Height of Children in Rural Areas and Impact of MGNREGS

Ganita Bhupal

Department of Economics Rajdhani College
E-mail: ganitabhupal@gmail.com

Abstract—*Health of the children constitutes an important policy outcome for any economy. Health has wide ranging impacts starting from the well-being of individuals to productivity and earnings. A very important indicator of children's health is their height. Focus on rural areas of India for the heights of children is an important exercise because of the prevalence of high malnutrition and undernutrition rates in rural India.*
I assess the impact of MGNREGS on the health of children in rural areas of India using child height. The MGNREGS is the employment guarantee scheme and was started in 2006 to provide employment in the rural and poor households of India. This scheme has been widely appreciated for its developmental benefits and a number of studies have analyzed the spill over benefits of this scheme. However, there have been only a handful of studies which analyze the impact of MGNREGS on the health of children and these too, have been confined to a few select areas of India.
I use data from India Human Development Survey (IHDS) - 2 to analyze nation-wide impacts of this scheme on health. Propensity score matching has been used to account for the self-selection of households in the scheme and use of linear regression is made to estimate the impact of MGNREGS on heights of children using district fixed effects. The results suggest that both participation and income from the scheme have positive and significant impact on the height of the children. This study corroborates the results from the past studies at a much broader level and hence, establishes the importance of this scheme for various developmental outcomes.

1. INTRODUCTION

Health of children constitutes a very important and crucial outcome for the policymakers all over the world. The health outcomes in childhood are connected to a number of other lifelong outcomes, such as long term health of individuals, their learning and cognitive capabilities, the wages and earning they make all through their lives [1,2,5]. One of the most important outcomes for health that has been studied extensively in the economics literature is the height of children [4,5]. Height of individuals is a very important indicator of the long term cumulative health. It represents the care and nutrition that individuals were exposed to in the early years of their life and it also reflects upon the genetic structure of individuals [4]. One of the most important aspects of using children's heights as an indicator of their health is that it reflects short term gains in nutrition and care [5]. Therefore any policy that induces households to make changes in care and nutrition of children can be evaluated by assessing the impact of this scheme on children's heights.

I use this indicator of health to estimate the impact of MGNREGS on the health of children in India. MGNREGS is an employment generating scheme which was started in India in 2006 and it guarantees the provision of unskilled manual work to adult members of all rural households for a maximum of 100 days in a year (GOI, 2006). Thus it guarantees employment generation as a right to people. If people do not get employment after 15 days of application, they are eligible for an unemployment allowance. Since MGNREGS is a legislation based scheme to provide gainful employment and is universal in nature, it is self-targeting and therefore, there arise issues of selection bias and endogeneity. To undertake correction for this econometric issue, I use the method of propensity score matching. Using IHDS 2 dataset and using the above mentioned technique, I find that the participation of households in MGNREGS positively affects the height of children below 11 years of age. However, I do not find any significant impact of the income earned from the scheme on the height.

The main contribution of this paper lies in the fact that it identifies the effects of the employment generation scheme on the health of children all across mainland India. There are other studies which have estimated the same effects, but either the dataset is confined to only a few select districts and states, or the methodology does not correct adequately for the selection bias. To the best of my knowledge, this is the first study to estimate such large scale impacts.

The rest of the paper is organized as follows: Section 2 discusses the review of literature, Section 3 discusses the data, Section 4 presents the methods used; results are discussed in Section 5 and Section 6 concludes.

2. LITERATURE REVIEW

The literature on the evaluation of the MGNREGS is both analytical and anecdotal. A number of studies have explored the impact of MGNREGS on outcomes of policy interest

including the objectives that it was supposed to meet. The impact on rural labour force participation, out-migration of labour from rural hinterland, changes in the structure of labour force, impact on the rural and urban wages in agricultural and non -agricultural sector are some of the most studied variables in this context.

Studies which analyze other developmental outcomes in terms of the spill over effects cover a broad range of topics too. Studies relate the increase in labour force participation of women to other outcomes of interest like change in the expenditure patterns of the household, the expenditure on health and nutrition, change in educational outcomes and school attendance for children etc.

The studies which analyze the impact of MGNREGS on health directly are limited in number

Studies have analyzed the impact of participation in MGNREGS on mitigating the effect of drought in the arid regions of Andhra Pradesh [3].

3. DATA

The study uses data from the second round of India Human Development Survey-2011-12.The dataset is a rich source of information on the sources of income, expenditure, health, education and other household variables. The information on the participation in MGNREGS was collected through various questions about participation, income and the amount of time in the scheme. I have used two variables for the MGNREGS: first, the participation in the scheme, used as a categorical variable if anyone from the household participated in the scheme in the past year, and second, income earned from the scheme in the past one year. I use data from 23,227 households for the preliminary estimation and about 7,648 observations on children for the estimation of height. The description of variables and their basic statistics are displayed in Table 1.

Table 1: Descriptive Statistics

Variable	Description	Mean	Standard Deviation
Ht	Height of children (in cms)	85.929	21.185
Nreg-part	Household participation in MGNRGES (0=No, 1=Yes)	0.5	0.5
Income-nreg	Income from the scheme	2840.332	4533.196
Hindu	1 if Hindu,0 otherwise	0.885	0.319
Brahmin	1 if belongs to Brahmin caste, 0 otherwise	0.022	0.148
Per capita consumption	Measured in rupees	13377.6	8313.543
Own-land	Land ownership (1=Yes, 0=No)	0.678	0.466
Num-Persons	Number of persons in the household	6.39	2.448
Assets	Total number of assets in the household	10.352	4.821
HH-Educ	Highest education in the household	6.349	4.581
Mem-mahila	1 if member of village manila manual, 0 otherwise	0.052	0.223
Debt	If the household has debts (1=yes, 0-no)	0.665	0.471
Male-chld	If the child is male (1=Yes, 0=No)	0.514	0.499
Age	Age of the child	5.151	3.184
Ante-natal checks	Number of Ante -natal checks	3.619	2.35
Birth size	Mother's perception of size of child at birth	2.129	0.527
Incidence	If the household faced any major incident (1=Yes, 0= No)	0.703	0.456
Media	If any adult member has exposure to mass media (1=Yes, 0=No)	0.706	0.455
Age-moth	Age of the mother	31.95	8.285

4. METHODOLOGY

Since MGNREGS is a universal programme and the participation of households is based on self selection, the data can exhibit issues related to endogeneity. The households which are more prone to participate could be more aware and hence, could be more concerned about the health of the children. In this case, the regression estimate could be upward biased due to omission of unobserved characteristics of the households. To account for such issues and to correct for biasedness and inconsistency of the estimates, some remedial measures must be undertaken. I use propensity score matching to undertake this correction. The propensity score matching involves matching the treatment and control group on the basis of observable covariates and then identifying the observations from the control group which are similar to those in the treatment group. Thus the unmatched observations are discarded and one is left with a subsample of the original with characteristics similar across the treatment and control group, thus making the two groups comparable.

The matching is undertaken by running a binary model on the data such that the probit or the logit model identifies the determinants of participation in the program. The matching is then performed using the propensity score obtained from the model. The unmatched observations are discarded in favour of the matched sample. The richness of the IHDS dataset is useful in this regard. Employing this data, I have used a number of covariates which explain the participation in the scheme. These are : caste, ethnicity and religious affiliation of the household, the number of members in the household, the asset level of the household, debt, incidence, non –NREG income of the household, whether the household owns land

etc. The results from the probit analysis are displayed in Table 2.

Table 2: Results from Propensity Score Matching Probit Model

Variables	Coefficients
Hindu	0.344***
Brah	-0.206***
Per Capita Consumption	-1.41e-05***
N Persons	-0.009**
HHEDUC	-0.02***
Media	0.101***
Debt	0.181***
Own- land	0.246***
Mem-Mahila	0.334***
Incidence	0.053**
Poverty	-0.0005**
Assets	-0.033***
Constants	-0.290*
Observations	23,277

After dropping the observations from the propensity score matching, the leftover observations are about 7,648. The regressions results are performed on this data with the inclusion of district fixed effects. The set of variables that form the main covariates are: ethnic and religion variables (indicator), household characteristics - assets of the household, poverty line status, highest education in the household, age of the household head, exposure to media, child characteristics - whether the child is male, age of the child and mother's perception of the size of the birth of the child. Apart from this, other variables including the debt status of the household, whether the household faced an incident which led to reduction in income or expenditure etc. were also used in the regression. These results are reported in Table 3.

Table 3: Results from the Regression Model on Matched Sample

Variables	Coefficients	Coefficients
Hindu	1.496***	1.485***
Brah	-0.263	-0.246
Per Capita Consumption	2.06e-05	1.96e-05
Education	-0.056	-0.055
N Pesons	-0.262***	-0.262***
Media	-0.460*	-0.646*
Debt	-0.121	-0.127
Own- land	1.100***	1.095***
Mem-Mahila	-0.813	-0.839
Incidence	-0.298	-0.295
Age- mother	0.088***	0,088***
Assets	0.183***	0.183***
Age	6.716***	6.717***
Brth-Size	0.365	0,359
Male-child	1.440***	1.435***
NREG-part	0.579*	
INCNREG		2.99e-05
Constant	56.16***	56.48***
Observations	7648	7648
R-Square	0.699	0.699

5. RESULTS

The results from the propensity score matching analysis are displayed in Table 2. The results suggest that the main factors which influence the participation of households in the MGNREGS positively and significantly are being hindu, exposure to mass media, land ownership, the female membership in mahila mandal, debt burden on the household and incidence of major events causing a decline in expenditure. The cumulative assets and per capita consumption of the household have negative influence on the probability of participation. I use nearest neighbor (1) matching with a caliper size of 0.2.

After the matching is carried out, the final sample carries about 7,648 observations. This sample is used for final analysis of assessing the impact of MGNREGS participation and income from the scheme on the height of children. The results suggest that the participation in the program increases the height of children by about 1.33 cms. In effect, I find that the children belonging to the participating households are about 0.576 cms taller on average than the children from the non-participating households. This is a huge impact considering that the there are high rates of prevalence of malnutrition in rural areas of India.

If the same model is analyzed using the income from the scheme as the main regressor, I find that the coefficient on this estimate is about 0.000964 indicating that a one rupee increase in the income from the scheme translates into a 0.0002 cm increase in the height. Even though, statistically there is not much economic sense to this interpretation, the analysis does reveal a positive increase in the height of children with increasing income from the program. The results, thus suggest that not only is the participation in the program important for an increase in the height of children, the importance of the income is also established. If one considers the fact that most of the participating households are poorer and belong to marginal sections of the society, the impact of participation as well as the income generated from the program makes a significant difference to the health of children.

Among the other variables of interest, the major variables which affect the height of children, the age of children, being a male child are strong predictors of the height. The affluence level of the household and per capita consumption determine the height of the children positively and significantly.

6. CONCLUSION

This paper undertakes a propensity score matching exercise to assess the impact of MGNREGS on the health of children across India. I use data from the second round of India Human Development Survey and use propensity score matching to account for selection bias. After dropping the unmatched observations, I use a linear regression approach to estimate the effect of NREGS participation on the height of children below seven years of age. The results suggest that both participation

in the program and the income generated from the program have a direct positive consequence for the height of children. The children from participation households are 0.567 cms taller on average than the children from non-participating households. This makes a huge difference considering the fact that taller children have better life outcomes than their non-tall counterparts.

REFERENCES

[1] Case, A. and Paxson, C. "Stature and status: Height, Ability and Labor Market Outcomes. NBER working paper no.12466. 2006.

[2] Case, A. and Paxson, C. "Causes and Consequences of Early Life Health. NBER working paper No. 15637. 2010.

[3] Dasgupta, A. Can the Major Public Works Policy Buffer the Negative Shocks in Early Childhood? Evidence from Andhra Pradesh, India. December, 2012. Available at http://cega.berkley.edu/assets /cega_events/49/Session_2B_Early_Exposure_and_Later_Life_ Outcomes.pdf

[4] Deaton, A. " Height, Health and Development". Proceedings of the National Academy of Sciences of the USA. 2007.

[5] Deaton, A. "Height, health and inequality: The distribution of adult heights in India." January, 2008. ouAvailable at SSRN:http://ssrn.com/abstract=1085880.

[6] Dewey, K.G. and Begum, K. " Long-term Consequences of Stunting in Early life" Maternal and Child Nutrition. October, 2011. Supplement 3:pp 5-18