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Political Economy, Capability Development, and Fundamental Cause:
Integrating Perspectives on Child Health in Developing Countries

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Abstract

Several dominant theoretical perspectives attempt to account for health disparities in developing countries, including political economy, the capability approach, and fundamental cause. This study combines the perspectives in a multi-level analysis of child malnutrition and diarrhea in order to gain a more comprehensive understanding of who faces increased health risks and who is shielded from them. Using the Demographic and Health Surveys and World Bank data, I estimate a series of models that predict the likelihood of child malnutrition and diarrhea, based on a set of country- and individual-level explanatory variables. Results suggest that at the individual-level, household wealth and maternal education are the most robust predictors of child health. These social factors are even more important than more proximate factors like clean water or sanitation. At the country-level, gross domestic product (GDP) per capita reduces malnutrition, but does not significantly affect incidence of diarrhea. Contrary to the predominant economic development paradigm, health care and education are more important in accounting for the prevalence of diarrhea than GDP. Finally, trade in and of itself is not harmful to well-being in developing countries. It is when countries become too dependent on one or a few commodities that trade starts to have detrimental costs. Thus, a synthesis of theoretical frameworks best illustrates the complex web of social structural factors that manifest as unequal life chances for children.

Keywords: multi-level analysis, health inequalities, child malnutrition, child diarrhea, economic development, trade, sanitation, clean water, health care, education, household socioeconomic status

More than 17,000 children under the age of 5 die every day, mostly from preventable causes and mostly in the developing world. Malnutrition accounts for up to half of those deaths, and diarrheal diseases account for another 10 percent (UNICEF 2014). More than one half of stunted children live in Asia and more than one third in Africa. Despite a worldwide decline in stunting prevalence over the last twenty-five years, the number of stunted children in Africa is actually on the rise (UNICEF 2015). In addition, the majority of all diarrhea deaths among children worldwide (more than 80 percent) occur in poor countries (Parashar et al. 2006). Yet, malnutrition and diarrhea have been relatively overlooked in the sociology literature to date, despite the fact that they remain two of the largest causes of child mortality in developing countries today.

Social scientists have long been interested in the social determinants of health more broadly. Nonetheless, this vast literature reveals much disagreement on indicators and modeling. Several dominant theoretical perspectives attempt to account for disparities in well-being across countries, including political economy, capability development, and fundamental cause. But each perspective has a different emphasis and different measurement approaches. In addition, each is examined within literatures that are not typically in conversation with one another. The goal of this study is to compare and contrast these literatures in a multi-level analysis of child malnutrition and diarrhea in order to gain a more comprehensive understanding of who faces increased health risks and who is shielded from them. The analysis utilizes indicators from each theoretical framework to illustrate the complex web of social structural factors that manifest as unequal life chances for children. Furthermore, it goes beyond traditional methodological approaches by recognizing that such factors operate at multiple levels simultaneously.

The political economy perspective includes several schools of thought: economic development, neoliberalism, and dependency/world-systems. Economic development is habitually used to explain variation in health outcomes between countries. In fact, the conventional wisdom in much social science literature is that increasing gross domestic product (GDP) per capita is the most effective way to improve well-being in developing countries. At the same time, there is considerable disagreement over the optimal path to economic development. Neoliberals claim that integration into the world economy boosts economic development and therefore well-being. Trade and foreign investment bring innovation, financing, and capital to periphery states, which allow them to catch up to core states in income and health. Dependency/world-systems theorists caution that integration into the world economy impedes economic development and well-being in low-income countries. Export-led production benefits foreign-owned transnational corporations (TNCs) who monopolize capital and do not reinvest in local communities. TNCs undermine social welfare policies that are not in their interests and diminish state capacity to decide how resources are used. In contrast to these political economy perspectives, the capability approach emphasizes improvements in education, sanitation, water, and health care over the maximization of GDP. This approach to development stresses the expansion of freedoms and enabling people to live the kinds of lives they value. Its proponents recognize that wealth may be a means to achieve well-being, but that it does not necessarily guarantee well-being. Finally, the fundamental cause perspective suggests that health inequalities are best understood by examining the individual-level social factors that enable and constrain one's ability to reduce health risks. This perspective underscores the enduring importance of wealth and education in particular because such resources can always be used to combat illness, especially preventable diseases with known treatments like malnutrition and diarrhea.

This study adds to extant cross-national scholarship on well-being in several key ways. First, I draw on insights from all of the above perspectives, using the lessons learned from each to ameliorate the limitations of the others. The political economy perspective emphasizes between-country disparities in trade and GDP. But it neglects within-country disparities in socioeconomic resources, which has been the focus of fundamental cause. The capability approach broadens the scope of what is important by bringing sanitation, water, education, and health care to the fore, underscoring the idea that non-economic resources are just as important, if not more so, than wealth alone. However, the capability approach perhaps overlooks the fact that wealth still continues to be a prominent predictor of variation in well-being. The political economy perspective and the capability approach provide a more global and comparative lens through which to view health disparities, one which the fundamental cause perspective lacks.

Second, I use these perspectives to inform a modeling strategy that goes beyond the traditional emphasis on *either* individual- *or* macro-level predictors of health. Instead, I use multi-level models that examine the country-level factors that effect individual-level child health, while also taking into account within-country variation in household and maternal characteristics. Previous findings on the effects of GDP per capita are largely limited to ecological-level associations. This study provides a more robust test of those effects by determining whether the findings still hold after taking into account the compositional characteristics of countries. Multi-level models demonstrate how children are affected not only by the characteristics of their own households, but also by the larger social structures of which those households are a part, including their country's location in the world-system hierarchy.

Third, using health data from a collection of standardized, population-based surveys in developing countries, I assess three indicators of child malnutrition: stunting, wasting, and underweight. These are derived from height and weight measurements taken by carefully trained survey teams in the field. I also assess whether a child has had a recent episode of diarrhea, as reported by the child's mother. These child health indicators are more valid and reliable than the more commonly used country-level indicators of infant mortality and life expectancy. Thus, using a novel approach to pooled data collection and multi-level modeling techniques, this study examines the contributions of multiple theoretical perspectives for explaining both within- and between-country variation in child malnutrition and diarrhea in developing countries.

Perspectives on Health Disparities

Drawing from several lines of scholarly inquiry, I briefly summarize three theoretical perspectives below. Each perspective highlights the explanatory potential of different variables, but together they provide a comprehensive framework for understanding health disparities.

Political Economy

Economic development. The prominent demographer Samuel Preston (1996: 531) remarks, "The major emphasis during the last half-century…has been on explaining movements in aggregate-level indices of mortality by reference to economic factors." Indeed, the dominant paradigm across the social sciences has been that economic growth and development are the most significant predictors of cross-national differences in health and mortality, particularly in developing countries (Brady, Kaya, and Beckfield 2007). This view has been widely popularized by leading economists like Jeffrey Sachs (2005) and Paul Collier (2007) who stress economic development as the primary concern and most effective way for improving well-being.

A significant body of empirical research substantiates these claims with comparative, country-level analyses of GDP per capita. For example, in their highly influential *American Sociological Review* article, Firebaugh and Beck (1994) examine the effect of GDP on male and female life expectancy, caloric intake, and infant survival in developing countries. They persuasively demonstrate just how powerful economic development is by showing that GDP is the only variable with consistent and robust effects on all health outcomes. Jenkins and Scanlan (2001) similarly contend that economic development increases the food supply and reduces child malnutrition, even controlling for an extensive set of relevant variables. Numerous other scholars orient their analyses around economic development and find that it significantly influences well-being in developing countries (e.g., Pritchett and Summers 1996; Hertzman and Siddiqi 2000). An even greater number of scholars include economic development as a control variable and similarly find robust effects. The frequency with which GDP is included in cross-national studies of health demonstrates the conventional wisdom of its paramount importance (Brady, Kaya, and Beckfield 2007).

Critics contend, however, that GDP does not necessarily benefit all segments of a population equally, and that GDP should be evaluated *alongside* other aspects of development to fully understand well-being (e.g., Blumberg 1995; Parpart et al. 2000). Proponents of the economic development perspective include GDP per capita in regression models to explain variation in well-being *between* countries. However, national statistics on GDP per capita neither reveal the distribution of income *within* countries, nor the real beneficiaries. They also do not take into account other aspects of development that people need and want, like access to health care or education (UNDP 1990). Fostering economic development alone will not necessarily provide for other central human needs (Nussbaum 2004).

For example, despite substantial economic growth in recent years, Nigeria has not experienced the broad-based improvements in well-being outcomes that typically correlate with higher GDP. Nigeria outperforms other lower middle-income countries in GDP per capita, yet experiences higher poverty rates and lags farther behind its counterparts in life expectancy, literacy, and gender equality (World Bank 2014). Some countries achieve better health than expected relative to their level of economic development *and vice versa* (Ragin and Bradshaw 1992; Shen and Williamson 2001). Recent cross-national research documents persistent health inequalities despite economic growth (Grimm et al. 2008). In fact, while global economic inequality converged from 1980-2005, infant mortality actually diverged (Eloundou-Enyegue and Rehman 2009). This suggests that something other than economic development is at work and that GDP per capita is an imperfect predictor of well-being in developing countries (Robeyns 2000). Nonetheless, substantial cross-national research shows the positive effects of economic development for health, and this remains the prevailing prescription for developing countries.

Neoliberalism. Although the benefits of economic development may be widely agreed upon, the primary route to economic development, and therefore better well-being, is disputed. Neoliberalism suggests that integration into the world economy through trade liberalization and the facilitation of foreign investment is the optimal path to economic development (Haque 1999, Hall 2011). In theory, trade liberalization lowers prices, increases national efficiency, and increases national wealth by enabling countries to specialize and export the goods in which they have a comparative advantage. Foreign investment provides product innovation, technology, and financing that can be leveraged to bring increasing returns to the host country. Thus integration into the world economy, through export-led production and foreign investment, "provides developing economies with the opportunity to catch up in income and productivity with more advanced economies" (Gilpin 2001: 198). In turn, everyone benefits from increased social mobility and better health and well-being (Haque 1999; Firebaugh and Beck 1994).

Dependency/world-sytems theory. Dependency and world-systems theorists, on the other hand, argue that trade and foreign investment decelerates economic growth and impedes well-being in poor countries. The expansion of global capitalism created a world market in which nations are involved in dependent, but unequal exchange relationships that favor the powerful core states (Wallerstein 2004). Transnational corporations (TNCs) monopolize internal capital, accumulate a disproportionate share of local sources of credit, repatriate profits instead of reinvesting them in local economies, and displace many local businesses. Furthermore, foreign investors hamper health and well-being by discouraging social welfare policies that are beneficial to the local population but that don't serve TNC interests (Beer and Boswell 2002; Shen and Williamson 2001). Through tax evasion and disguising taxable profits, TNCs reduce the government resources that would otherwise fund health and social services (Wimberley 1990). For these reasons, many scholars show that foreign trade and/or investment adversely affect mortality and food security (e.g., Shen and Williamson 2001; Jenkins and Scanlan 2001; Wimberley 1990; Wimberley and Bello 1992).

Moreover, as a result of the global division of labor, developing countries risk concentrating too heavily on one or a few export commodities (Burns, Kentor, and Jorgenson 2003). The more a country's exports are concentrated in a small number of products, the more vulnerable that country is to fluctuations and disturbances in the global market. Countries with more diverse export portfolios, however, can better weather economic downturns because they have more options in responding to those fluctuations (Beer and Boswell 2002; Shen and Williamson 2001). Export concentration also tends to correlate with trade partner concentration. That is, one country depends on trade with a few other countries that, in turn, depend on a few products. This leaves periphery countries vulnerable to economic and political pressures from major trading partners (Hirschman 1945; Babones and Farabee-Siers 2012). As a result, export concentration adversely affects economic growth, health care, and the physical quality of life (e.g., Shen and Williamson 2001; Ragin and Bradshaw 1992).

All of this suggests that location in the world-system hierarchy affects a country's freedom to assert its own governance priorities that, in turn, affects population health. As economic transactions cross national boundaries at an ever-increasing rate, the growing wealth and power of TNCs undermine the power of the state and marginalize the state as an actor (Evans 1997). TNCs gain control in economic, political, and social domains and limit the capacity of periphery states to implement policies in their own long-term interests (Kentor and Boswell 2003). For example, periphery countries are under intense pressure from international funding agencies and TNCs to privatize their healthcare systems. However, privatization creates inequities in access and quality of services and to rising out-of-pocket costs, which further exacerbates the poverty of the most marginalized (Johnson and Stoskopf 2010; Whitehead, Dahlgren, and Evans 2001). Lacking the technology and capital to effectively run state-owned enterprises, many governments feel as if they have no choice other than allowing foreign investors to take over (Ramamurti 1992). In this way, dependence on exports and foreign capital allows foreign investor countries to co-opt local politics and pursue their own interests. On the other hand, periphery countries with more diversified distributions of export production and trade partners allows them to better maintain their autonomy

(Kentor and Boswell 2003). Thus, variation in periphery states' relative levels of dependency and strength in global trade networks may, in part, account for their varying power to provide the capabilities people need to ensure good health.

Following convention, the present study includes GDP per capita, trade, foreign investment, and export concentration at the country level to test the political economy hypotheses. However, the multi-level modeling technique employed here goes beyond traditional analyses in this field by including individual-level variables as well. In doing so, it overcomes the limitation of focusing on aggregate wealth measures alone by also considering the way in which wealth is distributed within countries. Political economy perspectives are criticized for overgeneralizing and for concentrating exclusively on external forces, neglecting the role that internal forces can have in shaping well-being (Farmer 1999). The present study addresses this limitation as well, by including internal factors (e.g., education and sanitation) that may be equally or more important for explaining disparities in child health.

Capability Development

In contrast, the capability approach to improving health disparities emphasizes development that expands the freedoms that people have and the things they are able to accomplish, rather than the maximization of income and wealth (Sen 1999). The key feature of the capability approach is its emphasis on what people are able to do and to be (i.e., their capabilities) (Sen 1999; Nussbaum 2000; Robeyns 2005). According to this perspective, then, development is a process of broadening people's choices (UNDP 1990). As such, development entails eliminating major sources of "unfreedom," such as neglect of public facilities, and lack of access to health care, clean water, basic education or gainful employment (Sen 1999). The capability approach to development is a human outcome-oriented approach that underscores basic rights as the most important means to improve well-being. Of course, people typically want higher incomes, but "income is not the sum total of human life" (UNDP 1990: 9). Economic development can be an important *means* for improving well-being, but well-being depends on other factors as well (Sen 1999).

In his first empirical application of the capability approach, Amartya Sen (1985) shows that the gross national product (GNP) per capita of Brazil and Mexico in the early 1980s was more than 7 times the GNP per capita of Sri Lanka. Nevertheless, Sri Lanka outperformed Brazil and Mexico in terms of life expectancy and infant and child mortality. Sen concludes that public policies concentrating on food distribution and public health services allowed Sri Lanka to achieve remarkable improvements in well-being without the concomitant increase in economic development. Slottje (1991) compares a well-being index for 126 countries and finds that well-being varies across levels of economic development. A number of other studies further suggest that country rankings based on GDP per capita are quite different from rankings based on human capabilities and that, consequently, GDP should not be automatically equated with a growth in living standards (see Robeyns 2000 for a review).

The biggest critique of the capability approach lies in the problem of defining capabilities and operationalizing them in empirical research. Sen develops the idea over several decades and many publications, but never offers a concrete index of the most important or relevant capabilities. He views well-being as a multi-dimensional phenomenon that is contingent on individual choice and definition (Sen 1999). For this reason, some argue that the approach has not been sufficiently specified and that the idea is too broad to be operationalized in a meaningful way (Sugden 1993; Roemer 1996). Still, a review of the ways in which capabilities are measured in studies of developing countries reveals basic agreement on the most central aspects: education, sanitation, clean water, and health care (Saith 2001). Thus, the present study concentrates on these variables as indicators of the capability approach.

Martha Nussbaum (2004) claims that education is the key to all other capabilities. A considerable literature suggests that education at the macro-level has important consequences for population health, and some even find that find that secondary school enrollment has a larger direct effect on well-being than GDP per capita (Brady, Kaya, and Beckfield 2007; Burroway 2010). Inadequate access to clean water and sanitation facilities accounts for a large part of the burden of illness in developing countries (World Bank 2003). About half of the developing world (2.6 billion people) lacks even a simple latrine and about one-sixth (a little over 1 billion people) lacks clean water (WHO and UNICEF 2004). Furthermore, many developing countries experience human resource shortfalls that hinder the capabilities of local medical facilities to administer health care. Some estimates suggest that Africa needs approximately 1 million more health care workers to adequately care for its people (Garrett and Rosenstein 2005). The demand for health care exceeds the supply worldwide, but shortfalls in low-income countries are far worse than those in rich countries (Clark, Stewart, and Clark 2006). Additionally, physicians migrate from periphery to core countries in order to advance their careers and improve their socioeconomic status. This "brain drain" contributes even further to the global imbalance of health personnel (Hagopian et al. 2004).

In the analysis that follows, I first examine these variables separately, treating them as distinct aspects of capability development. However, I also create a new measurement of capability development: a composite scale that combines these four variables. This technique has the advantage of treating capability development as the multi-dimensional concept that Sen imagined it to be (Slottje 1991). The scale can be thought of as a broad measure representing the environment in which one lives and access to non-economic resources that may be just as important as GDP for reducing malnutrition and diarrhea.

Fundamental Cause

The fundamental cause perspective maintains that health disparities are best understood as a function of social factors, like wealth and education, that determine the extent to which individuals are able to avoid risks for morbidity and mortality (Link and Phelan 1995). Although epidemiological studies have been tremendously successful in identifying the risk factors for major diseases, they focus almost exclusively on proximate causes of illness, such as diet or high blood pressure. The fundamental cause perspective argues that such individual risk factors must be contextualized by examining "what puts people *at risk of risks*" (Link and Phelan 1995: 80).

The essential feature of fundamental social causes is that they embody important access to resources that allow individuals to prevent disease or minimize the consequences once it occurs (Phelan, Link, and Tehranifar 2010). Diseases, knowledge of risks, and treatments change over time. However, the association between socioeconomic status (SES) and health remains the same because people with more resources will always use them to garner a health advantage. The mechanisms between SES and health may change, but "when a population develops the wherewithal to avoid disease and death, individuals' ability to benefit from that wherewithal is shaped by resources of knowledge, money, [and] power" (Link and Phelan 2002: 730). Thus, SES should have particularly strong effects on preventable health conditions with known measures of treatment (Phelan et al. 2004), such as malaria, malnutrition, or diarrhea.

For example, education and wealth influence whether people know about or can afford particular treatments. Use of bed nets is the most *proximate* cause of malaria in developing countries. But wealth and education influence the likelihood of ownership and use of such nets and are therefore the *fundamental* causes of malaria (Dickinson et al. 2012). Poverty and ignorance limit the distribution and effectiveness of health enhancing technologies, thus shaping vulnerability to disease (Stratton et al. 2008). Even if bed nets were distributed evenly across the population, those with more wealth and education would still have a health advantage by finding other ways to ameliorate malaria risk, like antimalarial drugs. Artemisinin-based combination therapies (ACTs) are extremely successful in reducing malaria incidence, but the high cost and the lack of public awareness about ACTs prohibits their large-scale use (Stratton et al. 2008).

Similarly, water and sanitation are two of the most proximate causes of child malnutrition and diarrhea. However, household wealth largely determines access to water and sanitation. Even if all families had clean water and a flush toilet, wealthy families would still be better able to prevent these childhood illnesses or to minimize their consequences by purchasing oral rehydration therapy, high quality food, or professional health care. Additionally, more educated mothers have the knowledge required to most effectively utilize clean water and sanitation. Again, even if all families had access to water and sanitation, more educated mothers would still garner a health advantage for their children through their awareness of safe food preparation and storage, water handling and storage, safe feces disposal, hand washing, and nutrition. Wealth and education deficits create underlying vulnerabilities to illness (Stratton et al. 2008). They are therefore more important for explaining health disparities than more proximate causes of illness.

Table 1. Competing Perspectives on Child Health

	Individual-Level Indicators	*Country-Level Indicators*
Political Economy Economic Development Neoliberalism and Dependency/World-Systems	--	 GDP per capita Trade, Foreign Investment, Export Concentration
Capability Development	--	School Enrollment, Water, Sanitation, Doctors
Fundamental Cause	Household Wealth, Mother's Education	--

In sum, these theoretical perspectives provide multiple ways of conceptualizing the most important predictors of child health in developing countries and at multiple levels of analysis (Table 1). A fundamental cause perspective suggests that household wealth and mother's education should be the most important predictors of child health. The political economy perspective focuses on GDP, trade, and foreign investment at the country-level, but ignores the distribution of wealth within countries. The capability approach, on the other hand, posits that clean water, sanitation, education, and health care are just as important, if not more so, for improving child health. In the analysis that follows, I combine all of the theoretical perspectives using a multi-level statistical technique.[1] By including measures from each framework, the results illustrate the multifaceted set of social structural factors that manifest as unequal life chances for children. Furthermore, the modeling strategy shows that children are affected not only by their household circumstances, but also by larger societal contexts.

Data and Methods

I estimate a series of hierarchical generalized linear logit models (HGLM) with the HLM 6.08 software developed by Raudenbush and colleagues (2004). These models predict the odds that a child has had a recent episode of diarrhea or is stunted, wasted, or underweight based on a set of both individual- and country-level explanatory variables. The advantage of this technique is that

[1] Unfortunately, data limitations prevent comparable measures of health care from being included at both levels.

the net effects of one level can be estimated while controlling for variation in the other level. Ignoring the nesting of observations within clusters violates the assumption of independent standard errors and inflates the risk of a Type 1 error. However, hierarchical analysis provides unbiased and efficient estimates of the coefficients, as well as proper standard error estimates (Raudenbush and Bryk 2002). The analysis can be explained in two steps. First, at level 1, the log-odds of being stunted, wasted, underweight, or having a recent episode of diarrhea [log $(p_{ij}/1 - p_{ij})$] for the ith individual in the jth country is expressed as a function of country intercepts (β_{0j}) and a set of fixed individual-level characteristics (βX_{ij}), and an error term (r_{ij}):

$$\log (p_{ij}/1 - p_{ij}) = \beta_{0j} + \beta X_{ij} + r_{ij}$$

The individual-level variables are group-mean centered (differenced from their country means) in this equation.[2]

Second, at level 2, the parameters from the first step become the dependent variables and are regressed on a set of country-level predictors. Each country intercept (β_{0j}) is expressed as a function of a general intercept term (γ_{0j}), a set of country-level characteristics (γC_j), and an error term (ε_{0j}):

$$\beta_{0j} = \gamma_{0j} + \gamma C_j + \varepsilon_{0j}$$

This random intercept model tests the effects of the country-level variables on child health, while also accounting for within-country variation in maternal and household characteristics. While previous research has found important effects of economic development, trade, and foreign investment on health, those findings are limited to country-level associations. Such ecological-level studies cannot conclude that the findings would still hold after taking into account the compositional characteristics of countries (McTavish et al. 2010). The present study therefore contributes to extant scholarship by modeling both *country*- and *individual*-level influences on child health simultaneously. This is an important extension of previous work because it treats children as nested in larger structural contexts that shape their chances of being malnourished or having diarrhea.

Individual-level data (level 1) are drawn data from the Demographic and Health Surveys (DHS), a collection of nationally representative, population-based surveys in developing countries

[2] Group-mean centering produces the most accurate estimates of slope variance (Raudenbush and Bryk 2002). It implies that an individual's relative position within a country influences the outcome (Enders and Tofighi 2007). This is appropriate for cross-country comparisons in which levels of wealth or education, for example, may have different value depending on context.

(Macro 2009). Country-level data (level 2) are drawn from the World Development Indicators (WDI) database (World Bank 2010), unless otherwise noted. The sample is based on countries with available data on the dependent variables collected during DHS phases 3 through 5 (1995-2008) for comparability in time and content. Thus, the analysis pools data on 258,761 children under 5 in 47 developing countries.

The analysis includes four binary measures of child health. *Diarrhea* is self-reported by the respondent (the child's mother) for all children under 5 in the household. A child is coded 1 for having diarrhea if s/he has been ill with diarrhea at any time during the two weeks preceding the interview. Stunting, wasting, and underweight are calculated using anthropometric measures of height and weight. *Stunting* is defined as low height-for-age. A child is coded 1 for stunting if s/he is more than two standard deviations below the median of the World Health Organization child growth standards for his/her height, age, and gender (WHO 2006). *Wasting* is defined as low weight-for-height and *underweight* as low weight-for-age. They are similarly coded. The collection of outcomes together then represents a range of chronic to acute conditions: stunting (most chronic), underweight, wasting, and diarrhea (most acute).

One key advantage of these variables is that they are more valid and reliable than the more commonly used measures of infant mortality. Infant mortality is often derived from indirect estimation techniques that use all available information and attempt to reconcile differences among multiple sources, like vital registration systems, surveys, and censuses (World Bank 2010). Data vary by source and method for any given time and place, which makes cross-country comparison extremely difficult. On the contrary, one of the most significant contributions of the DHS is the collection of internationally comparable data. Carefully trained survey teams follow standardized guidelines in physically weighing and measuring children in the field. Training includes classroom instruction, as well as practice field experience and quality control tests to ensure proficiency (Sommerfelt and Stewart 1994).

Drawing from political economy, economic development is measured as real *gross domestic product (GDP) per capita* in hundreds of purchasing power parity dollars and is logged to correct for its highly skewed distribution. *Trade* is assessed by exports of goods and services as a percent of GDP. In order to further test the effects of trade, I also include *export concentration* as an index that evaluates a country's degree of product concentration. The Herfindahl-Hirschmann Index ranges from 0 to 1 and is calculated using the total value of exports, number of products that are exported from each country, and the value of each product. Values close to 1 indicate that exports are highly concentrated on a few products, and values close to 0 indicate that exports are distributed evenly across a variety of products (UNCTAD 2016). *Foreign investment* is measured as inward foreign direct investment stock as a percent of GDP (UNCTAD 2016).

The capability approach is assessed by 5 indicators at the country level. *Improved water source* reflects the percentage of the population with access to a household water connection, public standpipe, borehole, protected dug well, protected spring, or rainwater collection. *Improved sanitation facilities* reflects the percentage of the population with access to a public sewer, septic system, pour/flush latrine, private pit latrine, or ventilated pit latrine. Healthcare is measured as number of *physicians per 1,000* people. This variable is logged to correct for its skew. Education is measured as gross *secondary school enrollment* as a percentage of age appropriate children. I also create a *capability development scale* that includes water, sanitation, physicians, and school enrollment. This is a standardized scale with a mean of 0 and standard deviation of 1, generated in STATA using the "alpha" command. This recognizes the concept of capability development as multi-dimensional, as Sen intended. Cronbach's alpha for the capability development scale is .93, indicating that the variables are measuring the same underlying content. This combination of indicators is a good proxy for estimating the concept of capabilities (Boermans and Kattenberg 2011).[3]

Fundamental cause is assessed at the individual level by household wealth and mother's education. Household wealth is measured as a composite *wealth index* that represents the cumulative living standard of a household. Following Heaton and colleagues (2005), this index is calculated as the percentage of household items (including radio, television, electricity, refrigerator, bicycle, motorcycle, car, telephone, and finished floor) present in the home. Very few demographic surveys gather data on income or consumption expenditures in developing countries. Thus, researchers must rely on proxies for living standards (Montgomery et al. 2000). Asset-based measures of wealth like the one used here are widely used to indicate SES, and some researchers claim they are superior to income in developing country contexts (Bollen, Glanville, and Stecklov 2001). Mother's education is measured as a series of categorical variables including *primary*, *secondary*, and *higher*, with no education as the reference group. Maternal education is the most frequently used measure of SES in studies of health in developing countries (Bollen, Glanville, and Stecklov 2001).

I also include water and sanitation, the proximate causes of poor child health, as a comparison to the fundamental causes. These variables are coded according to WHO/UNICEF guidelines (2004). Improved water source is defined as either *piped water* or *well water*. A household is coded 1 for piped water if the main source of drinking water is piped into the dwelling, yard, or a public tap/standpipe. A household is coded 1 for well water if the main source of drinking water comes from a protected dug well, covered borehole, protected spring, or rainwater collection. The

[3] See Appendix 1 for a correlation matrix of the country-level variables.

reference group includes open/unprotected well, surface water (river, dam, lake, pond, stream), irrigation water, tanker truck water, or bottled water.[4] Improved sanitation facilities are defined as *flush toilet* or *pit latrine*. Flush toilets may be piped to a sewer system, septic tank, or pit latrine. A household is coded 1 for pit latrine only if the latrine is ventilated or has a slab covering. The reference group includes open pit latrine, bush/field, bucket, or no facility. Finally, several indicators of household family structure and size are included as controls: mother's employment and marital status, mother's age, household head's age and sex, child's age and sex, number of household members, and the presence of multiple young children. Descriptive statistics for all variables in the analysis are provided in Appendix 2.

Results

Tables 2-4 display the results for HGLM logit models of child malnutrition and diarrhea. Table 2 shows the effects of household wealth, mother's education, and household sanitation and water, controlling for other relevant household and maternal characteristics.[5] As such, it highlights the usefulness of fundamental cause for understanding variation in child health. At the country level, Table 2 tests the opposing hypotheses of neoliberalism and dependency/world-systems. Model 1 includes trade, foreign investment, and export concentration. Model 2 adds GDP per capita. Table 3 focuses on the capability development variables, comparing them to economic development.[6] Model 1 first displays the bivariate association between child health and water, sanitation, doctors, and education respectively. Again, Model 2 adds GDP per capita. Finally, Table 4 displays the key fundamental cause variables again, and contrasts the political economy variables with the capability development scale.

Individual-Level

Beginning with the individual-level variables only, Model 1 of Table 2 shows that wealth has a considerable effect on child health. Although the effect is robust across all 4 outcomes, wealth seems to have the strongest negative effect on stunting and underweight, the two most chronic indicators of child health. Well water, on the other hand, does not have a statistically significant effect on any of the health outcomes. Piped water only significantly affects the odds of underweight, when controlling for wealth and other household characteristics. The fact that wealth

[4] WHO/UNICEF (2004) does not consider bottled water as an improved source because of the limitations in quantity, not quality.

[5] The control variables are not displayed in Table 2 for the sake of parsimony, but are included in each model. See Appendix 3 for the full model.

[6] Again, the individual-level coefficients are not displayed in Table 3 for the sake of parsimony, although the full set of individual-level variables is included in every model. The effects of the individual-level variables remain stable throughout.

is a more robust predictor of child health than clean water supports the fundamental cause argument that socioeconomic status is an enduring determinant of health disparities in spite of intervening mechanisms that help eradicate disease.

Table 2. HGLM Logit Models of Child Health on Fundamental Cause and Political Economy (Odds Ratios Displayed)

	Diarrhea		**Stunting**		**Wasting**		**Underweight**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Individual Level								
Wealth Index	0.995***	0.995***	0.986***	0.986***	0.995***	0.995***	0.987***	0.987***
Improved Water Source								
Piped Water	0.988	0.988	0.978	0.978	0.973	0.973	0.927**	0.927**
Well Water	0.988	0.988	0.956	0.956	1.046	1.046	0.981	0.981
Improved Sanitation Facilities								
Flush Toilet	0.964	0.964	0.754***	0.754***	0.804***	0.804***	0.783***	0.783***
Pit Latrine	1.014	1.014	0.924+	0.924+	0.898*	0.898*	0.886**	0.886**
Mother's Education								
Primary	1.009	1.009	0.850***	0.850***	0.851***	0.851***	0.774***	0.774***
Secondary	0.911	0.911	0.649***	0.648***	0.750***	0.750***	0.587***	0.587***
Higher	0.681***	0.681***	0.499***	0.499***	0.737***	0.737***	0.420***	0.420***
Country Level								
Trade	0.992*	0.994	0.987*	0.995	0.995	1.003	0.983**	0.996
Export Concentration	1.504	1.299	4.670***	2.536**	4.414**	2.437+	7.135***	2.854*
Foreign Investment	1.005	1.005	0.997	0.999	0.994	0.996	0.991	0.993
GDP per capita		0.909		0.672***		0.680**		0.552***

+p<.10 *p<.05 **p<.01 ***p<.001 (two-tailed tests)

Note: Constants not shown. Each model also includes additional control variables not shown (see Appendix 3).

Access to improved sanitation facilities appears to be more consequential for malnutrition than access to improved water sources. Living in a home with a flush toilet or a pit latrine significantly decreases the odds of malnutrition. This supports previous findings that sanitation has a larger impact than drinking water quality on various health outcomes, including child growth (World Bank 2003). Still, neither the presence of a flush toilet nor a pit latrine significantly influences the odds of diarrhea. This is contrary to expectation, since poor hygiene is one of the largest causes of diarrhea. However, good hygiene is much more than just access to a toilet or latrine. It involves hand washing with soap and safe weaning practices, food preparation, water handling, water storage, and disposal of children's feces (World Bank 2003). It is possible that these hygiene practices are more important for diarrhea-prevention in particular. Again, household wealth has a more consistent effect on child health than access to improved sanitation.

Mother's education significantly reduces the odds of diarrhea and all 3 measures of malnutrition. The effects grow stronger with each level of education, supporting the fundamental cause perspective. The effects of mother's education are more robust than those of water and sanitation. This corroborates Smith and Haddad's (2000) finding that women's education has a larger impact on child malnutrition than access to safe water. Simply constructing water supply and sanitation facilities is not enough to improve health without simultaneously changing hygiene behaviors. Education, particularly targeted at women, is the most effective way to promote and maximize good hygiene behaviors (World Bank 2003). Additionally, more educated women are more likely to break from tradition and adopt newer innovations in technology and nutrition (Caldwell 1979). This again provides some support for fundamental cause. Despite the intervening mechanisms of water and sanitation, wealth and education are still more robust predictors of child health disparities.

Country-Level

Turning to the country-level variables, Table 2 also displays the effects of the political economy variables. The models are sequenced to examine possible mediating effects. In Model 1, foreign investment never reaches significance for any of the health outcomes. As neoliberalism would predict, trade is associated with reduced odds of diarrhea, stunting, and underweight. However, as dependency/world-systems theorists would predict, export concentration has adverse consequences for child health as it increases the odds of all three malnutrition indicators. This suggests that trade in and of itself is not harmful to well-being in developing countries. It is when countries become too dependent on one or a few commodities that trade starts to have detrimental costs.

Model 2 includes GDP per capita, in order to demonstrate the extent to which trade affects child health through its impact on economic development. Adding GDP reduces the trade coefficients to insignificance, suggesting that the benefits of trade are entirely mediated by economic development. Export concentration remains significant, although the odds ratios are slightly attenuated. Foreign investment remains insignificant, and the odds ratios are relatively unchanged. The effect of GDP is negative and robust for the three malnutrition variables, as the economic development perspective would posit. However, GDP does not significantly affect the odds of diarrhea, the most acute of the child health variables.

Table 3. HGLM Logit Models of Child Health on Capability Development

	Diarrhea		**Stunting**		**Wasting**		**Underweight**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Improved Water Source	0.992*	0.992	0.979***	0.992	0.987*	1.003	0.971***	0.992
	-1.149	***-1.149***	***-1.438***	***-1.154***	***-1.260***	***1.050***	***-1.650***	***-1.139***
	(-2.249)	(-1.440)	(-5.179)	(-1.661)	(-2.450)	(0.438)	(-5.026)	(-0.924)
GDP per capita		0.999		0.683***		0.614***		0.525***
		-1.001		***-1.378***		***-1.506***		***-1.719***
		(-0.007)		(-3.749)		(-3.767)		(-4.064)
Improved Sanitation	0.994*	0.994+	0.987***	0.993*	0.987***	0.992+	0.976***	0.984***
Facilities	***-1.183***	***-1.182***	***-1.432***	***-1.192***	***-1.430***	***-1.237***	***-1.933***	***-1.556***
	(-2.501)	(-1.841)	(-4.218)	(-2.035)	(-3.562)	(-1.883)	(-7.869)	(-4.752)
GDP per capita		0.999		0.684***		0.740*		0.638***
		-1.001		***-1.376***		***-1.287***		***-1.458***
		(-0.014)		(-4.942)		(-2.553)		(-4.595)
Physicians per 1,000	0.874***	0.835**	0.792***	0.906	0.862*	1.028	0.700***	0.852+
	-1.240	***-1.336***	***-1.453***	***-1.171***	***-1.269***	***1.046***	***-1.771***	***-1.292***
	(-3.483)	(-2.976)	(-4.617)	(-1.489)	(-2.304)	(0.337)	(-6.375)	(-1.882)
GDP per capita		1.135		0.691***		0.616**		0.584***
		1.112		***-1.364***		***-1.502***		***-1.572***
		(1.408)		(-3.762)		(-3.369)		(-3.666)
Secondary School	0.993**	0.991*	0.985***	0.991*	0.988**	0.995	0.976***	0.984***
Enrollment	***-1.212***	***-1.275***	***-1.518***	***-1.273***	***-1.389***	***-1.140***	***-1.964***	***-1.578***
	(-2.917)	***(-2.537)***	(-5.292)	(-2.157)	(-2.972)	(-0.976)	(-8.904)	(-4.388)
GDP per capita		1.090		0.741**		0.713**		0.689**
		1.075		***1.287***		***-1.328***		***-1.367***
		(1.034)		(-2.814)		(-2.760)		(-3.289)

+p<.10 *p<.05 **p<.01 ***p<.001 (two-tailed tests)
Note: Each cell contains odds ratios, standardized factor changes in bold and italics, and t-scores in parentheses. Constants and individual-level variables not shown.

Table 3 presents the country-level effects of capability development on child health. Each cell in Table 3 displays odds ratios, standardized factor changes, and t-scores.[7] Access to clean water at the country level has a significant bivariate relationship with all 4 child health indicators in Model 1. However, this effect is reduced to insignificance when GDP per capita is introduced in Model 2. Similar to the effects at the individual-level, wealth seems to be a more robust predictor of cross-national differences in child health than access to clean water.

[7] Standardized factor changes are calculated by first standardizing each coefficient to make the effect sizes comparable across models. Then, odds ratios below one are represented as the negative inverse (-1/OR) to make them substantively comparable to odds ratios above one.

Sanitation also significantly improves child health in bivariate models. The effect size is attenuated, but remains significant when economic development is added to the model. Furthermore, the effects of sanitation are slightly larger in magnitude than those of GDP for the odds of diarrhea and being underweight, which provides some evidence for the capability approach. These country-level effects again mirror the individual level in that sanitation is more consequential to child well-being than clean water.

Number of doctors has relatively sizable effects on all health outcomes in the bivariate models. Introducing economic development into the models greatly attenuates the effect of health care on malnutrition. However, this is not the case for diarrhea. Number of doctors remains a significant predictor of diarrhea, while GDP per capita has no effect, again providing some evidence that supports the capability approach.

Education has the most robust effects compared to the other capability development measures. The bivariate relationship is significant for all health outcomes. This relationship holds even controlling for GDP in 3 out of the 4 models. In fact, the effect of education is slightly larger in magnitude than that of GDP for the odds of being underweight. Moreover, GDP does not have a significant effect on diarrhea. Thus, as the capability approach would predict, the health-enhancement resulting from improvements in secondary school enrollment is larger than that of economic development for some child health outcomes.

Because the capabilities are highly collinear, they are measured with a scale. This broad indicator of development measures the environment in which children live and their access to non-economic resources that impact health. Table 4 shows that the capability scale has beneficial effects for child health, even controlling for GDP per capita, trade, and export concentration. As Sen and Nussbaum would predict, the benefits of capabilities are larger than those of GDP for being underweight and comparable for stunting. Notably, the capability scale significantly reduces the odds of diarrhea, while GDP has no statistically significant effect. Because the health enhancement resulting from increasing capabilities is larger than or comparable to the health enhancement resulting from GDP for 3 of the health outcomes, this suggests that economic development is not always the most effective way to improve well-being. Model 4 also shows that trade reduces the odds of being underweight, but export concentration increases the odds of all 3 malnutrition indicators. Thus, trading with global markets can be beneficial for well-being.

Table 4. HGLM Logit Models of Child Health on Fundamental Cause, Political Economy, and Capability Development

	Diarrhea	**Stunting**	**Wasting**	**Underweight**
Individual Level				
Wealth Index	0.995***	0.986***	0.995***	0.987***
Improved Water Source				
Piped Water	0.988	0.978	0.973	0.927**
Well Water	0.988	0.956	1.046	0.981
Improved Sanitation Facilities				
Flush Toilet	0.964	0.754***	0.804***	0.782***
Pit Latrine	1.014	0.925+	0.898*	0.887**
Mother's Education				
Primary	1.009	0.850***	0.851***	0.774***
Secondary	0.912	0.648***	0.750***	0.587***
Higher	0.681***	0.498***	0.737***	0.420***
Country Level				
Trade	0.997	0.994	1.001	0.990*
	-1.064	***-1.111***	***1.012***	***-1.191***
	(-1.220)	(-1.179)	(0.118)	(-2.079)
Export Concentration	0.948	2.146**	2.520+	2.065+
	-1.011	***1.174***	***1.214***	***1.164***
	(-0.159)	(2.802)	(1.970)	(1.742)
GDP per capita	1.187	0.788+	0.672*	0.768+
	1.155	***-1.221***	***-1.396***	***-1.248***
	(1.651)	(-1.747)	(-2.631)	(-1.984)
Capability Development	0.726*	0.814+	0.998	0.641***
Scale	***-1.326***	***-1.199***	***-1.002***	***-1.478***
	(-2.713)	(-1.880)	(-0.016)	(-3.918)

+p<.10 *p<.05 **p<.01 ***p<.001 (two-tailed tests)
Note: Constants not shown. Each model also includes additional control variables not shown (see Appendix 3). For individual-level, each cell contains odds ratios only. For country-level, each cell contains odds ratios, standardized factor changes in bold and italics, and t-scores in parentheses.

However, dependence on a few commodities is what makes trade harmful in developing countries. Table 4 presents final models that incorporate measures from all of the theoretical perspectives.[8]

Discussion

Political economy, capability development, and fundamental cause add both competing and complimentary insights into the study of health disparities. The results suggest that cross-national studies of child health would benefit from a theoretical approach that synthesizes these perspectives and situates individual- and country-level factors within a world-historical context. The highlights and lessons learned from each perspective are discussed in turn.

Political Economy

The conventional wisdom in much social science literature is that improving GDP per capita is the most effective route to alleviating health disparities in developing countries. Neoliberals claim that countries boost health through increasing exports and encouraging foreign investment. Integration into the global market brings economic development, which trickles down to improve social mobility and well-being for all. On the other hand, dependency/world-systems theorists caution that developing countries are harmed by trade and investment because TNCs repatriate most of their profits, displace local businesses, and discourage social welfare policies that are not in their interests. The results of this analysis suggest that economic development has a beneficial effect on child health, as it reduces the odds of all three malnutrition indicators. As neoliberalism would predict, trade also has health enhancing impacts. The effect of trade is attenuated to insignificance when GDP per capita is added to the model, suggesting that trade influences child health through economic development.

However, export concentration significantly increases the odds of malnutrition, as dependency/world-systems theory would predict. Thus, although integration into the global economy through trade can have beneficial effects for developing countries, the concentration on a small number of export commodities is harmful to well-being. The more a country's exports are concentrated in a small number of products, the more vulnerable that country is to fluctuations and disturbances in the global market, which adversely affects economic growth and health. Export concentration also leaves countries susceptible to the pressures of major trading partners to privatize health care and reduce other welfare supports. These pressures erode the authority of the state to provide the capabilities that are so important to health. This points to the importance of incorporating world-systemic factors into analyses of health outcomes by including relative levels

[8] Since foreign investment never reaches significance in Table 2, it is omitted in Table 4 for parsimony and to preserve degrees of freedom.

of country wealth and relational measures like trade concentration. The results suggest that position in the world-system hierarchy partially shapes countries' and households' abilities to ensure health.

Capability Development

The capability approach cautions that a disproportionate focus on economic development neglects other deprivations that are equally important for well-being. Indeed, the results of the analysis suggest that the benefits of economic development are not automatic or guaranteed. Sanitation and school enrollment both have slightly larger effects on the odds of being underweight than does GDP per capita. Perhaps even more surprising, GDP does not significantly affect diarrhea. Rather, improvements in sanitation, number of physicians, and secondary school enrollment are more consequential for reducing diarrhea. The capability development scale further indicates that broad contexts of access to non-economic resources have particularly beneficial effects on child health. Scholars and policymakers assume that the benefits of economic development "trickle down" to influence health and well-being (Jenkins and Scanlan 2001). But this may not be the case for particularly acute health issues like diarrhea. It is possible that doctors and education are more important for attending to immediate health needs.

One limitation of the analysis is that many of the country-level variables are moderately correlated (see Appendix 1). Thus, a bit of caution may be warranted in making conclusions about which aspects of development are most important. Part of the way in which economic development influences health in some contexts is by increasing access to water, sanitation, doctors, and education. A comparison of the size of the GDP coefficients between Appendix 2 and Table 3 suggests that the effects of GDP per capita are moderated by the inclusion of the capability variables. However, it is important to remember that this is not always the case. GDP per capita does not always bring improvements in capabilities or health (Shen and Williamson 2001; World Bank 2014). This is evidenced by the fact that some countries experience dramatically higher rates of malnutrition than their national income would suggest (Hagey 2012). Moreover, it is also possible that the capability variables contribute to improved child health by increasing economic development. After all, populations with better water, sanitation, health care, and access to education are likely more productive and can contribute more to the economic growth of society. A comparison of Models 1 and 2 in Table 3 suggest that this might also be the case. The capability development variables are moderated by the inclusion of GDP per capita. Although it is beyond the scope of the current methods to do so, future research could try to parse this out. As data DHS data collection efforts are ongoing, longitudinal analyses may be a feasible and fruitful next step.

Fundamental Cause

Household wealth and mother's education are the only variables that have robust and consistent effects across all four dependent variables at the individual level. They seem to produce greater health benefits for children than access to clean water and, in some cases, access to improved sanitation facilities. Despite the fact that these results are cross-sectional, this lends support to the fundamental cause perspective because it suggests that SES is a more robust predictor of child health than the more proximate intervening mechanisms of water and sanitation. That is, the effects of SES endure because those with more wealth and education will always use those resources to garner a health advantage, especially for illnesses like malnutrition and diarrhea with known treatment. Of course, a true test of the fundamental cause perspective would need longitudinal data to assess whether the relationship is reproduced over time with different intervening mechanisms (Phelan, Link, and Tehranifar 2010). The evidence provided here is suggestive and provides an avenue for future research in developing countries.

Conclusion

Sociologists have long been interested in the social determinants of health, and political economy scholars are particularly interested in how world-systems factors shape well-being. Yet research on globalization and development typically focuses on macro-economic processes like trade agreements and international markets, without recognizing the ways in which such processes affect the human body (de Casanova and Sutton 2013). The results of this study point to the need to integrate several theoretical frameworks that are typically deployed in separate literatures. The analyses provide evidence in support of all of the theories, demonstrating the usefulness of synthesizing them. In tandem, the fundamental cause, economic development, and political economy perspectives complement each other by making up for what each of the others lack. By utilizing multi-level models and several perspectives on health, this study offers a more comprehensive theoretical and empirical approach to the study of cross-national health disparities. In addition, the malnutrition and diarrhea variables analyzed here are more valid and reliable than the traditional estimates of mortality that are typically used in cross-national analyses of health. Stunting and underweight (the most chronic health indicators) seem to be most affected by household and maternal characteristics. Diarrhea (the most acute) is least affected by such variables, and it is the only health indicator that is not affected by GDP per capita. That the results vary across these outcomes has important implications for understanding health disparities, a fact which is obscured by the previous disproportionate focus on mortality alone.

More broadly, the results of this study inform our thinking about how global-level relationships influence states' and households' capacities to maintain health. Patterns of inequality are rooted in the relations among countries (Ragin and Bradshaw 1992). In the face of declining state power, countries in the periphery of the world-economy are less able to assert their own governance priorities than those in the core, which continue to sustain considerable welfare states. Some countries have more autonomy, and therefore more policy space, than others. This greatly affects the distribution of non-monetary resources that are so important for health, such as the provision of health care and education. Although the analysis is limited to low-income countries, it demonstrates how world-system factors shape the possibilities for this cluster of states. Understanding more about how some periphery countries are able to ensure child nutrition despite their relative lack of power in the world-system provides useful insights into how to improve well-being in an era of increasing globalization and marketization.

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Disclosure Statement

Any conflicts of interest are reported in the acknowledge section of the article's text. Otherwise, author has indicated that she has no conflict of interests upon submission of the article to the journal.

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Appendix 1. Correlation Matrix of Country-Level Variables

	1	2	3	4	5	6	7	8	9
(1) GDP per capita	1.00								
(2) Improved water source	.69	1.00							
(3) Improved sanitation facilities	.57	.65	1.00						
(4) Physicians per 1,000	.70	.71	.80	1.00					
(5) Secondary school enrollment	.70	.70	.80	.90	1.00				
(6) Capability development scale	.73	.85	.90	.94	.94	1.00			
(7) Trade	.40	.10	.13	.18	.20	.17	1.00		
(8) Export concentration	-.22	-.40	-.31	-.31	-.35	-.38	.33	1.00	
(9) Foreign direct investment	.33	.16	.29	.26	.33	.29	.52	.05	1.00

Appendix 2. Descriptive Statistics

Variable	Mean	SD	Min	Max
Individual Level (N=258,761)				
Dependent Variables				
Diarrhea	0.15	0.36	0.00	1.00
Stunting	0.33	0.47	0.00	1.00
Wasting	0.10	0.29	0.00	1.00
Underweight	0.18	0.38	0.00	1.00
Key Independent Variables				
Wealth Index	30.07	23.93	0.00	100.00
Improved Water Source				
Piped Water	0.44	0.50	0.00	1.00
Well Water	0.19	0.39	0.00	1.00
Improved Sanitation Facilities				
Flush Toilet	0.26	0.44	0.00	1.00
Pit Latrine	0.36	0.48	0.00	1.00
Mother's Education				
Primary	0.33	0.47	0.00	1.00
Secondary	0.27	0.44	0.00	1.00
Higher	0.05	0.22	0.00	1.00
Additional Control Variables				
Mother Employed	0.48	0.50	0.00	1.00
Mother's Marital Status				
Never Married	0.04	0.19	0.00	1.00
Formerly Married	0.06	0.23	0.00	1.00
Mother's Age	28.37	6.71	15.00	49.00
Head's Age	40.85	13.56	13.00	97.00
Child's Age (months)	28.32	17.13	0.00	59.00
Male	0.51	0.50	0.00	1.00
Female Head	0.15	0.35	0.00	1.00
Household Size	6.91	3.59	2.00	36.00
Multiple Children	0.66	0.47	0.00	1.00
Urban Residence	0.37	0.48	0.00	1.00
Country Level (N=47)				
GDP per capita	2.91	0.84	1.06	4.89
Trade	33.16	18.17	6.57	86.42
Export concentration	0.40	0.21	0.09	0.87
Foreign direct investment	24.74	21.71	0.66	111.12
Improved water source	72.53	17.10	41.00	98.00
Improved sanitation facilities	43.96	26.88	7.00	97.00
Physicians per 1,000	-1.39	1.60	-3.84	1.29
Secondary school enrollment	46.60	27.98	6.10	99.18
Capability development scale	-0.07	0.88	-1.39	1.66

Appendix 3. HGLM Logit Models of Child Health on *All* Individual-Level Variables and Country-Level GDP (Odds Ratios Displayed)

	Diarrhea		Stunting		Wasting		Underweight	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Individual Level								
Wealth Index	0.995***	0.995***	0.986***	0.986***	0.995***	0.995***	0.987***	0.987***
Improved Water Source								
Piped Water	0.988	0.988	0.978	0.978	0.973	0.973	0.927**	0.927**
Well Water	0.988	0.988	0.956	0.956	1.046	1.046	0.981	0.981
Improved Sanitation Facilities								
Flush Toilet	0.964	0.964	0.754***	0.754***	0.804***	0.804***	0.783***	0.783***
Pit Latrine	1.014	1.014	0.925	0.924	0.898*	0.898*	0.886**	0.886**
Mother's Education								
Primary	1.009	1.009	0.850***	0.850***	0.851***	0.851***	0.774***	0.774***
Secondary	0.911	0.911	0.649***	0.648***	0.750***	0.750***	0.587***	0.587***
Higher	0.681***	0.681***	0.499***	0.499***	0.737***	0.737***	0.421***	0.420***
Mother Employed	1.091***	1.091***	1.001	1.001	0.983	0.983	1.002	1.002
Mother's Marital Status								
Never Married	0.973	0.973	1.035	1.035	1.114	1.114	1.115*	1.115*
Formerly Married	1.149***	1.149***	1.074*	1.074*	1.144*	1.144*	1.066	1.066
Female Head	1.027	1.027	0.934***	0.934***	0.994	0.994	0.935***	0.935***
Mother's Age	0.989***	0.989***	0.995***	0.995***	1.004*	1.004*	1.000	1.000
Head's Age	1.000	1.000	0.997***	0.997***	1.000	1.000	0.999	0.999
Child's Age (months)	0.977***	0.977***	1.028***	1.028***	0.976***	0.976***	1.016***	1.016***
Male	1.109***	1.109***	1.175***	1.175***	1.208***	1.208***	1.119***	1.119***
Household Size	1.008	1.008	1.015***	1.015***	1.002	1.002	1.011**	1.011**
Multiple Children	0.878***	0.878***	1.132***	1.132***	0.996	0.996	1.092***	1.092***
Urban Residence	1.020	1.020	0.867**	0.867**	1.063	1.063	0.892	0.892
Country Level								
GDP per capita (logged)		0.890*		0.605***		0.640***		0.471***

*p<.05 **p<.01 ***p<.001 (two-tailed tests)