influence of child health in the families. These results provide a broader view of the economic characteristics of households and their consequences for infant health than is offered by the existing literature.

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1. Introduction

Labor migration from agriculture has become a fundamental issue in the study of development economics (Barrett, Carter, & Chavas, 2018; Lewis, 1954; Sen, 1966; Todaro, 1969). Chiodi et al, (2012) stated that the rural economy in the third world has stagnated so that the workforce chooses to migrate to be more prosperous. As part of the socio-economic aspect, rural-urban migration has both positive and negative

impacts on the biological and demographic aspects of society such as fertility, mortality, mortality, malnutrition, health and others (Bogin, 1981). Thus the study models trends in infant mortality for a more extended period of time than previous individual-level studies of infant mortality decline in less developed countries (e.g., DaVanzo 1988; Hale et al. 2009). The results show that better maternal education explains 15% of the infant mortality decline in Indonesia from 1980 to 2015 (Schellekens, 2021).

Existing research shows that migration has a significant impact on reducing household poverty, and improving living standards for people in developing countries (Adams and Cuecuecha, 2010; Nguyen and Purnamasari, 2011). Remittances have become an important component for households in meeting basic and investment needs. Nguyen & Purnamasari (2011) explained that they found that remittances had a positive influence on children's development through the presence of children in the family. This research intends to carry out activities on the impact of human capital by focusing on children's health conditions.

This study builds on previous research using survey data at the micro level in investigating the impact of migration on the welfare of migrant households in the area of origin (Adams and Cuecuecha, 2010; Nguyen and Purnamasari, 2011). IFLS data provides several household characteristics needed to produce a clear picture of the impact of migration activities on child health in rural households in Indonesia.

Hildebrandt et al (2005) suspect that migration leads to improved health in children through awareness of parents about health and increased income of parents. Fungsi produksi kesehatan Grossman, (1972) explains that there is a relationship between migration and health. The first is the direct effect where from migrating, households have additional income (remittances) so that there is additional income which of course is used for consumption activities on food, clothing and others so that this has a direct impact on health. The second is an indirect impact where there is an increase in awareness of migrants migrating to more developed areas so that they can take more careful actions in paying attention to the health of their families (children) in the area of origin. So that children's health can be improved through income and knowledge.

Research on the impact of migration on health is still limited. Kanaiaupuni et al, (1999) using data from 5 provinces in Mexico found that infant mortality increased in the early phase of the migration process and decreased after that, Frank and Hummer (2002) found that children from Migrants tend to be underweight. However, findings from Hildebrandt andc Mckenzie (2015) found that children from Migrants tend to be underweight. However, findings from. This study tries to provide an explanation of how the impact of migration on human capital (child health). Child health is an indication that a household is able to be more prosperous because it produces competent human resources.

This study tries to identify the impact of migration on children's health in households in Indonesia. Previous research still suspects that migrant activities lead to better children's health on the basis of increased household income levels so that they are able to provide adequate nutritional intake. But on the other hand, there are allegations that the poor health of the mother of the child can have an impact on the health of the pregnancy so that it has a risk of giving birth to an unhealthy baby and even causing death.

2. Literature Review

Maternal factors, such as age, parity, and birth interval, may mediate the effect of maternal education on infant mortality (Mosley and Chen 1984). For example, educated mothers tend to marry later and have fewer pregnancies. Thus, following previous studies, this study controls for maternal factors (e.g., Bhargava 2003; Hale et al. 2009; Murphy and Wang 2001). Nutrient deficiency is more likely to be a function of financial resources of the household than of the education of the mother (Mensch et al. 2019).

This section discusses the theory of demand for “health” commodities. In his paper, Grossman (1972) stated that health can be viewed as a "durable capital stock" where the output is "healthy time". It is assumed that individuals have an initial stock of health that depreciates with age and is increased through investment. Grossman (1972) explains that there is a “shadow price” component of health depending on several other variables apart from the price of health care. This shows that the shadow price increases with increasing age and will decrease with the education of an individual because educated people are more effective in health care.

Grossman's Intertemporal Utility Functions

In his paper, Grossman (1972) describes the intertemporal utility function of consumers:

$$U = U\ (\emptyset_0 H_0, \ldots, \emptyset_n H_n, \ldots, Z_n) \qquad (1)$$

Where H_0 is the inherited stock of health, H_i is the stock of health in period i_{th}. $\emptyset_0$ is the flow of stock services per unit, $h_i = \emptyset_i H_i$ is the total consumption of health services and z_i is the total consumption for other commodities in period. As in the intertemporal function, is the distance from a person's life and is an endogenous variable. So it can be stated that when $H_i = H_{min}$ then it is the time of death. The length of a person's life depends on the quantity of H_i where maximum utility is subject to the given production and resource constraints described.

By definition, the net investment in health stocks can be described as follows:

$$H_{i+1} - H_i = I_i - \delta_i H_i \quad (2)$$

Where I_i is gross investment and δ_i is depreciation rate in period. The rate of depreciation is assumed to be exogenous where the rate of depreciation can vary with a person's age. The level of investment in health can be broken down as follows by household production function:

$$I_i = I_i\,(M_i, TH_i E_i) \quad (3)$$

In this equation it is explained that investment decomposes based on M_i health care, TH_i time input and E_i is the stock of human capital. It is assumed that human capital can make investments in health run more effectively.

Grossman (1972) assumes that all production functions are homogeneous at degree 1 on goods and time inputs. Then the investment can be modeled as follows:

$$I_i = M_i g\,(t_i; E_i)$$

Under the condition $t_i = TH_i/M_i$ the marginal product of time and health care on the gross investment production of health can be written:

$$\frac{\partial I_i}{\partial TH_i} = \frac{\partial g}{\partial t_i} = g' \quad (5)$$

$$\frac{\partial I_i}{\partial M_i} = g - t_i g' \quad (6)$$

Migration has direct implications for the income received by households in the area of origin. When associated with the utility function of Grossman (1972), it can be seen that income and education of individuals have an influence on a person's health condition. So that the remittances obtained from doing migration activities will lead to an increase in health because one of the factors of is income.

3. Research Methods

This section describes the selection of variables that are used as proxies for child health and migration. The main variables are arranged systematically in order to test the hypothesis. There are several supporting variables which are referred to as shadow prices to achieve health. Namely some expenditures (sacrifice) by consumers in getting health.

With reference to Hildebrant and McKenzie (2005), this study uses birth weight and infant mortality as proxies for child health. The quality of maternal health has a very important role in giving birth to healthy children. In their paper, Hildebrant and McKenzie (2005), separate the model into two alternative parts. Model 1 uses category

Z score as the dependent variable and model 2 uses infant mortality as the dependent variable.

The Z score in infants is calculated based on anthropometric standards for assessing the nutritional status of children issued by the Ministry of Health Number: 1995/MENKES/SK/XII/2010. The calculation standard used is a combination of the child's age and weight. Where the age of the baby in the population data is 0 months because IFLS provides data on the birth weight of a baby in a household.

This study uses a dummy variable in describing migration activities. The migration variable is worth 1 if a person is outside the area (province) with the status of being at work. This study uses panel data of individuals who have children under 14 years old using 2 data periods, namely IFLS in 2007 and 2014.

The research model will be calculated using the fixed effect method where there are no variables invariant in time in the model so that the fixed effects method provides consistent estimation results compared to random effects or pooled least squares.

Estimated Models:

In testing the hypothesis, the empirical model in this study is as follows:

$$H_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 I_{it} + \beta_3 Ed_{it} + \beta_4 Age_{it} + \beta_5 RU_{it} + \varepsilon_I \qquad (7)$$

Description :

I	= household
t	= period
H_{it}	= child health (Z score/baby death)
M	= migrant household dummy
ed_{it}	= school year of head of household
$ageH_t$	= age of the head of the household
I_{it}	= income
RU_{it}	= village/city
ε_{It}	= error term

Research Hypothesis:

Assuming M=1 then

$$\frac{\partial H_{it}}{\partial M_{it}} = \beta_1$$

And

$$\beta_1 > 0$$

- ➢ The value of $\beta_1 > 0$ indicates that the migrant household has children with a higher z score.
- ➢ In the case of the dependent variable being infant mortality data, then $\beta_1 > 0$ indicates that the average migrant household has a lower probability of infant mortality compared to non-migrant households.

Data and Data Sources:
The data used in this study is IFLS (Indonesian Family Life Survey) data. The observation data used are household data in 12 provinces in Indonesia. The data used is data surveyed in the 4th wave of 2007, the 5th wave of 2014. The entire IFLS sample only represents 83 percent of the condition of the Indonesian population.

Variable Operational Definition:
1. Health condition

The formulation of the Z Score is carried out in defining the health of infants in a household. The assessment procedure for both the Z score and its categorization refers to the anthropometric standard for assessing the nutritional status of children issued by the Ministry of Health. This study uses weight standards in newborns to assess the Z score. As for households with 2 babies, their birth weight values will be averaged.

IFLS data provides information about the condition of the mother's pregnancy, especially regarding infant mortality and birth weight of the baby. Information on birth weight in infants is contained in column CH24, while CH25 and CH26 describe infant mortality in the form of a dummy.

2. Household per capita income

Per capita household income is measured based on income from work, income from business owned (net profit income) and non-labor income earned in the last year. IFLS provides information data on income from various sources. Income data obtained from work can be taken in book 3a, section tk and column TK25AY for main work, and TK25BY for side work. Then non-labor income can be seen in column HI14 in book 3 where all income received by all household members is added up. After getting the total household income within one year, the income data will be adjusted to the consumer price index so that the unit of money used is the real value.

3. Migration

This study looks at migration activities as an activity where there are individuals or several individuals in the household who are outside the province and abroad to work. The IFLS data provides information on the current place of residence for each household member in book K, column AR18i. In column AR18f there is information for household members who are outside the area, so that the migration status in this study is the presence of household members who leave the area to work.

4. Length of education of the head of the household

The length of education of the head of the household shows the capability of the head of the household in the field of education. The length of education is shown by calculating the length of schooling based on the last grade achieved at school. The last education can be defined as the length of education adjusted to the level of school completed, so that household members who finish elementary school can be defined as having a period of 6 years of education. The length of education can be seen in the AR section of the K book in the AR16 column.

5. Age of the Head of the Household

The age of the head of the household shows the ability of the head of the household to work and invest. The age of the head of the household also affects the productivity of the head of the household in producing so that the ability to accumulate assets is higher. For the reasons that have been explained, the age of the head of the household must be controlled in the research model. The age of each household member can be seen in the IFLS data book K, AR section AR09 column.

6. Village/City

Rural Urban can be identified from IFLS data by looking at where the household lives based on the separation between rural and urban areas. In the IFLS data, the data on the separation of rural and urban households is marked in column sc04.

7. Consumption

Consumption calculated in this study is the annual consumption of each household. As for consumption, the intended consumption is food consumption, non-food consumption and other consumption such as education and others.

4. Results

There are several estimation results that will be explained in this study. There are 2 approaches taken to see the relationship between children's health and household characteristics. the first model of child health using a dummy infant mortality at birth.

Infant Mortality Dummy Model

Following are the results of model 1 data processing.

.

$$DummyD\beta_{it} = 0.19loginc_{it} - 0{,}31logcons_{it} - 0{,}15DR_{it} - 0.004Educ_{it} - 0{,}28\ RU_{it} + 0{,}47\ Dmig_{it} + e$$

Data analysis of the infant mortality model used the random effect ordered probit regression method. Where the status of households that have experienced the loss of a baby due to death is 1 and has a status of 0 if the household has not experienced it. Consider the following table of estimation results:

Table 4.1 Estimation results panel data

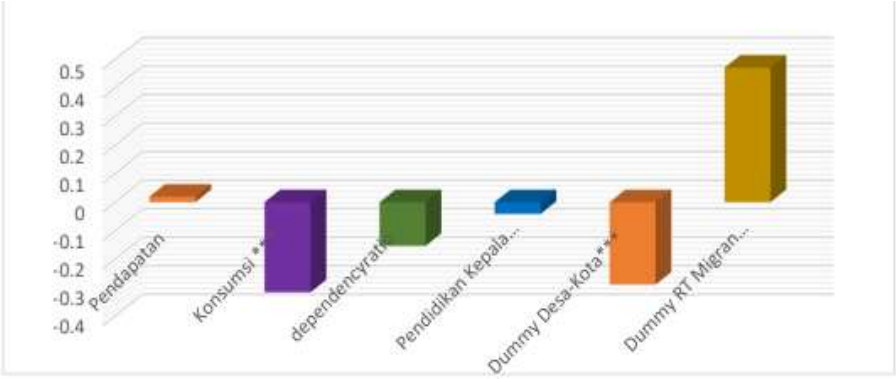
No	Variabel	Random Effect K	Random Effect Z Score	Probit Panel (Infant Mortality)
1	Log Income	0,009* (0,004)	0,024* (0,014)	0,0191 (0,0354)
2	Log Consumption	0,015** (0,005)	0,057*** (0,014)	-0,3158*** (0,064)
3	Dependency Ratio	0,033** (0,011)	0,174*** (0,031)	-0,153 -0,153
4	Education of Household Head	0,004*** (0,001)	0,004 (0,003)	-0,04*** (0,0132)
5	Dummy Rural Urban	-0,0272* (0,011)	0,065* (0,032)	-0,289*** (0,105)
6	Dummy Migrant Household	0,006 (0,016)	-0.013 0,046	-0.013 (0,128)
7	*Cons*	2,457***	-1.964***	
8	*R-square between*	0,014	0,014	
9	*R-square overall*	0,011	0,011	
10	*number of obs*	7576	7576	7575
11	*number of groups*	6116	6116	6116
12	prob > F	0	0	0

legend: * p<0.1; ** p<0.05; *** p<0.01

From the results of data analysis, it is known that the estimation model is significant. And there are several variables that can affect infant mortality in a household.

Look at the following graph:

Infant Mortality Model Coeficient Diagram



The estimation results show that household income has no effect on the risk of infant mortality in a household. but consumption of food has a significant effect. The results

show that the higher the level of household consumption of food will reduce the risk of infant mortality by 31.58%.

Furthermore, the education of the head of the household has an influence on the risk of infant mortality. The estimation results show that the higher the education (years of schooling) the head of the household will reduce the risk of infant mortality by 4% and the result is significant at the 0.002 level. This shows that the coefficient of the infant mortality model associated with the education obtained by the head of the household will cause pregnancy in housewives or other household members to be paid more attention and access to prenatal care can be better.

The area where the household lives can affect the risk of infant mortality in a household. It was noted that households living in cities had a higher risk of infant mortality than households living in rural areas. It was noted that urban households had a higher mortality rate of 28.9% than rural households.

Meanwhile, migration activities by one member of the household will increase the risk of infant mortality in the household. The average infant mortality rate in migrant households is 47.17% higher than in non-migrant households. This shows that the characteristics of migrant households in the data population are households that have low economic capacity.

Baby health model using Z Score

After estimating using the random effect method, the estimation model can be arranged as follows:

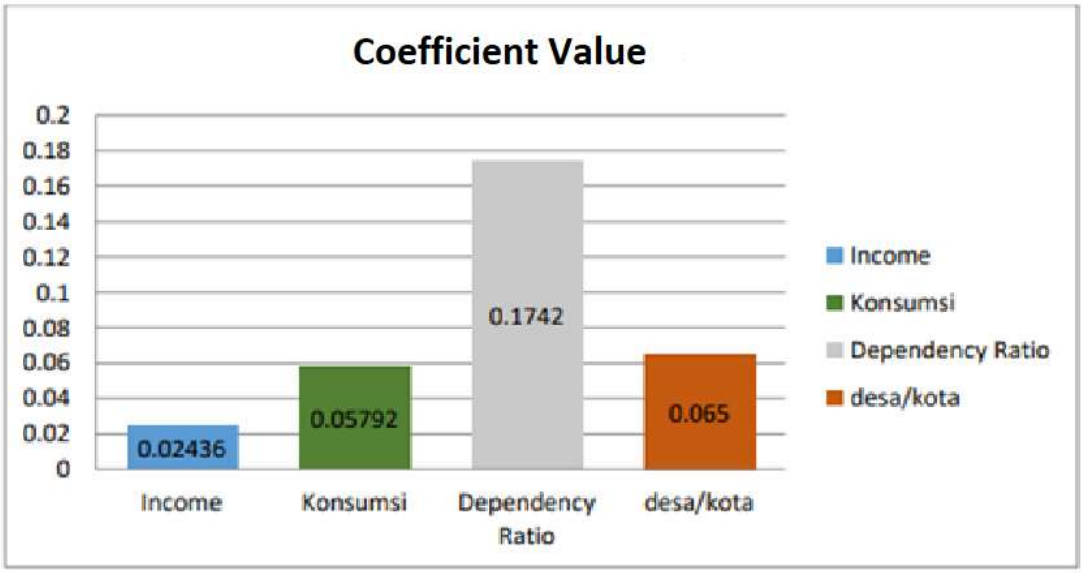
$$Z\ Score = -1.96 + 0.02\ loginc_{it} + 0.5\ logcons_{it} + 0.17 DR_{it} + 0.004\ Educ_{it} + 0.06 RU_{it} - 0.01\ Dmig_{it} + e$$

Ket:

$Z\ Score_{it}$ = Score Z
$loginc_{it}$ = Income (*)
$logcons_{it}$ = Consumption (***)
DR_{it} = Depedency ratio (***)
$Educ_{it}$ = school year of head of household
RU_{it} = Dummy Village/town (*)
$Dmig_{it}$ = Migrant Household Dummy

P < 0,05 (*)
P < 0.01(**)
P < 0.001(***).

See the diagram below.



Source: IFLS data (processed)

The results show that migrant households have no effect on the health conditions of infants in a household. Contrary to previous research, birth weight in Indonesia is significantly influenced by household income, consumption, dependency ratio and location of residence (rural/urban). Income has a positive effect on the baby's Z score at birth. However, the level of consumption of a household has a greater influence than its income. It is known that an increase in income of 1% will increase the Z score by 0.02, but an increase in the level of household consumption will increase the Z score by 0.5.

Furthermore, the dependency ratio has a positive influence on the Z Score of infants in a household. The increase in the value of the dependency ratio will increase the value of the Z Score by 0.17. And the last one is the village/city dummy. From the estimation results, it is known that the average household living in the village has a baby Z score of 0.06 lower than the z score of infants in the city. This relates to facilities and knowledge of health for pregnant women who are in better cities.

5. Conclusion

The main information to be explored in this research is the prediction of the impact of migration on children's health conditions. The results show that migrant households do not have a relationship with the Z score level of babies born in that household. In the second model, it is found that migrant households actually have a higher probability of 47.17% experiencing infant mortality compared to non-migrant households.

The findings of this study are contrary to the hypothesis that was built based on previous research. In exploring this, the researcher tries to understand the income structure of the entire population of research data. It was found that migrant households are dominated by households with low incomes so that the condition of the mother's pregnancy in this household is affected. It is known that economic factors are important factors to influence health conditions in a household.

Another interesting finding is that the level of food consumption in a household has a much greater influence than the level of income on the health condition of the baby. This can be an important contribution for policy makers that basically the need for pregnant women in maintaining health is the consumption of food.

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