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The Role of Early Childbearing on Child Health Outcomes in Punjab

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Early Childbearing is a major social and public health concern in developing countries. The study explores the role of early childbearing on child health outcomes in Punjab, Pakistan. Using the newly available data, Multiple Index Cluster Survey for Punjab 2017-18, the paper aims to test the association between early childbearing and child health outcomes both in the short and long term. Since early childbearing decision is influenced by a wide array of factors which include individual, household as well as social and cultural norms; the paper employs cluster & household fixed effects model to deal with the issue of omitted variable bias. The empirical results suggest that early childbearing exerts a negative impact on child health outcomes. The findings of the study are also robust to changing the specification of early childbearing as well as the data set. This study adds to the existing literature by providing insights into the strong influence of social and cultural norms in influencing childbearing decisions.

Keywords: Child Health, Maternal Characteristics, Social Norms, Household Fixed Effects

1. INTRODUCTION

Early childbearing is a common practice in developing economies because of the prevalence of deep-rooted social norms in society. Such practices have important implications for population growth and fertility levels. Early Childbearing refers to when women give birth in their adolescence as a consequence of early marriages.[1] The higher fertility and early family formation behaviour are influenced by strong social values and norms in society. In most developing countries, early childbearing continues to be a major social issue and public health concern as it poses risks to maternal and child health care.

Developing countries are characterised by higher fertility rates and increasing population levels. The latest data as of 2020 suggests that Pakistan has one of the highest fertility rates of 3.4 percent compared to India & Sri Lanka with 2.1 percent.[2] The regional comparisons suggest that; the adolescent fertility rate is seen higher typically in South Asian countries like Bangladesh and Nepal while Sri Lanka[3]again has the lowest adolescent fertility rate in the South Asian region which partly explains their development scape as well (*World Development Indicators*, 2022).

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[1] Number of women age 20-24 years who had at least one live birth before age 18.

[2] See Graph 1 : Total Fertility Rates.

[3] See Graph 2 : Adolescent fertility rate.

The societies in developing countries are generally described by early marriages and consequently early childbearing decisions[4] primarily because of the social norms prevalent as well as the interplay of household structure dynamics with social pressure (Maertens, 2013). It is important to note that societies in developing countries put great emphasis on "young brides" to start childbearing sooner as proof of their fertility; young brides interestingly undertake these decisions to increase their relative bargaining power and status within the households**.** Thus, the household dynamics and structure influenced by social norms have a substantial influence on private choices like childbearing decisions. Since the norm of early marriage is a common practice in Pakistani society; these young married women are under societal and family pressure to produce offspring to prove their fertility. This is demonstrated by the adolescent birth rate which was 42.3 percent for the year 2021 for Pakistan (*Word Development Indicators*, 2021).

Early childbearing tends to have negative consequences on child and maternal health because young maternal age at first birth deters higher education acquisition as well and it tends to be associated with lower social and economic background.[5] Young maternal age is also adversely related to child health partly because of the differential in health behaviour adopted by young mothers. The objective of the paper is to empirically explore the role of early childbearing and child health outcomes. The paper also addresses the empirical issues accompanied by testing the effect of early childbearing decisions on child health outcomes.

Using the recent MICS 2017 data set the results are suggestive of a negative association between early childbearing decisions even after controlling for unobserved characteristics at household and district levels. However, the drop in the size of the magnitude suggests that these unobserved characteristics play a significant role in explaining early childbearing decisions The contribution of the paper is to test if there is an association between early childbearing and child health outcomes and to cater to unobserved heterogeneity associated with early childbearing decisions.

The rest of the paper is organised as follows: Section 2 describes the Literature Review Section 3 presents data and econometric techniques employed. Section 4 presents empirical results, and Section 5 concludes.

2. LITERATURE REVIEW

The intra-household literature puts great emphasis on the role and behaviour of maternal characteristics in contributing to child well-being outcomes. Literature suggests that early childbearing is negatively associated with child outcomes and economic well-being. This is because early family formation hinders higher educational levels for the mothers which have consequences for inadequate human capital accumulation for both the current and future generations.

Literature shows different mechanisms through which the impact of early childbearing is transmitted to child wellbeing. Teenage mothers are physically and psychologically less mature; they lack the necessary skills needed to efficiently uptake

[4] (Westoff, 2003) Shows that teenage child bearing is higher in Sub-Shahran African region as well as exceptionally higher in Bangladesh.

[5] (Ferré, 2009) Shows empirically through instrumental variable approach that addition schooling tends to delay and shorten the reproductive fertility decisions. The study shows that an incremental year of schooling decreases the probability of giving birth in early age.

health care of children which results in adverse outcomes for child health. The results show that children born to teenage mothers are more likely to be shorter, stunted, and underweight (Branson, Ardington, & Leibbrandt, 2011).

One strand of literature tests the impact of teenage pregnancy on child health care, mortality, feeding practices, and birth weight. Young mothers also typically adopt health behaviour that is significantly different than their counterparts. The differential in health behaviour adopted by teenage mothers explains much of the variation in child health. The study shows that teenage childbearing is negatively associated with prenatal care as well as vaccination behaviour. In addition to this, the probability of receiving supplementary food by the age of 6 months is negatively and statistically significantly associated with teenage childbearing. The primary reason for such associations is because teenage mothers lack the maturity needed to nurture the child hence leading to adverse outcomes (LeGrand & Mbacke, 1993). (Maitra & Pal, 2007) also shows the adverse impact of early childbearing on mortality is significantly explained through health inputs[6]. This implies that young mothers are substantially different from old mothers in terms of their behavioural use of health inputs like vaccination and prenatal services[7]. (Miller, 1993) suggests that firstborn children of teenage mothers are likely to face health disadvantages compared to firstborns of non-teenage mothers. This is because teenage mothers are likely to belong to lower socioeconomic backgrounds, have lesser financial resources and health knowledge; and therefore likely to receive negligible prenatal care.

Teenage childbearing is also associated with birth injuries and congenital abnormalities; the effect diminishes once all the possible set controls are taken into consideration. The study suggests that the adverse impact of early childbearing on pregnancy outcomes is not because of age per se; which reflects physical immaturity; rather the underlying mechanism is the behavioural and socioeconomic factors experienced by teenage mothers (Letamo & Majelantle, 2001).

Another theme in the literature examines the influence of teenage childbearing on academic and behavioural outcomes.[8] The results suggest that teen parenting is more strongly associated with behavioural outcomes compared to short-term academic scores however the effect diminishes when fixed effects are employed. The reason for the stronger impact on behavioural outcomes is primarily because teenage childbearing suggests a lack of parenting skills to shape the behaviour of children. In addition to this, the mothers may lack the appropriate social network and ties which consequently have an impact on the behaviour of children. (Levine, Pollack, & Comfort, 2001).

(Mollborn & Dennis, 2012) also tests the impact of teenage childbearing on a child's outcomes in terms of cognition, behaviour, and health. The paper suggests that while short-

[6] (Conger, McCarty, Yang, Lahey, & Robert, 1984) also shows that chronological age and age at first birth have a negative influence on the behaviour of mother in terms of child care activities.

[7] (LeGrand & Mbacke, 1993) have shown that both physiological and behavioural characteristic of young mothers adversely affect child health through poor feeding practices and prenatal care as well as vaccination behaviour.

[8] The papers employ ordinary least squares, multiple regressions and cousins fixed effects to test the impact of teen age parenting on academic and behavioural outcomes. Teenage child bearing is measured through a set of four dummy variables of age at first birth (16 years and less, 17-18, 19 and 20-21 with greater than 21 as the base category) as compare to a single dummy of teen or non-teen variable. This kind of specification checks for the differentials as a result of early teens compared to later teens; as well as if childbearing after teens is associated with same outcomes (Levine, Pollack, & Comfort, 2001).

term effects are nonexistent the impact is profound on long-term indicators of behaviour. (Turley, 2003) shows that children of teenage mothers are more likely to face behavioural problems and lower academic scores as a result of family background characteristics and not because of young maternal age. The paper also finds evidence for the systematic difference hypothesis which advocates the idea that maternal age at first birth has a more significant role to play in child health outcomes compared to maternal age at child's birth. This then implies, the existence of some important background characteristics rather than age per se.

Another strand of literature tests the impact of teenage childbearing on the economic consequences. (Fletcher & Wolfe, 2009)shows that teenage childbearing reduces the probability of higher education for the mother which consequently has a direct impact on the potential earnings that can be earned by the mother; however, it increases the likelihood of receiving cash assistance.[9] (Hofferth & Moore, 1979) using a path analysis framework shows that later childbearing is associated with higher educational levels and earning potential which has an impact on the economic well-being of the household. On the contrary, women who experience early childbearing have lower education levels and therefore lower earning potential. (Geronimus & Korenman, 1992) uses a sister's comparison approach to test the association between socioeconomic well-being and teenage childbearing. While cross-sectional analysis overstates the impact of teenage childbearing; the sister's comparison caters to one of the sources of unobserved heterogeneity associated with teenage childbearing in terms of unmeasured background characteristics. However; due to mixed results from different data sets the study doesn't conclude that teenage childbearing contributes to significant differences in socioeconomic well-being. (Hoffman, Foster, & Jr., 1993) shows that even after accounting for unobserved family background characteristics, the impact of teenage childbearing on high school completion, family size, and economic well-being doesn't get affected.

Decisions about early childbearing are influenced by social norms and cultural values which exert pressure on individuals to undertake such behaviour. A wide array of literature emphasises the role of norms in determining fertility behaviour. Firstly, the social learning mechanism has its basis in the social learning theory which suggests that behaviours are learned through observation of models unveiling these behaviours (Bandura, 1977). This implies that individuals learn behaviours by observing actions and decisions made by other members of society. Observation learning allows the ego (self-realisation) to assess the consequence of a particular behaviour without taking into consideration the risk of potential adverse consequences such as failure or social disapproval. The fertility decisions tend to be influenced by the environment; as more members are in the network transiting into parenthood; more ego and self-realisation would adopt the same behaviour. Thus; the social learning hypothesis predicts a positive impact of social norms on the intention of entering parenthood and consequently on childbearing decisions.

The second mechanism is the social pressure from network members which suggests that members in the networks act as a channel to enforce norms through the personal nature of network ties (Keim, 2011). These network members have the ability to sanction each

[9] The paper estimates the impact of early childbearing through community fixed effects in order to account for unobserved community level factors associated with early pregnancy outcomes

other for behaviours that are not socially acceptable. Life course theorists believe that in every society there are social norms regarding each life stage in which normative evaluations are made for instance parenthood becomes due (Neugarten, 1979) Thus; these norms act as a social clock as soon as an individual reaches a certain stage at which transition is expected; these network members serves as a way to ensure adherence to norms by social approval or sanction. Thus; theoretically it is expected that the stronger tightly connected the society is; the more self-realisation is to comply with social expectations. In the case of childbearing decisions; it is expected that if there is a dominant number of befriended couples with children; there is societal pressure on couples without children to enter into parenthood.

The third mechanism is the social opportunity costs which suggests that there are higher opportunity costs of entering into parenthood in terms of reduced leisure time. Individuals consider these opportunity costs in relation to society dynamics. If a society is characterised by a childless society then the individuals would associate higher opportunity costs of child-rearing while it holds true conversely (Bernardi, 2003) Theoretically; the literature suggests that the inclusion of social norms in the fertility choice model[10] explains the high fertility equilibrium in societies characterised by increasing population levels; primarily because they are historically coordinated on a high fertility path; because of the society dynamics in terms of higher preference on having children sooner, this is observed typically in agro-based societies (Bhattacharya & Chakraborty, 2011).

The empirical literature finds evidence for these channels and shows higher support for the social learning view. Firstly, the empirical evidence suggests that self-realisation acquires information from couples with children pertaining to the aspects of parenthood. Secondly, the evidence also shows that parents without children feel pressured by other network members with children to start a family.[11] Thirdly, the social opportunity costs mechanism shows that the loss of social ties is reduced if the society is characterised by network members with children (Lois & Becker, 2014).[12] Another similar theme in the literature tests for the prevalence of norm-based theory of reproductive change which suggests that fertility choices are determined by norms prevalent in society. The intervention of contraceptive prevalence finds evidence for the existence of norm-based theory as the empirics suggest that individuals strongly respond to changes in contraceptive prevalence within their religious group in the village while cross-religion effects are absent (Munshi & Myaux, 2006).

One of the issues in determining the causal effect of early childbearing is self-selection; which implies that women who experience early childbearing tend to choose themselves into this behaviour. This is mostly attributed as a result of background characteristics and pre-existing social disadvantage. (Gruber, 2009) shows strong associations between disadvantaged background and teenage childbearing at the aggregate

[10]Inclusion of social norms essentially assumes that individuals are conformists which implies that individual behaviour pertaining to fertility is partly influenced by social norms where individuals tend to minimise their fertility distance from others in the society (AKERLOF, 1977) .

[11] (Udry, 1980) shows that respondent were confronted with direct social pressure primarily from social circles as well as specifically from mothers and mothers in law as they are precarious in response to new pregnancy.

[12] (Barbanb, 2014) shows that increasing child bearing by friends in a network through observational learning and social pressure induces couples without children to start child bearing.

level compared to the individual level; however, once state and year fixed effects estimates are employed the relationship between the two is greatly mitigated.

Although the sister comparison approach caters to unmeasured family background characteristics; however, it assumes family homogeneity in terms of the same parental treatment for all children. In addition to this, siblings are also likely to differ in terms of their endowments and physical traits which is not considered in the sister's comparison approach (East & Jacobson, 2000). (Ribar, 1999) controls for omitted variable bias pertaining to early childbearing by employing sibling fixed effects which differences out family-specific unobserved factors; while simple regressions lead to larger estimates of the impact of early childbearing; the sibling fixed effect reduces the magnitude of early childbearing on socioeconomic outcomes.

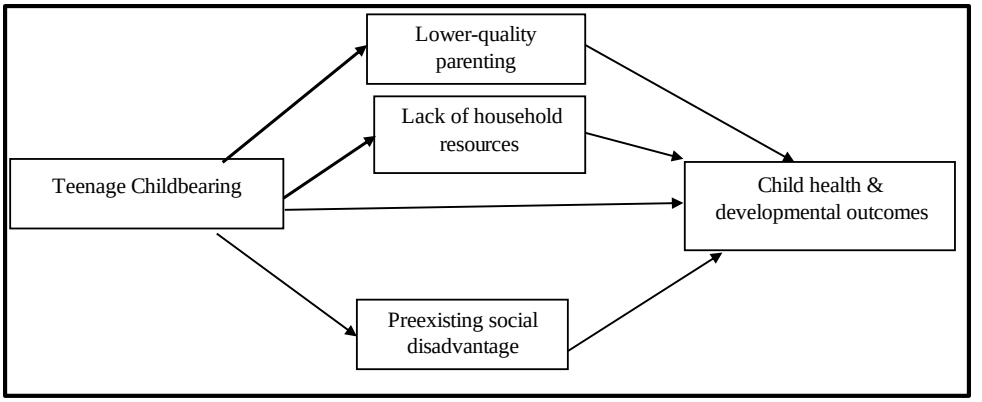
Econometrically, estimating the effects of early childbearing through simple ordinary least squares is likely to give biased estimates; as women who experience early childbearing are more likely to come from disadvantaged family backgrounds and have poorer outcomes compared to their counterparts. In addition to this, the estimated effect of early childbearing also suffers from omitted variable bias; as the literature suggests that there are important neighborhood mechanisms and cultural pressures at play when the decision to conceive a child is made. Simple regression estimates are thus likely to overstate the true impact of early childbearing on various outcomes of interest.

To deal with the unobserved heterogeneity associated with early childbearing; literature has used the instrumental variable approach and fixed effects estimation; the within-family estimates to test the impact of teenage childbearing on economic well-being; suggests that teenage sisters who experienced early childbearing have lower education level however the difference is not statistically significant which implies that much of the economic adversity associated is not because of the early childbearing itself but the disadvantage that precedes it.

The study fills in the gap in the literature by addressing, the role of early childbearing on child health outcomes by taking into consideration the presence of unobserved characteristics as discussed in the section above which is the existence of strong social norms that influence these decisions & consequently child health outcomes.

3. THEORETICAL FRAMEWORK, DATA & METHODOLOGY

The theoretical framework is influenced by the life course perspective which explains the link between teenage mothers and their child's health and developmental outcomes. Three possible channels are widely discussed in the literature as influencing a child's health outcome. Firstly, the preexisting social disadvantage suggests that mothers who experience teenage pregnancies are more likely to belong to poorer socioeconomic and educational backgrounds. Through intergenerational transmission, these characteristics are accumulated over time and transferred to the next generations. Secondly, the lack of household resources also influences child health developmental outcomes; as teenage childbearing puts pressure on the available resources by increasing the financial needs of the children. Thirdly the lower quality parenting influences child health outcomes primarily because young parents are not psychologically mature enough to uptake child health care efficiently. The children of teenage mothers are expected to experience different parenting styles which may be reflected in differences in developmental and health outcomes (Mollborn & Dennis, 2012).



Source: (Mollborn & Dennis, 2012).

3.1. Methodology & Variables Specification

The paper econometrically aims to test the impact of early childbearing on child health outcomes. The empirical strategy rests upon eliminating the unobserved heterogeneity associated with early childbearing; given variations in culture and norms governing early childbearing decisions across communities and households. The equation for estimating the impact of early childbearing on child health takes the following form:

$$Child\ health = \beta o + \beta_1\ Early\ Childbearing + \beta_2\ Maternal\ Education + \beta_3\ Child\ characteristics + \beta_4 Health\ Practices + \beta_5\ Household\ Characteristics + \varepsilon \quad \ldots \quad \ldots \quad (1)$$

Child health is measured through anthropometric indicators developed by the World Health Organisation (WHO) which includes height for age z-scores and weight for age z-scores. The height for age represents the long-term status of a child's health whereas weight for age is the short-term indicator; which reflects the current status of the child's health.

Early Childbearing is defined as a dummy variable which takes a value of 1; if the mother's age at first birth is less than 20 years and zero otherwise. The usefulness of employing a dummy variable approach to directly estimate the impact of being born to a teenage mother on child health outcomes.[13]

The analysis controls for the maternal education-based characteristics; in terms of the level of education acquired by the mother, while the child characteristics control for the gender and age of the child; as well as the past illness status of the child.

The equation takes into account the set of features that describe the household environment; which are captured through the gender of the household head and education of the household head. While the economic status is accounted for through wealth score and status of agricultural landownership. The health practices are captured by; salt iodisation as well as hand washing practices. The ε denotes the error term in the regression

An estimation of the given equation through ordinary least squares will inflate the true impact of early childbearing on child health outcomes; since there are important unobserved factors that are correlated with both early childbearing and child health. For example; socio-cultural values and norms in society are likely to pressure young brides to undertake the decision about early family formation to elevate their status in the household

[13] Base category refers to mothers who have had their first birth after 20 years of their age.

and society; however, once such decisions are taken; it limits the educational attainment as well as the earning potentials which then have implications for child health outcomes (Gruber, 2009) (Ribar, 1999)

In addition to this, early childbearing also suffers from self-selection bias, which implies that women who experience early childbearing tend to choose themselves into this behaviour. Young women who bear children early are substantially different from their counterparts intrinsically as they are likely to have lesser education as well as they also vary in terms of the knowledge and use of health inputs e.g. vaccination, and feeding behaviour. This then implies that unobserved factors in the error term are likely to impact both maternal behaviour as well as child health outcomes.

The data also suggests that differences exist in terms of various characteristics among the sample of mothers who experience teenage childbearing compared to their counterparts. The descriptive statistics[14] show that children of mothers who experienced early childbearing are on average shorter and weigh less compared to their counterparts. In addition to this, there are also significant dissimilarities in terms of maternal characteristics; as the sample of women who experienced early childbearing on average have lower levels of education compared to women who postpone early childbearing.

The household environment also varies significantly among teenage and non-teenage mothers; the data shows that on average the household head education is higher among non-teenage mothers. In addition to this, there are also variations in terms of health knowledge; as only 27 percent have awareness regarding aids compared to 41 percent among non-teenage mothers. These differences in characteristics imply that women who experience teenage childbearing face different household environments compared to their counterparts.

To eliminate the unobserved factors that create variations at the community level, the estimation strategy relies upon employing cluster fixed effect to differentiate the common unobserved factors that include social norms, culture, and practices that induce women to bear children earlier as well as child health. The cluster fixed effects are estimated through the following equation:

$$\begin{aligned} Child\ Health = {} & \beta o + \beta_1\ Early\ Childbearing + \beta_2 Maternal\ Characteristics \\ & + \beta_3 Child\ Characteristics + \beta_4 Health\ Practices \\ & + \beta_5\ Household\ Characteristics + \varphi + \varepsilon_i \quad \dots \quad \dots \quad \dots \quad (2) \end{aligned}$$

The unobserved variations are represented by φ; the unobserved factor which is common across clusters is differenced out as a result of employing cluster fixed effects; the coefficient of early childbearing then gives the net impact after taking into account the unobserved cultural norms and practices.

Similarly, at the household level, various characteristics induce women to bear children early to prove their fertility as well as to elevate their status in the household. To account for the household-level unobserved heterogeneity; the paper also estimates household fixed effects. The household fixed effects take the following form:

$$\begin{aligned} Child\ health = {} & \beta o + \beta_1\ Early\ Childbearing + \beta_2\ Maternal\ Education \\ & + \beta_3 Child\ Characteristics + \beta_4 Health\ Practices + \delta + \varepsilon_i \quad \dots \quad (3) \end{aligned}$$

[14] See Appendix : Table 2

The unobserved heterogeneity at the household level is represented by δ which is assumed to be shared across households. Once the unobserved heterogeneity is taken into consideration; the coefficient of early childbearing then represents the impact adjusted for the unobserved heterogeneity.

3.2. Data

The paper aims to do a cross-sectional analysis by using newly available data Multiple Indicator Survey (MICS) 2017-18 which is a comprehensive survey for assessing child health status. MICS covers all 36 districts of Punjab covering both rural and urban areas. The dataset includes 2,692 clusters; where each cluster comprises 20 households, which gives a total sample of 53,840 households in the data set. The sampling design used in MICS 2017 incorporates two stages; the first stage for urban and rural areas; is the selection of enumeration blocks and villages respectively. From each of the first stage; a sample of 20 households are selected in rural and urban areas. The first-stage units are selected by considering the probability proportional to size while for the second-stage units; equal probabilities are assigned. The total number of Primary Sampling Units (PSUs) clusters is 2050 and the Secondary Sampling Units (SSUs) households are 41,000. The urban/rural split is 38 percent and 62 percent respectively (MICS, 2017). MICS provides a separate questionnaire for children under the age of five which includes information about age, birth registration, early childhood development, breastfeeding and dietary intake, immunisation, care of illness, and anthropometry. The height for age and weight for age z-scores are provided for all the children under age five years in the child data file.

The focus of the analysis is children under the age of 5 years; which constitutes 32,579 in the sample. Based on the newly available data MICS 2017, shows that the mean height for age is –1.30 in the sample, which means that on average a child is 1.30 standard deviations below, compared to a child in the reference population. While; the weight for age z-scores shows that a typical child in the sample weighs less than 1.05 standard deviations compared to a child of the same age and sex in the reference population. The child health indicators show that 21.2 percent & 6.4percent; are moderately and severely underweight respectively. While 31.5 percent & 1.4 percent are moderately & severely stunted respectively (MICS, 2017).

Table 1

Child Health Status in Punjab for Children Under Age 5

Variable	Observations	Mean	SD	Moderate	Severe
Height for Age	32,579	–1.30	1.48	31.5 %	11.5%
Weight for Age	32,579	–1.05	1.21	21.2 %	6.4 %

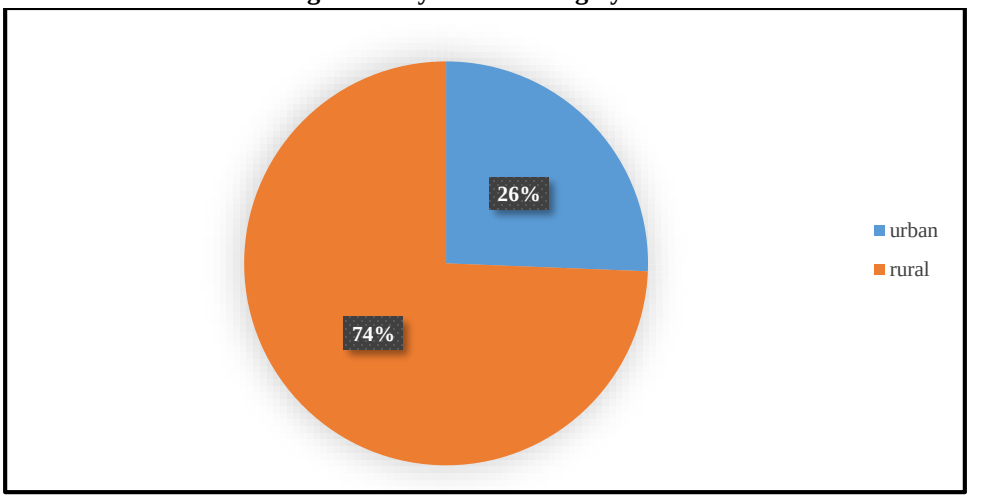
Source: Based on the author's calculation.

The role of maternal characteristics has a significant impact on child health outcomes. The data on maternal characteristics shows that the average age at marriage in the sample is 22 years; while on average the age at first birth is 24 years for women who have ever married and given birth. In addition to this, in our sample, 24 percent of currently married women in the sample have experienced early childbearing.[15] The incidence of

[15] In the analysis, early childbearing is defined as if age at first birth is less than 20 years.

women who experienced early childbearing by area also gives important insights in terms of the differentials associated with the area of residence. Figure 1 shows that among the women who have experienced early childbearing 74 percent of them belong to rural areas compared to 26 percent in urban areas, which partly reflects how preferences governing such private decisions are shaped by the area of residence.

Fig. 1. Early Childbearing by Area



Source: Author's calculation.

Early childbearing tends to deter education acquisition for young mothers which in literature is considered as one of the primary channels through which it can have an impact on child wellbeing. The data suggests that, among women who have experienced early childbearing 48 percent have no education compared to women who had postponed early childbearing with 37.3 percent. Interestingly, there are important differences, especially at higher and secondary educational levels. Among the mothers who have experienced early childbearing; only 11.6 percent have secondary and 3.9 percent have higher education compared to their counterparts with 15.4 percent and 17.3 percent respectively. .These educational differences reflect the choices made by young mothers pertaining to educational acquisition at different levels. It is evident that young mothers have significantly lower educational levels especially secondary and higher as it engages them in other tasks of child care and upbringing.

Table 2

Early Childbearing by level of education

Variable	Young Mothers Sample	Old Mothers Sample
None/Pre-School	48%	37.3%
Primary Education	21.4%	17.6%
Middle Education	14.1 %	14.6%
Secondary Education	11.6%	15.4%
Higher Education	3.9%	17.3%

Source: Author's calculation.

Table 3

Descriptive Statistics

Variable	Mean	Std. Dev.	Observations
Child Health Indicators			
Height for Age z-score	–1.303874	1.487435	32,579
Weight for Age z-score	–1.057604	1.215924	32,579
Maternal Characteristics			
Mother education none *	.4014549	.4902002	32,579
Mother education primary*	.2032905	.402453	32,579
Mother education middle*	.1099481	.3128299	32,579
Mother education secondary*	.1448479	.3519528	32,579
Mother education higher*	.1404586	.3474675	32,579
Age at marriage	21.18862	4.282141	32,579
Age at First Birth	22.56862	4.253881	32,579
Short First Birth Interval *	.3588815	.4796797	32,579
Early Childbearing*(age at first birth <20=1)	.2458946	.430623	32,579
hild Characteristics			
Child Gender(1=male ,Female=0)	.5141042	.4998087	32,579
Age of child	1.970871	1.406677	32,579
Child Past Illness Status *	.4092506	.4917032	32,452
Health Practices			
Ever heard of aids*	.2484116	.4320984	32,579
Ever used any family planning method*	.1313351	.3377751	19,751
Salt Iodisation *	.9891648	.1035284	32,579
Household Characteristics			
Household head primary education*	.1860094	.3891202	32,579
Household head middle education*	.1453697	.3524786	32,579
Household head secondary education*	.1905215	.3927185	32,579
Household head higher education*	.107646	.3099376	32,579
Gender of Household Head (Male=1,Female=0)	.9276835	.2590153	32,579
Number of Household Members	8.350348	4.204526	32,579
Households own agricultural land*	.3236441	.4678732	32,579
Area(Urban=1,Rural=0)*	.2802419	.4491242	32,579
Wealth Score	.0215109	.9716739	32,579

Source: Author's calculation.
Note: * indicates dummy variable.

The summary statistics show the set of controls included in the analysis to assess the impact of early childbearing on child health. To cater to the maternal characteristics, the analysis takes into account the maternal level of education and the age at which the mother starts childbearing. The descriptive statistics show that 40 percent of the mothers do not have any level of education while the average age at first birth in the sample taken into consideration is 22 years. In addition to this, the variable short first birth interval shows the spacing between marriage and first birth; the data shows that 35 percent of the women have experienced a shorter first birth interval.

The analysis also takes into account the child's characteristics; which includes the age and gender of a child where the data shows that on average the sample is equally divided by both genders. To proxy for the child's past illness status a dummy variable is created which reflects if the child has experienced either fever, cough, or diarrhea in the last two weeks. The descriptive statistics show that 40.9 percent of children have suffered any type of illness in the last two weeks.

To gauge the health knowledge and behaviour of the household, the descriptive statistics show that only 24 percent are aware of aids; while the use of contraceptive methods is only 13 percent. In addition to this, the analysis also takes into account the household characteristics which includes the gender and education of the household head; while to proxy for household size; the analysis includes the number of household members; as well as to cater for the economic status, we used the measure of wealth score and ownership of agricultural land by the household provided by Multiple Index Cluster Survey.

The incidence of early childbearing also varies across different regions of Punjab. The data shows visible north-south differences within Punjab pertaining to early childbearing. The data indicates that 25 percent of the women have experienced early childbearing in Southern Punjab compared to 21 percent in Northern as well Central Punjab[16] . These differences could be because of variations in the culture and social norms concerning early childbearing behaviour prevalent in different regions of Punjab as well as partly because of educational differences as well as variations in socioeconomic development[17] experienced in different regions within Punjab, all of these aspects have a substantial role to play in determining the attitudes and perceptions towards early family formation behaviour. Literature also suggests that districts where socioeconomic development and literacy rates are lower have higher patterns of total fertility rates; indicative of the influence of these channels on fertility behaviour (Khan, 2011)

4. RESULTS & DISCUSSIONS

As per the estimation strategy, the paper first estimates the proposed equation through a simple ordinary least square. The simple correlation of early childbearing with child health outcomes shows a strong negative association. Table 4 shows the correlation of early childbearing with height for age z-score and weight for age z-scores. The result indicates that the height for age decreases by 33.3 percent for early childbearing mothers compared to the base category.[18] This implies a negative and statistically significant relationship between early childbearing and child health outcomes. Table 4 gives the estimation results for children's height for age z-scores and weight for age z-scores. The estimates from ordinary least square regression indicate that early childbearing decreases height for age by 33 percent and weight by 21.9 percent standard deviations. These results suggest that early childbearing had a negative impact on both long-term and short-term child health measures.

[16] See Appendix : Table 1.
[17] (Afzal, 2010).
[18] Base category refers to mothers who have had their first birth after 20 years of their age.

Table 4

Correlation of Early Childbearing with Child Health Measures.

Dependent Variable	Height for Age (z-scores)	Weight for Age (z-scores)
Early Childbearing (Age at First	-0.333***	-0.219***
Birth<20=1)	(0.0188)	(0.0155)
Constant	-1.222***	-1.004***
	(0.00951)	(0.00776)
Observations	32,579	32,579
R-squared	0.006	0.009

*** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in parentheses.

4.1. Ordinary Least Square Results

Table 5 shows the estimates from ordinary least square results by including the possible set of observable characteristics. The results suggest that early childbearing is negatively associated with child health for both height for age and weight for age z-scores. All the regression results are carried out by implementing robust standard errors at the cluster level. The results suggest that being born to a teenage mother decreases the height for age z-scores by 11.10 percent and weight for age by 5 percent standard even after controlling for other maternal, child, and household characteristics. In addition to this, the mother's education is found to have strong positive associations with height for age and weight for age z-scores; which has been well documented in the literature [19]as it suggests that maternal education has a stronger role in in determining child health status as she is considered the primary caretaker of child health as well as maternal education can also enhance working and earning potential of the mother and consequently improving the nutrition uptake.

To proxy for the child's illness status, the paper takes into account the child's past illness status which is a dummy variable that indicates if the child had experienced either diarrhea, cough, or fever in the last two weeks. This variable shows a very strong negative and statistically significant relationship between a child's past illness condition with both the child's height and weight.

Moreover, health knowledge and practices have a substantial role to play in determining the child health status of the child. The estimates show that hand-washing practices & salt iodization have positive effects on height for age z-scores.

To gauge the role of household characteristics, the analysis takes into account multiple variables; firstly the household head education at a higher level has stronger explanatory power; the height for age z-scores improves by 30 percent and weight for age score improves by 19 percent. Wealth score [20]as provided by the Multiple Index Cluster Survey, shows a positive and statistically significant relationship with both height for age and weight for age z-score.

[19](Duncan Thomas & Henriques, 1991); (Desai & Alva, 1998) shows that mother's education have strong effects on height for age of children as well as on their immunisation statuses.

[20]Wealth scores are assigned on the basis of assets owned by the household which comprises of main material of the dwelling floor, main material of the roof, main material of the exterior walls, type of fuel used for cocking, household possessions (electricity, radio, television, non-mobile telephone, refrigerator/freezer, gas, computer, air conditioner, washing machine/dryer, air cooler/ fan, cooking range/micro wave, sewing/knitting machine, iron, water Filter and dunky pump/Turbine), utilities owned by household members (watch, mobile telephone, bicycle, motorcycle / scooter, animal drawn-cart, bus / truck, boat with motor, car / van, tractor/trolley), household ownership, ownership of land, having animals (cattle, milk cows, buffaloes or bulls, horses, donkeys, mules or camels, goats, sheep and chickens/ ducks/ turkey), possession of bank account, main source of drinking water and type of toilet. (MICS, 2014).

Table 5

Ordinary Least Square Results of the Impact of Early Childbearing on Child Health

Dependent Variable	(1) Height for Age (z-scores)	(2) Weight for Age (z-scores)
Maternal Education Levels		
Early Childbearing (Age at First Birth<20=1)	-0.110***	-0.0590***
	(0.0231)	(0.0205)
Mother Educated up to Primary Education	0.0949***	0.0659***
	(0.0286)	(0.0249)
Mother Educated up to Secondary Education	0.287***	0.225***
	(0.0343)	(0.0305)
Mother Educated up to Middle Education	0.0976***	0.102***
	(0.0352)	(0.0305)
Mother Educated up to Higher Education	0.440***	0.389***
	(0.0379)	(0.0329)
Child Demography & Health Conditions		
Child Gender	0.0160	-0.0268
	(0.0192)	(0.0167)
Child Age	-0.0676***	-0.0129**
	(0.00683)	(0.00610)
Child Past Illness Condition	-0.0703***	-0.0831***
	(0.0194)	(0.0172)
Health Knowledge/Health Practices:		
Salt Iodisation	0.0763	-0.0909
	(0.0861)	(0.0790)
Hand Washing	0.0124	-0.00718
	(0.0273)	(0.0232)
Household Characteristics :		
Household Head Educated up to Primary	0.0476*	0.00313
	(0.0274)	(0.0243)
Household Head Educated up to Secondary	0.183***	0.0907***
	(0.0294)	(0.0255)
Household Head Educated up to Middle	0.131***	0.0994***
	(0.0318)	(0.0279)
Household Head Educated up to Higher	0.302***	0.191***
	(0.0375)	(0.0321)
Gender of Household Head	0.0769**	0.0403
	(0.0370)	(0.0334)
Number of Household Members	3.43e-05	0.00159
	(0.00231)	(0.00201)
Household Owns Agricultural Land	0.191***	0.161***
	(0.0224)	(0.0193)
Urban	-0.121***	-0.117***
	(0.0241)	(0.0212)
Combined Wealth Score	0.278***	0.236***
	(0.0162)	(0.0139)
Constant	-1.349***	-1.124***
	(0.104)	(0.0948)
Observations	19,742	19,742
R-squared	0.109	0.091

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

4.2. Cluster Fixed Effects

To deal with the unobserved heterogeneity associated with early childbearing at the cluster level; the paper employs cluster-fixed effects. The cluster-fixed effects take into account the component of the omitted variable bias that is common across clusters because households located within a cluster share the same neighborhood characteristics. These factors comprise common cultural practices and shared norms and values in a specific community which exerts pressure on individual behaviour towards early childbearing decisions. The clusters are defined as primary sampling units[21]. On average there are approximately 20 households in each cluster. The cluster fixed effects show that even after controlling for the unobserved factors across clusters, the impact of early childbearing still holds strong explanatory power. If the age at first birth is less than 20, then after accounting for unobserved community factors; the height for age z-scores decreases by 12.3 percent while the weight for age decreases by 8.27 percent. The results are suggestive of the fact that early childbearing exerts a strong influence on both short-term and long-term child health outcomes.

Table 6

Cluster Fixed Effects Estimation

Dependent Variable:	Height For Age (z-scores)	Weight for Age (z-scores)
Early Childbearing (Age at First	–0.123***	–0.0827***
Birth <20=1)	(0.0299)	(0.0245)
Constant	–1.377***	–1.259***
	(0.144)	(0.119)
Observations	19,742	19,742
R-squared	0.068	0.051
Number of Cluster ID	2,551	2,551
Mother Controls	Yes	Yes
Child Controls	Yes	Yes
Community Controls	No	No
Household Controls	Yes	Yes

4.3. Household Fixed Effects

The paper also employs the household fixed effects model to eliminate the source of omitted variable bias which arises at the household level. The household fixed effects take into account the unobservable factors at the household level that influence early childbearing; these factors essentially comprise the preferences within a household pertaining to early childbearing and the value of having a child earlier. Table 7 shows the household fixed effect estimations. The results show that while early childbearing continues to exert a negative impact on height for age; the impact is however not statistically significant. For the case of weight for age z-scores; the results indicate that children born to teenage mothers have lower weight

[21]Census enumeration areas are defined as Primary Sampling Units (PSUs) .In the sampling frame, enumeration blocks, both urban and rural, are considered as Primary Sampling Units.

for age. This implies that after controlling for the unobserved household controls; early childbearing continues to have an impact on the short-term measure of child health while the long-term child health measure becomes insignificant. This implies that early childbearing has much more influence to play in the short-term health status of the child.

Table 7

Household Fixed Effects Estimation

Dependent Variable:	Height For Age (z-scores)	Weight for Age (z-scores)
Early Childbearing (Age at First Birth <20=1)	–0.0963	–0.0289
	(0.0816)	(0.0724)
Constant	–2.089***	–2.632***
	(0.114)	(0.0921)
Observations	19,742	19,742
R-squared	0.032	0.005
Number of Household ID	12,043	12,043
Mother Controls	Yes	Yes
Child Controls	Yes	Yes
Community Controls	Yes	Yes
Household Controls	No	No

4.4. Result Comparison across Estimation Strategies

Table 8 shows the coefficient comparison of early childbearing across different specifications for height for age. The comparison yields that once the ordinary least square accounts for all the possible set of controls; the size of the coefficient decreases by 66.7 percent, which implies that only 34 percent of the impact remains. The cluster fixed effects estimation reduces the size of the coefficient by 11.8 percent; which infers that the estimation takes into account the unobserved cluster factors, which influence early childbearing decisions. The coefficient of early childbearing also diminishes in terms of its magnitude as well as statistical significance once household fixed effects are employed; as only 5 percent of the impact of early childbearing remains on height for age. A similar pattern holds for weight for age regression results[22]; however the only difference arises when we employ the household fixed effects; as it shows that although the coefficient decreases in terms of its magnitude compared to a simple ordinary least square regression estimate the variable still holds strong statistical power; which implies that early childbearing continues to remain important even when unobserved household characteristics are eliminated. This is only true for weight for age z-score results which suggests that early childbearing endures having a major impact on short-term measures of child health (WAZ) compared to long-term measures (HAZ). The comparison of results across estimations suggests that early childbearing continues to influence the short-term measure of child health even once household unobserved characteristics are accounted for.

[22]See Appendix Table 3.

Table 8

Result Comparison across Estimation Strategies: Height for Age z-scores

Dependent Variable: Height for Age (z-scores)	OLS	OLS	Cluster FE	Household FE
Early Childbearing (Age at First Birth <20 =1)	–0.333***	–0.110***	–0.123***	–0.0963
	(0.0188)	(0.0231)	(0.0299)	(0.0816)
Observations	32,579	19,742	19,742	12,043
R-squared	0.006	0.109	0.068	0.032
Community FE	No	No	Yes	No
Number of Cluster id	–	–	2,551	–
Household FE	No	No	No	Yes
Number of Household id	–	–	–	12,043
Mother Controls	No	Yes	Yes	Yes
Child Controls	No	Yes	Yes	Yes
Community Controls	No	Yes	No	Yes
Household Controls	No	Yes	Yes	No

4.5. Robustness Checks

To check for the robustness of our results, the paper uses different strategies to check the validity of the results.

4.6. Robustness Checks: Changing the Specification[23]

One of the strategies to check if the results still hold importance is done by changing the specification of the key variable of interest which is early childbearing. Previously, early childbearing was specified through a dummy variable which took a value of one if the age at first birth was less than 20 years. To show that the results still hold the specification is changed by introducing a categorical variable of age at first birth. The ordinary least square results for height for age show that age at first birth is negatively associated with categories 17-18 and 19 at 5 percent and 10 percent significance levels respectively. However, once the unobserved cluster factors are taken into account only age at first birth at 19 years remains statistically significant; while household-level fixed effect yields that the mother's age at first birth is 16 and less and has strong explanatory power at a 1 percent significance level. The same set of results holds for the weight for age z-scores. The ordinary least square results show that the mother's age at 19 years; is negatively and statistically significantly associated with weight for age across different estimation strategies. However, the household fixed effects show that the mother's age at first birth less than or equal to 16 holds strong explanatory power. These results are in line with the previous specification; as the results show that a mother's age at first birth is less than 20 years is negatively associated with both long-term and short-term measures of child health.

4.7. Robustness Checks: Alternative Data Set[24]

To check whether the results hold for the previous data set as well; the paper uses the MICS 2011 Punjab data set. The comparison of results between 2011 and 2014 data sets shows similar results. The comparison yields that the sign of the coefficient of early

[23] See Appendix Table 4 & 5 for regression results.

[24] See Appendix Table 6 & 7 for Regression Results

childbearing remains the same for both data sets. The ordinary least square results for 2011 and 2014 remain statistically significant for both data sets at 5 percent and 1 percent respectively. However, once the regressions take into account the unobserved household characteristics; the coefficient of height for age does not remain statistically significant for both the data sets. This implies; that in the long run, the impact of early childbearing doesn't hold much explanatory power. The weight for age results comparison; shows that across different specifications the impact of early childbearing remains negative and statistically significant for both the data sets taken into consideration. This implies that teenage childbearing has negative influences in the short term compared to the long-term indicator of child health.

5. CONCLUSION & POLICY IMPLICATIONS

The study aims to test the impact of early childbearing on child health outcomes in Punjab. The analysis takes into account additional characteristics in terms of maternal education, health knowledge, household factors, and child characteristics. The empirical analysis is based on cluster and household fixed effects.

The role of early childbearing on child health measures; is partly explained by the differential in maternal education acquired by teenage mothers compared to non-teenage mothers. In addition to this, the analysis shows that teenage mothers differ significantly from non-teenage mothers in terms of the household characteristics they experience; which are considered in terms of household head education, wealth score, agricultural land ownership as well as the locality of the residence. While much of the previous empirical studies have focused on the role of background characteristics in influencing early childbearing and consequently child outcomes; this paper takes into consideration the unobserved contextual setup experienced by mothers in the face of social norms and cultural values to produce offspring as soon as they get married. Since it is difficult to quantify the cultural and household norms and preferences advocating such behaviour; the empirical strategy relies on employing cluster and household fixed effects models.

The empirical analysis shows that once the ordinary least square regressions control for household, child, and health knowledge characteristics; approximately 31 percent of the impact remains for height for age. However, once unobserved cluster and household factors are taken into account only 21 percent and 5percent of the impact remains for height for age. This shows that the size of the coefficient is greatly attenuated once unobserved characteristics are accounted for. The same set of patterns holds true for weight for age indicators as well. While it may be correct to say that the empirical analysis carried out does take into account the unobserved characteristics influencing early childbearing decisions; however, the analysis doesn't take into consideration the practical knowledge of teenage mothers which may develop over time and hence improve child health-seeking behaviour in the long run. In addition to this, the analysis assumes the type of omitted variable bias that exists; while there may be unobserved characteristics at different levels such as the mother and child's unobserved characteristics; this analysis is only confined to the issue of omitted variable bias existing at the household and cluster level.

The results are suggestive of the fact that besides nutrition and knowledge about health care; teenage pregnancy continues to have a significant impact on child health outcomes in both short-term and long-term measures. This suggests very strongly the

existence of social norms and practices and their influence on individual behaviour as well as the choices made about childbearing decisions.

Therefore, policies that focus on enhancing nutrition and health knowledge alone might not be effective; policies should rather focus on developing the parenting skills of young mothers so that they can efficiently uptake child health care. The government on the other hand can focus on taking innovative initiatives like developing mother-child care units while providing parenting skills to young mothers.

Future research in this area can focus on exploring the linkages between social norms and childbearing decisions. The research can also focus on the linkages between maternal empowerment, childbearing decisions, and its influence on a child's developmental and social outcomes.

APPENDIX

Table 1

Region Wise Distribution of Early Childbearing Pattern within Punjab

Regions	% of Women who Experienced Early Childbearing
South Punjab	25%
North Punjab	21%
Central Punjab	21%

Source: Author's calculation.

Note:

South Punjab includes the districts Bahawalpur; Bhawal Nagar; Rahimyar Khan; Dera Ghazi Khan; Layyah Muzaffargarh; Rajanpur; Multan; Khanewal; Vehari & Pakpattan.

North Punjab includes the districts Gujrat; Narowal; Sialkot; Nankana Sahib; Sheikhupura; Lodhran; Rawalpindi Attock; Chakwal; Jhelum; Sargodha; Bhakkar; Khushab & Mianwali

Central Punjab includes the district Faisalabad; Chiniot; Jhang; Toba Tek Singh; Gujranwala; Hafizabad;Mandi Bahaudin; Lahore; Kasur ;Sahiwal & Okara

Table 2

Descriptive Statistics: Break Down by Early Childbearing

Variables	Age at First Birth< 20	Age at First Birth ≥20
Child Health Indicators		
Height for age (z-scores)	–1.714603	–1.418112
Weight for age (z-scores)	–1.749793	–1.520961
Maternal Characteristics		
Age at Marriage	16.01	22.14
Short First Birth Interval*	.5165934	.436108
Mother Education Primary*	.1941224	.1853206
Mother Education Middle*	.0931627	.0946007
Mother Education Secondary*	.0881647	.133802
Mother Education Higher*	.02499	.1374578
Child Characteristics		
Child Gender(Male=1,Female=0)	.4990998	.5008733
Age of Child	2.612355	2.54342
Child had Diarrhea in Past Two Weeks *	.1813991	.1625282
Health Knowledge/Practices		
Ever Heard of Aids *	.2760896	.4175014
Ever use any Family Planning Method *	.1135546	.1079865
Salt Iodisation *	.6491403	.6985939
Household Characteristics		
Household Head Primary Education*	.1945222	.1749156
Household Head Middle Education*	.1321471	.1472441
Household Head Secondary Education*	.1505398	.1975816
Household Head Higher Education*	.0581767	.121766
Gender of Household Head (Male=1,Female=0)	.9528189	.9457255
Number of Household Members	8.159336	7.79207
Household Own Agriculture Land*	.2714914	.3055681
Area(Urban=1, Rural=0)	.2856857	.3585489
Wealth Score	–.3612048	–.0038705

* Indicates dummy variable.

Table 3

Regression Results: ORDINARY Least Square, Least Square Dummy Variable,

Dependent Variable: Weight for Age (z-scores)	OLS	OLS	Cluster FE	Household FE
Early Childbearing (Age at	–0.229***	–0.0583*	–0.0438**	–0.159***
First Birth <20 =1)	(0.0349)	(0.0336)	(0.0203)	(0.0473)
Observations	21,809	21,905	21,905	21,905
R-squared	0.007	0.114	0.059	0.019
Community FE	No	No	Yes	No
Number of Cluster id	–	–	2020	–
Household FE	No	No	No	Yes
Number of Household id	–	–	–	7606
Mother Controls	No	Yes	Yes	Yes
Child Controls	No	Yes	Yes	Yes
Community Controls	No	Yes	No	Yes
Household Controls	No	Yes	No	Yes

Table 4

Robustness Checks: Categorical Classification of Age at First Birth for Height for Age

Dependent Variable : Height for Age(z- scores)	OLS	Cluster FE	Household FE
Mother's Age at First Birth:			
≤ 16	–0.0435	–0.0586	–0.336***
	(0.0930)	(0.0507)	(0.116)
17-18	–0.121*	–0.0476	–0.00862
	(0.0623)	(0.0352)	(0.0862)
19	–0.123**	–0.0938**	–0.0737
	(0.0605)	(0.0388)	(0.0928)
20-21	–0.0590	–0.0175	–0.0822
	(0.0410)	(0.0263)	(0.0619)
Child Controls	Yes	Yes	Yes
Mother Controls	Yes	Yes	Yes
Household Controls	Yes	Yes	No
Observations	21,758	21,758	21,758
R-squared	0.112	0.054	0.018
Number of Cluster id	–	2,018	–
Cluster FE	–	Yes	No
Number of Household id	–	–	7584
Household FE	–	–	Yes

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

Table 5

Robustness Checks: Categorical Classification of Age at First Birth for Weight for Age

Dependent Variable : Weight for Age(z- scores)	OLS	Cluster FE	Household FE
Mother's Age at First Birth:			
≤ 16	–0.0129	–0.00493	–0.462***
	(0.0706)	(0.0416)	(0.0928)
17-18	–0.0528	–0.00523	–0.0982
	(0.0501)	(0.0288)	(0.0682)
19	–0.117**	–0.128***	–0.260***
	(0.0493)	(0.0316)	(0.0736)
20-21	–0.0160	–0.0134	–0.213***
	(0.0334)	(0.0216)	(0.0491)
Constant	–1.843***	–1.888***	–0.967**
	(0.0971)	(0.0669)	(0.434)
Child Controls	Yes	Yes	Yes
Mother Controls	Yes	Yes	Yes
Household Controls	Yes	Yes	No
Observations	21,905	21,905	21,905
R-squared	0.114	0.059	0.021
Number of cluster id	–	2,020	–
Cluster FE	–	Yes	No
Number of household id	–	–	7,606
Household FE	–	–	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6

Comparison of MICS 11 & MICS 14 data sets for Height for Age z-scores.

	OLS		Cluster FE		Household FE	
Dependent Variable : Height for Age(z- scores)	MICS 2011	MICS 2014	MICS 2011	MICS 2014	MICS 2011	MICS 2014
Early Childbearing	–0.128***	–0.0907**	–0.107***	–0.0613**	–0.111	–0.0170
(Age at First Birth<20=1)	(0.0237)	(0.0420)	(0.0264)	(0.0248)	(0.108)	(0.0596)
Constant	–0.955***	–1.875***	–0.926***	–1.874***	–0.171	1.121**
	(0.0519)	(0.114)	(0.0578)	(0.0813)	(0.521)	(0.544)
Observations	25,250	21,758	25,250	21,758	25,250	21,758
R-squared	0.124	0.112	0.094	0.053	0.112	0.017
Number of Cluster id	–	–	6,220	2,018	–	–
Cluster FE	–	–	Yes	Yes	–	–
Number of Household id	–	–	–	–	16,015	7584
Household FE	–	–	–	–	Yes	–
Child Controls	Yes	Yes	Yes	Yes	Yes	Yes
Mother Controls	Yes	Yes	Yes	Yes	Yes	Yes
Household Controls	Yes	Yes	Yes	Yes	No	No

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

Table 7

Comparison of MICS 11 & MICS 14 data sets for Weight for Age z-scores

	OLS		Cluster FE		Household FE	
Dependent Variable : Weight for Age(z- scores)	MICS 2011	MICS 2014	MICS 2011	MICS 2014	MICS 2011	MICS 2014
Early Childbearing (Age at First Birth<20=1)	–0.0742*** (0.0196)	–0.0583* (0.0336)	–0.0561*** (0.0213)	–0.0438** (0.0203)	–0.0148 (0.0867)	–0.159*** (0.0473)
Constant	–1.450*** (0.0426)	–1.844*** (0.0972)	–1.477*** (0.0466)	–1.888*** (0.0667)	–0.885** (0.421)	–1.075** (0.433)
Observations	25,574	21,905	25,574	21,905	25,574	21,905
R-squared	0.102	0.114	0.048	0.059	0.019	0.019
Number of Cluster id	–	–	6,235	2,020	–	–
Cluster FE	–	–	Yes	Yes	No	No
Number of Household id	–	–	–	–	16,146	16,146
Household FE	–	–	–	–	Yes	Yes
Child Controls	Yes	Yes	Yes	Yes	Yes	Yes
Mother Controls	Yes	Yes	Yes	Yes	Yes	Yes
Household Controls	Yes	Yes	Yes	Yes	No	No

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