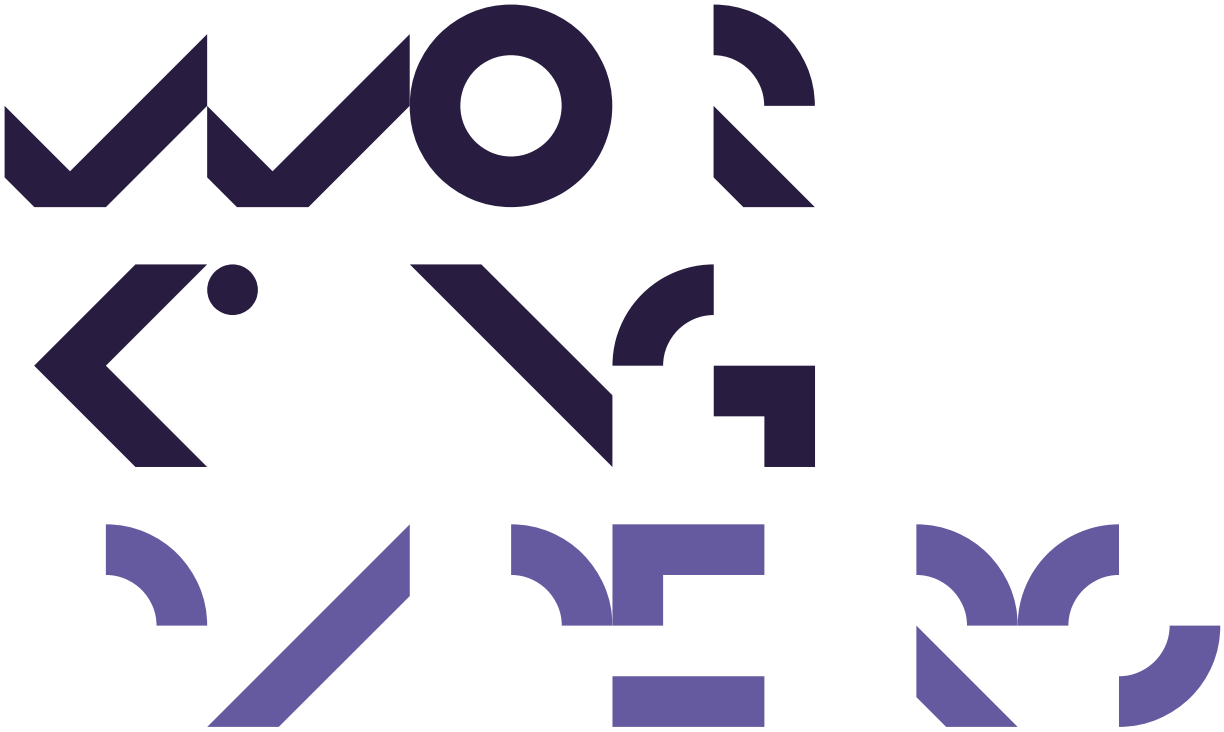

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The Impact of Household Membership in Community Based Organizations on Child Health and Education in Rural India

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Abstract:

This paper explores whether rural Indian households' membership in community based organizations (CBOs) affect child human capital formation in terms of health and education. Using the 2005 Indian Human Development Survey (IHDS), both OLS and IV models show that membership in one or more CBOs improves child educational performance. When considering specific CBOs, women's groups (*Mahila Mandal*) emerge as being best at reducing child malnourishment while youth clubs are beneficial for both child health and education. Religious groups have a negative impact on child health but improve school performance. Caste associations have a detrimental effect on both health and education.

1. Introduction

Community based organizations (CBOs), i.e., village-level community groups, are considered to be important forms of social capital (Grootaert et al, 2004). In developing economies, they may be influential channels of participatory development at the bottom of the pyramid. Access to community resources through social capital may generate important spillover effects that aid human capital development, a crucial ingredient of inclusive growth. On the other hand, collective action formed by membership in these organizations have been found to drive household decisions at micro and macro levels in both beneficial and less beneficial ways (Woolcock, 1998). Thus, it is important to understand the influence of such organizations on intergenerational aspects of household decision-making, for instance, the decision to invest in child human capital, since decisions impacting future generations have lasting consequences.

The purpose of this paper is to investigate the impact of membership in CBOs on child human capital—here child health and education—in rural India. In the development context, the major concern in case of child health is malnourishment while that in case of education is absenteeism and poor cognitive skills. The questions we wish to analyze are: what determines participation in community based organizations? And, what is the relationship between community based organizations and child health and education?

We make an important methodological contribution to the literature by allowing for the endogeneity of CBO membership in the determination of child health and education outcomes. Households that are more likely to take up CBO membership may be precisely the ones that invest more in their children's health and education on the strength of their unobserved characteristics leading to bias in the estimated effect of CBOs on child outcome. We therefore estimate both OLS and IV(2SLS) models and compare them via the Hausman test. The paper unfolds as follows: In section 2 we define CBOs in the Indian context. The literature review in section 3 reports the findings from a

number of current studies in the area. Details of the empirical methodology and data are explained in section 4, after which data description is given in section 5, to explain the basic facts about the data being studied. In section 6, the results from the econometric models are analyzed and in section 7 a discussion and a conclusion are offered.

2. Community Based Organizations

Our study explores the importance of *social capital* on the development of *human capital*. Coleman concludes that social capital comes about through changes in social relations which facilitate action (Coleman, 1988). Similar views are also expressed in a number of other studies (Cattell, 2001); (Kearns, 2001); (Woolcock & Narayanan, 2000)) i.e., that social capital implies using the strength of networks to create a unique communal identity that helps to mobilize individual resources toward achieving a common goal. Social capital consists of both subjective and objective aspects (Vanneman et.al, 2006). While the subjective aspect consists of 'trust in people' and 'confidence in public institutions' our study focuses on objectively measured social capital consisting of membership in CBOs.

CBOs are voluntary membership organizations consisting of a group of individuals organized into a self-defined community. The main aim of such organizations is to serve the common interests of their members including production, consumption, pooling of resources or delivery of services. In an Indian context, organizations such as women's groups, credit/saving groups, youth clubs, cooperative groups, religious groups, caste associations[i] and local NGOs all are categorized as community based or grassroots organizations (Arrossi, 1994).

Women's groups (*mahila mandal*) are the federations designed to help women to participate in rural activities and assist in formation of women-oriented self-help groups (Das, 2000). Self-help groups or SHGs are generally groups of individuals formed voluntarily in communities to extend

microcredit facilities to its members. Members gather regularly, typically every week, to pool their savings and lend from their accumulated pot to members at an interest rate designed to cover costs (Bauer, Chytilová, & Morduch, 2012). They also provide platforms for discussions of social issues (Bruderle & Chakravarti, 2009). Youth clubs are formed with the objective of involving young people in the process of development by offering sporting, recreational and educational activities. Village cooperatives are formed with the aim of pooling of member resources. They may be in the form of production cooperatives, consumer cooperatives, saving societies or marketing cooperatives.

Studies suggest that CBOs are important catalysts of development in rural communities by providing economic security and bargaining power to their members through mutual cooperation and collective action. They may also generate additional social capital through fostering feelings of mutual trust and interdependence among members (Rindell & Robinson, 1995). Due to their 'local' nature, CBOs have a better understanding of the needs, priorities and capabilities of the community in which they operate and by communicating these needs and capabilities to the policy makers they may give their communities a voice (Opare, 2007).

Membership in a CBO, thus, is not only a means to have access to resources but also a source of information and support. As such, they may serve as an important vehicle for, especially, poor rural households to gain access to the institutions and information channels that can best enhance their children's health and human capital.

3. Literature Survey

Numerous studies have been conducted on CBOs and their importance in integrated rural development. Most of the studies are based on comparitive country-level analysis of various Asian experiences, in China, India, Bangladesh, Sri Lanka etc. The conclusion arrived at by these studies is that CBOs must facilitate institutional development/strengthening to bring about integrated rural development. But few studies have actually documented a positive impact of these organizations on development at the micro level.

The effect of interventions and creating awareness among communities through community based organization is tested with the help of a randomized experiment in northern Indian villages (Duflo, 2007). The results show improvements occurring in the village just through creating awareness through meetings on the roles and responsibility of the Village Education Committee and interventions to improve children's performance in school. Such an exercise improved information gaps and some villages increased their engagement by hiring more contract teachers. Plus, there was improvement in the educational outcomes as well, which was achieved by empowering individuals to improve teaching in their own communities.

In another paper, Duflo and others evaluated efforts to improve education in Kenya, and found that the empowerment levied on the local school committee helped them to oversee the teacher recruitment process, effectively monitor teachers and to hold structured classes, thereby improving the performance of children (Duflo et.al, 2012).

In a randomized field experiment on community based monitoring in Uganda, the purpose was to investigate citizen-clients' ability to hold providers accountable (Björkman & Svensson, 2009). The study revealed that the community based monitoring project increased the quality and quantity of primary health provision, as the communities became more engaged and began to monitor the

health unit more extensively. Through the process of training and making the local health communities aware of their rights and providing incentives to these health workers, they are able to monitor the health providers. The effect of this intervention was seen in a difference-in-difference analysis between the treatment and the control group and showed marked improvement in health. This reveals the effectiveness of community involvement in improving health facilities in rural areas.

While randomized trials are undoubtedly considered the gold standard when making causal inference, they are generally based on small samples and are restricted to testing the effect of a single institutional aspect of community organizations at a time. However, villages typically contain a multiplicity of CBOs and the question of which type of CBO most facilitates development becomes prohibitively expensive to test employing RCT methodology

Very few micro-level studies connect CBOs to human capital development (health and education), and even fewer studies consider the impact of this objective component on the health and education of children. However, there is a literature suggesting the role of social capital as a whole in accumulation of human capital. Coleman (1988) hypothesized that generation of human capital depends upon social capital of the household as well as the community level social capital. It provides the resource base from which a child can draw, and thus it encourages educational achievement in the child. That study estimates the impact of family and community level social capital on the likelihood of children dropping out of high school. The analysis shows that the amount of social capital that the child has access to decreases the likelihood of child dropout (dropout rates of children with the highest level of social capital are 22.5 percentage points lower than those with the lowest level of social capital). Teachman, Paasch, & Carver (1996) also use a logistical regression model to determine whether social capital affects the probability of children dropping out of school. Iyengar (2011) has studied the impact of social capital on school

participation in India within a mixed methods approach. According to her, adult literacy, socio-eoconomic factors, caste and religious affiliations explain the level of social capital. Her study measures the impact of social capital on enrollment using HLM models. Furthermore, in a case study she finds women's self-help groups to be effective in terms of increasing school enrollment. She also concludes that different components of social capital must be studied seperately to assess their impact rather than combining them into a composite measure.

Concerning the link between health and social capital, studies have shown that social capital is a crucial factor affecting child health. One such study concludes that social capital plays a significant role in child welfare in terms of child health and development. They find that the families living in the areas without such social networks and formal organizations have low levels of child welfare (Gordon & Jordon, 1999). Harpham et al (2006) studies the importance of mother's social capital in terms of membership in CBOs and social networks i.e. structural social capital as well as trust and other type of cognitive social capital. The study concludes that social capital in general has strong associations with child health. Child health is measured by anthropometrics and mothers' reports of acute and chronic physical health problems and child mental health. Also, the study finds that this association is higher for children in infancy. According to their results, membership in CBOs is comparitively less damaging for children in early ages (0 to1) than in later ages (8 years). The study uses cross sectional survey data on children aged between 6-18 years and analyses the data using simple linear and logistical regressions models for anthropometric outcomes and other outcomes, respectively.

The above literature substantiates the significance of investigating the impact of household membership in CBOs on child health and education. However very few of the existing studies are empirical in nature. Among the few empirical studies, none differentiate between the impact of different types of CBOs on education and health outcomes of children. The current study not only

differentiates the impact caused by different community based organizations but also introduces relevant measure of educational outcome defined as test scores in reading, science and mathematics to understand impacts on cognitive abilities of children and absence in school to understand the level of engagment in school. Our study is thus unique because it emphasizes on impact on school absence in school which is an important factor in educational success an area that remains largely underexplored. Children who remain absent frequently may fall behind in school and that may affect the cognitive development of the child ((Sparkes, 1999); (Roby, 2004); (Nasim, 2010)).

An important methodological innovation in our study in relation to existing studies is to recognize the endogeneity of CBO membership in both child health and education. Even after controlling for caste, religion, economic status and the educational background of the head of household, there may be important unobservable factors that drive both a household's decision to participate in such organizations and their children's absence from school and cognitive performance. For instance, households that have higher expectations/ambitions for their childrens' future human capital may both encourage children to invest more in school/healthy lifestyle and themselves self-select into CBOs and social networks to be able to gain valuable information and access to resources. If this is the case, then failing to take account of this omitted factor (parental expectations/ambitions) may bias upwards the effect of CBOs on child health and education. To address this potential problem and be able to make causal inference, we use IV methods to correct for endogeneity of CBOs.

4. Theoretical Framework and Methodology

Empirical studies investigating the relationship between social capital and other forms of capital typically focus on the impact of social capital on accumulation of human capital. Investment in human capital by the household consists of investment in both, education as well as health (Becker, 2009), while objective social capital consists of CBO membership (Vanneman et.al, 2006). Generation of human capital depends on the household's financial capital, human capital of parents and social capital (Coleman, 1998). Thus accumulation of social capital is in addition important for raising human and financial capital of the household.

The model can be written up as follows:

$$CHK_{i,j,k} = \gamma 0 + \gamma_1 HHHK_{i,j,k} + \gamma_2 HHFC_{i,j,k} + \gamma_3 HHSC_{i,j,k} + \varepsilon_{i,j,k}, \quad (1)$$

where, for child *i* in family *j* of village k, CHK is child human capital (health & education) which incorporates short term and long term malnourishment status based on Z - scores according to the WHO standards concerning weight, height and age of the child. (For details refer appendix 5.1), and the probability of school absence and test scores (reading scores, mathematics scores and writing scores) which correspond to the two most important educational outcomes, attendance in school and level of cognitive development. HHHK, the household's human capital, HHFC, the household's financial capital and HHSC the household's social capital consisting of membership in CBOs. Thus, we allow for different kinds of household investments in children. A more stringent formulation may envision social capital as the means through which human and financial capital can be accessed (Teachman, Paasch, & Carver, 1997). So, even if the household has a large amount of human and financial capital, if social capital in the form of links to the community is low, the child will not be able to access other forms of capital. This would imply a threshold model where (1) holds only when HHSC > τ, a certain level. The level of social capital in this study is determined

based on membership in at least one of the nine community organizations[ii] may not be sufficient to explain the level of human capital that the child can accumulate by accessing the HHSC. Here, the quality of HHSC may also be essential. This paper attempts to measure the quality effect in CBO membership on children's human capital by controlling for membership in each of the nine different CBOs seperately, so as to evaluate which type of CBOs can be considered high quality organizations that enhance child health and education.

As stated in the theoretical model, the level of HHSC is the main control variable in the study. It includes membership in CBOs,which may not be completely exogenous as it may be affected by certain unobserved factors that may influence participation in community level organizations as well as children's human capital (CHK) creating omitted variable bias. For instance, households having certain proactive members may participate in certain groups or form certain networks, and their proactiveness may also affect the level of their children's human capital directly. Another potential unobserved factor may be the location factor. This concern may arise if certain households choose to live in areas where there are more community level groups or availability of medical facilities and schools that keep children healthy and allow them to obtain an education, which may create selection bias. But in the rural Indian context, that seems highly unlikely, as people live in their ancestral homes near their agricultural lands or other ancestral properties (Kingdon & Dréze, 2001). Therefore, intra village or inter village migration is a very rare phenomenon. Thus, the location effect may not be an issue.

The existence of reverse causality among CHK and HHSC may also be one of the reasons for an endogeneity concern to arise. In case of health, if children are malnourished (either wasted or underweight), households may try to become members of organizations or form certain networks. In case of education, if children remain absent in schools or score low in tests, then households may

try to acquire membership in organizations or form networks in important institutions in order to overcome these problems.

Such endogeneity concerns call for an instrumental variables approach. In this study, we use a supply variable ('availability of CBOs in the village') to instrument for endogeneity in case of HHSC. According to Vanneman et.al, membership in CBOs is dependent on availability of these community organizations, but it does not fully explain membership because it is not the ultimate precondition for the membership. If organizations are not present within the village, households do have an option to seek membership in organizations available in the nearest village or create new ones. Also, one has a choice of not to join the organization regardless of its availability. Thus, this instrument influences membership directly but does not determine it. We argue that availability of CBOs in a village will affect health and education of children in the households only through membership in such an organization. The benefits offered by the CBOs is mainly for its members so we argue that the impact on education and health is through membership in CBOs, hence, we rule out any spillover effects to non-members. In fact, we find it is strongly correlated with the endogenous regressor in both health and education models with t- values significant at the 99% confidence level, which aacounts for the stength of the instrument. 90% of the villages have one or more CBO available in the village. So after controlling for other infrastructural factors the instrument should be valid since the availability of CBO does not seem to depend upon other confounding factors

Since some of the CHK have ordered multiple outcomes (health measures and test scores) and and some are measured as binary outcome (absence in school), linear probability is imposed on each in order to achieve efficiency of the IV model. The two stage least squares model can be defined as:

$$CHK_{i,j,k} = \gamma 0 + \gamma_1 HHHK_{i,j,k} + \gamma_2 HHFC_{i,j,k} + \gamma_3 HHSC_{i,j,k} + \varepsilon_{i,j,k} \quad \text{.... (second stage)}$$

$$HHSC_{i,j,k} = \partial 0 + \partial_1 HHHK_{i,j,k} + \partial_2 HHFC_{i,j,k} + \partial_3 ACBO_k + \varepsilon_{i,j,k} \ldots.$$ (first stage)

Where, $ACBO_k$ is availability of CBOs in a village k, an IV for HHSC where $\partial_3 \neq 0$.

The Hausman tests (presented in appendix 2) show that the results of OLS were not statistically different from the two stage least square results, since p values > 0.05 in all cases. Hence the test fails to reject the null hypothesis and OLS results are found to be consistent and efficient. This implies that HHSC can be treated as a independent control variable in the model.

We use maximum likelihood estimates to measure the impact of HHSC on CHK. Since child health can vary according to the nutritional status, there is a clear ordering in case of health outcomes from severely and moderately malnourished to over-nourished, which justifies the use of an ordered probability model.

However it is important to note that severely and moderately malnourished children have an elevated risk of mortality compared to children over-nourished or mildly malnourished as per the WHO, hence, we only interpret effects of HHSC on the probability of being severely and moderately malnourished children. Similarly, in case of test performance, outcomes are clearly ordered from least score to highest score, leading to our interpreting the marginal effect results of only the least preferred outcome i.e. not being able to read, write or recognize numbers as children in this state of skill development need most help and attention. School absence (whether child remains absent for 1 or more days) is determined using a binary response model (Desai, 2010).

The study uses 2005 India Human Development Survey's (IHDS) cross sectional data which has been collected during the period of one year. It is a nationally representative survey conducted jointly by researchers from University of Maryland (USA) and National Council of Applied Economic Research in New Delhi (India). To measure health status, we look at children in the age

group of 0 to 5 years and educational status is measured for the children in the age group of 6 to 14 years since these age groups are considered as critical for measuring outcomes related to schooling and malnourishment respectively. Since, both individual and household characteristics are of interest in the study, rural household data is merged with rural individual data, based on a unique identifier. In order to incorporate village infrastructure, this data is further merged with village level data.[iii]

5. Data Description

The IHDS (Indian Human Development Survey) data from 2004/2005 (made available by the NCAER and University of Maryland) consists of 41,554 households from 1503 villages and 971 urban neighborhoods. For the purpose of this study only rural level data of children within the age group of 0-14 is considered. It is to be noted that 29,042 households have 41,612 children in this age group, out of which 10,791 are in the age group of 0 to 5 years. For a general summary of sample characteristics refer appendix 3. On average the family size is 7 persons to a household, with three children on average. The average age of the children in the data is around 8 years, i.e. primary school age. 48% of the children are females. Households in the data earn an average income of approximately Rs.43000 per annum with approximately 10 assets in the house. Almost 30% of the population is below the poverty line. Also, an average individual from a rural household in the data comes from a backward class (in terms of caste) as 69% of the households are dalit[iv], adivasi[v] or Hindu backward caste people. These are the disadvantaged groups in Indian society when it comes to income, health or educational opportunities. The caste that an individual belongs to, may influence the choices she makes in terms of education, health, membership in CBOs. The education status of adults in these households seems very poor, especially adult females, who have hardly

attained primary level schooling, on an average. Though men have studied comparatively more than their female counterparts, their overall education status is still very low.

Location factors and the infrastructural aspects of a particular village reflect the economic development status of the village and this may have influence on the individual's decision to participate in different types of organizations as well as child education and health. According to the data, on average, villages are located near the concrete roads. The distance to the bus stop is just a couple of kilometers as opposed to railway stations which can be as far as 23 kilometers. Thus it is fair to conclude that villages are comparatively better accessed by roads than by railways. Fair price- shops where generally food grains are available at affordable prices seem within the distance of just a kilometer in the villages on an average. Villages in the data also seem to have easy access to general stores for the purchase of basic necessities. As far as access to financial services is concerned, the villages in the data have a bank branch within 5 kilometers radius.

Village health facilities, however are quite poor, in fact there are hardly any. The closest village health sub-center is at a distance of 3 km, while a community health center is 15 km away. There are no district hospitals in the vicinity, the closest being 45 km away. A government maternity center is at a distance of 20 km from the village, and the data show that 60% of deliveries have taken place at home. Even the private hospital and private maternity centers are more than 15 km away, thus reflecting a lack of adequate health infrastructure in the villages (Refer appendix 3.3).

Regarding availability and accessibility of educational institutions, villages generally have no secondary and higher secondary schooling facilities; government or private. The distances to the nearest ones are approximately 1½ km and 4 km respectively. There are no girls' schools available in the village either and distance to the nearest ones is almost 12 km. Access to primary schools is comparatively better. There are a couple of government primary schools in the village and for those

villages that have no primary schools within the village, the nearest one is within a kilometer's distance. But as a whole, the rural areas have poor access to education facilities (Refer appendix 3.2).

Our main health outcome is malnourishment, in both short run (weight for height Z scores, WHZ) and long run (weight for age Z scores, WAZ)[vi]. Out of the 10,791 rural children in the age group of 0 to 5 years, 15% are severely and moderately wasted (measured with weight for height measurement). While almost half (49%) of them are mildly malnourished. Only about 19% of the children are in the normal nourishment state. These figures are quite alarming as in totality almost 64% of the children in rural sample are thus wasted malnourished. As far as underweight malnourishment is concerned, the condition is even worse. More than 80% of the children are underweight malnourished (measured with weight for age measurement) in rural India according to this data (35% -severely and moderately underweight and 48% mildly malnourished). The national figures of severely and moderately malnourished children in these categories are 20% (WHZ) and 48% [vii](WAZ), which are not very different from the above information. The difference is because the latter figures are national figures which would also include urban slum and rest of urban India other than rural areas. All these figures depict a situation of almost 50% of the children in rural India being mildly malnourished. But a closer look shows that the distribution of children in the mildly malnourished state remains almost constant in short run (WHZ) and long run (WAZ). But the percentages of children in the severely malnourished state more than doubles from short run to long run. This more than 100% increase in severe malnourishment in case of WAZ indicates that the focus of the study on child malnourishment is well justified.

A closer look at data on education reveals that although 94% of children in the age group of 6-14 are enrolled, approximately 54% out of these, remain absent for one or more days in the school. Education is not just about enrollment or attendance. Performance in school is an equally important

developmental measure. Thus, test scores for reading, writing and mathematical ability are used and show the following picture: approximately 11% of children in the age group between 8 to 11 years cannot read at all and 35% of them cannot write without making two or more mistakes in a sentence and their mathematical skills are alarmingly poor. With respect to mathematical skills, the children are given scores based on whether they can recognize numbers or perform functions such as subtraction or division or cannot recognize numbers or perform any function at all. Here children do not perform well compared to the above two tests. Almost 20% of the children cannot calculate at all. As the focus in this study is a household's participation in different community level organizations and social networks and its effects in turn on health and education of children. Therefore it becomes essential to know the extent of participation in these organizations and networks in rural India, which we turn to below.

{Fig.1.1 HERE}

CBO membership in rural households, in general is around 35%. As the figure above shows, out of those who are part of at least one organization most of them are associated with caste and religious groups followed by self-help groups, credit and savings groups and *mahila mandals*. Only 2% and 4% people are part of a development or NGO group and cooperative society, respectively. This seems quite plausible as religious organizations and caste associations are more common in rural areas as they are related to providing economic and political rights to their members, especially individuals belonging to lower castes and minority religions.

Memberships in CBOs & child Health and Education

The data shows that households that have membership in one or more organizations have a higher percentage (15.32%) of severely and moderately malnourished children compared to households that do not participate in any organization. Similarly more than half of the children from member

households are mildly malnourished (WHZ). However they also have slightly lower percentage of children in normal nourishment state[viii].

The percentage of underweight children in general is high. However CBO member households have a lower percentage (33.69%) of severely and moderately underweight children compared to the non-member households. They also have slightly greater number of normally nourished children. But in case of mild malnourishment the scenario changes. The member households have more mildly malnourished children at almost 50% compared to the non-members. Thus it is interesting to see that, the children from member households suffer more from severe malnourishment compared to the others[ix].

Next, we relate malnourishment status to membership in specific CBOs.

{Fig.2.1.a HERE}

Children belonging to member households do not show much variation within each health status across specific CBOs except for nongovernmental organizations (NGOs). While almost 60% of the children belonging to households that are part of NGOs are mildly wasted (WHZ), this is also the category that has the lowest percentage (10%) of children in the severely and moderately wasted category but they also have the lowest percentage of children in normal malnourishment state.

{Fig.2.1.b HERE}

Figure 2.1.b also shows a similar trend in the long run. Irrespective of the type of CBO, the distribution of children in each health state is more or less the same with very few exceptions. For instance, the children of religious group and caste association members are slightly more malnourished (severely and moderately) compared to the other groups. Children from the NGO member households have the least malnourished children in the worst health state and at the same

time also have the highest percentage of mildly malnourished children. Only 10% of the children from households participating in different organizations seem to be normally nourished.

The next area of interest is education. Out of the total number of children who belong to households having membership in one or more of the nine organizations, 52.7% of them remain absent in school compared to 54.5% of their non-member household counterparts. Out of the children belonging to households that are members of one or more CBO, 8% of the children cannot read at all compared to 12% who belong to non-members. Also when we compare the highest scores on reading skill, more than 36% children belonging to the households with membership in CBOs can read an entire story, whereas only 30% of the children belonging to households without such memberships can do the same. Similarly 15% of the children from households that are members of one or more CBOs cannot recognize numbers compared to 22% of the children belonging to non-member households. As far as highest mathematical scores are concerned, there is hardly any difference between member and non-member households in the proportion of children who have the skills to perform mathematical operation such as division. So, in general mathematical performance is poor irrespective of organizational membership. As far as the writing skills are concerned, 29% of the children belonging to households with membership in one or more CBOs cannot write at all compared to 38% of children belonging to non-member households. Thus it can be concluded from above information that children in the CBO member household seem to be performing better than the ones who do not have any membership[x]. Here too, the membership in certain type of CBO may be important as well.

{Fig.2.2.a HERE}

Figure 2.2.a points out that the percentage of absence is almost constant, across the children belonging to non-member households. Whereas, among the CBO member households, children's

absence (in%) changes with the type of organization. For instance, a lower percentage of children who belong to the households that are members of either mahila mandal, youth club, credit saving group or NGOs seem to remain absent in school compared to those who belong to the non-member households. In case of religious/social organizations and caste associations, the scenario is exactly the opposite. 62% and 58% of the children belonging to the households holding membership with religious organizations and caste associations respectively seem to remain absent compared to 52.5% and 53% of those who are not associated with these two organizations respectively. Therefore, greater proportions of children remain absent, belonging to the households with membership in religious groups and caste associations compared to the others.

The cognitive skills of children in the data are scrutinized to observe whether there is difference in the performance of children belonging to the households that are part of a particular type of CBO.

{Fig.2.2.b HERE}

Considering *reading skills*, it can be seen that highest proportion of children that cannot read at all, belong to households that are members of caste associations. Here, membership in *Mahila Mandal* seems to have slight advantage over other groups. In case of *mathematical skills* 19% of children affiliated to caste association cannot even recognize numbers compared to only 7.2% of children belonging to households which are members of youth/reading or sports club. The story of writing skills is similar to mathematics. When it comes to *writing ability*, households with the membership in caste associations once again have the highest proportion of children scoring the least. 30% of children from these households cannot write compared to 17% of the children belonging to the households associated with youth/reading/sports clubs. But here the proportion of children from households that are members of a self-help group, show similar results as the ones associated to the caste association. Thus, based on the above facts we can conclude that the children belonging to

households that are members in caste associations are generally disadvantaged when it comes to both education and health compared to the other groups in the data.

The evidence of relationships among CBO membership and child health and education is investigated in the next section where results from regression analysis are studied in detail. We also take into account that CBO membership is self-chosen and therefore potentially endogenous to child outcome, either by way of reverse causation, selection or omitted variables. For instance, households with the high levels of some unobserved factor such as aspirations for their children may both invest more heavily in their children's health and education *and* join community organizations/build up their networks for gaining more information. Or, it could be the case that households with sick children or children who perform poorly in school may not have the time or resources to participate in CBOs or accumulate contacts. In both cases, a positive correlation would arise between child outcome and participation in CBOs. On the other hand, a negative correlation due to reverse causation is also possible, that households with sick children or poorly performing children tend to seek out information and resources through CBOs. The sign of the correlation would depend also on the type of organization. If NGOs are sought out by the poorer segment of the population, this may explain a negative correlation between membership and child health and education. Although we control for poverty status, assets and education and a number of household, village and community-level factors in the analysis, to account for any remaining potential endogeneity of CBOs due to unobserved factors we adopt the instrumental variables method.

5. Analysis

a. Determinants of membership in CBOs:

Since the dependent variables are 0-1 binary variables, we estimate probit models of participation and the results shown in the tables are the marginal effects.

{TABLE 1 HERE}

As can be seen in the above table, economic status has a significant influence on membership of CBOs. Households with higher income have a greater probability of joining CBOs. Hence naturally, the poverty status of the household limits their possibility of participation in community level organizations very significantly. Households with a larger number of assets present in the house may not feel the need to join community organizations probably because they already have the access to economic welfare opportunities offered by these organizations. Of course, we cannot rule out that some common unobserved determinant matters for both asset ownership and participation in CBOs, even after controlling for income. We also find robust evidence of positive sorting by educational levels of both male and female members of the household and negative sorting by marginalized caste and religion. Backward caste Hindus or households of Muslim or Christian religious background have very limited opportunities to participate in community based organizations when compared to forward caste Hindus in rural parts of India.

Regional differences in terms of household participation in community organizations are quite high in rural India. The reason behind this may be an uneven distribution of infrastructure, economic resources, and cultural diversity across the country. Households belonging to north or central region are less likely to join any of the community organizations compared to their southern counterparts. This is also supported by a report published based on the same data (Desai, 2010)

where it was found that more than 70% of the households in a particular state in Southern India are members of at least one of the nine organizations. General activeness of the household in village level politics also plays an important role. This political activeness is reflected through voting in elections, attending public meetings and by being involved in the village panchayat (local government/village level body). Higher level of political activeness shown by the household by attending public meetings is very strongly associated with the possibility of acquiring membership in organizations. Involvement in village panchayat significantly increases participation in organizations by 6% if the member of the household is an official in a panchayat. The reason may be that, occupying an authoritative position in village panchayat makes the individual more influential and strong in the community and therefore enables him/her to be more active, socially and politically which reflects in the high level of participation in community organizations. Confidence in different public institutions also is a significant determinant of organizational membership. If households have higher level of confidence on institutions of state, justice, and defense it appears to significantly decreases their probability of joining an organization. That may indicate that community level voluntary organizations are seen as sort of substitutes to formal governing bodies. Therefore, if individuals do not have faith in these institutions they feel the need to join community level voluntary organizations to serve their needs. Another important result that comes up in this table concerns confidence in banks. Thus, if households have confidence in banks they appear not to feel the need to join CBOs and the probability decreases significantly by 10%. Of course these estimates represent only associations and our aim is to present them as such, and not to make causal inference.

b. Effect of Household membership in CBOs on child health and education:

In this sub-section, we evaluate the effects of such participation on health and education of their children.

{TABLES 2 & 3 HERE}

CBO membership in any one of the nine organizations is detrimental for the short run health status of the child represented by a 1% increase in the probability of being severely and moderately wasted compared to those households who are not members of any CBOs. But this effect does not persist in terms of the long run health status, i.e. the probability of being severely or moderately underweight. When it comes to education, household membership in one or more of the nine CBOs increases the probability of child school absence by 5% compared to the households who are not part of any organization. The reason behind such negative effects on health and absence may be that when we consider membership in one or more of the nine organizations, we do not differentiate between the different types of organizations. So, this may mask the problem of a very strong negative effect due to membership in a few organizations of a particular nature which could wipe out the positive effects from membership in others. However child educational performance in terms of *Test Scores* seems to be positively influenced by membership in one or more CBOs. To be precise, if anyone in the household is a member of at least one organization, the children in the household may decrease the probability of having no *reading skills* at all by approximately 2%, no *mathematical skills* by approximately 1% and no *writing skills* by approximately 3%. This means that, household membership in one or more CBOs is not favorable for school attendance of the children but it increases their possibility of performing better. The reason may be that certain CBOs may provide an alternative to the formal educational teaching facilities which may increase

children's absence in schools but yet help them in gaining cognitive skills. Hence, we now disaggregate the impact of each type of CBO on child health as well as education.

Religious / Social group: Households joining *religious or social groups* significantly increases the probability of their children being severely and moderately malnourished by 2% in the short run. While the direction of the effect of this on children's malnourishment is same in the long run, the result is not significant. The reason behind such a negative effect may be that even though these organizations provide health related services, these services may not be effective enough to reduce malnourishment levels. This may be because the services are not customized for child nutrition.

Out of all the CBOs, religious organizations have the strongest effect in terms of statistical significance as well as size on *school participation* compared to other organizations. Membership in religious organizations increases the possibility of children remaining *absent* in school by approximately 12% compared to children belonging to households where no one is a member of these organizations. So membership is unfavorable in terms of school participation of children. This may be due to the fact that affiliation with these groups may result in members not sending children to formal schools but instead sending them to these institutions to learn (Iyengar, 2011). This in turn results in absence in schools. Or, it could be that religious households keep their children away from school for longer periods in order to observe religious festivals or rituals. But in case of performance in school, membership in these organizations has a positive effect for children belonging to member households. Religious organizations *reduce* the probability of having *no* reading, writing and mathematics skills. The effect is significant especially in case of reading and writing skills. This may be due to the fact that these institutions provide educational services and therefore children learn to read and write even though they may be irregular in attendance in formal schools. Thus these organizations provide comparatively greater educational services than child

health which translates into a positive effect on educational performance but not so positive effect on reducing malnutrition of the child (Iyer et.al, 2011).

Caste association: After religious groups, the next strongest effect on child malnourishment and school participation is from membership in caste associations. Households participating in caste association show an increasing probability of their children being severely and moderately wasted by 2%. And again in the long run even though the direction of the effect is the same as the religious groups, the result is not that significant. Nutrition outcomes are greatly affected by social norms, values and customary practices within the family, the community, ethnic, religious, indigenous and racial groups or the socially disadvantaged. Unfair exclusion from access to opportunities through markets and non-markets transaction causes high malnutrition among the socially excluded groups and communities, which are part of such *caste associations* (Thorat, 2011). These groups also have a strong negative impact on educational outcome of the children of their members. Membership in these organizations very strongly increases possibilities of children remaining *absent* in school by approximately 10% compared to children belonging to households not associated with this group. When it comes to school performance, household membership in these groups proves detrimental to their children's reading and mathematical skills. Membership in caste associations significantly increases the probability of children from member households of having no mathematical ability by almost 3%. Thus children that belong to the households that have joined these caste associations suffer more in terms of their performance than others. Membership in caste associations proves strongly negative for children's health and education due to the nature of these associations. These organizations are politically motivated and their main purpose is to provide political rights to backward castes and minorities (Rudolph, 1960). Thus the focus is not particularly on education and health related development. Also the members in these associations are economically deprived, socially excluded and lack education (Nair, 2009) therefore the children belonging to these

households suffer in terms of health and education. Note, however, we simultaneously control for household income, education of the head as well as the household's religious and social group affiliation along with a number of other region, village and infrastructural factors, so the effects of membership in caste associations arise net of these controls. The findings show therefore that caste associations prove to be more regressive than progressive.

Mahila Mandal: it is perhaps not surprising that an organization such as *mahila mandal* (women's group) which has a focus of promoting nutritional education, family welfare, immunization of children and related services has a positive effect on child health in the short run. If the household members participate in this organization then the probability of their children being severely and moderately wasted decreases significantly by 2% as compared to non-members. In the long run too, membership in this organization reduces malnourishment but the effect is not very strong. This maybe because women in rural India do not participate in household decision-making and they have to take permission to even go out of the house. This is also supported by (Derné, 1994) in his research on dominance of men over women in Hindu households. Therefore, the women probably cannot sustain the participation or teachings in these *mahila mandals* in the long run, and hence there is no effect on the underweight malnourishment status of the child. But they lack any significant influence on school absence or performance of children which leads us to conclude that women welfare groups are more effective for child health than for education.

Youth/Reading/Sports club: The nature of this organization makes its members more health conscious or knowledgeable than the others in the village. Therefore we see that the probability of children being severely and moderately wasted decreases by 2% if they belong to the households that have membership in this group. The effectiveness of this group on child health is insignificant in the long run, as mostly men participate in such organizations; and in the long run factors related to the mother and child such as their post-natal check-up, the availability of nutritious food, the

duration of breastfeeding of the child become more important (Refer Family characteristics below for further discussion).

In case of education, although membership in this group has no effect on children's participation in school in terms of absence, it does have an effect on their performance in school. The strongest effect is in case of writing skills. A household's membership in a youth group significantly reduces probability of having no writing skills by almost 7%. In case of reading and mathematical skills, the household membership in this group reduces the probability of lowest scores but these effects are not statistically strong. The reading groups, as the name suggests encourage education related activities, hence help in increasing performance of children belonging to member households.

NGO/Development group: Members of this group find their children to be positively influenced in terms of educational outcomes. Out of nine organizations only membership in *Non-governmental organization or Development group* reduces the probability of children remaining absent in school although the effect is not very strong. But when it comes to children's cognitive skills, NGOs do not seem to be very favorable. In fact, other things remaining constant, it increases the probability of having no reading skills at all by 5%. In case of other skills, it has no significant effect. This indicates that although NGOs or Developmental groups may advocate attendance in school they do not necessarily help the children in raising their educational performance. The reason behind this may be that mere school attendance does not help children in increasing their reading, writing and mathematical abilities as the quality of learning in the school may matter more in this case, which is very poor in rural India (Kingdon G. G., 2007). In case of health outcomes, the effect is positive but insignificant pointing towards potential impact.

One of the reasons behind the weak effect on health and education may be the low level of participation in these groups (Refer appendix 3). NGOs in fact, have the lowest participation

compared to other groups. They currently are not highly effective in reducing malnourishment or increasing educational performance of the children of their members, but one important point to be noted here is that development groups are special. They are aimed at serving the poor in the community and therefore actual membership is not a prerequisite to receiving benefits from this group (Refer appendix 4 for definition). Since the focus of NGO/development groups is development of the community as a whole irrespective of the membership, they show potential.

Union/Business group: Membership of this group has no impact on child health but it has a strong negative impact on child education. If adults in the household participate in *unions/business group* this increases the probability that the child will remain absent in school by 7.34% compared to the rest. It also affects school performance negatively. In case of mathematical ability, household membership in this group significantly increases the likelihood of not being able to even recognize numbers (having least score) by 8.44% compared to those children from non-member households. One of the possible reasons for this is that if elders in the household are part of the union, they have to spend significant amount of time away, which may require their children to stay home and take care of the household chores or younger siblings. This may in turn result in increased absence in school. The reading and writing skills are unaffected by the membership.

Self Help Group: Participation in self-help groups has no significant impact on either child health or on education, except writing skills. Membership of household members in *self-help group* increases possibility of lowest writing scores by approximately 5% compared to the children belonging to non-member households. The reason may be that these self-help groups are generally women oriented groups (refer appendix 4 for definition). Here the focus is to provide micro credit to female entrepreneurs. Participation in such groups may keep the women away from home for a longer time and could result in low level of involvement in children's schooling and this may harm children's performance in school. Also these groups consist of rural women that generally have

very low level of formal education (refer appendix 3). Therefore mere participation in these groups where the focus is not on providing formal education to their members will not help in contributing to the development of child's cognitive skills.

Credit /Savings group and Cooperative society: Membership in both of these groups has no significant effect on education or health of children. This may be because, these are the societies where members receive benefits in terms of financial help or help in marketing their agricultural produce. They do not really influence health or education of children (refer appendix 4 for definition).

c. IV Results:

The notion of causal effects can be made more precise using IV techniques establishing robustness to endogeneity or reverse causality. As mentioned in methodology section, 'availability of CBOs in village' proved to be a good instrument since it is significantly correlated with participation in CBOs (refer Theoretical Framework and Methodology section). In case of health outcomes, we found that, being member of CBO reduced the chances of a child in the household to attain better nutritional state significantly. It reduced its nourishment status in the short run as per WHZ measure by approximately 0.4 Z scores. In the long run, as per WAZ measure, membership in CBOs increases the health outcome by improving the health status by 0.12 Z scores but both the coefficients are statistically insignificant. The Hausman test conducted on results from 2SLS model and non-IV model of linear regression clearly indicates that there is no significant difference between the IV and the ordered probit results (Hausman test results for WHZ: p>chi2=0.0986 and WAZ: p>chi2=0.6036). Hence, we can conclude that IV results are not very meaningful for interpretation. The direction of both the results also conforms to the direction of ordered probability results without using IV (in case of WHZ, the ordered probability result increases the possibility of

being severely malnourished by 1.15% and in case of WAZ ordered probability result reduces the probability of being severely malnourished by 0.5%).

When it comes to educational outcomes, let us first consider IV results for absence in school. The direction of the result of having a member of CBOs in the household shows reduction in absence. The Hausman test result once again confirms that results between IV model and linear regression model are not systematically different (p>chi2=0.4085). Moving on to the performance in different tests, being a member of CBO in a household does not increase the probability of having highest score in all three tests. Hausman test conducted here too, shows that IV and non-IV results are not very different except for Math score (Writing Score Hausman test: p>chi2=0.7774 Reading test: p>chi2=0.1642 and Math score: p>chi2=0.00018). Once again, except for Math score none of the IV coefficients are statistically significant.

Thus, from the above results it is clear that using IV models would not improve the efficiency and consistency of the results and therefore non-IV results can be considered efficient. See appendix 2 for Hausman test results.

d. Other determinants of child health and education:

Other control variables show similar results in all the models (participation in at least one organization or each organization separately as well as in case of social networks) therefore interpretation can be generalized (refer appendix 3). They are included in order to increase then explanatory power of the model.

Among these, *household assets* (refer appendix 3) indicate economic status of the household have a significant impact on both health and educational outcomes. This effect can be explained by the facts that generally in rural India, property and assets are inherited which represents household wealth (Kingdon & Dréze, 2001). Therefore even though individuals would not have the income to

purchase certain assets, the ones they inherit reflect their living conditions. Hence more assets would mean better living conditions and hence better welfare of children.

Among family characteristics, family size is one of the important determinants for absence in school and health outcomes, as larger family size helps in pooling of resources such as money, food as well as sharing of household responsibilities and chores. Therefore the bigger the family size, the lower is the probability of children being severely malnourished or remaining absent in school. Education of adult females is more relevant in the long run for health outcomes as well as school performance. But in the short run it has a negative impact owing to the fact that in rural India, generally the household decisions are taken by the males in the household and females do not have much say. This lack of decision making power may have guided this particular result. Education of the adult male is highly relevant for educational outcomes alone.

Regional differences in terms of education and health of the children are high. These differences may be attributed to dissimilarity due to diverse degrees of availability, accessibility of schools and health facilities in the regions. Region seems to have a strong effect on child health in the short run and even more in the long run. It can be clearly seen that north eastern states fare better in terms of health of children compared to the southern and western regions in India (Radhakrishna, 2004). Belonging to the central region of India has a significantly negative impact on attendance as well as school performance. Whereas, belonging to southern and western region of India has a very peculiar effect. Statistically it has the strongest effect on probability of reducing school absence compared to other regions. This particular relationship is also confirmed by (Jayachandran, 2002) in her findings related to school attendance in India, as interstate differences may be responsible for these effects. But surprisingly in terms of performance it does not have a favorable effect. This means, mere participation in school is not enough for developing cognitive abilities of children. Quality of learning and other factors such as regularity of study perhaps play a more important role.

In case of caste and religion, backward caste households and Muslim minorities are disadvantaged in their children's health and educational outcomes which can be attributed to lack of education and poor economic status of people belonging to this community (Kingdon & Dréze, 2001).

Village infrastructural factors seem to be comparatively more important for education than for health. The farther are these facilities in a village, the higher is the possibility of children being malnourished and poorly developed in terms of their cognitive skills and school participation. There are certain factors that are specific determinants of health such as children receiving vaccinations and immunization; post natal care significantly decreases the probability of child malnourishment both, in short run and long run. As far as education specific determinants are concerned, distance from school, type of school (government or private) play a very important role in determining the likelihood of children's absence and performance in school representing the quality of schools mainly in terms of infrastructure and teaching. In this respect children going to government schools are generally disadvantaged (Kingdon G. G., 2007). Among other factors, the insignificance of a gender gap with respect to the possibility of school absence may seem a bit intriguing. In India there is evidence of lower level of gender bias found in terms of school attendance among backward classes of population (Jayachandran, 2002). The data in this case is dominated by these backward caste households which may explain the result[xi] but this gender gap becomes evident in terms of school performance. Being a girl, has an increasing effect on the probability of not being able to read, write and calculate at all approximately by 2%, 3% and 5% respectively. This can be attributed to a lack of interest in a girl's education from parents in rural India, as most of the girls are burdened with housework and are made to assist their mothers, which is the case for many developing countries. This may result in less time spent in studies and school work which reflects in poor performance. This claim is substantiated by (Nankhuni & Findeis, 2004) where they

conclude that girls may find it difficult to progress well in school owing to the extra burden of housework.

6. Conclusion

Our analysis of results above helps us conclude that households become members in CBOs based on their caste, region of residence, economic status, confidence in public institutions, activeness in politics etc. and that one cannot generalize the results from mere membership in one or more CBOs on health and educational outcomes without considering impact of specific type of CBOs. Certain CBOs such as *mahila mandal and youth/sports/reading club* prove beneficial for improving nourishment status of children in the members' households. Membership in *caste associations* is detrimental to both, health and educational outcomes. *Religious group* membership has a mixed impact where it helps in improving cognitive skills of children in the member households, but does not have such positive effect on nutritional status of the children as well as school attendance. Other types of groups do not affect health or educational outcomes of children in the member households as strongly as the groups discussed above.

Malnutrition problems of children can be tackled more effectively through prevention measures such as awareness programs rather than cure. Such approach was implemented successfully by USAID in one such program (USAID, November 2010). The same can be achieved through groups such as *mahila mandal* and *youth groups* in rural India, by fostering greater involvement in health awareness and welfare programs.

Members in all the groups need to be involved in actual process of formal education by either teaching the children directly or providing educational facilities to members who in turn could help

their children to improve cognitive skills and school participation. When empowered in such a way, CBOs may turn out to be promising vehicles for achieving inclusive growth.

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Figures

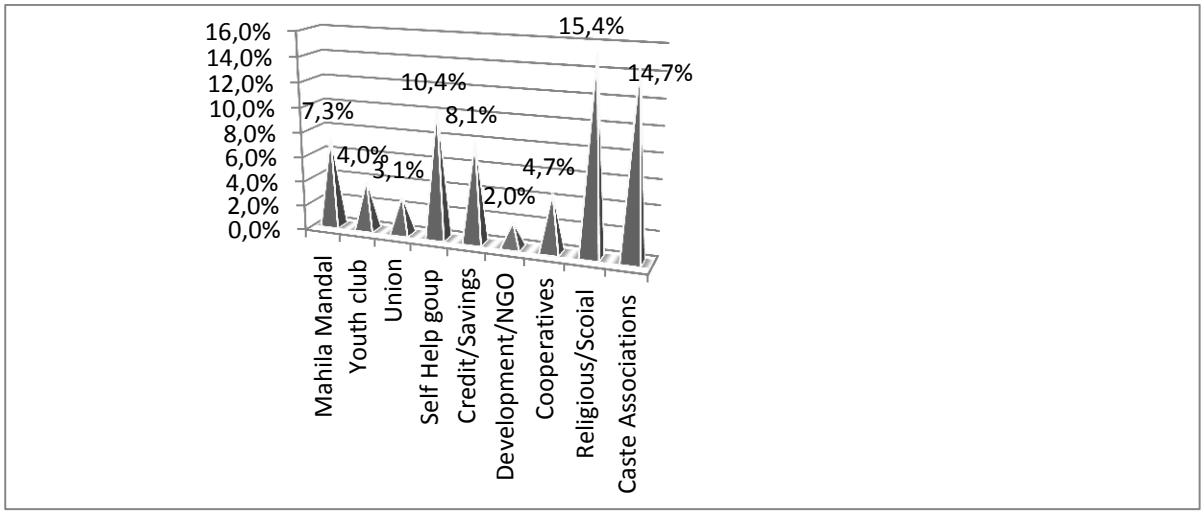

Fig. 1.1 Percentage distribution of household's membership in different CBOs

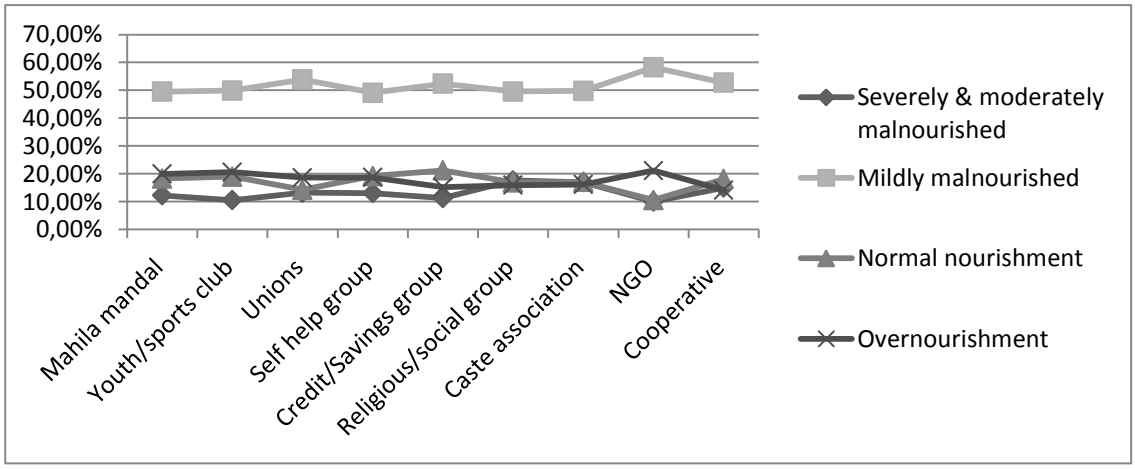

Figure 2.1.a.: Weight-for-height: Percentage distribution of children from households with membership in particular CBO

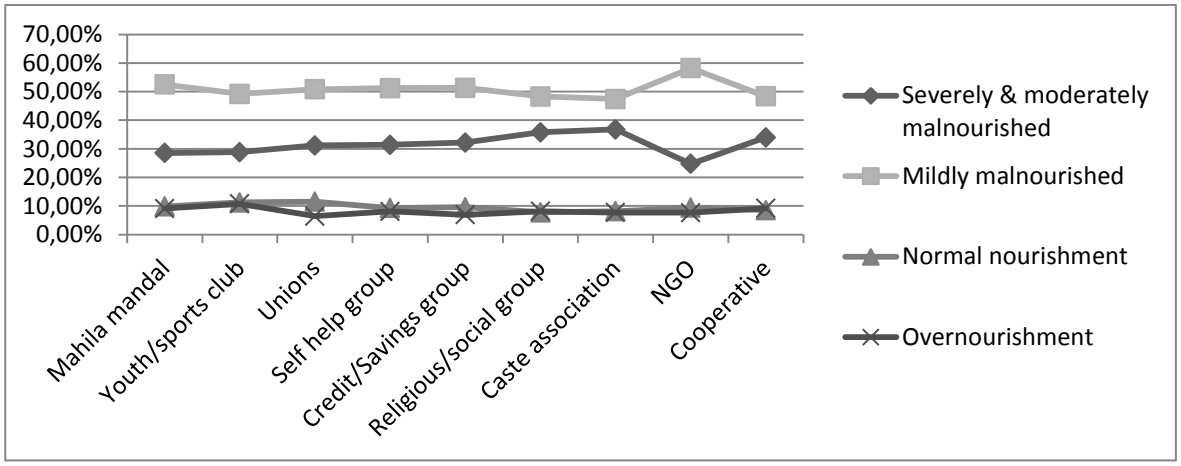

Figure 2.1.b.: Weight-for-age: Percentage distribution of children from households with membership in particular CBOs

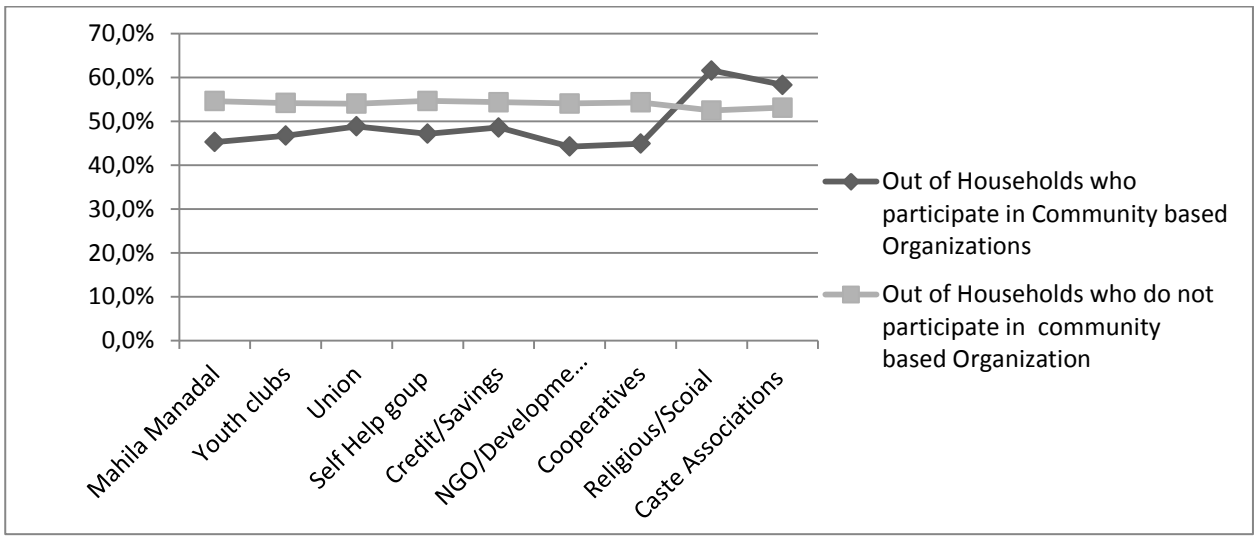

Figure 2.2.a: Absence/Attendance: Percentage distribution of children from households with membership in particular CBOs

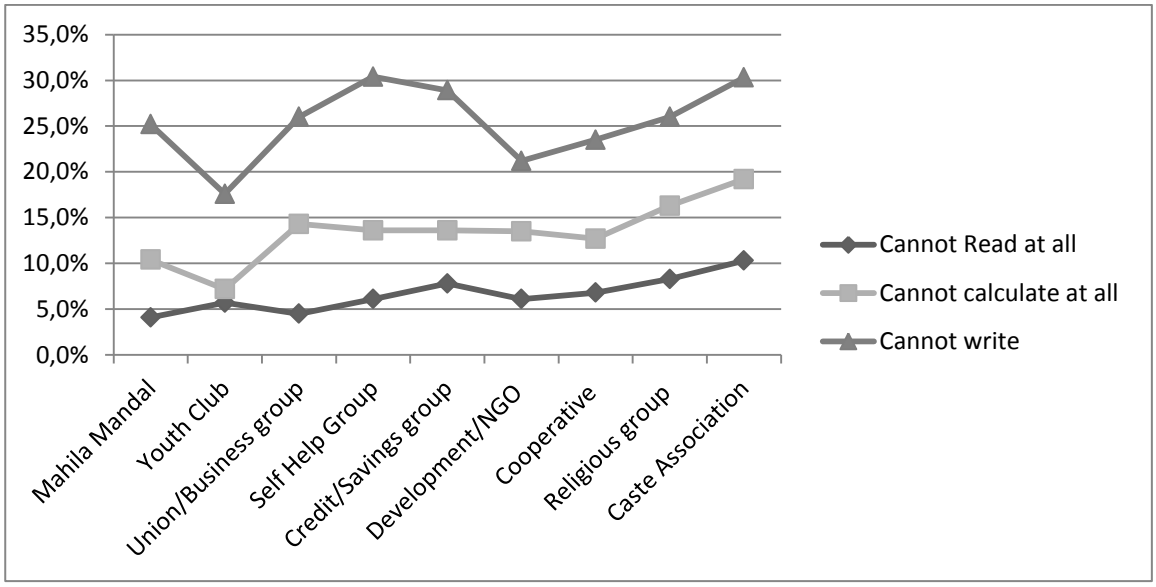

Fig.2.2.b. Test Scores: Percentage distribution of children from households with membership in particular CBOs

Tables:

Table 1. Marginal Effects from a Probit model of Participation in CBOs	
Variables	**DV=1 if Household is part of any Community Based Organization**
Economic Status and Family Characteristics	
Total Income	0.0121***
Poor	-0.0465***
Number of Household Assets	-0.0022**
Highest education level of female in the HH	0.0035***
Highest education level of male in the HH	0.0080***
Family size	-0.0003
Number of Children	0.0051
Region	
North	-0.2265***
Central	-0.1823***
West	-0.0134
South	0.0949***
Religion & Social Background	
Backward class	0.0447***
Muslim	0.0461***
Sikh or Jain	-0.2062***
Christian	0.0727**
Village Infrastructure & Institutions	
Distance to closest bus stop in km	-0.0100***
Distance to closest railway station in km	0.0011***
Distance to closest police station in km	0.0014***
Distance to closest fair price shop in km	0.0013
Distance to closest market in km	-0.0026***
Distance to closest General store in km	0.0050***
Distance to closest bank branch office in km	-0.0018**
Distance to closest post office in km	-0.0092***
CBO related variables	
Availability of organization in village	0.171***
Number of loans taken in last 5 years	0.0094***
If voted in 2004 elections	0.0045
Attend public meeting	0.1443***
Official in Panchayat	0.0619***
Confidence in Politicians	-0.0271***
Confidence in Military	0.0011
Confidence in Police	-0.0411***
Confidence in State Govt.	-0.0452***
Confidence in Newspaper	0.0275**

Confidence in Panchayat	-0.0026
Confidence in School	0.0791***
Confidence in Medical	0.1354**
Confidence in Courts	-0.0283***
Confidence in Banks	-0.1017**

Note: The first column shows the determinants of having membership in community based organizations. The reported coefficients are the marginal effects. DV = dependent variable. *Significant at 10% ** Significant at 5% *** Significant at 1%.

Table 2: Marginal effects of the ordered probit model for child's health

Variables	*Child Health*	
	DV=1 if child is severely and moderately wasted (WHZ)	**DV=1 if child is severely and moderately underweight (WAZ)**
Economic Status and Family characteristics		
Total Income	-0.0043	-0.0038
Poor	0.0098	0.0214**
Number of Household Assets	-0.0028***	-0.0088***
Family size	-0.0034**	0.0001
Number of children	0.0078***	0.0072*
Highest education level of male in the HH	0.00024	0.0004
Region		
North	-0.0145*	0.0633***
Central	0.0116	0.0571***
West	0.0834***	0.1007***
South	0.0299***	0.1015***
Religion & Social Background		
Backward caste	0.0077	0.0049
Muslim	-0.0098	0.012
Sikh or Jain	-0.0560***	-0.1259***
Christian	-0.0182	-0.0778*
Female	-0.0059	-0.0173**
Village Infrastructure and Institutions		
Distance to closest bus stop in km	0.0031***	-0.0005
Distance to closest railway station in km	0.0002	0.00002
Distance to closest police station in km	-0.0002	0.0005
Distance to closest fair price shop in km	0.0019*	0.0023
Distance to closest market in km	0.0001	-0.0012
Distance to closest General store in km	0.0007	-0.0031***
Distance to closest bank branch office in km	-0.0008	0.0003
Distance to closest post office in km	-0.0015	0.0018
Membership in CBOs		
Membership in one or more CBOs	0.0115***	-0.0055
Mahila Mandal	-0.0223**	-0.0207
Youth/reading/sports Club	-0.0245***	-0.0239
Union/business group	0.0165	0.0114
Self Help Group	-0.0103	-0.0128
Credit/Savings group	-0.0075	-0.0002
Religious/Social group	0.0212***	0.0083
Caste Association	0.0184***	0.0083
NGO/Development group	-0.0095	-0.0083
Cooperative Society	0.01291	0.0024

Health related controls		
Child age from 0 to 2 years	-0.0252***	-0.1757***
Whether water is purified in HH	-0.0109***	-0.0035
Distance to medical facility	0.0023	0.0053
Size of the child	0.0075*	0.0131*
Postnatal checkup of mother or child or both or none	-0.0042	-0.0085**
Having a vaccination card	-0.0188**	-0.0182
Duration of breastfeeding	-0.0004	-0.0018***
Age at which supplementary food started	-0.0006	0.0024**
Has child received immunization from anganwadi	-0.0289***	0.0174
Has child received food from anganwadi	0.0132*	-0.0012
Has the child received any growth monitoring	0.0102	0.0039

Note: Each entry refers to the marginal effect of a unit change in the respective explanatory variable (listed in the first column) of children being severely and moderately malnourished (WHZ/WAZ= -2) WHZ= weight for height, WAZ= height for age, these measurements are used to check the health status of a child below 5 years of age in the short term and long terms respectively (ref appendix 5.1). DV= Dependent Variable *Significant at 10%, ** Significant at 5%, *** Significant at 1%

Table 3. Marginal effects of the ordered probit model for child's education

	Child Education			
Variables	**DV=1 if child is absent for one or more days during the month**	**DV=1 if child cannot read at all**	**DV=1 if child cannot identify numbers at all**	**DV=1 if child cannot write without two or more mistakes**
Economic Status and Family Characteristics				
Total Income	-0.0034	-0.0009	0.0005	0.0023
Poor	- 0.0368***	0.0140***	0.0267***	0.0468***
Number of Household Assets	-0.0061***	-0.0041***	-0.0062***	-0.0067***
Family size	-0.0025	0.0016*	0.0015	0.0031
Number of children	0.0012	0.0030*	0.0062**	0.0068
Highest education level of female in the HH	0.0016*	-0.0032***	-0.0058***	-0.0124***
Highest education level of male in the HH	-0.0042***	-0.0025***	-0.0057***	-0.0070***
Region				
North	0.0046	0.0352***	0.0785***	0.1664***
Central	0.1323***	-0.0067	0.1451***	0.2881***
West	-0.1754***	-0.0128**	0.0704***	0.0604***
South	-0.2823***	0.0416***	0.0733***	0.0750***
Religion and Social Background				
Backward caste	0.0762***	0.0195***	0.0398***	0.0395***
Muslim	0.0683***	0.0442***	0.0656***	0.0994***
Sikh or Jain	0.2022***	0.0286	0.0535**	-0.0255
Christian	0.1031***	-0.01	0.0628*	-0.0521
Female	0.0103	0.0135***	0.0486***	0.0268**
Village Infrastructure				
Distance to closest bus stop in km	0.0048***	0.0017***	0.0033***	-0.0022
Distance to closest railway station in km	-0.00005	-0.00017*	-0.0002*	-0.0011***
Distance to closest police station in km	-0.0036***	-9.50E-06	-0.00009	0.0014
Distance to closest fair price shop in km	-0.0024	0.00142**	0.0013	0.0083***
Distance to closest market in km	-0.0008	0.00015	0.0004	0.0013
Distance to closest General store in km	0.0004	-0.0026***	-0.0018***	-0.0035**
Distance to closest bank branch office in km	0.0026***	0.0011***	0.0013***	0.0032***
Distance to closest post office in km	-0.0018	0.0003	-0.0014	-0.0006
Membership in CBOs				
Membership in one or more CBOs	0.0488***	-0.0161***	-0.0117*	-0.0344***
Mahila Mandal	0.0132	-0.0045	-0.0147	0.0036
Youth/reading/sports Club	0.0162	-0.0128	-0.0252*	-0.0670**
Union/business group	0.0734***	-0.003	0.0844***	0.056
Self Help Group	0.0112	-0.0091*	0.0097	0.0489**

Credit/Savings group	0.0166	-0.0075	-0.0168*	-0.0024
Religious/Social group	0.1175***	-0.0094**	-0.0087	-0.0609***
Caste Association	0.0970***	0.0023	0.0267***	-0.0355**
NGO/Development group	-0.0441*	0.0500***	0.0214	-0.0457
Cooperative Society	0.011	-0.0045	0.0002	-0.0218
Education related variables				
Age 6 to 9 years	0.0403***			
Age 10 to 12 years	0.0271***			
Ever Repeated a grade	0.0220*	0.0209**	0.0464***	0.0016
Distance to School	-0.0032**	-0.0056***	-0.0001	-0.0064**
School fees in Rs. Per annum	0.003	-0.0107***	-0.0180***	-0.0232***
Expenditure on books, uniform etc. In Rs. Per annum	-0.0286***	-0.0263***	-0.0406***	-0.0271***
Private tuition fees in Rs. Per annum	0.0173*	0.0006	-0.0126	-0.0173
Harassment of girls	-0.007	0.0074*	0.0084	-0.0239
Government school	0.0664***	-0.0357***	-0.0338***	-0.0187
January	0.0954***			
February	0.1051***			
March	0.1009***			
April	0.0370***			
May	0.0809***			
June	-0.0077			
July	0.0330*			
August	0.1678***			
September	0.2224***			
October	0.3297***			
November	0.0145			

Note: Each entry refers to the marginal effect of a unit change in the respective explanatory variable (listed in the first column) of children being Absent, and their Test scores that measure cognitive ability of the children. DV= Dependent Variable. *Significant at 10%, ** Significant at 5%, *** Significant at 1%.

Endnotes

[i] Refer appendix 4 for a detailed explanation of all the community based organizations.

[ii] Organizations=mahila mandal, youth/sports/reading club, trade unions, self -help groups, credit/savings group, religious/ social groups, caste association, NGO/development group, cooperative society

[iii] Refer appendix 1 for detailed explanation

[iv] The caste system is a social division in India that stratifies various social groups for centuries. Dalits are the lowest caste group and have been treated as 'untouchables' for a number of centuries.

[v] Adivasi is the indigenous term for tribal population who are socially marginalized.

[vi] According to Antrhorpometric indicators measurement guide under Food and Nutrition Technical Assistance Project by USAID, the measure of weight-for-height indicates wasting and helps to identify children suffering from current or acute undernutrition and is appropriate for examining short-term nutritional stress. Whereas the measure for weight for age measure is a composite measure of stunting and wasting and is recommended as the indicator to assess changes in the magnitude of malnutrition over time.

[vii] http://www.unicef.org

[viii] Refer Appendix 3 for detailed descriptive figures on membership in one or more CBOs and child health and education

[ix] Refer to endnote viii

[x] Refer to endnote viii

[xixixixi] 68% of the data consists of individuals from backward castes. (Refer appendix 3)

Technical Appendix

Appendix 1: Data and Methodology

India Human Development Survey 2005: it is a national level survey conducted jointly by researchers from University of Maryland (USA) and National Council of Applied Economic Research in New Delhi (India). It is a multi-topic survey of 41554 households from 1503 villages and 971 urban neighborhoods. For the purpose of this study only rural level data of children within the age group of 0-14 is considered. As the study requires both household and individual characteristics, Individual level and household level data were merged in STATA. The master dataset is the 'Individual data set' in which household and village level data sets are merged by using unique identifier 'IDHH' which is a long integer variable, calculated as stateid*10000000+ distid*100000+ psuid*1000+hhid*10+ hhsplitid. Where, stateid is a state code, distid is a district code, psuid is a village or neighborhood code, hhid is a household id and hhsplitid is a split household id. The final dataset consists of 41,612 children.

The data set was then divided into 2 parts

1. Children in the age group of 0 to 5 years- This has a total sample size of 10,791. There are important reasons to focus on this age group.

i. Under nutrition among children aged 0 to 4 years contribute more to the country's overall disease burden than the age group of 5 to 14 years[xi].

ii. Secondly young children in developing countries start to fall behind the developed country standard[xi]

iii. Nutritional status of children is related to subsequent labor productivity and development.

iv. The WHO also provides child growth standards data for the age group of 0 to 5 years of age. This perfectly meets the requirement of the study as the survey data provides information for children in the age group of 0 to 4 years of age.

2. Data set with the children in the age group of 6 to 14 years. Total sample size of 30,821.

For school performance, Test score variables from individual data set are used. There are 12,040 children in the age group of 8 to 11 residing in rural areas.

(Refer: India human development survey 2005, data sharing for demographic research, weighting and other study documentation by (Desai et al, 2010) University of Maryland and National council for applied economic research, India).

Missing value treatment

The data has coded missing values as numerical values i.e. -1 for all the valid blanks and -2 to -4 for values really missing. For the purpose of analysis and descriptive statistics these numerical values were decoded and valid blanks were coded as '.' (dots). Missing dummies have been created, where missing dummy takes value 1 if there is a missing value in the original variable and 0 otherwise. All the missing values were replaced in the original variable by 0 after creation of its corresponding missing dummy. In case of dependent variable, all the missing values in dependent variable are dropped automatically by STATA while running the models. The missing dummy approach is efficient when the value is missing because the question is not applicable to individual (valid blank), as no value exists in this case[xi]. Since majority of the missing values in this data are mostly valid blanks, the missing dummy approach is efficient.

Appendix 2: Hausman Test Results

Education:

Hausman test for Absence in School				
Variable	(b) b_iv	(B) B_ols	Difference	sqrt S.E.
Organization	-0,0287206	0,043001	-0,071722	0,0867679
lincome	-0,0018721	-0,00227	0,000402	0,0004857
POOR	-0,033554	-0,03033	-0,003229	0,0039063
HHASSETS	-0,0054839	-0,00544	-4,56E-05	0,0000552
HHED5F	0,0024221	0,002102	0,00032	0,0003869
HHED5M	-0,0029358	-0,00356	0,00062	0,0007503
NPERSONS	-0,0026646	-0,00302	0,000358	0,0004328
NCHILD	0,0024074	0,002552	-0,000145	0,0001754
ED6	0,0131012	0,01526	-0,002159	0,0026116
CS4	-0,0028681	-0,00322	0,000357	0,0004313
logCS18	-0,0008389	0,001614	-0,002453	0,0029669
logCS19	-0,0304131	-0,03122	0,000807	0,0009758
logCS20	0,0179754	0,015912	0,002063	0,0024961
LC4	-0,0046182	-0,00424	-0,000376	0,0004545
Govtschool	0,0570754	0,057803	-0,000728	0,0008803
North	-0,0043225	0,011012	-0,015334	0,0185512
Central	0,1113747	0,122308	-0,010933	0,013227
West	-0,1526813	-0,15482	0,002143	0,0025926
South	-0,2409804	-0,25303	0,01205	0,0145777
BackwardC	0,0716374	0,068136	0,003501	0,0042359
Muslim	0,0629794	0,061744	0,001236	0,0014949
SikhJ	0,1949145	0,201789	-0,006874	0,0083165
Christian	0,1116492	0,109931	0,001718	0,0020783
Female	0,0104106	0,009597	0,000814	0,0009844
VI11B	0,0034135	0,004057	-0,000643	0,0007779
VI12	-9,62E-06	-0,00012	0,000109	0,0001319
VI13A	-0,0029571	-0,0031	0,000145	0,0001752
VI13B	-0,00192	-0,00204	0,000121	0,0001466
VI13C	-0,0008657	-0,00073	-0,000136	0,0001646
VI13D	0,000628	0,000541	8,68E-05	0,0001051
VI13E	0,0022699	0,00233	-6,04E-05	0,0000731
VI13F	-0,0012206	-0,00165	0,000428	0,0005183
Jan	0,0908032	0,089037	0,001766	0,0021367
Feb	0,1040863	0,100567	0,00352	0,0042581
March	0,0936221	0,091852	0,00177	0,0021416
Apr	0,0356551	0,035318	0,000337	0,0004078
May	0,0800524	0,078344	0,001709	0,0020669
Jun	0,0150529	0,006325	0,008728	0,0105594
Jul	0,0433592	0,035567	0,007792	0,0094268
Aug	0,1531454	0,15126	0,001885	0,0022805
Sept	0,2165207	0,210907	0,005613	0,006791
Oct	0,3375374	0,31671	0,020828	0,0251973

Nov	0,023015	0,012361	0,010654	0,0128894
_cons	0,6574643	0,645909	0,011555	0,0139794

Test Result: Absence in School

b= Consistent under Ho and Ha; obtained from ivregress
B = inconsistent under Ha, efficient under Ho; obtained from regress
Test: Ho: difference in coefficients not systematic
chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)== 0.68
Prob>chi2 = 0.4085
(V_b-V_B is not positive definite)

Hausman test for Test Scores- Writing

Variable	b_IV	B_ols	Difference	S.E. sqrt
Organization	-0,0021574	0,032019	-0,034176	0,1209069
lincome	-0,0019219	-0,00218	0,0002545	0,0009003
POOR	-0,0529824	-0,05081	-0,0021764	0,0076997
HHASSETS	0,0058051	0,005873	-0,000068	0,0002407
HHED5F	0,0096479	0,009431	0,0002165	0,0007658
HHED5M	0,0072206	0,006937	0,0002832	0,0010021
NPERSONS	-0,001702	-0,00182	0,0001209	0,0004276
NCHILD	-0,0072133	-0,00743	0,0002119	0,0007498
ED6	-0,0002758	0,00158	-0,0018556	0,0065645
CS4	0,0031349	0,002849	0,0002861	0,0010122
logCS18	0,0172795	0,018726	-0,0014463	0,0051166
logCS19	0,0266131	0,025994	0,000619	0,0021897
logCS20	-0,00486	-0,00624	0,001384	0,0048963
LC4	0,0217147	0,022489	-0,0007745	0,0027402
Govtschool	0,0173257	0,018207	-0,0008813	0,0031177
North	-0,1559701	-0,14975	-0,006223	0,0220156
Central	-0,2643277	-0,26069	-0,0036417	0,0128834
West	-0,0473981	-0,04925	0,0018561	0,0065666
South	-0,0544341	-0,06179	0,0073561	0,0260241
BackwardC	-0,0319697	-0,03378	0,0018095	0,0064015
Muslim	-0,0891561	-0,08896	-0,0001956	0,0006919
SikhJ	0,0072691	0,010483	-0,0032137	0,0113695
Christian	-0,0073489	-0,00799	0,0006405	0,0022658
Female	-0,0253457	-0,02568	0,0003321	0,001175
VI11B	0,0016766	0,00196	-0,0002836	0,0010032
VI12	0,0010815	0,001032	0,0000495	1,75E-04

VI13A	-0,0014204	-0,00146	0,0000421	0,0001491
VI13B	-0,0074237	-0,00743	0,0000035	0,0000127
VI13C	-0,0010682	-0,001	-0,0000709	0,000251
VI13D	0,0037008	0,003511	0,00019	0,0006721
VI13E	-0,0031238	-0,00305	-0,0000732	0,000259
VI13F	0,0003812	0,000144	0,0002375	0,0008404
_cons	0,618108	0,613569	0,004539	0,0160581

Test Result: Test Scores-Writing

b= consistent under H0 and Ha ; obtained from IV regress
B= inconsistent under Ha; efficient under H0 ; obtained from regress
Test : H0: Difference in coefficient is not systematic
Chi2(1) = (b-B)'[(V_b_V_B)^(-1)](b-B) = 0.08
Prob>chi2 = 0.7774

Hausman test for Test Scores-Mathematics

Variable	b_iv	B_ols	Difference	S.E.squrt
Organization	-0,7451179	0,037305	-0,78242	0,250427
lincome	0,0040771	-0,0018	0,005882	0,001883
POOR	-0,1438839	-0,09394	-0,04994	0,015985
HHASSETS	0,0200908	0,021655	-0,00156	0,000501
HHED5F	0,0258368	0,020852	0,004985	0,001596
HHED5M	0,0262309	0,019685	0,006546	0,002095
NPERSONS	-0,0019275	-0,00451	0,002582	0,000826
NCHILD	-0,0173917	-0,02249	0,005096	0,001631
ED6	-0,1980757	-0,15796	-0,04012	0,012841
CS4	0,0045615	-0,0018	0,006361	0,002036
logCS18	0,0282309	0,061899	-0,03367	0,010776
logCS19	0,1531571	0,138911	0,014246	0,00456
logCS20	0,0654534	0,032693	0,032761	0,010486
LC4	-0,0455664	-0,02769	-0,01788	0,005723
Govtschool	0,0788743	0,097857	-0,01898	0,006076
North	-0,4051733	-0,2632	-0,14198	0,045442
Central	-0,4869415	-0,40415	-0,08279	0,0265
West	-0,1757341	-0,21937	0,043634	0,013966
South	-0,0692871	-0,23623	0,166947	0,053434
BackwardC	-0,0905533	-0,13236	0,04181	0,013382
Muslim	-0,2029875	-0,19816	-0,00483	0,001546
SikhJ	-0,2204722	-0,14902	-0,07146	0,022871
Christian	-0,1577681	-0,17412	0,016347	0,005232

Female	-0,1529332	-0,16071	0,00778	0,00249
VI11B	-0,0183031	-0,01177	-0,00654	0,002092
VI12	0,0020492	0,000938	0,001111	3,56E-04
VI13A	0,0009867	9,86E-05	0,000888	0,000284
VI13B	-0,0042875	-0,00462	0,000332	0,000106
VI13C	-0,00316	-0,0014	-0,00176	0,000563
VI13D	0,0100033	0,005573	0,00443	0,001418
VI13E	-0,0058529	-0,00432	-0,00154	0,000491
VI13F	0,0117668	0,006698	0,005069	0,001622
_cons	0,6655164	0,568235	0,097282	0,031137

Test Result: Test Scores-Mathematics

b= consistent under H0 and Ha ; obtained from IV regress
B= inconsistent under Ha; efficient under H0 ; obtained from regress
Test : H0: Difference in coefficient is not systematic
Chi2(1) = (b-B)'[(V_b_V_B)^(-1)](b-B) = 9.76
Prob>chi2 = 0.0018

Hausman Test for Test Scores-Reading skills

Variable	B_iv	b_ols	Difference	S.E.sqrt
organization_s	-0,32680	0,13320	-0,46000	0,33070
lincome	0,01060	0,00700	0,00350	0,00250
poor	-0,14770	-0,11790	-0,02970	0,02140
Hhasests	0,03030	0,03130	-0,00100	0,00070
HHEED5F	0,02580	0,02290	0,00290	0,00210
HHED5M	0,02500	0,02110	0,00380	0,00270
Npersons	-0,01010	-0,01150	0,00140	0,00100
Nchild	-0,02270	-0,02590	0,00310	0,00220
ED6	-0,19470	-0,17160	-0,02310	0,01660
CS4	0,03540	0,03150	0,00390	0,00280
logcs18	0,06300	0,08280	-0,01980	0,01420
logcs19	0,22490	0,21660	0,00830	0,00590
logcs20	-0,00330	-0,02260	0,01930	0,01390
LC4	-0,06770	-0,05690	-0,01080	0,00770
Govtschool	0,24450	0,25670	-0,01210	0,00870
North	-0,40710	-0,32340	-0,08370	0,06010
Central	-0,03960	0,00920	-0,04880	0,03510
West	0,12020	0,03590	0,02430	0,01740

South	-0,20080	-0,29980	0,09890	0,01710
Bwdcaste	-0,12080	-0,14540	0,02460	0,01760
Muslim	-0,29180	-0,28860	-0,00320	0,00230
SikhJ	-0,26000	-0,21780	-0,04220	0,03030
Christian	0,03810	0,02910	0,00900	0,00650
Female	-0,10660	-0,11110	0,00450	0,00320
VI11B	-0,01800	-0,01430	-0,00370	0,00270
VI12	0,00190	0,00120	0,00060	0,00470
VI13A	-0,00010	-0,00070	0,00050	0,00040
VI13B	-0,01120	-0,01130	0,00007	0,00005
VI13C	-0,00260	-0,00160	-0,00090	0,00060
VI13D	0,02430	0,02180	0,00250	0,00180
VI13E	-0,00930	-0,00830	-0,00100	0,00070
VI13F	0,00280	-0,00030	0,00320	0,00230
_cons	1,13428	1,07735	0,05693	0,04093

Test Result: Test scores-Reading Skills

b= consistent under H0 and Ha ; obtained from IV regress
B= inconsistent under Ha; efficient under H0 ; obtained from IV regress
Test : H0: Difference in coefficient is not systematic
Chi2(1) = (b-B)'[(V_b_V_B)^(-1)](b-B) = 1.93
Prob>chi2 = **0.1642**

Health:

Hausman Test for- Weight for Height

Variable	b_iv	B_ols	Difference	S.E.squrt
organizations	-0,4441173	-0,04656	-0,39756	0,240682
lincome	0,0235855	0,019764	0,003822	0,002314
POOR	-0,0617852	-0,03364	-0,02814	0,017036
HHASSETS	0,0080086	0,01072	-0,00271	0,001642
NPERSONS	0,0184382	0,014108	0,00433	0,002622
NCHILD	-0,0302398	-0,03115	0,000912	0,000552
HHED5F	-0,0046139	-0,00649	0,001876	0,001136
HHED5M	0,0032828	-0,00108	0,004362	0,002641
WA10	0,0436216	0,039693	0,003929	0,002379
QC2	-0,0045496	-0,00824	0,003691	0,002234
LB16	-0,0257274	-0,03494	0,009209	0,005575
LB18	0,0126605	0,012025	0,000636	0,000385
LB23	0,0349836	0,064783	-0,0298	0,018041

LB33	0,0017894	0,001374	0,000415	0,000251
LB34B	0,0021897	0,002274	-8,4E-05	5,11E-05
LB36A	0,1148576	0,117988	-0,00313	0,001895
LB36C	-0,0632334	-0,06006	-0,00317	0,001921
LB36D	-0,0076243	-0,03253	0,024905	0,015077
North	-0,0081196	0,036956	-0,04508	0,027289
Central	-0,1008005	-0,06451	-0,03629	0,021969
West	-0,2555478	-0,27795	0,022404	0,013564
South	-0,0296832	-0,11625	0,086568	0,052408
Bwdcaste	-0,0259761	-0,02604	6,48E-05	3,93E-05
Muslim	0,0385239	0,045145	-0,00662	0,004008
SikhJ	0,2277796	0,278222	-5,04E-02	0,030537
Christian	0,0942657	0,09299	0,001276	0,000772
Female	0,0215901	0,019813	0,001777	0,001076
Age0to2	0,1136842	0,116751	-0,00307	0,001857
VI11B	-0,0159064	-0,01258	-0,00333	0,002014
VI12	-0,0001465	-0,00064	0,000492	0,000298
VI13A	0,0006277	0,000724	-9,6E-05	0,000058
VI13B	-0,0067607	-0,00649	-0,00027	0,000164
VI13C	-0,0011379	-0,00054	-0,0006	0,000363
VI13D	-0,0031326	-0,00306	-7,5E-05	4,51E-05
VI13E	0,0030517	0,00313	-7,8E-05	4,74E-05
VI13F	0,0079117	0,007185	0,000727	0,00044
_cons	-0,794765	-0,86759	0,072823	0,044087

Test Result: Weight for Height

b = consistent under Ho and Ha; obtained from ivregress
B = inconsistent under Ha, efficient under Ho; obtained from regress
Test: Ho: difference in coefficients not systematic
chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)= 2,73
Prob>chi2 = 0.0986

Hausman Test for- Weight for Age

Variable	b_iv	B_ols	Difference	S.E.squrt
organizations	0,12120	0,01012	0,11108	0,21393
lincome	0,00551	0,00658	-0,00107	0,00206
POOR	-0,02498	-0,03284	0,00786	0,01514
HHASSETS	0,01767	0,01691	0,00076	0,00146

NPERSONS	-0,00007	0,00114	-0,00121	0,00233
NCHILD	-0,01649	-0,01624	-0,00025	0,00049
HHED5F	0,00563	0,00615	-0,00052	0,00101
HHED5M	-0,00263	-0,00141	-0,00122	0,00235
WA10	0,00765	0,00874	-0,00110	0,00211
QC2	-0,01284	-0,01181	-0,00103	0,00199
LB16	-0,02235	-0,01978	-0,00257	0,00496
LB18	0,01164	0,01182	-0,00018	0,00034
LB23	0,03181	0,02349	0,00833	0,01604
LB33	0,00370	0,00382	-0,00012	0,00022
LB34B	-0,00594	-0,00597	0,00002	0,00005
LB36A	-0,01932	-0,02020	0,00087	0,00168
LB36C	-0,02200	-0,02289	0,00089	0,00171
LB36D	-0,00867	-0,00172	-0,00696	0,01340
North	-0,11073	-0,12332	0,01259	0,02426
Central	-0,10300	-0,11314	0,01014	0,01953
West	-0,20662	-0,20036	-0,00626	0,01206
South	-0,22630	-0,20211	-0,02419	0,04658
Bwdcaste	-0,01209	-0,01207	-0,00002	0,00003
Muslim	-0,03087	-0,03272	0,00185	0,00356
SikhJ	0,31486	0,30076	0,01409	0,02714
Christian	0,19045	0,19081	-0,00036	0,00069
Female	0,04276	0,04325	-0,00050	0,00096
Age0to2	0,41629	0,41543	0,00086	0,00165
VI11B	0,00225	0,00132	0,00093	0,00179
VI12	-0,00012	0,00001	-0,00014	0,00026
VI13A	-0,00066	-0,00069	0,00003	0,00005
VI13B	-0,00338	-0,00346	0,00008	0,00015
VI13C	0,00185	0,00168	0,00017	0,00032
VI13D	0,0052593	0,005239	2,08E-05	4,01E-05
VI13E	-0,0006042	-0,00063	2,19E-05	4,22E-05
VI13F	-0,00450	-0,00429	-0,00020	0,00039
_cons	-1,37529	-1,35494	-0,02035	0,03919

Test Result: Weight for Age

b = consistent under Ho and Ha; obtained from ivregress
B = inconsistent under Ha, efficient under Ho; obtained from regress
Test: Ho: difference in coefficients not systematic
chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)= 0,27
Prob>chi2 = 0.6036

The above Hausman tests of the difference between the OLS and 2SLS model show that the two are not significantly very different. Hence the above results fail to reject the null hypothesis as p value is more than alpha value of 0.05, as results are calculated at 5% significance level. Therefore the difference between OLS and 2SLS are not very different. So OLS is both consistent and efficient. Thus the strategy of using a model without IV is justified.

Note: Out of the three test scores, the null hypothesis is rejected only in case of mathematics test scores. But, in order to maintain the consistency and simplicity, IV model was not used. And as outcomes of all the test scores are in ordered form, the use of ordered probit model is suitable.

Appendix 3: Data Description and Summary

The variables of interest are either taken directly from the data or constructed as per the requirement of the study. The variables are as follows:

3.1 Variable Definitions

Variable name	Variable name in STATA output	Definition
Membership in one or more CBOs	organization	Household is part of one or more organizations(1), otherwise (0)
Mahila Mandal	ME1	Anyone in the Household member of Mahila mandal(1), otherwise (0)
Youth/reading/sports Club	ME2	Anyone in the Household member of Youth/sports/reading club(1), otherwise (0)
Union/Business Group	ME3	Anyone in the Household member of Trade Union(1), otherwise (0)
Self Help Group	ME4	Anyone in the Household member of Self Help Group(1), otherwise (0)
Credit/Savings group	ME5	Anyone in the Household member of Credit/ Savings Group(1), otherwise (0)
Religious/Social group	ME6	Anyone in the Household member of Religious/ Social Group(1), otherwise (0)
Caste Association	ME7	Anyone in the Household member of Caste Association(1) , otherwise (0)
NGO/Development group	ME8	Anyone in the Household member of Development/NGO group(1), otherwise (0)
Cooperative Society	ME9	Anyone in the Household member of Cooperative Group(1), otherwise (0)

Total Income	lincome	Total income in household per annum. (converted into log)
Poor	POOR	Household below the poverty line (1),Household above the poverty line (0)
Number of Household Assets	HHASSETS	Total number of household assets in the household
Family size	NPERSONS	Number of persons in the household
Number of children	NCHILD	Number of children in the household (in years)
Highest education level of female in the HH	HHED5F	Highest Education level of female in the Household (in years)
Highest education level of male in the HH	HHED5M	Highest Education level of male in the Household
North	North	Sample population belonging to-Jammu& Kashmir,Himachal Pradesh,Punjab, Haryana,Uttranchal,Delhi,Rajasthan,Uttar Pradesh,Bihar-(1), otherwise (0)
Central	East	Sample population belonging to-Sikkim,Arunachal Pradesh,Nagaland,Manipur,Mizoram,Tripura,Meghalaya,Assam,West Bengal,Jharkhand,Orissa-(1), otherwise (0)
West	Central	Sample population belonging to-Madhya Pradesh, Chhattisgarh-(1), otherwise (0)
South	West	Sample population belonging to-Gujrat,Daman & Diu, Dadar & Nagare Haveli, Maharashtra-(1), otherwise (0)
Forward caste	South	Sample population belonging to-Andhra Pradesh,Karnataka,Goa,Kerela,Tamil Nadu, Pondicherry-(1), otherwise (0)
Backward caste	BackwardC	Other backward caste, Dalits, Adivasi -(1), otherwise (0)
Muslim	Muslim	Muslim(1), otherwise (0)
Sikh or Jain	SikhJ	Sikh or Jain (1), otherwise (0)
Christian	Christian	Christian(1), otherwise (0)
Female	Female	If child is female (1), otherwise (0) - variable is constructed from original variable R03 that describes sex of the child.
Distance to closest bus stop in km	VI11B	Distance to closest Bus stop (in Km)
Distance to closest railway station in km	VI12	Distance to closest Railway station(in Km)
Distance to closest police station in km	VI13A	Distance to closest Police Station (in Km)
Distance to closest fair price shop in km	VI13B	Distance to closest Fair price shop (in Km)

Distance to closest market in km	VI13C	Distance to closest Market/ Bazaar (in Km)
Distance to closest General store in km	VI13D	Distance to closest Kirana/ General Market Shop (in Km)
Distance to closest bank branch office in km	VI13E	Distance to closest bank branch(in Km)
Distance to closest post office in km	VI13F	Distance to closest post office (in Km)
ONLY RELEVANT TO HEALTH		
Weight- for -height	WHZ	Constructed based on the instructions given in the WHO website using Stata commands. Severely and moderately malnourished(-2),Mildly malnourished (-1),Normally nourished(0),Over nourished(1)
Weight- for-age	WAZ	Constructed based on the instructions given in the WHO website using Stata commands. Severely and moderately malnourished(-2),Mildly malnourished (-1),Normally nourished(0),Over nourished(1)
Child age from 0 to 2 years	Age0to2	Children in the age group of 0 to 2 years
Child age from 3 to 5 years	Age3to5	Children in the age group of 3 to 5 years
Whether water is purified in HH	WA10	How often water is purified in the household (rarely/never-0,Sometimes-1,Usually-2, Always-3)
Distance to medical facility	QC2	Distance to medical treatment-private/govt (in Km)
Size of the child	LB16	Size of the child [Large(1),Average(2),Small(3),Very Small(4)]
Postnatal check- up of mother or child or both or none	LB18	Postnatal check -(0) No check- up,(1) Check -up done for mother, child or both
Having a vaccination card	LB23	Household has a vaccination card(1), otherwise(0)
Duration of breast feeding	LB33	Duration of breastfeeding (in months)
Age at which supplementary food started	LB34B	Age (in months) at which child's diet is supplemented with canned or other mild with solid foods
Has child received immunization from anganwadi	LB36A	Has child received immunization from anganwadi(1), otherwise (0)
Has child received food from anganwadi	LB36C	Has child received any food/meals from anganwadi(1), otherwise (0)
Has the child received any growth monitoring	LB36D	Has the child received any growth monitoring(1), otherwise (0)

ONLY RELEVANT TO EDUCATION		
Absence	Absence	Constructed based on variable name CS11, Absent for one or more days in a month(1), otherwise (0)
Reading Score	TA7LVL	Cannot read at all(0),Can read a word(1),Can read a sentence(2),Can read a paragraph(3),Can read a entire story(4)
Math Score	TA8LVL	Cannot identify numbers at all(0),can identify numbers(1),can perform subtraction(2),can perform division(3)
Writing Score	TA9LVL	Cannot write at all(0), Can write a sentence with two or less mistakes(1)
Age 6to9 years	Age 6 to 9	Children in the age group of 6 to 9 years
Age 10 to12 years	Age 10 to 12	Children in the age group of 10 to 12 years
Age 13 & above	Age 13 & above	Children in the age group between 13 to 14 years
Ever Repeated a grade	ED6	Has the child ever repeated a grade in school (1), otherwise (0)
Distance to School	CS4	Distance to school in kilometers
School fees in Rs. Per annum	Log CS18	Log of school fees paid in Rupees per annum
Expenditure on books, uniform (In Rs. Per annum)	Log CS19	Log of expenditure on books, uniform or transportation in Rupees per annum
Private tuition fees in Rs. Per annum	Log CS20	Log of private tuition fees paid in rupees per annum
Harrasment of girls	LC4	Are girls harassed in the village(1) otherwise (0)
Governemnt school	Govtschool	Originally based on CS3 type of school where children going to EGS, government or government aided school (1), otherwise 0
Months of Interview	HS2	dummies for all 12 months of interview: These variables were constructed based on a string variable HS2 in the original data which is a variable denoting the date of an interview. This variable was reversed and then substring action was performed and then reversed once again to get the month of an interview.
VARIABLES RELATED TO ORGANIZATIONS		
Number of loans taken in last 5 years	DB1	Number of loans taken in the last 5 years by the household
If voted in 2004 elections	ME10	If household voted in 2004 elections (1), otherwise (0)
Attend public meeting	ME11	If anyone in the household attends public meeting(1), otherwise(0)
Official in Panchayat	ME12	If anyone in the household is official in panchayat(1), otherwise(0)

Confidence in Politicians	CI1	If there's conflict in village: Alot and Some(1), Get along (0) – *converted to binary*
Confidence in Military	CI2	If household has confidence in politician: A great and some(1), Hardly any (0) *converted to binary*
Confidence in Police	CI3	If household has confidence in Police: A great and some(1), Hardly any (0) *converted to binary*
Confidence in State Govt.	CI4	If household has confidence in State Government: A great and some(1), Hardly any (0) *converted to binary*
Confidence in Newspaper	CI5	If household has confidence in Newspaper: A great and some(1), Hardly any (0) *converted to binary*
Confidence in Panchayat	CI6	If household has confidence in Panchayat: A great and some(1), Hardly any (0) *converted to binary*
Confidence in School	CI7	If household has confidence in school: A great and some(1), Hardly any (0) *converted to binary*
Confidence in Medical	CI8	If household has confidence in Medical: A great and some(1), Hardly any (0) *converted to binary*
Confidence in Courts	CI9	If household has confidence in courts: A great and some(1), Hardly any (0) *converted to binary*
Confidence in Banks	CI10	If household has confidence in Banks: A great and some(1), Hardly any (0) *converted to binary*
Availability of organization in village	availabilityorg	If atleast one community based organization is available in the village (1), otherwise(0)

3.2 Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
General characteristics (children 0 to 14 years)					
Family size	41,612	7.0864	3.256356	2	38
Number of children	41,612	3.293593	1.773249	1	17
Highest education of adult Female in the household	41,261	3.073362	4.16504	0	15
Highest education of adult male in the household	39,959	5.722591	4.785022	0	15
Total Income of the household	41,612	43,360.16	68,829.88	0	2,148,557
Household assets	41,612	9.43872	5.124873	0	29
Poverty status	41,612	.3039748	.4599774	0	1
Age	41,612	8.140993	3.929438	0	14

Sex (Female)	41,612	.4819043	.4996784	0	1
Religion					
Forward Caste	41,612	.1643276	.370577	0	1
Backward Caste	41,612	.6930453	.461236	0	1
Muslim	41,612	.1215755	.3267988	0	1
SikhJ	41,612	.0120879	.1092796	0	1
Christian	41,612	.0089638	.094253	0	1
Region of Residence					
North	41,612	.4257426	.494461	0	1
South	41,612	.1686773	.3744711	0	1
East	41,612	.1616841	.3681652	0	1
West	41,612	.1157358	.3199117	0	1
Central	41,612	.1281601	.3342721	0	1
Community based Organization Membership					
Membership in one or more CBOs	41,612	.3603528	.4801085	0	1
Mahila mandal	41,561	.0709319	.2567141	0	1
Youth/Sports/reading club	41,568	.0402473	.1965411	0	1
Trade Union	41,568	.0298066	.1700554	0	1
Self Help group	41,564	.0991242	.2988324	0	1
Credit/Savings group	41,561	.0782705	.2686	0	1
Religious Organizations	41,564	.1531614	.3601473	0	1
Caste Associations	41,559	.1457205	.3528301	0	1
NGO/Development group	41,556	.0189864	.1364785	0	1
Cooperative societies	41,529	.0461364	.209783	0	1
Voted in election	41,555	.9083143	.2885853	0	1
Attend public meeting	41,529	.3570035	.4791216	0	1
Official in Panchayat	41,446	.1515948	.411223	0	2
Confidence in Public Institutions where 1= Great deal 2=Some and 3=Hardly any					
Confidence in Politicians	41,307	2.47	.6942937	1	3
Confidence in Military	40,965	1.15	.4168345	1	3
Confidence in Police	41,260	2.10	.7174068	1	3
Confidence in State Govt.	40,851	1.95	.7015176	1	3
Confidence in Newspapers	37,559	1.69	.6227595	1	3
Confidence in Panchayats	40,898	1.83	.7267079	1	3
Confidence in Schools	41,243	1.40	.6228642	1	3
Confidence in Medical facility	41,398	1.43	.6511422	1	3
Confidence in courts	39,073	1.54	.6771663	1	3
Confidence in Banks	40,951	1.11	.3612745	1	3
Village Infrastrucutre					
Distance to closest bus stop	40944	2.23	3.555.753	0	40
Distance to closest Railway station	38846	23.02	2.155.162	0	96
Distance to closest Police station	40948	8.67	7.043.022	0	61

Distance to closest Fair price shop	40967	1.02	2.484.581	0	32
Distance to closest Market	40967	6.65	7.084.654	0	80
Distance to closest General store	40967	2.53	4.863.369	0	50
Distance to Bank branch	40967	4.91	5.581.653	0	50
Distance to closest Post office	40967	1.61	2.582.865	0	32
Percentage households with electricity	40,722	64.18	34.69576	0	100
Number of Hours of Electricity	37,872	12.05	6.934088	0	24
Distance from concrete Road	40,594	1.70	4.297791	0	50
Health related variables (Children 0 to 5 years)					
WHZ	10,791	-0.6031	.9449665	-2	1
WAZ	10,791	-1.1056	.8681132	-2	1
Size of the child	9,358	2.099915	.6343773	1	4
Post natal check up	9,342	.5988011	1.061451	0	3
Having a vaccination card	7,263	.8123365	.3904701	0	1
Duration of breastfeed	3,395	1.792459	9.858317	0	66
Age of starting supplementary food	7,387	8.601868	5.367311	0	66
Immunization at anganwadi	8,662	.3103209	.4626517	0	1
Received food from anganwadi	8,552	.2667212	.4422713	0	1
Received growth monitoring from anganwadi	8,547	.2606763	.4390293	0	1
Place of delivery	9,374	2.53243	.7789809	1	4
Schooling related variables (Children 6 to 14 years)					
Absence in school	24,736	0.5382034	0.4985484	0	1
Age 6 to9 years	30,821	0.4299341	0.4950745	0	1
Age 10to12 years	30,821	0.3519029	0.4775716	0	1
Age 13 and above	30,821	0.2181629	0.4130053	0	1
Test score for children 8 to11 years of age					
Readingscore	8,640	2.49711	1.35348	0	4
Mathscore	8,609	1.45220	1.018565	0	3
Writingscore	8,566	0.6563157	0.474965	0	1
Ever repeated a grade in school	27,446	.0728339	.2598684	0	1
Distance to school in Kilometers	25,072	1.781589	2.5122	1	50
Government school	26,001	.7680858	.4220626	0	1
School fees	24,658	316.63	886.975	0	23,060
Books and uniform	24,847	610.11	903.219	0	30,000
Private tuition	20,645	120.62	583.480	0	48,000
3.3 Village level Health Infrastructure related summary statistics					
Health sub-centres in village	10,489	.4483745	.7011687	0	12
If none then nearest one (in Km)	9,629	3.257971	6.089957	0	80
Primary Health Centre	10,542	.1346044	.3747049	0	6
If no primary health center, distance to nearest	9,915	8.106203	7.901267	0	62
Community Health Centre	10,545	.020863	.1429323	0	1

If no commnunity health center, distance to the nearest (in Km)	9,148	15.70846	12.11198	0	90
District Hospital	10,545	0	0	0	0
If no district hospital, distance to the nearest	10,545	45.92755	28.52655	1	120
Government Maternity Centre	10,545	.0335704	.1817018	0	2
If no, then distance to one	9,410	20.99926	18.19357	0	95
Private Hospitals	10,545	.0570887	.3808824	0	6
If no private hospital, distance to the nearest (in Km)	9,551	17.20165	15.25631	0	90
Private Maternity	10,545	.0362257	.2747881	0	5
If no private maternity, distance to the nearest (in Km)	10,545	28.48857	29.81863	0	120
3.4. Village level School Infrastructure related summary statistics					
Number of Govt. Primary schools	30,157	1,70	1,5276	0	18
Number of Private Primary schools	30,157	.7480519	1,5068	0	20
If none, then distance to the closest one	29,815	.0756331	.8445733	0	19
Number of Govt. Middle schools	30,157	.6823291	.7112383	0	7
Number of Private Middle schools	30,108	.3807958	.9457883	0	18
If none, then the distance to the nearest one	29,207	1,40	2,8992	0	42
Number of Govt. Secondary Schools	30,157	.2906788	.53197	0	4
Number of Private Secondary schools	30,112	.2000863	.6644415	0	18
If none, then distance to the nearest	28,411	3,87	4,9819	0	60
Number of Government higher secondary school	30,157	.1293564	.3830358	0	4
Number of Private higher secondary school	30,112	.0706695	.331933	0	4
If none, then distance to the nearest	28,184	7,36	7,4746	0	60
Number of Govt. Girls school	30,157	.1134397	.3354286	0	2
Number of Private Girls school	30,157	.0210565	.1674569	0	3
If none, then distance to the nearest	26,053	11,64	11,3557	0	85

3.3. Membership in one or more CBOs and child health and Education

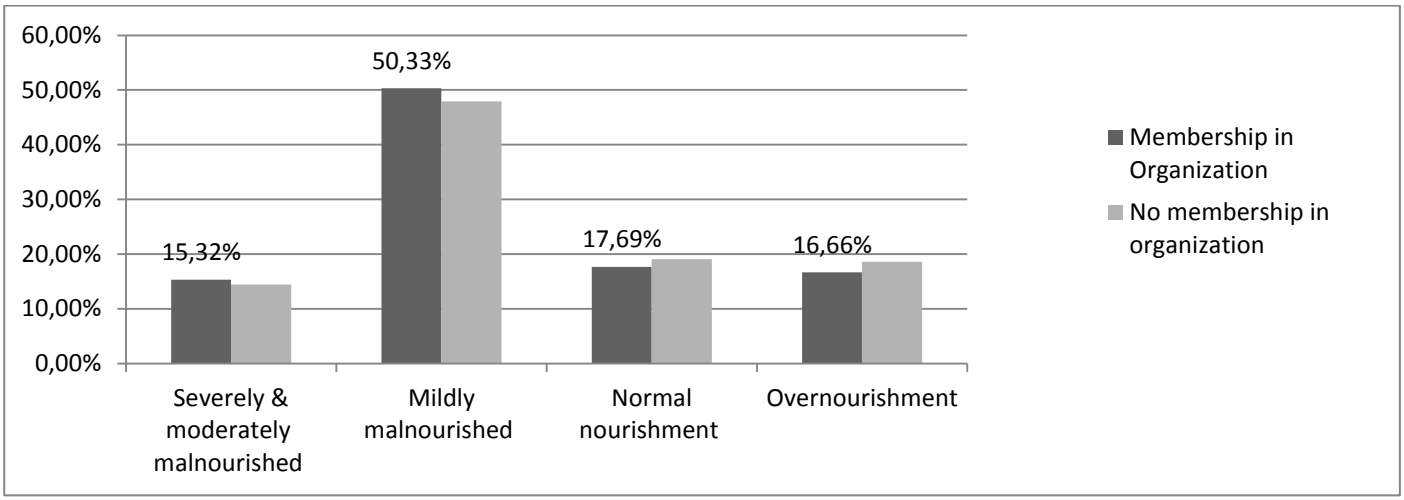

Figure 3.3.a: Percentage distribution of children under weight –for- height measurement in households with membership in one or more CBOs

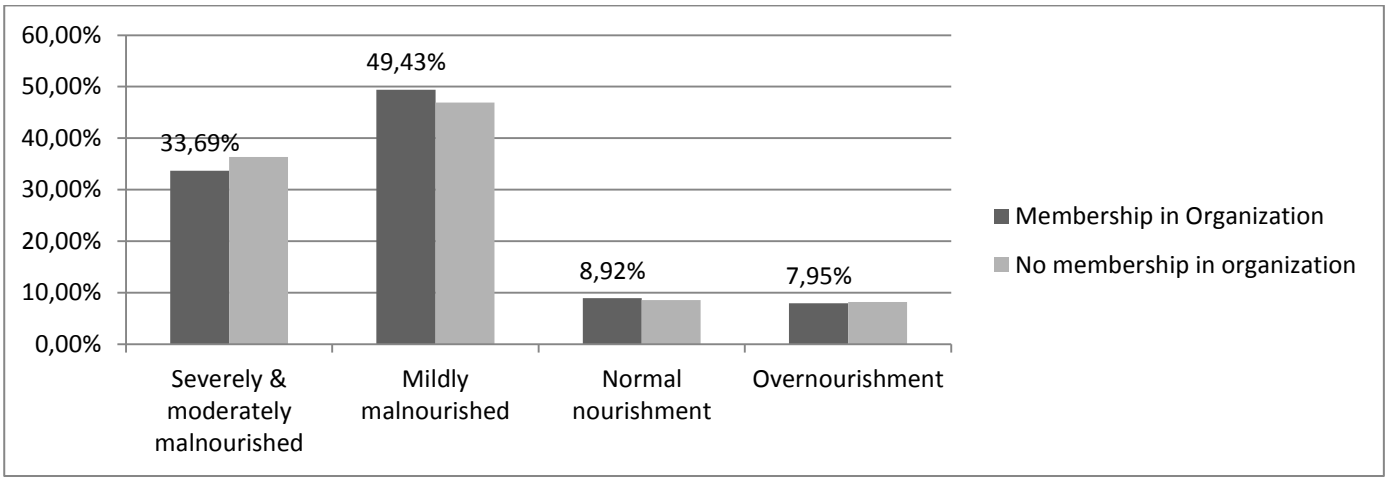

Figure 3.3.b: Percentage distribution of children under weight- for- age measurement in households with membership in one or more CBOs

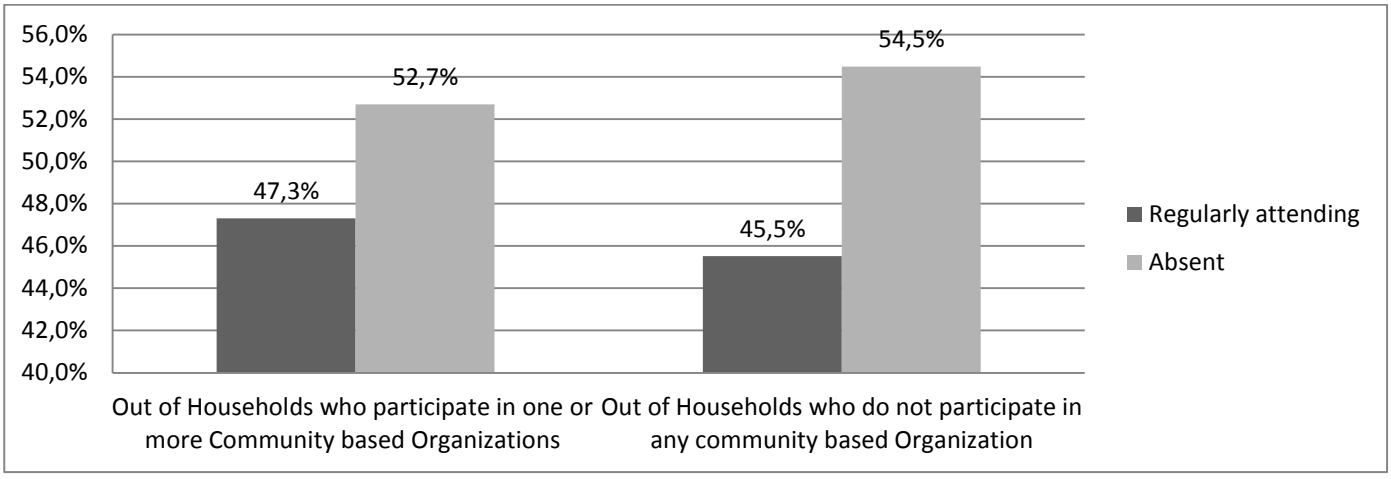

Figure 3.3.c.: Absence/attendance: Percentage distribution of children from households with membership in one or more CBOs

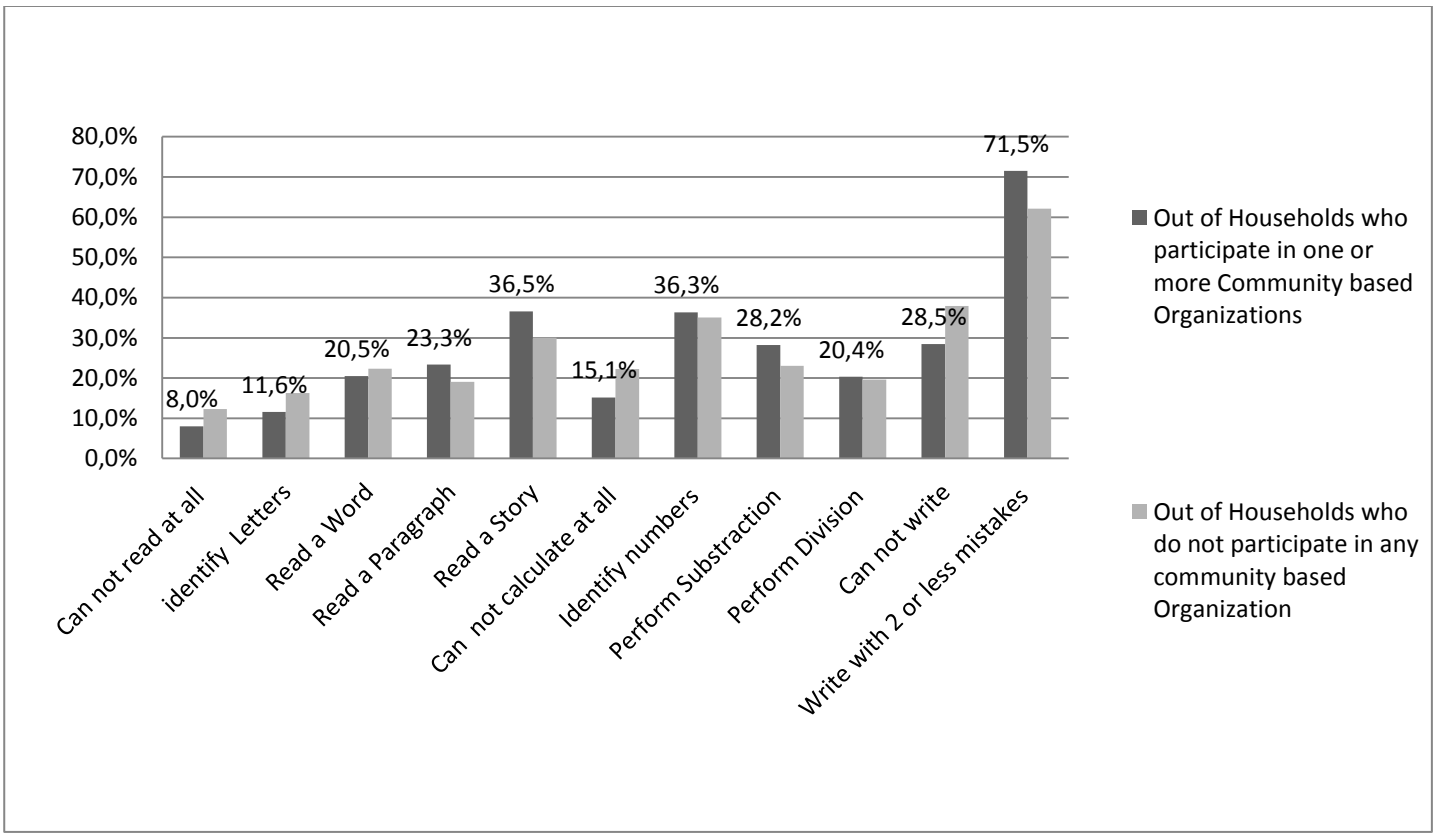

Figure 3.3.d: Test Scores: Percentage distribution of children from households with membership in one or more CBOs

Appendix 4: Community Based Organizations

Explanation of Community Based Organization terminology:

4.1 Mahila Mandal Program: The Mahila Mandal Programme (Central Social Welfare Board) is the decentralised programme under the Central Social Welfare Board and being run by the State Boards. These programmes started in 1961-62 in those areas where there were no voluntary organisations to take up welfare services for women and children. These Groups of women function essentially like NGOs and they form an entry point for comprehensive welfare services to be taken to the grass-roots level.

4.2 Youth/sports /reading club: as the name suggests it involves youngsters from the area to promote youth, sports and reading related activities in the village.

4.3 Union/Business group: They are organized labor groups.

4.4 Self Help Group (SHG) – Self-help groups are inspired by Grameen Bank. These are informal institutions and can decide their own membership and the terms and conditions for their working. The groups generally comprise 10–25 people, and gather regularly, typically every week, to pool their savings and lend from their accumulated pot to members at an interest rate designed to cover costs and the whole group is responsible for the loan repayment. Attendance is compulsory. The members select a group president and bookkeeper who help lead sessions. All transactions are made publicly in front of the entire group. The SHGs also establish linkages with different financing and development institutions and play a great role in creating a culture of self-sustenance amongst the rural communities. (Bauer, Chytilová, & Morduch, 2012).

4.5 Credit /savings group- Members of savings and credit groups are usually neighbors, friends and fellow workers. They may not be from the same religious or caste group but have similar socio-

economic background. This is substitute for poor people's banking practices and a potential channel of banking services.

4.6 Religious /social group: These groups are organized around religious activities like *bhajan mandals* or temple committees. The *bhajan mandalis* sing devotional songs during particular days of the year. Temple committees are responsible for overseeing the management and maintenance of the temple (Bruderle& Chakravarti, 2009).

4.7 Caste association- Membership in a caste is completely ascriptive. Once born into a caste, a man has no way to change social identity in so far as the social structure and cultural norms recognize caste. Caste norms prescribe the ritual, occupational, commensal, marital and social relationships of members and caste organization and authority enforce these norms within the group and with other caste groups. Caste members are culturally and socially quite homogeneous since they share the same occupation, social status and ritual position. This social homogeneity results in a sense of exclusiveness and identity which tends to subsume all social roles to that of caste membership. (Rudolph, 1960)

4.8 Development/NGO group- In India NGO's can be defined as organizations that are generally formed by professionals or quasi professionals from middle or lower middle class, either to serve or work with poor or to channel financial support to community based or grass root organizations (CBO or GRO) of the poor. These are generally non-member ship organization and have salaried employees. They could be in the form of societies, trusts and company and if they make any profit, it would be distributed amongst its members[xi]. NGO in the form of society must be registered under the Societies Registration Act, 1860. While NGO in the form of trust maybe governed by Public trust Act if applicable in the concerned state where it functions

(India). An NGO in the form of section 25 company is a company with limited liability that maybe formed for promoting ‘commerece, art, science, religion or any other useful object’

4.9 Member cooperative- The primary function of the village cooperative are the provision of short and medium term credit, supply of inputs for agriculture and allied sector, as well as marketing of agricultural products. The cooperatives have a vast rural network covering majority of the villages in respect of dairy milk supply. The habit of thrift and saving has been the essential objectives of the cooperatives.

Appendix 5: Anthropometric measures

5.1 Brief Description of anthropometric measures

The anthropometric measures[xi] are used to assess and predict performance, health and survival of individuals and reflect the economic and social well-being of populations. In case of children this measure is a common tool to assess the growth and nutritional status of children from birth till adolescence. Monitoring the growth of infants and young children becomes critical as malnutrition is often not recognized by the mother until it has become severe and then reversing the condition becomes expensive and often difficult[xi]. It is a widely used, inexpensive and non-invasive measure of the general nutritional status of an individual or a population group[xi]. This measure is the most useful tool used for assessing the nutritional status of children, for children under 5 years, as per the World Health Organization (WHO).

While there are many measures to assess the health of the child, this paper focuses on two major measures namely weight- for - height (hereafter WHZ) and weight -for - age (hereafter WAZ) to assess the malnutrition status of the child.

1. Weight-for-height (WHZ)[xi] – "Low weight for height helps to identify children suffering from acute under nutrition. This is appropriate for examining *short term* nutritional stress brought about by illness" (USAID). The weight is taken in kilograms and height in centimeters which determines the WHZ. Acute malnourishment in this category is termed as *wasting*. "Wasting is the result of a weight falling significantly below the weight expected of a child of the same length or height. Wasting indicates current or acute malnutrition resulting from failure to gain weight or actual weight loss. Causes include inadequate food intake, incorrect feeding practices, disease and infection or, more frequently, a combination of these factors" (USAID)

2. Weight-for-age (WAZ) – Low weight for age index identifies the condition of being underweight, for a specific age. Underweight based on weight for age is a composite measure of stunting and wasting and is recommended as the indicator to assess changes in the magnitude of malnutrition over time" (USAID).The weight (taken in kilograms) and age in years of the child determine WAZ. "*Though height-for-age is considered to be a better indicator of stunting among children, weight-for-age prescribed by the World Health Organization is most commonly used for child welfare work in India*".[xi]

The main reason to specifically take these two measures in the analysis is to study the factors that affect the short term (WHZ) and long term (WAZ) health of the child[xi]. This would make it easier to list the important factors affecting children health.

By referring to a growth standard chart prepared by the WHO, the children can be classified as per the Z-score into severely, moderate and mildly malnourished children, normally nourished and over nourished children, based on their height, weight and age. For example: A child can be termed as severely wasted malnourished if the height and the corresponding weight in the growth standard chart fall below the Z score of -3. Similarly a child is severely underweight if the age and the corresponding weight of the child falls below the Z score -3. Below are the cut off for the malnutrition classification[xi] for both WHZ and WAZ.

Table 5.a: Malnutrition classification as per WHO

Malnutrition classification	Cut off
Severe	< -3 Z-score
Moderate	< -2 to >-3 Z score
Mild	<-1 to >-2 Z score

Source: Food and nutrition technical assistance, FANTA-2, USAID.

"These charts have curved lines printed on them that help interpret the plotted points that represent a child's growth status. The line labeled 0 on each chart represents the median which is generally speaking the average. The other curved lines are Z-scores[xi] lines which indicate distance from the average. The median and the z-score lines are derived from measurements of children in the WHO Multicentre Growth Reference Study who were fed and raised in the environments that favoured optimal growth."

Based on the above information, children can be classified in these categories and thus know the percentage of malnourished children in the society. The Government can accordingly take actions to improve the health of such children. However it is to be noted that this paper has combined the Z-score of severely and moderately malnourished children under the category of, -2 Z score (UNICEF). Since both are critical stages of the child health. Therefore the levels of child health taken are severely, moderately malnourished (-2), mildly malnourished (-1), normal nourishment (0) and over nourishment (1)[xi].

Note: The over nourished children that fall in the Z score above 1 also pose a growth problem in terms of obesity or overweight. However it is not a health problem that is of concern in rural India as the problem of focus is malnourishment which is mostly rampant in these areas. Also there is no clear definition for Z-score of above 1 in the Weight–for-Age measurement (WAZ) as the child Height- to- Age measurement also needs to be verified in order to see whether child is in fact overweight/ having growth problem. (WHO Child Growth Standards: Interpreting growth indicators)

5.2 Education:

Absence in school

Absence in school is converted into binary outcome. The conversion is done to simplify the model. Although the original variable is in the continuous form, due to measurement errors, the outcomes were not sensible. Also there is no clear criterion established in the literature which explains ‘how many days of absence is regarded as detrimental to child development.

Appendix 6: Econometric Outputs

Table 6.1

Absence - Probit Marginal effects	Organizations	t value	Mahila mandal	t value	Youth clubs	t value	Trade unions	t value
On Absence	0.0488	6.60	0.0132	1.03	0.0162	0.99	0.0734	4.01
Total Income in log	-0.0034	-1.59	-0.0031	-1.47	-0.0031	-1.47	-0.0033	-1.56
Poor	-0.0368	-4.28	-0.0381	-4.45	-0.0382	-4.45	-0.0384	-4.48
Number of Household Assets	-0.0061	-6.34	-0.0061	-6.38	-0.0061	-6.41	-0.0064	-6.65
Highest education level of female in the HH	0.0016	1.64	0.0018	1.80	0.0018	1.82	0.0020	1.94
Highest education level of male in the HH	-0.0042	-4.62	-0.0038	-4.21	-0.0038	-4.24	-0.0039	-4.34
Family Size	'-0.0025	-1.36	-0.0022	-1.22	-0.0023	-1.25	-0.0023	-1.25
Number of Children	0.0012	0.38	0.0012	0.36	0.0012	0.37	0.0012	0.36
Ever Repeated a grade	0.0220	1.65	0.0204	1.54	0.0204	1.53	0.0202	1.52
Distance to School	-0.0032	-2.19	-0.0029	-1.98	-0.0029	-2.00	-0.0031	-2.16
School fees in Rs. Per annum	0.0030	0.90	0.0015	0.46	0.0015	0.46	0.0014	0.43
Expenditure on books, uniform etc. In Rs. Per annum	-0.0286	-6.55	-0.0283	-6.47	-0.0281	-6.44	-0.0276	-6.33
Private tuition fees in Rs. Per annum	0.0173	1.72	0.0186	1.86	0.0184	1.84	0.0174	1.73
Harrasment of girls	-0.0070	-0.75	-0.0067	-0.72	-0.0073	-0.78	-0.0076	-0.81
Governemnt school	0.0664	6.20	0.0658	6.15	0.0658	6.14	0.0648	6.04
North	0.0046	0.39	-0.0047	-0.41	-0.0045	-0.39	-0.0042	-0.37
Central	0.1323	9.88	0.1273	9.51	0.1272	9.50	0.1282	9.59
West	-0.1754	-12.82	-0.1721	-12.55	-0.1723	-12.56	-0.1723	-12.56
South	-0.2823	-23.42	-0.2749	-22.62	-0.2741	-22.63	-0.2781	-22.96
Backward caste	0.0762	8.27	0.0783	8.50	0.0784	8.52	0.0784	8.51
Muslim	0.0683	5.25	0.0691	5.31	0.0687	5.27	0.0687	5.27
Sikh-Jain	0.2022	8.79	0.2013	8.71	0.2012	8.71	0.2025	8.79
Christian	0.1031	2.82	0.1014	2.77	0.1024	2.80	0.1014	2.76
Female	0.0103	1.56	0.0105	1.59	0.0105	1.59	0.0098	1.48
Age6to9	0.0403	4.18	0.0397	4.12	0.0398	4.13	0.0390	4.05
Age10to12	0.0271	2.92	0.0265	2.85	0.0265	2.85	0.0261	2.82
Distance to closest Bus stop in Km.	0.0048	4.57	0.0044	4.17	0.0044	4.16	0.0044	4.14
Distance to closest Railway station in km	-0.00005	-0.32	3.44e	0.02	9.05e-	0.05	8.13e	0.05
Distance to closest Police station in km	-0.0036	-6.31	-0.0035	-6.11	-0.0035	-6.09	-0.0035	-6.10
Distance to closest Fair price shop in km	-0.0024	-1.62	-0.0023	-1.56	-0.0023	-1.56	-0.0022	-1.52
Distance to closest Market in km	-0.0008	-1.40	-0.0009	-1.59	-0.0009	-1.55	-0.0009	-1.49
Distance to closest General store in km	0.0004	0.59	0.0005	0.62	0.0005	0.63	0.0005	0.67
Distance to closest Bank branch in km	0.0026	3.29	0.0026	3.25	0.0025	3.22	0.0026	3.28
Distance to closest Post office in km	-0.0018	-1.21	-0.0016	-1.06	-0.0015	-1.03	-0.0016	-1.07
January	0.0954	7.43	0.0968	7.54	0.0972	7.58	0.0964	7.51
February	0.1051	7.87	0.1074	8.05	0.1073	8.04	0.1059	7.92

March	0.1009	6.87	0.1017	6.93	0.1021	6.95	0.1008	6.86
April	0.0370	2.64	0.0371	2.65	0.0376	2.69	0.0367	2.62
May	0.0809	5.59	0.0820	5.66	0.0823	5.68	0.0811	5.60
June	-0.0077	-0.41	-0.0014	-0.07	-0.0015	-0.08	-0.0028	-0.15
July	0.0330	1.71	0.0382	1.98	0.0382	1.99	0.0362	1.88
August	0.1678	9.60	0.1688	9.64	0.1687	9.64	0.1692	9.68
September	0.2224	12.22	0.2258	12.49	0.2262	12.52	0.2260	12.54
October	0.3297	15.49	0.3363	16.21	0.3361	16.21	0.3357	16.19
November	0.0145	0.80	0.0214	1.18	0.0211	1.17	0.0214	1.18

Absence Probit Marginal effects	**Self help groups**	**t value**	**Credit/savings group**	**t value**	**Religious/ Social group**	**t value**
On Absence	0.0112	0.98	0.0166	1.35	0.1175	12.50
Total Income in log	-0.0031	-1.47	-0.0031	-1.48	-0.0035	-1.63
Poor	-0.0385	-4.49	-0.0383	-4.47	-0.0324	-3.77
Number of Household Assets	-0.0061	-6.35	-0.0061	-6.39	-0.0061	-6.40
Highest education level of female in the HH	0.0018	1.84	0.0018	1.83	0.0013	1.27
Highest education level of male in the HH	-0.0038	-4.22	-0.0038	-4.19	-0.0042	-4.69
Family Size	-0.0022	-1.23	-0.0022	-1.23	-0.0025	-1.39
Number of Children	0.0012	0.37	0.0012	0.36	0.0009	0.26
Ever Repeated a grade	0.0206	1.55	0.0209	1.57	0.0222	1.67
Distance to School	-0.0029	-2.01	-0.0029	-2.01	-0.0026	-1.82
School fees in Rs. Per annum	0.0015	0.45	0.0015	0.44	0.0042	1.22
Expenditure on books, uniform etc. In Rs. Per annum	-0.0281	-6.44	-0.0281	-6.44	-0.0288	-6.59
Private tuition fees in Rs. Per annum	0.0185	1.85	0.0187	1.86	0.0166	1.66
Harrasment of girls	-0.0069	-0.74	-0.0068	-0.73	-0.0119	-1.27
Governemnt school	0.0658	6.14	0.0657	6.13	0.0697	6.49
North	-0.0044	-0.38	-0.0042	-0.36	0.0108	0.93
Central	0.1274	9.49	0.1271	9.50	0.1337	10.03
West	-0.1713	-12.46	-0.1730	-12.59	-0.1826	-13.34
South	-0.2755	-22.51	-0.2749	-22.65	-0.2668	-21.85
Backward caste	0.0783	8.51	0.0783	8.51	0.0732	7.91
Muslim	0.0694	5.33	0.0692	5.32	0.0579	4.41
Sikh-Jain	0.2010	8.70	0.2018	8.75	0.1966	8.46
Christian	0.1026	2.81	0.1041	2.86	0.1006	2.73
Female	0.0105	1.60	0.0107	1.62	0.0111	1.68
Age6to9	0.0397	4.13	0.0398	4.14	0.0423	4.39
Age10to12	0.0265	2.86	0.0265	2.86	0.0278	2.99
Distance to closest Bus stop in Km.	0.0044	4.17	0.0043	4.13	0.0051	4.79

Distance to closest Railway station in km	8.88e	0.05	0.00001	0.06	-0.00004	-0.26
Distance to closest Police station in km	-0.0035	-6.10	-0.0035	-6.09	-0.00376	-6.47
Distance to closest Fair price shop in km	-0.0023	-1.54	-0.0023	-1.54	-0.0019	-1.31
Distance to closest Market in km	-0.0009	-1.55	-0.0009	-1.50	-0.0004	-0.80
Distance to closest General store in km	0.00049	0.60	0.0004	0.56	0.0003	0.45
Distance to closest Bank branch in km	0.0026	3.25	0.0026	3.25	0.0024	3.05
Distance to closest Post office in km	-0.0015	-1.02	-0.0014	-0.97	-0.0024	-1.57
January	0.0968	7.54	0.0974	7.59	0.0978	7.62
February	0.1072	8.03	0.1073	8.04	0.1086	8.14
March	0.1014	6.91	0.1019	6.94	0.1037	7.07
April	0.0366	2.62	0.0371	2.65	0.0373	2.66
May	0.0816	5.64	0.0827	5.71	0.0755	5.20
June	-0.0020	-0.11	-0.0016	-0.08	-0.0211	-1.11
July	0.0380	1.98	0.0396	2.06	0.0193	0.99
August	0.1683	9.61	0.1689	9.65	0.1656	9.40
September	0.2254	12.51	0.2269	12.57	0.2099	11.12
October	0.3359	16.18	0.3365	16.26	0.3162	13.85
November	0.0215	1.19	0.0213	1.17	0.0129	0.71

Absence Probit Marginal effects	**Caste Association**	**t value**	**NGO/Development group**	**t value**	**Cooperatives**	**t value**
On Absence	0.0970	10.00	-0.0441	-1.91	0.0110	0.71
Total Income in log	-0.0032	-1.50	-0.0030	-1.40	-0.0030	-1.43
Poor	-0.0342	-3.98	-0.0380	-4.44	-0.0379	-4.42
Number of Household Assets	-0.0062	-6.53	-0.0061	-6.41	-0.0061	-6.40
Highest education level of female in the HH	0.0020	1.94	0.0018	1.83	0.0018	1.83
Highest education level of male in the HH	-0.0042	-4.66	-0.0037	-4.10	-0.0038	-4.21
Family Size	-0.0020	-1.08	-0.0022	-1.21	-0.0023	-1.25
Number of Children	0.0003	0.09	0.0011	0.33	0.0012	0.36
Ever Repeated a grade	0.0228	1.72	0.0203	1.52	0.0209	1.57
Distance to School	-0.0033	-2.27	-0.0029	-2.01	-0.0029	-2.00
School fees in Rs. Per annum	0.0030	0.89	0.0018	0.53	0.0016	0.48
Expenditure on books, uniform etc. In Rs. Per annum	-0.0288	-6.58	-0.0280	-6.41	-0.0280	-6.40
Private tuition fees in Rs. Per annum	0.0170	1.70	0.0190	1.89	0.0187	1.87
Harrasment of girls	-0.0066	-0.70	-0.0072	-0.78	-0.0072	-0.77
Governemnt school	0.0666	6.21	0.0662	6.18	0.0663	6.19
North	0.00008	0.01	-0.0064	-0.55	-0.0049	-0.42
Central	0.1224	9.12	0.1254	9.35	0.1263	9.44
West	-0.1697	-12.28	-0.1722	-12.56	-0.1735	-12.57
South	-0.2879	-23.47	-0.2735	-22.57	-0.2741	-22.62
Backward caste	0.0749	8.13	0.0789	8.56	0.0786	8.53

Muslim	0.0631	4.83	0.0688	5.29	0.0688	5.28
Sikh-Jain	0.1996	8.63	0.1995	8.62	0.2000	8.65
Christian	0.1148	3.14	0.1033	2.84	0.1035	2.84
Female	0.0098	1.49	0.0109	1.65	0.0107	1.63
Age6to9	0.0396	4.11	0.0401	4.17	0.0399	4.15
Age10to12	0.0269	2.90	0.0265	2.85	0.0265	2.86
Distance to closest Bus stop in Km.	0.0050	4.71	0.0043	4.12	0.0044	4.18
Distance to closest Railway station in km	-0.00001	-0.08	0.00002	0.13	0.00001	0.07
Distance to closest Police station in km	-0.0036	-6.25	-0.0035	-6.03	-0.0035	-6.09
Distance to closest Fair price shop in km	-0.0028	-1.87	-0.0023	-1.54	-0.0022	-1.50
Distance to closest Market in km	-0.0006	-1.04	-0.0009	-1.57	-0.0009	-1.56
Distance to closest General store in km	0.0005	0.71	0.0004	0.61	0.0004	0.56
Distance to closest Bank branch in km	0.0024	3.03	0.0025	3.24	0.0025	3.24
Distance to closest Post office in km	-0.0017	-1.14	-0.0014	-0.97	-0.0015	-1.02
January	0.0952	7.40	0.0967	7.54	0.0970	7.56
February	0.1070	7.99	0.1076	8.06	0.1074	8.05
March	0.0992	6.74	0.1011	6.89	0.1019	6.95
April	0.0372	2.65	0.0362	2.59	0.0372	2.66
May	0.0783	5.39	0.0815	5.63	0.0824	5.69
June	-0.0113	-0.60	-0.0023	-0.13	-0.0020	-0.11
July	0.0286	1.48	0.0382	1.98	0.0385	2.00
August	0.1671	9.52	0.1678	9.57	0.1690	9.65
September	0.2125	11.39	0.2253	12.51	0.2256	12.52
October	0.3138	13.67	0.3356	16.10	0.3350	16.08
November	0.0089	0.49	0.0217	1.20	0.0217	1.20

Table 6.2.a

Orpobit probability of scores being 0	Organization	t value	Mahila Mandal	t value	Youth Club	t value	Trade unions	t value
Reading score	-0.0161	-4.51	-0.0045	-0.71	-0.0128	-1.53	-0.0030	-0.30
Total Income in log	-0.0009	-0.87	-0.0010	-0.95	-0.0010	-0.95	-0.0010	-0.97
Poor	0.0140	3.15	0.0151	3.37	0.0151	3.37	0.0152	3.38
Number of Household Assets	-0.0041	-7.99	-0.0040	-7.93	-0.0040	-7.91	-0.0040	-7.89
Highest education level of female in the HH	-0.0032	-5.76	-0.0033	-5.92	-0.0033	-5.89	-0.0033	-5.96
Highest education level of male in the HH	-0.0025	-5.42	-0.0026	-5.71	'-0.0026	-5.62	-0.0026	-5.72
Family Size	0.0016	1.68	0.0015	1.62	0.0016	1.67	0.0016	1.63
Number of Children	0.0030	1.69	0.0029	1.62	0.0029	1.60	0.0029	1.63
Ever Repeated a grade	0.0209	2.54	0.0218	2.62	0.0219	2.62	0.0219	2.62
Distance to School	-0.0056	-5.49	-0.0058	-5.67	-0.0058	-5.68	-0.0058	-5.59
School fees in Rs. Per annum	-0.0107	-5.79	-0.0101	-5.43	-0.0101	-5.45	-0.0100	-5.41
Expenditure on books, uniform etc. In Rs. Per annum	-0.0263	-11.60	-0.0265	-11.68	-0.0265	-11.65	-0.0266	-11.73

Private tuition fees in Rs. Per annum	0.0006	0.10	-0.0001	-0.02	-0.00004	-0.01	-0.00002	-0.00
Harrasment of girls	0.0074	1.64	0.0077	1.71	0.0079	1.74	0.0079	1.75
Governemnt school	-0.0357	-5.16	-0.0351	-5.09	-0.0351	-5.09	-0.0350	-5.08
North	0.0352	5.92	0.0383	6.46	0.0379	6.38	0.0385	6.48
Central	-0.0067	-1.01	-0.0052	-0.77	-0.0056	-0.84	-0.0051	-0.75
West	-0.0128	-2.09	-0.0134	-2.21	-0.0134	-2.19	-0.0134	-2.19
South	0.0416	4.81	0.0379	4.45	0.0377	4.46	0.0375	4.44
Backward caste	0.0195	4.33	0.0188	4.16	0.0188	4.16	0.0188	4.16
Muslim	0.0442	4.99	0.0443	4.99	0.0445	5.00	0.0445	5.01
Sikh-Jain	0.0286	1.54	0.0300	1.60	0.0302	1.61	0.0304	1.62
Christian	-0.0100	-0.57	-0.0107	-0.62	-0.0094	-0.53	-0.0105	-0.60
Female	0.0135	3.95	0.0134	3.91	0.0134	3.90	0.0134	3.91
Distance to closest Bus stop in Km.	0.0017	3.43	0.0019	3.69	0.0019	3.70	0.0019	3.71
Distance to closest Railway station in km	-0.00017	-1.88	-0.0001	-2.10	-0.0001	-2.10	-0.0001	-2.12
Distance to closest Police station in km	'-9.50e-06	-0.03	-0.00002	-0.09	-0.00003	-0.11	-0.00003	-0.11
Distance to closest Fair price shop in km	0.00142	1.98	0.0014	1.97	0.0014	2.00	0.0014	1.97
Distance to closest Market in km	0.00015	0.52	0.0002	0.70	0.0002	0.66	0.0001	0.64
Distance to closest General store in km	-0.0026	-5.96	-0.0026	-6.16	-0.0027	-6.19	-0.0026	-6.16
Distance to closest Bank branch in km	0.0011	2.96	0.0011	3.04	0.0011	3.08	0.0011	3.06
Distance to closest Post office in km	0.0003	0.46	0.0002	0.31	0.0002	0.35	0.0002	0.30

Orpobit probability of scores being 0	**Self Help group**	**t value**	**Credit/Savings group**	**t value**	**Religious/Social group**	**t value**
Reading score	-0.0091	-1.69	-0.0075	-1.28	-0.0094	-2.07
Total Income in log	-0.0010	-0.93	-0.0010	-0.94	-0.0010	-0.93
Poor	0.0154	3.43	0.0152	3.40	0.0144	3.22
Number of Household Assets	-0.0041	-7.97	-0.0040	-7.92	-0.0040	-7.95
Highest education level of female in the HH	-0.0032	-5.87	-0.0033	-5.92	-0.0032	-5.87
Highest education level of male in the HH	-0.0026	-5.70	-0.0027	-5.74	-0.0026	-5.64
Family Size	0.0016	1.66	0.0016	1.64	0.0016	1.66
Number of Children	0.0029	1.59	0.0029	1.60	0.0030	1.65
Ever Repeated a grade	0.0216	2.60	0.0215	2.59	0.0218	2.62
Distance to School	-0.0058	-5.61	-0.0058	-5.63	-0.0059	-5.65
School fees in Rs. Per annum	-0.0100	-5.42	-0.0100	-5.43	-0.0102	-5.53
Expenditure on books, uniform etc. In Rs. Per annum	-0.0266	-11.72	-0.0266	-11.72	-0.0265	-11.66
Private tuition fees in Rs. Per annum	0.00004	0.01	-0.0002	-0.03	0.0002	0.04
Harrasment of girls	0.0077	1.71	0.0078	1.74	0.0080	1.77
Governemnt school	-0.0350	-5.08	-0.0351	-5.09	-0.0356	-5.15
North	0.0376	6.33	0.0384	6.46	0.0372	6.24
Central	-0.0058	-0.87	-0.0050	-0.74	-0.0057	-0.84
West	-0.0140	-2.31	-0.0129	-2.11	-0.0125	-2.03
South	0.0395	4.59	0.0380	4.50	0.0364	4.32

Backward caste	0.0189	4.18	0.0189	4.18	0.0193	4.27
Muslim	0.0439	4.94	0.0442	4.98	0.0457	5.09
Sikh-Jain	0.0301	1.60	0.0299	1.60	0.0314	1.66
Christian	-0.0104	-0.60	-0.0115	-0.67	-0.0104	-0.60
Female	0.0135	3.93	0.0134	3.91	0.0133	3.88
Distance to closest Bus stop in Km.	0.0019	3.68	0.0019	3.72	0.0018	3.59
Distance to closest Railway station in km	-0.0001	-2.07	-0.0001	-2.12	-0.0001	-1.96
Distance to closest Police station in km	-0.00002	-0.09	-0.00003	-0.11	-0.00002	-0.09
Distance to closest Fair price shop in km	0.0013	1.95	0.0013	1.95	0.0013	1.93
Distance to closest Market in km	0.0002	0.67	0.0001	0.63	0.0001	0.49
Distance to closest General store in km	-0.0026	-6.16	-0.0026	-6.09	-0.0026	-6.08
Distance to closest Bank branch in km	0.0011	3.04	0.0011	3.04	0.0011	3.03
Distance to closest Post office in km	0.0002	0.31	0.0001	0.26	0.0003	0.45

Orpobit probability of scores being 0	**Caste Association**	**t value**	**NGO/Development group**	**t value**	**Cooperative group**	**t value**
Reading score	0.0023	0.47	0.0500	2.65	-0.0045	-0.55
Total Income in log	-0.0010	-0.98	-0.0011	-1.02	-0.0010	-0.96
Poor	0.0154	3.41	0.0154	3.44	0.0149	3.34
Number of Household Assets	-0.0040	-7.92	-0.0040	-7.96	-0.0040	-7.89
Highest education level of female in the HH	-0.0033	-5.96	-0.0033	-6.02	-0.0033	-5.99
Highest education level of male in the HH	-0.0027	-5.74	-0.0027	-5.79	-0.0026	-5.68
Family Size	0.0016	1.64	0.0016	1.63	0.0016	1.63
Number of Children	0.0029	1.61	0.0029	1.63	0.0029	1.63
Ever Repeated a grade	0.0220	2.64	0.0223	2.67	0.0219	2.63
Distance to School	-0.0058	-5.66	-0.0058	-5.59	-0.0058	-5.66
School fees in Rs. Per annum	-0.0099	-5.37	-0.0101	-5.48	-0.0101	-5.45
Expenditure on books, uniform etc. In Rs. Per annum	-0.0267	-11.72	-0.0267	-11.74	-0.0267	-11.75
Private tuition fees in Rs. Per annum	-0.0001	-0.03	-0.0004	-0.08	-0.0001	-0.02
Harrasment of girls	0.0079	1.75	0.0081	1.78	0.0079	1.74
Governemnt school	-0.0350	-5.08	-0.0349	-5.08	-0.0351	-5.09
North	0.0386	6.49	0.0398	6.68	0.0385	6.48
Central	-0.0051	-0.76	-0.0041	-0.61	-0.0048	-0.71
West	-0.0133	-2.17	-0.0135	-2.22	-0.0130	-2.09
South	0.0370	4.40	0.0380	4.50	0.0377	4.46
Backward caste	0.0186	4.12	0.0185	4.11	0.0186	4.11
Muslim	0.0443	4.98	0.0448	5.05	0.0441	4.98
Sikh-Jain	0.0304	1.62	0.0315	1.67	0.0299	1.60
Christian	-0.0106	-0.61	-0.0113	-0.66	-0.0107	-0.62
Female	0.0133	3.89	0.0134	3.92	0.0133	3.88
Distance to closest Bus stop in Km.	0.0019	3.73	0.0019	3.74	0.0019	3.70
Distance to closest Railway station in km	-0.0001	-2.13	-0.0001	-2.11	-0.0001	-2.10

Distance to closest Police station in km	-0.00003	-0.11	-0.00005	-0.21	-0.00003	-0.11
Distance to closest Fair price shop in km	0.0014	1.96	0.0014	1.98	0.0014	1.97
Distance to closest Market in km	0.0002	0.68	0.0002	0.72	0.0002	0.67
Distance to closest General store in km	-0.0027	-6.17	-0.0027	-6.23	-0.0026	-6.15
Distance to closest Bank branch in km	0.0011	3.06	0.0011	3.05	0.0011	3.04
Distance to closest Post office in km	0.0002	0.28	0.0001	0.19	0.0002	0.31

Table 6.2.b

Orpobit probability of scores being 0	**Organization**	**t value**	**Mahila Mandal**	**t value**	**Youth Club**	**t value**	**Trade unions**	**t value**
Math Score	-0.0117	-1.88	-0.0147	-1.40	-0.0252	-1.94	0.0844	3.90
Total Income in log	0.0005	0.29	0.0004	0.26	0.0004	0.25	0.0001	0.09
Poor	0.0267	3.47	0.0275	3.57	0.0275	3.57	0.0287	3.72
Number of Household Assets	-0.0062	-7.35	-0.0062	-7.33	-0.0062	-7.30	-0.0065	-7.62
Highest education level of female in the HH	-0.0058	-6.16	-0.0058	-6.12	-0.0058	-6.15	-0.0058	-6.20
Highest education level of male in the HH	-0.0057	-7.10	-0.0058	-7.22	-0.0057	-7.11	-0.0059	-7.36
Family Size	0.0015	0.92	0.0015	0.91	0.0016	0.97	0.0017	0.99
Number of Children	0.0062	1.97	0.0060	1.93	0.0060	1.91	0.0058	1.87
Ever Repeated a grade	0.0464	3.41	0.0467	3.43	0.0468	3.43	0.0481	3.51
Distance to School	-0.0001	-0.14	-0.0003	-0.27	-0.0003	-0.25	-0.0011	-0.89
School fees in Rs. Per annum	-0.0180	-5.85	-0.0176	-5.71	-0.0176	-5.71	-0.0171	-5.56
Expenditure on books, uniform etc. In Rs. Per annum	-0.0406	-10.57	-0.0405	-10.53	-0.0405	-10.55	-0.0404	-10.53
Private tuition fees in Rs. Per annum	-0.0126	-1.24	-0.0132	-1.31	-0.0130	-1.28	-0.0153	-1.51
Harrasment of girls	0.0084	0.99	0.0084	0.99	0.0088	1.04	0.0080	0.95
Governemnt school	-0.0338	-3.22	-0.0335	-3.20	-0.0334	-3.19	-0.0346	-3.31
North	0.0785	7.54	0.0800	7.74	0.0795	7.66	0.0823	7.96
Central	0.1451	8.49	0.1456	8.52	0.1447	8.46	0.1486	8.67
West	0.0704	4.96	0.0697	4.92	0.0701	4.95	0.0706	4.98
South	0.0733	5.52	0.0719	5.43	0.0710	5.39	0.0656	5.03
Backward caste	0.0398	5.11	0.0394	5.06	0.0393	5.05	0.0389	5.00
Muslim	0.0656	4.70	0.0655	4.70	0.0659	4.72	0.0664	4.76
Sikh-Jain	0.0535	2.11	0.0541	2.12	0.0549	2.15	0.0573	2.23
Christian	0.0628	1.93	0.0624	1.93	0.0657	1.99	0.0516	1.61
Female	0.0486	8.21	0.0486	8.22	0.0485	8.21	0.0477	8.08
Distance to closest Bus stop in Km.	0.0033	3.55	0.0033	3.64	0.0034	3.67	0.0033	3.64
Distance to closest Railway station in km	-0.0002	-1.64	-0.0002	-1.72	-0.0002	-1.74	-0.0002	-1.72
Distance to closest Police station in km	-0.00009	-0.19	-0.00008	-0.18	-0.00009	-0.20	-0.0001	-0.21

Distance to closest Fair price shop in km	0.0013	1.11	0.0013	1.10	0.0013	1.14	0.0013	1.17
Distance to closest Market in km	0.0004	0.92	0.0005	1.08	0.0004	0.98	0.0004	1.03
Distance to closest General store in km	-0.0018	-2.69	-0.0019	-2.78	-0.0019	-2.82	-0.0019	-2.87
Distance to closest Bank branch in km	0.0013	2.02	0.0013	2.03	0.0013	2.09	0.0013	2.12
Distance to closest Post office in km	-0.0014	-1.20	-0.0014	-1.22	-0.0014	-1.20	-0.0015	-1.31

Orpobit probability of scores being 0	**Self Help group**	**t value**	**Credit/Savings group**	**t value**	**Religious/Social group**	**t value**
Math Score	0.0097	0.96	-0.0168	-1.70	-0.0087	-1.09
Total Income in log	0.0003	0.20	0.0005	0.27	0.0004	0.25
Poor	0.0275	3.57	0.0279	3.62	0.0270	3.49
Number of Household Assets	-0.0062	-7.25	-0.0062	-7.32	-0.0062	-7.33
Highest education level of female in the HH	-0.0059	-6.25	-0.0058	-6.17	-0.0058	-6.17
Highest education level of male in the HH	-0.0059	-7.27	-0.0059	-7.27	-0.0058	-7.19
Family Size	0.0015	0.90	0.0016	0.95	0.0016	0.94
Number of Children	0.0061	1.96	0.0059	1.90	0.0061	1.95
Ever Repeated a grade	0.0472	3.46	0.0461	3.38	0.0469	3.44
Distance to School	-0.0002	-0.21	-0.0002	-0.21	-0.0003	-0.27
School fees in Rs. Per annum	-0.0174	-5.65	-0.0175	-5.68	-0.0176	-5.71
Expenditure on books, uniform etc. In Rs. Per annum	-0.0408	-10.62	-0.0408	-10.63	-0.0406	-10.59
Private tuition fees in Rs. Per annum	-0.0134	-1.32	-0.0134	-1.32	-0.0129	-1.27
Harrasment of girls	0.0089	1.05	0.0087	1.03	0.0089	1.05
Governemnt school	-0.0335	-3.20	-0.0335	-3.20	-0.0338	-3.22
North	0.0815	7.85	0.0804	7.77	0.0796	7.65
Central	0.1476	8.59	0.1466	8.57	0.1459	8.53
West	0.0709	4.98	0.0715	5.02	0.0711	5.00
South	0.0682	5.18	0.0719	5.44	0.0695	5.27
Backward caste	0.0392	5.03	0.0397	5.10	0.0398	5.10
Muslim	0.0666	4.76	0.0655	4.69	0.0670	4.77
Sikh-Jain	0.0557	2.18	0.0542	2.13	0.0559	2.18
Christian	0.0613	1.89	0.0599	1.86	0.0625	1.92
Female	0.0484	8.19	0.0487	8.23	0.0484	8.19
Distance to closest Bus stop in Km.	0.0034	3.69	0.0034	3.68	0.0033	3.60
Distance to closest Railway station in km	-0.0002	-1.78	-0.0002	-1.76	-0.0002	-1.67
Distance to closest Police station in km	-0.0001	-0.22	-0.00009	-0.20	-0.00009	-0.21

Distance to closest Fair price shop in km	0.0013	1.12	0.0012	1.08	0.0012	1.09
Distance to closest Market in km	0.0004	0.94	0.0004	0.92	0.0004	0.87
Distance to closest General store in km	-0.0019	-2.80	-0.0018	-2.68	-0.0018	-2.75
Distance to closest Bank branch in km	0.0013	2.08	0.0013	2.03	0.0013	2.06
Distance to closest Post office in km	-0.0015	-1.27	-0.0015	-1.29	-0.0014	-1.17

Orpobit probability of scores being 0	**Caste Association**	**t value**	**NGO/Development group**	**t value**	**Cooperative group**	**t value**
Math Score	0.0267	2.97	0.0214	0.88	0.0002	0.02
Total Income in log	0.0003	0.19	0.0004	0.21	0.0004	0.24
Poor	0.0296	3.81	0.0279	3.62	0.0274	3.55
Number of Household Assets	-0.0062	-7.35	-0.0062	-7.33	-0.0062	-7.34
Highest education level of female in the HH	-0.0059	-6.22	-0.0059	-6.23	-0.0059	-6.27
Highest education level of male in the HH	-0.0059	-7.37	-0.0059	-7.27	-0.0058	-7.23
Family Size	0.0017	0.99	0.0015	0.92	0.0015	0.89
Number of Children	0.0057	1.82	0.0061	1.94	0.0061	1.95
Ever Repeated a grade	0.0483	3.53	0.0471	3.45	0.0472	3.46
Distance to School	-0.0005	-0.42	-0.0002	-0.19	-0.0002	-0.22
School fees in Rs. Per annum	-0.0167	-5.43	-0.0175	-5.68	-0.0176	-5.72
Expenditure on books, uniform etc. In Rs. Per annum	-0.0411	-10.71	-0.0408	-10.63	-0.0408	-10.70
Private tuition fees in Rs. Per annum	-0.0143	-1.41	-0.0133	-1.32	-0.0131	-1.29
Harrasment of girls	0.0094	1.10	0.0088	1.04	0.0087	1.02
Governemnt school	-0.0326	-3.13	-0.0334	-3.19	-0.0336	-3.20
North	0.0822	7.92	0.0814	7.84	0.0808	7.80
Central	0.1447	8.48	0.1471	8.58	0.1469	8.57
West	0.0713	5.01	0.0699	4.93	0.0695	4.83
South	0.0670	5.14	0.0706	5.37	0.0704	5.34
Backward caste	0.0380	4.87	0.0392	5.04	0.0391	5.03
Muslim	0.0637	4.58	0.0661	4.73	0.0656	4.70
Sikh-Jain	0.0546	2.14	0.0557	2.18	0.0547	2.14
Christian	0.0658	2.01	0.0617	1.91	0.0623	1.92
Female	0.0481	8.12	0.0486	8.22	0.0484	8.18
Distance to closest Bus stop in Km.	0.0035	3.82	0.0034	3.67	0.0033	3.66

Distance to closest Railway station in km	-0.0002	-1.84	-0.0002	-1.76	-0.0002	-1.75
Distance to closest Police station in km	-0.00009	-0.20	-0.0001	-0.24	-0.0001	-0.21
Distance to closest Fair price shop in km	0.0011	1.00	0.0013	1.11	0.0013	1.11
Distance to closest Market in km	0.0005	1.15	0.0004	0.98	0.0004	0.98
Distance to closest General store in km	-0.0019	-2.88	-0.0019	-2.79	-0.0019	-2.80
Distance to closest Bank branch in km	0.0013	2.06	0.0013	2.06	0.0013	2.05
Distance to closest Post office in km	-0.0016	-1.34	-0.0015	-1.28	-0.0015	-1.26

Table 6.2.c

Orpobit probability of scores being 0	Organization	t value	Mahila Mandal	t value	Youth Club	t value	Trade unions	t value
Writing score	-0.0344	-2.92	0.0036	0.16	-0.0670	-2.21	0.0560	1.55
Total Income in log	0.0023	0.69	0.0021	0.64	0.0023	0.69	0.0020	0.60
Poor	0.0468	3.55	0.0489	3.71	0.0483	3.66	0.0498	3.77
Number of Household Assets	-0.0067	-4.20	-0.0067	-4.18	-0.0066	-4.17	-0.0068	-4.28
Highest education level of female in the HH	-0.0124	-6.86	-0.0127	-6.98	-0.0125	-6.91	-0.0127	-6.98
Highest education level of male in the HH	-0.0070	-4.80	-0.0073	-4.98	-0.0071	-4.84	-0.0073	-5.02
Family Size	0.0031	1.00	0.0030	0.95	0.0032	1.01	0.0030	0.96
Number of Children	0.0068	1.20	0.0066	1.17	0.0064	1.14	0.0064	1.14
Ever Repeated a grade	0.0016	0.07	0.0034	0.15	0.0035	0.15	0.0040	0.17
Distance to School	-0.0064	-2.18	-0.0069	-2.34	-0.0069	-2.36	-0.0075	-2.48
School fees in Rs. Per annum	-0.0232	-3.99	-0.0216	-3.74	-0.0220	-3.80	-0.0213	-3.69
Expenditure on books, uniform etc. In Rs. Per annum	-0.0271	-3.89	-0.0277	-3.98	-0.0273	-3.91	-0.0273	-3.92
Private tuition fees in Rs. Per annum	-0.0173	-0.78	-0.0189	-0.85	-0.0186	-0.83	-0.0202	-0.91
Harrasment of girls	-0.0239	-1.59	-0.0235	-1.57	-0.0233	-1.56	-0.0239	-1.60
Governemnt school	-0.0187	-1.06	-0.0174	-0.98	-0.0175	-0.99	-0.0179	-1.01
North	0.1664	8.88	0.1725	9.27	0.1698	9.11	0.1734	9.31
Central	0.2881	12.08	0.2917	12.27	0.2880	12.09	0.2927	12.31
West	0.0604	2.54	0.0579	2.44	0.0586	2.47	0.0582	2.45
South	0.0750	3.09	0.0664	2.75	0.0684	2.85	0.0639	2.66
Backward caste	0.0395	2.57	0.0378	2.46	0.0376	2.44	0.0375	2.43
Muslim	0.0994	4.27	0.0997	4.28	0.0992	4.26	0.0999	4.29

Sikh-Jain	-0.0255	-0.52	-0.0225	-0.46	-0.0236	-0.48	-0.0213	-0.43
Christian	-0.0521	-0.71	-0.0534	-0.73	-0.0476	-0.64	-0.0611	-0.84
Female	0.0268	2.51	0.0263	2.46	0.0263	2.47	0.0259	2.42
Distance to closest Bus stop in Km.	-0.0022	-1.35	-0.0019	-1.16	-0.0019	-1.18	-0.0019	-1.17
Distance to closest Railway station in km	-0.0011	-3.89	-0.0011	-4.04	-0.0011	-4.01	-0.0011	-4.02
Distance to closest Police station in km	0.0014	1.55	0.0013	1.50	0.0013	1.49	0.0013	1.51
Distance to closest Fair price shop in km	0.0083	3.79	0.0083	3.78	0.0083	3.81	0.0083	3.79
Distance to closest Market in km	0.0013	1.40	0.0013	1.44	0.0014	1.51	0.0013	1.47
Distance to closest General store in km	-0.0035	-2.56	-0.0037	-2.68	-0.0037	-2.72	-0.0037	-2.68
Distance to closest Bank branch in km	0.0032	2.64	0.0032	2.70	0.0033	2.74	0.0033	2.73
Distance to closest Post office in km	-0.0006	-0.28	-0.0009	-0.39	-0.0006	-0.28	-0.0009	-0.41

Orpobit probability of scores being 0	**Self Help group**	**t value**	**Credit/Savings group**	**t value**	**Religious/Social group**	**t value**
Writing score	0.0489	2.38	-0.0024	-0.12	-0.0609	-4.10
Total Income in log	0.0019	0.58	0.0022	0.65	0.0023	0.68
Poor	0.0481	3.64	0.0490	3.71	0.0446	3.37
Number of Household Assets	-0.0065	-4.08	-0.0066	-4.17	-0.0068	-4.23
Highest education level of female in the HH	-0.0129	-7.10	-0.0126	-6.97	-0.0124	-6.83
Highest education level of male in the HH	-0.0074	-5.04	-0.0073	-5.00	-0.0071	-4.88
Family Size	0.0028	0.90	0.0030	0.96	0.0032	1.03
Number of Children	0.0069	1.22	0.0066	1.17	0.0068	1.21
Ever Repeated a grade	0.0046	0.20	0.0031	0.14	0.0027	0.12
Distance to School	-0.0070	-2.41	-0.0069	-2.35	-0.0072	-2.45
School fees in Rs. Per annum	-0.0215	-3.72	-0.0215	-3.73	-0.0234	-4.03
Expenditure on books, uniform etc. In Rs. Per annum	-0.0277	-3.98	-0.0277	-3.97	-0.0270	-3.88
Private tuition fees in Rs. Per annum	-0.0195	-0.87	-0.0190	-0.85	-0.0166	-0.75
Harrasment of girls	-0.0228	-1.53	-0.0234	-1.56	-0.0219	-1.46
Governemnt school	-0.0177	-1.00	-0.0174	-0.98	-0.0210	-1.19
North	0.1763	9.45	0.1722	9.25	0.1661	8.87
Central	0.2955	12.41	0.2913	12.26	0.2888	12.11
West	0.0619	2.60	0.0582	2.44	0.0668	2.80
South	0.0573	2.38	0.0669	2.78	0.0640	2.67
Backward caste	0.0375	2.43	0.0380	2.47	0.0409	2.66
Muslim	0.1027	4.39	0.0999	4.29	0.1050	4.49

Sikh-Jain	-0.0204	-0.41	-0.0223	-0.45	-0.0179	-0.36
Christian	-0.0559	-0.76	-0.0536	-0.73	-0.0507	-0.69
Female	0.0260	2.43	0.0265	2.48	0.0259	2.43
Distance to closest Bus stop in Km.	-0.0018	-1.12	-0.0019	-1.17	0.0022	-1.39
Distance to closest Railway station in km	-0.0012	-4.10	-0.0011	-4.04	0.0011	-3.73
Distance to closest Police station in km	0.0013	1.47	0.0013	1.51	0.0014	1.52
Distance to closest Fair price shop in km	0.0084	3.82	0.0083	3.77	0.0082	3.72
Distance to closest Market in km	0.0013	1.41	0.0013	1.45	0.0011	1.17
Distance to closest General store in km	-0.0037	-2.74	-0.0037	-2.67	0.0035	-2.58
Distance to closest Bank branch in km	0.0033	2.75	0.0032	2.70	0.0032	2.64
Distance to closest Post office in km	-0.0009	-0.40	-0.00089	-0.38	-0.0002	-0.10

Orpobit probability of scores being 0	**Caste Association**	**t value**	**NGO/Development group**	**t value**	**Cooperative group**	**t value**
Writing score	-0.0355	-2.32	-0.0457	-1.07	-0.0218	-0.83
Total Income in log	0.0022	0.65	0.0022	0.65	0.0021	0.63
Poor	0.0464	3.51	0.0485	3.68	0.0478	3.62
Number of Household Assets	-0.0066	-4.15	-0.0066	-4.17	-0.0066	-4.15
Highest education level of female in the HH	-0.0127	-6.98	-0.0127	-6.98	-0.0128	-7.03
Highest education level of male in the HH	-0.0072	-4.91	-0.0072	-4.96	-0.0072	-4.90
Family Size	0.0029	0.91	0.0029	0.94	0.0030	0.96
Number of Children	0.0070	1.25	0.0066	1.18	0.0066	1.16
Ever Repeated a grade	0.0019	0.08	0.0030	0.13	0.0035	0.15
Distance to School	-0.0066	-2.25	-0.0069	-2.35	-0.0069	-2.35
School fees in Rs. Per annum	-0.0227	-3.91	-0.0215	-3.72	-0.0219	-3.79
Expenditure on books, uniform etc. In Rs. Per annum	-0.0272	-3.91	-0.0277	-3.98	-0.0280	-4.02
Private tuition fees in Rs. Per annum	-0.0177	-0.79	-0.0188	-0.84	-0.0188	-0.84
Harrasment of girls	-0.0241	-1.61	-0.0236	-1.58	-0.0234	-1.56
Governemnt school	-0.0187	-1.06	-0.0174	-0.98	-0.0176	-1.00
North	0.1708	9.16	0.1716	9.20	0.1721	9.24
Central	0.2938	12.36	0.2909	12.22	0.2925	12.31
West	0.0567	2.39	0.0584	2.46	0.0603	2.51
South	0.0712	2.96	0.0666	2.78	0.0684	2.85

Backward caste	0.0396	2.57	0.0377	2.45	0.0371	2.41
Muslim	0.1021	4.37	0.0992	4.26	0.0990	4.25
Sikh-Jain	-0.0215	-0.44	-0.0234	-0.47	-0.0242	-0.49
Christian	-0.0573	-0.79	-0.0532	-0.73	-0.0533	-0.73
Female	0.0269	2.52	0.0262	2.45	0.0259	2.42
Distance to closest Bus stop in Km.	-0.0021	-1.31	-0.0019	-1.17	-0.0019	-1.18
Distance to closest Railway station in km	-0.0011	-3.98	-0.0011	-4.03	-0.0011	-4.00
Distance to closest Police station in km	0.0013	1.50	0.0014	1.53	0.0013	1.52
Distance to closest Fair price shop in km	0.0085	3.86	0.0083	3.78	0.0083	3.78
Distance to closest Market in km	0.0012	1.33	0.0013	1.46	0.0014	1.49
Distance to closest General store in km	-0.0036	-2.64	-0.0037	-2.69	-0.0037	-2.70
Distance to closest Bank branch in km	0.0032	2.69	0.0033	2.72	0.0032	2.68
Distance to closest Post office in km	-0.0007	-0.31	-0.0008	-0.35	-0.0007	-0.33

Table 6.3

Oprbit-WHZ	Organizations	t-value	Mahila Mandal	t-value	Youth Club	t-value	Trade Union	t-value
Organizations	0.0115	2.14	-0.0223	-2.49	-0.0245	-2.24	0.0165	1.03
Total Income	-0.0043	-1.40	-0.0041	-1.36	-0.0039	-1.30	-0.0043	-1.40
Poor	0.0098	1.61	0.0089	1.47	0.0089	1.48	0.0091	1.50
Number of Household Assets	-0.0028	-3.81	-0.0029	-3.93	-0.0029	-3.92	-0.0029	-3.94
Family size	-0.0034	-2.44	-0.0033	-2.36	-0.0032	-2.30	-0.0034	-2.38
Number of children	0.0078	3.08	0.0079	3.12	0.0078	3.09	0.0078	3.10
Highest education level of female in the HH	0.0016	2.16	0.0018	2.39	0.0018	2.35	0.0017	2.23
Highest education level of male in the HH	0.00024	0.35	0.0004	0.56	0.0004	0.61	0.0003	0.51
Whether water is purified in HH	-0.0109	-3.37	-0.0108	-3.32	-0.0106	-3.24	-0.0110	-3.39
Distance to medical facility	0.0023	1.19	0.0025	1.26	0.0024	1.21	0.0025	1.26
Size of the child	0.0075	1.78	0.0078	1.85	0.0077	1.82	0.0077	1.83
Postnatal check- up of mother or child or both or none	-0.0042	-1.61	-0.0041	-1.57	-0.0042	-1.61	-0.0042	-1.60
Any vaccination given to the child	-0.0188	-2.31	-0.0194	-2.38	-0.0202	-2.48	-0.0194	-2.38
Duration of breastfeeding	-0.0004	-1.49	-0.0004	-1.42	-0.0004	-1.46	-0.0004	-1.46
Age at which supplementary food started	-0.0006	-1.09	-0.0006	-1.05	-0.0006	-1.06	-0.0006	-1.08
Has child received immunization from anganwadi	-0.0289	-4.09	-0.0289	-4.08	-0.0286	-4.03	-0.0292	-4.12

Has child received food from anganwadi	0.0132	1.81	0.0137	1.87	0.0126	1.73	0.0129	1.78
Has the child received any growth monitoring	0.0102	1.31	0.01124	1.45	0.0118	1.51	0.0110	1.42
North	-0.0145	-1.76	-0.0159	-1.94	-0.0159	-1.94	-0.0157	-1.91
Central	0.0116	1.14	0.0095	0.93	0.0098	0.97	0.0107	1.06
West	0.0834	6.30	0.0843	6.37	0.0852	6.42	0.0841	6.36
South	0.0299	2.59	0.0354	3.03	0.0339	2.93	0.0314	2.70
Backward class	0.0077	1.11	0.0076	1.09	0.0072	1.03	0.0076	1.10
Muslim	-0.0098	-1.03	-0.0107	-1.13	-0.0104	-1.10	-0.0101	-1.06
Sikh or Jain	-0.0560	-2.98	-0.0579	-3.13	-0.0576	-3.10	-0.0572	-3.08
Christian	-0.0182	-0.68	-0.0157	-0.58	-0.0188	-0.70	-0.0189	-0.71
Female	-0.0059	-1.22	-0.0059	-1.23	-0.0056	-1.18	-0.0058	-1.20
Child age from 0 to 2 years	-0.0252	-4.96	-0.0253	-4.98	-0.0254	-5.00	-0.0253	-4.97
Distance to closest bus stop in km	0.0031	4.45	0.0029	4.29	0.0029	4.33	0.0029	4.33
Distance to closest railway station in km	0.0002	1.57	0.0002	1.76	0.0002	1.67	0.0002	1.68
Distance to closest police station in km	-0.0002	-0.51	-0.0002	-0.47	-0.0002	-0.55	-0.0002	-0.52
Distance to closest fair price shop in km	0.0019	1.80	0.0019	1.84	0.0019	1.82	0.0019	1.79
Distance to closest market in km	0.0001	0.16	0.0001	0.22	0.0001	0.23	0.0001	0.14
Distance to closest General store in km	0.0007	1.11	0.0007	1.11	0.0007	1.01	0.0007	1.14
Distance to closest bank branch office in km	-0.0008	-1.54	-0.0008	-1.52	-0.0008	-1.54	-0.0008	-1.53
Distance to closest post office in km	-0.0015	-1.31	-0.0014	-1.22	-0.0014	-1.25	-0.0015	-1.31

Oprbit-WHZ	**Self Help Group**	**t-value**	**Credit/Saving**	**t-value**	**Religious/social group**	**t-value**
Organizations	-0.0103	-1.19	-0.0075	-0.87	0.0212	2.84
Total Income	-0.0041	-1.35	-0.0041	-1.35	-0.0042	-1.36
Poor	0.0090	1.48	0.0088	1.45	0.0102	1.67
Number of Household Assets	-0.0029	-3.94	-0.0029	-3.92	-0.0028	-3.84
Family size	-0.0033	-2.36	-0.0033	-2.34	-0.0034	-2.41
Number of children	0.0078	3.10	0.0078	3.08	0.0077	3.04
Highest education level of female in the HH	0.0017	2.30	0.0017	2.26	0.0016	2.15
Highest education level of male in the HH	0.0004	0.56	0.0004	0.54	0.0002	0.32
Whether water is purified in HH	-0.0107	-3.30	-0.0109	-3.34	-0.0112	-3.43
Distance to medical facility	0.0024	1.24	0.0024	1.23	0.0024	1.25
Size of the child	0.0078*	1.84	0.0077	1.83	0.0071	1.68
Postnatal check- up of mother or child or both or none	-0.0043	-1.64	-0.0042	-1.61	-0.0042	-1.62
Any vaccination given to the child	-0.0194	-2.38	-0.0194	-2.38	-0.0175	-2.15
Duration of breastfeeding	-0.0004	-1.40	-0.0004	-1.44	-0.0004	-1.51
Age at which supplementary food started	-0.0006	-1.07	-0.0006	-1.06	-0.0006	-1.06
Has child received immunization from anganwadi	-0.0285	-3.99	-0.0288	-4.05	-0.0288	-4.06

Has child received food from anganwadi	0.0131	1.80	0.0129	1.77	0.0135	1.85
Has the child received any growth monitoring	0.0108	1.39	0.0112	1.44	0.0099	1.28
North	-0.0169	-2.04	-0.0161	-1.96	-0.0146	-1.77
Central	0.0092	0.90	0.0102	1.00	0.0106	1.04
West	0.0826	6.23	0.0843	6.37	0.0809	6.10
South	0.0339	2.91	0.0331	2.86	0.0326	2.82
Backward class	0.0081	1.16	0.0078	1.12	0.0076	1.10
Muslim	-0.0099	-1.05	-0.0100	-1.06	-0.0113	-1.21
Sikh or Jain	-0.0572	-3.07	-0.0573	-3.08	-0.0567	-3.03
Christian	-0.0184	-0.69	-0.0183	-0.69	-0.0168	-0.62
Female	-0.0058	-1.20	-0.0058	-1.20	-0.0059	-1.23
Child age from 0 to 2 years	-0.0254	-4.99	-0.0254	-4.98	-0.0252	-4.96
Distance to closest bus stop in km	0.0029	4.31	0.0029	4.33	0.0031	4.47
Distance to closest railway station in km	0.0002	1.69	0.0002	1.67	0.0002	1.59
Distance to closest police station in km	-0.0002	-0.50	-0.0002	-0.51	-0.0002	-0.54
Distance to closest fair price shop in km	0.0019	1.81	0.0019	1.79	0.0019	1.86
Distance to closest market in km	0.0001	0.15	0.0001	0.11	0.0001	0.29
Distance to closest General store in km	0.0007	1.04	0.0007	1.08	0.0007	1.06
Distance to closest bank branch office in km	-0.0008	-1.53	-0.0008	-1.54	-0.0008	-1.49
Distance to closest post office in km	-0.0015	-1.27	-0.0015	-1.30	-0.0016	-1.37

Oprbit-WHZ	**Caste Association**	**t-value**	**NGO**	**t-value**	**Cooperatives**	**t-value**
Organizations	0.0184	2.43	-0.0095	-0.54	.01291	1.05
Total Income	-0.0043	-1.40	-0.0041	-1.34	-0.0042	-1.38
Poor	0.0103	1.68	0.0090	1.49	0.0091	1.50
Number of Household Assets	-0.0029	-3.87	-0.0029	-3.94	-0.0029	-3.95
Family size	-0.0033	-2.38	-0.0033	-2.36	-0.0033	-2.41
Number of children	0.0077	3.04	0.0078	3.10	0.0078	3.11
Highest education level of female in the HH	0.0017	2.27	0.0017	2.23	0.0017	2.26
Highest education level of male in the HH	0.0003	0.44	0.0004	0.56	0.0003	0.50
Whether water is purified in HH	-0.0108	-3.31	-0.0108	-3.32	-0.0109	-3.34
Distance to medical facility	0.0024	1.22	0.0025	1.26	0.0025	1.26
Size of the child	0.0072	1.70	0.0078	1.84	0.0079	1.85
Postnatal check-up of mother or child or both or none	-0.0039	-1.53	-0.0041	-1.57	-0.0041	-1.59
Any vaccination given to the child	-0.0178	-2.19	-0.0196	-2.40	-0.0196	-2.41

Duration of breastfeeding	-0.0004	-1.41	-0.0004	-1.44	-0.0004	-1.42
Age at which supplementary food started	-0.0006	-1.06	-0.0006	-1.08	-0.0006	-1.11
Has child received immunization from anganwadi	-0.0290	-4.09	-0.0290	-4.09	-0.0291	-4.10
Has child received food from anganwadi	0.0133	1.81	0.0129	1.77	0.0132	1.80
Has the child received any growth monitoring	0.0111	1.43	0.0109	1.40	0.0104	1.34
North	-0.0157	-1.91	-0.0159	-1.94	-0.0159	-1.93
Central	0.0087	0.86	0.0104	1.02	0.0106	1.05
West	0.0835	6.31	0.0840	6.35	0.0824	6.16
South	0.0287	2.48	0.0328	2.84	0.0322	2.79
Backward class	0.0071	1.01	0.0078	1.12	0.0081	1.16
Muslim	-0.0109	-1.16	-0.0099	-1.04	-0.0097	-1.02
Sikh or Jain	-0.0571	-3.06	-0.0571	-3.06	-0.0565	-3.01
Christian	-0.0168	-0.63	-0.0184	-0.69	-0.0179	-0.67
Female	-0.0059	-1.22	-0.0059	-1.22	-0.0058	-1.21
Child age from 0 to 2 years	-0.0253	-4.97	-0.0253	-4.97	-0.0252	-4,96
Distance to closest bus stop in km	0.0030	4.42	0.0029	4.32	0.0029	4.31
Distance to closest railway station in km	0.0002	1.62	0.0002	1.68	0.0002	1.67
Distance to closest police station in km	-0.0002	-0.53	-0.0002	-0.50	-0.0002	-0.50
Distance to closest fair price shop in km	0.0019	1.79	0.0019	1.78	0.0019	1.81
Distance to closest market in km	0.0001	0.26	0.0001	0.13	0.00006	0.12
Distance to closest General store in km	0.0007	1.10	0.0007	1.13	0.0007	1.06
Distance to closest bank branch office in km	-0.0008	-1.54	-0.0009	-1.55	-0.0008	-1.53
Distance to closest post office in km	-0.0015	-1.30	-0.0015	-1.31	-0.0015	-1.29

Table 6.4

Oprbit-WAZ	**Organization**	**t-value**	**Mahila Mandal**	**t-value**	**Youth Club**	**t-value**	**Trade Union**	**t-value**
Organizations	-0.0055	-0.63	-0.0207	-1.34	-0.0239	-1.22	0.0114	0.47
Total Income	-0.0038	-0.71	-0.0038	-0.71	-0.0037	-0.69	-0.0039	-0.73
Poor	0.021	2.10	0.0216	2.13	0.0217	2.14	0.0218	2.14
Number of Household Assets	-0.0088	-7.28	-0.0087	-7.26	-0.0087	-7.25	-0.0087	-7.26
Family size	0.0001	0.05	0.0001	0.03	0.0001	0.06	0.00004	0.02
Number of children	0.0072	1.71	0.0073	1.72	0.0072	1.70	0.0072	1.71
Highest education level of female in the HH	-0.0032	-2.53	-0.0031	-2.46	-0.0031	-2.49	-0.0032	-2.56

Highest education level of male in the HH	0.0004	0.35	0.0004	0.31	0.0004	0.34	0.0003	0.29
Whether water is purified in HH	-0.0035	-0.67	-0.0035	-0.67	-0.0033	-0.63	-0.0037	-0.70
Distance to medical facility	0.0053	1.63	0.0053	1.62	0.0052	1.59	0.0053	1.61
Size of the child	0.0131	1.82	0.0131	1.81	0.0129	1.79	0.0129	1.80
Postnatal check-up of mother or child or both or none	-0.0085	-2.06	-0.0085	-2.04	-0.0086	-2.06	-0.0085	-2.06
Any vaccination given to the child	-0.0182	-1.27	-0.0176	-1.23	-0.0184	-1.28	-0.0176	-1.23
Duration of breastfeeding	-0.0018	-4.21	-0.0018	-4.21	-0.0019	-4.23	-0.0019	-4.23
Age at which supplementary food started	0.0024	2.50	0.0024	2.52	0.0024	2.52	0.0024	2.50
Has child received immunization from anganwadi	0.0174	1.38	0.0174	1.38	0.0178	1.41	0.0173	1.37
Has child received food from anganwadi	-0.0012	-0.10	-0.0005	-0.04	-0.0014	-0.12	-0.0011	-0.09
Has the child received any growth monitoring	0.0039	0.29	0.0039	0.29	0.0045	0.33	0.0037	0.28
North	0.0633	4.61	0.0637	4.66	0.0638	4.66	0.0639	4.68
Central	0.0571	3.36	0.0565	3.33	0.0568	3.35	0.0577	3.40
West	0.1007	5.73	0.1003	5.71	0.1011	5.74	0.1003	5.71
South	0.1015	5.69	0.1025	5.76	0.1013	5.72	0.0993	5.56
Backward class	0.0049	0.43	0.0049	0.42	0.0045	0.38	0.0049	0.42
Muslim	0.0120	0.73	0.0115	0.70	0.0118	0.72	0.0121	0.73
Sikh or Jain	-0.1259	-4.14	-0.1262	-4.15	-0.1259	-4.14	-0.1254	-4.12
Christian	-0.0778	-1.84	-0.0755	-1.78	-0.0784	-1.85	-0.0782	-1.86
Female	-0.0173	-2.16	-0.0175	-2.17	-0.0172	-2.14	-0.0174	-2.16
Child age from 0 to 2 years	-0.1757	-21.56	-0.1757	-21.55	-0.1758	-21.57	-0.1756	-21.56
Distance to closest bus stop in km	-0.0005	-0.40	-0.00046	-0.38	-0.0004	-0.36	-0.0004	-0.36
Distance to closest railway station in km	0.00002	0.10	0.00002	0.12	0.00001	0.07	0.00002	0.07
Distance to closest police station in km	0.0005	0.74	0.0006	0.76	0.0005	0.72	0.0005	0.73
Distance to closest fair price shop in km	0.0023	1.25	0.0024	1.27	0.0024	1.26	0.0023	1.25
Distance to closest market in km	-0.0012	-1.47	-0.0011	-1.41	-0.0011	-1.41	-0.0011	-1.45
Distance to closest General store in km	-0.0031	-3.01	-0.0031	-3.00	-0.0032	-3.06	-0.0031	-2.98
Distance to closest bank branch office in km	0.0003	0.33	0.0003	0.34	0.0003	0.33	0.00032	0.34
Distance to closest post office in km	0.0018	0.98	0.0019	1.02	0.0019	1.00	0.0018	0.97

Oprbit-WAZ	**Self Help Group**	**t-value**	**Credit/Saving**	**t-value**	**Religious/social group**	**t-value**
Organizations	-0.0128	-0.88	-0.0002	-0.01	0.0083	0.70
Total Income	-0.0038	-0.71	-0.0038	-0.72	-0.0038	-0.72
Poor	0.0217	2.14	0.0218	2.14	0.0222	2.18
Number of Household Assets	-0.0088	-7.26	-0.0087	-7.26	-.0087	-7.23
Family size	0.00006	0.03	0.00007	0.03	0.00004	0.02
Number of children	0.0073	1.71	0.0072	1.70	0.0072	1.69

Highest education level of female in the HH	-0.0031	-2.50	-0.0032	-2.55	-0.0032	-2.57
Highest education level of male in the HH	0.00037	0.32	0.0003	0.30	0.0003	0.25
Whether water is purified in HH	-0.0034	-0.65	-0.0036	-0.68	-0.0037	-0.70
Distance to medical facility	0.0052	1.61	0.0053	1.61	0.0053	1.61
Size of the child	0.0130	1.81	0.0130	1.80	0.0127	1.76
Postnatal check- up of mother or child or both or none	-0.0087	-2.08	-0.0086	-2.06	-0.0086	-2.06
Any vaccination given to the child	-0.0175	-1.22	-0.0178	-1.24	-0.0169	-1.18
Duration of breastfeeding	-0.0018	-4.19	-0.0018	-4.22	-0.0019	-4.23
Age at which supplementary food started	0.0024	2.51	0.0024	2.50	0.0024	2.51
Has child received immunization from anganwadi	0.0181	1.43	0.0175	1.38	0.0175	1.39
Has child received food from anganwadi	-0.0009	-0.08	-0.0011	-0.09	-0.0009	-0.07
Has the child received any growth monitoring	0.0035	0.26	0.0036	0.27	0.0032	0.24
North	0.0626	4.54	0.0639	4.66	0.0644	4.71
Central	0.0559	3.27	0.0575	3.38	0.0576	3.39
West	0.0986	5.58	0.1004	5.72	0.0993	5.62
South	0.1016	5.72	0.1002	5.67	0.1002	5.67
Backward class	0.0054	0.46	0.0049	0.43	0.0049	0.42
Muslim	0.0122	0.74	0.0121	0.74	0.0115	0.70
Sikh or Jain	-0.1255	-4.13	-0.1253	-4.12	-0.1251	-4.11
Christian	-0.0781	-1.85	-0.0778	-1.84	-0.0772	-1.82
Female	-0.0173	-2.16	-0.0174	-2.16	-0.0174	-2.16
Child age from 0 to 2 years	-0.1757	-21.56	-0.1757	-21.55	-0.1756	-21.55
Distance to closest bus stop in km	-0.0004	-0.37	-0.0004	-0.36	-0.0004	-0.32
Distance to closest railway station in km	0.00002	0.08	0.00001	0.07	0.00001	0.05
Distance to closest police station in km	0.0005	0.74	0.0005	0.74	0.0005	0.73
Distance to closest fair price shop in km	0.0024	1.26	0.0023	1.25	0.0024	1.26
Distance to closest market in km	-0.0011	-1.44	-0.0011	-1.46	-0.0011	-1.42
Distance to closest General store in km	-0.0032	-3.04	-0.0031	-3.00	-0.0031	-3.01
Distance to closest bank branch office in km	0.0003	0.34	0.0003	0.33	0.0003	0.34
Distance to closest post office in km	0.0019	1.00	0.0018	0.98	0.0018	0.96

Oprbit-WAZ	**Caste Association**	**t-value**	**NGO**	**t value**	**Cooperative**	**t value**
Organizations	0.0083	0.68	-0.0083	-0.29	0.0024	0.12
Total Income	-0.0039	-0.73	-0.0038	-0.71	-0.0038	-0.72
Poor	0.0223	2.19	0.0218	2.14	0.0218	2.14
Number of Household Assets	-0.0087	-7.24	-0.0087	-7.26	-0.0087	-7.25

Family size	0.00005	0.02	0.0001	0.03	0.00005	0.02
Number of children	0.0072	1.69	0.0072	1.71	0.0072	1.71
Highest education level of female in the HH	-0.0032	-2.55	-0.0032	-2.56	-0.0032	-2.56
Highest education level of male in the HH	0.0003	0.27	0.0004	0.31	0.0003	0.29
Whether water is purified in HH	-0.0035	-0.67	-0.0035	-0.67	-0.0036	-0.68
Distance to medical facility	0.0052	1.60	0.0052	1.62	0.0053	1.61
Size of the child	0.0127	1.76	0.0129	1.80	0.0130	1.81
Postnatal check -up of mother or child or both or none	-0.0085	-2.04	-0.0085	-2.03	-0.0085	-2.06
Any vaccination given to the child	-0.0169	-1.18	-0.0177	-1.24	-0.0178	-1.24
Duration of breastfeeding	-0.0018	-4.21	-0.0018	-4.22	-0.0018	-4.22
Age at which supplementary food started	0.0024	2.51	0.0024	2.50	0.0024	2.50
Has child received immunization from anganwadi	0.0174	1.38	0.0174	1.38	0.0174	1.38
Has child received food from anganwadi	-0.0009	-0.08	-0.0011	-0.09	-0.0011	-0.09
Has the child received any growth monitoring	0.0037	0.28	0.0036	0.27	0.0035	0.26
North	0.0639	4.68	0.0638	4.66	0.0639	4.67
Central	0.0567	3.33	0.0574	3.38	0.0576	3.39
West	0.1001	5.70	0.1002	5.70	0.1001	5.64
South	0.0984	5.50	0.1003	5.67	0.1001	5.68
Backward class	0.0047	0.40	0.0050	0.43	0.0051	0.43
Muslim	0.0116	0.71	0.0122	0.74	0.0122	0.74
Sikh or Jain	-0.1253	-4.12	-0.1253	-4.12	-0.1252	-4.11
Christian	-0.0771	-1.82	-0.0779	-1.85	-0.0777	-1.84
Female	-0.0174	-2.16	-0.0174	-2.16	-0.0174	-2.16
Child age from 0 to 2 years	-0.1756	-21.55	-0.1756	-21.55	-0.1756	-21.55
Distance to closest bus stop in km	-0.0004	-0.33	-0.0004	-0.36	-0.0004	-0.36
Distance to closest railway station in km	0.00001	0.05	0.00002	0.07	0.00001	0.07
Distance to closest police station in km	0.0005	0.73	0.0005	0.74	0.0005	0.74
Distance to closest fair price shop in km	0.0023	1.24	0.0023	1.24	0.0024	1.25
Distance to closest market in km	-0.0011	-1.42	-0.0011	-1.46	-0.0011	-1.46
Distance to closest General store in km	-0.0031	-3.00	-0.0031	-2.95	-0.0031	-3.01
Distance to closest bank branch office in km	0.0003	0.33	0.0003	0.33	0.0003	0.33
Distance to closest post office in km	0.0018	0.98	0.0018	0.97	0.0018	0.98

Table 6.5

Marginal Effects from a Probit model of Participation in CBOs

Variables		t value
Total Income	0.0121	2.84

Poor	-0.0465	-5.71
Number of Household Assets	-0.0022	-2.36
Highest education level of female in the HH	0.0035	3.51
Highest education level of male in the HH	0.0080	9.10
Family size	-0.0003	-0.18
Number of Children	0.0051	1.58
North	-0.2265	-23.74
Central	-0.1823	-18.51
West	-0.0134	-1.08
South	0.0949	7.74
Backward caste	0.0447	4.89
Muslim	0.0461	3.43
Sikh or Jain	-0.2062	-8.35
Christian	0.0727	2.08
Distance to closest bus stop in km	-0.0100	-9.27
Distance to closest railway station in km	0.0011	6.95
Distance to closest police station in km	0.0014	2.67
Distance to closest fair price shop in km	0.0013	0.92
Distance to closest market in km	-0.0026	-4.75
Distance to closest General store in km	0.0050	6.81
Distance to closest bank branch office in km	-0.0018	-2.49
Distance to closest post office in km	-0.0092	6.32
Availability of organization in village	0.1717	15.64
Number of loans taken in last 5 years	0.0094	7.87
If voted in 2004 elections	0.0045	0.40
Attend public meeting	0.1443	20.41
Official in Panchayat	0.0619	7.82
Confidence in Politicians	-0.0271	-3.89
Confidence in Military	0.0011	0.05
Confidence in Police	-0.0411	-5.23
Confidence in State Govt.	-0.0452	-5.39
Confidence in Newspaper	0.0275	2.23
Confidence in Panchayat	-0.0026	-0.28
Confidence in School	0.0791	5.34
Confidence in Medical	0.1354	9.57
Confidence in Courts	-0.0283	-2.53
Confidence in Banks	-0.1017	-3.97
No. Of obs	25167	-

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