Final Report

on

Does Childhood Poverty Affect Health Conditions in the Adulthood? Evidence from a Longitudinal Survey in Bangladesh.

Dr. Md. Deen Islam
Associate Professor
Department of Economics
University of Dhaka

and

Abul Kalam Azad
Assistant Professor
Department of Economics
University of Dhaka

February 27, 2024

Table of Contents

List of Tables

List of Figures

Abstract

This study investigates the enduring impact of childhood poverty on adult health status using longitudinal data from the Mahbub Hossain Panel Data in Bangladesh spanning three decades. Employing an Ordered Logit Model, the research examines the relationship between childhood poverty, individual and household characteristics, and health outcomes. The findings reveal a significant negative association between childhood poverty and adult health status, persisting even after adjusting for various individual factors. However, when household characteristics are considered, the significance of childhood poverty diminishes, indicating the mediating role of the household environment in shaping health outcomes. Policy implications emphasize the need for early childhood interventions, income support, mental health services, housing and neighborhood improvements, and strategies promoting income mobility. Overall, the study underscores the urgency of targeted public health measures to break the cycle of poverty-related health disparities and promote equitable health outcomes across the life course.

Introduction

Childhood poverty is a serious problem that affects millions of children around the world. It is defined as the lack of necessary resources and opportunities for a child to develop and reach their full potential. The effects of childhood poverty are far-reaching and can have a profound impact on a child's physical, emotional, and cognitive development.

One of the most immediate effects of childhood poverty is poor nutrition and lack of access to healthcare. Children living in poverty are more likely to suffer from malnutrition, which can lead to health problems and developmental delays. They also may not have access to regular check-ups and preventative care, which can lead to untreated illnesses and conditions. These health issues can have a long-term impact on a child's physical and cognitive development, making it more difficult for them to succeed in school and in life. Another effect of childhood poverty is poor educational outcomes. Children living in poverty often attend schools with fewer resources and less qualified teachers. They may also not have access to extracurricular activities and programs that can help them develop important skills and interests. These factors can make it more difficult for children living in poverty to succeed in school and achieve their full potential. In addition to these effects, children living in poverty are at increased risk of behavioral and emotional problems, including anxiety and depression. They may also experience feelings of shame and isolation, which can further compound the negative effects of poverty on their mental health. The stress and uncertainty of living in poverty can also affect a child's ability to form healthy relationships and trust others.

However, the effect of childhood poverty only affects the ' 'child's health during childhood. Its impact on health may well continue to adulthood. Childhood poverty has a significant and lasting effect on health during adulthood. There is a growing body of research that has linked poverty during childhood to a wide range of negative health outcomes in adulthood, including higher rates of chronic diseases, mental health issues, and premature death. One of the main ways that childhood poverty affects health during adulthood is through its impact on child development. Children who grow up in poverty are more likely to experience stress, malnutrition, and exposure to environmental toxins, all of which can have a negative impact on their physical and cognitive development. This can lead to a range of health issues in adulthood, including chronic diseases such as heart disease, diabetes, and obesity.

Additionally, childhood poverty has been linked to mental health issues in adulthood. Children who grow up in poverty are more likely to experience trauma and have less access to mental health services, which can lead to higher rates of depression, anxiety, and other mental health conditions in adulthood. Another way that childhood poverty affects health during adulthood is through its impact on social determinants of health. Children from low-income families are more likely to live in neighborhoods with poor-quality housing, limited access to healthy food, and limited access to healthcare services. This can lead to a range of health issues in adulthood, such as respiratory problems and infectious diseases. Moreover, poverty in childhood also affects educational and occupational opportunities, which in turn affects the economic status and access

to healthcare in adulthood. It is well established that individuals with higher education and income have better health outcomes.

Thus, exposure to poverty and lack of fulfilling basic needs, such as food, healthcare, and proper shelter, can lead to worse health outcomes during adulthood. The objective of this project is to investigate the effects of childhood poverty on the incidence and prevalence of chronic diseases, such as diabetes, heart condition, respiratory conditions, etc., during the adulthood of individuals.

Related literature

Childhood poverty is a significant global issue that can have long-lasting effects on an individual's physical, mental, and social well-being. One of the areas where the impact of childhood poverty are particularly apparent is in an individual's health during adulthood. A systematic literature review is an efficient way to assess the current research and synthesize the findings on a specific topic. The studies included in this review were identified through a search of the PubMed, EBSCOhost, and JSTOR databases using the keywords "childhood poverty," "health," and "adulthood." The search was limited to articles published in English between 2000 and 2021. Only the most relevant studies are included in this review.

The studies included in this review suggest that childhood poverty has a significant negative impact on an individual's physical and mental health during adulthood. The majority of the studies found that individuals who experienced poverty during childhood have an increased risk of developing chronic health conditions, such as heart disease, diabetes, and respiratory problems (Evans, 2004; Braveman & Barclay, 2009). Raphel (2011) also showed that people who experienced childhood poverty are most severely affected by type-II diabetes and cardiovascular diseases. These health conditions are often linked to poor diet, lack of access to healthcare, and exposure to environmental toxins, which are everyday experiences among individuals who grow up in poverty (Kreps et al., 2008). The children who experienced poverty in their childhood are more likely to have obesity problem in their adulthood (Xu & Yilmazer, 2021). The severity and length of childhood poverty experience cause to vary the consequence of health outcome in adulthood. Wielding the longitudinal data from the US decennial census and American community survey, Huang and Sparks (2023) revealed that durable exposure to childhood poverty increase the likelihood of obesity in emerging adulthood than transitory experiences.

Additionally, studies have shown that childhood poverty is associated with an increased risk of developing mental health conditions, such as depression and anxiety (Wilder et al., 2014; Williams et al., 2016; Kaminer et al, 2023). These conditions are often linked to stress and trauma, which are common experiences among individuals who grow up in poverty (Gershoff, 2002). The studies also found that children who experienced poverty are more likely to engage in risky behaviors, such as smoking and substance abuse (Jessor et al., 2002), which can further contribute to poor health during adulthood.

Lee et al. (2021) investigated the association of childhood poverty and adult health conditions to gauge the measure of adverse childhood exposure. They found that childhood poverty is

negatively correlated with adult health outcome and adult depression. Evans and De France, (2022) tested how proportion of childhood experience affect the multimethodological measures of psychological well-being. They pointed out that childhood experience in poverty explained the increased level of chronic mental stress over time. Zhou (2023) found that children who faced adverse socioeconomic vulnerability in their childhood experience bad health outcome in the later stage of their lives. Maner et al. (2023) also found similar finding in their research. They showed that an unstable, uncontrollable, and uncertain childhood is more likely to face adverse health outcome in their adulthood. On the other hand, children who enjoyed a privileged childhood have better health outcome in their old stages (Zhou, 2023).

The studies included in this review also suggest that the effects of childhood poverty on health during adulthood may be mediated by a range of factors. For example, some studies found that the relationship between childhood poverty and poor health during adulthood is stronger for individuals who experienced poverty for a longer duration or at a younger age (Geronimus et al., 2006; Ford et al., 2009). Other studies found that the relationship between childhood poverty and poor health during adulthood is stronger for individuals who experienced poverty in combination with other risk factors, such as poor nutrition or poor housing (Kreps et al., 2008; Braveman & Barclay, 2009).

González et al. (2009) found that childhood poverty increases the likelihood of obesity for women is more evident than the men and women experience at their early stage than men. They also found that adverse socioeconomic conditions in childhood and waist circumference in adulthood are inversely related to women. Most of the existing literature also shows that childhood hardship is more likely to cause an increased waist circumference, hip circumference, and waist-hip ratio (WHR) for most of women in their adulthood. Therefore, this development causes abdominal obesity, increasing the risk of cardiovascular diseases in adulthood (Xu & Yilmazer, 2021; Huang & Sparks, 2023). It's worth noting that some studies included in this review found that the relationship between childhood poverty and poor health during adulthood may be more complex than previously thought. For example, some studies found that the relationship between childhood poverty and poor health during adulthood is not linear and that the effects of poverty may be different at different stages of an individual's life (Geronimus et al., 2006; Ford et al., 2009). Moreover, some studies found that the negative effects of childhood poverty on health during adulthood can be mitigated by positive experiences and protective factors, such as strong social support, positive role models, and access to quality education (Kreps et al., 2008; Gershoff, 2002).

The studies included in this systematic literature review suggest that childhood poverty has a significant negative impact on an individual's physical and mental health during adulthood. Individuals who experienced poverty during childhood have an increased risk of developing chronic health conditions, such as heart disease, diabetes, and respiratory problems, and mental health conditions, such as depression and anxiety (Evans, 2004; Wilder et al., 2014).

Data

One of the main quantitative methods used in research on the effects of childhood poverty on health outcomes during adulthood is the use of longitudinal studies. These studies follow a group of individuals over an extended period of time, allowing researchers to track the development of health outcomes and identify any links between childhood poverty and adult health. Longitudinal studies can include data on a wide range of demographic and socioeconomic variables, such as income, education, and occupation, as well as health outcomes, such as chronic diseases, mental health conditions, and mortality.

Another important quantitative method is the use of observational studies, which use data from existing databases and surveys to analyze the relationship between childhood poverty and health outcomes. These studies can include data from large-scale national surveys, such as the Household Income and Expenditure Survey and the Demographic and Health Survey, as well as data from specific population groups, such as low-income families and street children.

In this study, we will use data from the Mahbub Hossain Panel Data (MHPD), which is the longest panel data in Bangladesh, tracking more than 1200 rural households over three decades (Hossain & Bayes). To date, the MHPD has a total of five rounds of surveys since 1987. The baseline survey was started in 1987-88, followed by the surveys held in 1999-00, 2003-04, 2007-08, and 2013-14 (Azad, 2021). A two-stage random sampling method has been wielded to select the sample households for the initial 1987-88 survey. At the baseline survey, 64 districts of the country were selected to conduct a nationwide survey. However, three Chittagong Hill Tracts (CHT) districts were dropped from the sample due to unrest in the CHT region during the 1980s (Malek et al., 2022). Besides, 4 districts that had difficulties in conducting the survey were also dropped, leaving a total of 57 districts. Among the remaining 57 districts across the country, 62 unions-lowest levels of the administrative unit-were chosen from the list of all unions using the random number table.

At the final stage, a pair of villages were purposively chosen based on - (1) household numbers (in a range of households between 100-250), (2) the ratio of land to person, and (3) literacy rateyielding 124 villages in this second stage. Finally, a village from each union was determined based on focused group discussion for the final in-depth household study. In order to identify the sample households, a household census of 9847 households in the 62 villages was carried out. Based on land ownership and land tenure characteristics, 20 households, on average, were selected for the final survey using the stratified random sampling method. Following this method, 1245 households were selected for the benchmark survey conducted in 1987-88.

The next four rounds of MHPD were fielded in 1999-00, 2003-04, 2007-08, and 2013-14. The same households were tracked in the following rounds to produce a longitudinal data set. In each round of the surveys, some households were dropped due to the attrition of the previous round. On the other hand, the split households were added in the succeeding rounds to ensure the inclusion of the original households. In addition, some additional households were also added in the second, and finally, 2846 households were surveyed in the fifth round. However, we will use

the baseline and the fifth round to investigate our objectives. We also have access to this data set from the late Dr. Mahabub Hossain.

Method

This study employs an Ordered Logit Model to analyze the relationship between individual and household characteristics and the health status of individuals. The dependent variable, health status, is categorized into ordinal levels: "Always Sick," "Sometimes Sick," "Hardly Sick," to understand how various factors influence an individual's health status. The independent variables consist of individual characteristics, such as gender, age, age at first marriage, marital status, education, occupation, as well as household characteristics, such as household size, dependency ratio, household monthly income, access to electricity, access to safe water, and the construction material of the house's walls. The Ordered Logit Model is an appropriate choice for this analysis as it accommodates ordinal dependent variables.

Ordered Logit Model

The Ordered Logit Model is an extension of the binary logistic regression model, suitable for ordinal dependent variables. It assumes that the odds of an individual falling into one category of the dependent variable versus a lower category are proportional, and it models these cumulative odds using a logistic function. Let Y_i represent the ordinal health status of individual i, where Y_i takes on one of three values: 1 for "Always Sick," 2 for "Sometimes Sick," and 3 for "Hardly Sick." The probability of a given observation is given by:

$$p_{ij} = \Pr(y_i = j) = \Pr\left(\kappa_{j-1} < X_i\beta + u \leq \kappa_j\right) = \frac{1}{1 + \exp(-\kappa_j + X_i\beta)}$$
$$= \frac{1}{1 + \exp(-\kappa_{i-1} + X_i\beta)}$$

Where κ_0 is defined as $-\infty$ and κ_k as $+\infty$.

The Ordered Logit Model is specified as follows:

$$logit\left(P(Y_i \leq j|X_i)\right) = \alpha_j - X_i\beta, \;\; for\; j = 1, 2$$

$$logit\left(P(Y_i \leq 3|X_i)\right) = \alpha_3 - X_i\beta$$

Where:

- $P(Y_i \leq j|X_i)$ is the probability that individual i falls into category j or below,
- α_j are the threshold parameters that separate the categories,
- β is a vector of coefficients that represent the effect of independent variables on the odds of moving up in the health status categories,

- X_i is a vector of individual and household characteristics.

X_i represents the explanatory variables containing household and individual characteristics. Among the individual characteristics, gender, marital status, education, age, age at first marriage, wage labor status, religion. On the other hand, household size, earning members, dependency ratio, household income in Bangladesh Taka (BDT), total land holding, access to tubewell, access to electricity, and NGO participation are considered as household characteristics. The detailed description of the variables used in this study is reported in the Table A1 of the appendix section. In addition to the individual characteristics, household characteristics also significantly affect the health outcome of individual. For instance, a larger household size may cause the household to provide the less food, less cloth, less medicine to its members compared to a household with fewer household members remaining other variables constant. Thus, in our study we control both individual and household characteristics to find the most accurate causal effect.

Model Estimation

The estimation of the Ordered Logit Model involves finding the values of the coefficients (β) and the threshold parameters (α_j) that maximize the likelihood function. The likelihood function is given by:

$$\mathcal{L}(\alpha_1, \alpha_2, \beta | Y_i, X_i) = \prod_{i=1}^{N} P(Y_i | X_i)$$

Where:

- N is the total number of observations,
- $P(Y_i|X_i)$ is the probability that individual ii falls into the observed category given the values of X_i.

The coefficients and thresholds are estimated using maximum likelihood estimation techniques, and STATA statistical software.

The estimated coefficients (β) provide insights into the impact of individual and household characteristics on the odds of having a higher health status category. A positive coefficient indicates an increase in the odds of having a higher health status, while a negative coefficient suggests a decrease in these odds.

The threshold parameters (α_j) help in understanding the cutoff points between health status categories. For example, α1α1 represents the threshold between "Always Sick" and "Sometimes Sick," and α_2 represents the threshold between "Sometimes Sick" and "Hardly Sick." These thresholds can vary depending on the values of the coefficients and may provide valuable information about transitions in health status.

In summary, the Ordered Logit Model allows us to assess how various individual and household characteristics influence an individual's health status, considering the ordinal nature of the

dependent variable. It provides a robust framework for understanding the factors associated with different levels of health in a population.

Results

In this section, we first discuss the descriptive statistics of the dependent and independent variables to provide important insights about the variables we are using in our investigation. We then provide the disucssion of our ordered logit regression, which estimates the effect of childhood poverty on the health status in adulthood after controlling a number of individual and household characterisitics.

Descriptive statistics

Table 1 reports the summary statisitics of the dependent variable, termed as “Health status.” It provides a comprehensive breakdown of adult health status among both females and males, categorizing their self-reported health into three distinct categories: "Almost always sick," "Sometimes sick," and "Hardly ever sick." The data presented in this table is instrumental in assessing the potential impact of childhood poverty on the health outcomes of adults. Health status of an adulthood bettween 26 and 40 years old individual[1] is categorized as “Always sick,” “Sometimes sick,” and “Hardly ever sick.” The “Always sick” category includes individuals who reported their health as being in a consistently poor state. These individuals experience frequent health issues. The “Sometimes sick” category represents individuals who reported experiencing health issues periodically. While not in a constant state of ill health, they do encounter health challenges from time to time. Finally, the “Hardly ever sick” category encompasses individuals who reported experiencing good health most of the time. They rarely face significant health problems.

The data in Table 1 for females indicate that 7.08% of adult women reported being "Almost always sick," 49.41% reported being "Sometimes sick," and 43.51% reported being "Hardly ever sick." For males, the data shows that 4.52% reported being "Almost always sick," 35.88% reported being "Sometimes sick," and a larger proportion, 59.60%, reported being "Hardly ever sick." The table also provides the total number of respondents for both females and males. For females, the total number is 1,101, while for males, it is 995.

[1] The poverty status is from the the survey year 1988 and we estimate the impact of this poverty on health outcome reported in the latest survey round, which is 2014, so, individuals who are between 26 and 40 were between 0 and 14 in the year 1988 and we consider these individuals as our estimating sample.

Table 1: Proportion of females and males with different health status in their adulthood

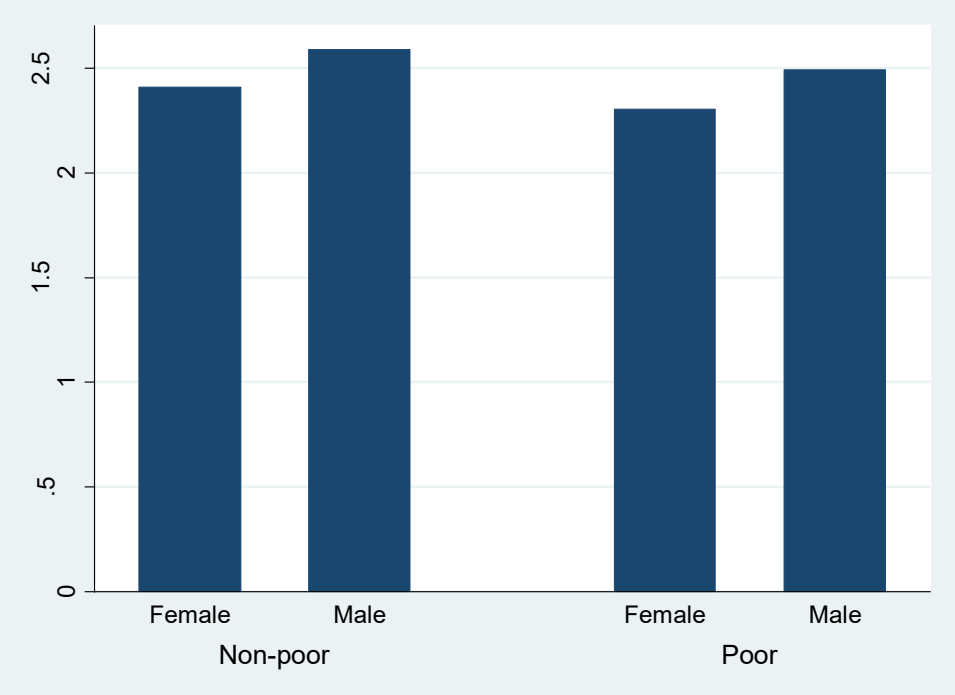
	Female		Male	
Health status	Number	Percent	Number	Percent
Almost always sick	78	7.08	45	4.52
Sometimes sick	544	49.41	357	35.88
Hardly ever sick	479	43.51	593	59.60
Total	1101	100	995	100

Source: Authors' estimation using MHPD data.

Figure 1 provides a comprehensive view of the average health status of both females and males, shedding light on intriguing patterns. These patterns reveal that, regardless of childhood poverty status, males tend to exhibit better overall health status in adulthood compared to their female counterparts. However, when we delve deeper into the comparison between non-poor individuals and their economically disadvantaged counterparts, a noteworthy trend emerges. Among both females and males, those who experienced a non-poor childhood exhibit superior health status.

The figure distinctly illustrates the health divide between genders during adulthood. Irrespective of their childhood economic background, males consistently exhibit more favourable health outcomes. This gender-based health advantage in adulthood is a critical observation stemming from this analysis. In addition, to better understand the influence of childhood poverty, we examined how health status varies between those who experienced economic hardship during childhood (referred to as "poor") and those who did not (referred to as "non-poor"). Across both genders, the data strongly indicates that individuals from non-poor childhoods enjoy better health status in adulthood. This underscores the lasting impact of early economic conditions on adult health outcomes.

Figure 1: Health status in adulthood for poor and non-poor individuals.



Source: Authors' illustration using MHPD data.

Table 2 offers a comprehensive summary of various individual characteristics, including childhood poverty rates, age, education, marital status, age at first marriage, occupation, and religion, stratified by gender (female and male). These statistics are crucial for understanding the demographic and socio-economic profiles of the study's participants in relation to childhood poverty and how these characteristics may influence health outcomes in adulthood. Key Insights from Table 2 is outlined below:

Childhood poverty rates: The table presents the childhood poverty rates for both females and males. Among females, the childhood poverty rate is 44.24%, while for males, it is slightly lower at 40.21%. This indicates that a relatively higher proportion of females experienced poverty during their childhood compared to males. Figure 2 presents a compelling visual representation of childhood poverty rates among individuals with varying health statuses. The figure not only highlights these disparities but also hints at a potentially inverse relationship between childhood poverty and health status in adulthood. The figure effectively delineates how childhood poverty rates differ across distinct health status categories. It becomes evident that individuals with varying health statuses experienced varying degrees of economic disadvantage during their formative years.

A thought-provoking insight gleaned from Figure 2 is the potential negative association between childhood poverty and adult health status. As childhood poverty rates increase, there appears to

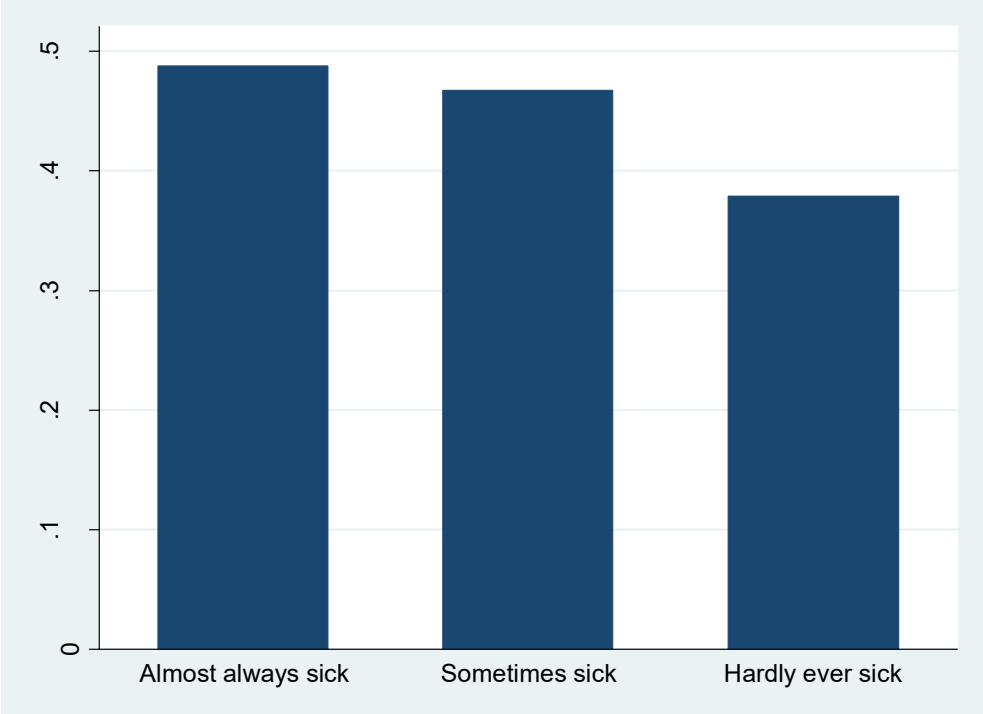
be a corresponding decline in health status during adulthood. This suggests that individuals who grew up in impoverished conditions may face greater health challenges as they age. This visual representation underscores the intricate relationship between early-life economic circumstances and adult health outcomes. Policymakers, healthcare professionals, and social advocates can draw valuable insights from this figure to develop targeted interventions aimed at breaking the cycle of childhood poverty and its potential long-term health repercussions.

Table 2: Individual characterisitcs that could potentially impact health status

		Female **Total number =1101**	Male **Total number = 995**
Individual characteristics			
Childhood poverty (rate)		44.24	40.21
Age (years)		32.53	32.79
Education	No education	20.41	21.23
	Primary	29.58	32.19
	Secondary	43.38	34.41
	Higher secondary	4.63	5.43
	Graduation/Post-graduation	2.01	6.74
Marital Status (%)	Unmarried	0.73	10.05
	Married	96.28	89.25
	Widow/Widower	1.27	0.4
	Divorced	1.09	0.3
	Separated	0.36	0
Age at 1st marriage (year)		17.34	21.34
Occupation (%)	Wage Labor	0.27	12.96
	Salaried Labor	2.72	10.15
	Self-employed	0.27	20.9
	Trader	0	19.7
	Production	0.09	0.3
	Farming	0.27	31.96
	Unemployed	96.37	4.02
Religion (%)	Islam	89.94	89.65
	Hindu	9.88	9.95
	Bhuddist	0.09	0.2
	Christian	0.09	0.2

Source: Authors' estimation using MHPD data.

Figure 2: Childhood poverty could negatively impact adulthood health status.

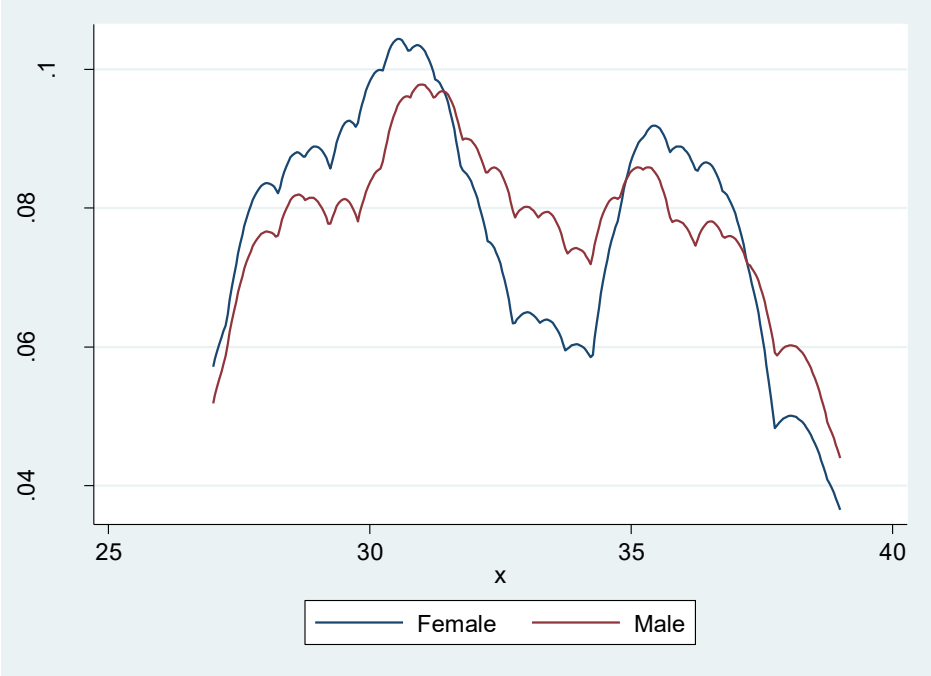


Source: Authors' illustration using MHPD data.

Age: The average age for females is 32.53 years, whereas for males, it is slightly higher at 32.79 years. These age statistics reflect the approximate age range of the study's participants. Figure 3 provides the distribution of age for females and males. From the figure, one can see that for age below 30, the proportion of females is smaller than the proportion of males, while for age between 30 and 35, this is the opposite and for age above 35, the proportions of males and females seem to be similar.

Figure 3 offers a comprehensive view of the age distribution within the study's population, carefully distinguishing between females and males. This figure not only showcases the age profiles but also uncovers intriguing patterns in their distribution.The figure prominently displays the age disparities between females and males within the dataset. It is evident that these disparities evolve significantly across different age brackets, providing noteworthy insights into the demographic composition of the study. These age-related insights unveiled by Figure 3 carry implications for various facets of the study, particularly regarding health outcomes in adulthood and their potential association with childhood poverty. The age distributions presented here underscore the importance of accounting for age-related variables when exploring the nuanced relationship between early-life economic conditions, age, and health status in adulthood.

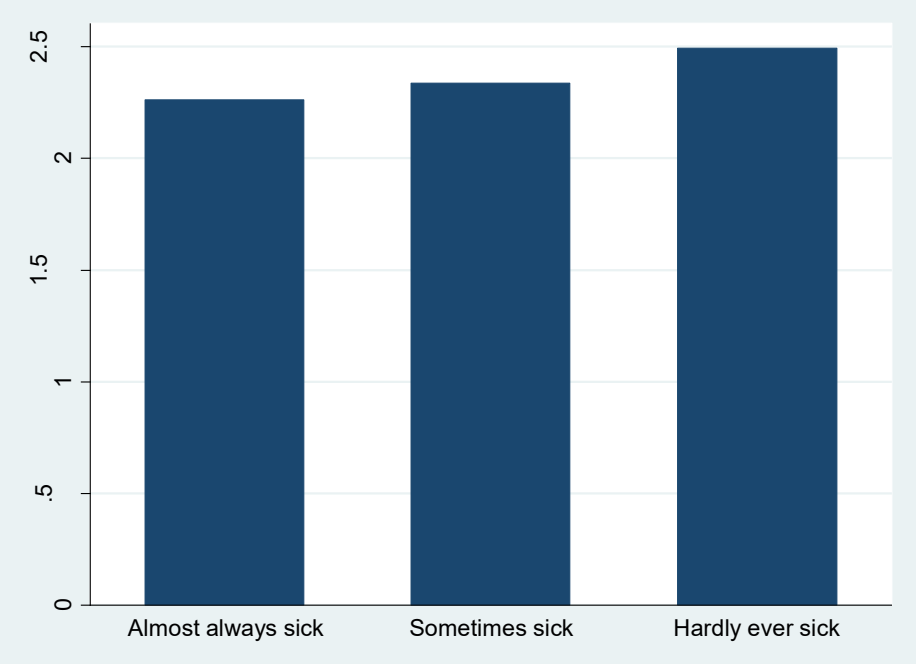
Figure 3: Age distribution of females and males for sample individuals



Source: Authors' illustration using MHPD data.

Education: Education levels are categorised into several groups, from "No education" to "Graduation/Post-graduation." Notably, among both females and males, the majority fall into the "Secondary" education category. However, there are gender differences in the distribution of education levels. For instance, a higher percentage of males (6.74%) have completed "Graduation/Post-graduation" compared to females (2.01%). Conversely, a larger proportion of females (29.58%) have "Primary" education compared to males (32.19%). Figure 4 meticulously outlines the dynamic association between health status and educational achievement. It illuminates the profound connection between these variables, emphasising that they are far from independent. The figure eloquently underscores the trend that individuals with higher levels of educational attainment also tend to exhibit superior health status. This suggests a positive correlation between health and education, implying that those with better health are more likely to pursue and complete advanced educational milestones.

Figure 4: Average level of education at different health status

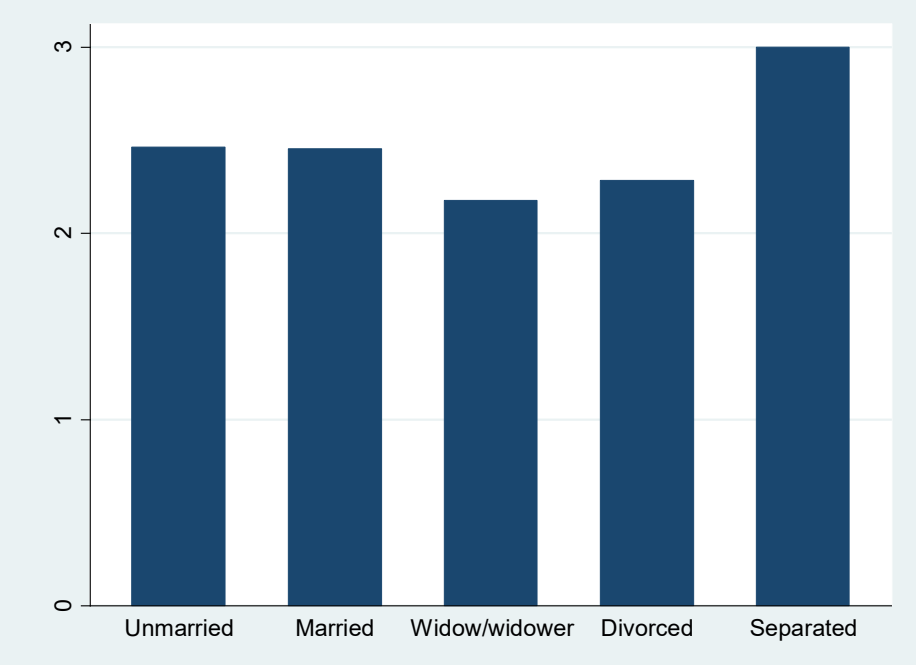


Source: Authors' illustration using MHPD data.

Marital status: The table provides the distribution of marital status among participants, including "Unmarried," "Married," "Widow/Widower," "Divorced," and "Separated." It is noteworthy that a higher percentage of females (10.05%) are "Unmarried" compared to males (0.73%). In contrast, a larger percentage of males (89.25%) are "Married" compared to females (96.28%). Figure 5 offers a comprehensive exploration of health status concerning diverse marital statuses. This illuminating visual representation unveils intriguing insights into how one's marital status can intricately intersect with their health status, ultimately shaping their well-being in adulthood. Notably, Figure 5 discerns that health status appears fairly comparable between married and unmarried individuals. This observation suggests that the act of being married, in and of itself, may not inherently dictate one's health status, at least on average.

However, a more granular view reveals that individuals who have experienced the loss of a spouse (widow/widower) or those who have gone through the process of divorce exhibit lower average health status. These findings spotlight the unique challenges and stressors that may be associated with these marital transitions, which can have enduring effects on health. The findings in Figure 5 beckon further investigations into the mechanisms linking marital status to health outcomes. Researchers may explore the specific factors that contribute to lower health status among widowed or divorced individuals, paving the way for tailored interventions and support systems.

Figure 5: Average health outcome at different marital status

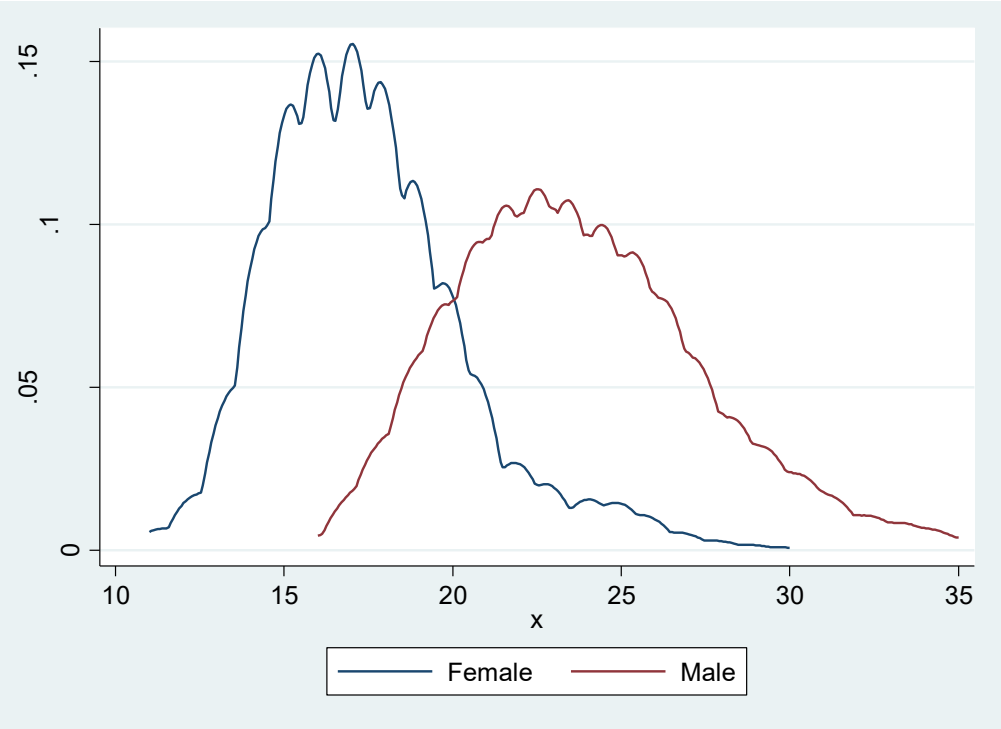


Source: Authors' illustration using MHPD data.

Age at first marriage: The table reports the average age at which individuals got married for both genders. Females, on average, get married at 17.34 years, whereas males tend to marry at a later age, with an average age of 21.34 years. In Figure 6, we depict the distribution of age at first marriage for females and males included in our estimating sample. Figure 6 offers a compelling narrative surrounding the age at which females and males enter into their first marriages, providing valuable insights into the temporal dimension of life choices and its potential implications for their health status in adulthood. This figure illuminates a stark contrast in the age at which females and males embark on their marital journeys. While males exhibit a relatively even distribution of age at first marriage, centred around the age of 25, the picture for females tells a different story.

Figure 6 paints a concerning portrait of early marriages among females, with a substantial proportion tying the knot before reaching the age of 20. This phenomenon raises poignant questions about the socio-cultural factors and practices that drive these early unions, often during childhood or adolescence. The critical intersection between early marriage and adulthood health status emerges as a focal point of Figure 6's narrative. The implication is clear: early marriages, particularly those occurring during childhood, may exert a profound and lasting influence on an individual's health in later life.

Figure 6: Distribution of age at first marriage for famels and males



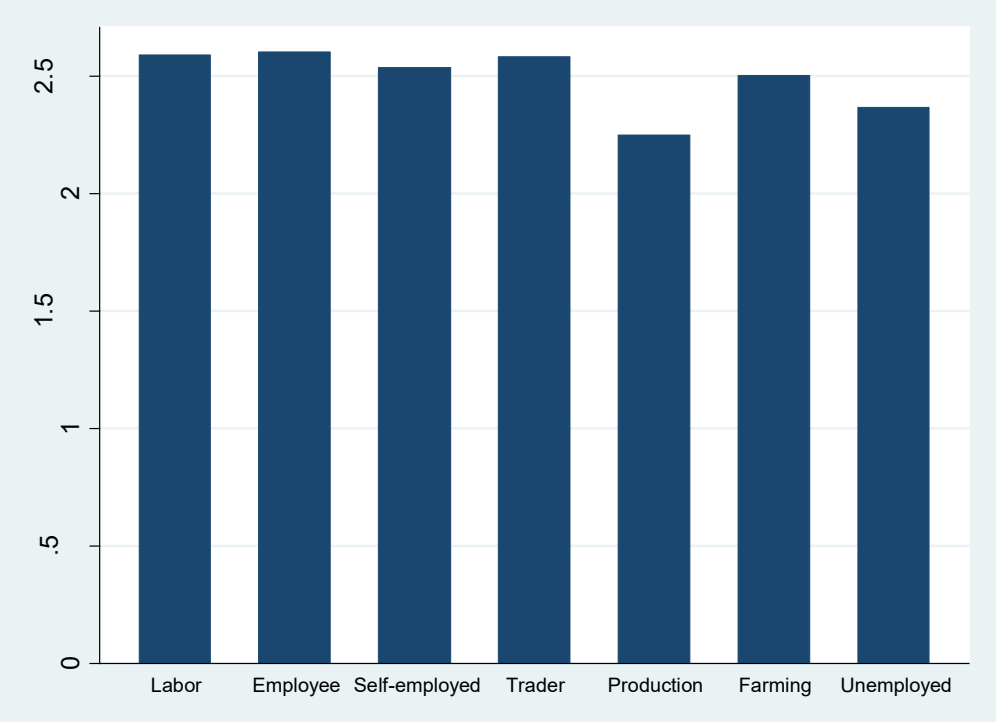
Source: Authors' illustration using MHPD data.

Occupation: Participants' occupations are classified into categories such as "Wage Labor," "Salaried Labor," "Self-employed," "Trader," "Production," "Farming," and "Unemployed." The data reveals significant gender disparities in occupation. For instance, a substantial majority of females (96.37%) are classified as "Unemployed," whereas this category comprises only 4.02% of males. Conversely, a higher percentage of males are engaged in "Farming" (31.96%) compared to females (0.27%). igure 7 offers an intricate tapestry of health status variations among individuals belonging to diverse occupational groups, providing a compelling glimpse into the profound interplay between one's chosen profession and their health outcomes. It becomes evident that the choice of occupation holds substantial sway over an individual's health status.

Figure 7 teases out a mosaic of health trajectories. Some occupations seem to nurture better health outcomes, while others are associated with relatively poorer health. This divergence sparks questions about the underlying mechanisms that link one's work to their health. Notably, production workers emerge as a group with comparatively lower average health status. This revelation prompts a deeper inquiry into the specific challenges and stressors inherent to

production work that may contribute to these health disparities. Being unemployed also seems to affect the health status. Unemployed individuals' health status is slightly worse than others.

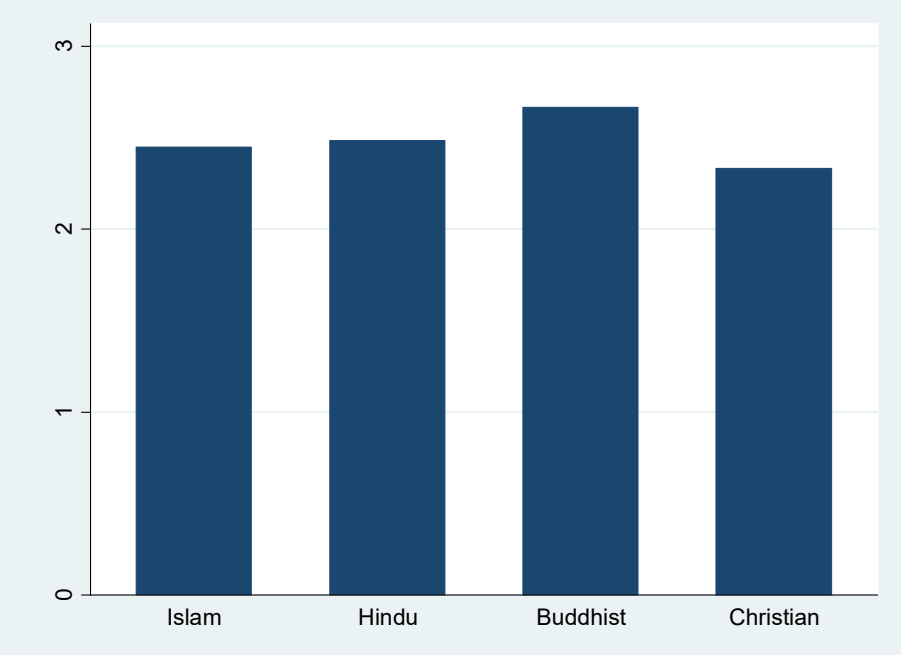
Figure 7: Average health status across various occupation groups



Source: Authors' illustration using MHPD data.

Religion: The table presents the distribution of participants' religious affiliations, including "Islam," "Hindu," "Buddhist," and "Christian." The data shows that the majority of both females (89.94%) and males (89.65%) identify as "Islam." Figure 8 depicts average health status across individuals of different failth and it seems that there is no difference in health status among the followers of different religions, except Buddhists seem to have slightly better average health status than the rest of population.

Figure 8: Average health status among individuals with different faith



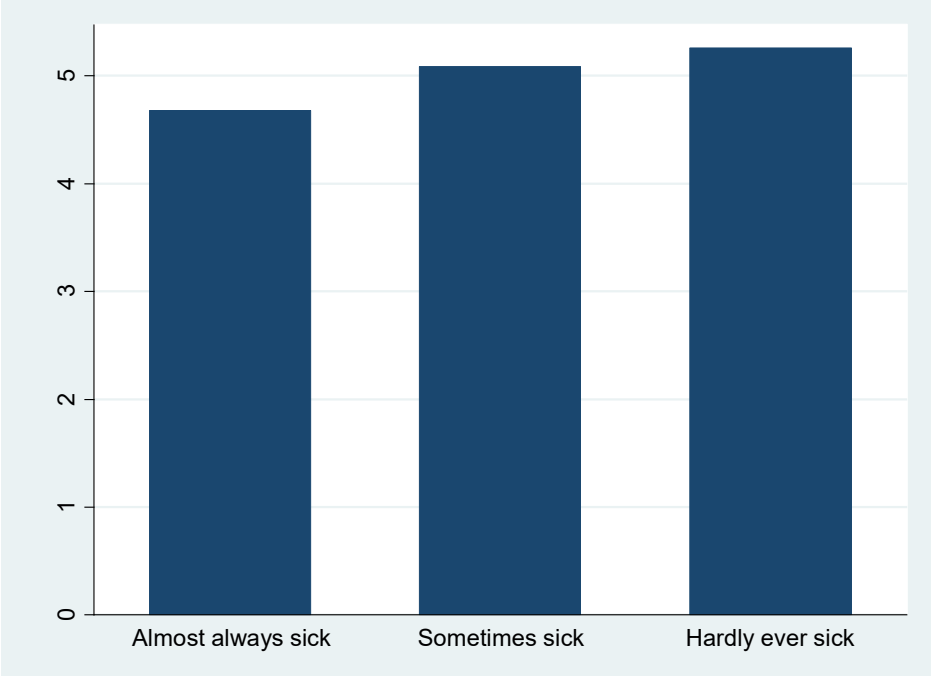
Source: Authors' illustration using MHPD data.

These summary statistics provide valuable insights into the socio-demographic characteristics of the study's participants, which are essential for understanding how childhood poverty and individual attributes may interact to influence health status in adulthood..

Table 3 provides a summary of various household characteristics that have the potential to influence an individual's health status, segmented by gender (female and male). These household-level statistics are crucial for understanding the socio-economic context in which individuals were raised and currently reside, and how these factors might impact health outcomes in adulthood. The important Insights of these household-level characteristics are discussed below:

Average household size: On average, female participants come from households with an average size of 5.04 individuals, while male participants tend to reside in slightly larger households with an average size of 5.27 individuals. These statistics reveal the approximate household sizes for the study's participants. Figure 9 delves into the relationship between household size and health status. It suggests that, on average, people in larger households tend to have better health. This could be because of shared resources and more social interaction. It indicates that health isn't just an individual thing; it's influenced by our families and communities.

Figure 9: Household size of individuals with different health status



Source: Authors' illustration using MHPD data.

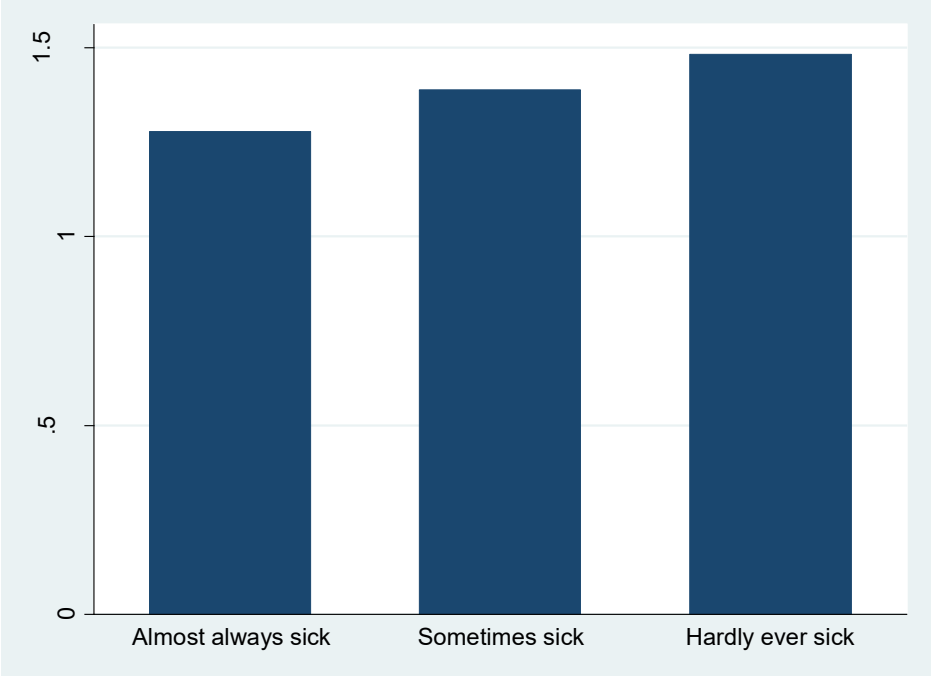
Table 3: Household characterisitcs

	Female **Total number = 1101**	Male **Total number = 995**
Household Characteristics		
Average household size	5.04	5.27
Average number of eaning members	1.31	1.55
Dependency ratio	0.97	0.76
Monthly Household Income (BDT)	16285.99	17379.67
Total land holding (Decimal)	98.48	107.24
Tubewell (%)	84.95	85.73
Electricity (%)	74.49	73.57
NGO participation (%)	35.08	5.63

Source: Authors' estimation using MHPD data.

Number of earning members: The table presents the average number of earning members per household. Among females, households have an average of 1.31 earning members, whereas male households have a slightly higher average of 1.55 earning members. This indicates that male households, on average, have a somewhat larger number of income earners. In Figure 10, we see how the average number of earners in a household relates to people's health. The data suggests that individual from households with fewer earners tend to have more health issues compared to those in households with more earners. This finding has important implications. It indicates that the economic stability of a household can influence the health of its members. Households with more earners might have better access to healthcare or resources for a healthier lifestyle.

Figure 10: Average number of earning members

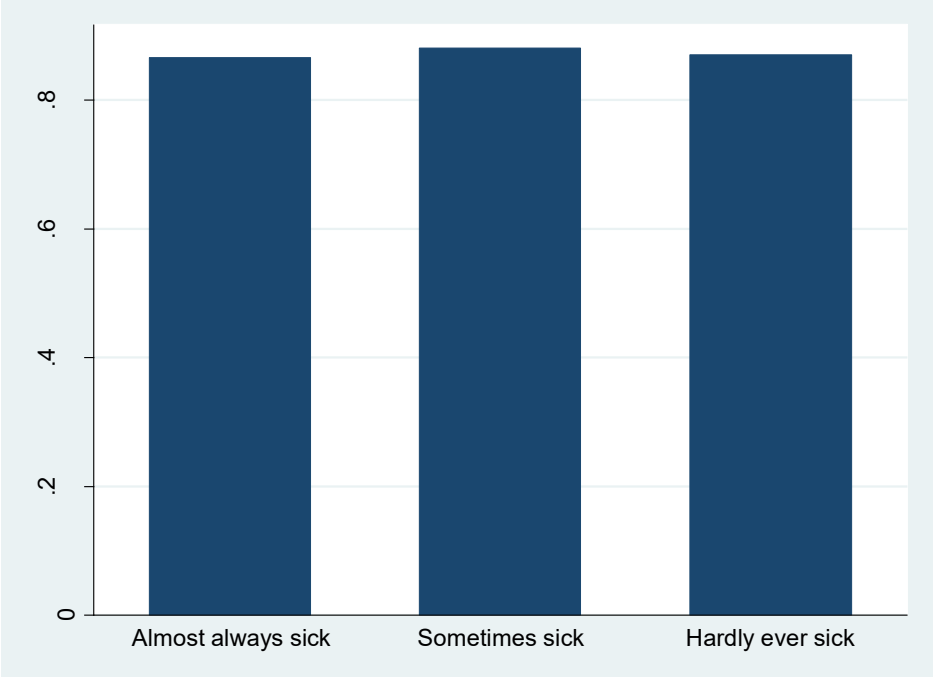


Source: Authors' illustration using MHPD data.

Dependency ratio: The dependency ratio is calculated by dividing the number of dependents (those not in the labor force) by the number of working-age individuals in the household. For females, the average dependency ratio is 0.97, while for males, it is lower at 0.76. This suggests that, on average, male-headed households have a lower dependency ratio, indicating a potentially higher level of financial independence. Figure 11 explores the relationship between a household's dependency ratio and the health status of its members. The data here indicates that there isn't a significant variation in the health status of individuals based on their household's dependency ratio. This finding raises interesting questions. While the number of dependents in a household

might affect its overall financial situation, it doesn't seem to be a major factor when it comes to individual health.

Figure 11: Dependency ratio in households with various levels of health status

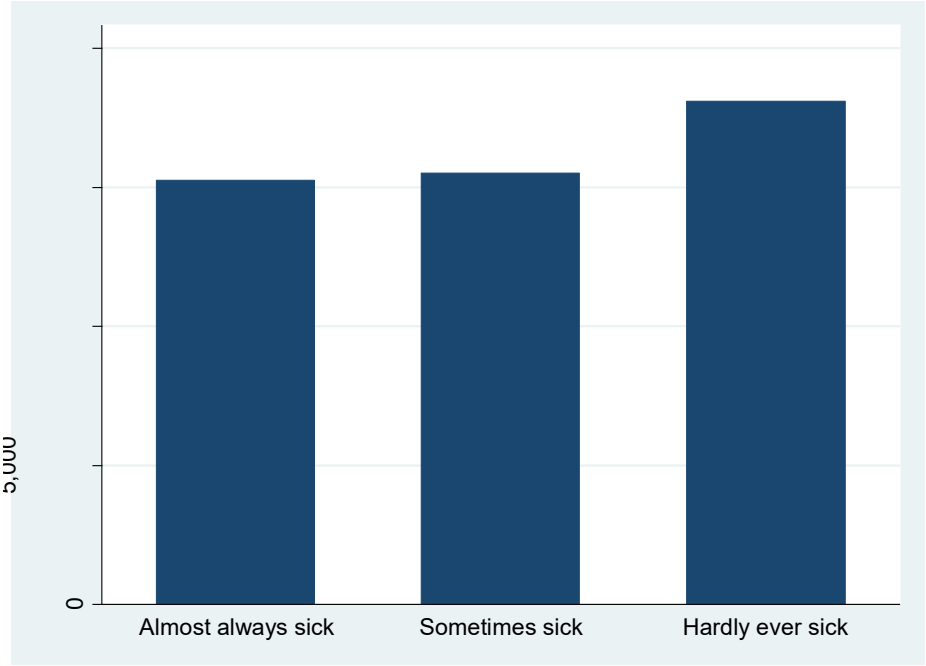


Source: Authors' illustration using MHPD data.

Monthly household income (BDT): This statistic represents the average monthly income of households in Bangladeshi Taka (BDT). Female-headed households have an average monthly income of 16,285.99 BDT, whereas male-headed households report a slightly higher average income of 17,379.67 BDT. Figure 12 presents the average monthly household income among individuals with varying health statuses. What we observe here is that those who reported being "almost always sick" or experiencing illness "sometimes" tend to have fairly similar average monthly incomes. However, a notable disparity arises when we look at those who reported being "hardly ever sick" – they demonstrate significantly higher average monthly household incomes.

This finding sparks intriguing questions about the relationship between health and income. While it's not surprising that individuals in better health may have greater earning potential due to increased work capacity, Figure 12 adds nuance to this connection. It suggests that, on average, those with fewer health issues are associated with higher household incomes. Yet, it's essential to remember that correlation does not imply causation. Several factors could contribute to this income disparity, including access to better job opportunities, education, and overall socio-economic status.

Figure 12: Monthly average household income across ditteferent levels of health status



Source: Authors' illustration using MHPD data.

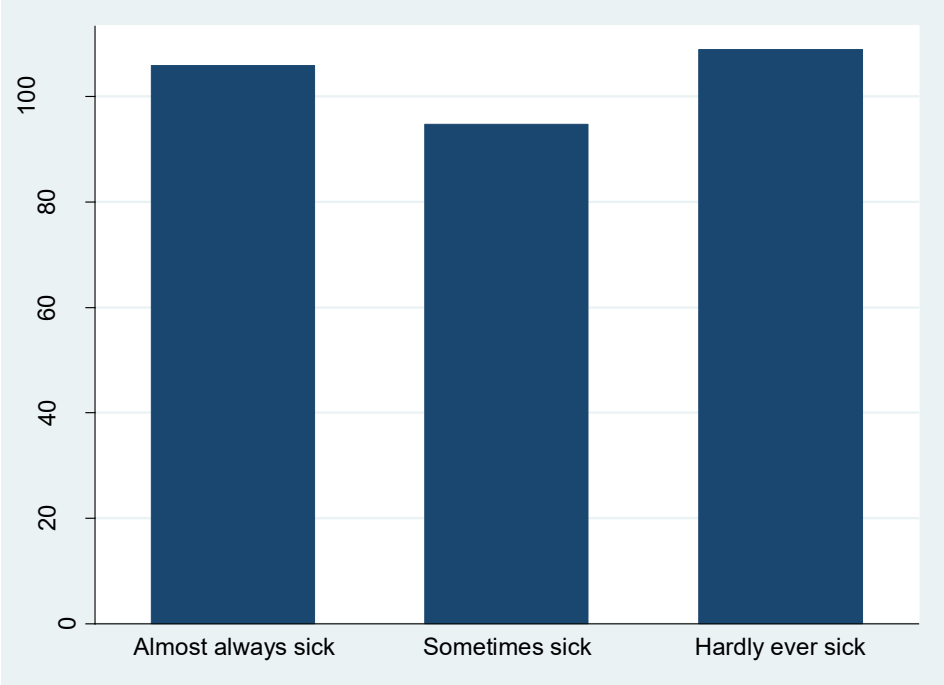
Total land holding (Decimal): The table displays the average total land holding per household in decimal units. Female-headed households have an average land holding of 98.48 decimals, while male-headed households have a higher average of 107.24 decimals. This indicates that, on average, male households possess a larger land area. In Figure 13, we examine the relationship between household total land holdings and the reported health status of their members. The data reveals intriguing insights into this dynamic.

At first glance, it might appear that there is no clear and consistent pattern between land ownership and health status. However, upon closer examination, some noteworthy trends emerge. Households with individuals who report "hardly ever" experiencing illness tend to have, on average, the highest total land holdings. This observation raises interesting questions about the role of land ownership in maintaining better health. It could imply that households with more substantial land holdings have better access to resources, including nutritious food and income-generating opportunities, which in turn contribute to improved health outcomes.

Surprisingly, households with members who claim to be "almost always sick" have, on average, larger total land holdings than households with members who report being sick "sometimes." This finding is unexpected and merits further investigation. It could be indicative of diverse economic strategies employed by households facing persistent health challenges, such as increased reliance on land-based livelihoods for financial stability. However, it's essential to interpret these observations cautiously. The relationship between health status and land

ownership is likely influenced by various factors, including geographical location, economic activities, and cultural practices. Therefore, while Figure 13 offers valuable insights, it does not provide a definitive explanation for these patterns.

Figure 13: Total land holding by the households with different levels of health status



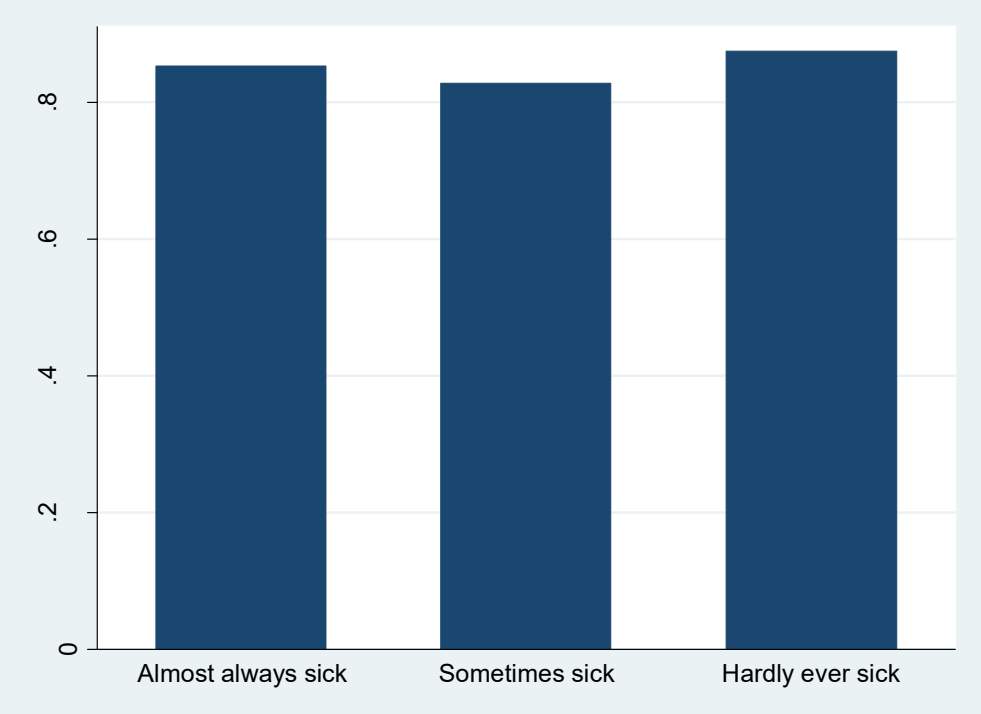
Source: Authors' illustration using MHPD data.

Tubewell (%): Tubewell usage is reported as a percentage of households with access to tubewell water sources. In this context, 84.95% of female-headed households and 85.73% of male-headed households have access to tubewells. These statistics highlight the prevalence of tubewell usage in both groups. Fordifferent levels of health status, Figure 14 explores an essential aspect of household infrastructure – access to tubewells – and its potential correlation with the health status of household members. Tubewells are often associated with a safer source of drinking water, and this figure delves into whether this access has any discernible link to the health status of residents. Upon examination, Figure 14 reveals a rather surprising pattern. It appears that the presence of a tubewell within households is strikingly similar across households with varying levels of health status. This finding raises intriguing questions about the relationship between water source and health outcomes.

One might initially expect that households reporting better health status would have a more significant tendency to access tubewell water, given its reputation for safety. However, this

figure challenges that assumption, suggesting that factors beyond water source might play a more prominent role in determining health status. Several explanations could account for this unexpected result. Firstly, the quality of water from tubewells may not be consistent, and variations in water safety practices within households could diminish any potential health benefits. Secondly, other critical factors, such as sanitation, hygiene practices, and healthcare access, may exert more substantial influence on health outcomes, overshadowing the role of water source.

Figure 14: Access to tube well by households with different levels of health status



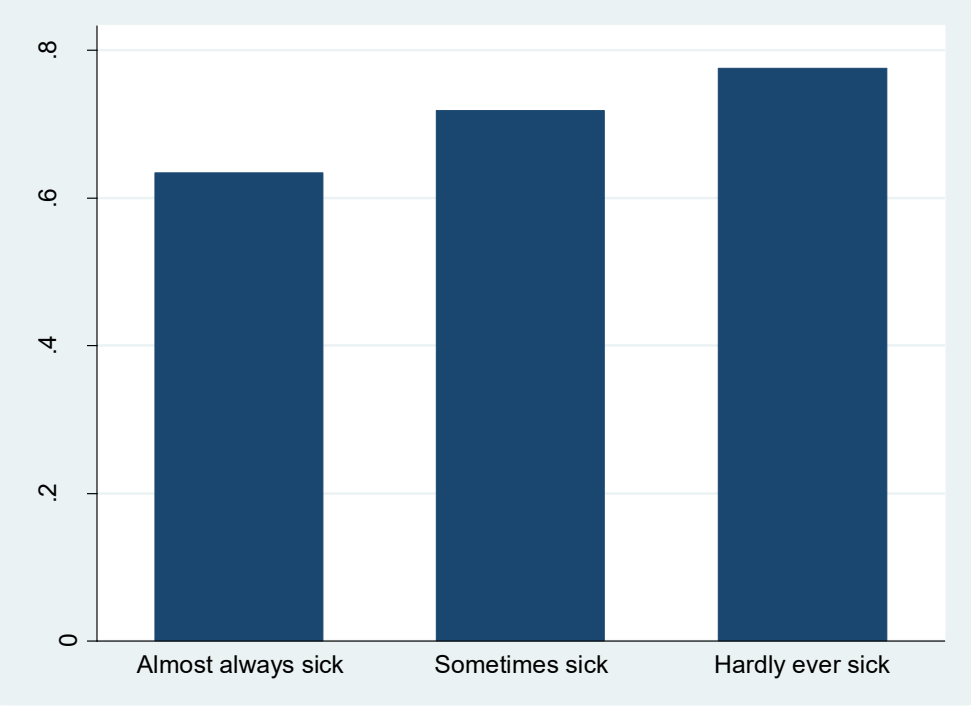
Source: Authors' illustration using MHPD data.

Electricity (%): This category indicates the percentage of households with access to electricity. Among females, 74.49% of households have electricity, while for males, this percentage is slightly lower at 73.57%. These statistics reflect the degree of electricity access in both gender groups. Figure 15 delves into an important aspect of modern living: household access to electricity. This figure investigates whether the presence of electricity within households correlates with the health status of its members, shedding light on the potential role of electrification in improving health outcomes. Upon examination, Figure 15 reveals a compelling and clear pattern. As households report greater access to electricity, there is a noticeable improvement in the health status of their members. This finding suggests a positive association between electricity access and health, which merits closer attention and consideration.

The correlation observed in Figure 15 may be explained by several factors. Firstly, access to electricity can facilitate the use of various medical devices and appliances, enabling better

healthcare within the household. For instance, refrigeration for storing medicines, lighting for nighttime emergencies, and electrical medical equipment all contribute to improved health outcomes. Secondly, electricity can enhance overall living conditions. It allows for better ventilation, heating, and cooling, which can positively impact general well-being. Additionally, improved lighting conditions can contribute to safer environments, reducing the risk of accidents and injuries. Thirdly, electricity enables access to electronic media and communication, which can promote health awareness and facilitate timely healthcare-seeking behavior. Individuals with access to information may be more likely to adopt healthier lifestyles and seek medical attention when needed.

Figure 15: Access to electricity by households with different levels of health status

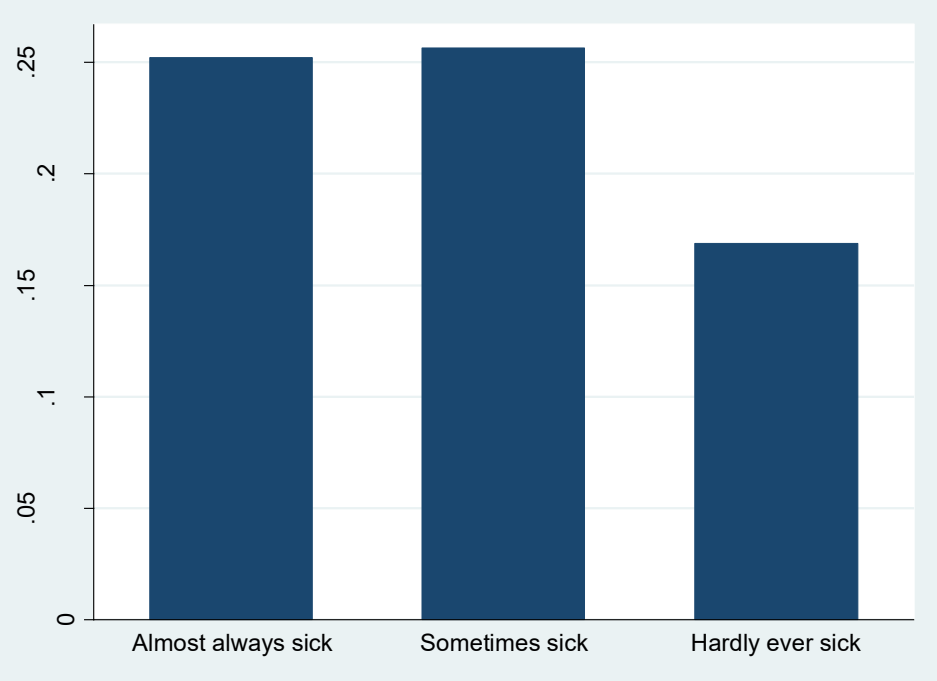


Source: Authors' illustration using MHPD data.

NGO Participation (%): The table reports the percentage of households with participation in non-governmental organisations (NGOs). Notably, 35.08% of female-headed households and 5.63% of male-headed households have participated in NGOs. This indicates a higher prevalence of NGO involvement among female households. Figure 16 investigates an intriguing aspect of household dynamics: the connection between households and non-governmental organizations (NGOs), and how this relates to the health status of household members. It raises questions about the impact of NGO engagement on health knowledge and outcomes. One might intuitively assume that households linked to NGOs would have better health and nutritional knowledge, potentially leading to improved health statuses among their members. However, Figure 16 presents a rather unexpected narrative.

Contrary to expectations, this figure portrays a different scenario. It shows that individuals who reported "hardly ever getting sick" tend to reside in households with fewer connections to NGOs compared to households whose members reported being "almost always sick" or "sometimes sick." This observation raises intriguing questions about the relationship between NGO engagement and health outcomes. Several factors may contribute to this surprising finding. First, it is possible that poorer households, facing greater health challenges, are more likely to seek assistance from NGOs. Consequently, their members may report poorer health statuses due to pre-existing health conditions. Second, health knowledge doesn't solely rely on NGO connections. Households may acquire health-related information from various sources, including government initiatives, community networks, or personal experiences. The absence of NGO connections doesn't necessarily imply a lack of health information.Third, the way individuals perceive and report their health status can be influenced by various factors, including socioeconomic status, cultural beliefs, and expectations. This reporting bias could affect the data depicted in Figure 16.

Figure 16: Proportion of households connected to an NGO with different levels of health status



Source: Authors' illustration using MHPD data.

Regression results

Table 4 presents the results of an ordered regression analysis, exploring the relationship between health status and various independent variables. Health status is categorized into three levels: "almost always sick," "sometimes sick," and "hardly ever sick." The table is divided into three columns, each providing different insights into the odds ratios associated with the independent variable "childhood poverty" (child_poor) and other individual and household characteristics.

Column (1) shows the odd ratio from a simple ordered logit model, where we include only child_poor. The odds ratio for childhood poverty is 0.782 with a standard error of 0.068. This indicates that individuals who experienced childhood poverty are 0.782 times as likely to report a better health status (“Hardly ever sick”) compared to those who did not experience childhood poverty. The negative coefficient suggests a significant negative association between childhood poverty and adult health status. Hence, childhood poverty significantly affects the health status in adulthood and an individual experiencing childhood poverty is more likely to get almost always sick or sometimes sick compared to individuals who have not suffered from poverty in their childhood.

Column (2) presents the odds ratios when we consider individual characteristics alongside childhood poverty. The childhood poverty ratio becomes slightly larger, indicating slightly lower odds of poorer health status in adulthood due to childhood poverty. This relationship remains statistically significant. The odds ratio for gender shows that females are 1.055 times more likely to report better health status in adulthood compared to males, although this gender difference doesn't appear statistically significant.

The odds ratio for age is 0.978 with a standard error of 0.013, meaning that for each one-year increase in age, individuals are 0.978 times as likely to report better health status. In simpler terms, as people get older, their health status tends to decline. Regarding marital status, different levels yield varying odds ratios: 2.458 (divorced), 0.275 (widow/widower), and 4.004 (separated), respectively. These values suggest that divorced or separated individuals are more likely to report better health compared to married individuals, while widow/widower individuals are significantly less likely to report better health status than their married counterparts.

Odds ratios differ among the various education levels, but all of them are greater than 1, implying that higher education levels are associated with better health statuses. For instance, an odds ratio of 1.657 for "Graduation/Post-graduation" suggests that individuals with these education levels are 1.657 times as likely to report better health status. However, only the primary and graduation/postgraduation education levels are statistically significant at the 10 percent level, meaning they have a stronger impact on health status. The odds ratio for age at first marriage is 1.039 with a standard error of 0.015, indicating that for each one-year increase in the age at which individuals first marry, they are 1.039 times as likely to report better health status. This implies that delaying marriage is associated with better health statuses and is statistically significant at the 10 percent level.

Table 4: Estimated odd ratios from the ordered logit regression models

Varaible	Dep. Var. = Health status		
	(1)	(2)	(3)
child_poor	0.782*** (0.068)	0.839* (0.079)	0.891 (0.101)
Individual characteristics			
gender		1.055 (0.322)	0.744 (0.279)
age		0.978* (0.013)	0.974* (0.014)
Married (base category)			
Widow/Widower		2.458* (1.327)	1.691 (1.116)
Divorced		0.275** (0.166)	0.311 (0.202)

Separated		4.004 (3.752)	3.134 (4.211)
No education (base category)			
Primary		1.281* (0.165)	1.191 (0.161)
Secondary		1.086 (0.139)	1.012 (0.139)
Higher secondary		1.164 (0.274)	1.138 (0.288)
Graduation/Post-graduation		1.657* (0.459)	1.600 (0.501)
age_first marriage		1.039*** (0.015)	1.036** (0.016)
Wage Labor (base category)			
Salaried Labor		0.834 (0.234)	0.784 (0.229)
Self-employed		0.886 (0.199)	0.861 (0.199)
Trader		0.939 (0.222)	0.959 (0.235)
Production		2.342 (2.634)	2.834 (3.918)
Farming		0.746* (0.156)	0.722 (0.157)
Unemployed		0.734 (0.246)	0.496* (0.203)
Islam (base category)			
Hindu		0.759* (0.114)	0.772* (0.121)
Buddhist		4.116 (5.463)	3.988 (5.369)
Christian		0.282 (0.343)	0.307 (0.378)
Household characteristics			
Household size			1.022 (0.035)
Earning members			0.883 (0.089)
Dependency ratio			0.954 (0.099)
Monthly Household Income (BDT)			1.001 (0.003)
Total land holding (Decimal)			1.009 (0.029)
Tube well (%)			1.377 (0.187)
Electricity (%)			1.186 (0.136)
NGO participation (%)			0.781 (0.098)
Number of observations and model fitness			
N	2096	1986	1792
LR Ch2	8.09	70.82	79.84
Prob > chi2	0.0045	0.0000	0.0000
Pseudo R2	0.0022	0.0204	0.0258

Note: ***p-value<0.01, **p-value<0.05, and *p-value<0.1

The relationship between adulthood health status and individuals' occupations is not statistically significant. However, in terms of religion, individuals of Hindu and Christian faiths seem to have lower health status compared to individuals with Islamic faith, while Buddhists are more likely to report better health status than Muslims.

Column (3) reveals the outcomes of the full model, encompassing both individual and household characteristics alongside childhood poverty. In this comprehensive model, the odds ratio of childhood poverty still indicates a potential link to lower health status, but this relationship is no longer statistically significant.

The odds ratio for household size is 1.022 with a standard error of 0.035. This implies that for each one-unit increase in household size, individuals are 1.022 times as likely to report a better health status. Larger households might be marginally associated with improved health statuses.

Similarly, the odds ratio of the number of earning members is 0.883 with a standard error of 0.089. This means that for each additional earning member in the household, individuals are 0.883 times as likely to report a better health status. Surprisingly, more earning members appear to have a negative impact on members' health statuses.

The odds ratio of the dependency ratio is 0.954 with a standard error of 0.099. This suggests that for each one-unit increase in the dependency ratio, individuals are 0.954 times as likely to report a lower health status. While higher dependency ratios may be linked to lower health statuses, this effect is not statistically significant.

The odds ratio of monthly income is 1.001 with a standard error of 0.003. This indicates that for each one-unit increase in monthly household income (measured in BDT), individuals are 1.001 times as likely to report a better health status. However, the association between income and health status is very weak, almost negligible.

The odds ratio of total land holding is 1.009 with a standard error of 0.029. This suggests that for each one-unit increase in total land holding (measured in decimals), individuals are 1.009 times as likely to report a better health status. Having more land holdings may be associated with slightly better health statuses.

The odds ratio of having a tube well is 1.377 with a standard error of 0.187, indicating that households with access to a tube well are 1.377 times as likely to have individuals reporting better health statuses. This relationship is statistically significant at the 5 percent level, suggesting that tube well water, generally considered safe, might positively influence health status.

The odds ratio of access to electricity is 1.186 with a standard error of 0.136. This implies that households with access to electricity are 1.186 times as likely to have individuals reporting better health statuses, indicating that greater access to electricity may be associated with improved health statuses.

Lastly, the odds ratio of households' participation in NGO activities is 0.781 with a standard error of 0.098. This surprising result suggests that households connected to an NGO are 0.837 times as likely to have individuals reporting better health statuses. This association challenges the assumption that NGO participation necessarily leads to better health outcomes.

In summary, this table provides valuable insights into the relationship between childhood poverty, individual characteristics, household characteristics, and health status. It underscores that childhood poverty is negatively linked to adult health status, a relationship that holds even

when considering a broad range of individual factors. However, when household characteristics are introduced, the significance of childhood poverty diminishes. Additionally, the table highlights the importance of these variables in explaining variations in health outcomes.

Discussion and policy implications

The findings of this study shed light on the multifaceted and persistent impact of childhood poverty on health status in adulthood. Our analysis underscores the enduring association between childhood poverty and adverse health outcomes in adulthood, even after adjusting for a wide array of individual characteristics. Individuals who experienced childhood poverty displayed a heightened likelihood of reporting poorer health statuses in their adult years. This reaffirms the significance of early-life socioeconomic conditions in shaping long-term health outcomes. Of particular interest is the observation that the significance of childhood poverty diminished when household characteristics were introduced into the model. This suggests that while childhood poverty plays a crucial role in adult health, the household environment acts as a mediating factor. This highlights the interconnectedness of socioeconomic factors in shaping health outcomes over the life course.

Understanding the lasting effects of childhood poverty on adult health calls for targeted public health interventions that commence early in life. These interventions should focus on economically disadvantaged children, aiming to break the cycle of poverty-related health inequities by addressing the multifaceted determinants of health. The findings of our study imply the following policy implications.

Early Childhood Interventions: To mitigate the health impact of childhood poverty, policymakers should prioritize early childhood interventions. These initiatives should encompass high-quality early education, nutrition programs, and comprehensive healthcare services targeting children from economically disadvantaged backgrounds. Ensuring access to regular check-ups and preventative care is crucial in preventing untreated illnesses and conditions.

Income Support: Enhancing income support mechanisms for impoverished families can provide immediate relief and help alleviate the health disparities associated with childhood poverty. Income support programs should be designed to provide a safety net for families facing financial hardships.

Mental Health Services: Given the heightened risk of behavioral and emotional problems associated with childhood poverty, there is a need for increased access to mental health services, particularly in economically disadvantaged communities. Early intervention and support for children facing trauma and emotional distress are essential.

Housing and Neighborhood Improvement: Efforts to improve the quality of housing in low-income neighborhoods, increase access to healthy food, and enhance access to healthcare services can mitigate the health risks associated with disadvantaged living conditions.

Income Mobility and Economic Opportunities: Policies aimed at fostering income mobility and expanding economic opportunities for adults who experienced childhood poverty can be instrumental. Education and job training programs can empower individuals to secure stable employment, thereby improving their economic status and access to healthcare.

This study underscores the critical need for comprehensive strategies to address childhood poverty's lasting impact on health in adulthood. While the effects of early-life disadvantage persist, targeted interventions and policy measures can mitigate these effects, promoting healthier lives and greater equity for all individuals, regardless of their socioeconomic background.

Conclusion

This study has delved into the profound and long-lasting impact of childhood poverty on the health status of individuals in adulthood. Our investigation reveals a strong association between childhood poverty and adverse health outcomes in later life, corroborating existing research that emphasizes the pivotal role of early-life socioeconomic conditions in shaping lifelong health.

Notably, childhood poverty was found to significantly increase the likelihood of reporting poorer health statuses in adulthood. This underscores the urgency of addressing the multifaceted challenges faced by economically disadvantaged children. While the significance of childhood poverty was somewhat attenuated when household characteristics were introduced into the analysis, it remains clear that early-life socioeconomic conditions play a crucial role in shaping adult health. The household environment, as revealed by this study, acts as a mediating factor, highlighting the intricate interplay of socioeconomic determinants in influencing health outcomes across the life course.

In light of these findings, it is imperative that public health policymakers and practitioners focus on targeted interventions that commence early in life. These interventions should prioritize economically disadvantaged children and aim to break the cycle of poverty-related health disparities by addressing the comprehensive determinants of health.

References

Azad, A. K. (2021). Determinants of Crop Diversification in Bangladesh: An Econometric Analysis. *Asia-Pacific Journal of Rural Development*, 31(2), 195–217. DOI: doi.org/10.1177/24551333211069752

Braveman, P., & Barclay, C. (2009). Health disparities begin in childhood: a life-course perspective. *American Journal of Preventive Medicine*, 36(5), 389-397.

Evans, G. W. (2004). The environment of poverty: multiple stressor exposure, psychophysiological stress, and socioemotional adjustment. *Child Development*, 75(2), 417-434.

Evans, G. W., & De France, K. (2022). Childhood poverty and psychological well-being: The mediating role of cumulative risk exposure. Development and Psychopathology, 34(3), 911-921.

Ford, K., Richardson, E., & Roberts, C. (2009). The effects of poverty on child health and development. *The Lancet*, 374(9696), 1830-1834.

Geronimus, A. T., Hicken, M., Keene, D., & Bound, J. (2006). Weathering and age patterns of allostatic load scores among blacks and whites in the United States. *American Journal of Public Health*, 96(5), 826-833.

Gershoff, E. T. (2002). Corporal punishment by parents and associated child behaviors and experiences: a meta-analytic and theoretical review. *Psychological Bulletin*, 128(4), 539-579.

González, D., Nazmi, A. and Victora, C.G., 2009. Childhood poverty and abdominal obesity in adulthood: a systematic review. *Cadernos de saude publica*, 25, pp.S427-S440.

Hossain, M. & Bayes A. 2018. Rural Transformation: Insight from Bangladesh. The University Press Limited, Dhaka.

Huang, Y., & Sparks, P. J. (2023). Longitudinal exposure to neighborhood poverty and obesity risk in emerging adulthood. Social science research, 111, 102796.

Jessor, R., Donovan, J. E., & Costa, F. M. (2002). Adolescent problem behavior and psychosocial development: problem behavior theory. In R. Jessor (Ed.), New perspectives on adolescent risk behavior (pp. 3-32). Cambridge: Cambridge University Press.

Kaminer, D., Bravo, A. J., Mezquita, L., & Pilatti, A. (2023). Adverse childhood experiences and adulthood mental health: A cross-cultural examination among university students in seven countries. Current Psychology, 42(21), 18370-18381.

Kreps, G. L., Caughy, M. O., DiPietro, J. A., & Strobino, D. M. (2008). Early childhood poverty and health: timing and specificity of effects. *Pediatrics*, 121(4), e826-e833.

Lee, H., Slack, K. S., Berger, L. M., Mather, R. S., & Murray, R. K. (2021). Childhood poverty, adverse childhood experiences, and adult health outcomes. Health & social work, 46(3), 159-170.

Malek, A. M., Kikkawa, A., Azad., A. K. & Sawada, Y. 2022. Rural Development in Bangladesh over Three Decades: Findings from Mahabub Hossain Panel Data and the Way Forward. ADBI Working Paper 1350. Tokyo: Asian Development Bank Institute. DOI: doi.org/10.56506/PPXG8315

Maner, J. K., Hasty, C. R., Martinez, J. L., Ehrlich, K. B., & Gerend, M. A. (2023). The role of childhood unpredictability in adult health. Journal of Behavioral Medicine, 46(3), 417-428.

Raphael, D., 2011. Poverty in childhood and adverse health outcomes in adulthood. *Maturitas*, *69*(1), pp.22-26.

Wilder, C., Flisher, A. J., Lombard, C., King, G., & Rico, E. (2014). Childhood poverty and mental health in South Africa. Journal of Child Psychology and Psychiatry, 55(3), 227-234.

Williams, D. R., Neighbors, H. W., & Jackson, J. S. (2016). Racial/ethnic discrimination and health: findings from community studies. American Journal of Public Health, 96(2), 292-299.

Xu, Y., & Yilmazer, T. (2021). Childhood socioeconomic status, adulthood obesity and health: The role of parental permanent and transitory income. Social Science & Medicine, 283, 114178.

Zhou, T., Harris, R., & Manley, D. (2023). Childhood Socioeconomic Status and Late-Adulthood Health Outcomes in China: A Life-Course Perspective. Applied Spatial Analysis and Policy, 16(2), 511-536.

Appendix

Table A1: Description of the variables

Variables	Definition
Individual characteristics	
Child Poverty	If the household was income-poor in 1987-88 using the national threshold level
Gender	Male if Gender=1, 0 otherwise
Age	Age in years
Married (Categorical variable)	Marital status is unmarried if Married=1; married if Married=2 (base category); widow/widower if Married=3; divorced if Married=4; and separated if Married=5
Education (Categorical variable)	No education if Education=0 (base category); primary education if Education =5 (5 years of education); secondary education if Education=6-10 (6 to 10 years of education); higher secondary if Education=11-12; Graduation if Education=13-16; and post-graduation if Education=17 and above
Age at first marriage	The first marriage age in years
Occupation (Categorical variable)	Occupation is wage labor if Occupation=1(base category); salaried labor if Occupation=2; self-employed if Occupation=3; Trader if Occupation=4; production related work if Occupation=5; farming if Occupation=6; and unemployed if Occupation=7
Religion (Categorical variable)	Religion is Islam if Religion=1 (base category); Hindu if Religion=2; Buddhist if Religion=3; and Christian if Religion=4
Household characteristics	
Health status	The health of the household members aged between 26-40 years is 'almost always sick' if Health status=1; 'sometimes sick' if Health status=2; and 'hardly ever sick' if Health status=3
Household size	Number of household members
Earning members	Number of earning members
Dependency ratio	Dividing the number of dependents (those not in the labor force) by the number of working-age individuals in the household
Monthly Household Income (BDT)	Monthly household income in Bangladesh Taka (BDT)
Total land holding (Decimal)	Household total land holding in decimal
Tube well (%)	Household proportion of having tube wells in percentage
Electricity (%)	Household proportion of having electricity connection in percentage

NGO participation (%)	Proportion of household membership status in non-government organizations (NGO) in percentage

Source: Prepared by the authors