Long Run Impacts of Famine Exposure: A Study of the 1974 - 1975 Bangladesh Famine

Preliminary Draft

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Abstract

There is a burgeoning literature on the short-term effects of child heath on human capital. It is widely accepted that environmental conditions while in utero impact short-term outcomes such as birth weight and mortality. However, it is less well known if effects experienced in utero or in early childhood persist long-term. To further understand the relationship between early life health and adult health and economic outcomes, this paper takes advantage of a natural experiment caused by a severe famine in Bangladesh from 1974 - 1975. This was caused, in part, by severe monsoon flooding, which destroyed a significant majority of the annual rice crop. This led to an escalation in rice prices, an unemployment spike and the erosion of purchasing power for farmers. I use an unbalanced individual level panel dataset for the years 1974 - 1996 for the Matlab region of Bangladesh to estimate the effect of the famine using both a cohort approach and a difference-in-difference approach. Results indicate that early childhood exposure to acute malnutrition affects males and females differently. There is evidence of positive selection for males born during the famine, as they are 0.48 standard deviations taller, and obtain 1.89 more years of completed education on average in the presence of the famine. Boys in their early childhood years show evidence of being negatively influenced by the adverse health shock. I contribute to this important literature by focusing on the long-term effects of a short but severe nutritional shock. Furthermore, the rich dataset allows me to look at the characteristics of those who died and moved as a result of the famine, thus allowing me to constructively look at the selection problem that is inseparable from using a famine as a natural experiment.

JEL: I10, J13, J16, J24, I15

NEUDC Program Area: Health, Sub-area: Malnutrition

1 Introduction

The field of economics has become increasingly interested in how an individual develops their human capital. From the pioneering work on human capital by Gary Becker and Jacob Mincer in the 1960's, an expanding body of research has focused on the importance of human capital and the role it plays in our world today. The role of childhood and *in utero* health in an individual's human capital development is a more recent avenue of research spurred on by the fetal origins hypothesis which postulates that there is a causal link between one's health while *in utero* and their adult health and human capital.[1]

To look at the relationship between early life heath and later in life economic outcomes I exploit the natural experiment, a short but severe famine in Bangladesh from 1974 - 1975.[2] Using an individual level panel data set that follows people from May 1974 through the end of 1996, I exploit variations in famine exposure by birth cohort and famine severity to determine how famine affects an individual's anthropometric measures and educational attainment. In future work, I plan on looking at employment outcomes, cognitive functioning and morbidity.

There is a burgeoning literature on the short-term effects of child heath on human capital. However, it is less well known if effects experienced in childhood persist long-term. I contribute to this important literature by focusing on the long-term effects of a short but severe nutritional shock. Furthermore, the rich data set used allows me to look at the characteristics of those who died and moved as a result of the famine, thus allowing me to constructively look at the selection

[1] The fetal origins hypothesis is most commonly attributed to the physician David J. Barker who was interested in the link between cardiovascular disease and nutrition while *in utero*, Barker (1995). This avenue of research is also related to the field of epigenetics in the biomedical literature. It posits the idea that genes can be turned on and off while *in utero* in response to the environmental conditions the woman is facing.

[2] The famine is thought to have begun in June 1974 and officially ended in July 1975.

problem that is inseparable from using a famine as a natural experiment. I contribute to the fetal origins and famine literature by being the first to look at the long term impacts of the 1974-75 Bangladesh famine and by being able to look at selection issues that plague other research.

The rest of this paper will be outlined as follows: Section 2 will give a brief review of the economic literature on famine research, Section 3 will give background information on the 1974 - 1975 Bangladesh famine and potential mechanisms, Section 4 will describe the data, Section 5 will discuss the methodology, and 6 will discuss preliminary results.

2 Literature Review

A recent paper by Almond (2011), gives a comprehensive review of the literature on fetal origins both in the economic and the epidemiology literature. It is now widely believed that the environmental conditions while *in utero* impact short-term outcomes such as birth weight and mortality. There is also some conditional evidence that conditions while *in utero* affect long-term outcomes such as morbidity (Almond and Mazumder, 2008). However, the general size of these effects are still being debated. Furthermore, it is less well understood when during pregnancy environmental conditions are most influential. A comprehensive look at famines over the past five millennia, and their causes and consequences has also recently been published (O'Grada, 2009).

Razzaque *et al.* (1990) look at the sustained effects of the 1974 - 1975 Bangladesh famine on cohort mortality in the Matlab region of Bangladesh. Using three distinct cohorts, those born during the famine, those conceived during the famine and those born shortly after the famine the authors look at how mortality rates between these groups differ and interact with an individual's socio-economic status using a logistic regression.

The authors use data from 66 villages close to the river on the assumption that these villages were more severely affected than others. Results indicate famine conceived neonates had a 33 percent higher probability of dying than those from the non-famine cohort.[3] Furthermore, the odds of dying were significantly higher for boys than for girls providing evidence for the Trivers Willard hypothesis, which states that males do not fare as well while *in utero* to adverse conditions. Overall, results suggest mortality among the famine conceived and famine born cohorts was higher up to the second year of life when compared to the non famine group. Results also indicate famine born children in higher socio-economic homes had a significantly lower rate of mortality than those in low socio-economic homes.[4] This paper extends this analysis by examining longer term outcomes and takes advantage of variation in famine severity within Matlab to improve upon the cohort design.

There are also documented effects of the 1974 - 1975 famine on fertility in the Matlab region (Razzaque, 1988). Total fertility rates declined by 34% during the famine, but the post famine period experienced a 17% increase in fertility. While fertility for women of all ages and socioeconomic groups was influenced, those of lower socio-economic status experienced a greater decline in fertility during the famine.

Hernandez-Julian *et al.* (2011) also investigate the relationship between the 1974 Bangladesh famine and infant mortality and the sex ratio at birth during the famine. Using data from the 1996 Matlab Health and Socioeconomic Survey and a cohort level analysis, results suggest exposure to the

[3] Neonates refers to babies in their first 28 days of life.

[4] Socio-ecconomic status was determined by the sum of the number of articles a home had. There were five types of articles considered: quilts, lamps, radios, watches and remittances.

famine while pregnant decreases the probability of a male birth. Analysis is restricted to individuals born between 1970 and 1980 and in utero is considered to be those born between September 1974 and December 1975. The paper also concludes that children who were *in utero* during the most severe months of the famine were 2 percent more likely to die within one month or one year of birth. The second outcome this paper considers is whether exposure to the famine while pregnant impacts post-famine pregnancy outcomes. To do this they look at the women who were pregnant during the famine and their post famine pregnancy outcomes (live birth, still birth, miscarriage). Results indicate women pregnant during the famine have a higher probability of having a stillbirth in a future pregnancy. Thus, there appear to be lingering effects of exposure to the famine while pregnant.

The 1959 - 1961 Chinese famine, which is the worst in recorded history with approximately 30 million deaths [Li and Yang (2005)], is the most extensively researched famine by economists. While the exact causal underpinnings of the famine are still being debated it is believed the economic policies of the Great Leap Forward are primarily to blame [Li and Yang (2005)].[5] The first paper to rigorously analyze the long term impacts of this devastating famine was Chen and Zhou (2007). Using the famine as a natural experiment the authors are able to investigate how exposure to famine at a young age and while *in utero* effects the adult height of individuals. Their key insight is to consider different age cohorts in conjunction with how severely a region was affected by the famine. To proxy for famine severity the authors use the excess death rate in 1960 for each region.[6] They take advantage of the variation both across regions and birth cohorts in a difference-in-difference

[5] Meng *et al.* (2010) also looks at the institutional causes of the 1959 - 1961 Chinese famine.

[6] The authors calculate the excess death rate in 1960 as the gap between the 1960 death rate and the three year average death rate before 1959 for each region.

model with region and cohort fixed effects.[7]

Using 1991 cross-sectional data they find exposure to the famine while in early childhood tends to have a more devastating and lasting effect than exposure at an older age. For example, they estimate that individuals born in 1960 would have grown 3.44 cm taller if they were not born during the famine.

This paper provides a framework to examine the long term impacts of a famine but it has several shortfalls. First, it is unable to address mortality selection, in the sense that individuals who survive may not be a random sample of individuals alive during the famine. It is not clear that survival is unrelated to height.[8] Furthermore, the data set used requires the authors to assume famine survivors did not internally migrate.[9] Using the 1959 - 1961 Chinese famine as a case study also lacks external validity since this famine was so widespread and severe, the results are difficult to place in another context.

Almond *et al.* (2010) also analyze the long term effects of *in utero* exposure to the 1959 - 1961 Chinese famine. They consider a more expansive number of socio-economic outcomes such as literacy, labor market status, wealth and marriage market outcomes. This paper is able to mitigate some of the potential confounding factors in the Chen and Zhou (2007) paper, such as the issue of internal migration. Using 2000 Chinese Population Census data, they look at cohorts born between 1956 - 1964, therefore having three pre-Famine years and three post-Famine years.[10] From the census they are able to determine an individual's birth month and year as well as their

[7]People born from 1954 - 1962 are the treatment group and those born from 1963 - 1967 are the control group.

[8]Grgens *et al.* (2012) have a recent paper that looks to disentangle the stunting and selection effects of the Chinese famine.

[9]The assumption about internal migration is based upon the residence registration system, which is called the Hukou. Migration under the planned economy needed to be approved by authorities on a case by case basis.

[10]They have a 1% sample of the 2000 census which includes more than 11 million observations.

province of birth which allows them to account for any potential internal migration that may have occurred.

In order to evaluate the effects of the Chinese famine, the authors construct a famine severity measure for each person. This measure is the province weighted average death rate for the duration of their fetal period.[11] To look systematically at how economic outcomes were affected by prenatal exposure to the Chinese famine they estimate an OLS regression that includes this famine severity index, year of birth, year of birth squared, year of birth cubed and province dummies. Regressions are run separately for men and women.

Basic results indicate exposure to famine while *in utero* is associated with having decreased economic outcomes. For example, women in the most famine exposed cohorts were 7.5% more likely to be illiterate and 13% more likely to be disabled. Furthermore, men in the most famine exposed cohorts were 6.5% more likely to be unmarried, and 8.2% more likely to have never married. Results indicate that prenatal famine exposure raised male mortality, as the most exposed famine cohort was composed of more females in 2000.[12] Moreover, it is found that women prenatally exposed to the famine bore more females than males.

One of the weaknesses of this paper, as with other famine papers, is the inability to address the selection issue created by famine-induced mortality. The authors believe that famine induced mortality causes negative selection and thus causes the results to be downward biased. Moreover, I believe the authors are not able to adequately address the issue of fertility selection. It could be the

[11]The measure captures the death rate while a person was in utero, which proxies for their level of famine exposure with the implicit assumption that exposure to a higher death rate implies a higher famine exposure.

[12]This result is consistent with the Trivers Willard hypothesis that male offspring tend to be more sensitive to adverse conditions while in utero.

case that mothers who chose to have children during the famine are somehow different than those who did not and the potential direction of this bias is not clear. The authors of this paper claim the education of women who had children during the famine is not any worse than women with children in adjacent cohorts and therefore believe there is no fertility selection bias. In my paper, I am able to address both the mortality and fertility selection issue in a more concrete manner.

3 Background

3.1 The 1974 - 1975 Bangladesh Famine

The Bangladesh famine of 1974 - 1975 was caused, in part, by severe monsoon flooding which destroyed a significant majority of the annual rice crop. The destruction of this crop, a staple in the area, led to an escalation of rice prices, a spike in unemployment and reduced the purchasing power of the poor whose primary occupation is farming (Razzaque *et al.*, 1990). Figure 1 depicts the average retail price of medium rice from July 1972 to May 1976, by month for Bangladesh overall and for the Chittagong district where Matlab is located. It can be seen from this figure the price of rice began to increase in early 1974 and then peaked in March 1975. The price of rice returned to its pre-famine level in late 1975. Market failures and price speculation in the food-grains market also played a substantial role in the cause of the famine (Ravallion, 1985).

To understand the long term impact of the famine it is also important to understand other historical events in the region now known as Bangladesh. Table 1 depicts a short timeline of major events in the region. While the region was settled in the early 1500's, Bangladesh did not become an independent state until 1971. The Bangladesh Liberation War with Pakistan began on March

25th, 1971 and officially ended on December 16th, 1971. Besides the tragedies of war, the region has also experienced two other large famines. The first one occurred between 1769-1770 and killed as many as a third of the Bengal delta population. The second famine occurred from 1943 - 1944 and an estimated 3.5 million people perished (Schendel, 2009).

Overall, the 1974-1975 famine had a significant impact causing an estimated 450,000 - 1.5 million deaths through starvation and diseases such as cholera and diarrheic diseases. For the purposes of this paper, I treat the rice price and availability shock, that caused the famine, as a random event and believe the empirical techniques described in Section 5 can be interpreted as causal estimates.

3.2 Trends in Mortality

Figures 2 - 4 graphically show the trends in mortality during and after the famine in the Matlab region of Bangladesh. Figure 2 graphs the average death rate for each year, by gender, for the entire Matlab region for May 1974 - May 1981. A large increase in the death rate is seen during the time of the famine for both males and females. Females have a slightly higher average death rate than males post famine.

Figure 3 depicts the number of deaths by year for different age groups. During the famine there is an increase in the number of deaths for those less than 10 years old and for those more than 50. However, there is not a substantial increase in the number of deaths for those aged 20 - 30 during the famine. This provides some evidence that this age group is an appropriate comparison group as they may not have been as severely affected by the famine in terms of mortality or development.

Lastly, Figure 4 depicts the death rate by year for villages with an above average famine severity index and for villages with a below average famine severity index. Construction of the famine severity index is detailed in the next section, but this is a general village level measure of famine severity. As expected, villages with an above average famine severity index experienced a higher death rate in 1975 than those with a below average famine severity index. However, those with a below average famine severity index did experience an increase in mortality during the famine.

3.3 Mechanisms

I postulate that an individual's nutritional status is the mechanism through which this health shock may affect later life outcomes. Nutrition has consistently been linked to short term and long term human capital outcomes. Recent reviews on this topic include (Currie, 2009) and (Glewwe and Miguel, 2008). However, due to data constrains the analysis follows a reduced form approach. Results can not be attributed to a specific mechanism, such a malnutrition, but rather to overall predicted famine exposure.

4 Data

To examine the long term effects of the 1974 - 1975 Bangladesh famine I use three data sources. The key component to these three data sets is the unique individual identifiers that are common between the three data sources, making it possible to link each of the datasets. All of the data sources cover the Matlab region of Bangladesh.[13] The first data set comes from the Demographic Surveillance System (DSS), which tracks all vital events for people in Matlab. A vital event is defined as a birth, death, marriage, divorce, migration out or in to the area. The DSS covers 149

[13]The Matlab area of Bangladesh is located approximately 60 kilometers south-east of Dhaka and is primarily a poor rural area.

villages and approximately 200,000 people. It was set up in 1966 by the International Center for Diarrhoeal Disease Research, Bangladesh (ICDDR, B) and is still tracking people in the Matlab region today. Unfortunately, the data only exists electronically starting from May 1974. For this analysis, data from May 1974 through 1996 is used.

In addition to the DSS data, the 1996 Matlab Health and Socioeconomic Survey (MHSS), conducted by ICDDR,B, the University of Colorado and other partner institutions is used.[14] This survey collected detailed information on health, demographic, social and economic outcomes for 15 percent of the DSS site. The individuals surveyed in MHSS come from a random subsample of baris, the primary decision making unit in Bangladesh, within the DSS site.[15] The primary sample includes 4,538 households. The MHSS data contains information regarding an individual's long-term outcomes such as disability status, cognitive ability, anthropometric measures, earnings and educational attainment. Currently I use anthropometric and educational attainment information from the MHSS. All outcome data comes from the MHSS.

In the analysis when height is used as an outcome each individual's height is standardized into a z-score. This is done so different ages can be compared to each other. While it is optimal to use international height standards, I can not find any information on international standards for both adults and children.[16] To temporarily overcome this problem, I internally standardized height by gender and age.

[14]This survey is referred as MHSS1 because another large survey of the same area will be occurring in 2012 and is referred to as MHSS2.

[15]Baris usually consist of 2 to 3 households

[16]To my knowledge the WHO only has international hight standardizing information for those under the age of 19. However, I will need information for those older than this. One option I am exploring is obtaining height information from India to use in standardizing the data. Another option is obtaining height information from Bangladesh prior to the famine. I am looking into both of these options.

The final dataset I use is the 1974 census of the entire DSS site.[17] The household level census includes data on the household unit (i.e. how much land the household owns) and basic questions such as date of birth and educational attainment for all members of a household. The 1974 census was taken in March, before the beginning of the famine in June. I use the 1974 census to obtain baseline characteristics about individuals and the households they lived in during the famine. This census will be critical when examining the heterogenous effects of the famine, such as the differential impacts by socio-econoic status.

4.1 Famine Severity Index

It is understood that the famine affected areas of Matlab differently. Specifically, villages along the main river are thought to have been more severely affected by the flood than others (Razzaque *et al.*, 1990). To account for this, I create a famine severity index to capture the intensity of the famine within a village. Using the DSS and the 1974 census, the famine severity index is created to be the percent deviation of the 1975 death rate for a village from the average death rate for that village from 1978. Ideally, I would have liked to have used 1974 death rate data instead of 1978 death rate data to construct the index, however due to data constraints this is not possible. I chose to only use data from 1978 to form a basis of comparison because the family planning measures of the MCH-FP were introduced in 1977 in half of Matlab, and mortality was affected for several years after the famine.[18] The family planning measures provided in MCH-FP have been shown to reduce

[17] Censuses are also conducted in 1982, 1993 and 2005 of the entire DSS area.

[18] The Matlab Maternal and Child Health and Family Planning Program (MCH-FP) is a large and comprehensive social program aimed at improving the health and human capital of it's participants. The program included access to family planning beginning in 1977 and then health measures such as doorstep delivery of vaccines began in 1982. Treatment status in the program is something I control for in my analysis.

fertility and thus impact the overall death rate of a village (LeGrand and Phillips, 1996). Figure 5 depicts the Matlab area with the village boundaries and the treatment and comparison status of each village for the MCH-FP program. Only using the death rate from 1978 reduces potential contamination with the MCH-FP program.

The preliminary index ranges from -1 to 3.38, with a mean of 0.68. Over 90 percent of villages have a positive index, indicating that most villages experienced increased mortality during the famine.[19] A village with an index of 0.68 has a 68% increase in the death rate during 1975 as compared to the death rate in 1978 for that village. Figure 6 gives a spatial representation of where the high famine severity villages are located. It can be seen from this figure that some villages close to the river did suffer from the famine more in terms of mortality, however not all villages that were the most affected are close to the river.

I am exploring how noisy the death rate is since the population in each village may not be large enough to give a reliable estimate. One option to overcome this potential problem is to group small villages together. From Figure 6 it can be seen that some villages are rather small. Creating a famine severity index by a larger geographical unit than the village may be necessary, to mitigate the small population in some villages. I also intend on generating a famine severity index for males and females separately, as (Razzaque *et al.*, 1990) found that male mortality was much higher than female mortality during the famine. In future drafts, I intend on generating an index that only considers the under five mortality rate.

[19] Only one small village has a famine severity index equal to -1. This village has no reported deaths in 1975 and will not be included in the analysis.

5 Estimation Strategy

To empirically test the long-term effects of the 1974 -1975 Bangladesh famine I examine the effect of the famine on six age groups. Figure 7 depicts a timeline of the famine and explains the age groups. The famine began in June, 1974 and officially ended in July, 1975.[20] Four of these cohort groups are people who are alive during the famine. I focus on those aged 0 - 5, 6 - 10, 11 - 15 and 16 - 20. The next group are those individuals born during the famine but conceived prior to the famine. These individuals will have date of births between June, 1974 and March, 1975. To test the fetal origins hypothesis I am interested in the group of individuals conceived during the famine, those with date of births between March, 1975 and April, 1976.

There are two potential cohorts of interests that can be used as a comparison group. The first group are those individuals alive during the famine, but old enough so that the famine did not impact their economic and health capital outcomes. In analyzing the data it appears that the appropriate comparison group are those aged 20 - 25 during the famine. While this group should be quite similar to the treatment groups it is possible they too are affected by the famine in a way that influences their long-term outcomes. Assuming the 20 - 25 year old cohort is affected in the same way as the treatment cohorts of interest, using this group as a comparison leads to potentially attenuated results.

The second potential comparison group are those individuals born after the famine. It is not useful to use those born directly after the famine as there are documented lingering effects of the famine on mortality, thus it is likely there are lingering effects on other outcomes as well (Razzaque

[20] For this proposal I am assuming months begin and end on the 15th.

et al., 1990). However, using individuals born a few years after the famine also presents forms of bias. The potential bias from this group is less clear as there are two potential competing stories. The first story is a world where only the strongest adults survived and are able to reproduce shortly after the famine. Therefore, this group may be inherently different as they may be taller or more educated to begin with thus creating a positive bias. On the other hand there could be potential lingering effects of the famine that could influence these individuals introducing a negative bias. Due to the potential bias from using a cohort born after the famine, I use those aged 20 - 25 during the time of the famine as a comparison group.

5.1 Empirical Specification

I estimate a cohort model where all of the treatment groups are included separately. Equation (1) depicts the first model specification.

$$\begin{aligned} Y_{iv} &= \beta_0 + \beta_1 Conceived_{iv} + \beta_2 Born_{iv} + \beta_3 Age0to5_{iv} + \beta_4 Age6to10_{iv} \\ &\quad + \beta_5 Age11to15_{iv} + \beta_6 Age16to20_{iv} + \delta_v + X'_{iv}\mu + SB'_i\theta + \epsilon_{iv} \qquad (1) \end{aligned}$$

Where i denotes an individual, v a village and c a cohort. The variables of interest, *Conceived*, *Born*, *Age0to5*, *Age6to10*, *Age11to15*, *Age16to20*, equal one if an individual's birthdate lies in the intervals described in Figure 7 and zero otherwise. The omitted age group are those aged 21 - 25 during the famine. An individual's outcome variable of interest is denoted by Y_{ivc}.[21]

This model includes village fixed effects, so it is identified off of variation in the cohorts within a village. The vector X includes a number of baseline (March 1974) controls such as religion,

[21] I have also run a model that has single year of birth indicators. This specification helped me choose the 6 age groups of interest.

household head's education in 1974, household size in 1974, eligibility for the Maternal Child Health and Family Planning (MCH-FP) program, and whether the household benefited from the embankment. Controls are included to account for differences there may have been prior to the famine, and major changes that took place afterwards. Season of birth fixed effects are also included, as $SB\theta$. Three seasons are used, the hot season (March - May), the monsoon season (June - October) and the dry season (November - February). The hot season is the omitted group. The coefficients of interest in this equation are β_1 - β_6 , which are the effect of being exposed to the famine at different age groups. The relative size and ranking of each of these coefficients is interesting as it sheds light on which age during childhood adverse environmental conditions have the most impact. The causal inference of this model relies on the assumption that the famine was random given the vector of controls.

All regressions are run separately for males and females, as there are documented gender differences in nutritional status during the famine (Bairagi, 1986). Results should be interpreted in an intent-to-treat framework as there is no individual measure of how much the famine affected an individual.[22]

While the cohort analysis provides intuition as to which age groups should be affected, one concern with this methodology is the presence of general trends in the Matlab region of Bangladesh. For example, it is not unreasonable to believe that individuals are becoming more educated over time. For this reason, it is useful to introduce another level of variation to the analysis.

To account for possible changes over time and across cohorts, I take advantage of the spatial

[22]All of this analysis is done using the MHSS dataset for outcome variables and to identify an individual's date of birth. The 1974 census is used to build the vector of controls.

and cohort variation in the famine by fully interacting the famine severity index with each of the cohorts of interest.

$$Y_{ivc} = \sum_c Cohort_c \beta + \sum_c FSI_v * Cohort_c \gamma + \delta_v + X^{'}_{ivc}\mu + SB\theta + \epsilon_{ivc} \tag{2}$$

Here $Cohort_c$ includes the cohort variables of interest: *Conceived*, *Born*, *Age0to5*, *Age6to10*, *Age11to15*, *Age16to20*. These variables equal one if an individual's birthdate lies in the intervals described in Figure 7 and zero otherwise. Each cohort dummy is then interacted with the famine severity index, FSI_v. This model is a difference-in-difference style estimator that does not rely solely on cohort comparisons. The omitted age group are those aged 21 - 25 during the famine. This group is not likely to be affected by the famine so it controls for differences between the areas. For the estimates of this model to be unbiased I assume that changes in the excess death rate are not systematically related to other omitted factors that may affect outcomes.

It is also useful to look at the different quartiles of the famine severity index. To better understand how individuals who were exposed to a higher famine severity index fare compared to those exposed to a lower famine severity index I create four quartile dummies for the famine severity index. The fourth quartile represents the highest famine severity. I then interact each quartile with the treatment groups of interest. Equation (3) depicts this model.

$$Y_{ivc} = \sum_c Cohort_c \beta + \sum_c \sum_{i=2}^{4} QiFSI_v * Cohort_c \gamma + \delta_v + X^{'}_{ivc}\mu + SB\theta + \epsilon_{ivc} \tag{3}$$

This model follows the same notation as the one described in Equation 2. Each cohort dummy is then interacted with three of the famine severity quartiles. The famine severity index quartiles are represented as: QiFSI, where $i = 2, 3, 4$ is a dummy variable for each quartile. The group not included is the lowest famine severity quartile and those aged 21 - 25. With this model it is possible to compare the effects of the famine within the same cohort group based on which famine severity quartile an individual is in. For example, the coefficient on $Q4FSI_v * Conceived$ gives the the effect for an individual conceived during the famine and in the highest exposure group compared to conceived individuals in the lowest exposure group. A monotone relationship is expected between the three coefficients where a given cohort is interacted with the quartile dummies. A larger effect is expected for those in the fourth quartile as compared to those in the second or third quartile.[23]

To further explore the effects of the famine on individuals, I am interested in the potential for heterogenous treatment effects across individuals with particular characteristics. Such as: the education of the household head, the land holdings of the family, gender and socio-economic status. Estimating these effects requires fully interacting the individual characteristic with the model given in Equation (2) or Equation (3).

6 Preliminary Results

6.1 Graphical Analysis

Figures 8 - 12 graphically examine the long term impacts of the 1974 Bangladesh famine on an individual's height and years of completed education. Figure 8 graphs the average height in cen-

[23]In future work, I would like to conduct a partial F-test to determine if the coefficients within a cohort are statistically different. This test is also run on the coefficients for the different age cohorts. Additionally, the coefficients on the three quartile indicators themselves should all be close to zero, as this indicates there are no differences with respect to the outcome in the villages prior to the famine.

timeters by year of birth for 1950 - 1978 by gender. The two vertical lines represent the duration of the famine. Females are on average 150 cm tall, which is roughly 12 cm shorter than males. There is no general increase or decreasing trend for males or females during this time frame. However, some noise in the estimate can be seen for both males and females.

Figure 9 looks at the height of males in 1996 as a function of their year of birth and their quartile of the famine severity index.[24] The highest and lowest quartiles are graphed. The famine is indicated by vertical bars for the years 1974 and 1975. It is evident the average height is similar in magnitude, in high and low famine severity areas, until a large separation is seen for those born between 1967- 1970. Those born during this time and who lived in a village where the famine severity index is in the first quartile appear to be taller on average compared to the fourth quartile. To the extent that height is a measure of childhood health, this difference is consistent with the story that individuals in villages more severely hit by the famine in terms of mortality had worse health as a child. It can also be seen that those individuals conceived during the famine, those born during 1975 or early 1976, are taller for both famine severity index quartiles than the cohorts surrounding them.

Female height by year of birth and famine severity index is graphed in Figure 10. The height for the first quartile and fourth quartile appear to be slightly different for those born between 1950 and 1955 for the females. There also appears to be a difference between the two quartiles for those born between 1967 and 1971. This is an age group whose development may have been affected by the famine. Indeed those born in a village with a lower mortality impact from the famine are taller on average than those born in a more severely impacted village. Females in the first famine

[24] The height and education data comes from the MHSS 1996 survey.

severity index quartile, and born or conceived during the famine appear to be taller than those born or conceived during the famine but in the fourth famine severity index quartile.

The completed years of education for males by year of birth and famine severity index is graphed in Figure 11. Again the vertical bars indicate the years of the famine. An increasing trend beginning in 1967 can be seen for both the first and fourth quartiles of the famine severity index. A separation between the average years of completed education is seen between the first and fourth famine severity index quartiles for those born between 1963 and 1967. These individuals were between the ages of 7 and 11 during the time of the famine. Males born in a first quartile famine severity index village obtained more education on average. This result is consistent with the story that an individual's human capital development was negatively affected by the severity of the famine.

Figure 12 represents the average completed level of education for females by year of birth and famine severity index quartile. An increasing trend over time is seen for this group. While the average level of education for females does appear a bit noisier than the results for males, a separation is also seen for individuals born between 1963 and 1967. Again, those born in a village with a lower famine severity index appear to have obtained more education on average. Females born or conceived during the famine also appear to have higher levels of completed education if they were born in a village with a lower famine severity index.

6.2 Regression Results

Tables 2 - 11 describe preliminary regression results. In each of these table there are five columns, representing five separate regressions. The first column has no controls or fixed effects, the second column adds village fixed effects, the third adds baseline controls, the fourth adds a control for the embankment and the fifth adds season of birth fixed effects. The age group left out is always those age 21 - 25 during the famine.

Table 2 depicts the first cohort model, described in Equation **??**, for both males and females using the z-score of height as the outcome of interest. All point estimates can be interpreted in terms of standard deviation changes. There are no statistically significant effects on height for any age cohort, for either gender. For females conceived during the famine there is a consistent negative point estimate across the specifications, suggesting females conceived during the famine were negatively impacted by the famine.

Regression results for the difference-in-difference model using the z-score of height as the dependent variable are presented in Tables 3 and 4 for males and females. For males, those born or conceived during the famine are taller on average suggesting the presence of positive selection. In the full specification, on average, individuals born during the famine grew .479 standard deviations taller in the presence of the famine.[25] Negative effects are seen for those alive during the famine but under the age of 20, although the estimates are not statistically significant.

For females, a different story is evident. The only cohort negatively affected by the famine are those born during the famine. On average, females born during the famine would have otherwise grown .34 standard deviations taller in the absence of the famine, given the full specification. All other cohorts have positive point estimates, but nothing is statistically significant in the full specification.

Tables 5 and 6 represent the third model for males and females, considering the z-score of height as the dependent variable. The fourth quartile are the highest famine severity villages and the first

[25] This is calculated given the mean value of the famine severity index is .68 and the point estimate is 0.705

quartile are the lowest famine severity villages. Looking at the results by famine severity quartile reveals differences between the quartiles, previously concealed in the other models. For example, for males, only those born during the famine and in a village where the famine severity index is in the third or fourth quartile experience a positive effect of the famine. Those born during the famine in a village in the highest famine severity quartile are on average 0.583 standard deviations taller than individuals born during the famine in a village in the lowest famine severity quartile. While the magnitude of these results are in a reasonable range, the estimates should be analyzed with caution due to the potential small sample sizes in each quartile cohort cell.

Table 6 provides the strongest evidence that height was negatively affected for females born during the famine. Results also indicate those age 0 - 5 during the famine were shorter if they lived in a third quartile famine severity village compared to a first quartile famine severity village. Taken together, Tables 5 and 6 highlight the fact that the famine affected males and females differently.

Years of completed education is the outcome of interest in the remaining results tables. Table 7 presents the first cohort model results for both males and females. From this table it is evident there are strong trends in years of completed education over time, as both males and females are increasing their education ever time.

Tables 8 and 9 represent the second empirical specification for males and females, considering years of completed education as the outcome. Males born or conceived during the famine have higher levels of completed education while those age 0 - 10 have decreased average levels of completed education. For example, on average those conceived during the famine obtained 0.86 years more of completed education.[26] This story is similar to the one seen for male height.

[26]This is calculated given the mean of the famine severity index of 0.68 and the point estimate of 1.274.

While no variable is statistically significant in Table 9, it appears that females conceived or age 11 - 15 during the famine experienced decreased levels of completed education. The other cohorts experienced positive increases in the years of completed education.

Tables 10 and 11 show regression results for the third model specification for males and females respectively. For males, there are consistent positive effects for those born or conceived during the famine and negative effects for those in the older cohorts during the famine. While none of the point estimates are statistically significant, their relative magnitudes are quite large. For example, those conceived during the famine in a village most impacted by the famine have, on average, 1.45 more years of completed education than those conceived during the famine in a village least impacted by the famine. For females, there are no evident patterns.

7 Selection Issues

Two important sources of bias are selection due to mortality and migration. Mortality selection occurs as people perish during the famine non randomly. Similarly, people migrated during the famine in non random ways. The direction of the bias due to these sources of selection is unclear and may differ for males and females.

During the 13 month period of the famine 4,502 people died in the Matlab region. Of these people 50% were female, 29% were born after March 1974 and 58% were under the age of 10. During the famine there were 10,720 people who migrated, 30% of which were under the age of 10 and 50% of which were female. The preliminary evidence of family migration during a natural disaster is something I will explore further.[27]

To begin to understand the selection problems, Table 12 depicts descriptive statistics of households who had a family member die during the famine, those who had a family member migrate during the famine and households that had neither event occur. Results indicate households who had a family member die or migrate were larger in size than those not affected. Households that migrated also appear to have walls and roofs made out of tin with less frequency than households who were not affected, indicating some dimension of socio-economic status. Most of the characteristics are significantly different from each other when looking between the three groups, indicating the circumstances an individual faced in each of these groups was indeed different.

In an effort to address the selection bias issue when looking at the long-term impacts of the famine I plan on creating bounds for the estimated average treatment effects. I will use the method presented in (Lee, 2009), which will identify the excess number of individuals who die because of the famine and then trim the upper and lower tails of the outcome distribution by this number.[28]

8 Conclusion

Using the 1974-1975 Bangladesh Famine, this paper explores the effects of an adverse health shock on an individual's long-term human capital outcomes. Using an individual's age during the famine and how severe their exposure was, a difference-in-difference specification is used to determine the

[27] In the region of Matlab it is most common for only men to migrate for work, and thus evidence of family migration is interesting. Using the DSS I will also be able to see which families came back to Matlab after the famine and which ones left permanently.

[28] For the selection issue I do not think I can use a standard Heckman two-step estimator to correct the bias as I do not have a variable that affects selection but not the outcome of interest. I can not credibly defend an any exclusion restriction I would have to make.

impact of the famine on an individual's height and completed years of education. When looking at the height of males, there appears to be positive selection for those born or in utero during the famine as they experience an increase in height. Males born during the famine are 0.48 standard deviations taller in the presence of the famine. However, females born during the famine are 0.34 standard deviations shorter in the presence of the famine. Similarly, males born during the famine obtain 1.89 more years of completed education on average in the presence of the famine, while females born during the famine only receive .93 more years of education in the presence of the famine. Thus, even though the results are not statistically significant, males born during the famine seem to experience a positive selection, while females born during the famine were negatively effected by the adverse health shock.

Figure 1: Average Retail Price of Medium Rice (in Taka) Source: Hernandez-Julian et al. 2011

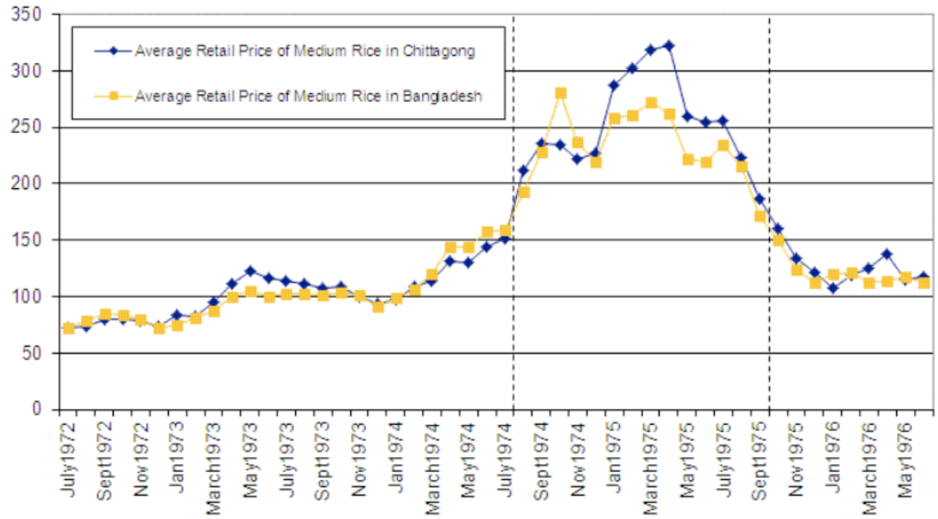


Figure 2: Matlab Mortality by Gender

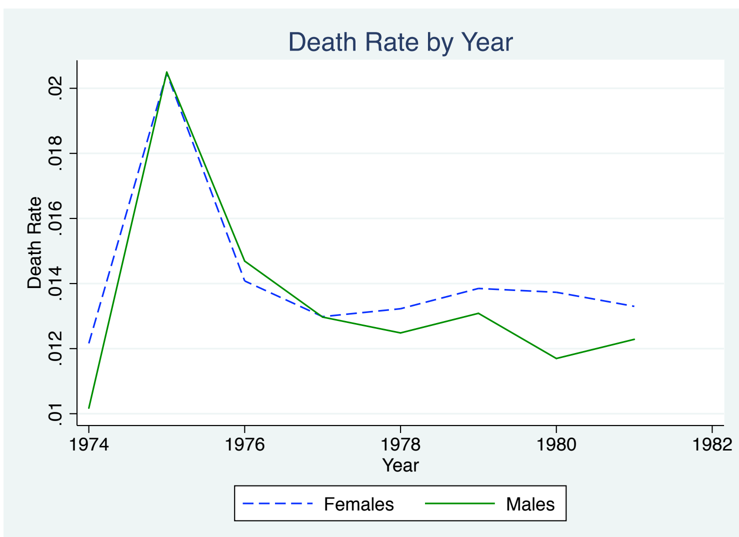


Figure 3: Matlab Mortality by Age Group

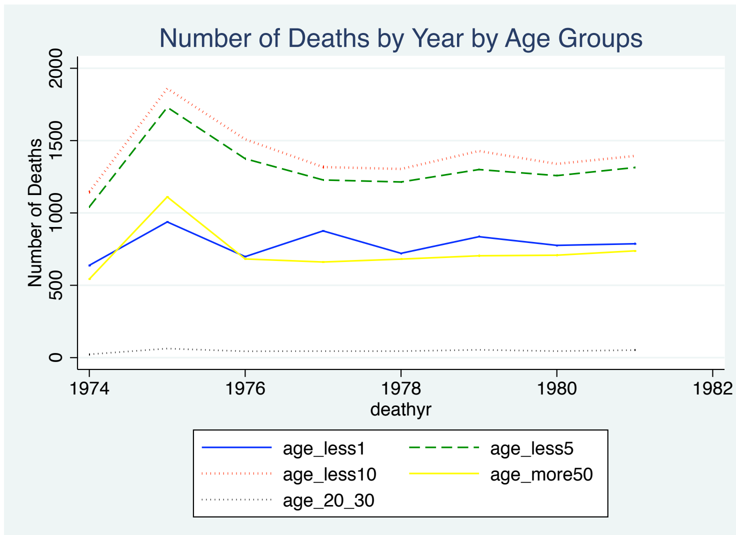


Figure 4: Matlab Mortality by Famine Severity Index

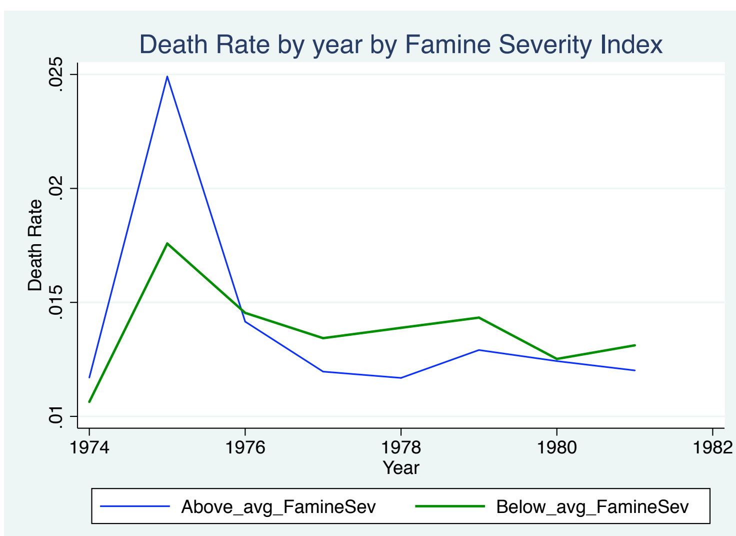


Figure 5: The Matlab Study Site, MCH-FP Treatment Status by Village

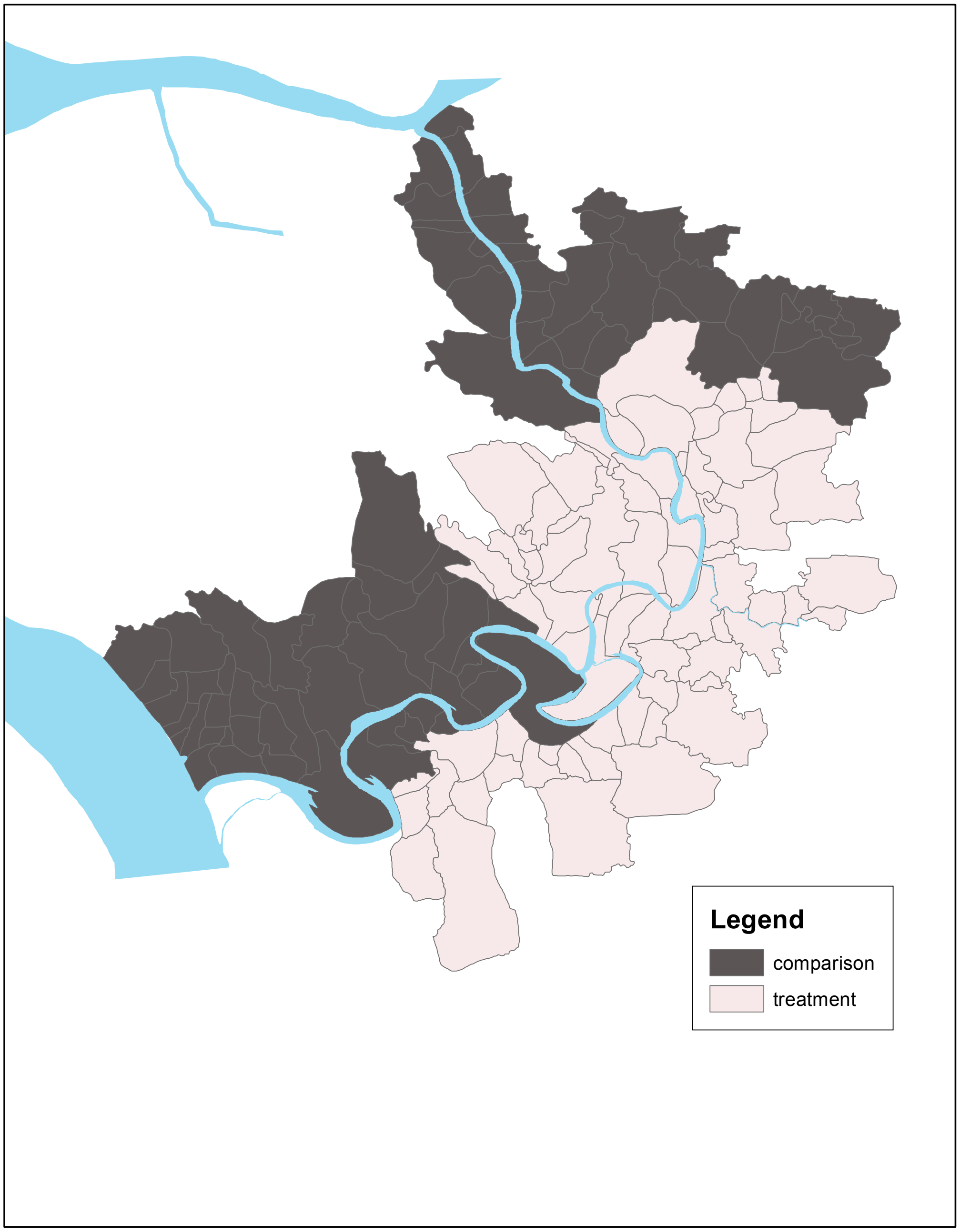


Figure 6: Matlab, Famine Severity Index by Village

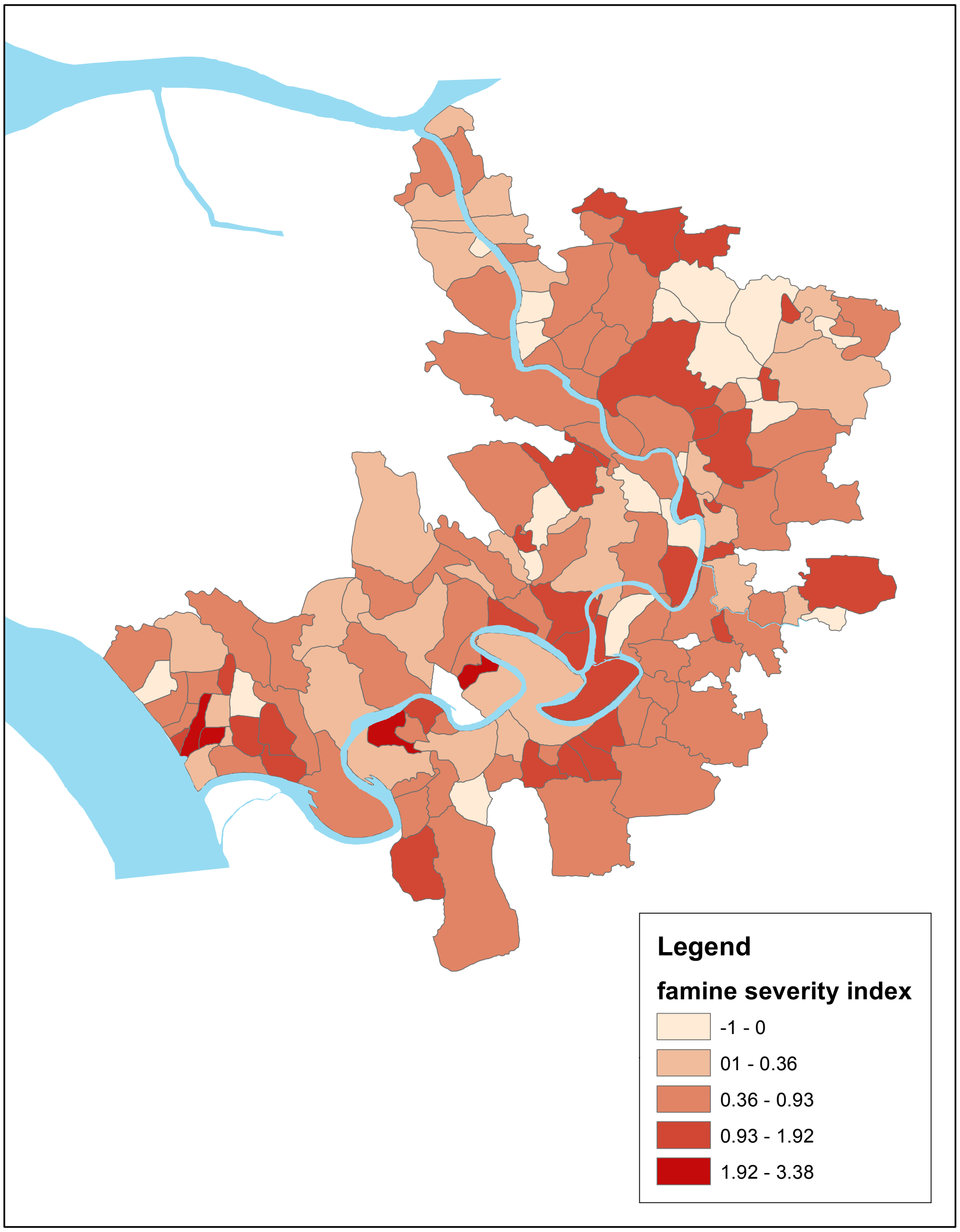
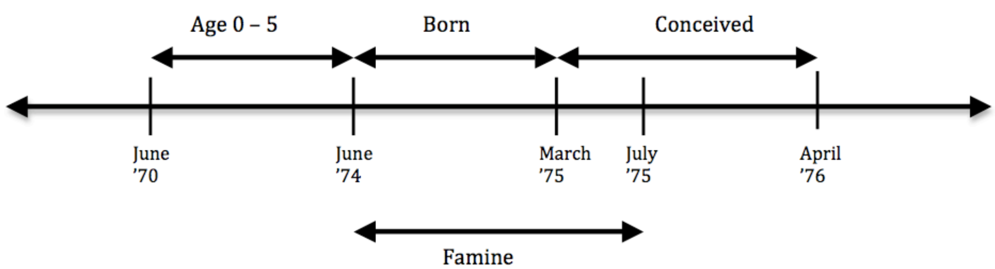


Figure 7: 1974 - 1975 Bangladesh Famine Timeline



Famine:	June 1974 – July 1975	Age 6 - 10:	DOB June 1965 – June 1970
Conceived:	DOB March ’75 - April ‘76	Age 11 - 15:	DOB June 1960 – June 1965
Born:	DOB June ’74 – March ’75	Age 16 - 20:	DOB June 1955 – June 1960
Age 0 – 5:	DOB June’70 – June ’74	Age 21 - 25:	DOB June 1950 – June 1955

Figure 8: Height by Year of Birth

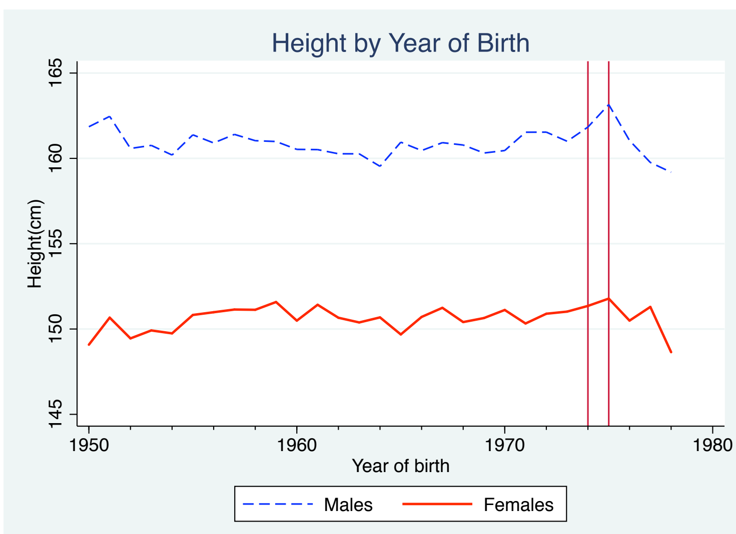


Figure 9: Male Height by Year of Birth and Famine Severity Index

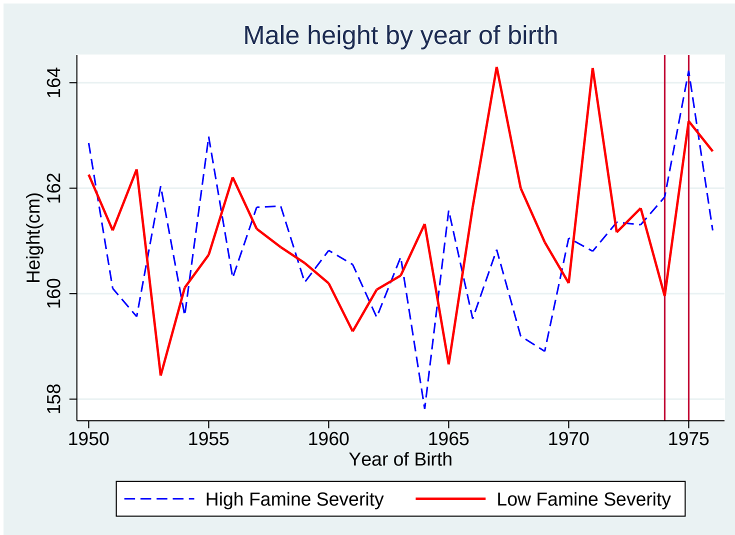


Figure 10: Female Height by Year of Birth and Famine Severity Index

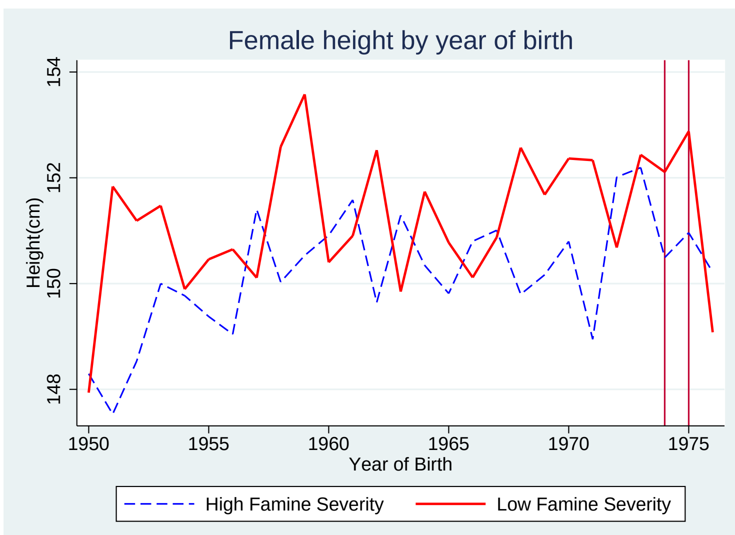


Figure 11: Male Education by Year of Birth and Famine Severity Index

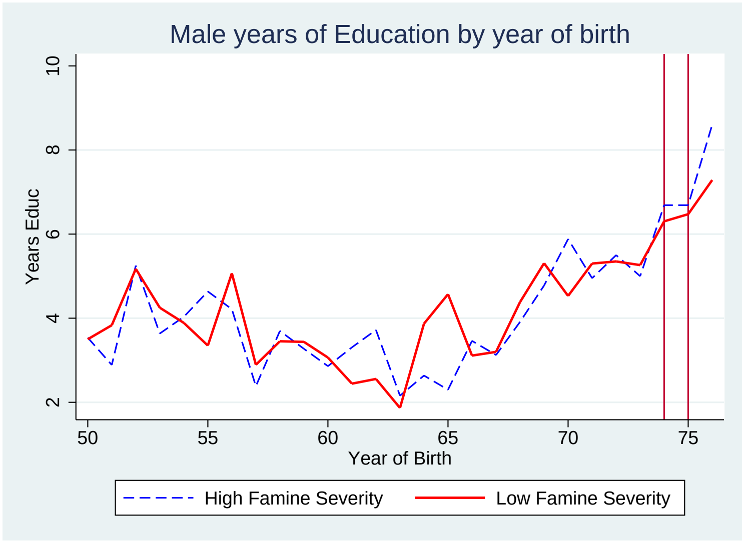


Figure 12: Female Education by Year of Birth and Famine Severity Index

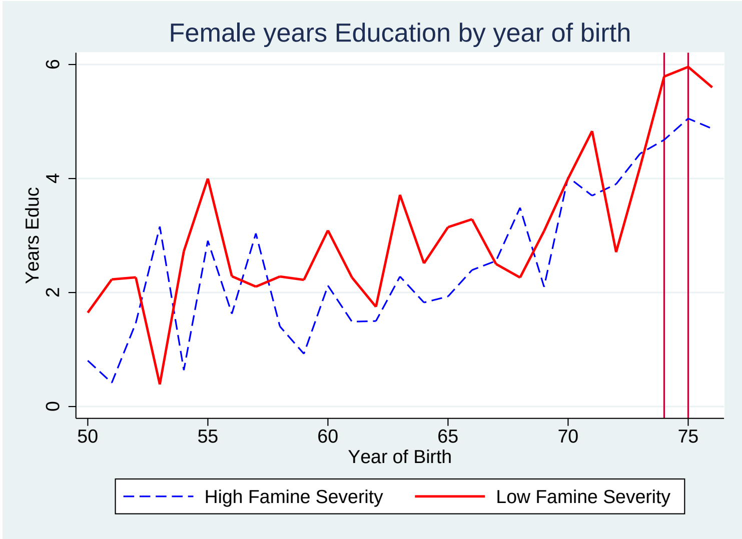


Table 1: Timeline of Bangladesh Major Events

Date	Event
1520s	First Europeans (Portuguese) settle in the Bengal delta
1580s	Portuguese open the first European trading post in Dhaka (Dutch follow in 1650s, English in 1660s, French in 1680s)
1690	Calcutta (today Kolkata) established by British
1757	British East India Company establishes itself as de facto ruler of Bengal
1757 - 1911	Kolkata is the capital of Bengal and British India
1769 - 1770	Great Famine. As many as a third of Bengal's population may have perished
1858	East India Company abolished and British crown assumes direct control
1860	British annex last part of Bengal, the Chittagong Hill Tracts
1943-4	Great Bengal Famine causes about 3.5 million deaths
1947	August 14, British rule ends and British India is partitioned. The Bengal delta becomes part of the new state of Pakistan under the name 'East Bengal'. Dhaka is the capital.
1947-8	About 800,000 migrants arrive in East Pakistan from India, and about 1,000,000 migrants leave East Pakistan for India.
1956	'East Bengal' renamed 'East Pakistan'
1965	India-Pakistan War
1970	Cyclone kills 350,000 - 500,000 people in the Bengal delta
1971	March 25, beginning of Bangladesh Liberation War
1971	December 16, end of war. East Pakistan becomes independent state of Bangladesh
1972	Bangladesh declares itself a people's republic
1973	Bangladesh's first general elections. Constitution and parliamentary systems established.
1974	Famine causes excess mortality of an estimated 1.5 million people
1975 -97	Chittagong Hill Tracts war
1988	Major floods cover 60 percent of Bangladesh for fifteen to twenty days
1991	General elections won by Bangladesh Nationalist Party (BNP). Khaleda Zia becomes prime minister (1991-1996)
1991	Cyclone kills 140,000 people in southeastern Bangladesh
1993	Groundwater arsenic poisoning discovered
1998	Major floods cover 60 percent of Bangladesh for sixty-five days
2006	Nobel Prize for Grameen Bank and Muhammad Yunus

Timeline is adapted from Schendel 2009

Table 2: Model 1 Males and Females, Dependent Variable: Height Z-Score

	(1)	(2)	(3)	(4)	(5)
A. Males					
Conceived	-0.027	-0.055	-0.079	-0.085	-0.079
	(0.118)	(0.123)	(0.147)	(0.146)	(0.145)
Born	-0.003	-0.043	-0.167	-0.166	-0.162
	(0.183)	(0.200)	(0.216)	(0.216)	(0.217)
Age 0 - 5	-0.007	0.007	-0.007	-0.013	-0.010
	(0.079)	(0.081)	(0.090)	(0.088)	(0.088)
Age 6-10	-0.002	0.041	0.041	0.040	0.043
	(0.075)	(0.078)	(0.080)	(0.080)	(0.081)
Age 11-15	-0.002	0.008	0.010	0.012	0.013
	(0.071)	(0.075)	(0.076)	(0.076)	(0.076)
Age 16 - 20	-0.003	0.021	0.039	0.038	0.039
	(0.074)	(0.080)	(0.083)	(0.082)	(0.083)
Constant	0.004	-0.021	-0.135	-0.002	0.024
	(0.053)	(0.055)	(0.089)	(0.121)	(0.127)
Observations	1774	1774	1632	1629	1629
R-squared	0.000	0.072	0.089	0.091	0.091
B. Females					
Conceived	-0.117	-0.127	-0.090	-0.089	-0.082
	(0.145)	(0.149)	(0.148)	(0.146)	(0.149)
Born	0.005	0.019	0.023	0.023	0.024
	(0.140)	(0.140)	(0.170)	(0.167)	(0.168)
Age 0 - 5	-0.022	-0.017	-0.020	-0.015	-0.011
	(0.068)	(0.072)	(0.075)	(0.075)	(0.074)
Age 6-10	-0.013	-0.016	-0.006	-0.002	0.003
	(0.061)	(0.064)	(0.069)	(0.070)	(0.069)
Age 11-15	-0.016	-0.034	-0.024	-0.014	-0.011
	(0.059)	(0.060)	(0.061)	(0.060)	(0.060)
Age 16 - 20	-0.028	-0.051	-0.080	-0.080	-0.076
	(0.070)	(0.072)	(0.069)	(0.069)	(0.069)
Constant	0.018	0.108**	0.046	0.290**	0.285**
	(0.049)	(0.045)	(0.083)	(0.141)	(0.142)
Observations	2629	2629	2227	2223	2223
R-squared	0.000	0.070	0.085	0.087	0.087
Village FE	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	Yes
Embankment Control	No	No	No	Yes	Yes
Season of Birth FE	No	No	No	No	Yes

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Notes: Standard errors are clustered at the village level. Baseline controls include characteristics from the 1974 census. These are: if the household head was Hindu, years of education of the household head, household size, whether the house had a tin roof and MCH-FP treatment status. The left out season of birth dummy is the dry season, November - February.

Table 3: Model 2 Males, Dependent Variable: Height Z-Score

	(1)	(2)	(3)	(4)	(5)
Conceived	-0.217	-0.254	-0.302	-0.308	-0.300
	(0.182)	(0.186)	(0.228)	(0.228)	(0.230)
Born	-0.268	-0.395	-0.574	-0.575	-0.575
	(0.341)	(0.362)	(0.362)	(0.359)	(0.359)
Age 0 - 5	0.066	0.074	0.087	0.077	0.074
	(0.138)	(0.138)	(0.177)	(0.175)	(0.175)
Age 6 - 10	0.161	0.177	0.153	0.152	0.152
	(0.144)	(0.149)	(0.170)	(0.170)	(0.170)
Age 11- 15	0.141	0.127	0.149	0.150	0.148
	(0.157)	(0.165)	(0.178)	(0.178)	(0.178)
Age 16 - 20	0.077	0.096	0.085	0.086	0.084
	(0.152)	(0.162)	(0.179)	(0.179)	(0.179)
Conceived * FSI	0.299	0.309	0.338	0.338	0.335
	(0.236)	(0.256)	(0.301)	(0.302)	(0.303)
Born * FSI	0.475	0.627	0.698	0.700	0.705
	(0.461)	(0.473)	(0.472)	(0.469)	(0.466)
Age 0 - 5 * FSI	-0.111	-0.103	-0.147	-0.141	-0.132
	(0.171)	(0.175)	(0.258)	(0.257)	(0.257)
Age 6 - 10 * FSI	-0.253	-0.212	-0.176	-0.176	-0.172
	(0.207)	(0.226)	(0.259)	(0.259)	(0.257)
Age 11 - 15 * FSI	-0.221	-0.186	-0.216	-0.215	-0.211
	(0.216)	(0.229)	(0.258)	(0.258)	(0.259)
Age 16 - 20 * FSI	-0.123	-0.116	-0.071	-0.072	-0.069
	(0.215)	(0.235)	(0.270)	(0.270)	(0.269)
FSI	0.061				
	(0.169)				
Constant	-0.037	-0.070	-0.183	-0.054	-0.028
	(0.114)	(0.106)	(0.139)	(0.159)	(0.161)
Observations	1774	1774	1632	1629	1629
R^2	0.006	0.077	0.094	0.096	0.096
Village FE	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	Yes
Embankment Control	No	No	No	Yes	Yes
Season of Birth FE	No	No	No	No	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: Standard errors are clustered at the village level. Baseline controls include characteristics from the 1974 census. These are: if the household head was Hindu, years of education of the household head, household size, whether the house had a tin roof and MCH-FP treatment status. The left out season of birth dummy is the dry season, November - February.

Table 4: Model 2 Females, Dependent Variable: Height Z-Score

	(1)	(2)	(3)	(4)	(5)
Conceived	-0.317	-0.400	-0.265	-0.269	-0.270
	(0.256)	(0.263)	(0.321)	(0.317)	(0.317)
Born	0.172	0.157	0.308	0.312	0.313
	(0.253)	(0.249)	(0.277)	(0.273)	(0.272)
Age 0-5	-0.203*	-0.171	-0.103	-0.095	-0.092
	(0.108)	(0.117)	(0.127)	(0.128)	(0.127)
Age 6-10	-0.041	-0.057	-0.015	-0.014	-0.010
	(0.092)	(0.100)	(0.106)	(0.108)	(0.108)
Age 11-15	-0.136	-0.146	-0.098	-0.087	-0.086
	(0.104)	(0.108)	(0.105)	(0.106)	(0.106)
Age 16 -20	-0.037	-0.059	-0.094	-0.096	-0.094
	(0.109)	(0.118)	(0.112)	(0.111)	(0.111)
Conceived * FSI	0.343	0.493	0.328	0.339	0.353
	(0.394)	(0.432)	(0.513)	(0.503)	(0.504)
Born * FSI	-0.273	-0.227	-0.498	-0.505	-0.505
	(0.301)	(0.294)	(0.315)	(0.313)	(0.314)
Age 0 -5 * FSI	0.272***	0.230*	0.132	0.128	0.131
	(0.103)	(0.118)	(0.155)	(0.155)	(0.155)
Age 6 - 10 * FSI	0.043	0.064	0.016	0.022	0.023
	(0.108)	(0.122)	(0.142)	(0.143)	(0.143)
Age 11 - 15 * FSI	0.188	0.175	0.122	0.121	0.124
	(0.130)	(0.136)	(0.122)	(0.122)	(0.122)
Age 16 - 20 * FSI	0.010	0.009	0.022	0.026	0.030
	(0.114)	(0.128)	(0.131)	(0.130)	(0.130)
FSI	-0.155*				
	(0.079)				
Constant	0.117	0.165**	0.075	0.319**	0.314**
	(0.076)	(0.073)	(0.099)	(0.149)	(0.150)
Observations	2629	2629	2227	2223	2223
R^2	0.004	0.072	0.087	0.089	0.089
Village FE	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	Yes
Embankment Control	No	No	No	Yes	Yes
Season of Birth FE	No	No	No	No	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: Standard errors are clustered at the village level. Baseline controls include characteristics from the 1974 census. These are: if the household head was Hindu, years of education of the household head, household size, whether the house had a tin roof and MCH-FP treatment status. The left out season of birth dummy is the dry season, November - February.

Table 5: Model 3 Males, Dependent Variable: Height Z-Score

	(1)	(2)	(3)	(4)	(5)
Conceived	-0.128	-0.133	-0.174	-0.173	-0.169
	(0.167)	(0.152)	(0.191)	(0.192)	(0.194)
Born	-0.115	-0.162	-0.356	-0.349	-0.347
	(0.382)	(0.444)	(0.474)	(0.470)	(0.468)
Age 0 - 5	0.009	-0.009	-0.010	-0.011	-0.009
	(0.161)	(0.145)	(0.160)	(0.160)	(0.161)
Age 6 - 10	0.120	0.103	0.150	0.155	0.158
	(0.137)	(0.126)	(0.146)	(0.145)	(0.147)
Age 11 - 15	-0.120	-0.140	-0.107	-0.102	-0.102
	(0.161)	(0.170)	(0.170)	(0.171)	(0.172)
Age 16 - 20	-0.100	-0.099	-0.048	-0.043	-0.045
	(0.130)	(0.137)	(0.133)	(0.133)	(0.134)
Conceived * Q2	-0.024	-0.001	0.090	0.064	0.072
	(0.295)	(0.301)	(0.324)	(0.321)	(0.322)
Conceived * Q3	-0.071	-0.110	-0.163	-0.164	-0.156
	(0.292)	(0.313)	(0.408)	(0.410)	(0.414)
Conceived * Q4	0.398	0.347	0.363	0.355	0.350
	(0.300)	(0.305)	(0.337)	(0.334)	(0.336)
Born * Q2	-0.488	-0.517	-0.345	-0.369	-0.357
	(0.459)	(0.505)	(0.552)	(0.546)	(0.544)
Born * Q3	0.397	0.357	0.331	0.327	0.326
	(0.478)	(0.546)	(0.601)	(0.597)	(0.596)
Born * Q4	0.308	0.433	0.581	0.577	0.583
	(0.580)	(0.619)	(0.631)	(0.628)	(0.625)
Age 0 - 5 * Q2	-0.161	-0.061	-0.054	-0.098	-0.102
	(0.237)	(0.242)	(0.280)	(0.261)	(0.262)
Age 0 - 5 * Q3	0.031	0.061	0.055	0.064	0.068
	(0.201)	(0.197)	(0.220)	(0.221)	(0.221)
Age 0 - 5 * Q4	0.020	0.030	-0.010	-0.010	-0.004
	(0.231)	(0.229)	(0.261)	(0.261)	(0.260)
Age 6 - 10 * Q2	-0.134	-0.078	-0.138	-0.161	-0.158
	(0.213)	(0.220)	(0.241)	(0.232)	(0.234)
Age 6 - 10 * Q3	-0.196	-0.090	-0.220	-0.221	-0.224
	(0.201)	(0.193)	(0.210)	(0.209)	(0.212)
Age 6 - 10 * Q4	-0.172	-0.096	-0.078	-0.082	-0.081
	(0.201)	(0.215)	(0.229)	(0.229)	(0.231)
Age 11 - 15 * Q2	0.009	0.064	0.014	-0.007	-0.007
	(0.235)	(0.246)	(0.260)	(0.256)	(0.258)
Age 11 - 15 * Q3	0.284	0.348*	0.321	0.326	0.329
	(0.186)	(0.193)	(0.197)	(0.197)	(0.199)
Age 11 - 15 * Q4	0.127	0.135	0.085	0.081	0.085
	(0.209)	(0.225)	(0.232)	(0.232)	(0.233)
Age 16 - 20 *Q2	0.018	0.064	0.045	0.030	0.033
	(0.245)	(0.257)	(0.275)	(0.273)	(0.274)
Age 16 - 20 * Q3	0.086	0.148	0.069	0.066	0.070
	(0.165)	(0.181)	(0.176)	(0.177)	(0.176)
Age 16 - 20 *Q4	0.227	0.248	0.216	0.209	0.213
	(0.196)	(0.216)	(0.210)	(0.210)	(0.210)
Constant	0.077	0.036	-0.100	0.023	0.051
	(0.075)	(0.090)	(0.121)	(0.146)	(0.149)
Observations	1774	1774	1632	1629	1629
R^2	0.009	0.079	0.097	0.099	0.100
Village FE	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	Yes
Embankment Control	No	No	No	Yes	Yes
Season of Birth FE	No	No	No	No	Yes

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

Table 6: Model 3 Females, Dependent Variable: Height Z-Score

	(1)	(2)	(3)	(4)	(5)
Conceived	-0.323	-0.335	-0.189	-0.174	-0.170
	(0.229)	(0.233)	(0.269)	(0.268)	(0.272)
Born	0.338	0.393	0.504	0.504*	0.510*
	(0.262)	(0.259)	(0.308)	(0.300)	(0.299)
Age 0 - 5	0.050	0.092	0.090	0.096	0.102
	(0.131)	(0.138)	(0.137)	(0.137)	(0.137)
Age 6 - 10	0.018	0.021	0.031	0.030	0.036
	(0.104)	(0.103)	(0.121)	(0.121)	(0.122)
Age 11 - 15	0.014	0.031	0.046	0.049	0.054
	(0.110)	(0.115)	(0.127)	(0.127)	(0.129)
Age 16 - 20	-0.080	-0.080	-0.095	-0.096	-0.092
	(0.115)	(0.126)	(0.121)	(0.120)	(0.119)
Conceived * Q2	0.375	0.408	0.313	0.270	0.265
	(0.385)	(0.377)	(0.388)	(0.385)	(0.387)
Conceived * Q3	0.227	0.193	-0.069	-0.079	-0.075
	(0.397)	(0.402)	(0.389)	(0.383)	(0.389)
Conceived * Q4	0.125	0.219	0.238	0.230	0.246
	(0.287)	(0.320)	(0.390)	(0.387)	(0.390)
Born * Q2	-0.215	-0.278	-0.365	-0.359	-0.369
	(0.478)	(0.470)	(0.508)	(0.497)	(0.495)
Born * Q3	-0.583*	-0.664**	-0.931**	-0.944***	-0.944***
	(0.302)	(0.300)	(0.357)	(0.349)	(0.351)
Born * Q4	-0.502	-0.515	-0.672	-0.677*	-0.684*
	(0.336)	(0.337)	(0.413)	(0.406)	(0.408)
Age 0 - 5 * Q2	0.002	-0.030	-0.040	-0.032	-0.034
	(0.198)	(0.215)	(0.216)	(0.219)	(0.218)
Age 0 - 5 * Q3	-0.408**	-0.473**	-0.497***	-0.502***	-0.503***
	(0.189)	(0.189)	(0.189)	(0.189)	(0.189)
Age 0 - 5 *Q4	0.159	0.102	0.141	0.136	0.137
	(0.161)	(0.170)	(0.173)	(0.173)	(0.173)
Age 6 - 10 * Q2	0.024	0.064	0.072	0.076	0.068
	(0.181)	(0.177)	(0.171)	(0.175)	(0.176)
Age 6 - 10 * Q3	-0.217	-0.270*	-0.251	-0.242	-0.243
	(0.150)	(0.156)	(0.175)	(0.177)	(0.177)
Age 6 - 10 * Q4	0.081	0.083	0.075	0.083	0.085
	(0.164)	(0.167)	(0.200)	(0.201)	(0.200)
Age 11 - 15 * Q2	-0.051	-0.069	-0.050	-0.043	-0.049
	(0.181)	(0.188)	(0.181)	(0.184)	(0.185)
Age 11 - 15 *Q3	-0.185	-0.276	-0.282	-0.263	-0.266
	(0.167)	(0.171)	(0.191)	(0.187)	(0.188)
Age 11 - 15 *Q4	0.119	0.094	0.092	0.094	0.095
	(0.142)	(0.148)	(0.155)	(0.155)	(0.155)
Age 16 - 20 * Q2	0.177	0.198	0.136	0.132	0.125
	(0.235)	(0.239)	(0.214)	(0.212)	(0.213)
Age 16 - 20 *Q3	0.002	-0.062	-0.052	-0.044	-0.041
	(0.164)	(0.177)	(0.174)	(0.172)	(0.172)
Age 16 - 20 *Q4	0.025	-0.013	-0.014	-0.013	-0.010
	(0.161)	(0.172)	(0.178)	(0.177)	(0.177)
Constant	0.107	0.069	0.003	0.258	0.252
	(0.085)	(0.084)	(0.104)	(0.157)	(0.157)
Observations	2629	2629	2227	2223	2223
R^2	0.012	0.078	0.094	0.096	0.096
Village FE	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	Yes
Embankment Control	No	No	No	Yes	Yes
Season of Birth FE	No	No	No	No	Yes

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

Table 7: Model 1 Males and Females, Dependent Variable: Years of Completed Education

	(1)	(2)	(3)	(4)	(5)
A. Males					
Conceived	2.253***	1.890***	2.090***	2.017***	2.003***
	(0.421)	(0.439)	(0.432)	(0.452)	(0.456)
Born	2.600***	2.393***	2.260***	2.455***	2.411***
	(0.558)	(0.599)	(0.620)	(0.610)	(0.610)
Age 0 - 5	0.659*	0.627	0.906**	0.957***	0.940**
	(0.372)	(0.389)	(0.362)	(0.361)	(0.362)
Age 6 - 10	-0.644*	-0.662*	-0.222	-0.277	-0.293
	(0.363)	(0.387)	(0.364)	(0.374)	(0.378)
Age 11- 15	-1.675***	-1.691***	-1.148***	-1.180***	-1.192***
	(0.295)	(0.319)	(0.256)	(0.263)	(0.264)
Age 16 - 20	-0.907***	-0.855***	-0.506**	-0.485**	-0.486**
	(0.257)	(0.270)	(0.231)	(0.236)	(0.235)
Constant	4.488***	5.860***	2.389***	3.144***	3.048***
	(0.247)	(0.231)	(0.377)	(0.812)	(0.816)
Observations	2123	2123	1985	1907	1907
R^2	0.063	0.154	0.313	0.311	0.311
B. Females					
Conceived	3.806***	3.918***	4.015***	3.973***	3.991***
	(0.409)	(0.403)	(0.377)	(0.383)	(0.381)
Born	2.974***	3.140***	2.831***	2.760***	2.732***
	(0.419)	(0.448)	(0.457)	(0.466)	(0.466)
Age 0 - 5	2.623***	2.716***	2.777***	2.799***	2.788***
	(0.223)	(0.231)	(0.211)	(0.214)	(0.215)
Age 6 - 10	1.092***	1.172***	1.287***	1.262***	1.257***
	(0.189)	(0.205)	(0.183)	(0.188)	(0.188)
Age 11- 15	0.661***	0.690***	0.709***	0.713***	0.711***
	(0.164)	(0.175)	(0.162)	(0.167)	(0.167)
Age 16 - 20	0.593***	0.682***	0.658***	0.646***	0.647***
	(0.165)	(0.170)	(0.168)	(0.175)	(0.176)
Constant	1.457***	1.975***	-0.244	0.110	0.146
	(0.163)	(0.124)	(0.209)	(0.398)	(0.403)
Observations	3107	3107	2819	2717	2717
R^2	0.083	0.186	0.295	0.296	0.296
Village FE	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	Yes
Embankment Control	No	No	No	Yes	Yes
Season of Birth FE	No	No	No	No	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: Standard errors are clustered at the village level. Baseline controls include characteristics from the 1974 census. These are: if the household head was Hindu, years of education of the household head, household size, whether the house had a tin roof and MCH-FP treatment status. The left out season of birth dummy is the dry season, November - February.

Table 8: Model 2 Males, Dependent Variable: Years of Completed Education

	(1)	(2)	(3)	(4)	(5)
Conceived	1.138	0.932	1.453*	1.234	1.216
	(0.719)	(0.729)	(0.828)	(0.850)	(0.853)
Born	1.541	1.627	1.287	1.293	1.245
	(1.022)	(1.170)	(1.150)	(1.131)	(1.133)
Age 0 - 5	0.495	0.647	1.132*	1.196**	1.196**
	(0.585)	(0.620)	(0.601)	(0.598)	(0.590)
Age 6 - 10	-0.794	-0.727	-0.152	-0.225	-0.239
	(0.526)	(0.553)	(0.586)	(0.594)	(0.596)
Age 11- 15	-2.080***	-2.001***	-1.171***	-1.231***	-1.237***
	(0.490)	(0.541)	(0.442)	(0.450)	(0.448)
Age 16 - 20	-1.326***	-1.112**	-0.799*	-0.719*	-0.719*
	(0.405)	(0.450)	(0.407)	(0.405)	(0.402)
Conceived * FSI	1.833*	1.601	1.034	1.270	1.274
	(1.079)	(1.082)	(1.150)	(1.219)	(1.209)
Born * FSI	1.717	1.256	1.568	1.887	1.889
	(1.497)	(1.631)	(1.466)	(1.456)	(1.460)
Age 0 - 5 * FSI	0.261	-0.035	-0.368	-0.382	-0.408
	(0.685)	(0.759)	(0.665)	(0.665)	(0.655)
Age 6 - 10 * FSI	0.231	0.098	-0.119	-0.095	-0.100
	(0.670)	(0.703)	(0.692)	(0.698)	(0.701)
Age 11- 15 * FSI	0.633	0.486	0.027	0.070	0.059
	(0.647)	(0.722)	(0.574)	(0.581)	(0.578)
Age 16 - 20 * FSI	0.656	0.409	0.464	0.367	0.366
	(0.591)	(0.642)	(0.545)	(0.542)	(0.541)
FSI	-0.604				
	(0.527)				
Constant	4.874***	6.030***	2.482***	3.246***	3.142***
	(0.410)	(0.338)	(0.486)	(0.872)	(0.876)
Observations	2123	2123	1985	1907	1907
R^2	0.064	0.155	0.315	0.312	0.313
Village FE	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	Yes
Embankment Control	No	No	No	Yes	Yes
Season of Birth FE	No	No	No	No	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: Standard errors are clustered at the village level. Baseline controls include characteristics from the 1974 census. These are: if the household head was Hindu, years of education of the household head, household size, whether the house had a tin roof and MCH-FP treatment status. The left out season of birth dummy is the dry season, November - February.

Table 9: Model 2 Females, Dependent Variable: Years of Completed Education

	(1)	(2)	(3)	(4)	(5)
Conceived	4.781***	5.207***	4.594***	4.597***	4.603***
	(0.874)	(0.844)	(0.851)	(0.860)	(0.860)
Born	2.671***	2.601***	2.238***	2.161***	2.128***
	(0.616)	(0.628)	(0.658)	(0.676)	(0.675)
Age 0 - 5	2.559***	2.760***	2.744***	2.725***	2.722***
	(0.441)	(0.473)	(0.399)	(0.406)	(0.407)
Age 6 - 10	1.046***	1.256***	1.114***	1.095***	1.093***
	(0.356)	(0.387)	(0.341)	(0.347)	(0.346)
Age 11 - 15	1.019***	1.167***	0.935***	0.925***	0.925***
	(0.359)	(0.361)	(0.341)	(0.352)	(0.352)
Age 16 - 20	0.830**	0.967**	0.633	0.563	0.562
	(0.406)	(0.392)	(0.383)	(0.391)	(0.391)
Conceived * FSI	-1.591	-2.076*	-0.969	-1.062	-1.043
	(1.312)	(1.243)	(1.269)	(1.308)	(1.310)
Born * FSI	0.455	0.822	0.917	0.925	0.933
	(0.591)	(0.562)	(0.631)	(0.646)	(0.646)
Age 0 - 5 * FSI	0.097	-0.074	0.048	0.108	0.095
	(0.515)	(0.531)	(0.458)	(0.467)	(0.469)
Age 6 - 10 *FSI	0.065	-0.124	0.273	0.261	0.255
	(0.394)	(0.427)	(0.361)	(0.362)	(0.362)
Age 11 - 15 * FSI	-0.565	-0.743	-0.356	-0.335	-0.338
	(0.501)	(0.483)	(0.416)	(0.425)	(0.426)
Age 16 - 20 * FSI	-0.389	-0.444	0.038	0.130	0.132
	(0.528)	(0.501)	(0.489)	(0.501)	(0.504)
famineSeverity	-0.188				
	(0.455)				
Constant	1.580***	1.823***	-0.233	0.153	0.187
	(0.365)	(0.252)	(0.270)	(0.430)	(0.432)
Observations	3107	3107	2819	2717	2717
R^2	0.088	0.189	0.297	0.298	0.298
Village FE	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	Yes
Embankment Control	No	No	No	Yes	Yes
Season of Birth FE	No	No	No	No	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: Standard errors are clustered at the village level. Baseline controls include characteristics from the 1974 census. These are: if the household head was Hindu, years of education of the household head, household size, whether the house had a tin roof and MCH-FP treatment status. The left out season of birth dummy is the dry season, November - February.

Table 10: Model 3 Males, Dependent Variable: Years of Completed Education

	(1)	(2)	(3)	(4)	(5)
Conceived	1.945**	1.577**	1.721*	1.349	1.345
	(0.753)	(0.736)	(0.967)	(0.991)	(0.978)
Born	2.699**	2.780**	1.720	1.803	1.740
	(1.046)	(1.195)	(1.321)	(1.280)	(1.269)
Age 0 - 5	1.010	0.940	1.111*	1.128*	1.120*
	(0.622)	(0.637)	(0.665)	(0.664)	(0.652)
Age 6 - 10	-0.211	-0.105	0.215	0.212	0.192
	(0.638)	(0.693)	(0.844)	(0.843)	(0.849)
Age 11 - 15	-1.337**	-1.170	-0.767	-0.836	-0.842
	(0.668)	(0.751)	(0.625)	(0.627)	(0.623)
Age 16 - 20	-1.025***	-0.797*	-0.653	-0.580	-0.578
	(0.364)	(0.473)	(0.471)	(0.450)	(0.447)
Conceived * Q2	-0.347	-0.161	0.162	0.731	0.701
	(1.189)	(1.221)	(1.319)	(1.325)	(1.307)
Conceived * Q3	-0.027	0.082	0.213	0.534	0.530
	(1.097)	(1.217)	(1.267)	(1.282)	(1.261)
Conceived * Q4	1.666	1.502	1.107	1.448	1.451
	(1.195)	(1.177)	(1.257)	(1.343)	(1.323)
Born * Q2	-1.212	-1.676	1.230	1.193	1.209
	(1.508)	(1.681)	(1.768)	(1.736)	(1.732)
Born * Q3	0.018	-0.158	0.447	0.369	0.416
	(1.528)	(1.666)	(1.796)	(1.761)	(1.756)
Born * Q4	0.423	-0.120	0.798	1.372	1.369
	(1.577)	(1.682)	(1.688)	(1.625)	(1.619)
Age 0 - 5 * Q2	0.031	0.164	0.097	0.328	0.332
	(1.024)	(1.061)	(1.014)	(0.982)	(0.970)
Age 0 - 5 * Q3	-1.354	-1.233	-0.545	-0.564	-0.577
	(1.007)	(1.047)	(1.121)	(1.105)	(1.094)
Age 0 - 5 * Q4	0.056	0.004	-0.269	-0.266	-0.284
	(0.855)	(0.881)	(0.831)	(0.836)	(0.821)
Age 6 - 10 * Q2	-0.237	-0.365	-0.012	-0.152	-0.165
	(0.875)	(0.949)	(0.991)	(1.006)	(1.002)
Age 6 - 10 * Q3	-1.389	-1.531	-1.343	-1.364	-1.348
	(0.978)	(1.047)	(1.087)	(1.084)	(1.095)
Age 6 - 10 * Q4	0.090	-0.065	-0.013	-0.034	-0.019
	(0.963)	(1.037)	(1.077)	(1.093)	(1.090)
Age 11 - 15 * Q2	-0.560	-0.896	-0.624	-0.593	-0.601
	(0.789)	(0.858)	(0.701)	(0.716)	(0.710)
Age 11 - 15 *Q3	-1.006	-1.205	-0.626	-0.567	-0.574
	(0.843)	(0.937)	(0.766)	(0.768)	(0.764)
Age 11 - 15 *Q4	0.256	0.123	-0.182	-0.145	-0.156
	(0.905)	(0.992)	(0.821)	(0.832)	(0.824)
Age 16 - 20 * Q2	-0.293	-0.490	-0.369	-0.372	-0.375
	(0.632)	(0.714)	(0.647)	(0.654)	(0.646)
Age 16 - 20 * Q3	0.054	-0.179	0.378	0.284	0.276
	(0.611)	(0.681)	(0.616)	(0.600)	(0.599)
Age 16 - 20 * Q4	0.701	0.495	0.598	0.445	0.451
	(0.708)	(0.783)	(0.697)	(0.698)	(0.691)
Constant	4.419***	5.585***	2.239***	3.067***	2.976***
	(0.578)	(0.460)	(0.607)	(0.939)	(0.938)
Observations	2123	2123	1985	1907	1907
R^2	0.069	0.160	0.319	0.316	0.316
Village FE	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	Yes
Embankment Control	No	No	No	Yes	Yes
Season of Birth FE	No	No	No	No	Yes

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

Table 11: Model 3 Females, Dependent Variable: Years of Completed Education

	(1)	(2)	(3)	(4)	(5)
Conceived	4.445***	4.807***	4.139***	4.087***	4.122***
	(0.838)	(0.823)	(0.867)	(0.861)	(0.869)
Born	3.170***	3.499***	3.294***	3.234***	3.202***
	(0.649)	(0.599)	(0.650)	(0.662)	(0.656)
Age 0 - 5	2.453***	2.760***	2.815***	2.749***	2.738***
	(0.492)	(0.549)	(0.471)	(0.478)	(0.478)
Age 6 - 10	0.935**	1.267***	1.329***	1.271***	1.266***
	(0.436)	(0.481)	(0.439)	(0.451)	(0.448)
Age 11 - 15	0.652	0.974**	0.899**	0.863*	0.859*
	(0.424)	(0.421)	(0.439)	(0.461)	(0.461)
Age 16 - 20	0.746	1.041**	0.831*	0.699	0.706
	(0.477)	(0.461)	(0.455)	(0.457)	(0.457)
Conceived * Q2	-0.028	-0.296	0.363	0.373	0.334
	(1.157)	(1.154)	(1.073)	(1.064)	(1.073)
Conceived * Q3	-1.366	-1.599	-0.741	-0.700	-0.730
	(1.154)	(1.125)	(1.183)	(1.179)	(1.187)
Conceived * Q4	-0.808	-1.380	-0.069	-0.104	-0.091
	(1.219)	(1.190)	(1.170)	(1.204)	(1.212)
Born * Q2	-0.156	-0.692	-0.782	-0.731	-0.726
	(1.020)	(1.005)	(1.037)	(1.082)	(1.084)
Born *Q3	-1.076	-1.480	-1.553	-1.505	-1.509
	(1.165)	(1.283)	(1.233)	(1.236)	(1.235)
Born *Q4	0.419	0.702	0.460	0.341	0.363
	(0.938)	(0.915)	(1.094)	(1.125)	(1.126)
Age 0 - 5 * Q2	-0.054	-0.471	-0.485	-0.365	-0.354
	(0.668)	(0.750)	(0.647)	(0.667)	(0.670)
Age 0 - 5 * Q3	0.191	0.002	-0.026	0.035	0.028
	(0.683)	(0.696)	(0.614)	(0.621)	(0.621)
Age 0 - 5 * Q4	0.504	0.187	0.273	0.426	0.423
	(0.605)	(0.645)	(0.593)	(0.603)	(0.604)
Age 6 - 10 * Q2	0.247	-0.075	-0.114	-0.051	-0.038
	(0.681)	(0.730)	(0.623)	(0.654)	(0.651)
Age 6 - 10 * Q3	-0.112	-0.424	-0.504	-0.446	-0.454
	(0.508)	(0.549)	(0.497)	(0.509)	(0.506)
Age 6 - 10 * Q4	0.488	0.155	0.499	0.521	0.519
	(0.543)	(0.591)	(0.522)	(0.535)	(0.532)
Age 11 - 15 * Q2	0.340	-0.108	-0.281	-0.260	-0.256
	(0.534)	(0.551)	(0.532)	(0.560)	(0.559)
Age 11 - 15 * Q3	-0.081	-0.536	-0.283	-0.244	-0.240
	(0.487)	(0.506)	(0.530)	(0.549)	(0.549)
Age 11 - 15 * Q4	-0.180	-0.475	-0.204	-0.114	-0.113
	(0.538)	(0.539)	(0.514)	(0.534)	(0.534)
Age 16 - 20 * Q2	-0.403	-0.684	-0.693	-0.546	-0.551
	(0.542)	(0.532)	(0.517)	(0.531)	(0.533)
Age 16 - 20 * Q3	-0.034	-0.389	-0.112	0.021	0.002
	(0.559)	(0.559)	(0.554)	(0.556)	(0.558)
Age 16 - 20 * Q4	-0.198	-0.393	0.034	0.215	0.221
	(0.546)	(0.538)	(0.525)	(0.537)	(0.536)
Constant	1.930***	1.822***	-0.345	0.051	0.088
	(0.462)	(0.322)	(0.322)	(0.462)	(0.463)
Observations	3107	3107	2819	2717	2717
R^2	0.094	0.191	0.299	0.300	0.300
Village FE	No	Yes	Yes	Yes	Yes
Baseline Controls	No	No	Yes	Yes	Yes
Embankment Control	No	No	No	Yes	Yes
Season of Birth FE	No	No	No	No	Yes

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

Table 12: Baseline Characteristics by types of Households affected by Famine

	Households where a family member Died			**Household where a family member Migrated**			**Households where no family member Migrated or Died**		
	Mean	SD	Obs	Mean	SD	Obs	Mean	SD	Obs
A. Household Head Characteristics, 1974 Census									
Age	48.01	14.66	4476	45.45	13.43	10678	45.34	13.77	20892
Female (=1)	0.06	0.25	4482	0.11	0.32	10678	0.12	0.33	20900
Years of Education	1.98	2.94	4482	2.05	3.11	10678	2.25	3.16	20900
Hindu (=1)	0.16	0.37	4482	0.25	0.43	10678	0.15	0.36	20898
B. Household Characteristics, 1974 Census									
Family Size	6.62	2.97	4487	6.4	2.69	10685	5.68	2.58	20922
Wall made of tinmix (=1)	0.19	0.39	4423	0.14	0.35	10411	0.21	0.41	20542
Roof made of tin (=1)	0.76	0.43	4424	0.65	0.48	10414	0.79	0.4	20554
Own quilt (=1)	0.3	0.46	4484	0.31	0.46	10674	0.35	0.48	20896
Own lamp (=1)	0.54	0.5	4484	0.52	0.5	10674	0.58	0.49	20896
Own radio (=1)	0.06	0.24	4484	0.07	0.25	10674	0.06	0.24	20896
No. Rooms Per Capita	0.22	0.12	4487	0.21	0.11	10685	0.24	0.16	20922

	Difference Died vs. Neither			**Difference Migrated vs. Neither**			**Difference Died vs. Migrated**		
	Mean	M/SD	T-stat	Mean	M/SD	T-stat	Mean	M/SD	T-stat
A. Household Head Characteristics, 1974 Census									
Age	2.67	0.19	10.03	0.11	0.01	0.41	2.55	0.18	7.14
Female (=1)	-0.06	-0.18	-12.27	-0.01	-0.02	-1.1	-0.05	-0.17	-6.02
Years of Education	-0.28	-0.09	-4.88	-0.2	-0.06	-2.19	-0.08	-0.03	-0.82
Hindu (=1)	0.01	0.03	1.37	0.1	0.26	4.33	-0.09	-0.21	-4.28
B. Household Characteristics, 1974 Census									
Family Size	0.94	0.35	16.2	0.72	0.27	11.72	0.22	0.08	3.15
Wall made of tinmix (=1)	-0.02	-0.04	-2.48	-0.07	-0.17	-7.31	0.05	0.13	4.79
Roof made of tin (=1)	-0.04	-0.09	-4.86	-0.15	-0.33	-9.79	0.11	0.23	6.84
Own quilt (=1)	-0.05	-0.1	-5.98	-0.04	-0.09	-2.86	-0.01	-0.02	-0.42
Own lamp (=1)	-0.04	-0.08	-3.95	-0.06	-0.12	-3.77	0.02	0.04	1.18
Own radio (=1)	0	-0.01	-0.7	0	0.01	0.5	-0.01	-0.03	-0.92
No. Rooms Per Capita	-0.03	-0.18	-14.03	-0.04	-0.27	-17.83	0.01	0.1	4.48

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