Trading Equality for Health?

Social Inequalities in Child Mortality in Developing Nations

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ABSTRACT

Population health is a forefront area for cross-national comparative sociology. We contribute to this comparative turn in the field of population health by examining how education and wealth generate inequalities in child mortality in developing countries. Specifically, we develop and test the hypotheses that (1) social inequalities in health vary systematically across national context, (2) there is a trade-off between population health and health inequality such that lower-mortality countries have higher levels of inequality in health, (3) the expansion of the educational system reduces inequality in health, and (4) public investment in the health system reduces inequality in health. We test these hypotheses using individual-level data on 1,487,860 live births in 38 developing nations that participated in the most recent wave of the Demographic and Health Surveys, and macro-level data from several sources. The results show that although maternal education and wealth are associated with child mortality in all nations, the magnitude of the association varies systematically by national context – but not in a way that suggests a trade-off between the child mortality rate and inequalities in child mortality. Rather than a trade-off between inequality and health, the results suggest that the expansion of the educational system and public health expenditure are associated with lower levels of social inequality in child mortality.

INTRODUCTION

Social inequalities in health have captured the attention of policymakers, funding agencies, the general public, and the research community (US DHHS 2000, European Commission 2007, WHO CSDH 2011). Many markers of socioeconomic position, including education and wealth, are strongly associated with an array of health indicators, including mortality (Elo 2009), leading scholars to argue that socioeconomic position is a "fundamental cause" of health and illness (Link and Phelan 1995). Still, despite the ongoing documentation of health inequalities by the international research community, social inequality in health is rarely investigated as an object of cross-national comparative research. As a result, very little is known about the institutional features of societies that produce health inequalities, especially in the developing nations of the Global South (Beckfield and Krieger 2009).

In this paper, we contribute to an ongoing turn toward comparative research on health inequalities (Beckfield and Olafsdottir 2009) by developing and testing hypotheses on the institutional determinants of social inequalities in child mortality in developing nations. We begin by demonstrating the presence of strong associations between two indicators of socioeconomic position – maternal education and household wealth – and child mortality in 38 nations that participate in the Demographic and Health Surveys. Next, we show that although these associations are present in nearly every DHS nation, they are highly variable across national contexts, making health inequality itself a promising puzzle for cross-national comparative research. The

centerpiece of our paper (a report on in-progress research) is an attempt to explain the substantial cross-national variation that we observe. Drawing on the large, trans-disciplinary literature on population health, we test the hypotheses that social inequality in child mortality in a society is a function of (1) the national child mortality rate, suggesting a trade-off between health and health inequality; (2) the expansion of the educational system, suggesting a role for the stratification structure itself; and (3) public expenditure on health, suggesting that health policy shapes health inequality.

Perhaps our most provocative finding is that there is no evidence of a trade-off between health and health inequality in these 38 developing nations. Instead, inequality in child mortality according to maternal education is associated with the expansiveness of the educational system itself: where more women attain formal schooling, education-based health inequalities are lower. And, inequality in child mortality according to household wealth is associated with public expenditure on health: nations that spend more on health have lower levels of wealth-based inequality in child mortality. In what follows, we outline our theoretical approach. We then turn to a description of the data and methods we employ, followed by a presentation of our results, and a discussion of the limitations of our (in-progress) research.

THEORETICAL MOTIVATION

We argue that an investigation of social inequalities in health presents an opportunity to develop and test theories of how national-level institutions (the “rules of the game”)

have distributional implications. That is, how do institutions create winners and losers? Drawing on theory and comparative research in the area of social stratification, we argue that institutions shape social inequalities in health for at least two reasons.

First, stratification structures themselves are cross-national variables. For example, owing in substantial part to institutional differences, nations vary systematically in the distribution of educational attainment (Shavit and Blossfeld 1993), household income (Alderson and Nielsen 2002), political representation by gender (Paxton et al. 2006), occupational sex segregation (Pettit and Hook 2009), poverty (Brady 2009), wealth (Sierminska et al 2006), and forms of cultural exclusion and inclusion (Hall and Lamont 2009). Extending the connection between institutions and stratification to social inequality in health, we suggest that institutions may matter for health inequalities in part because they influence the distribution of socioeconomic position itself.

Second, institutions shape the translation of socioeconomic position into other kinds of resources. A classic case from the stratification literature is the cross-national comparative research on intergenerational mobility, which establishes that parents' ability to transfer status and wealth to their children varies systematically across national context (Erikson and Goldthorpe 1992). Another example is the influence of the welfare state on the effects of unemployment on subsequent income and employment (Esping-Andersen 1990; Gangl 2004). Extending such arguments about how institutions affect the effects of socioeconomic position on other goods to the domain of social inequality in health, we suggest that institutions may matter for health

inequalities by intervening on the ability of people to translate their social (dis)advantages into health (and illness).

Thus, our most basic hypothesis is that social inequalities in child mortality should vary significantly across developing nations. But what explains the variation? In the developing nations that participate in the Demographic and Health Surveys, a key axis of institutional variation is the inclusiveness of the educational system. Specifically, the systems of formal schooling in developing nations have been expanding at variable rates since the "third wave" of democratization in the 1960s. Currently, the incorporation of women into these systems of formal schooling varies dramatically across the developing nations in our sample, from a low of around 10% of adult women with some secondary education in nations such as Mali and Burkina Faso to a high of around 80% in Zimbabwe. It is clear, then, that the stratification of educational attainment varies across nations, and our approach suggests the hypothesis that nations with more inclusive educational systems should exhibit lower levels of education-based inequality in child mortality.

The developing nations in our sample also vary in the effort devoted by the state to health. In our framework, we conceptualize public health expenditure as the sort of institutional variable that should reduce social inequality in health by weakening the link between (stratified) material resources and health. Thus, we further hypothesize that states spending more public resources on health should exhibit lower levels of wealth-based inequality in child mortality.

Our comparative institutional approach to social inequalities in health complements established theories in the field of population health by delving deeper into the "political context" that is commonly included in conceptual models of health inequalities (Beckfield and Krieger 2009). One influential approach from population health research is the so-called "fundamental cause" theory of Link and Phelan (1995), who argue that socioeconomic position affects health through a wide range of mechanisms that can change over time and differ across contexts. Because the mechanisms vary and even appear to be reversible, Link and Phelan advocate for research on "upstream" factors that generate the robust, general association between socioeconomic position and health. Thus, the fundamental-cause approach suggests the hypothesis that the developing nations in our study should universally exhibit strong associations between socioeconomic position (here, maternal education and household wealth) and child mortality.

A second approach that informs our research is drawn from health economics, which has developed the theory that social inequality in health is in part a function of improvements in population health. That is, the very things that improve population health (basic sanitation, medical technology, healthy behaviors) are likely to increase social inequality in health because the better-positioned will be the first to adopt such technologies (Cutler et al. 2006; Glied and Lleras-Muney 2008). Extending this approach to the case of child mortality in developing countries, we evaluate the hypothesis that social inequality in child mortality (both by mother's education and by household

wealth) is associated with the national child mortality rate, such that lower-mortality nations exhibit more inequality.

DATA AND METHODS

In this project, we measure health inequalities in 38 developing countries. In order to produce a summary measure of health inequalities at the country-level, we employ individual-level data provided by the Demographic and Health Surveys (DHS). The DHS are nationally-representative household surveys designed to collect information on demographics, health, and nutrition in developing countries. They are conducted approximately every five years and sample sizes range from 5,000 to 30,000 households (see Appendix A for a list of sample sizes by country).

The DHS have been administered in more than 90 countries. In order to highlight more recent evidence and facilitate comparisons across countries, we limit our analysis to surveys completed between 2003 and 2007. Since our focus is on developing countries, we also restrict our analysis to countries classified as "low-income" or "lower-middle-income" by the World Bank's gross national income (GNI) per capita rankings.[1] Since we seek to explore health inequalities in understudied regions outside of Europe and North America, we only include countries in Africa, Asia, and Latin America. This leaves a total of 38 countries (which are listed in Appendix A).

[1] The World Bank ranks countries according to GNI per capita and classifies them into four different categories: low-income, lower-middle-income, upper-middle-income, and high-income.

DHS surveys include three core questionnaires: one for women, one for men, and one at the household level. For this project we employ data generated by the women's questionnaire. Women ages 15-49 are asked to provide birth histories and demographic information for up to 15 children. We use this information to construct a child-level dataset that allows us to evaluate patterns of child mortality. In total, we analyze 1,487,860 live births across 38 countries.

To measure health inequalities, we fit separate logistic regression models of the odds of a child dying for each country. Each model includes the covariates maternal age, sibship size, child's sex, child's birth order, maternal education, and household wealth. Child's sex is represented by a dummy variable if a child is male. Household wealth is based on the DHS wealth index. The index is calculated using data on a household's ownership of selected assets including bicycles, televisions, housing, and sanitation facilities (DHS 2012). It is represented with dummy variables representing each quintile of a country's wealth distribution (with the least wealthy quintile as the reference category). Maternal education is represented with dummy variables for three education categories that correspond to standard ISCED classifications: 1-6 years of education, 7-12 years, and 13 or more years (with 0 years of education as the reference category). Since DHS samples are based on a two-stage cluster design, we adjust standard errors to account for this clustered structure.[2]

[2] In supplemental analyses, we also assess the effects of adjusting for the clustering of children within mothers, but this procedure does not impact the observed results and so we exclude this adjustment from the present analysis.

Based on these analyses, we compare the relationship between maternal education and child death and household wealth and child death for each country in our sample. Logistic regression coefficients themselves are not comparable across countries, because one cannot assume identical error variances across countries. Instead, we use predicted probabilities to compare magnitudes of health inequalities. Predicted probabilities can be used to compare across groups because they do not require the assumption of identical error variances. Thus, for each country, we calculate the difference in the predicted probabilities of dying between children with mothers in the top and bottom education groups, with all other covariates held constant at their mean level. We also calculate the difference in the predicted probabilities of dying between children from different household wealth quintiles, again with all other covariates held constant at the mean. These differences in predicted probabilities of child death between education groups and wealth quintiles serve as our measure of the level of health inequality in a given country.

In addition to comparing health inequalities across our sample of developing countries, we also evaluate potential relationships between health inequalities and a range of variables representing national institutional structures and population characteristics. These include public health expenditures, the child mortality rate, and educational coverage.[3] Based on this information, we construct scatterplots and

[3] Data on health expenditures come from the World Health Statistics Reports produced by the World Health Organization (WHO). The reports include information on government health expenditures per capita and total health expenditures per capita (WHO 2010). Data on child mortality comes from the U.S. Census Bureau's International Database (U.S. Census Bureau 2012). Data on educational coverage is estimated using information provided in the DHS. For each country we calculate the proportion of women who received 1-6, 7-12, and 13 or more education. Data on maternal mortality comes from the 2009

calculate (Pearson) correlation coefficients that describe the associations between health inequalities and these country-level variables.

RESULTS

Figures 1-3 show the results for maternal education. Specifically, we depict the difference in the predicted probability of mortality for children born to mothers with no formal schooling, relative to children born to mothers who have progressively higher levels of formal schooling (0 years vs. 1-6 years, 7-12 years, and 13+ years). Figure 1 shows the first contrast, the difference in the predicted probability of child mortality between mothers with 1-6 years of formal schooling vs. mothers with no formal schooling. Maternal education significantly reduces the predicted probability of child mortality in most DHS countries, up to a difference in predicted probability of -.06 in Rwanda. Notably, children born to mothers with no formal schooling are not significantly disadvantaged relative to mothers with 1-6 years of formal schooling in several countries, including India, Egypt, and Honduras. Overall, considering the smallest contrast between levels of maternal education (0 years vs. 1-6 years), the results suggest that education-based inequalities vary significantly across nations.

Figures 2-3 show that disparities between mothers with and without formal schooling grows in a gradient-like fashion as we compare mothers without formal

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World Health Statistics Report. The report includes every country's maternal mortality rate in 2005 (WHO 2009).

schooling to mothers with higher levels of educational attainment. Above, the largest difference in the predicted probability of child mortality was about -.06; in Figure 2, which compares mothers with no formal schooling to mothers with 7-12 years of formal schooling, the largest difference is slightly higher, above .07. Also, the bulk of the estimates for the 0-vs.-1-6 contrast shown in Figure 1 are between 0 and -.02, while the bulk of the estimates for the 0-vs.-7-12 contrast shown in Figure 2 are between -.02 and -.05. This suggests that education-based social inequalities in health are graded, such that larger differences between maternal education translate into larger differences in child mortality.

Figures 2 and 3 also reinforce the finding that education-based social inequality in child mortality varies significantly across national context. The point estimates in Figure 3 range from a minimum of about 0 (in Ivory Coast, Jordan, Zimbabwe, and Pakistan, which are all nations with very high levels of child mortality, in the 100-200 per 1,000 range) to a maximum of over -.1 (in Rwanda, Mozambique, Niger, and Cambodia, which also all have child mortality rates of over 100 per 1,000 live births). Taken together, then, the results from Figures 1-3 support the fundamental-cause hypothesis as well as our institutionalist hypothesis: maternal education is associated with a lower predicted probability of child mortality in nearly all countries, but the size of the association varies substantially across national context.

Figures 4-7 show the difference in the predicted probability of mortality for children born to mothers with lower vs. higher levels of household wealth. As in the case of maternal education, we present the results for the smallest contrast (Quintile 4,

the second-lowest quintile, vs. Quintile 5, the lowest quintile) first, followed by the results for higher degrees of inequality (Q3 vs. Q5, Q2 vs. Q5, and Q1 vs. Q5). Figure 4 shows that a one-step move up the wealth ladder is associated with a significant reduction in the predicted probability of child mortality in about a third of these 38 nations. In contrast, the 95% confidence interval overlaps zero in most cases, suggesting that in these developing nations there is not striking inequality in mortality among children of mothers in the bottom two quintiles of the wealth distribution.

As we extend the wealth contrasts to consider differences between the bottom quintile and, respectively, the third, second, and first quintiles, the degree of health inequality grows in a gradient-like fashion. Comparing Figure 4 to Figures 5 and 6, more of the differences in predicted probability reach statistical significance, and the point estimates grow in absolute magnitude. In Figure 7, which shows wealth inequality in child mortality for the bottom quintile vs. the top quintile, most of the point estimates are significantly negative, indicating a general advantage of wealth in nearly all nations, and in magnitude they range from -.02 to -.10. As in the analysis of education-based inequality, there are a few nations with no discernable inequality in the child mortality by household wealth: Honduras, Ghana, Kenya, Jordan, and Liberia. Mozambique and Niger again appear as nations with among the highest level of inequality in child mortality.

In sum, then, the results for the analysis of inequality in child mortality according to the household wealth of the mother reinforces the results from the analysis of education-based inequality: (1) wealth inequality in child mortality is present in nearly

every nation, (2) wealth inequality is graded such that health inequality grows as wealth inequality grows, and (3) the association between child mortality and maternal wealth varies significantly in magnitude across national context. In other words, children with wealthier mothers do better nearly everywhere, but how much better they do varies greatly according to where they were born.

Is it the case that children of better-educated and wealthier mothers do better where overall mortality conditions are more favorable? Figures 8 and 9 show our assessment of the hypothesized trade-off between social inequality in health and average population health. Figure 8 plots the difference in the predicted probability of child mortality for mothers with no formal schooling vs. 13+ years of formal schooling on the y-axis, against the population-level child mortality rate (deaths per 1,000 live births) on the x-axis. The figure shows evidence of a negative association: higher child mortality rates are associated with more-negative differences in predicted probabilities (Pearson's r = -.39), which is actually the reverse of the health-equality tradeoff scenario. The data show that in nations with lower child mortality rates, such as Jordan, Honduras, Egypt, and the Philippines, inequality in child mortality according to maternal education is also lower.

Figure 9 shows that the same result holds for wealth: children of wealthier mothers are, surprisingly, less advantaged than children of poorer mothers in low-mortality nations relative to high-mortality nations. In the case of wealth, the negative association is even stronger (Pearson's r = -.64), such that the nations with the most inequality in child mortality by maternal wealth (the largest negative predicted

probabilities) are also those with the highest child mortality rates: Mozambique, Niger, and Mali. Taken together, then, Figures 8 and 9 suggest no evidence of an inequality-for-health tradeoff. The highest levels of inequality in child mortality by education and wealth are not in the lowest-mortality nations, but appear instead in the highest-mortality nations. It appears that inequality in health and poor overall population health go together.

Figure 10 shows evidence on the hypothesis that the inclusiveness of the educational system is associated with lower levels of educational inequality in child mortality. That is, Figure 10 responds to the question: where more women attain formal schooling, is child mortality by educational attainment lower? The evidence suggests that it is. The figure shows that the % of women in these 38 developing nations who attained 7-12 years of formal schooling varies widely, from a low of about 10% to a high of 60-70%. Generally, the difference in predicted probability of mortality for children born to mothers with no vs. 7-12 years of schooling is lower in places where women's educational attainment is higher: Tanzania, Congo (Brazzaville), Jordan, and Zimbabwe. Conversely, this inequality in child mortality is higher in places where fewer women attain this middle level of formal schooling: Niger, Mali, Ethiopia. The correlation between educational inequality in child mortality and average female educational attainment is a moderate .33 (Pearson's r).

Figure 11 shows results from our assessment of the hypothesis that public health expenditure is associated with lower levels of wealth-based inequality in child mortality. There is some support for the hypothesis: the association between wealth-based

inequality in child mortality and public health spending per capita is .33, suggesting that maternal wealth reduces the chance of child mortality less where the state devotes more public resources to health. Still, we note that the association is only moderate, and the figure suggests that there are declining returns at higher levels of health expenditure. The association is positive, but non-linear.

SUMMARY AND DISCUSSION

As interest in social inequalities in health grows, research has turned toward cross-national comparative investigation of the institutional factors that increase or reduce these inequalities (Beckfield and Krieger 2009; Beckfield and Olafsdottir 2009). We advance that turn by taking a comparative approach to inequality in child mortality in developing nations. We show that inequality in child mortality is a compelling cross-national variable for comparative analysis: while children born to less-educated and poorer mothers are more likely to die in nearly every one of the 38 nations included in our study, the degree of these disparities varies widely and systematically across national context. While we find no evidence that inequalities are larger in healthier nations, we do find support for our hypotheses that inequalities tend to be smaller in nations with more encompassing educational systems, and in nations that devote more public resources to health. The findings thus support the general institutional approach we develop by providing evidence that the institutional context shapes social inequality

in health through both the stratification of socioeconomic position (here, educational attainment) and the relation between health and stratified resources (here, wealth).

In this paper, we have reported research that is still in progress. Several important limitations remain. First, we have investigated only a limited range of institutional factors that might be associated with health inequality (others that we are currently analyzing are income inequality, democratization, economic development, and an array of cause-specific mortality rates). Second, our data are cross-sectional (we are currently expanding the scope of our analysis to include earlier waves of the DHS, which was first fielded in the 1980s). Third, because our data come from surveys of (live) mothers, our data omit cases of child mortality due to complications from childbirth that also result in maternal mortality (sadly not a rare occurrence in high-mortality nations). This may result in a downward bias in our estimates of inequality in child mortality; we note that the maternal mortality rate (taken from WHO Statistical Reports) is associated with higher levels of education- and wealth-based inequality in these 38 nations (Pearson's r = -.40 and -.43, respectively).

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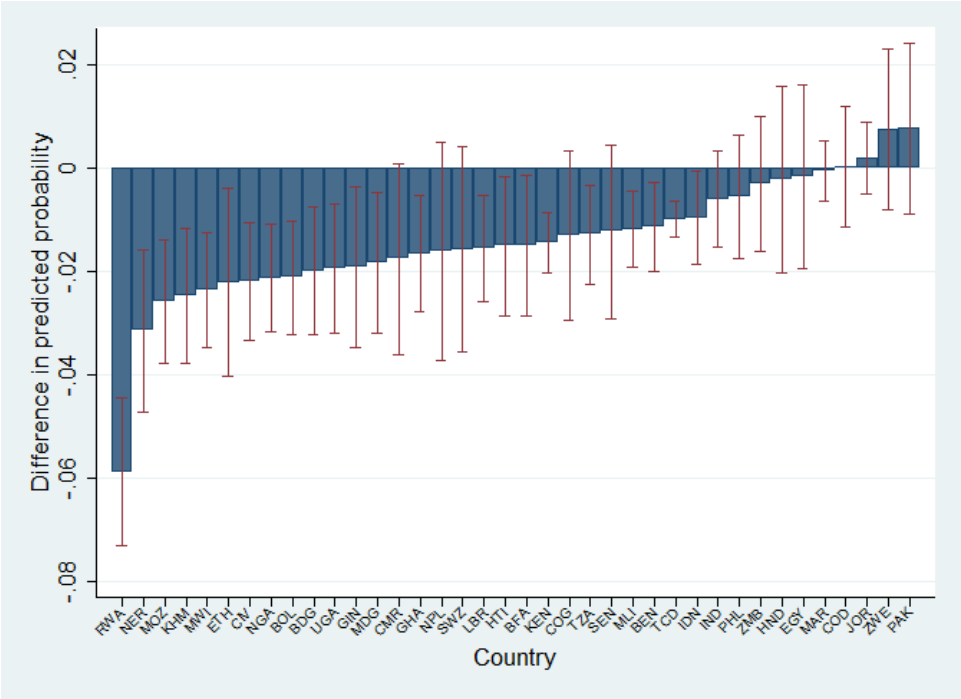
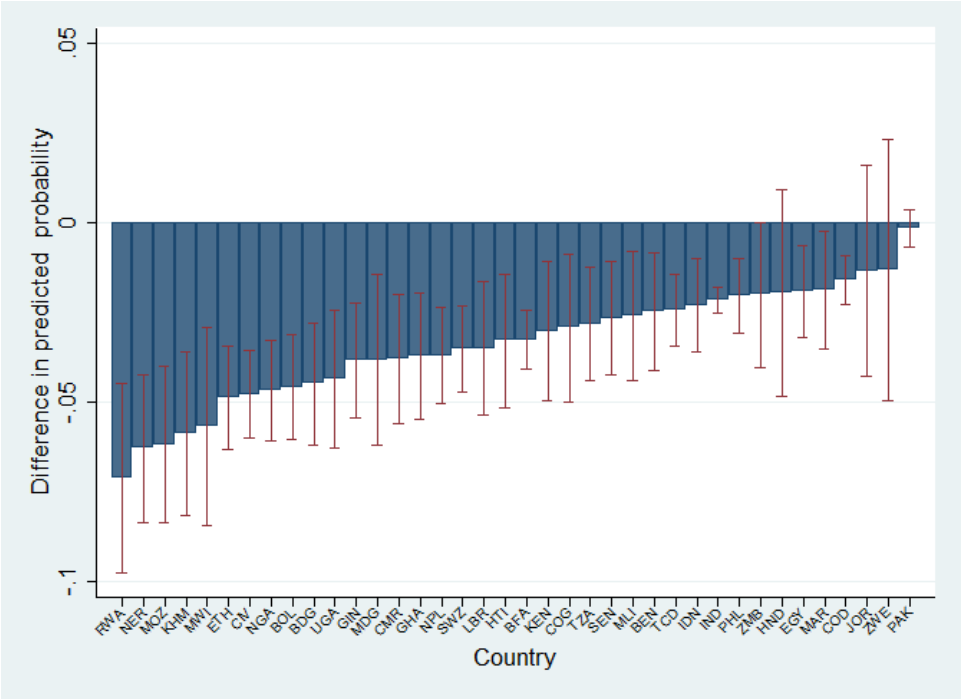
Figure 1. Differences in Predicted Probabilities of Child Mortality by Maternal Educational Attainment (1-6 Years of Formal Schooling vs. 0 Years of Formal Schooling)



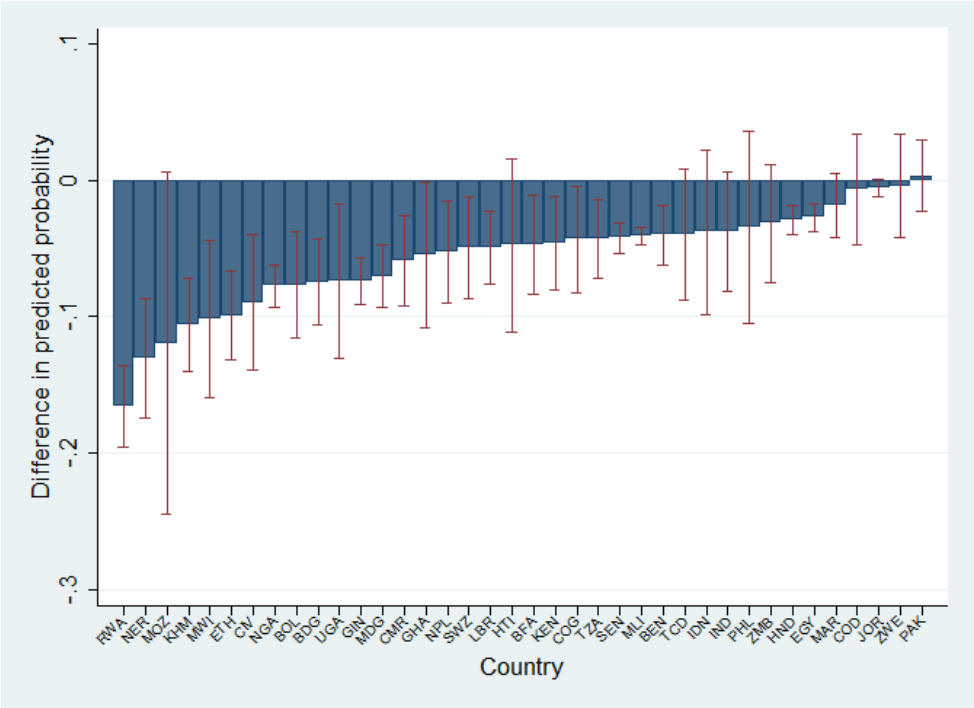
Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and household wealth; these covariates are held at their mean in the calculation of predicted probabilities. The red lines indicate 95% confidence intervals.

Figure 2. Differences in Predicted Probabilities of Child Mortality by Maternal Educational Attainment (7-12 Years of Formal Schooling vs. 0 Years of Formal Schooling)



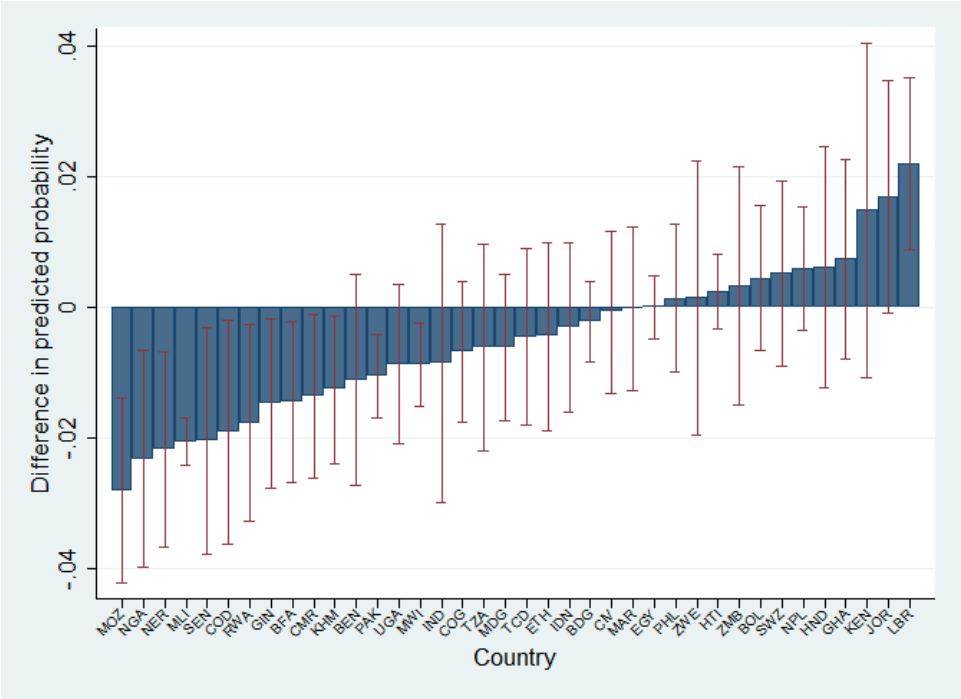
Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and household wealth; these covariates are held at their mean in the calculation of predicted probabilities. The red lines indicate 95% confidence intervals.

Figure 3. Differences in Predicted Probabilities of Child Mortality by Maternal Educational Attainment (13+ Years of Formal Schooling vs. 0 Years of Formal Schooling)



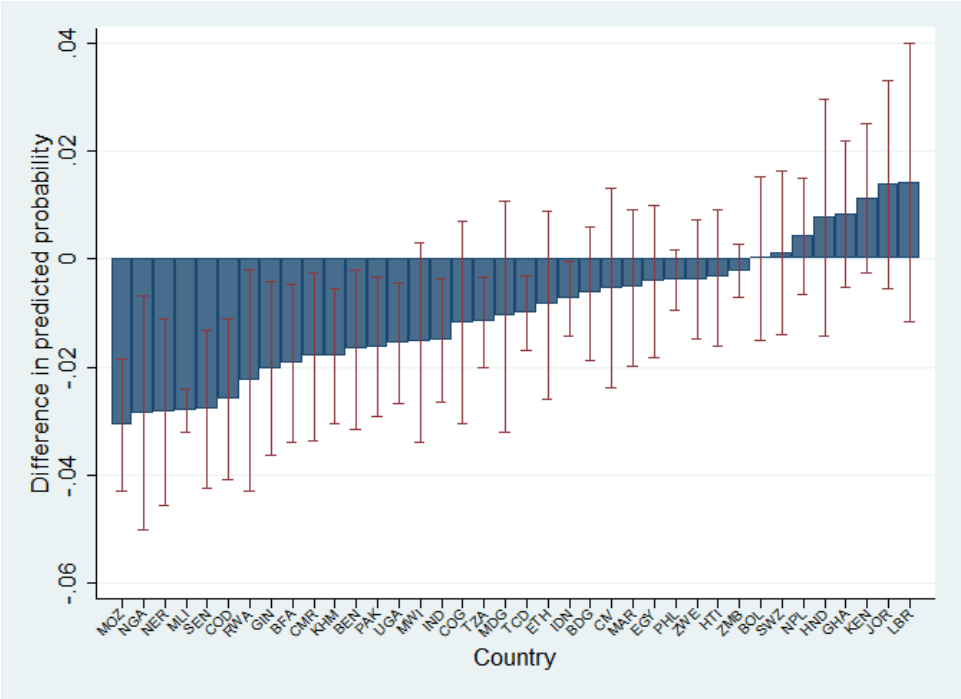
Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and household wealth; these covariates are held at their mean in the calculation of predicted probabilities. The red lines indicate 95% confidence intervals.

Figure 4. Differences in Predicted Probabilities of Child Mortality by Household Wealth (Q4 vs. Q5)



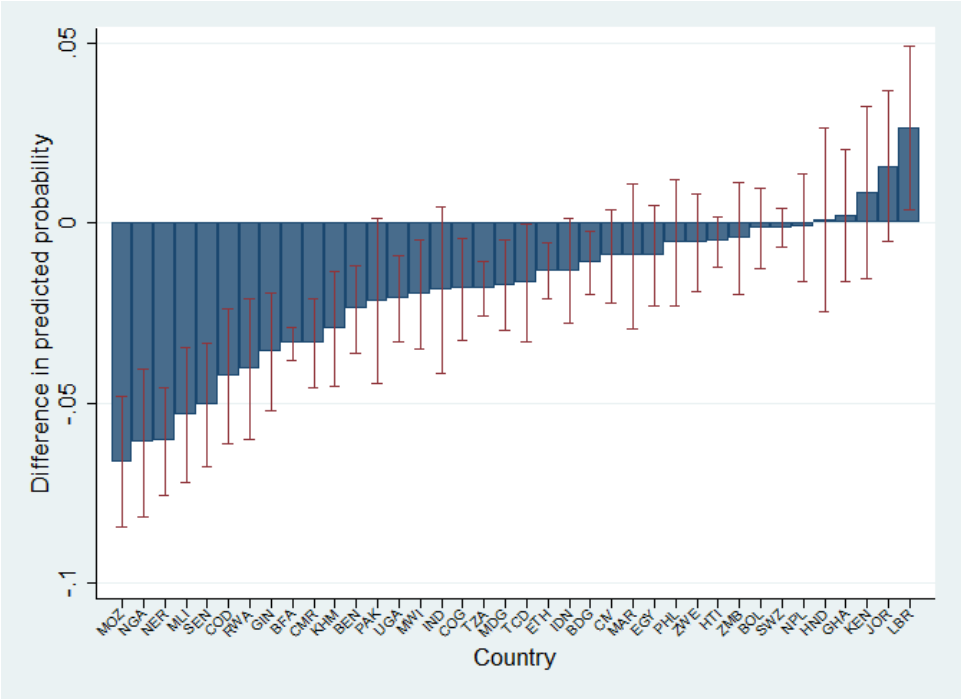
Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and maternal education; these covariates are held at their mean in the calculation of predicted probabilities. The red lines indicate 95% confidence intervals.

Figure 5. Differences in Predicted Probabilities of Child Mortality by Household Wealth (Q3 vs. Q5)



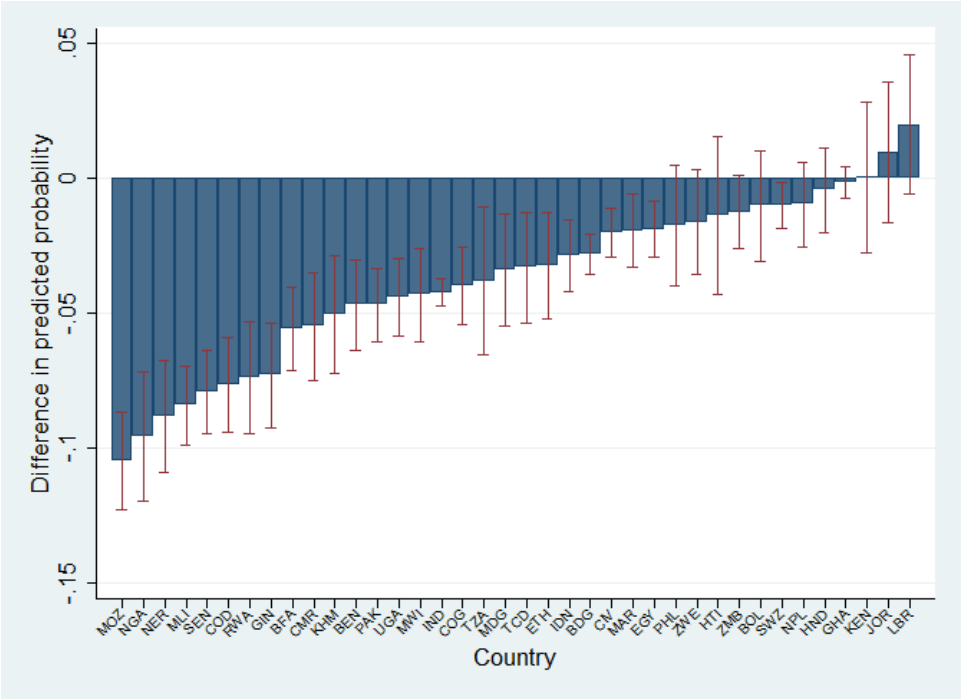
Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and maternal education; these covariates are held at their mean in the calculation of predicted probabilities. The red lines indicate 95% confidence intervals.

Figure 6. Differences in Predicted Probabilities of Child Mortality by Household Wealth (Q2 vs. Q5)



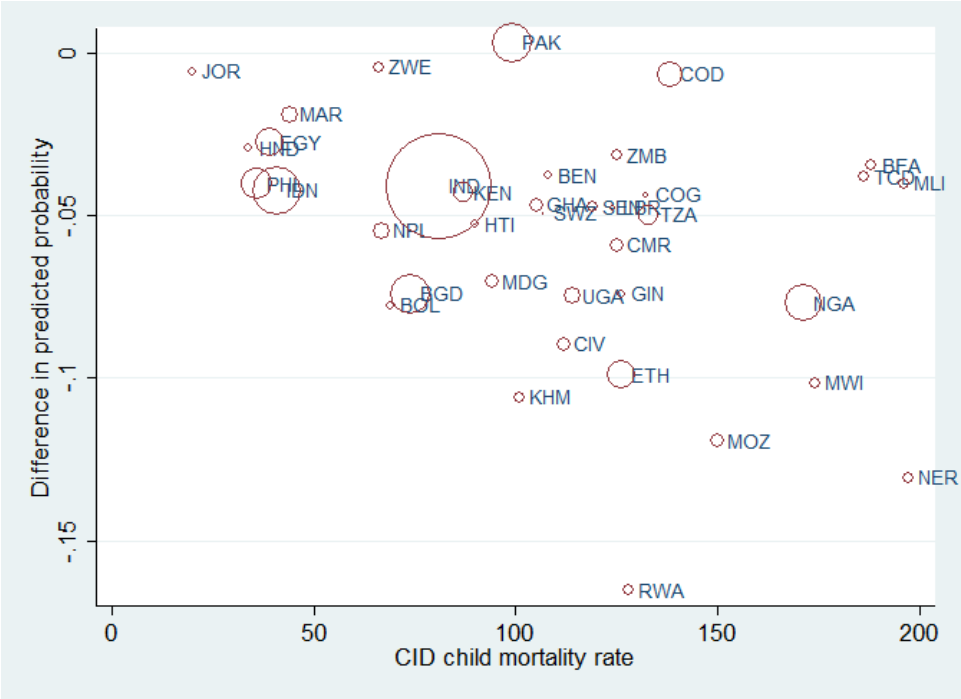
Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and maternal education; these covariates are held at their mean in the calculation of predicted probabilities. The red lines indicate 95% confidence intervals.

Figure 7. Differences in Predicted Probabilities of Child Mortality by Household Wealth (Q1 vs. Q5)



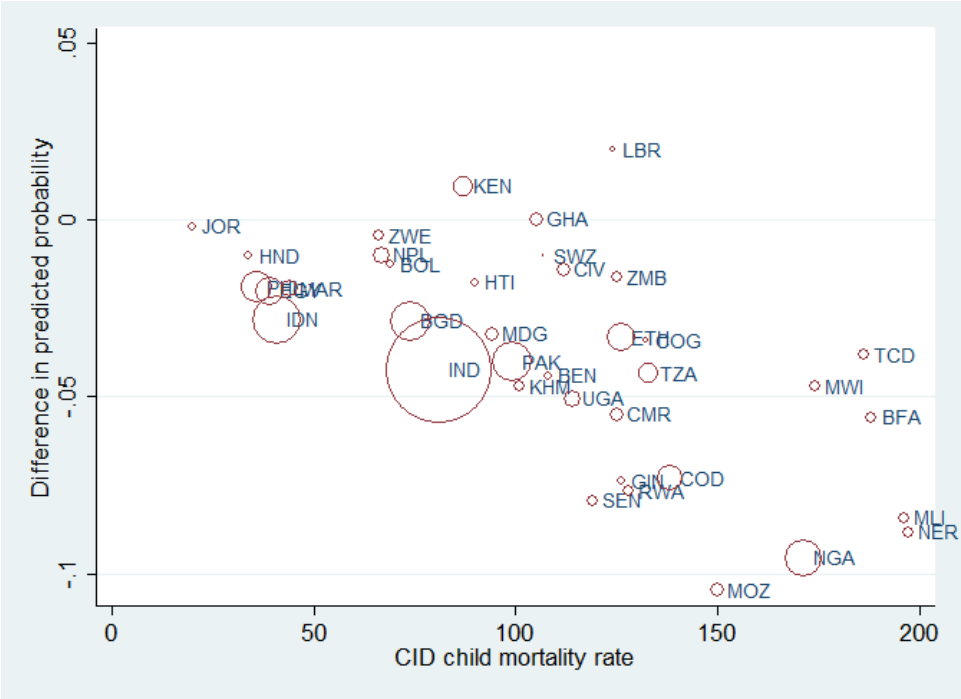
Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and maternal education; these covariates are held at their mean in the calculation of predicted probabilities. The red lines indicate 95% confidence intervals.

Figure 8. Health Inequality by Education (0 years vs. 13+ years) and the Child Mortality Rate



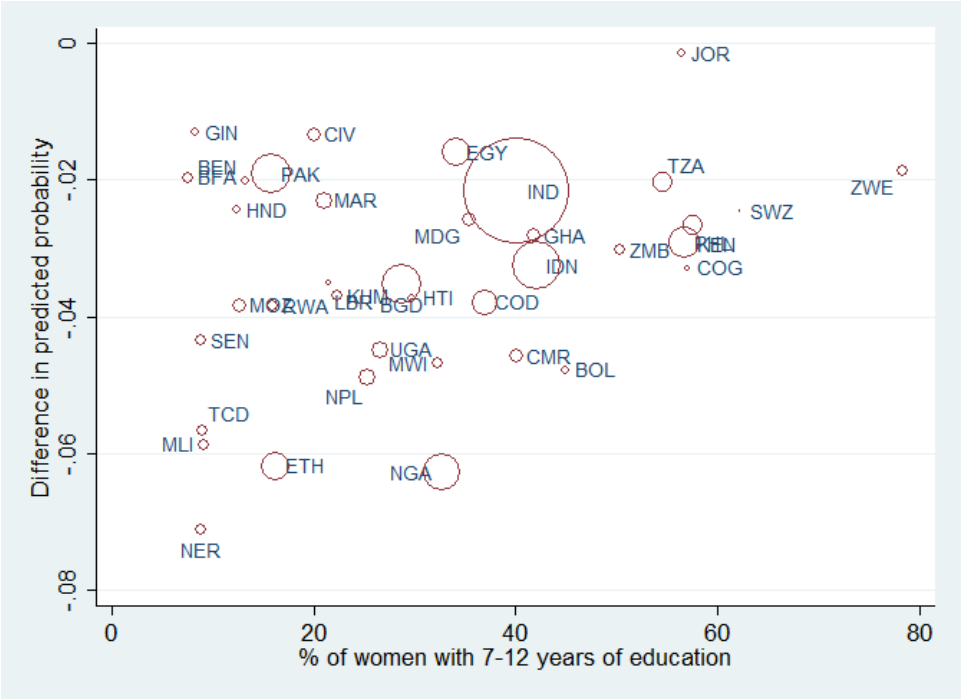
Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and household wealth; these covariates are held at their mean in the calculation of predicted probabilities. The red circles are scaled to the size of the population.

Figure 9. Health Inequality by Household Wealth (Q1 vs. Q5) and the Child Mortality Rate



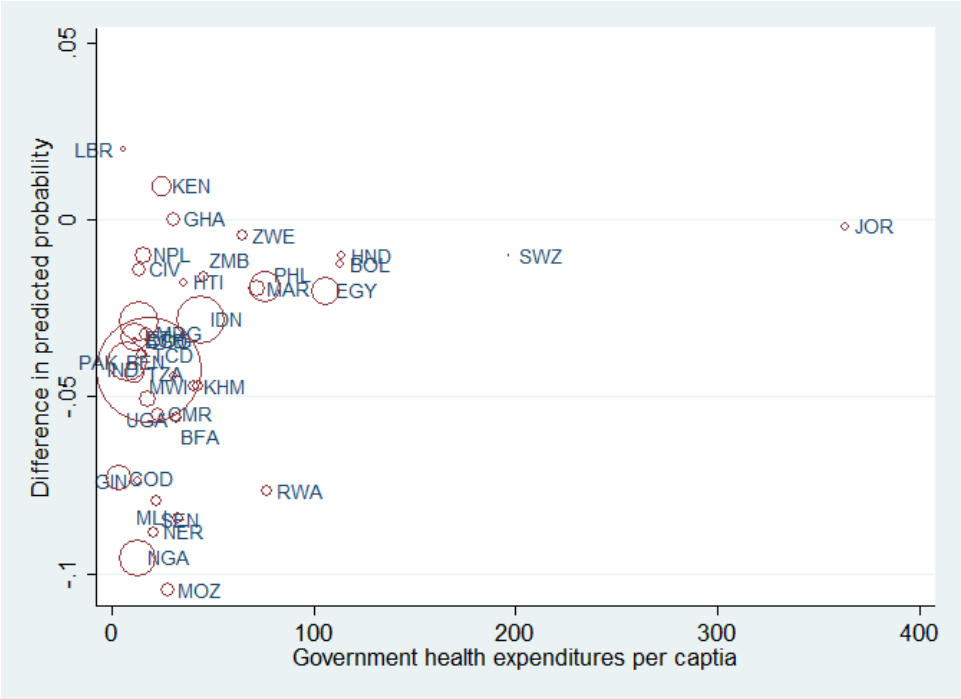
Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and maternal education; these covariates are held at their mean in the calculation of predicted probabilities. The red circles are scaled to the size of the population.

Figure 10. Health Inequality by Education (0 years vs. 7-12 years) and Educational Expansion (% of Women with 7-12 Years of Schooling)



Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and household wealth; these covariates are held at their mean in the calculation of predicted probabilities. The red circles are scaled to the size of the population.

Figure 11. Health Inequality by Household Wealth (Q1 vs. Q5) and Public Expenditure on Health



Notes. Predicted probabilities are from binary logistic regression models that include maternal age, sibship size, child's sex, child's birth order, and maternal education; these covariates are held at their mean in the calculation of predicted probabilities. The red circles are scaled to the size of the population.

Appendix A. Countries and Years Included in the Analysis

Country	Survey Year	3 Letter UN Code	N (children)
Bangladesh	2007	BGD	30,527
Benin	2006	BEN	57,229
Bolivia	2003	BOL	45,113
Burkina Faso	2003	BFA	41,520
Cambodia	2005	KHM	40.457
Cameroon	2004	CMR	29,452
CDR	2007	COD	29,547
Chad	2004	TCD	16,687
Congo Brazzaville	2005	COG	21,447
Cote d'Ivoire	2005	CIV	13,358
Egypt	2005	EGY	61,451
Ethiopia	2005	ETH	39,879
Ghana	2003	GHA	15,086
Guinea	2005	GIN	27,115
Haiti	2005	HTI	24,830
Honduras	2005	HND	50,089
India	2005	IND	256,781
Indonesia	2007	IDN	84,726
Jordan	2007	JOR	43,452
Kenya	2003	KEN	22,073
Liberia	2007	LBR	22,123
Madagascar	2004	MDG	20,799
Malawi	2004	MWI	35,882
Mali	2006	MLI	52,139
Morocco	2003	MAR	32,492
Mozambique	2003	MOZ	37,443
Nepal	2006	NPL	26,393
Niger	2006	NER	34,374
Nigeria	2003	NGA	23,038
Pakistan	2006	PAK	39,047
Philippines	2003	PHL	30,439
Rwanda	2005	RWA	30,068
Senegal	2005	SEN	39,895
Swaziland	2006	SWZ	11,409
Tanzania	2004	TZA	30,556
Uganda	2006	UGA	30,089
Zambia	2007	ZMB	21,366
Zimbabwe	2005	ZWE	19,489
Total			1,487,860