What Explains Differences in Child Health between Rural, Urban, and Slum Areas? Evidence from India*

Claus C Pörtner
Department of Economics
Albers School of Business and Economics
Seattle University
cportner@seattleu.edu
www.clausportner.com
&
Center for Studies in Demography and Ecology
University of Washington

Yu-hsuan Su
Graduate Institute of Development Studies
National Chengchi University
yuhsu@nccu.edu.tw
yuhsu.weebly.com

September 2014

*We would like to thank Judith Thornton, Robert Plotnick, Seik Kim, and participants at the Labor and Development Seminar of the Department of Economics at the University of Washington for their helpful comments. Partial support for this research came from a Eunice Kennedy Shriver National Institute of Child Health and Human Development research infrastructure grant, 5R24HD042828, and the Center for Studies in Demography and Ecology at the University of Washington.

Abstract

The developing world is rapidly becoming more and more urban, but our understanding of the differences between urban and rural areas is still limited, especially in the important area of child health and its determinants. Simple averages show clearly that average child health in India is worst in rural areas and best in urban areas—with slums in between—but it is unclear exactly what accounts for these differences. We examine the determinants of these differences in child health across areas using the 2005-06 National Family Health Survey (NFHS-3) data from India. Once we control for wealth status or observed health environmental conditions in addition to basic individual and household characteristics, the urban advantage in height-for-age disappears and slum children fare significantly worse than their rural counterparts. Potential explanations, such as mortality selection and migration, are explored, but are unlikely to explain these results. The implication is that the differences in composition of types of households across the three areas essentially hides the substantial negative effect slums have on child health. We argue that the worse health environment in slums, such as over-crowding and open sewage, which is insufficiently captured by the available information, is likely the main culprit.

Keywords: Child health; Z-score; mortality; slum; urban; rural; India; maternal education

JEL Classification: I14, J13, O18.

1 Introduction

Child health is a key measure of a society's development and an important indicator of future labor productivity and economic growth. As the urban population in the developing world increases from 2.7 billion in 2011 to a projected 5.1 billion in 2050,[1] it is important to understand how child health and its determinants differ between rural and urban areas to design effective policies. The proportion of stunted or underweight children is substantially lower in urban areas than rural areas, but the absolute number of undernourished children has increased faster in urban areas than rural areas (Haddad, Ruel and Garrett 1999; Smith, Ruel and Ndiaye 2005; Fotso 2007; de Poel, O'Donnell and Doorslaer 2007).

What is behind the differences in child health between areas? One possibility is a composition effect: parents in urban areas are richer and better educated on average, and richer and better educated parents have healthier children. If composition effects explain the urban-rural child health differentials, then controlling for key determinants of child health should eliminate the urban advantage. The results from the limited literature are, however, inconclusive and depend on outcome and countries examined. Controlling for determinants of child health and mortality does, indeed, reduce the urban advantage, but there are many cases where the differences are still statistically significant (van de Poel, O'Donnell and van Doorslaer 2009; Bocquier, Madise and Zulu 2011).[2] This points to a second potential reason for the urban advantage: there is something about living in cities that promotes better child health. There is, however, little evidence of differences in the coefficient sizes for determinants, such as women's education, access to safe water and sanitation, and household economic status, on child nutritional status using DHS data from 28 countries (Smith et al. 2005).

[1] See United Nations (2012).

[2] Using Demographic and Health Survey (DHS) data from 47 developing countries, the differences in stunting and under-5 mortality risk between urban and rural areas are still statistically significant in 16 countries for stunting and 11 countries for mortality even after controlling for a board set of explanatory variables (de Poel et al. 2007). For further examples see also Timaeus and Lush (1995), Fotso (2006), Fotso (2007), Dye (2008), and van de Poel et al. (2009).

An additional complication is that any urban advantage is unlikely to be uniformly distributed. In some cases living in urban areas is associated with better child health for both rich and poor families, with the effect larger the richer the family (Timaeus and Lush 1995; Fotso 2006; Dye 2008), but in others, the urban poor experience statistically significantly *higher* mortality than their rural counterparts once wealth and socio-demographic factors are controlled for (van de Poel et al. 2009).[3] In no countries, however, is stunting significantly higher among urban poor than rural poor when including controls, and there are more countries that retain their statistically significant urban advantage for both mortality and stunting when restricting to only poor households than when using the full sample (van de Poel et al. 2009).

A possible explanation for these inconclusive results may be that the prior research has not been able to take account of the potentially important division within urban areas between slums and regular urban areas. Slums are often the first stop for people moving from rural areas in search of new opportunities in cities, and just as the overall urban population is growing there are more and more people living in slums. Currently around 33 percent, equivalent to about 863 million, of the urban population in developing countries live in slums (UN-Habitat 2013, p. 151). Despite the concerns about poor living conditions in slums because of the higher density and paucity of services such as water and sanitation, there is only a small literature on slums and child health. Surveys often exclude slum areas since they are considered illegal settlements, and when they are included the sample size is often too small to allow reasonable slum-specific estimates (Fotso 2007; Marx, Stoker and Suri 2013).[4] Because DHS only include information on slum residence for a small number of surveys, the two studies that use cross-country data to compare child health across

[3] A household is considered poor if it belongs to the lowest wealth quintile in a country. The countries are Benin, Mauritania, Namibia, Uganda, Bangladesh, India, Pakistan, Bolivia, and Nicaragua.

[4] Descriptive studies indicate that people in slums are less healthy compared to those in non-slum urban areas (Basta 1977; James, Ferro-Luzzi and Waterlow 1988; Mullick and Goodman 2005). The greater availability of health practitioners would appear to be an advantage for slum children over their rural counterparts, but concentrated poverty is associated with lower rates of use of health service (Montgomery and Hewett 2005). Slums do, however, often turn out to be stable and homogeneous communities rather than chaotic agglomerations (Fry, Cousins and Olivola 2002).

rural, urban, and slum instead create their own indicator for slum based on neighborhood characteristics. Child mortality rates in slums areas in 18 African countries are significantly higher in slum areas than non-slum urban areas, although they are still lower than in rural areas in most cases (Günther and Harttgen 2012). Similarly, results, using DHS data from 73 low- and middle-income countries, show that when not controlling for determinants other than residence, slum children face higher health risks than urban children, but lower than rural children (Fink, Günther and Hill 2014). Controlling for maternal education, wealth, and health access, slum children in towns of less than 1 million lose their health advantage over rural children with comparable characteristics. What is even more remarkable is that in cities of more than 1 million residents, slum children retain their health advantage over rural children, even when these controls are included.

The inconclusive nature of the results on child health and area of residence, and especially the finding by Fink et al. (2014) that there appear to be a health advantage to living in a city slum over a rural area, lead to the two main questions of this paper: what accounts for the differences in child health across rural, urban, and slum areas, and are living in slums really not that unhealthy after all?

With potentially considerable heterogeneity in slum conditions between countries and since the relationship between living in rural, urban, and slum areas might differ by country, we take a different approach from the previous literature and focus on a specific country, India, which has substantial and rapidly-growing slum areas. India's slum-dwelling population has risen from 27.9 million in 1981 to 65.49 million in 2011 (India Office of the Registrar General and Census Commissioner 2013). In India's largest city, Mumbai, more than 6 million live in slums out of the city's approximately 12 million people, even though slums occupy only about 9 percent of the city's land, and the number of slum dwelling has grown 40 percent since 1995 (Burra 2005; Murthy 2012).

We use data from the 2005-06 National Family Health Survey (NFHS-3) to examine differences in child health across rural, urban, and slum areas and explore the determinants

of these differences. Contrary to other DHS data sets, NFHS-3 explicitly surveyed slums areas in addition to rural and urban areas, providing us with a data set that has a sufficient number of observations to identify any potential differences across areas. The main outcomes of interest are height-for-age, weight-for-height, and mortality risk. Simple averages from NFHS-3 show that urban children do better than slum children for all three health measures and that slum children in turn to substantially better than rural children. We examine how these unconditional urban and slum advantages over rural areas change as we control for different sets of household and community characteristics.

India is an interesting case since it is the second most populous country in the world and a high proportion of its population lives in slums. There are, however, two additional motivations for focusing on India. First, Indian children are, on average, shorter than similarly aged children from Sub-Saharan Africa, despite that India is richer than the average African country. Multiple potential explanations have been proposed for this, although none of the studies attempt to identify any potential difference across areas or specifically in slums. One possibility is that low status and poor health of Indian women could directly affect their children's anthropometric status (Coffey, Khera and Spears 2013). Another is that parental preferences for lower birth order children underlie much of India's child stunting (Jayachandran and Pande 2013). Finally, open defecation, which is exceptionally widespread in India, has been argued to account for much or all of the excess stunting in India (Spears 2013). The second motivation is that there is substantial evidence of sex selective abortions in India in both urban and rural areas—with usage higher in urban than rural areas—and use has been increasing over time (Pörtner 2013). These factors may all serve to muddle the relationship between area of residence and child health in cross-country studies. As an example, imagine a situation where girls not born because of the use of sex selective abortions would have had worse health and higher mortality than the average girl in the area. In that case, sex selection will result in better health and reduced mortality for those girls that are born.[5] If

[5] See Lin, Liu and Qian (2014) for a discussion of the potential relationship between sex selection and child health in Taiwan.

sex selection is furthermore used to different degrees across areas, even after controlling for household characteristics, that would bias estimates of differences between areas.

[Findings] We find that slum children fare worse significantly than both rural and urban non-slum children once factors are controlled for.

2 Data and Estimation Strategy

The data come from the 2005-06 National Family Health Survey (NFHS-3). NFHS-3 is the third in a series of national surveys; earlier NFHS surveys were carried out in 1992-93 (NFHS-1) and 1998-99 (NFHS-2).[6] We use only NFHS-3 because the first two surveys did not include information on slums.[7] The survey used clustered random sampling and the sample design for NFHS-3 is described in detail in International Institute for Population Sciences (IIPS) and Macro International (2007, Chapter 1).

In eight large cities, Chennai, Delhi, Hyderabad, Indore, Kolkata, Meerut, Mumbai, and Nagpur, the NFHS-3 surveyed both urban non-slum areas and urban slum areas. An important issue here is what constitutes a slum. As shown in UN-HABITAT (2003, Chapter 1), the word "slum" takes on different meaning at different times and different places. The recommended operational definition of a slum is "...an area that combines, to various extents, the following characteristics (restricted to the physical and legal characteristics of the settlement, and excluding the more difficult social dimensions): inadequate access to safe water; inadequate access to sanitation and other infrastructure; poor structural quality of housing; overcrowding; insecure residential status." (UN-HABITAT 2003, p. 12), with each indicator further broken down into a specific definition.

In NFHS-3, the definition of a slum follows the 2001 Census's definition: "(i) all specified areas in a town or city notified as 'Slum' by State/Local Government and UT Administration

[6] All three surveys were conducted under the stewardship of the Ministry of Health and Family Welfare, Government of India, with the International Institute for Population Sciences, Mumbai, serving as the coordinating agency.

[7] NFHS-2 did provide separate estimates for slum and non-slum areas in Mumbai, but not in any other cities.

under any Act including a "Slum Act" (ii) all areas recognized as 'Slum' by State/Local Government and UT Administration, Housing and Slum Boards, which may have not been formally notified as slum under any act; and, (iii) a compact area of at least 300 population or about 60-70 households of poorly built congested tenements, in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities." (Gupta, Arnold and Lhungdim 2009, p. 10). Category (iii) consists mainly of what is known as non-notified slums. These areas tend to have little access to service and civic facilities and be mainly inhabited by recent rural or temporary immigrants. In addition to the official Census definition, an area could also be identified as a slum by the interviewing team supervisor at the time of the data collection using the category (iii) criterion, independently of whether the area was officially recognized as a slum or not. We consider an area a slum if it has been identified as such either by the census, by the survey supervisor, or both. The reason we incorporate both is that the Census identify slum and non-slum areas two to three years before the census is conducted and with the rapidly growing cities it is very likely that a substantial number of areas that were not previously slums might have turned into slums in the almost ten years that have passed from when the census frame was drafted to the NFHS-3 survey.[8]

We restrict our sample to the seven states that have slum samples in order to make the rural, slums, and urban samples more comparable. The seven states with slum samples are Delhi, Uttar Pradesh, West Bengal, Madhya Pradesh, Maharashtra, Andhra Pradesh, and Tamil Nadu. Furthermore, we restrict the sample to Hindus and Muslims because of the very small number of children with other religions surveyed in slums.

[8] [THIS SHOULD BE MOVED TO SENSITIVITY SECTION] The replications of the main results by using the census identification and the supervisor identification are available upon request. The results are consistent with what we present here, but with lower level of statistically significance as expected.

2.1 Estimation Strategy

As the descriptive statistics show urban children has a statistically significant health advantage over slum children, and slum children over rural children. We begin our analysis with a specification that shows how the three areas compare in terms of child health controlling for child gender and age, by estimating the following:

$$H_{ijk} = \alpha + \mathbf{A}_{jk}\beta_1 + \mathbf{C}_{ijk}\beta_2 + \epsilon_{ijk}, \tag{1}$$

where H_{ijk} is the health status of child i in household j in state k. We use height-for-age Z-scores as the main indicator for child health. A child with a Z-score of zero is exactly at the mean of the comparison population in terms of height-for-age, while children with negative Z-scores are shorter than average. The results of weight-for-height Z-scores are also reported in the basic estimation for comparison.[9] $\mathbf{A}_{jk}$ captures the area of residence of the household, divided into three exclusive areas: rural, urban non-slum, and urban slum areas. $\mathbf{C}_{ijk}$ is a vector of personal characteristics of that child, including gender and age in months.

The second specification considers basic parental and household characteristics.

$$H_{ijk} = \alpha + \mathbf{A}_{jk}\beta_1 + \mathbf{C}_{ijk}\beta_2 + \mathbf{P}_{jk}\beta_3 + \mu_k + \epsilon_{ijk}, \tag{2}$$

where $\mathbf{P}_{jk}$ is a vector of parental characteristics, including mother's and father's level of education, and mother's height, household religion, caste, and fixed effects, μ_k, for state and the month of survey being conducted.[10]

To examine how the household wealth and the local health environment are correlated

[9] We do not use the information on diarrhea, cough, and fever because of the noisiness of these self-reported variables.

[10] The father's height is not included because the information is missing for more than half of the children in our sample

with child health conditions we estimate:

$$H_{ijk} = \alpha + \mathbf{A}_{jk}\beta_1 + \mathbf{C}_{ijk}\beta_2 + \mathbf{P}_{jk}\beta_3 + \mathbf{W}_{jk}\beta_4 + \mathbf{R}_{jk}\beta_5 + \mu_k + \epsilon_{ijk}, \tag{3}$$

where $\mathbf{W}_jk$ is a vector of the household's wealth status and $\mathbf{R}_{jk}$ is a vector of area characteristics for household jk. For each area characteristic variable we use the minus-i method: $R_{jk} = \frac{1}{n-1}\sum R_{-jk}$, where jk indicate that the sum is over all other households in the PSU except for jk. Thus, R_jk is the average living condition in the PSU excluding household jk. This approach is often used to deal with endogeneity issues (Aizer 2010). The advantage of this approach is that, by construction, area characteristics are no longer correlated with the unobserved characteristics of the individual household. Household wealth is captured using the NFHS-constructed wealth index, described in detail below.

Another measure of child health is child mortality. We estimate the effects of individual, household, and area characteristics on child mortality using the Cox proportional hazard model in which the instantaneous hazard rates of death is specified for child i, at age t measured in months, conditional on still being alive at age t, as:

$$\lambda(t \mid \mathbf{X}_{ijkt}) = \lambda_0(t)\exp(\mathbf{X}_{ijkt}\beta). \tag{4}$$

The baseline hazard, $\lambda_0(t)$, is a nonparametric, time-varying function. X_{ijkt} is a vector of regressors that combine the explanatory variables in the previous specifications. The outcome is children's age, measured in months, at time of survey if they are still alive or their age when they died if not alive at time of survey. An observation for a child alive at the time of survey and less than five years of age is considered censored, that is, we know that the child survived up to the survey age but not whether the child will survive to age five. The two main advantages of using a hazard model such as the Cox model over a logistic model on whether the child is alive or not at the survey, is that the hazard model incorporates the information provided by the length of the child's survival and accounts explicitly for censoring. Loosely

speaking the hazard model assigns more weight to observations that provide more complete information, that is, the child has died at a specific time or the child was older at the time of the survey. The Logit model instead assigns the same weight to a child who was born the week before the survey and a child that survived five years. [THIS NEEDS EDITING]

In addition to being of interest in its own right, the child mortality results also provide an indication of whether differential mortality across areas lead to a mortality selection problem for our height-for-age and weight-for-height results. Say that we have two equally low-health children, but that the likelihood of a child dying at that level of health is higher in rural areas than in urban areas. That would lead us to overestimate the health status of children in rural areas, because the weakest children are no longer observed in the sample. In other words, this would make the unhealthy areas appear less bad than they are.

Maternal education has consistently been shown to have a positive effect on child health (Behrman and Deolalikar 1988; Behrman 1990; Strauss and Thomas 1995; Lam and Duryea 1999; Glewwe 1999). The exact mechanisms behind the positive effect of maternal education on child health is still under exploration, but are generally thought to work through income, information, or health knowledge (Thomas, Strauss and Henriques 1991; Glewwe 1999; Kovsted, Pörtner and Tarp 2003). To examine if maternal education has a differential effect between areas we estimate the following equation:

$$H_{ij} = \alpha + \mathbf{A}_j\beta_1 + \mathbf{M}_j\beta_2 + \mathbf{A}_j\mathbf{M}_j\beta_3 + \mathbf{C}_{ij}\beta_4 + \mathbf{P}_j\beta_5 + \mathbf{W}_j\beta_6 + \mathbf{R}_j\beta_7 + \epsilon_{ij}, \qquad (5)$$

where $\mathbf{M}_j$ a vector the categorical variable for mother's education levels and $\mathbf{A}_j$ is the vector of area dummies. The remaining explanatory variables are the same as in the original specification.

For all models we present results for three samples: all children combined, boys only, and girls only. This allows us to explore potential gender differences, which is especially important in an country like India where discrimination against girls and sex selection is

prevalent. All results make use of the provided weights to account for oversampling of slum areas. Furthermore, we use robust standard errors clustered at PSU level for all regressions to allow for potential intragroup correlation of errors. Clustering is at PSU level because that is the highest level of aggregation for which we have variables of interest (Moulton 1990). All regressions are done in Stata 12.1 using the "cluster" option, which also implies robust estimation of the standard errors.[11]

A potentially important issue here is endogenous migration. For example, if households believe that living in slums is bad for their children's health, those who care more about child health are more likely to move away from slums. Similarly, urban dwellers that do poorly in economic life may be more likely to move to slums, and rural people, who are looking to improve their living conditions, may see slums as a first step toward living in the urban non-slum areas. This implies that unobservable household characteristics, place of residence, and child health may be correlated, which would bias the estimated effects. Unfortunately, NFHS-3 does not provide much information about migration. The only questions available are how long the respondent has been living continuously in the current PSU, and if the respondent has moved at one point, was the last previous place of residence in a city, in a town, or in the countryside. This makes it difficult to control for selective migration. To examine whether selective migration based on preferences for child health is important, we present results by migration status as sensitivity checks, estimating separately for children of women who have always lived in the current area and for those who have moved at one point in their lives.

2.2 Variables and Descriptive Statistics

Table 1 presents descriptive statistics by area of residence: rural, slums, and urban non-slums. We limit the sample to children less than five years of age because anthropometric information is not available for older children. The two Z-scores used as dependent variables

[11] Cox proportional hazard models are run using "stcox" and all other regressions using "regress." All models include dummies for state and month of survey.

are height-for-age and weight-for-height. Height-for-age Z-score is generally considered the better measure of children's long-term health. Weight-for-height Z-score is also presented here and in some of the later analyses for a more comprehensive examination of child health. The table also shows individual, household, and area characteristics.

[Table 1 about here.]

As expected, the overall health status of children in the sample is poor. The average height-for-age Z-score is -1.78, which means that the average child in the sample is close to being stunted. Clearly, children in rural areas on average do worst, with a height-for-age Z-score of -1.99, while slum children have an average height-for-age Z-score of -1.59, and urban children are the healthiest with a height-for-age Z-score of -1.50. The differences between the three areas are all statistically significant at the five percent level. [12] Using a threshold of height-for-age Z-score of -2, more than half of the rural children are stunted, whereas around 40 percent fall in this category for slums and urban areas. The difference in percent stunted between urban and slum is not statistically significant. Hence, despite the common view of slums as detrimental to health, slum children do surprisingly well according to the simple averages, although still worse than urban children. Weight-for-height follows a similar pattern as height-for-age, but the differences are less distinct. The differences between rural and both slum and urban are both statistically significant, but the difference between slum and urban is not.[13] Both height-for-age Z-score and weight-for-height Z-score are close to normally distributed and do not appear to be substantially skewed.[14] Mortality is higher in rural areas than slum and urban areas in terms of the percentage of children who have died before their fifth birthday. Descriptive statistics for mortality is discussed in more detail below.

[12] The t-statistic between rural and slum is 11.06, between rural and urban it is 15.38, and between slum and urban it is 2.36.

[13] The t-statistic between rural and slum is 7.82, between rural and urban it is 9.84, and between slum and urban it is 0.73.

[14] Histograms of outcomes by area and sex are available on request.

The natural sex ratio at birth is around 105 boys per 100 girls.[15] This means that in the absence of sex selective abortions and differential mortality between boys and girls, we should expect 48.8 percent of the sample to be girls. The percentage of girl in rural areas is at the expected number. In urban areas, 48 percent of the people in the sample are girls, whereas only 46 percent are girls in slum areas. This indicates that sex selective abortions are possibly used in urban and slum areas.

Corresponding to the height differences between children, mothers are, on average, tallest in urban areas, followed by slum areas, and finally by rural areas. Intriguingly, the average level of education of both mothers and fathers in urban non-slums and slum areas are similar, and both are substantially higher than in rural areas.[16] There is less than a year's difference in the average education levels between slum areas and urban areas for both mothers and fathers. Given the common perception that slums are mainly populated by a transient population, it is interesting that 27 percent of the slum children's mothers are born in the same PSU as they are surveyed in. This is higher than both urban—where 22 percent have never moved—and rural, where only 14 percent are living where they were born. The low number for the rural population is most likely the result of the Indian practice of exogamy, where a woman marries into a household in another village and becomes part of her husband's household.

Hindus constitute approximately 80 percent of our sample and Muslims 20 percent.[17] In rural areas the distribution is 87 percent Hindu and 13 percent Muslim, while slums and urban areas have a higher proportion of Muslims with around 27 percent in slums and 24 percent in urban areas. Around 77 percent of rural children in the sample belong to a scheduled caste, scheduled tribe, or other back class.[18] In slum areas the number is 58

[15] For a detailed discussion of sex ratios at birth and an analysis of sex selective abortions in India see Pörtner (2013).

[16] For the estimations below, we use a set of dummies to capture parental education rather than having them enter linearly. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12-plus years of education.

[17] As mentioned we exclude other religions because of the small number of children in slums that belongs to a different religion.

[18] These three groups tend to be poorer and historically suffered from discrimination. India now employs affirmative action to enhance their participation in economic and political life.

percent and for urban areas it is 60 percent.

The wealth index is constructed in NFHS-3 based on 33 assets and housing characteristics by principle components analysis.[19] Not surprisingly, rural is the poorest among the three areas, with 60 percent of the children belonging to a household that is among the bottom 40 percent of Indian households in terms of wealth. Urban areas have the higher proportion in the top category (category 5), with 47 percent of children in that category, but interestingly, slums are not far behind with 38 percent in the top category. Furthermore, focusing on the top two groups show that households in slums have close to the same amount of assets and housing characteristics as households in urban areas: 78 percent of slum children belong to the top two wealth groups in slums compared to 74 percent in urban areas.

The bottom portion of Table 1 shows the area characteristics. These characteristics fall in two categories: health environment and wealth. Health environment includes characteristics that are thought to broadly reflect the healthiness of the living conditions of the area. These include water access, (captured by the average time to fetch water and type of drinking water source), access to improved cooking fuel, sharing a toilet with ten or more households, access to improved toilet facilities, and the average number of people per room. Area wealth is captured by the percentage of households in each of the five wealth categories. For each household all area characteristics are calculated as the average of households in the PSU, excluding the household itself as described in 2.1.

The time to fetch water is essentially identical across urban and slum areas at around six minutes, which is about half the time it takes in rural areas. We follow the official NFHS-3 report for the definition of access to improved sources of drinking water (International Institute for Population Sciences (IIPS) and Macro International 2007). In addition to

[19] Each asset was assigned a weight (factor score) generated through principle components analysis, and the resulting asset scores were standardized in relation to a standard normal distribution with a mean of zero and a standard deviation of one. The sum of the scores of the assets possessed by each household resulted in that household's wealth index factor or score. The sample was then divided into population quintiles, with each quintile given a rank from one (poorest) to five (wealthiest). In NFHS-3, the wealth index has been developed for the whole sample and for the country as a whole. Thus, at the national level, 20 percent of the household population is in each wealth quintile, although this is not necessarily true at the state level.

water piped into the dwelling, yard or plot, an improved drinking water source includes water available from a public tap or standpipe, a tube well or borehole, a protected dug well, a protected spring, rainwater, and bottled water. Using this definition, around 96 percent of households in urban and slum areas have access to an improved source of drinking water, with rural areas only slightly behind at 87 percent.[20]

Access to improved cooking fuel is important because smoke from solid cooking fuels is a serious health hazard (International Institute for Population Sciences (IIPS) and Macro International 2007).[21] Interestingly, the proportion of households that use improved cooking fuels is higher in slums than in urban areas, with 78 percent in slums and 69 percent in urban areas. Rural areas are far behind, with only 7 percent using an improved cooking fuel. At 19 percent, slums have the highest percentage of households sharing toilets with ten or more other households, probably because most slum dwellers rely on public toilets in the community. In urban areas, 6 percent of households share with 10 or more households, while less than 1 percent do so in rural areas. About three-quarters of households in slums and urban areas have access to improved toilets, while only 17 percent in rural areas have similar access. Slums and rural areas have essentially the same number of people per room at 3.7, with urban households having an average of 3.3 people per room. Although number of people per room does provide some indication of crowding, it fails to capture the fact that dwellings in slums areas are located much closer together than in either urban or rural areas. Ideally, having information on the number of people per square kilometer would be a better measurement, but that is not available in our data. Unfortunately, NFHS-3 does not

[20] To investigate whether there are differential effects by source we also tried splitting into main sources: piped into dwelling or yard/plot; public tab or standpipe; tube well or borehole; other improved water source;and unsafe or unimproved water source. More than three quarters of the slum population get their drinking water either piped or from a public tap; this number is only slightly lower in urban areas. The main drinking water source in rural areas are tube wells and boreholes, which accounts for more than sixty percent. The regressions were re-estimated with unsafe/unimproved water source as the excluded category and the four categories as dummies. None of the four dummies for water source were statistically significantly different from unsafe/unimproved water sources and all are close to zero in effect. Consistent with this, the changes in the area dummies' effects on height-for-age Z-score and weight-for-height Z-score were minimal.

[21] Solid cooking fuels include coal/lignite, charcoal, wood, straw, shrubs, grass, agricultural crop waste and dung cakes. We consider electricity, natural gas, biogas and kerosene as improved cooking fuel.

provide information about the exact location of survey areas, making it impossible to match PSU location with secondary data. As expected, given the distribution of wealth discussed above, slums and urban areas are relatively similar in terms of area wealth distribution, while households in rural areas generally have less wealth.

Even though the general perception of slums is one of squalor and poor living conditions, these descriptive statistics paint a somewhat different picture. First, there are more children in the top two wealth categories in slum areas than in urban areas and parental education levels are relatively high. Second, slum children, although they clearly are worse off than children in urban areas, do not lag far behind in terms of health and certainly are in better health than rural children. Now, the question is whether or not these simple averages provide an adequate description of child health and its determinants; therefore, we turn to our estimation of the child health production function.

3 Determinants of Child Health

Table 2 presents the results for our estimation of the determinants of health as described above for child height-for-age Z-scores. Columns 1 to 7 show the results for different sets of control variables, beginning with a specification that only includes child age and sex and ending with a specification that includes all variables. The results are shown both for girls and boys combined and for each sex separately. To ease interpretation, only the main results for the differences between areas are presented here.[22]

[Table 2 about here.]

The simplest specification, column (1), which includes only age dummies, shows—like the descriptive statistics—that children in urban slums appear to be in better health than rural children, with children in urban areas the healthiest. Compared with rural children, slum children are, on average, 0.38 standard deviations taller, and urban children are 0.43

[22] Full results are available upon request.

standard deviations taller. Both differences are statistically significant at the 1 percent level. Controlling for parental education, mother's height, and state and survey month fixed effects in column (2) substantially reduces the urban health advantage, and there is now no statistically significant difference between children's health in rural and slum areas. Furthermore, once we include either household wealth, area wealth distribution, or area health environment as additional explanatory variables, shown in columns (3) through (5), children in slums are in statistically significantly worse health than rural children. This means that controlling for household wealth and area characteristics a child living in a slum is actually significantly shorter than what we would expect if we had observe the child with the same characteristics in a rural area. In the full specification, column (7), holding all other factors constant, a slum child is 0.22 standard deviations shorter than a rural child.

The difference between boys and girls in height-for-age is small and not significant when we pool girls and boys together. When we estimate using boys only, there is no significant difference between rural and urban or slums in columns (3) through (5) and column (7), although height-for-age in slums areas are still substantially below rural areas. Furthermore, where the dummy for slum in the pooled estimates were more than twice the size of the urban dummy, there is less difference between urban and slum when looking only at boys' health. The estimates for girls show only a very small difference between child health in rural and urban areas for columns (3) through (7). For girls, however, living in slums is associated with substantially and statistically significantly worse health relative to rural areas. Once we control for wealth status and distribution and area health environment girls in slums are almost a quarter of a standard deviation shorter than girls in rural areas with the same characteristics.

Table 3 shows the same specification as Table 2 but with weight-for-height Z-score as the dependent variable. In the literature on child health, the results for height-for-age are often substantially stronger than for weight-for-height. That being said, the overall pattern of the results for weight-for-height are strikingly similar to the results for height-for-age. The basic

specification shows an advantage in child health for both slums and urban children over rural children with the largest difference for urban children. Once we control for variables such as household wealth, area wealth distribution, and area health environment slum children have lower weight-for-height Z-score than rural children. The differences between slum, urban, and rural areas are, however, not statistically significant in the specifications that include area characteristics.

[Table 3 about here.]

[Interpretation of results here] - composition effect - girls especially affected

3.1 Mortality Across Areas

To examine how child mortality differs by area we expand the sample above to also include children who have died before their fifth birthday but who would have been surveyed for height and weight if they had been alive. A total of 1,118 children born within the last five years of the survey have died, making the total sample 16,179 children born.[23] The mortality rate is highest in rural areas, where 8.3 percent of children have died. For those born in slums, 5.5 percent have died, and 5.1 percent of urban births did not survive. All of these numbers are unweighted. Figure 1 shows non-parametric Kaplan-Meier survival curves. These do not control for any of the explanatory variables except age but do take into account the weights provided in the data. The majority of mortality is concentrated within the first months of life, and essentially all of the mortality occurs within the first two years of life. Children born in rural area have substantially worse survival than those born in slums or urban areas. Survival, using weights, is slightly better in slums than in urban areas, although the difference is small.

[Figure 1 about here.]

[23] There is an average of 1.36 births per woman within the five years prior to the survey date with a minimum of one and a maximum of four.

Table 4 follows the same specifications as height-for-age and weight-for-height to examine how child mortality differs by area, except that age of the child is incorporated directly into the baseline hazard. The coefficients presented are hazard ratios; a coefficient less than one indicates that there is a lower risk of death compared to the reference group, whereas a coefficient greater than one indicates a higher risk than the reference group. For the pooled sample of boys and girls, the simplest specification shows a hazard that is more than 40 percent lower for children in slums and urban areas compared to rural areas, and these estimates are statistically significant different from one. The main difference from the height-for-age and weight-for-height results is that including additional explanatory variables does not materially reverse the pattern of urban and slums children having better survival chances, although it does mitigate how far apart the areas are. Urban children have around 20 to 25 percent lower mortality hazard than rural children with the same characteristics, and this difference is statistically significant in all models. Slum children have a similar advantage, or even higher, but the estimate is outside the normal significance interval for the full model in column (7).

[Table 4 about here.]

Girls appear to be slightly more likely to die before their fifth birthday than boys in the pooled sample, but the differences are not statistically significant. This, however, hide some substantial differences between areas as the separate estimates for boys and girls show. For boys in slums there is an elevated risk of dying compared to rural boys in the full model, but this effect is not statistically significant, and in some specifications mortality is slightly lower for boys in slums than for boys in rural areas. Girls show a distinctly different pattern from boys. In all specifications, girls from both slums and urban areas are substantially *less* likely to die than girls from rural areas. What is more, girls from slums appear to have identical or lower mortality than girls from urban areas in all specifications. In the full model, column (7), the mortality hazard for slum girls is 70 percent lower than the hazard

for rural girls, whereas urban girls have slightly more than 40 percent lower hazard. Both of those differences are statistically significant.

These mortality results do appear to complicate the story. Using the pooled sample and the full model, slum children do significantly worse than rural children in terms of health, but slum children also have lower mortality, albeit not significantly so. Hence, it is possible that part of the explanation for the worse health outcomes in slum areas when we take into account composition effects is mortality selection. Imagine a situation where there was no difference in predicted health between a slum child and a similar rural child, but that low health children had a higher likelihood of dying in rural areas than in slum areas. In that case, we could end up in a situation like this because of the mortality selection. If more children survive in slums than in rural areas, this would make the rural children appear to be more healthy when compared with the slum children.[24]

A further complication arises from the large differences in results by sex. Boys in slums have higher mortality and worse health compared with rural boys, although none of these differences are statistically significant. In urban areas, boys have slightly but not statistically significantly worse health than rural boys but lower mortality risk. The implication is that it is hard to see evidence of selective mortality driving the health results for boys. For girls there is little difference between urban and rural in terms of health but significantly lower mortality for urban girls. Girls in slums have substantially and statistically significantly lower mortality compared with rural girls, and also do worse in terms of health measures. Hence, it is possible that part of the reason why we observe poorer health outcomes in slums is due to the much lower mortality among girls in slums relative to rural girls.

There is, however, an important caveat to this mortality selection explanation: both urban and slum areas show substantially bias in observed sex ratios at birth. With 1,612 recorded male births in slums there should be 1,535 girls born, but only 1,374 are observed.[25]

[24] See Pitt (1997) for a discussion of estimating child health when there is potentially selection in fertility and mortality.

[25] The natural sex ratio at birth is approximately 105 boys per 100 girls. Pörtner (2013) shows that this sex ratio holds for India. The expected number of girls born in slums is therefore $1,612 \times \frac{100}{105} = 1,535$.

Similarly, with 2,354 boys born in urban area there should be 2,242 girls born but only 2,122 are observed. For rural areas, there are 4,456 male births and 4,261 female births, which means 51.1 percent of the children born are boys and that corresponds closely to the expected sex ratio.

There are three possible explanations for the biased sex ratios: sampling issues, recall error, and sex selective abortions. The sample size for slums makes it unlikely that the low number of female births is simply an artifact of sampling where families with more boys were randomly selected for the survey. The girls could also be missing because of recall error, as would happen if the girls died relatively soon after birth and where not listed when the mother was asked about her births. In the NFHS data recall error appears, however, to be mainly an issue for births that occurred much further away from the survey date (Pörtner 2013). That the sex ratio for rural children is identical to the natural sex ratio also shows that recall error is probably not the likely explanation. This leaves outright sex selection as the most possible explanation for the low number of girls observed. With sex selective abortions predominately used by better educated women—those with eight or more years of education—this would fit with the distribution of educational attainment between urban, slums, and rural areas (Pörtner 2013).

The number of missing girls is important because girls not born because of sex selective abortions would likely have had higher mortality risk and higher morbidity rates than those who are carried to term [CITE JEEA PAPER JUST SENT TO ME]. To get an idea of how much selection there is in our estimate we can combine observed mortality with the number of girls missing. This tells us how many children should have been observed if there was no selection because of mortality or sex selective abortions. Combining observed mortality with the number of girls missing show that selection is unlikely to explain away our results on height-for-age and weight-for-height.

Rural areas show no evidence of sex selective abortions, so for the pooled sample of boys and girls there are 8 percent of rural children for whom we do not have health information.

For urban areas the combined number of missing and dead children comes to 8 percent and for slum areas it is 10 percent.[26] If we restrict to girls the result is even more striking; the combination of missing and dead over observed births and predicted missing would be 9 percent in rural areas, 10 percent in urban areas, and 15 percent in slums.[27] Hence, there are more children that we do not have health information on in slum areas than in rural areas and this difference is especially large if we look only at girls.

Seen in this light our mortality results are consistent with what we find for both height-for-age and weight-for-height. If anything, the slum results on height-for-age and weight-for-height are likely underestimates, in the sense that child health in slums compared to rural areas would be even worse if there was no sex selection. Those girls who were not born because of sex selective abortions in slums areas would likely have been treated worse than those who are born and therefore we should expect that they would have had both higher morbidity and higher mortality than what we see for the observed girls.

3.2 Sensitivity Analysis: Maternal Education and Migration

[Tone down causality claims here]

This section focuses on how robust the results presented above are. There are two areas that warrant special attention: the possibility of selective migration and the role of maternal education.

As shown in Column (6) in the results above parental education and maternal height are important factors in child health and mortality. Maternal education especially is often considered to be an important factor in determining child health.

Children of mothers with no education are worse off in both slums and urban areas than

[26] For rural areas there were 724 deaths out of 8,717 births. For urban areas there were 120 girls missing and 230 observed deaths. To calculate the percentage the number of missing girls is added to the number of observed births to yield $\frac{120+230}{2,354+2,122+120} = 0.08$. For slum areas there were 161 girls missing and 164 observed deaths to yield $\frac{161+72}{1,612+1,374+161} = 0.10$.

[27] There are 384 female deaths out of 4,261 female births in rural areas. In urban areas there are 120 missing girls, 98 female deaths and 2,122 observed female births. Finally, for slum areas there are 161 missing girls, 72 female deaths, and 1,374 observed female births.

in rural areas, although these differences are not statistically significant. As expected given the prior literature, there is a positive effect of maternal education for all levels except 1-4 years of education for rural children, and the effect is statistically significant from 8 years of maternal education and up. For slum areas there is, however, no statistically significant effect of maternal education on child health. Furthermore, the coefficients are generally small, or even negative, except for the effect of 12-plus years of maternal education, but even here the estimated effect is lower than for the same level of education in rural areas. In urban areas, there is a positive effect from 5 years of education and up, and a substantial and statistically significant effect of having 12-plus years of education. This large effect is possibly the result of the larger number of women in this category who have university degrees in urban areas relative to rural areas.

Estimating the effects of maternal education by the sex of the child show somewhat diverging patterns between boys and girls. For rural children, there appears to be a slightly more positive effect of maternal education on boys than on girls, although among the best-educated women there is a larger effect of education on girls than on boys. In slums there is also a mostly similar effect of increasing mother's education for boys and girls, but the lack of statistical significance makes it difficult to draw any strong conclusions. Interestingly, for urban children, the health gradient of maternal education is stronger for girls than for boys. None of the interactions are statistically significant for boys, whereas the girls show statistically significant effect from the 5-7 years of education group and up.

Part of the problem in establishing the effect of living in different areas and the effect of maternal education between these areas is the possibility of selective migrations (either in or out of specific areas) based on unobservables. As we explain above, there is no good way to directly address migration because of data limitation. What we can do is to examine to what extent the results above are driven by either those who have never moved and/or by those who have migrated. This exercise is complicated by the fact that there is substantial marriage migration in India, which means that the sample of non-migration will be small.

In other words, those who do not migrate might be different along other (unobservable) dimensions and we might therefore substitute one selection problem for another. With these caveats, Table C.3 presents the results for the full models of child health and mortality split by mothers who have never moved and women who were not born in the area in which they were surveyed.

Based on height-for-age results it appears that the negative effect of slums is due to the children whose mothers were not born in the area of survey. The only statistically significant effect is for girls in slums with migrant mothers, although there is also a negative coefficient on slum for boys of migrant mothers. What makes the picture more muddled is that the results for weight-for-height are essentially the complete opposite: In slums, boys of non-migrant mothers do statistically significantly worse than boys of migrant mothers, and there is no statistically significant effect for girls at all. In terms of survival, girls have much better survival chances in slums and urban areas than in rural areas, and that effect holds for both migrants and non-migrants. Boys of non-migrants mothers have substantially higher mortality risks in slums and urban areas compared to rural areas, whereas boys of migrant mothers have lower mortality risk in slums and urban areas compared with rural areas. However, here the small sample size problem is especially acute. For non-migrant mothers there are a total of 204 deaths (113 boys and 91 girls) among 3,203 children across all areas.

Table C.4 presents results when the effect of mother's education is allowed to vary by area, split by migrant and non-migrants and by sex of the child. What is interesting here is that children of migrant women in slums appear to do relatively worse than children of non-migrant women in terms of the gradient for mother's education; with the exception of 1-4 years of education the size of the interaction between education and slum is lower for migrants than for non-migrants. Hence, the gradient for maternal education is at best very low and at worst even negative. Furthermore, this pattern is relatively stable between boys and girls. Children of non-migrant women, on the other hand, show a more positive effect

of increasing education.

Table C.5 shows OLS regression of the relation between mother's education and wealth and literacy by area estimated by migration status. There are no discernable differences in the wealth gradient or the literacy gradient for education between migrants and non-migrants. Hence, there is no substantial evidence that differences between migrants and non-migrants are the driving force behind the negative effects on health for children in slums relative to rural children.

4 Conclusion

Child health is an important indicator of economic development, as children's health has long-term impacts on their health and productivity as adults. With the rapid urbanization of the developing world, understanding the differences in child health across areas—and the determinants for child health—is an important undertaking and potentially has important policy implications in both the short and the long term.

Simple averages from the third round of India's National Family Health Survey show that child health is worst in rural areas and best in urban areas, with slums in between. This runs counter to the common belief that slums are very unhealthy. Another aspect of the distribution between rural, slums, and urban areas that runs counter to common perceptions is that slum residents are only slightly less well-off compared to urban residents, and that the education levels for women are comparable. Clearly, the simple averages on height-for-age of children do not take into account this composition effect of parental characteristics, and the composition of the population may obscure or even swamp the negative or positive health effects of specific areas.

When we control for wealth and health environment variables, however, we find that urban children are not really doing better than rural children, and that children in slums fare substantially worse. These findings confirm that the composition effect is responsible

for the simple averages that show relatively healthy children in slum areas.

In other words, it appears that moving a child from a rural setting to a slum setting while keeping parental characteristics the same would lead to worse health outcomes for the child. Another way of looking at it is that people in slums do not get as high a return to their wealth status in terms of child health as they do in rural areas.

Furthermore, the standard policy recommendation of increasing mother's education to achieve better child health outcomes appears to work less well in slums than in rural areas. In slums, there is little apparent difference in child health outcomes between a mother with no education and one with up to 11 years of education, holding wealth status and area characteristics constant. We explore whether the lower efficiency of mother's education in creating child health is the result of lower-quality schools for mothers in slums. Although there do appear to be slightly lower levels of literacy for given years of schooling in slums, this effect is not large. There is not much difference in terms of the wealth status achieved.

We conclude that something about the health environment that we are unable to adequately capture in the data is responsible for both the lower levels of health in slums when controlling for parental and area characteristics and for making maternal education less efficient at impacting child health. To some extent this might not be too surprising. It might not matter much for health that a mother knows to wash her hands, to boil water before use, and to take a sick child to the doctor if the local playground is an open sewer, or if diseases are allowed to spread quickly and easily because of too-high population density. On the other hand, the greater density of slum population means that policies and interventions can reach a much larger number of people at a lower cost compared to less dense areas.

Hence, in addition to the variables which have been included in this paper, future research should consider other factors that can better capture residential crowding and health service facilities. In addition, dealing with the potential endogeneity issue caused by selec-tive migration might shed more light on the potential mechanisms at work among the urban poor, but exploring that issue also requires better data than what is currently available. Creating

a better understanding of what it is, exactly, about slums that make them unhealthy, and why there is less effect of maternal education on child health in slums are important areas for future research.

Our results do, however, provide some guidance for policies that aim to improve child health. If our current results hold true, we should expect to see a greater impact on child health from "soft" investments such as education and female empowerment in rural areas, whereas in urban, and especially slum areas, priority should be given to "hard" investments, which deal with housing and health environment. To ensure the health and overall well-being of the growing urban population, policymakers and researchers should focus more attention on interventions that improve city environments and what the impact of those improvements may be. This supports a need for public health and public infrastructure projects that directly target health conditions in slums. The upside is that given the density of population in urban areas in general, and in slums in particular, there is the potential for appropriate policies to generate substantial effects and to become effective at lower costs.

[maybe include in conclusion/discussion] We argue that the health environmental variables normally included in household surveys are insufficient to fully capture the differences in health environment across areas, and fall especially short when it comes to slums.

References

Aizer, Anna, "The Gender Wage Gap and Domestic Violence," *The American Economic Review*, 2010, *100* (4), 1847–1859.

Basta, Samir S., "Nutrition and Health in Low Income Urban Areas of the Third World," *Ecology of Food and Nutrition*, 1977, *6*, 113–124.

Behrman, Jere R, "The Action of Human Resources and Poverty on One Another: What We Have Yet to Learn," Technical Report, World Bank, Washington, D.C. 1990.

_ **and Anil Deolalikar**, "Health and Nutrition," *Handbook of Development Economics*, 1988, *I*, 631–711.

Bocquier, Philippe, Nyovani Janet Madise, and Eliya Msiyaphazi Zulu, "Is there an urban advantage in child survival in sub-saharan Africa? Evidence from 18 countries in the 1990s," *Demography*, May 2011, *48* (2), 531–58.

Burra, Sundar, "Towards a pro-poor framework for slum upgrading in Mumbai, India," *Environment and Urbanization*, April 2005, *17* (1), 67–88.

Coffey, Diane, Reetika Khera, and Dean Spears, "Women's Status and Children's Height in India : Evidence from Joint Rural Households," Working Paper, Princeton University 2013.

de Poel, Ellen Van, Owen O'Donnell, and Eddy Van Doorslaer, "Are urban children really healthier? Evidence from 47 developing countries," *Social Science Medicine*, 2007, *65* (10), 1986 – 2003.

Dye, Christopher, "Health and Urban Living," *Science (New York, N.Y.)*, February 2008, *319* (5864), 766–9.

Fink, Günther, Isabel Günther, and Kenneth Hill, "Slum Residence and Child Health in Developing Countries," *Demography*, 2014, *51* (4), 1175–1197.

Fotso, Jean-Christophe, "Child health inequities in developing countries: differences across urban and rural areas," *International Journal for Equity in Health*, January 2006, *5* (9).

_ , "Urban-rural differentials in child malnutrition: Trends and socioeconomic correlates in sub-Saharan Africa," *Health & Place*, 2007, *13* (1), 205 – 223. Part Special Issue: Environmental Justice, Population Health, Critical Theory and {GIS}.

Fry, Sarah, Bill Cousins, and Ken Olivola, "Health of Children Living in Urban Slums in Asia and the Near East: Review of Existing Literature and Data," Technical Report 2002.

Glewwe, Paul, "Why does mother's schooling raise child health in developing countries? Evidence from Morocco," *Journal of human resources*, 1999.

Günther, Isabel and Kenneth Harttgen, "Deadly Cities? Spatial Inequalities in Mortality in sub-Saharan Africa," *Population and Development Review*, 2012, *38* (3), 469–486.

Gupta, Kamla, Fred Arnold, and H. Lhungdim, *Health and Living Conditions in Eight Indian Cities* National Family Health Survey (NFHS-3), India, 2005-06, Mumbai: International Institute for Population Sciences, August 2009.

Haddad, Lawrence, Marie T Ruel, and James L Garrett, "Are Urban Poverty and Undernutrition Growing? Some Newly Assembled Evidence," *World Development*, November 1999, *27* (11), 1891–1904.

India Office of the Registrar General and Census Commissioner, "Primary Census Abstract for Slum," Technical Report, New Delhi 2013.

International Institute for Population Sciences (IIPS) and Macro International, *National Family Health Survey (NFHS-3), 2005–06: India: Volume I*, Vol. I, Mumbai: IIPS, 2007.

James, W. P. T., Anna Ferro-Luzzi, and J. C. Waterlow, "Definition of Chronic Deficiency in Adults - Report of a Working Party of the International Dietary Energy Consultative Group," *European Journal of Clinical Nutrition*, 1988, *42* (12), 969–81.

Jayachandran, Seema and Rohini Pande, "Why Are Indian Children Shorter Than African Children?," Working Paper, Department of Economics, Northwestern University 2013.

Kovsted, Jens, Claus C. Pörtner, and Finn Tarp, "Child Health and Mortality: Does Health Knowledge Matter?," *Journal of African Economies*, 2003, *11* (1995), 542–560.

Lam, David and Suzanne Duryea, "Effects of schooling on fertility, labor supply, and investments in children, with evidence from Brazil," *Journal of Human Resources*, 1999, *34* (1), 160–192.

Lin, Ming-Jen, Jin-Tan Liu, and Nancy Qian, "More Missing Women, Fewer Dying Girls: The Impact of Sex-Selective Abortion on Sex at Birth and Relative Female Mortality in Taiwan," *Journal of the European Economic Association*, August 2014, *12* (4), 899–926.

Marx, Benjamin, Thomas Stoker, and Tavneet Suri, "The Economics of Slums in the Developing World," *Journal of Economic Perspectives*, 2013, *27* (4), 187–210.

Montgomery, Mark R and Paul C Hewett, "Urban poverty and health in developing countries: household and neighborhood effects," *Demography*, August 2005, *42* (3), 397–425.

Moulton, Brent R, "An Illustration of a Pitfall in Estimating the Effects of Aggregate Variables on Micro Units," *Review of Economics and Statistics*, 1990, *72* (4), 334–338.

Mullick, Mohammad Sayadul Islam and Robert Goodman, "The prevalence of psychiatric disorders among 5-10 year olds in rural, urban and slum areas in Bangladesh: an

exploratory study," *Social psychiatry and psychiatric epidemiology*, August 2005, *40* (8), 663–71.

Murthy, Sharmila L, "Land security and the challenges of realizing the human right to water and sanitation in the slums of Mumbai, India," *Health and human rights*, January 2012, *14* (2), 61–73.

Pitt, Mark M, "Estimating the Determinants of Child Health when Fertility and Mortality are Selective," *Journal of Human Resources*, 1997, *32* (1), 129–158.

Pörtner, Claus C, "Sex Selective Abortions, Fertility, and Birth Spacing," Working Paper, Seattle University, Seattle, WA 2013.

Smith, Lisa C., Marie T. Ruel, and Aida Ndiaye, "Why Is Child Malnutrition Lower in Urban Than in Rural Areas? Evidence from 36 Developing Countries," *World Development*, 2005, *33* (8), 1285 – 1305.

Spears, Dean, "How Much International Variation in Child Height Can Sanitation Explain?," Policy Research Working Paper 6351, World Bank, Washington, DC February 2013.

Strauss, John and Duncan Thomas, "Human resources: Empirical modeling of household and family decisions," *Handbook of development economics*, 1995, *III*, 1883–2023.

Thomas, Duncan, John Strauss, and Maria helena Henriques, "How does mother's education affect child height?," *Journal of Human Resources*, 1991, *26* (2), 183–211.

Timaeus, Ian M and Louisiana Lush, "Intra-urban differential in child health," *Health Transition Review*, 1995, *5* (2), 163–190.

UN-HABITAT, *The challenge of slums: global report on human settlements, 2003*, London ; Sterling, VA: Earthscan Publications, 2003.

UN-Habitat, *State of the World's Cities 2012/2013: Prosperity of Cities* State of the World's Cities, New York, NY: Routledge, 2013.

United Nations, *World Urbanization Prospects: The 2011 Revision*, United Nations, Department of Economic and Social Affairs, Population Division, 2012.

van de Poel, Ellen, Owen O'Donnell, and Eddy van Doorslaer, "What Explains the Rural-Urban Gap in Infant Mortality: Household or Community Characteristics?," *Demography*, 2009, *46* (4), 827–850.

Table 1: Descriptive Statistics

Variable	Rural	Slum	Urban	Total	t tests[a]
Dependent Variables					
Height-for-age Z-score	−1.99	−1.59	−1.50	−1.78	ABC
	(1.67)	(1.63)	(1.69)	(1.68)	
Ratio with height-for-age Z-score < -2[b]	0.51	0.40	0.39	0.46	AB
	(0.50)	(0.49)	(0.49)	(0.50)	
Weight-for-height Z-score	−1.04	−0.81	−0.79	−0.93	AB
	(1.29)	(1.35)	(1.38)	(1.33)	
Ratio with weight-for-height Z-score < -2[b]	0.20	0.17	0.16	0.19	AB
	(0.40)	(0.38)	(0.37)	(0.39)	
Percent that have died[c]	8.28	5.32	5.06	6.82	N/A
Individual and Household Variables					
Girl	0.49	0.46	0.48	0.48	A
Age of child (months)	30.0	30.5	30.6	30.3	
	(17.0)	(16.8)	(16.7)	(16.9)	
Mother's height (cm)	151.2	152.1	152.4	151.7	ABC
	(5.6)	(5.7)	(5.8)	(5.7)	
Mother's education (years)	3.3	6.7	7.3	5.1	ABC
	(4.3)	(5.0)	(5.6)	(5.2)	
Father's education (years)	6.0	7.9	8.6	7.1	ABC
	(5.0)	(4.8)	(5.4)	(5.2)	
Mother born in PSU	0.14	0.27	0.22	0.19	ABC
Hindu	0.87	0.73	0.76	0.81	ABC
Muslim	0.13	0.27	0.24	0.19	ABC
Scheduled caste	0.23	0.20	0.17	0.21	ABC
Scheduled tribe	0.10	0.04	0.02	0.06	ABC
Other backward classes	0.44	0.34	0.40	0.41	ABC
Not a scheduled/backward caste/tribe/class	0.23	0.42	0.40	0.31	AB
Wealth category 1 (poorest)	0.33	0.01	0.04	0.19	ABC
Wealth category 2	0.27	0.04	0.07	0.17	ABC
Wealth category 3	0.22	0.17	0.15	0.19	AB
Wealth category 4	0.14	0.40	0.27	0.22	ABC
Wealth category 5 (richest)	0.04	0.38	0.47	0.22	ABC
Area Variables					
Average time to get water, and return (minutes)	11.62	6.73	6.29	9.20	AB
Percentage with improved source of drinking water	0.87	0.96	0.96	0.91	AB
Percentage sharing toilet with 10 plus households	0.00	0.19	0.06	0.05	ABC
Percentage that has improved toilet	0.17	0.74	0.75	0.44	ABC
Average number of people per room	3.66	3.68	3.33	3.57	BC
Percentage with improved cooking fuel	0.07	0.78	0.69	0.38	ABC
Percentage in wealth category 1 (poorest)	0.34	0.01	0.03	0.19	ABC
Percentage in wealth category 2	0.29	0.05	0.07	0.18	ABC
Percentage in wealth category 3	0.21	0.17	0.15	0.18	ABC
Percentage in wealth category 4	0.12	0.40	0.28	0.22	ABC
Percentage in wealth category 5 (richest)	0.04	0.38	0.47	0.22	ABC
Observations	7,993	2,822	4,246	15,061	

Notes: Standard deviations in parentheses (not shown for categorical variables except stunting and wasting). All area variables are calculated as the mean for the household's PSU, excluding the household itself.

[a] T tests for differences between areas assuming unequal variance. A indicates that there is a statistically significant difference at the 5 percent level between rural and slum areas; B indicates that there is a statistically significant difference at the 5 percent level between rural and urban areas; and C indicates that there is a statistically significant difference at the 5 percent level between slum and urban areas.

[b] The ratio of stunted and wasted children is presented for information only and not used as dependent variables.

[c] Mortality calculation is based on all births that occurred in the five years prior to the survey. The sample sizes are 8,717 in rural areas, 2,986 in slums, and 4,476 in urban non-slums, for a total of 16,179 births. The outcome used for Cox mortality regressions is length of life rather than dummy for died.

Table 2: Determinants of Child Health: Height-for-Age Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion and caste[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=15,061)							
Slum	0.38***	0.07	−0.12**	−0.15*	−0.22**	−0.26**	−0.22**
	(0.06)	(0.06)	(0.06)	(0.08)	(0.11)	(0.11)	(0.11)
Urban	0.43***	0.14***	−0.03	−0.08	−0.08	−0.13*	−0.10
	(0.06)	(0.04)	(0.05)	(0.07)	(0.07)	(0.07)	(0.07)
Girl	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
R^2	0.10	0.20	0.21	0.20	0.20	0.18	0.21
Adj. R^2	0.10	0.20	0.21	0.20	0.20	0.18	0.21
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		50.03	23.69	7.88	3.28	33.55	7.44
Degrees of freedom		(15,1515)	(4,1515)	(4,1515)	(9,1515)	(11,1515)	(17,1515)
P-value		0.00	0.00	0.00	0.00	0.00	0.00
Boys (n=7,858)							
Slum	0.39***	0.12	−0.09	−0.10	−0.19	−0.25*	−0.19
	(0.08)	(0.08)	(0.09)	(0.11)	(0.13)	(0.13)	(0.13)
Urban	0.41***	0.13**	−0.06	−0.10	−0.11	−0.17*	−0.13
	(0.06)	(0.05)	(0.06)	(0.09)	(0.09)	(0.09)	(0.09)
R^2	0.09	0.20	0.21	0.21	0.21	0.18	0.21
Adj. R^2	0.09	0.20	0.21	0.20	0.20	0.17	0.21
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		37.22	14.56	5.63	2.31	21.16	4.60
Degrees of freedom		(15,1443)	(4,1443)	(4,1443)	(9,1443)	(11,1443)	(17,1443)
P-value		0.00	0.00	0.00	0.01	0.00	0.00
Girls (n=7,203)							
Slum	0.37***	0.02	−0.14	−0.19*	−0.24*	−0.27*	−0.24*
	(0.07)	(0.08)	(0.09)	(0.11)	(0.14)	(0.14)	(0.14)
Urban	0.45***	0.16***	0.01	−0.05	−0.04	−0.09	−0.06
	(0.07)	(0.06)	(0.07)	(0.09)	(0.09)	(0.09)	(0.09)
R^2	0.11	0.21	0.21	0.21	0.21	0.19	0.22
Adj. R^2	0.11	0.20	0.21	0.20	0.20	0.19	0.21
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		21.88	14.47	4.42	2.71	15.38	5.00
Degrees of freedom		(15,1430)	(4,1430)	(4,1430)	(9,1430)	(11,1430)	(17,1430)
P-value		0.00	0.00	0.00	0.00	0.00	0.00

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table 3: Determinants of Child Health: Weight-for-Height Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion and caste[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=15,061)							
Slum	0.21***	0.08	0.01	−0.02	−0.05	−0.07	−0.06
	(0.05)	(0.05)	(0.06)	(0.07)	(0.09)	(0.09)	(0.09)
Urban	0.22***	0.14***	0.08*	0.06	0.02	0.01	0.02
	(0.04)	(0.04)	(0.04)	(0.06)	(0.06)	(0.06)	(0.06)
Girl	0.03	0.04	0.04	0.04	0.04	0.04	0.04
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
R^2	0.02	0.08	0.08	0.08	0.08	0.08	0.08
Adj. R^2	0.02	0.08	0.08	0.08	0.08	0.07	0.08
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		9.41	3.46	1.26	1.44	4.79	1.45
Degrees of freedom		(15,1515)	(4,1515)	(4,1515)	(9,1515)	(11,1515)	(17,1515)
P-value		0.00	0.01	0.28	0.16	0.00	0.10
Boys (n=7,858)							
Slum	0.17**	0.09	0.01	0.00	−0.03	−0.04	−0.03
	(0.07)	(0.07)	(0.08)	(0.09)	(0.11)	(0.12)	(0.11)
Urban	0.23***	0.16***	0.08	0.08	0.06	0.05	0.06
	(0.05)	(0.05)	(0.05)	(0.07)	(0.08)	(0.08)	(0.08)
R^2	0.01	0.09	0.09	0.09	0.09	0.08	0.09
Adj. R^2	0.01	0.08	0.09	0.08	0.08	0.08	0.09
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		7.95	4.88	1.09	1.12	4.76	1.56
Degrees of freedom		(15,1443)	(4,1443)	(4,1443)	(9,1443)	(11,1443)	(17,1443)
P-value		0.00	0.00	0.36	0.34	0.00	0.07
Girls (n=7,203)							
Slum	0.26***	0.07	0.03	−0.02	−0.09	−0.10	−0.09
	(0.06)	(0.07)	(0.07)	(0.09)	(0.12)	(0.13)	(0.12)
Urban	0.21***	0.11**	0.08	0.04	−0.02	−0.04	−0.02
	(0.05)	(0.05)	(0.05)	(0.08)	(0.08)	(0.08)	(0.08)
R^2	0.02	0.07	0.08	0.08	0.08	0.08	0.08
Adj. R^2	0.02	0.07	0.07	0.07	0.07	0.07	0.07
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		3.79	2.30	1.58	1.38	2.24	1.78
Degrees of freedom		(15,1430)	(4,1430)	(4,1430)	(9,1430)	(11,1430)	(17,1430)
P-value		0.00	0.06	0.18	0.19	0.01	0.03

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table 4: Determinants of Child Health: Mortality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[a]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion and caste[b]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[c]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[d]	No	No	No	Yes	No	Yes	Yes
Area health environment[e]	No	No	No	No	Yes	Yes	Yes
All children (n=16,179)							
Slum	0.57***	0.83	0.93	0.83	0.67	0.70	0.67
	(0.09)	(0.15)	(0.17)	(0.17)	(0.18)	(0.19)	(0.18)
Urban	0.60***	0.77**	0.84	0.80*	0.72**	0.75**	0.73**
	(0.06)	(0.08)	(0.09)	(0.11)	(0.10)	(0.10)	(0.10)
Girl	1.12	1.11	1.11	1.11	1.11	1.11	1.11
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Boys (n=8,422)							
Slum	0.70**	0.94	1.08	0.95	1.24	1.30	1.25
	(0.13)	(0.19)	(0.23)	(0.23)	(0.34)	(0.35)	(0.34)
Urban	0.68***	0.85	0.95	0.88	0.89	0.92	0.90
	(0.08)	(0.11)	(0.13)	(0.16)	(0.16)	(0.16)	(0.16)
Girls (n=7,757)							
Slum	0.45***	0.68	0.75	0.69	0.30***	0.32***	0.31***
	(0.11)	(0.18)	(0.20)	(0.21)	(0.13)	(0.13)	(0.13)
Urban	0.52***	0.70**	0.74*	0.71*	0.54***	0.56***	0.55***
	(0.07)	(0.10)	(0.11)	(0.14)	(0.12)	(0.12)	(0.12)

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted Cox regresions with robust standard errors clustered at PSU level in parentheses. Coefficients presented are hazards ratios; a coefficient less than 1 indicates that there is a lower risk of death compared to the reference group, whereas a coefficient greater than 1 indicates that there is a higher risk than the reference group.

[a] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.

[b] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.

[c] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.

[d] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.

[e] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

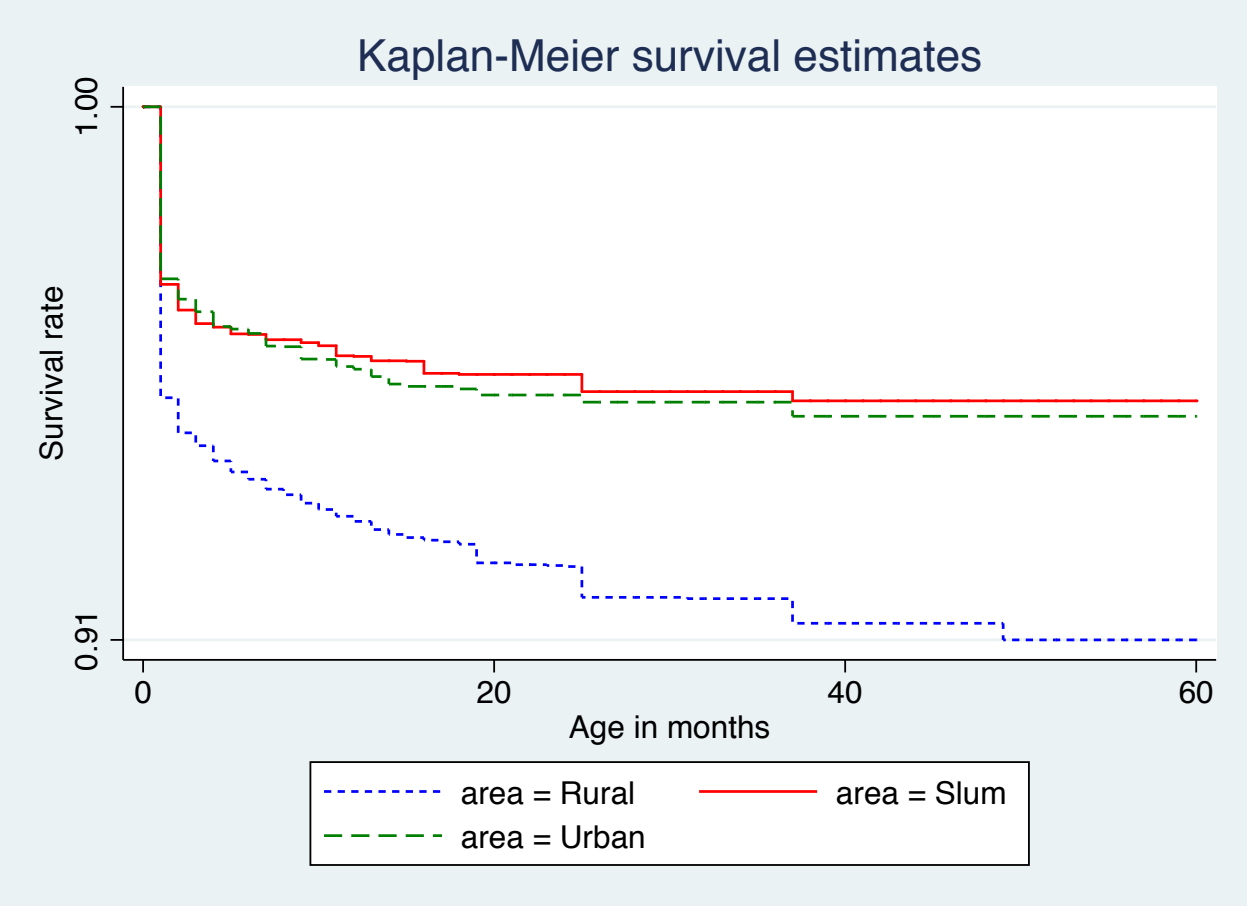

Figure 1: Mortality in Rural, Slum, and Urban Areas Until Age 5

A Appendix

[Figure 1 about here.]

[Figure 2 about here.]

[THIS HAS NOT BEEN UPDATED TO REMOVE AREA ASSETS/FIT OTHER REGRESSION MODELS]

[Table 1 about here.]

[THIS HAS NOT BEEN UPDATE TO REMOVE AREA ASSETS/FIT OTHER REGRESSION] [MIGHT NEED TO BE DELETED COMPLETELY]

[Table 2 about here.]

[THIS HAS NOT BEEN UPDATE TO REMOVE AREA ASSETS/FIT OTHER REGRESSION] [MIGHT NEED TO BE DELETED COMPLETELY]

[Table 3 about here.]

[THIS HAS NOT BEEN UPDATE TO REMOVE AREA ASSETS/FIT OTHER REGRESSION] [MIGHT NEED TO BE DELETED COMPLETELY]

[Table 4 about here.]

[THIS HAS NOT BEEN UPDATE TO REMOVE AREA ASSETS/FIT OTHER REGRESSION] [MIGHT NEED TO BE DELETED COMPLETELY]

[Table 5 about here.]

B Replication of results using strict census definition

[Table 6 about here.]

[Table 7 about here.]

[Table 8 about here.]

C Replication of results by major religion and caste affiliation

// Hindu

[Table 9 about here.]

[Table 10 about here.]

[Table 11 about here.]

// MUSLIMS

[Table 12 about here.]

[Table 13 about here.]

[Table 14 about here.]

// SCHEDULED CASTE/TRIBE

[Table 15 about here.]

[Table 16 about here.]

[Table 17 about here.]

// OTHER BACKWARD CASTE/TRIBE

[Table 18 about here.]

[Table 19 about here.]

[Table 20 about here.]

// NOT IN SCHEDULED CASTE/TRIBE OR OTHER BACKWARD CASTE

[Table 21 about here.]

[Table 22 about here.]

[Table 23 about here.]

Table C.1: Mother's Education and Child Health

	All	Girls	Boys
Rural × 1-4 years of education	−0.012	−0.068	0.023
	(0.070)	(0.107)	(0.089)
Rural × 5-7 years of education	0.030	−0.023	0.088
	(0.051)	(0.071)	(0.069)
Rural × 8-9 years of education	0.132**	0.088	0.176**
	(0.059)	(0.086)	(0.083)
Rural × 10-11 years of education	0.202**	0.161	0.228**
	(0.086)	(0.122)	(0.109)
Rural × 12+ years of education	0.232***	0.281**	0.187*
	(0.084)	(0.119)	(0.113)
Slum	−0.065	−0.198	0.046
	(0.140)	(0.188)	(0.177)
Slum × 1-4 years of education	0.112	0.523	−0.145
	(0.169)	(0.512)	(0.229)
Slum × 5-7 years of education	−0.091	0.042	−0.193
	(0.158)	(0.232)	(0.200)
Slum × 8-9 years of education	−0.228	−0.208	−0.257
	(0.147)	(0.218)	(0.190)
Slum × 10-11 years of education	0.069	0.284	−0.111
	(0.159)	(0.190)	(0.226)
Slum × 12+ years of education	0.242	0.288	0.211
	(0.176)	(0.261)	(0.196)
Urban	−0.107	−0.133	−0.063
	(0.088)	(0.111)	(0.114)
Urban × 1-4 years of education	−0.101	−0.202	−0.007
	(0.141)	(0.219)	(0.160)
Urban × 5-7 years of education	0.163	0.208*	0.123
	(0.101)	(0.124)	(0.143)
Urban × 8-9 years of education	0.103	0.300**	−0.117
	(0.108)	(0.149)	(0.131)
Urban × 10-11 years of education	0.101	0.208	−0.036
	(0.122)	(0.174)	(0.169)
Urban × 12+ years of education	0.321***	0.398***	0.220
	(0.107)	(0.136)	(0.143)
female	0.015		
	(0.027)		
Child age dummies[a]	Yes	Yes	Yes
Father's education and mother's height[b]	Yes	Yes	Yes
Household religion and caste[c]	Yes	Yes	Yes
Household wealth status[d]	Yes	Yes	Yes
Area health environment[e]	Yes	Yes	Yes
Area asset[f]	Yes	Yes	Yes
Area wealth distribution[g]	Yes	Yes	Yes
State and survey month fixed effects	Yes	Yes	Yes
Observations	15,617	7,462	8,155

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.

[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.

[b] Education dummies for father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.

[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.

[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively

[e] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average of households in PSU excluding the household itself.

[f] Area assets include improved building materials (floor, wall, and roof), radio, television, refrigerator, bicycle, motorcycle/scooter, car, telephone (land-line and mobile), watch, cart, and computer. Each calculated as the average of households in PSU excluding the household itself.

[g] Area wealth is the percentage of households in wealth categories 2 through 5. Each calculated as the average of households in PSU excluding the household itself.

Table C.2: Relationship between Mother's Education and Wealth and Literacy

	Wealth[a]		Literacy[b]	
	OLS	Ordered Logit	LPM	Logit
Rural × 1-4 years of education	0.377***	0.762***	0.495***	4.419***
	(0.054)	(0.102)	(0.026)	(0.198)
Rural × 5-7 years of education	0.707***	1.342***	0.790***	5.887***
	(0.044)	(0.082)	(0.020)	(0.202)
Rural × 8-9 years of education	1.048***	1.909***		
	(0.051)	(0.096)		
Rural × 10-11 years of education	1.446***	2.652***		
	(0.076)	(0.146)		
Rural × 12+ years of education	1.979***	3.643***		
	(0.059)	(0.126)		
Slum	1.455***	2.431***	0.031**	1.083***
	(0.088)	(0.182)	(0.015)	(0.405)
Slum × 1-4 years of education	0.375***	0.808***	0.509***	3.664***
	(0.118)	(0.240)	(0.075)	(0.479)
Slum × 5-7 years of education	0.543***	1.141***	0.685***	4.431***
	(0.084)	(0.180)	(0.061)	(0.460)
Slum × 8-9 years of education	0.789***	1.772***		
	(0.087)	(0.197)		
Slum × 10-11 years of education	0.888***	2.075***		
	(0.099)	(0.258)		
Slum × 12+ years of education	1.164***	3.210***		
	(0.093)	(0.276)		
Urban	1.115***	2.042***	0.010	0.390
	(0.078)	(0.151)	(0.007)	(0.322)
Urban × 1-4 years of education	0.232**	0.437**	0.477***	4.084***
	(0.108)	(0.193)	(0.049)	(0.335)
Urban × 5-7 years of education	0.623***	1.097***	0.786***	5.521***
	(0.077)	(0.141)	(0.034)	(0.339)
Urban × 8-9 years of education	1.021***	1.949***		
	(0.079)	(0.160)		
Urban × 10-11 years of education	1.363***	2.866***		
	(0.085)	(0.193)		
Urban × 12+ years of education	1.666***	4.262***		
	(0.074)	(0.190)		
Observations	11318		5969	

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. All regressions weighted and with robust standard errors clustered at PSU level in parentheses. Explanatory variables not shown are mother's age and age squared, religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category, and state dummies.

[a] Outcome is household being in wealth category 1, 2, 3, 4, or 5.

[b] Literacy is coded 1 for being literate and 0 if not being literate. Women with 6 or more years of education were assumed to be literate and where therefore not given the literacy test during the survey. The sample consists of 3,982 rural, 828 slum, and 1,159 urban residents.

Table C.3: Area of Residence and Child Health by Migration Status

	All		Girls		Boys	
	Non-migrants	Migrants	Non-migrants	Migrants	Non-migrants	Migrants
Height-for-age Z-score						
Slum	0.052	−0.244**	0.214	−0.325*	−0.084	−0.172
	(0.194)	(0.121)	(0.281)	(0.170)	(0.264)	(0.139)
Urban	−0.053	−0.088	0.030	−0.052	−0.155	−0.110
	(0.137)	(0.081)	(0.193)	(0.098)	(0.196)	(0.102)
Girl	0.151*	−0.011				
	(0.079)	(0.029)				
Observations	2,999	12,618	1,432	6,030	1,567	6,588
Weight-for-height Z-score						
Slum	−0.363*	−0.048	−0.148	−0.147	−0.559**	0.037
	(0.205)	(0.098)	(0.296)	(0.135)	(0.256)	(0.122)
Urban	−0.093	0.012	0.111	−0.061	−0.344*	0.084
	(0.147)	(0.064)	(0.181)	(0.085)	(0.207)	(0.077)
Girl	0.065	0.019				
	(0.067)	(0.024)				
Observations	2,999	12,618	1,432	6,030	1,567	6,588
Cox regression on survival						
Slum	0.892	0.556*	0.162*	0.311**	2.598*	0.860
	(0.436)	(0.169)	(0.156)	(0.152)	(1.361)	(0.295)
Urban	1.077	0.649***	0.470	0.605**	1.959*	0.665*
	(0.359)	(0.102)	(0.305)	(0.149)	(0.782)	(0.139)
Girl	0.811	1.156**				
	(0.144)	(0.085)				
Observations	3,203	13,557	1,523	6,502	1,680	7,055
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	Yes	Yes	Yes	Yes	Yes	Yes
Household religion and caste[c]	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	Yes	Yes	Yes	Yes	Yes	Yes
Area health environment[e]	Yes	Yes	Yes	Yes	Yes	Yes
Area asset[f]	Yes	Yes	Yes	Yes	Yes	Yes
Area wealth distribution[g]	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Top two panels show weighted OLS and bottom panel shows Cox regression on length of life. All have robust standard errors clustered at PSU level in parentheses.

[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.

[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.

[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.

[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively

[e] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average of households in PSU excluding the household itself.

[f] Area assets include improved building materials (floor, wall, and roof), radio, television, refrigerator, bicycle, motorcycle/scooter, car, telephone (land-line and mobile), watch, cart, and computer. Each calculated as the average of households in PSU excluding the household itself.

[g] Area wealth is the percentage of households in wealth categories 2 through 5. Each calculated as the average of households in PSU excluding the household itself.

Table C.4: Mother's Education and Child Health by Migration Status

	All		Girls		Boys	
	Non-migrants	Migrants	Non-migrants	Migrants	Non-migrants	Migrants
Rural × 1-4 years of education	−0.048	−0.018	−0.288	−0.022	0.300	−0.035
	(0.195)	(0.073)	(0.259)	(0.115)	(0.284)	(0.094)
Rural × 5-7 years of education	−0.017	0.020	−0.095	−0.031	0.053	0.071
	(0.141)	(0.055)	(0.184)	(0.078)	(0.190)	(0.074)
Rural × 8-9 years of education	0.048	0.132**	0.080	0.087	0.008	0.175**
	(0.164)	(0.064)	(0.218)	(0.093)	(0.226)	(0.089)
Rural × 10-11 years of education	0.242	0.165*	−0.149	0.195	0.630**	0.130
	(0.204)	(0.093)	(0.240)	(0.140)	(0.294)	(0.115)
Rural × 12+ years of education	0.093	0.250***	0.007	0.328**	0.172	0.173
	(0.227)	(0.094)	(0.271)	(0.131)	(0.309)	(0.126)
Slum	−0.074	−0.060	−0.079	−0.173	−0.063	0.031
	(0.278)	(0.161)	(0.391)	(0.217)	(0.375)	(0.204)
Slum × 1-4 years of education	−0.029	0.191	0.138	0.561	−0.164	−0.080
	(0.370)	(0.302)	(0.363)	(0.673)	(0.524)	(0.244)
Slum × 5-7 years of education	0.132	−0.188	0.385	−0.119	0.006	−0.244
	(0.241)	(0.211)	(0.351)	(0.301)	(0.322)	(0.260)
Slum × 8-9 years of education	0.040	−0.363**	0.059	−0.369	0.041	−0.383*
	(0.272)	(0.182)	(0.408)	(0.246)	(0.417)	(0.228)
Slum × 10-11 years of education	0.269	0.008	0.908*	0.033	−0.132	−0.011
	(0.353)	(0.173)	(0.466)	(0.212)	(0.470)	(0.238)
Slum × 12+ years of education	0.545*	0.098	0.318	0.177	0.658*	0.045
	(0.294)	(0.217)	(0.420)	(0.313)	(0.379)	(0.232)
Urban	0.011	−0.118	−0.068	−0.134	−0.067	−0.083
	(0.197)	(0.096)	(0.273)	(0.118)	(0.262)	(0.125)
Urban × 1-4 years of education	−0.204	−0.128	−0.091	−0.246	0.035	−0.043
	(0.283)	(0.160)	(0.495)	(0.234)	(0.343)	(0.177)
Urban × 5-7 years of education	−0.102	0.198*	−0.097	0.286**	0.076	0.120
	(0.265)	(0.102)	(0.346)	(0.125)	(0.376)	(0.143)
Urban × 8-9 years of education	0.016	0.117	0.799**	0.227	−0.327	−0.024
	(0.277)	(0.118)	(0.401)	(0.160)	(0.306)	(0.144)
Urban × 10-11 years of education	0.019	0.099	−0.084	0.211	0.173	−0.068
	(0.254)	(0.132)	(0.405)	(0.180)	(0.334)	(0.186)
Urban × 12+ years of education	0.073	0.359***	−0.155	0.510***	0.365	0.194
	(0.246)	(0.115)	(0.354)	(0.143)	(0.323)	(0.157)
female	0.151*	−0.010				
	(0.080)	(0.029)				
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	Yes	Yes	Yes	Yes	Yes	Yes
Household religion and caste[c]	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	Yes	Yes	Yes	Yes	Yes	Yes
Area health environment[e]	Yes	Yes	Yes	Yes	Yes	Yes
Area asset[f]	Yes	Yes	Yes	Yes	Yes	Yes
Area wealth distribution[g]	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,999	12,618	1,432	6,030	1,567	6,588

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Top two panels show weighted OLS and bottom panel shows Cox regression on length of life. All have robust standard errors clustered at PSU level in parentheses.

[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.

[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.

[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.

[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively

[e] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average of households in PSU excluding the household itself.

[f] Area assets include improved building materials (floor, wall, and roof), radio, television, refrigerator, bicycle, motorcycle/scooter, car, telephone (land-line and mobile), watch, cart, and computer. Each calculated as the average of households in PSU excluding the household itself.

[g] Area wealth is the percentage of households in wealth categories 2 through 5. Each calculated as the average of households in PSU excluding the household itself.

Table C.5: Relationship between Mother's Education and Wealth and Literacy by Migration Status

	Wealth[a]		Literacy[b]	
	Non-migrants	Migrants	Non-migrants	migrants
Rural × 1-4 years of education	0.408***	0.364***	0.485***	0.495***
	(0.126)	(0.058)	(0.060)	(0.029)
Rural × 5-7 years of education	0.635***	0.708***	0.678***	0.808***
	(0.095)	(0.047)	(0.056)	(0.021)
Rural × 8-9 years of education	1.041***	1.038***		
	(0.114)	(0.057)		
Rural × 10-11 years of education	1.282***	1.476***		
	(0.143)	(0.084)		
Rural × 12+ years of education	2.069***	1.948***		
	(0.129)	(0.062)		
Slum	1.352***	1.467***	0.075	0.022*
	(0.208)	(0.086)	(0.053)	(0.012)
Slum × 1-4 years of education	0.593***	0.304**	0.512***	0.501***
	(0.222)	(0.145)	(0.140)	(0.079)
Slum × 5-7 years of education	0.646***	0.521***	0.556***	0.749***
	(0.196)	(0.090)	(0.111)	(0.079)
Slum × 8-9 years of education	0.911***	0.732***		
	(0.221)	(0.087)		
Slum × 10-11 years of education	0.900***	0.905***		
	(0.212)	(0.102)		
Slum × 12+ years of education	1.363***	1.068***		
	(0.200)	(0.096)		
Urban	0.817***	1.148***	0.003	0.010
	(0.195)	(0.078)	(0.015)	(0.008)
Urban × 1-4 years of education	0.331	0.227*	0.558***	0.453***
	(0.258)	(0.126)	(0.112)	(0.049)
Urban × 5-7 years of education	0.747***	0.615***	0.654***	0.811***
	(0.198)	(0.081)	(0.088)	(0.034)
Urban × 8-9 years of education	1.139***	1.020***		
	(0.230)	(0.080)		
Urban × 10-11 years of education	1.514***	1.364***		
	(0.212)	(0.088)		
Urban × 12+ years of education	1.830***	1.655***		
	(0.201)	(0.075)		
Observations	2,223	9,095	919	5,050

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. All regressions OLS weighted and with robust standard errors clustered at PSU level in parentheses. Explanatory variables not shown are mother's age and age squared, religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category, and state dummies.

[a] Outcome is household being in wealth category 1, 2, 3, 4, or 5.

[b] Literacy is coded 1 for being literate and 0 if not being literate. Women with 6 or more years of education were assumed to be literate and where therefore not given the literacy test during the survey. The sample consists of 3,982 rural, 828 slum, and 1,159 urban residents.

Table C.6: Determinants of Child Health: Height-for-Age Z-Score
Census Definition of Slums

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion and caste[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=15,061)							
Slum	0.34***	0.10	−0.09	−0.10	−0.18*	−0.22**	−0.17
	(0.06)	(0.06)	(0.06)	(0.08)	(0.11)	(0.11)	(0.11)
Urban	0.43***	0.13***	−0.03	−0.08	−0.08	−0.13*	−0.10
	(0.05)	(0.04)	(0.05)	(0.07)	(0.07)	(0.07)	(0.07)
Girl	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
R^2	0.10	0.20	0.21	0.20	0.20	0.18	0.21
Adj. R^2	0.10	0.20	0.21	0.20	0.20	0.18	0.21
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		49.99	23.65	7.92	3.25	33.53	7.45
Degrees of freedom		(15,1515)	(4,1515)	(4,1515)	(9,1515)	(11,1515)	(17,1515)
P-value		0.00	0.00	0.00	0.00	0.00	0.00
Boys (n=7,858)							
Slum	0.36***	0.14	−0.07	−0.07	−0.17	−0.23*	−0.17
	(0.09)	(0.10)	(0.10)	(0.12)	(0.14)	(0.13)	(0.14)
Urban	0.41***	0.12**	−0.06	−0.11	−0.11	−0.17*	−0.13
	(0.06)	(0.05)	(0.06)	(0.09)	(0.09)	(0.09)	(0.09)
R^2	0.09	0.20	0.21	0.21	0.21	0.18	0.21
Adj. R^2	0.09	0.20	0.21	0.20	0.20	0.17	0.21
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		37.23	14.54	5.64	2.29	21.17	4.60
Degrees of freedom		(15,1443)	(4,1443)	(4,1443)	(9,1443)	(11,1443)	(17,1443)
P-value		0.00	0.00	0.00	0.02	0.00	0.00
Girls (n=7,203)							
Slum	0.32***	0.06	−0.10	−0.14	−0.18	−0.22	−0.17
	(0.08)	(0.08)	(0.09)	(0.11)	(0.14)	(0.14)	(0.14)
Urban	0.46***	0.16***	0.00	−0.05	−0.04	−0.09	−0.06
	(0.07)	(0.06)	(0.07)	(0.09)	(0.09)	(0.09)	(0.09)
R^2	0.11	0.21	0.21	0.21	0.21	0.19	0.22
Adj. R^2	0.11	0.20	0.21	0.20	0.20	0.19	0.21
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		21.82	14.45	4.43	2.69	15.34	5.00
Degrees of freedom		(15,1430)	(4,1430)	(4,1430)	(9,1430)	(11,1430)	(17,1430)
P-value		0.00	0.00	0.00	0.00	0.00	0.00

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses. Definition of slum follows strictly whether area is designated as such by the census.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.7: Determinants of Child Health: Weight-for-Height Z-Score
Census Definition of Slums

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion and caste[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=15,061)							
Slum	0.20***	0.08	0.01	−0.02	−0.05	−0.08	−0.06
	(0.05)	(0.06)	(0.06)	(0.07)	(0.09)	(0.10)	(0.09)
Urban	0.22***	0.14***	0.08*	0.06	0.02	0.01	0.02
	(0.04)	(0.04)	(0.04)	(0.06)	(0.06)	(0.06)	(0.06)
Girl	0.03	0.04	0.04	0.04	0.04	0.04	0.04
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
R^2	0.02	0.08	0.08	0.08	0.08	0.08	0.08
Adj. R^2	0.02	0.08	0.08	0.08	0.08	0.07	0.08
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		9.39	3.45	1.26	1.44	4.78	1.45
Degrees of freedom		(15,1515)	(4,1515)	(4,1515)	(9,1515)	(11,1515)	(17,1515)
P-value		0.00	0.01	0.29	0.17	0.00	0.10
Boys (n=7,858)							
Slum	0.14*	0.08	−0.01	−0.01	−0.05	−0.07	−0.05
	(0.08)	(0.08)	(0.08)	(0.10)	(0.12)	(0.12)	(0.12)
Urban	0.23***	0.16***	0.08	0.08	0.05	0.05	0.05
	(0.05)	(0.05)	(0.05)	(0.07)	(0.08)	(0.08)	(0.08)
R^2	0.01	0.09	0.09	0.09	0.09	0.08	0.09
Adj. R^2	0.01	0.08	0.09	0.08	0.09	0.08	0.09
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		7.94	4.89	1.08	1.13	4.76	1.56
Degrees of freedom		(15,1443)	(4,1443)	(4,1443)	(9,1443)	(11,1443)	(17,1443)
P-value		0.00	0.00	0.36	0.34	0.00	0.07
Girls (n=7,203)							
Slum	0.26***	0.09	0.04	−0.00	−0.06	−0.09	−0.07
	(0.06)	(0.07)	(0.08)	(0.09)	(0.12)	(0.12)	(0.12)
Urban	0.21***	0.11**	0.08	0.04	−0.02	−0.04	−0.02
	(0.05)	(0.05)	(0.05)	(0.08)	(0.08)	(0.08)	(0.08)
R^2	0.02	0.07	0.08	0.08	0.08	0.08	0.08
Adj. R^2	0.02	0.07	0.07	0.07	0.07	0.07	0.07
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		3.77	2.29	1.57	1.36	2.23	1.78
Degrees of freedom		(15,1430)	(4,1430)	(4,1430)	(9,1430)	(11,1430)	(17,1430)
P-value		0.00	0.06	0.18	0.20	0.01	0.03

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses. Definition of slum follows strictly whether area is designated as such by the census.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.8: Determinants of Child Health: Mortality
Census Definition of Slums

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[a]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion and caste[b]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[c]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[d]	No	No	No	Yes	No	Yes	Yes
Area health environment[e]	No	No	No	No	Yes	Yes	Yes
All children (n=16,179)							
Slum	0.64**	0.89	1.00	0.90	0.74	0.78	0.74
	(0.11)	(0.17)	(0.20)	(0.20)	(0.21)	(0.22)	(0.21)
Urban	0.59***	0.77***	0.84	0.80*	0.72**	0.75**	0.73**
	(0.06)	(0.08)	(0.09)	(0.11)	(0.10)	(0.11)	(0.10)
Girl	1.12	1.11	1.11	1.11	1.11	1.11	1.11
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Boys (n=8,422)							
Slum	0.73	0.95	1.10	0.94	1.23	1.29	1.23
	(0.15)	(0.21)	(0.26)	(0.25)	(0.37)	(0.39)	(0.37)
Urban	0.68***	0.85	0.95	0.88	0.89	0.92	0.90
	(0.08)	(0.11)	(0.13)	(0.16)	(0.16)	(0.16)	(0.16)
Girls (n=7,757)							
Slum	0.54**	0.80	0.88	0.82	0.39**	0.42**	0.40**
	(0.14)	(0.22)	(0.25)	(0.26)	(0.17)	(0.18)	(0.17)
Urban	0.51***	0.69***	0.74**	0.71*	0.54***	0.57**	0.55***
	(0.07)	(0.10)	(0.11)	(0.14)	(0.12)	(0.13)	(0.12)

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted Cox regresions with robust standard errors clustered at PSU level in parentheses. Coefficients presented are hazards ratios; a coefficient less than 1 indicates that there is a lower risk of death compared to the reference group, whereas a coefficient greater than 1 indicates that there is a higher risk than the reference group. Definition of slum follows strictly whether area is designated as such by the census.

[a] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.

[b] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category. Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.

[c] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.

[d] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.

[e] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.9: Determinants of Child Health for Hindus: Height-for-Age Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household caste[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=12,232)							
Slum	0.36***	0.07	−0.11	−0.11	−0.16	−0.24*	−0.17
	(0.07)	(0.07)	(0.07)	(0.09)	(0.12)	(0.12)	(0.12)
Urban	0.47***	0.12**	−0.05	−0.07	−0.06	−0.13*	−0.08
	(0.06)	(0.05)	(0.05)	(0.08)	(0.07)	(0.08)	(0.08)
Girl	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
R^2	0.10	0.20	0.21	0.20	0.20	0.18	0.21
Adj. R^2	0.10	0.20	0.21	0.20	0.20	0.18	0.21
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		47.62	19.99	5.65	2.44	31.06	6.39
Degrees of freedom		(14,1436)	(4,1436)	(4,1436)	(9,1436)	(11,1436)	(17,1436)
P-value		0.00	0.00	0.00	0.01	0.00	0.00
Boys (n=6,386)							
Slum	0.34***	0.08	−0.14	−0.13	−0.19	−0.29**	−0.21
	(0.09)	(0.09)	(0.09)	(0.12)	(0.15)	(0.15)	(0.15)
Urban	0.45***	0.09	−0.11*	−0.12	−0.12	−0.21**	−0.15
	(0.06)	(0.06)	(0.07)	(0.09)	(0.10)	(0.10)	(0.10)
R^2	0.09	0.20	0.21	0.20	0.20	0.17	0.21
Adj. R^2	0.09	0.19	0.20	0.20	0.20	0.17	0.20
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		33.22	13.63	4.03	1.77	17.53	4.06
Degrees of freedom		(14,1346)	(4,1346)	(4,1346)	(9,1346)	(11,1346)	(17,1346)
P-value		0.00	0.00	0.00	0.07	0.00	0.00
Girls (n=5,846)							
Slum	0.38***	0.06	−0.08	−0.09	−0.12	−0.18	−0.11
	(0.09)	(0.09)	(0.10)	(0.12)	(0.16)	(0.16)	(0.16)
Urban	0.50***	0.16***	0.02	−0.01	0.04	−0.04	0.02
	(0.07)	(0.06)	(0.07)	(0.10)	(0.10)	(0.10)	(0.10)
R^2	0.12	0.21	0.22	0.22	0.22	0.20	0.23
Adj. R^2	0.12	0.21	0.22	0.21	0.21	0.19	0.22
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		23.44	11.07	3.16	1.98	16.30	4.14
Degrees of freedom		(14,1332)	(4,1332)	(4,1332)	(9,1332)	(11,1332)	(17,1332)
P-value		0.00	0.00	0.01	0.04	0.00	0.00

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.10: Determinants of Child Health for Hindus: Weight-for-Height Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household caste[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=12,232)							
Slum	0.21***	0.09	0.01	−0.02	−0.07	−0.10	−0.07
	(0.06)	(0.06)	(0.07)	(0.08)	(0.10)	(0.11)	(0.11)
Urban	0.24***	0.14***	0.07	0.04	−0.00	−0.02	−0.01
	(0.04)	(0.04)	(0.04)	(0.06)	(0.07)	(0.07)	(0.07)
Girl	0.03	0.04	0.04	0.04	0.04	0.04	0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
R^2	0.02	0.08	0.08	0.08	0.08	0.08	0.08
Adj. R^2	0.02	0.08	0.08	0.08	0.08	0.08	0.08
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		8.50	3.89	2.00	1.71	3.30	1.93
Degrees of freedom		(14,1436)	(4,1436)	(4,1436)	(9,1436)	(11,1436)	(17,1436)
P-value		0.00	0.00	0.09	0.08	0.00	0.01
Boys (n=6,386)							
Slum	0.15*	0.08	−0.02	−0.03	−0.03	−0.06	−0.04
	(0.08)	(0.08)	(0.09)	(0.11)	(0.13)	(0.13)	(0.13)
Urban	0.29***	0.19***	0.10*	0.09	0.06	0.04	0.05
	(0.05)	(0.05)	(0.06)	(0.08)	(0.09)	(0.09)	(0.09)
R^2	0.02	0.09	0.10	0.09	0.09	0.09	0.10
Adj. R^2	0.02	0.09	0.09	0.09	0.09	0.08	0.09
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		7.14	3.78	1.05	1.07	3.38	1.29
Degrees of freedom		(14,1346)	(4,1346)	(4,1346)	(9,1346)	(11,1346)	(17,1346)
P-value		0.00	0.00	0.38	0.38	0.00	0.19
Girls (n=5,846)							
Slum	0.28***	0.11	0.06	0.00	−0.10	−0.13	−0.11
	(0.07)	(0.08)	(0.08)	(0.10)	(0.15)	(0.15)	(0.14)
Urban	0.19***	0.08	0.04	−0.00	−0.07	−0.10	−0.08
	(0.05)	(0.05)	(0.06)	(0.08)	(0.09)	(0.09)	(0.09)
R^2	0.02	0.08	0.08	0.08	0.08	0.08	0.08
Adj. R^2	0.02	0.07	0.07	0.07	0.07	0.07	0.07
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		3.76	1.86	2.32	1.58	1.83	2.17
Degrees of freedom		(14,1332)	(4,1332)	(4,1332)	(9,1332)	(11,1332)	(17,1332)
P-value		0.00	0.11	0.05	0.12	0.05	0.00

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.11: Determinants of Child Health for Hindus: Mortality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[a]	No	Yes	Yes	Yes	Yes	No	Yes
Household caste[b]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[c]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[d]	No	No	No	Yes	No	Yes	Yes
Area health environment[e]	No	No	No	No	Yes	Yes	Yes
All children (n=13,168)							
Slum	0.65**	0.95	1.09	0.89	0.81	0.88	0.83
	(0.11)	(0.18)	(0.21)	(0.20)	(0.24)	(0.27)	(0.25)
Urban	0.63***	0.85	0.95	0.83	0.79	0.84	0.80
	(0.07)	(0.09)	(0.12)	(0.13)	(0.14)	(0.14)	(0.14)
Girl	1.11	1.10	1.10	1.11	1.11	1.11	1.11
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Boys (n=6,857)							
Slum	0.78	1.12	1.34	1.02	1.60	1.76*	1.67
	(0.15)	(0.25)	(0.32)	(0.28)	(0.51)	(0.55)	(0.52)
Urban	0.78*	1.02	1.18	0.98	1.09	1.15	1.11
	(0.10)	(0.14)	(0.19)	(0.20)	(0.22)	(0.24)	(0.23)
Girls (n=6,311)							
Slum	0.53**	0.76	0.83	0.72	0.30**	0.33**	0.31**
	(0.14)	(0.22)	(0.25)	(0.24)	(0.15)	(0.16)	(0.15)
Urban	0.50***	0.67**	0.71*	0.64*	0.45***	0.49***	0.46***
	(0.08)	(0.11)	(0.14)	(0.16)	(0.13)	(0.13)	(0.13)

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted Cox regresions with robust standard errors clustered at PSU level in parentheses. Coefficients presented are hazards ratios; a coefficient less than 1 indicates that there is a lower risk of death compared to the reference group, whereas a coefficient greater than 1 indicates that there is a higher risk than the reference group.

[a] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.

[b] Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.

[c] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.

[d] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.

[e] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.12: Determinants of Child Health for Muslims: Height-for-Age Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household caste[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=2,829)							
Slum	0.50***	−0.01	−0.25*	−0.24	−0.32	−0.25	−0.28
	(0.10)	(0.13)	(0.15)	(0.18)	(0.22)	(0.23)	(0.23)
Urban	0.37***	0.14	−0.04	−0.10	−0.11	−0.09	−0.09
	(0.12)	(0.11)	(0.13)	(0.16)	(0.17)	(0.19)	(0.18)
Girl	0.16**	0.16**	0.16**	0.17**	0.15**	0.15**	0.15**
	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
R^2	0.12	0.21	0.22	0.22	0.22	0.21	0.23
Adj. R^2	0.11	0.20	0.21	0.20	0.21	0.20	0.22
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		7.62	4.81	3.13	2.18	5.13	3.05
Degrees of freedom		(14,443)	(4,443)	(4,443)	(9,443)	(11,443)	(17,443)
P-value		0.00	0.00	0.01	0.02	0.00	0.00
Boys (n=1,472)							
Slum	0.64***	0.21	0.02	0.11	−0.16	−0.05	−0.07
	(0.15)	(0.19)	(0.21)	(0.26)	(0.29)	(0.29)	(0.29)
Urban	0.41***	0.20	0.09	0.01	0.00	0.03	0.06
	(0.14)	(0.15)	(0.16)	(0.21)	(0.23)	(0.23)	(0.23)
R^2	0.13	0.25	0.25	0.26	0.25	0.23	0.27
Adj. R^2	0.13	0.23	0.23	0.23	0.23	0.21	0.24
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		10.40	1.89	2.40	1.02	5.24	1.54
Degrees of freedom		(14,368)	(4,368)	(4,368)	(9,368)	(11,368)	(17,368)
P-value		0.00	0.11	0.05	0.42	0.00	0.08
Girls (n=1,357)							
Slum	0.36***	−0.26	−0.52**	−0.57**	−0.38	−0.31	−0.35
	(0.13)	(0.20)	(0.21)	(0.26)	(0.30)	(0.32)	(0.32)
Urban	0.32**	0.06	−0.16	−0.18	−0.21	−0.20	−0.20
	(0.16)	(0.14)	(0.17)	(0.20)	(0.22)	(0.23)	(0.23)
R^2	0.11	0.20	0.22	0.20	0.22	0.23	0.24
Adj. R^2	0.10	0.17	0.20	0.18	0.19	0.21	0.21
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		13.78	5.45	1.33	3.32	1.79	3.26
Degrees of freedom		(14,354)	(4,354)	(4,354)	(9,354)	(11,354)	(17,354)
P-value		0.00	0.00	0.26	0.00	0.05	0.00

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.13: Determinants of Child Health for Muslims: Weight-for-Height Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household caste[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=2,829)							
Slum	0.11	0.05	0.06	0.04	0.12	0.16	0.15
	(0.10)	(0.12)	(0.13)	(0.15)	(0.20)	(0.20)	(0.20)
Urban	0.05	0.13	0.13	0.13	0.13	0.18	0.17
	(0.11)	(0.09)	(0.09)	(0.11)	(0.12)	(0.13)	(0.13)
Girl	0.01	0.01	0.01	0.01	0.01	0.02	0.02
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
R^2	0.01	0.08	0.09	0.08	0.09	0.07	0.09
Adj. R^2	0.00	0.07	0.07	0.07	0.07	0.06	0.07
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		5.74	1.89	0.35	0.52	5.08	1.07
Degrees of freedom		(14,443)	(4,443)	(4,443)	(9,443)	(11,443)	(17,443)
P-value		0.00	0.11	0.84	0.86	0.00	0.38
Boys (n=1,472)							
Slum	0.09	0.15	0.17	0.16	0.18	0.32	0.26
	(0.15)	(0.17)	(0.18)	(0.20)	(0.25)	(0.25)	(0.26)
Urban	−0.10	0.09	0.09	0.10	0.13	0.22	0.18
	(0.12)	(0.10)	(0.10)	(0.12)	(0.14)	(0.15)	(0.15)
R^2	0.01	0.09	0.10	0.10	0.10	0.10	0.12
Adj. R^2	0.00	0.07	0.08	0.07	0.07	0.07	0.08
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		8.74	2.47	0.81	0.95	2.47	2.10
Degrees of freedom		(14,368)	(4,368)	(4,368)	(9,368)	(11,368)	(17,368)
P-value		0.00	0.04	0.52	0.48	0.01	0.01
Girls (n=1,357)							
Slum	0.12	−0.06	−0.09	−0.08	0.04	0.06	0.07
	(0.11)	(0.15)	(0.15)	(0.20)	(0.25)	(0.25)	(0.25)
Urban	0.21	0.20*	0.20*	0.18	0.15	0.16	0.17
	(0.14)	(0.11)	(0.12)	(0.16)	(0.16)	(0.17)	(0.16)
R^2	0.02	0.12	0.13	0.12	0.12	0.10	0.13
Adj. R^2	0.01	0.09	0.10	0.09	0.09	0.07	0.10
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		3.94	2.18	0.17	1.12	3.36	1.09
Degrees of freedom		(14,354)	(4,354)	(4,354)	(9,354)	(11,354)	(17,354)
P-value		0.00	0.07	0.96	0.35	0.00	0.36

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.14: Determinants of Child Health for Muslims: Mortality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[a]	No	Yes	Yes	Yes	Yes	No	Yes
Household caste[b]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[c]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[d]	No	No	No	Yes	No	Yes	Yes
Area health environment[e]	No	No	No	No	Yes	Yes	Yes
All children (n=3,011)							
Slum	0.33***	0.53*	0.52**	0.72	0.53	0.47	0.52
	(0.10)	(0.18)	(0.17)	(0.30)	(0.29)	(0.31)	(0.33)
Urban	0.49***	0.62**	0.59**	0.79	0.73	0.69	0.73
	(0.10)	(0.13)	(0.12)	(0.20)	(0.23)	(0.21)	(0.24)
Girl	1.15	1.11	1.13	1.10	1.09	1.11	1.09
	(0.20)	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)
Boys (n=1,565)							
Slum	0.43**	0.38**	0.40*	0.84	1.22	0.84	1.17
	(0.16)	(0.18)	(0.20)	(0.53)	(0.71)	(0.56)	(0.77)
Urban	0.35***	0.34***	0.36***	0.67	0.68	0.51	0.73
	(0.11)	(0.12)	(0.14)	(0.29)	(0.35)	(0.25)	(0.37)
Girls (n=1,446)							
Slum	0.24***	0.82	0.72	0.80	0.13	0.17	0.13
	(0.09)	(0.38)	(0.34)	(0.42)	(0.17)	(0.23)	(0.18)
Urban	0.64*	1.09	0.96	1.05	0.88	0.94	0.90
	(0.16)	(0.31)	(0.28)	(0.36)	(0.32)	(0.39)	(0.35)

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted Cox regresions with robust standard errors clustered at PSU level in parentheses. Coefficients presented are hazards ratios; a coefficient less than 1 indicates that there is a lower risk of death compared to the reference group, whereas a coefficient greater than 1 indicates that there is a higher risk than the reference group.

[a] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.

[b] Caste dummies for each of scheduled caste, scheduled tribe, and other backward class, with none of the above the excluded category.

[c] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.

[d] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.

[e] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.15: Determinants of Child Health for Scheduled Caste/Tribe: Height-for-Age Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=4,143)							
Slum	0.42***	0.21*	0.05	0.05	−0.11	−0.28	−0.16
	(0.10)	(0.11)	(0.13)	(0.15)	(0.18)	(0.18)	(0.18)
Urban	0.40***	0.22***	0.06	0.04	−0.04	−0.14	−0.08
	(0.09)	(0.08)	(0.09)	(0.12)	(0.12)	(0.13)	(0.13)
Girl	0.05	0.06	0.06	0.06	0.06	0.06	0.06
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
R^2	0.09	0.17	0.18	0.17	0.18	0.15	0.18
Adj. R^2	0.09	0.16	0.17	0.17	0.17	0.14	0.17
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		14.57	6.85	1.46	1.64	11.77	2.32
Degrees of freedom		(12,916)	(4,916)	(4,916)	(9,916)	(11,916)	(17,916)
P-value		0.00	0.00	0.21	0.10	0.00	0.00
Boys (n=2,167)							
Slum	0.33***	0.13	−0.03	−0.08	−0.32	−0.44*	−0.35
	(0.12)	(0.13)	(0.15)	(0.20)	(0.24)	(0.25)	(0.24)
Urban	0.46***	0.26**	0.11	0.03	−0.10	−0.17	−0.12
	(0.11)	(0.10)	(0.13)	(0.17)	(0.18)	(0.18)	(0.19)
R^2	0.08	0.16	0.16	0.16	0.16	0.13	0.17
Adj. R^2	0.08	0.14	0.15	0.15	0.15	0.12	0.15
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		8.69	2.51	1.40	1.08	6.69	1.14
Degrees of freedom		(12,755)	(4,755)	(4,755)	(9,755)	(11,755)	(17,755)
P-value		0.00	0.04	0.23	0.38	0.00	0.31
Girls (n=1,976)							
Slum	0.57***	0.36	0.21	0.25	0.16	−0.10	0.12
	(0.22)	(0.25)	(0.25)	(0.26)	(0.28)	(0.29)	(0.29)
Urban	0.34***	0.21**	0.02	0.08	0.08	−0.12	0.01
	(0.12)	(0.11)	(0.13)	(0.15)	(0.16)	(0.17)	(0.17)
R^2	0.11	0.20	0.21	0.20	0.21	0.18	0.22
Adj. R^2	0.10	0.19	0.19	0.19	0.19	0.16	0.20
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		9.17	5.06	0.46	2.60	8.32	2.37
Degrees of freedom		(12,714)	(4,714)	(4,714)	(9,714)	(11,714)	(17,714)
P-value		0.00	0.00	0.77	0.01	0.00	0.00

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.16: Determinants of Child Health for Scheduled Caste/Tribe: Weight-for-Height Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=4,143)							
Slum	0.31***	0.12	0.01	−0.03	−0.05	−0.14	−0.11
	(0.08)	(0.09)	(0.10)	(0.11)	(0.16)	(0.16)	(0.16)
Urban	0.28***	0.17**	0.08	0.04	0.03	−0.02	−0.02
	(0.08)	(0.07)	(0.08)	(0.10)	(0.11)	(0.11)	(0.11)
Girl	0.06	0.08*	0.08*	0.08*	0.08*	0.08**	0.08*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
R^2	0.02	0.09	0.10	0.10	0.10	0.10	0.10
Adj. R^2	0.02	0.09	0.09	0.09	0.09	0.09	0.09
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		2.38	1.77	1.35	1.42	1.37	1.44
Degrees of freedom		(12,916)	(4,916)	(4,916)	(9,916)	(11,916)	(17,916)
P-value		0.01	0.13	0.25	0.18	0.18	0.11
Boys (n=2,167)							
Slum	0.28***	0.18	0.09	0.11	0.06	−0.06	−0.01
	(0.10)	(0.12)	(0.13)	(0.15)	(0.19)	(0.20)	(0.20)
Urban	0.36***	0.23***	0.16	0.19	0.11	0.06	0.09
	(0.10)	(0.09)	(0.10)	(0.12)	(0.14)	(0.14)	(0.14)
R^2	0.02	0.11	0.11	0.11	0.11	0.11	0.12
Adj. R^2	0.02	0.10	0.10	0.10	0.10	0.09	0.10
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		2.11	0.85	0.52	0.83	1.59	1.08
Degrees of freedom		(12,755)	(4,755)	(4,755)	(9,755)	(11,755)	(17,755)
P-value		0.01	0.49	0.72	0.59	0.10	0.37
Girls (n=1,976)							
Slum	0.37***	0.09	−0.06	−0.13	−0.16	−0.26	−0.23
	(0.12)	(0.14)	(0.16)	(0.17)	(0.23)	(0.24)	(0.24)
Urban	0.20**	0.12	−0.00	−0.11	−0.09	−0.15	−0.14
	(0.10)	(0.10)	(0.12)	(0.15)	(0.15)	(0.16)	(0.16)
R^2	0.03	0.10	0.10	0.10	0.10	0.11	0.11
Adj. R^2	0.02	0.08	0.08	0.08	0.08	0.09	0.09
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		1.56	2.20	1.99	1.67	0.88	1.86
Degrees of freedom		(12,714)	(4,714)	(4,714)	(9,714)	(11,714)	(17,714)
P-value		0.10	0.07	0.09	0.09	0.56	0.02

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.17: Determinants of Child Health for Scheduled Caste/Tribe: Mortality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[a]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion[b]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[c]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[d]	No	No	No	Yes	No	Yes	Yes
Area health environment[e]	No	No	No	No	Yes	Yes	Yes
All children (n=4,533)							
Slum	0.57**	0.72	0.83	0.64	0.87	1.05	1.00
	(0.15)	(0.24)	(0.28)	(0.23)	(0.37)	(0.45)	(0.43)
Urban	0.53***	0.61***	0.67*	0.54**	0.62	0.68	0.67
	(0.10)	(0.12)	(0.15)	(0.14)	(0.20)	(0.23)	(0.22)
Girl	1.08	1.08	1.08	1.08	1.08	1.08	1.08
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Boys (n=2,359)							
Slum	0.66	0.96	1.21	0.74	1.49	1.58	1.67
	(0.24)	(0.40)	(0.53)	(0.35)	(0.74)	(0.77)	(0.81)
Urban	0.73	0.89	1.06	0.73	0.96	1.04	1.05
	(0.17)	(0.21)	(0.26)	(0.24)	(0.31)	(0.36)	(0.35)
Girls (n=2,174)							
Slum	0.47***	0.55	0.59	0.48	0.39	0.52	0.46
	(0.13)	(0.21)	(0.24)	(0.22)	(0.29)	(0.40)	(0.35)
Urban	0.35***	0.40***	0.38**	0.32**	0.30*	0.30*	0.29*
	(0.10)	(0.13)	(0.15)	(0.15)	(0.19)	(0.21)	(0.20)

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted Cox regresions with robust standard errors clustered at PSU level in parentheses. Coefficients presented are hazards ratios; a coefficient less than 1 indicates that there is a lower risk of death compared to the reference group, whereas a coefficient greater than 1 indicates that there is a higher risk than the reference group.

[a] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.

[b] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category.

[c] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.

[d] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.

[e] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.18: Determinants of Child Health for Other Backward Caste: Height-for-Age Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=6,180)							
Slum	0.42***	−0.02	−0.20**	−0.18	−0.20	−0.20	−0.22
	(0.10)	(0.10)	(0.10)	(0.13)	(0.17)	(0.17)	(0.17)
Urban	0.42***	0.09	−0.05	−0.06	−0.03	−0.05	−0.04
	(0.08)	(0.06)	(0.07)	(0.10)	(0.10)	(0.11)	(0.11)
Girl	0.02	0.03	0.03	0.03	0.03	0.03	0.03
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
R^2	0.12	0.22	0.23	0.23	0.22	0.21	0.23
Adj. R^2	0.12	0.22	0.23	0.22	0.22	0.20	0.23
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		19.66	10.90	2.93	0.94	11.95	3.23
Degrees of freedom		(12,1081)	(4,1081)	(4,1081)	(9,1081)	(11,1081)	(17,1081)
P-value		0.00	0.00	0.02	0.49	0.00	0.00
Boys (n=3,228)							
Slum	0.35***	−0.04	−0.27**	−0.23	−0.21	−0.26	−0.24
	(0.13)	(0.13)	(0.13)	(0.16)	(0.20)	(0.19)	(0.19)
Urban	0.38***	0.06	−0.12	−0.11	−0.11	−0.14	−0.12
	(0.10)	(0.08)	(0.09)	(0.12)	(0.13)	(0.13)	(0.13)
R^2	0.11	0.23	0.24	0.24	0.23	0.21	0.24
Adj. R^2	0.11	0.22	0.23	0.23	0.22	0.20	0.23
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		16.80	8.32	2.62	1.04	10.81	2.65
Degrees of freedom		(12,949)	(4,949)	(4,949)	(9,949)	(11,949)	(17,949)
P-value		0.00	0.00	0.03	0.40	0.00	0.00
Girls (n=2,952)							
Slum	0.49***	0.04	−0.08	−0.09	−0.11	−0.07	−0.10
	(0.11)	(0.12)	(0.13)	(0.17)	(0.22)	(0.22)	(0.22)
Urban	0.46***	0.13	0.03	0.02	0.07	0.08	0.07
	(0.10)	(0.09)	(0.09)	(0.13)	(0.13)	(0.14)	(0.13)
R^2	0.13	0.23	0.24	0.23	0.23	0.22	0.24
Adj. R^2	0.13	0.22	0.23	0.22	0.22	0.21	0.23
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		8.89	6.04	1.20	0.84	6.17	2.00
Degrees of freedom		(12,899)	(4,899)	(4,899)	(9,899)	(11,899)	(17,899)
P-value		0.00	0.00	0.31	0.58	0.00	0.01

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.19: Determinants of Child Health for Other Backward Caste: Weight-for-Height Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=6,180)							
Slum	0.07	−0.02	−0.08	−0.06	−0.13	−0.12	−0.13
	(0.06)	(0.07)	(0.08)	(0.10)	(0.12)	(0.12)	(0.12)
Urban	0.11*	0.08	0.03	0.03	0.01	0.02	0.02
	(0.06)	(0.05)	(0.05)	(0.07)	(0.08)	(0.08)	(0.08)
Girl	0.02	0.03	0.03	0.03	0.02	0.02	0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
R^2	0.02	0.07	0.08	0.08	0.08	0.07	0.08
Adj. R^2	0.02	0.07	0.07	0.07	0.07	0.07	0.07
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		4.09	1.92	1.19	1.50	2.93	1.31
Degrees of freedom		(12,1081)	(4,1081)	(4,1081)	(9,1081)	(11,1081)	(17,1081)
P-value		0.00	0.10	0.31	0.14	0.00	0.18
Boys (n=3,228)							
Slum	−0.04	−0.10	−0.22**	−0.20	−0.34**	−0.31*	−0.32*
	(0.09)	(0.11)	(0.11)	(0.13)	(0.17)	(0.16)	(0.16)
Urban	0.08	0.05	−0.04	−0.05	−0.06	−0.03	−0.05
	(0.08)	(0.07)	(0.07)	(0.09)	(0.10)	(0.10)	(0.10)
R^2	0.01	0.09	0.09	0.09	0.09	0.09	0.10
Adj. R^2	0.01	0.08	0.08	0.08	0.08	0.08	0.09
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		4.09	4.99	2.93	2.15	3.05	2.35
Degrees of freedom		(12,949)	(4,949)	(4,949)	(9,949)	(11,949)	(17,949)
P-value		0.00	0.00	0.02	0.02	0.00	0.00
Girls (n=2,952)							
Slum	0.18*	0.09	0.11	0.13	0.10	0.10	0.10
	(0.09)	(0.11)	(0.11)	(0.14)	(0.17)	(0.17)	(0.17)
Urban	0.14*	0.11	0.13*	0.14	0.09	0.07	0.09
	(0.07)	(0.07)	(0.07)	(0.10)	(0.11)	(0.11)	(0.11)
R^2	0.03	0.08	0.08	0.08	0.08	0.08	0.08
Adj. R^2	0.03	0.07	0.07	0.07	0.07	0.06	0.07
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		1.18	0.80	0.47	0.73	1.31	0.87
Degrees of freedom		(12,899)	(4,899)	(4,899)	(9,899)	(11,899)	(17,899)
P-value		0.29	0.52	0.75	0.68	0.21	0.61

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.20: Determinants of Child Health for Other Backward Caste: Mortality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[a]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion[b]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[c]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[d]	No	No	No	Yes	No	Yes	Yes
Area health environment[e]	No	No	No	No	Yes	Yes	Yes
All children (n=6,611)							
Slum	0.42***	0.71	0.69	0.65	0.36***	0.34***	0.35***
	(0.11)	(0.19)	(0.20)	(0.21)	(0.14)	(0.13)	(0.14)
Urban	0.69***	0.89	0.88	0.84	0.61**	0.61**	0.60**
	(0.09)	(0.13)	(0.14)	(0.16)	(0.14)	(0.13)	(0.13)
Girl	1.28**	1.27**	1.27**	1.27**	1.27**	1.28**	1.27**
	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
Boys (n=3,440)							
Slum	0.73	1.28	1.25	1.15	1.47	1.55	1.58
	(0.22)	(0.41)	(0.43)	(0.48)	(0.59)	(0.63)	(0.65)
Urban	0.70*	0.92	0.91	0.83	0.76	0.79	0.78
	(0.14)	(0.20)	(0.23)	(0.25)	(0.26)	(0.25)	(0.26)
Girls (n=3,171)							
Slum	0.18***	0.28***	0.26***	0.26***	0.08***	0.06***	0.07***
	(0.06)	(0.10)	(0.11)	(0.11)	(0.04)	(0.04)	(0.04)
Urban	0.68**	0.88	0.86	0.86	0.48**	0.48**	0.48**
	(0.13)	(0.18)	(0.20)	(0.23)	(0.15)	(0.15)	(0.15)

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted Cox regresions with robust standard errors clustered at PSU level in parentheses. Coefficients presented are hazards ratios; a coefficient less than 1 indicates that there is a lower risk of death compared to the reference group, whereas a coefficient greater than 1 indicates that there is a higher risk than the reference group.

[a] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.

[b] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category.

[c] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.

[d] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.

[e] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.21: Determinants of Child Health for Not in Scheduled Caste/Tribe or Other Backward Caste: Height-for-Age Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=4,738)							
Slum	0.15*	0.08	−0.14	−0.28**	−0.26*	−0.31**	−0.27*
	(0.08)	(0.09)	(0.09)	(0.13)	(0.15)	(0.16)	(0.16)
Urban	0.34***	0.14*	−0.08	−0.24**	−0.18	−0.28**	−0.20*
	(0.09)	(0.08)	(0.08)	(0.11)	(0.12)	(0.12)	(0.12)
Girl	−0.06	−0.07	−0.08	−0.07	−0.06	−0.06	−0.07
	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
R^2	0.09	0.19	0.20	0.20	0.20	0.17	0.21
Adj. R^2	0.09	0.19	0.20	0.19	0.20	0.17	0.21
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		25.46	8.98	8.40	4.41	14.74	4.73
Degrees of freedom		(12,1025)	(4,1025)	(4,1025)	(9,1025)	(11,1025)	(17,1025)
P-value		0.00	0.00	0.00	0.00	0.00	0.00
Boys (n=2,463)							
Slum	0.22*	0.23*	0.01	−0.09	−0.15	−0.19	−0.14
	(0.11)	(0.13)	(0.14)	(0.19)	(0.21)	(0.23)	(0.22)
Urban	0.27***	0.10	−0.10	−0.26*	−0.14	−0.23	−0.16
	(0.11)	(0.10)	(0.10)	(0.15)	(0.16)	(0.16)	(0.16)
R^2	0.10	0.21	0.22	0.22	0.22	0.19	0.23
Adj. R^2	0.09	0.20	0.21	0.21	0.21	0.17	0.22
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		18.99	4.50	5.12	2.59	10.41	3.03
Degrees of freedom		(12,857)	(4,857)	(4,857)	(9,857)	(11,857)	(17,857)
P-value		0.00	0.00	0.00	0.01	0.00	0.00
Girls (n=2,275)							
Slum	0.09	−0.08	−0.28**	−0.48***	−0.37*	−0.41*	−0.39*
	(0.11)	(0.12)	(0.13)	(0.18)	(0.20)	(0.21)	(0.21)
Urban	0.42***	0.18*	−0.05	−0.24	−0.23	−0.35**	−0.26*
	(0.11)	(0.10)	(0.11)	(0.15)	(0.15)	(0.15)	(0.15)
R^2	0.09	0.19	0.21	0.20	0.21	0.18	0.22
Adj. R^2	0.09	0.18	0.19	0.19	0.20	0.17	0.20
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		11.70	6.61	4.97	4.51	6.38	4.06
Degrees of freedom		(12,826)	(4,826)	(4,826)	(9,826)	(11,826)	(17,826)
P-value		0.00	0.00	0.00	0.00	0.00	0.00

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.22: Determinants of Child Health for Not in Scheduled Caste/Tribe or Other Backward Caste: Weight-for-Height Z-Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child age dummies[a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[b]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion[c]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[d]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[e]	No	No	No	Yes	No	Yes	Yes
Area health environment[f]	No	No	No	No	Yes	Yes	Yes
All children (n=4,738)							
Slum	0.13	0.14	0.09	0.02	−0.02	−0.05	−0.02
	(0.08)	(0.09)	(0.10)	(0.14)	(0.17)	(0.18)	(0.18)
Urban	0.23***	0.21***	0.17**	0.13	0.06	0.02	0.06
	(0.06)	(0.06)	(0.08)	(0.12)	(0.13)	(0.14)	(0.14)
Girl	0.01	−0.00	−0.00	−0.00	−0.01	−0.00	−0.01
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
R^2	0.01	0.07	0.07	0.07	0.08	0.06	0.08
Adj. R^2	0.01	0.06	0.07	0.07	0.07	0.06	0.07
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		5.71	0.67	0.65	1.65	4.35	1.21
Degrees of freedom		(12,1025)	(4,1025)	(4,1025)	(9,1025)	(11,1025)	(17,1025)
P-value		0.00	0.61	0.63	0.10	0.00	0.25
Boys (n=2,463)							
Slum	0.11	0.20*	0.17	0.11	0.18	0.12	0.18
	(0.11)	(0.12)	(0.13)	(0.16)	(0.20)	(0.21)	(0.20)
Urban	0.24***	0.29***	0.25***	0.24*	0.19	0.14	0.21
	(0.08)	(0.08)	(0.10)	(0.14)	(0.15)	(0.16)	(0.15)
R^2	0.02	0.08	0.09	0.09	0.09	0.07	0.09
Adj. R^2	0.01	0.07	0.07	0.07	0.07	0.06	0.07
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		3.53	0.32	0.41	1.25	3.02	0.81
Degrees of freedom		(12,857)	(4,857)	(4,857)	(9,857)	(11,857)	(17,857)
P-value		0.00	0.87	0.80	0.26	0.00	0.68
Girls (n=2,275)							
Slum	0.16*	0.07	−0.00	−0.10	−0.23	−0.20	−0.22
	(0.09)	(0.11)	(0.13)	(0.18)	(0.23)	(0.23)	(0.23)
Urban	0.21***	0.14*	0.08	0.02	−0.07	−0.09	−0.08
	(0.08)	(0.08)	(0.10)	(0.15)	(0.16)	(0.17)	(0.17)
R^2	0.02	0.08	0.08	0.08	0.08	0.07	0.09
Adj. R^2	0.01	0.06	0.06	0.06	0.07	0.06	0.07
Wald test against model		(1)	(2)	(2)	(2)	(7)	(2)
F-statistics		2.79	0.81	0.78	1.33	2.31	1.13
Degrees of freedom		(12,826)	(4,826)	(4,826)	(9,826)	(11,826)	(17,826)
P-value		0.00	0.52	0.54	0.22	0.01	0.32

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted OLS with robust standard errors clustered at PSU level in parentheses.
[a] Age dummies for 4-7, 8-11, 12-17, 18-23, 24-35, 36-47, and 48-59 months old, with 0-3 as the excluded category.
[b] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.
[c] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category.
[d] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.
[e] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.
[f] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Table C.23: Determinants of Child Health for Not in Scheduled Caste/Tribe or Other Backward Caste: Mortality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
State and survey month fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Parental education and mother's height[a]	No	Yes	Yes	Yes	Yes	No	Yes
Household religion[b]	No	Yes	Yes	Yes	Yes	Yes	Yes
Household wealth status[c]	No	No	Yes	No	No	Yes	Yes
Area wealth distribution[d]	No	No	No	Yes	No	Yes	Yes
Area health environment[e]	No	No	No	No	Yes	Yes	Yes
All children (n=5,035)							
Slum	0.70	0.89	1.13	1.36	1.13	1.13	1.09
	(0.18)	(0.25)	(0.33)	(0.47)	(0.59)	(0.64)	(0.60)
Urban	0.60***	0.75	0.92	1.19	1.16	1.27	1.18
	(0.10)	(0.14)	(0.19)	(0.33)	(0.31)	(0.34)	(0.31)
Girl	0.92	0.93	0.93	0.91	0.91	0.91	0.91
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Boys (n=2,623)							
Slum	0.71	0.87	1.10	1.38	1.50	1.44	1.39
	(0.20)	(0.27)	(0.38)	(0.56)	(0.79)	(0.80)	(0.78)
Urban	0.66**	0.79	0.98	1.34	1.26	1.29	1.28
	(0.14)	(0.18)	(0.24)	(0.41)	(0.40)	(0.42)	(0.41)
Girls (n=2,412)							
Slum	0.69	0.91	1.15	1.25	0.75	0.83	0.83
	(0.24)	(0.38)	(0.50)	(0.65)	(0.59)	(0.73)	(0.67)
Urban	0.53***	0.76	0.94	1.04	1.11	1.35	1.21
	(0.13)	(0.21)	(0.28)	(0.44)	(0.42)	(0.52)	(0.46)

Notes. * sign. at 10%; ** sign. at 5%; *** sign. at 1%. Weighted Cox regresions with robust standard errors clustered at PSU level in parentheses. Coefficients presented are hazards ratios; a coefficient less than 1 indicates that there is a lower risk of death compared to the reference group, whereas a coefficient greater than 1 indicates that there is a higher risk than the reference group.

[a] Education dummies for mother and father. The dummies are for 1-4 years, 5-7, 8-9, 10-11, and 12 plus years of education.

[b] Religion dummies for each of Muslim, Christian, and other, with Hindu the excluded category.

[c] Wealth dummies for the household being in wealth category 2, 3, 4, and 5, respectively.

[d] Area wealth is the percentage of households in wealth categories 2 through 5, calculated excluding the household itself.

[e] Area health environment variables include water access, captured by the average time to fetch water and whether an improved source of drinking water is available, access to improved cooking fuel, sharing toilet with ten or more households, access to improved toilet, and the average number of people per room. Each calculated as the average in PSU excluding the household itself.

Figure C.1: Histogram of Height-for-age Z-score by Area and Sex

Figure C.2: Histogram of Weight-for-height Z-score by Area and Sex