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The Effects of Foreign Aid for Health on Health Outcomes in Developing Countries

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THE EFFECTS OF FOREIGN AID FOR HEALTH ON HEALTH OUTCOMES IN
DEVELOPING COUNTRIES

A Thesis

Presented to

the Faculty of Arts and Humanities

University of Denver

In Partial Fulfillment

of the Requirements for the Degree

Master of Economics

by

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June 2014

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ABSTRACT

The purpose of this thesis is to investigate the effectiveness of foreign aid for health on the child mortality rate in developing countries. This is a controversial subject as many economists have found grounds to believe it is effective while others provide rationale for why it is ineffective. Based on panel data analysis, this study looks at the effects of external resources for health as a percentage of health spending on the child mortality rate in developing countries to determine how effective aid for health is in terms of improving health outcomes. With an understanding of the current nature of aid and previous empirical research on this topic, this paper will highlight what has been done and what still needs to be improved in future research in order to answer this important question.

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CHAPTER ONE: INTRODUCTION

Foreign aid for health outcomes has many economic implications but also tends to hold many ethical implications, tugging at emotions and challenging common beliefs. Many public figures have been outspoken about the importance of donating to efforts that seek to improve health outcomes in developing countries. With the use of imagery and anecdotes, development foundations and individual donors make an impact on the people they reach with this message. However, globally, many countries are still poverty-stricken and are overcome by diseases and undernourishment. After decades of aid donations, the income gap between the countries that are developed and the countries that have not yet developed remains expansive. Understanding the effectiveness of foreign aid has significant implications for economics and human development.

While it is difficult to deny that donations have saved lives, the concern is whether the current format of foreign aid is sustainable and effective or if there are more effective ways to help countries to develop. This study investigates is the question of whether foreign aid for health effective. There is great disparity in the opinions of economists as to whether aid is effective and why or why not. Some argue that aid has helped tremendously and the numbers of lives saved are all the indication one needs. Others argue that countries will never develop if they form dependencies on aid or even finance corruption with aid. When billions of dollars are spent on aid, it is important to know that it is having a proportionate impact and not hindering development in any way.

Leading development institutions such as the World Bank, United Nations and the United Nations Children's Fund (UNICEF) have been working to achieve the Millennium Development Goals (MDG) they have set to advance development. They have been reporting on the success of these goals thus far and while the results are not as drastic as they require, they do report progress towards reaching these goals. Donors have been reporting successes across all MDGs and believe that increasing funds will allow for even more success. Still, there is a general consensus that challenges of coordination, governance and transparency prevent total success. While donors and development institutions generally agree on the existence of these challenges, there is great disagreement with how to solve the problems and whether more aid is the answer.

This empirical study based on ad hoc modeling seeks to answer the general question of the effectiveness of foreign aid specifically on health outcomes. Research on this topic has sought to understand the effectiveness of foreign aid, even on health outcomes, but there has not been up to date empirical research on this topic. For developing countries, data on many key indicators or important control variables has not been tracked until recently. Others have studied this in the past, but have not had the consistent data, which has been made available only in roughly the past fifteen years. Multiple studies on the effectiveness of aid on health outcomes have shown different results. Using the control variable groupings typically used in mortality studies, this study seeks to use the available data to perform a regression analysis on how external resources as a percentage of total health spending in a developing country affects the child mortality rate in that country.

Understanding the impact that foreign aid has on child mortality rates will offer insight as to how effective aid is. It still leaves the question of how aid should be used, but it is an important step in finding the answers to the questions many economists have argued about. This paper seeks to explain the current nature of aid and the goals for development along with their challenges. Additionally, it will inform about the research that has been done surrounding aid and development outcomes, specifically child mortality, and provide the alternative argument that calls into question whether aid might even be harmful for development. After providing the viewpoints surrounding foreign aid for health outcomes, this study seeks to provide empirical insight about this topic.

Given the information provided by the World Bank and the UN, I would expect that with an increase in foreign aid for health, health outcomes would improve. In this study, the health outcome evaluated is child mortality rate, one of the MDGs. This indicator of overall health in a country would be expected to decrease as aid for health increases. However, I do not expect the change in child mortality rate to be terribly large in comparison to the amount of aid the country received. By studying the overall effects of foreign aid for health on child mortality rates across forty-seven developing countries and ten years, I expect to find out whether foreign aid has the intended impact on health and open up a discussion about how aid should be used in the future.

CHAPTER TWO: DEVELOPMENT AND FOREIGN AID

Millennium Development Goals

Over the past several decades, lending institutions have made improved health outcomes a priority. In 2000, the United Nations established eight Millennium Development Goals (MDGs) that were agreed upon by 189 countries, as well as leading development institutions.¹ These goals are intended to make significant strides in the advancement of developing countries by 2015. With these goals, the United Nations can better gauge the success of programs and finances dedicated to improving the state of developing countries.

All signatory countries cooperate on MDG advancement, parts of which may be progressing more than others. However, while country-specific goals may exist, they do not detract from the global goals. The global goals decided upon by the United Nations are as follows:²

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality

1 UN. "United Nations Millennium Development Goals." UN News Center. <http://www.un.org/millenniumgoals/> (accessed October 5, 2013).

2 "The Millennium Development Goals Eight Goals for 2015." Millennium Development Goals. <http://www.undp.org/content/undp/en/home/mdgoverview/> (accessed October 5, 2013).

5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

The UN has tracked these goals and reported the progress of these eight objectives. While the goals themselves are described in a brief, subjective manner, there are objective, measurable milestones that allow their success to be tracked.

As it stands, globally, poverty rates have been halved between 1990-2010, yet roughly 1.2 billion people still live in poverty. The trends show that universal primary education will not be achieved by 2015, though gender equality has been improving due to quota systems. The specific goal for reducing the child mortality rate is to reduce the rate by two thirds and while it is unlikely that this goal will be met, there has been progress. The target set by the UN for improving maternal health was to decrease maternal mortality by three fourths but currently it has only been halved. Unfortunately, there has also been inadequate funding for universal access to reproductive healthcare. There has been a steady decline of those infected with HIV/AIDS, malaria and other major diseases but 2.5 million people are newly infected each year making it a challenge to reach the specific goals of combating these diseases. Environmental sustainability has been an especially difficult goal as emissions have risen, fishing has been overexploited and resources have been diminishing. Still, since 1990, roughly 2.1 billion people gained access to better water. One of the most significant disappointments is that since 1990, donors have contributed less aid money and it has been the poorest countries that have

suffered the most as a result.³ This is a problem for developing a global partnership for development.

For the purpose of studying overall health outcomes, the MDG of interest is reduction of the child mortality rate. While there are data on all eight of the goals, there are data on the child mortality rate across most countries and across time. The UN uses data from the World Health Organization (WHO) on the under-five mortality rate, infant mortality rate, and the proportion of one year olds immunized against measles. *Effective Aid, Better Health* by the OECD, the WHO, and the World Bank discusses the progress as it pertains to child mortality. In all regions other than Sub-Saharan Africa, there has been progress towards reaching the MDG. Progress toward reducing child mortality in Sub-Saharan Africa, however has been minimal. This is particularly true in the countries with high rates of HIV as well as countries with ongoing political or social conflict. The slow progress in reducing maternal mortality also affects the progress of reducing child mortality.⁴

Fantu Cheru and Colin Bradford discuss three challenges for achieving the change required by the MDGs in their book, *The Millennium Development Goals: Raising the Resources to Tackle World Poverty*. The challenges are global governance, mobilizing resources, and clarifying policy agendas. Part of the success of the MDGs derives from the realization that the scope of the MDGs must go beyond economic growth and include

³ Ibid.

⁴ *Effective Aid, Better Health*. Geneva 27: World Health Organization, 2008, 1.

social, environmental, and political advancement in order to attain sustainability. However, this calls for the ministers of health, education, labor, and more in developing countries to coordinate so that there is a holistic approach to realizing the MDGs. In addition, there must be cooperation between trade and finance ministries in developed countries so that the financing of the MDGs is done efficiently and equitably. Beyond the ministries in industrialized nations, the major international institutions must be heavily involved in seeking sustainable solutions.⁵

With an understanding that the success of the MDGs relies heavily on sustainable solutions, international institutions have met every few years at the High Level Forums on Aid Effectiveness. After recognizing that increases in the amount of aid were not leading to the expected outcomes, leaders in development came together in Paris in 2005, at the Second High Level Forum on Aid Effectiveness and signed the Paris Declaration. The purpose of the Paris Declaration was to outline measurable ways to increase the effectiveness of foreign aid and eventually reach the MDGs. The Paris Declaration outlined five pillars for success and established measurable goals for countries to achieve by 2010.

The first pillar, ownership, encourages developing countries to establish their own strategies and policies. By taking ownership of the policies that they see as appropriate for their country, leaders can better implement changes. The donors and international institutions should respect the developing countries' policies and support their efforts.

⁵ Fantu Cheru, and Colin I. Bradford. *The millennium development goals: raising the resources to tackle world poverty*. London: Zed Books, 2005, 1.

Without the country taking ownership in development, nothing the donors do can be sustainable. The second pillar requires that along with ownership, donors must align themselves with the strategies of developing countries. In return, developing countries must be transparent and cooperative. The third pillar, harmonization, requires donors to coordinate amongst themselves to be as efficient as possible without duplication. This also means donors should consult with developing countries to find out how their donations can be leveraged most effectively and how to create a comparative advantage. These three pillars encourage the best use of donations to make the most impact with the funds available.⁶ The final pillars, managing results and mutual accountability, stress measurement of the success or failure of aid strategies and encouraging transparency among nations. By managing results, information can be used to make decisions in the future about how to use donations most effectively. Mutual accountability is essential for gaining information. The recipient countries and donor entities must be in agreement and be open about efforts and their expected results.

In 2011, at the Fourth High Level Forum on Aid Effectiveness in Busan, Korea, stakeholders once again met to evaluate the success of the Paris Declaration and discuss how to continue promoting aid effectiveness.⁷ In their evaluation of the principles outlined in the Paris Declaration, the leaders of development organizations, along with leaders from developing countries found that progress was very slow, despite the pillars they had set in place. The idea behind the Paris Declaration was that steps needed to be

⁶ "The Paris Declaration on Aid Effectiveness and the Accra Agenda for Action." OECD.org. <http://www.oecd.org/dac/effectiveness/34428351.pdf> (accessed January 8, 2014).

⁷ Ibid.

taken to stay on target with the MDGs, but the targets were not met. The survey found that progress is being made thus providing information that has proved useful in going forward in the hopes of reaching the MDGs, despite the progress being slow. The survey of twelve developing nations allowed leaders to pinpoint some of the major challenges they faced that prevented them from reaching the desired targets.⁸ Using the information from the evaluation of the results of the Paris Declaration, stakeholders came up with lessons that, if adhered to, should make the MDGs more attainable.

The first lesson is that there needs to be a stronger, more integrated partnership between developing countries and donor countries. They need to have a shared vision of how resources should be used. Another challenge to understand is that there will be risks involved in aiding developing countries. It is best to mitigate these risks by being aware of the political structures within the developing countries and finding the best way to provide aid given the internal dynamics of the target recipient country. This will lead to longer-lasting solutions. It has been clear that the most sustainable aid mechanism is allowing the developing country to take ownership of the development process. By creating incentives to increase accountability of both donors and developing countries, a sustainable solution will be more realizable. Another lesson is that development can increase and improve if there is an emphasis on results. While results may be difficult to measure, finding ways to understand the results of foreign assistance will make contributions more effective. A final lesson the stakeholders took away from the results of the Paris Declaration is that donors need to be willing to change their aid structure if it

⁸ Ibid.

means they can improve efficiency and create better relationships with the recipient countries. Donors need to follow through on initiatives to adjust their aid structure according to the structures within recipient countries. With coordination amongst donors and improved processes in developing countries, more progress can be made towards reaching the MDGs.⁹

The Millennium Development Goals give an idea of what most countries have officially agreed to in terms of improving the state of developing countries. This has been made clear in all the efforts made to reach the MDGs, many of which are related to health. However, there is contention as to whether foreign aid is in fact advantageous for the economies of developing nations or if it hinders the countries from becoming self-sustaining. The MDGs indicate that advancements have been made in several areas, though not across the board. Some economists and politicians argue that more progress would be made in developing countries if policies relied more heavily on self-advancement, yet there is also evidence of foreign aid helping in reaching development outcomes.

Many researchers have found that foreign aid does have a positive relationship with growth and development, but not without stipulation. Certain conditions must be in place in order for aid to be as effective as possible. In their article, “Aid, Policies, and Growth,” Craig Burnside and David Dollar found that aid has a positive impact on growth when the recipient countries have good policies in place. This means that, if

⁹ Abdel-Malek, Talaat, and Bert Koenders. "Progress Towards More Effective Aid: What Does the Evidence Show?." oecd.org. <http://www.oecd.org/dac/effectiveness/48966414.pdf> (accessed January 8, 2014).

coupled with good economic policies and a stable political environment, that aid can be effective. This is also a result of donors preferring to send more aid to countries with more effective policies and good governance.¹⁰ This concept backs up the pillars mentioned in the Paris Declaration, which acknowledge the importance of good governance and cooperation from recipient countries.

If governance and policies are essential to the effectiveness of foreign aid, it begs the question of what kind of political structures make aid most effective. Peter Boone studied the relationship between development outcomes and the type of government in place in developing countries in his article for *European Economic Review*. He concluded, “while at the margin all political systems allocate aid to the elite, liberal political regimes, *ceteris paribus*, have approximately 30% lower infant mortality than the least free regimes”.¹¹ Once again, this backs up the idea that if the government in the recipient country cooperates and has good economic policies in place such that aid money does reach the poor, aid can be effective.

While it is clear that the effectiveness of the recipient country’s policies is essential to growth, the reverse may also be true in that some donors are more effective than others in producing positive outcomes. In an IMF study by Camelia Minoiu and Sanjay G. Reddy, they find a positive relationship between aid and growth in the long run. While they acknowledge that donors may select countries that would already be

10 Craig Burntside, and David Dollar, "Aid, Policies, and Growth." *American Economic Review* 90, no. 4 (2000): 868.

11 P. Boone, "Politics And The Effectiveness Of Foreign Aid." *European Economic Review* 40, no. 2 (1996): 323.

more apt to grow economically (based on the findings of Boone, Burnside, and Dollar) it is apparent that donors who choose a more long-term approach have much more success with their donations. Their findings “help counter claims that aid is inherently ineffective and aid budgets should be reduced. On the contrary, an increase in aid and a change in its composition in favor of developmental aid are likely to create sizable returns in the long run”.¹² While this does not answer the question of exactly what the donors who are more successful are doing to be successful in the long run, it gives another condition for success in reaching the MDGs through foreign aid.

Foreign Aid for Health: Vertical Versus Horizontal Programs

While Minoiu and Reddy found empirical evidence to back up the notion that long-term aid is most effective, there is still a great deal of disagreement about the best form of aid. Since one of the greatest issues discussed in the High Level Forums on Aid Effectiveness is how to use funds efficiently to make the most impact, this discourse is crucially important. Strong advocates of vertical aid, or donations that go directly towards eradicating diseases and target specific medical issues, believe their method is superior because they can better avoid issues of corruption and poor governance. Donors of this form are usually charitable organizations, such as the Gates Foundation, rather than governments or international organizations, though UNICEF, the World Bank and CDCP have supported such efforts as well. The other form of aid targets a country’s economy as

¹² Camelia Minoiu, and Sanjay G. Reddy, “Development Aid and Economic Growth: A Positive Long-Run Relation.” IMF Working Paper 09/118, 17 (2009).

a whole, trusting that preventative and primary care will lead to sustainable health solutions. This is called horizontal aid.

Horizontal programs are community oriented and focus on changing economic and social structures in order to improve the overall health conditions in a country. The emphasis is on the importance of basic primary health so that long-term health improvements are possible. In 1978, the International Conference on Primary Health Care was held in Alma Ata (now Almaty), Kazakhstan and the participants urged governments and donors to emphasize primary health care and horizontal programs to improve health in developing countries. Primary health care aims to improve overall health by educating people, preventing common illnesses, addressing the food and water supply, improving family planning, and contributing to overall development. The holistic focus is on the economic, political, social and health-related needs of a particular community. By promoting community and self-reliance, countries could make use of their own resources and become self-sufficient. If developing countries have to rely less on external resources, they can become more capable of developing and sustaining their own systems. The hope was that donors and organizations would increase funding toward primary health and thereby increase overall health around the world.¹³ In their article for the National Center for Biotechnology Information, several medical professionals discuss the effectiveness of horizontal programs saying, “The stronger a country's primary healthcare system, the higher the system's quality and cost-effectiveness and the greater

13 "Declaration of Alma-Ata." who.int. http://www.who.int/publications/almaata_declaration_en.pdf?ua=1 (accessed February 27, 2014).

its impact on health".¹⁴ They further their point by citing the World Health Report 2006, which states,

In the 42 countries accounting for 90% of child deaths worldwide, 63% could have been prevented by full implementation of primary care where the common problems of diarrhea, pneumonia, measles, malaria, HIV/AIDS, preterm delivery, neonatal tetanus, and neonatal sepsis could be addressed in one, integrated clinical setting.¹⁵

This leads to their recommendation that vertical programs be fully integrated into horizontal programs so as to not detract from the work being done by primary care systems.

In her article published in *Journal of International Development*, Valeria Oliveira-Cruz, Christoph Kurowski, and Anne Mills describe the advantages and disadvantages of both vertical and horizontal aid. Despite the recommendations of medical professionals for full integration of vertical programs into horizontal programs, for many donors, it is too polarized of an issue for an integrated solution. Oliveira-Cruz details the arguments from both sides of the issue of aid for health outcomes. Those who believe vertical aid is the most effective argue that horizontal programs lead to too many problems with staffing. The staff is underfunded and therefore does not meet the needs of any health system. This is coupled with inefficient management and administration due to a lack of personnel. Because horizontal programs are more long term, they require more regular funding to get them started. This is why there can be staffing challenges due to lack of

¹⁴ Jan De Maeseneer, Chris van Weel, David Egilman, Khaya Mfenyana, Arthur Kaufman, and Nelson Sewankambo. "Strengthening primary care: addressing the disparity between vertical and horizontal investment." National Center for Biotechnology Information. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2148229/> (accessed February 27, 2014).

¹⁵ Ibid.

funding. One of the chief arguments against horizontal aid is the fact that it is difficult to measure the results. Due to the long-term nature of horizontal programs, it is difficult to demonstrate the effectiveness, especially within a short time period.¹⁶

Proponents of vertical programs also believe it is the better method because it involves clear objectives that are easily measured. It is a more short-term solution that can achieve results. Because it achieves fairly quick results, it is easier to get donations for vertical programs. Donors want to see that their money is contributing to improving health and are able to see those results relatively quickly so they know they are getting a valuable return on their investment. Organizations and donors that run most vertical programs are located outside of the country in need. This makes donors feel more secure because of the transparency and the understanding that their donations are less likely to fall into the hands of corrupt leaders within the recipient country. For those in a place of political or social power, donating to vertical programs make them look successful with their donations because the results are relatively immediate compared to horizontal programs. Because of the benefits for donors, it is often easier for vertical programs to get funding which contributes to their success.

However, there are many downsides to vertical programs as Cruz points out. Vertical programs do not take into account the community-specific needs. They use a top-down approach rather than gaining an understanding of the recipient countries specific culture and needs. Because of this, vertical aid does not promote self-reliance for

¹⁶ Valeria Oliveira-Cruz, Christoph Kurowski, and Anne Mills, "Delivery of priority health services: searching for synergies within the vertical versus horizontal debate." *Journal of International Development* 15, no. 1 (2003): 75.

the recipient country; rather it keeps the country dependent on external resources. In fact, because there is no integration with what the recipient country is promoting, it may undermine successes the country has already had. For example, if the developing country is trying to promote health education and primary care, citizens may ignore such efforts in order to receive quick treatment of one specific disease but miss out on information about how to prevent or treat any of their other medical issues.¹⁷ In their policy brief for The Regional Office for Europe of the World Health Organization, “When do vertical (stand-alone) programmes have a place in health systems?” Rifat A. Atun, Sara Bennett and Antonio Duran point out that despite the benefits of a results-oriented approach that has transparency, it should not stand-alone. The lack of engagement with the local population does not give any ownership to the recipient country. This is unsustainable and inefficient. Vertical programs focus on a disease, not a population of people with a collection of health problems. This causes many negative externalities because people are not gaining access to the health system they need. Health outcomes are a result of economic, social and political outcomes. By ignoring the broader needs of the people and targeting one specific disease, proponents of vertical aid undermine the greater solutions that can lead to development overall.¹⁸

¹⁷ Ibid, 73-76.

¹⁸ Rifat A. Atun., Sara Bennett, and Antonio Duran, "When do vertical (stand-alone) programmes have a place in health systems?." euro.who.int. http://www.euro.who.int/__data/assets/pdf_file/0008/75491/E93417.pdf (accessed March 2, 2014).

Foreign Aid is Harmful

Dambisa Moyo, a Zambian economist, is adamant that foreign humanitarian aid is not only ineffective, but is actually damaging to the recipient countries' growth. In her book *Dead Aid*, Moyo discusses why foreign aid has inhibited African nations from flourishing economically, socially, and politically and offers alternative solutions that she considers to be more sustainable. Moyo was born in Zambia and attended primary and secondary school in her home country. She began college in Zambia but was unable to complete her degree because an attempted coup against the president shut down the university. This led her to seek education in the United States where she was able to continue her education on a scholarship. She spent two years at the World Bank, and then went on to get her master's degree in economics at Harvard, continuing on to complete her doctorate in economics at Oxford. While Moyo wanted to use her education and experience to help her home country, she felt there was no opportunity for her in Zambia because the country could not get itself out of the cycle of dependency, corruption, and poverty.¹⁹

Moyo gives a detailed background of the struggle to develop in Africa, pointing out that there are great differences across countries but many shared problems. She recognizes that there are different religions, cultures, resources and health challenges in each country. For example, the prevalence of HIV/AIDS is much greater in Swaziland than Ghana. The resources in Kenya adhere to tea production while in the Republic of Congo minerals are a large export. Senegal has Arab influences while Malawi is a former

¹⁹ Dambisa Moyo, *Dead aid: why aid is not working and how there is a better way for Africa*. New York: Farrar, Straus and Giroux, 2009. 1.

British colony. Despite these kinds of differences, Moyo describes “common ties that bind sub-Saharan African countries together”.²⁰ Though they vary in magnitude, the issues of poverty, corruption, government instability, disease, war, and unrest can be found across Africa. Moyo’s hope is for African leaders and policymakers as well as for leaders in developed countries and development organizations to understand that the cycle of poverty and disease can be ended and Africa can flourish *without aid*.

Over the past few decades, western countries and international organizations have donated over \$1 trillion to the continent but Moyo argues it has not made Africa better off. She states that the poor are getting poorer and corruption is only worsening. She describes aid as “an unmitigated political, economic, and humanitarian disaster for most of the developing world”.²¹ After explaining that the amount of people living in poverty has doubled since the early 1980s, life expectancy has declined, literacy rates have plunged significantly in the past thirty years, and much of Africa still remains under oppressive regimes, Moyo asks rhetorically why this is occurring. It appears that Africa is alone in its perpetuation of poverty. She offers up some possibilities why. Africa’s people might simply be less capable, leaders may be more corrupt, or policy makers may be incompetent. But ultimately, Moyo ultimately finds one reason for the cycle that is somewhat unique to Africa: aid. While donations to other parts of the world have been

20 Ibid, 1.

21 Ibid, 2.

significant, Africa is a large target of foreign, systematic aid and Moyo sees this as obstructive.²²

Moyo criticizes both charity-based (or vertical) aid, as well as systematic (or horizontal) aid. She points out the common criticism that charity aid has high administration costs and the real needs of the country are not taken into account during implementation. Moyo's main criticism with aid, however, lies within the systematic aid from wealthy countries to Africa. Large donations or loans of systematic aid have been common practice for decades, used first to rebuild countries that had been devastated by the Second World War. At that time, John Maynard Keynes led discussions about organizations that could oversee the rebuilding of Europe. These organizations--the World Bank, the International Trade Organization Monetary Fund, and the International Monetary Fund--were intended to manage reconstruction and help stabilize the global financial system. After the pooling of funds and implementation of aid, Europe was successfully rebuilt and rehabilitated into the world economy.

The World Bank defines two different phases in the history of foreign aid: Cold War Aid and Post Cold War Aid. Cold War Aid included the post war aid, most of which came from the United States, for rebuilding Europe which transitioned to economic development assistance of the 1960s when organized aid from growing amounts of donors was used for development and the International Development Association (IDA) was established. In the 1970s major donors such as the United States and France reduced the flexibility of aid and began targeting very specific economic problems in developing

²² Ibid, 6.

countries and funneling money directly to solutions to those problems. In the 1980s, integrating developing countries into the global economic sphere became a priority for donors. They lent money or donated aid in order to promote market-oriented policies. As the structure of aid transitioned into the Post Cold War Aid phase, the goal of aid was to promote sustainable solutions that would reduce poverty. In the 1990s, donors focused on issues like governance and reform from within the recipient country.²³ They did this through Poverty Reduction Strategy Papers (PRSP). These strategies were to be “poverty-focused, country-driven, results-oriented, and comprehensive”.²⁴ They hoped for improved coordination amongst donors and recipient countries. In the 2000s, the focus was on achieving the MDGs. From Moyo’s perspective, aid became a way for developed countries to partake in the development of poverty stricken countries. In fact, Moyo says the concept of foreign aid developed into an “obsession” of wealthy countries, which viewed aid as the only answer to Africa’s problems and which expected results that matched the success in postwar Europe.²⁵

When the focus was off of Europe, the IMF and World Bank refocused their attentions on Africa. Other countries saw Africa as an opportunity for investment and at times, even weaponry. By controlling the flow of donor aid into and out of certain locations, western powers were able to wield influence around the globe, which became

23 International Development Association Resource Mobilization. "Aid Architecture: An Overview of the Main Trends in Official Development Assistance Flows." WorldBank. http://www.worldbank.org/ida/papers/IDA15_Replenishment/Aidarchitecture.pdf (accessed April 13, 2014), 35.

24 Ibid, 46.

25 Moyo, *Dead Aid*, 12.

especially important during the Cold War. Donor countries wanted to push their economic and political practices on countries that they did not understand. Then came the debt crisis when countries all over the world surmounted so much debt that the only solution to avoid complete destruction of worldwide financial stability was to restructure debt. This just increased the developed countries' dependence on aid. As free market policies became more and more popular in the United States and Europe, programs were put in place to push Africa towards laissez-faire economics as well.²⁶ Africa may not have been entirely ready for the extent of privatization that accompanied this push and many businesses failed. In addition to all of these problems with aid over the past few decades, corruption was causing significant decline in the development of African countries. Because this study focuses on the past decade of foreign aid, the problem of corruption is especially relevant today.²⁷

The problems discussed at the High Level Forums for Aid Effectiveness are the same problems Moyo cites as reasons why aid is ineffective. Inefficiencies in implementation, poor governance, lack of understanding of the recipient country's needs, and corruption are serious problems when it comes to aid effectiveness. She points out that corruption not only hinders putting foreign aid to good use, but at the same time, aid actually contributes to corruption by financing corrupt practices. In fact, experts estimate

²⁶ Ibid, 20.

²⁷ Ibid, 56.

that 25% of donations go directly into the hands of corrupt government officials.²⁸ Moyo states,

One of the most depressing aspects of the whole aid fiasco is that donors, policymakers, governments, academicians, economists and development specialists know, in their heart of hearts, that aid doesn't work, hasn't worked and won't work.²⁹

She points out that the countries receiving the most aid actually have declining growth rates. Moyo believes this decline is the result of corruption and also the practice of consumption rather than investment of aid. Instead of pursuing long run success, countries choose not to invest the donations they receive but consume right away. According to Moyo, the IMF is well aware of this issue. "The IMF has also cautioned governments, donors and campaigners to be more modest in their claims that increased aid will solve Africa's problems".³⁰

Moyo's suggestion for development without aid involves all lending institutions cutting off their aid to developing countries. She believes that because the poorest people within these countries do not see the benefits of aid, they would not be worse off. In fact, she believes that the countries that were cut off from aid would eventually have to change and there is nowhere to go but up. Her belief is that without aid, corruption would decrease and innovation and growth would increase. This could begin a new cycle of economic prosperity and with it, better health, education, and lifestyle outcomes. Moyo's specific plan for development would be a gradual decrease in aid each year, with new

28 Ibid, 51.

29 Ibid, 46.

30 Ibid, 49.

financing coming from trade, foreign direct investment, micro finance, investments and savings. For countries with natural resources and commodities, trade with China and other emerging markets would be a step towards a capitalist, growth-centered economy. Countries that cannot count on natural resources could focus on capital markets. If financing happens through these capitalist venues, corruption would likely decrease because other countries would not want to trade with or lend to countries that misused the money. Citizens will require accountability from the private sector to deliver sustainable hospitals, schools, and infrastructure because without the trust of the consumer, they cannot succeed.³¹ The reason this solution has not been implemented is because

Western donors have an aid industry to feed, farmers to placate (vulnerable when trade barriers are removed), liberal constituencies with ‘altruistic’ intentions to allay, and, facing their own economic challenges, very little time to worry about Africa’s demise.³²

Moyo believes that the donor institutions have felt they know what is best for developing countries but they need to allow the countries in need to become self-sufficient in their own way.

Dambisa Moyo is not alone in her views on foreign aid. William Easterly, economist and co-director of the NYU Development Research Institute at New York University shares her views. In his book, *The White Man’s Burden: Why the West’s Efforts to Aid the Rest Have Done So Much Harm and So Little Good*, he argues that the developed countries of the western world need to stop pushing their systems and beliefs on other countries. While westerners seem to believe they know what’s best for everyone,

³¹ Ibid, 144.

³² Ibid, 148.

it is the people that are living in the poverty stricken, disease-ridden countries that know best how to better their situation.³³ He elaborates on the issues with foreign aid in his book, *Reinventing Foreign Aid*. He points out that even the UNDP while requesting more donations of aid, admits that the “weapon of aid” is flawed and needs to be used more efficiently.³⁴ There is a common insistence amongst development institutions such as the IMF, UNDP, Department for International Development (DFID) and World Bank, that aid works and is a good tool for reducing poverty.³⁵ However, each has admitted that the system does not work as it is and needs to be revised. Easterly notes that many economists and leaders of development institutions promote idealistic initiatives with emotional and inspirational oratory and the reality of the situation falls by the wayside.

Easterly sets up his argument against the status quo by explaining the difference between planners and searchers. He describes the current leaders and institutions behind the MDGs and other aid decisions as planners. He explains that planners have a predetermined goal and brainstorm to develop a grand plan to reach the intended goal. In the case of development, the UNDP decided on the MDGs as their ultimate end goal for development. They then must assign a great deal of resources to reaching the goal. Easterly argues that planners believe they already know the answers and are certain that their plan will allow them to be successful. He says that these planners simply assume

33 William Easterly, *The white man's burden: why the West's efforts to aid the rest have done so much ill and so little good*. New York: Penguin Press, 2006.

34 William Easterly, *Reinventing foreign aid*. Cambridge, Mass.: MIT Press, 2008.

"Improving Aid Quality The Paris Declaration and the Accra Agenda for Action." oecd.org accessed January 8, 2014).

35 *Ibid.*, 2.

fixed aid inputs as in a Leontif production function and that their detailed plans will automatically lead to the expected outcomes. On the other hand, searchers do not believe they have the answers but rather seek out opportunities to learn about and solve problems that are truly solvable. The emphasis for searchers is on gaining feedback so they can solve the problem in the most efficient manner. Applying this concept again to development, a searcher would acknowledge how complicated the scope is and recognize all of the different stakeholders will prevent an easy formula from working.³⁶

The planners--the UN, IMF, and World Bank--describe the importance of partnerships and symbiosis between the aid donors and businesses and governments. They believe the private sector is essential to development and want to encourage market-based solutions. However, they still feel that many countries require specific plans to reach their goals. Poverty reduction strategy papers (PRSP) detail in-depth, specific plans for development that are so complicated that the recipient countries cannot follow them. Even for developed governments these plans are challenging to work with; for countries that have limited capacity to implement basic plans, these PRSPs are unhelpful.³⁷ Easterly questions why-- when there is so much uncertainty and there are so many complications--would institutions want to continue devoting such an abundance of resources and energy to their plan? He uses a mathematical example to further his point. He uses a probability equation, $P_s = P_{1j}P_{2j}P_{3j}, \dots, P_{nj}$, to show how the probability of each component of the plan would all contribute to the overall probability of the plan in its

³⁶ Ibid, 10.

³⁷ Ibid, 8.

entirety, P_s .³⁸ He makes the point that even if each individual component has a fairly high probability for success, the overall probability of success is quite low. Since it seems quite obvious that uncertainty is inevitable, the investment into the MDGs and likeminded plans probably will not pay off.

An illustration of the complications and misuse of aid specifically for healthcare furthers Easterly's scrutiny. He cites studies in Guinea, Cameroon, Uganda, and Tanzania that show roughly 30-70% of donated drugs do not reach the patients. He states that much of aid for health disappears in the health bureaucracies.³⁹ Meeting the health goals requires many stakeholders to participate properly in reaching the goal. To reach better health outcomes, there are many diseases and health issues that need to be addressed, and within each health issue, many critical aspects of the unique intervention must be implemented perfectly. So even if the probability is high for successful implementation of one solution, the overall probability of reaching broad health outcomes would be very small. Easterly uses an example of eradication of malaria.⁴⁰ Even if every dollar intended to be used in the eradication of malaria truly was used for drugs and bed nets, in order for complete success, the nets need to be properly designed and delivered to those in need. Once the bed net is delivered, the recipient needs to be trained on how to use it correctly. In order for complete success, many minute details of the overall implementation need to be executed flawlessly. Somewhere between planning and the actual outcomes, aid

38 Ibid, 22.

39 Ibid, 11.

40 Ibid, 22.

money is getting lost and misused, decreasing the overall probability of success. What works in theory does not always come to fruition.

Because planners support a top-down approach, their strategy lacks a beneficial feedback accountability loop.⁴¹ Essentially, the planners believe they have the answer so they implement solutions based on their grand plan. The plan itself predicts results, rather than gaining an understanding of all the variables to best comprehend the outcomes. For example, Easterly questions the idea of the poverty trap as a basis for increasing aid. Proponents of increasing foreign aid to further the top down approach for development say that the poorest countries cannot escape the cycle of poverty because they have no extra income to save. Therefore they are in need of the most aid. Easterly notes that studies have found that poor countries such as Chad, Zaire, and the Democratic Republic of Congo received the most aid some years yet also boasted the worst growth rates. Other countries that were once extremely poor such as Botswana and China have risen out of poverty without excessive aid and now possess excellent growth rates. Easterly raises the question of whether lack of aid is the reason countries have limited or no growth or if it is a matter of governance.⁴² Easterly is unconvinced that aid is the answer to the problems of development.

Many individual donors strongly disagree with these ideas. Bill Gates, whose foundation donates billions of dollars to tackle diseases in Africa and around the world, responded to Moyo's accusations of aid causing more harm than good by saying,

⁴¹ Ibid, 13.

⁴² Ibid, 15.

Having children not die is not creating a dependency, having children not be so sick they can't go to school, not having enough nutrition so their brains don't develop. That is not a dependency. That's an evil thing and books like that – they're promoting evil.⁴³

He cites all the accomplishments that donations to the health outcomes in Africa have made. He argues that this can in no way be considered a problem. Jeffrey Sachs, economist from Columbia University calls Moyo's views "cruel and mistaken".⁴⁴ He goes on to say that she received scholarship money to further her education in the United States yet she opposes giving a child ten dollars for a bed net to fight malaria.⁴⁵

Both Moyo and Easterly have responded to these types of attacks by stating that it shouldn't come to personal attacks and that they are misunderstanding Moyo's point. Moyo simply questions why after more than \$3 trillion of donations over the course of fifty years, the situation in Africa has not significantly improved.⁴⁶ Moyo looks at the broader impact of the favored course of action over time and observes that the results would be expected to be more significant. Easterly agrees with Moyo's point saying,

Moyo's main argument against aid has three main strands. First, it is a complaint about how the West is patronizing Africans. Second, it documents specific ways in which aid has harmed Africa. Three, it offers entrepreneurial alternatives for Africa's path from now on.⁴⁷

43 Bill Gates, "Bill Gates' shocking personal attacks on Dr. Dambisa Moyo and Dead Aid," YouTube video, 2:04, posted by "dambisamoyo," May 29, 2013, <https://www.youtube.com/watch?list=PLE327717CA0322879&v=5utDdxveaJc>.

44 Claire Provost, "Bill Gates and Dambisa Moyo spat obscures the real aid debate." [theguardian.com](http://www.theguardian.com/global-development/poverty-matters/2013/may/31/bill-gates-dambisa-moyo-aid). <http://www.theguardian.com/global-development/poverty-matters/2013/may/31/bill-gates-dambisa-moyo-aid> (accessed February 6, 2014).

45 Jeffrey Sachs, "Aid Ironies." The Huffington Post. http://www.huffingtonpost.com/jeffrey-sachs/aid-ironies_b_207181.html (accessed February 6, 2014).

46 Moyo, *Dead Aid*, 28.

47 William Easterly, *Introduction to Dead Aid*, unpublished, 2009.

Easterly and Sachs have debated extensively, often referring to each other's arguments in their books and publications.

The opinion that foreign aid is ineffective is widespread and Sachs acknowledges this in his article for *Foreign Policy* but goes on to say, "the recent evidence shows that development aid, when properly designed and delivered, works, saving the lives of the poor and helping to promote economic growth".⁴⁸ He points out that while aid effectiveness requires good governance, cooperation, transparency and good policies, it is not impossible. He backs this up by describing the advancement in health outcomes due to new institutions dedicated to promoting health and the increase in donations for this purpose. He discusses the successes in regards to vaccination, treatment of malaria and HIV, and other diseases. He counters Easterly's comments on the lack of success in eradicating malaria by examining the developments of new nets, medicines and technology that were successful in controlling malaria. These are all things that individuals in developing countries could not afford on their own, only with the help of donations. Sachs uses this as an example of how aid is necessary for improving health outcomes.

In addition to Sachs, Nicholas D. Kristof of the New York Times also provides a counterargument to Easterly's book, *The White Man's Burden*. He agrees that there are an abundance of challenges to aiding developing countries, even expounding on his own

⁴⁸ Jeffrey Sachs, "The Case for Aid." *Foreign Policy*. http://www.foreignpolicy.com/articles/2014/01/21/the_case_for_aid (accessed April 5, 2014).

anecdotal experiences in Darfur. He does acknowledge the empirical research that has shown aid to be ineffective or even harmful. However, he argues that it should not matter because “for pennies, you can vaccinate a child and save his or her life. For \$5 you can buy a family a large mosquito net and save several people from malaria. For \$250, you can repair a teenage girl's fistula, a common childbirth injury, and give her a life again”.⁴⁹ He solidifies his point by saying, “The problems are real, but so are the millions of people alive today who wouldn't be if not for aid”.⁵⁰ Sachs, Kristof, Gates and many others take the pragmatic view that regardless of the issues faced by the UNDP and their development goals or any other donor, it should not keep them from donating due to the simple fact that it saves lives.

According to Sachs, Gates and the information put out by the UN on the MDGs, there should be a significant negative relationship between an increase in foreign aid for health and the child mortality rate. As more aid is donated to countries specifically for health, there would be an expected decrease in the child mortality rate. However, according to Moyo and Easterly, there could be a positive relationship so that as aid for health increases, the child mortality rate also increases. Moyo and Easterly don't differentiate health outcomes with overall economic outcomes, so with control variables to hold other aspects of development, the results may indicate that health outcomes improve with increases in aid. However, Moyo explicitly states that the trillions of dollars transferred from wealthy countries to the developing nations of the world failed at

49 Nicholas Kristof, "Foreign Aid Has Flaws. So What?" The New York Times, June 13, 2006.

50 Ibid.

improving the development of recipient countries. Donor countries and international organizations have openly admitted that the amount of aid is not the only factor when it comes to how effective aid might be for health outcomes. It is widely accepted that efficiencies, partnerships, governance and cooperation are just as important in improving health outcomes as increasing donations.

Child Mortality

The MDGs focus heavily on devoting resources to health outcomes in order to further development. UNICEF has responded to trends in child mortality rates. They have found that roughly half of child deaths have occurred in just five countries: China, Nigeria, the Democratic Republic of Congo, India and Pakistan. They also discovered that most child deaths are preventable with pneumonia, diarrhea and malaria as the main causes. Malnutrition is also a major cause in child deaths. UNICEF's responses to these trends include purchasing and distributing vaccines, mosquito nets, and nutritional supplements. They have increased funding and advocates for community health programs that improve maternal health and breastfeeding. Beyond these programs supporting maternal health, UNICEF has been working with governments to improve health systems so that children have access to providers and basic health supplies. UNICEF has been helping to develop better water systems so that people in developing countries have access to improved water in hopes to reduce water-borne diseases. Still, UNICEF acknowledges that despite progress, the child mortality rate is the most "off-track" goal and they have a long ways to go in reaching it.⁵¹

51 "Millennium Development Goals." UNICEF . http://www.unicef.org/mdg/index_childmortality.htm (accessed April 12, 2014).

In their study on the determinants of child mortality, health and nutrition in developing countries, Barbara L. Wolfe and Jere R. Behrman discuss four reasons why child mortality rates are critical to understanding development and health outcomes in developing countries. The first reason is that child mortality is an index of socioeconomic welfare. The second is that the health status of children leads to the health and nutrition of adults because their health in childhood affects their health throughout their lives. The third is that the health of children may be correlated with the level of importance placed on education, which has a long run impact on productivity. The final reason is that child mortality and nutrition “may be important intervening variables through which intergenerational socioeconomic mobility is limited”.⁵² These reasons describe why the MDG of reducing child mortality can lead to overall improvements in development but in order to successfully reduce child mortality, there needs to be an understanding of what might be significant causes of child mortality.

Clearly, the child mortality rate is indicative of overall development but it is important to also understand what determines child mortality. Wolfe and Behrman explore the determinants of child mortality in their regression analysis of overall household utility. They found empirical estimates of determinants of child mortality which led them to conclude that the level of urbanization, amount of time for child care (which depends on female employment), prenatal care, level of education, number of children, caloric intake and access to better water are all significant indicators of child mortality. They did not find that formal medical care or income were major predictors in

⁵² Barbara L. Wolfe, and Jere R. Behrman. "Determinants of child mortality, health, and nutrition in a developing country." *Journal of Development Economics* 11, no. 2 (1982): 163-164.

child mortality.⁵³ Given this data, pursuing the MDG of reducing child mortality rates should involve targeting these determinants of child mortality rates.

To understand the whole picture of what determines child mortality, T. Paul Schultz created a general health production function that takes into account biological inputs to the health of the child and biological endowments of the child. The child's health endowment consists of any genetic or environmental circumstances that cannot be changed by the family. This is different from economic endowments, which are also included in the production function. Economic endowments include preferences of the family, capital, prices, and environmental conditions.⁵⁴ The demand for health inputs is a derived demand. Households want to maximize utility and this can be done in part by having good health. This is where demand for health inputs plays a role in the overall utility of the family. Schultz suggests programs that increase demand for these inputs by reducing prices, create better access to information on how to produce health more efficiently and that improve the overall health environment through vaccines and control of diseases.⁵⁵ Schultz's study points out the difference between demand driven determinants of child mortality and predetermined determinants of child mortality.⁵⁶ He wanted to better understand which determinants of health can be improved with policy, and which are exogenous.

53 Ibid, 189-191.

54 T. Paul Schultz Population and Development Review, Vol. 10, Supplement: Child Survival: Strategies for Research (1984), 217.

55 Ibid, 222.

56 Ibid, 225.

Beyond these endogenous and exogenous determinants of child mortality discussed in Schultz's study, J.N. Hobcraft, J.W. McDonald and S.O. Rutstein did a regression analysis on the demographic determinants of child mortality, specifically looking at the effects that sex of the child, birth order, and the age of the mother had on child mortality. Studying 39 different developing countries, they found that in the first month of life, males have a higher chance of mortality while beyond the first month females have a higher chance of mortality. They also found that first-born children had a much higher mortality rate as infants and through childhood. In fact, the higher the number in birth order, the lower the chance of mortality. As the age of the mother increases, they found the chance of mortality decreases. They point out that even older mothers, over age 35, did not lead to a higher rate of mortality, just a greater chance of birth defects or other risks.⁵⁷ While these determinants do not have a direct solution like some of the social determinants, it may lead to a better understanding of the complexity of reducing child mortality rates.

Limin Wang describes some of the challenges of reducing child mortality in her article "Determinants of child mortality in LDCs: Empirical findings from demographic and health surveys". A noteworthy observation she found is that reduction in child mortality was much slower in rural areas, where there is a higher concentration of the poor. She found this to show that health interventions have not been terribly successful in reaching the poor. She noted, "the analysis on mortality determination shows that at the national level access to electricity, incomes, vaccination in the first year of birth, and

⁵⁷ J. N. Hobcraft, J. W. McDonald and S. O. Rutstein, *Population Studies*, Vol. 39, No. 3 (Nov., 1985), 367-369

public health expenditure significantly reduce child mortality”.⁵⁸ While this in some way contradicts the findings of Wolfe and Behrman in that they found income and formal medical care to be insignificant, Wang elaborates on some issues she found. The model overestimated the significance of income until she added the electricity variable. Access to electricity was actually highly significant in urban areas. However, she found that policy interventions were more successful in reducing child mortality for households that were generally better off as observed in the gap between urban and rural results.⁵⁹ In fact, most variables that were significant for urban areas were insignificant in rural areas. Therefore, she determined, in order to reduce child mortality rates, inequality within countries needs to be addressed.⁶⁰

The challenges surrounding reduction of child mortality are multi-faceted. Since there are clearly many determinants of child mortality, there is not one “magic bullet” to reduce child mortality. As mentioned by Wang, inequalities within developing countries make policy-making challenging but understanding the best policy for reaching this MDG is even more complicated. The approach for reaching the MDGs has been largely reliant on foreign donations. To understand how effective the program for reaching the MDGs has been, it is important to understand the effectiveness of foreign aid in reaching these goals, in particular reduction in child mortality rates. Prachi Mishra and David Newhouse explored the effectiveness of foreign aid on reaching health related MDGs in

58 Limin Wang, "Determinants of child mortality in LDCs." *Health Policy* 65, no. 3 (2003): 277.

59 *Ibid*, 279.

60 *Ibid* 299.

their International Monetary Fund (IMF) paper. They found that even if foreign aid were to double, the reduction in child mortality would be so low that the MDG would not be reached. “The calculations suggest that a massive increase in health aid would be needed to achieve the MDG target by 2015”.⁶¹ This makes reaching the MDGs, in particular child mortality reduction, sound like an unlikely feat. However, others have found very different results.

In their study on the effects of growth on infant and child mortality, Lucia Hanmer, Robert Lensink and Howard White sought out whether health spending in developing countries should have a greater emphasis or if a focus on income per capita better leads to a reduction in child mortality. Through regression analysis, studying 115 countries across seven time periods, using both child and infant mortality as the dependent variables, they found that income per capita is a significant determinant of infant and child mortality. They also found health education, and gender inequality variables to be robust. To understand whether health spending is effective, they used health services delivery as an indicator. This was more significant than health expenditure, leading to the finding that “specific health interventions [are] robust determinants of these variables”. Hanmer, Lensink and White found results consistent with the idea that health spending is “poorly targeted”.⁶² This leads them to conclude,

61 Prachi Mishra, and David Newhouse, “Health Aid and Infant Mortality.” IMF Working Paper 07/100. (2007): 29.

62 Lucia Hanmer , Robert Lensink & Howard White. Infant and child mortality in developing countries: Analysing the data for Robust determinants, *The Journal of Development Studies*, 40:1, 101-118, DOI: 10.1080/00220380412331293687. (2003): 116

“The contention that health expenditure is an inefficient means of improving child health is unproven”.⁶³

While in this study the focus is on child mortality, John Lynch and several colleagues presented key determinants in mortality overall in their paper on income inequality and population health. Since mortality rate is an important indicator of health in a country, they sought to understand the determinants of mortality. They found clean water, sanitation, food supply, health care and income equality to be significant determinants of mortality rates. Specifically, while comparing mortality rates across countries, they found that higher income inequality is associated to a higher mortality rate among young people. While they did not find strong support for a direct effect of income inequality on mortality, they did not find evidence contradicting the hypothesis. Lynch et al. points out that income inequality is an attribute of the social system while income is related to an individual. His point is that determinants of health in individuals may be different for populations so while lower incomes may have an effect on the individual’s health; income inequality is a result of social structures, politics, and economic policies.⁶⁴ These overall determinants of mortality are important for consideration when looking at determinants of child mortality as well.

⁶³ Ibid,116.

⁶⁴ Lynch, John, George Davey Smith, Sam Harper, Marianne Hillemeier, Nancy Ross, George A. Kaplan, and Michael Wolfson. "Is Income Inequality A Determinant Of Population Health? Part 1. A Systematic Review." *The Milbank Quarterly* 82, no. 1 (2004):81.

CHAPTER THREE: EMPIRICAL MODEL

Method and Data

In this study, the focus is on the aid specifically directed at improving health outcomes. Because of this, the key indicators will be external resources for health as a percentage of total expenditure on health as well as general government expenditure on health as a percentage of total government expenditure. The data from the World Health Organization (WHO) for external resources for health as a percentage of total expenditure on health includes any external resources whether it is from private sources donated directly through private delivery means or it is given to governments to distribute as part of the country's health system.⁶⁵ The data on general government expenditure on health as a percentage of total government expenditure, also from WHO, includes all public spending on health such as direct spending from the government as well as any entities controlled by the government such as insurance.⁶⁶ Both of these indicators from the will show whether foreign contributions to health have a significant effect on the particular health outcome: child mortality rate.

65 Global Health Observatory Data Repository. 1995-2011. "Health expenditure ratios Data by country." World Health Organization. <http://apps.who.int/gho/data/node.main.75?lang=en> (accessed September 29, 2013).

66 Global Health Observatory Data Repository. 1995-2011. "General government expenditure on health as a percentage of total government expenditure ." World Health Organization. <http://apps.who.int/gho/data/node.main.75?lang=en> (accessed September 29, 2013).

In order to test whether external resources for health in developing countries have a significant effect on the child mortality rate, several other variables must be included in the regression as control variables. By using the basic groupings commonly found in the literature on mortality, this study will account for the important categories of control variables. The studies reviewed by Lynch et al. include control variables that fall into several broad categories. These categories include poverty, health, education, gender, demographics, labor market, and social environment. Based on the findings in the literature on key determinants of child mortality and the groupings presented by Lynch the variables that were to be included were population density, housing, access to clean water, the Human Development Index (HDI), unemployment rate, GDP, female literacy rate, malnutrition, HIV/AIDS prevalence, health resources, malaria, political corruption and conflict. Unfortunately, there was not consistent data across countries and time periods for housing, HDI, unemployment rate, female literacy rate, or health resource availability. I was however to come up with other control variables to fit the necessary groupings and account for the major determinants of child mortality.

Under the health grouping, I included HIV and malaria. Both are expected to have a significant impact on health outcomes so this study must control for the number of cases of these diseases in a particular country as a percentage of the total population of that country.^[67]^[68] Consistent data for health resources (vaccines, physicians, etc.) was

67 World Development Indicators. 1990-2012. "Prevalence of HIV, total."

World Bank. <http://data.worldbank.org/indicator/SH.DYN.AIDS.ZS> accessed March 2, 2014).

68 World Malaria Report 2013. 1990-2012. "Reported Malaria cases by species ." World Health Organization. http://www.who.int/malaria/publications/world_malaria_report_2013/en/ (accessed March 3, 2014).

not available. The study also controls for poverty indicators including what percentage of the country has access to an improved water source. The variable, improved water source, contains data for the percentage of the population that has access to improved water sources such as piped water on premises, public sources, protected springs, and rainwater.⁶⁹ Another control variable under this grouping is the prevalence of undernourishment, which I used as a proxy for malnutrition due to insufficient data for malnutrition. This describes the percentage of the population that is unable to continuously meet the dietary requirements.⁷⁰

Other non-health related variables include GDP per capita which is an important indicator of the country's overall economic well-being. Since this study compares different developing countries, it includes this high level indicator of income. Also included, under the labor market category, is labor participation rate as a proxy for unemployment rate, and under the demographic grouping, population density.^{[71][72][73]} As an age control for the dependent variable, I must also control for the percentage of the

69 World Development Indicators. 1990-2011. "Improved water source." World Bank. <http://data.worldbank.org/indicator/SH.H2O.SAFE.ZS> (accessed March 2, 2014).

70 World Development Indicators. 1991-2011. "Prevalence of undernourishment." World Bank. <http://data.worldbank.org/indicator/SN.ITK.DEFC.ZS> (accessed March 2, 2014).

71 World Bank. 1980-2013. "GDP per Capita." World Bank. <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD> (accessed March 2, 2014).

72 World Development Indicators. 1990-2012. "Labor participation rate, total." World Bank. <http://data.worldbank.org/indicator/SL.TLF.CACT.ZS> (accessed March 2, 2014).

73 World Development Indicators. 1980-2011. "Population density." World Bank. <http://data.worldbank.org/indicator/EN.POP.DNST> (accessed March 2, 2014).

population under age 14.⁷⁴ To account for gender and education, this study includes the percentage of female primary school enrollment out of the population of females of the official primary school age since education--in particular--female education is an important aspect of development.⁷⁵ Based on the literature, the social and political environment of a country play a major role in the effectiveness of aid. To control for these factors that fall under the social environment grouping, the study includes data on social effectiveness, political effectiveness and violence. This data from the Center for Systemic Peace (CSP) uses a ranking system to give each country a score for each of these variables. Through coding, researchers at the CSP define the magnitude of given variables based on observed incidents and patterns in regard to social and political structures. Social effectiveness is a measurement based off of the UNDP's Human Development Index.⁷⁶ Political effectiveness measures the governance stability based on regime durability, current leader's years in office and total number of coups.⁷⁷ These scores are ranked from 0-3, with 0 being the most effective and 3 being the least effective. The violence variable is based on interstate, societal, and communal warfare

74 World Development Indicators. 1980-2012. "Population ages 0-14." World Bank.
<http://data.worldbank.org/indicator/SP.POP.0014.TO.ZS> (accessed March 2, 2014).

75 World Development Indicators. 1980-2012. "School enrollment, primary, female." World Bank.
<http://data.worldbank.org/indicator/SE.PRM.ENRR.FE> (accessed March 2, 2014).

76 Integrated Network for Societal Conflict Research. (1946-2012). "Social Effectiveness." Center for Systemic Peace.
<http://www.systemicpeace.org/inscr/inscr.htm> (accessed September 30, 2013).

77 Ibid

magnitude scores.⁷⁸ This score is based on a 0-10 scale with countries with no such incidents receiving a score of zero.

In order to capture the best understanding of how external aid affects child mortality rates, this study uses panel data across forty-seven countries from four continents and over ten years (2000-2009), providing a total of 470 observations. The most general form of the regression is as follows:

$$\Delta Y_{it} = B_0 + B_1 X_{1it} + B_2 X_{2it} + B_3 Z_{it} + E$$

This regression includes the dependent variable, child mortality rate across countries and time, with the independent variables external resources as a percentage of health expenditure across countries and time, government spending on health as a percentage of government spending across countries and time, and a vector, *Z*, of control variables across countries and time. The control variables are included to reduce the chance of omitted variable bias. The control variable GDP was logged in order to create a linear model. Since the dependent variable, child mortality rate, appeared nonstationary, I made this stationary so that it shows the difference in child mortality between each year. The independent variables, external resources as a percentage of health expenditure and government spending on health as a percentage of government spending are also tested with a lag of one year due to aid from one year being implemented the following year.

78 Integrated Network for Societal Conflict Research. (1946-2012). "Major Episodes of Political Violence." Center for Systemic Peace. <http://www.systemicpeace.org/inscr/inscr.htm> (accessed September 30, 2013).

Additionally, there could be unobserved country-specific and time invariant factors as well as unobserved time-specific and country invariant factors determining child mortality so the regression must also include fixed and time effects:

$$\Delta Y_{it} = B_0 + B_1 X_{1it-1} + B_2 X_{2it-1} + B_3 Z_{it} \alpha_i + \delta_t + E$$

When using the data for country effects, I may have to worry about heteroskedasticity. However, if I cluster the errors, the standard errors allow for a random correlation with a cluster, but still have them be uncorrelated across clusters. This means that there can be heteroskedasticity in the errors but it will not be problematic. In addition, time series data can often include serial correlation. It is possible for there to be correlation over time within an entity. Using the clustered errors will alleviate this problem as well.

Results

Using Stata statistical software, I got significant results for these regressions. In the first series of regressions, where external resources for health as a percentage of health spending and general government expenditure on health as a percentage of total government expenditure are not lagged, running a regression without any entity or time effects results in an R^2 of 52.5% which means only half of the variation in cross-country child mortality is explained. The only variables significant at the 1% level are undernourishment and social efficiency. Population density is also significant at the 10% level. This shows that as the prevalence of undernourishment increases by 1%, the change in child mortality rate decreases by .139 people per thousand. As social efficiency increases by one point, the change in child mortality rate decreases by .921 people per thousand. As population density increases by one unit, the change in child mortality rate

decreases by .003 per thousand. However, given that this regression does not account for fixed effects or time effects, it should not be the focus of this analysis.

The next regression added fixed effects which are clearly important because not only is the F-statistic significant, in this cross-country analysis, fixed effects would be expected to be important. However, time effects were not found to be significant. This may be due to the short time period of ten years in which there appears to have been no major disruption or crisis that would cause a drastic change over time across all countries during that time period. Since time effects are not significant for this study, the focus will be on the regression that includes fixed effects but not time effects (Regression 2).

In the regression with fixed effects, external resources for health as a percentage of health spending is significant at the 1% level and general government expenditure on health as a percentage of total government expenditure is significant at the 5% level. Prevalence of HIV, population density, access to improved water and prevalence of undernourishment are significant at the 1% level. Prevalence of malaria is also significant at the 10% level. This shows that with a 1% increase in external resources for health as a percentage of health spending, the change in child mortality rate decreases by .042 people per thousand. With a 1% increase in general government expenditure on health as a percentage of total government expenditure, the change in child mortality decreases by .115 people per thousand.

Table 1: Regression analysis of external resources for health as a percentage of total health expenditure on child mortality rate.

	1	2	3	4
EXTHEALTHRESOURCES	-0.013 (0.016)	-0.042** (0.020)	-0.010 (0.016)	-0.046** (0.021)
GOVTHEALTHRESOURCES	-0.063 (0.043)	-0.115** (0.045)	-0.054 (0.043)	-0.107** (0.045)
lnGDP	-0.386 (0.386)	-0.205 (0.511)	-0.073 (0.504)	-0.816 (0.631)
MALARIA	-0.048 -(0.030)	-0.064* -(0.034)	-0.048 -(0.030)	-0.06* -(0.035)
HIV	0.035 (0.059)	-0.877*** (0.291)	0.014 (0.064)	-0.892*** (0.292)
POPDENS	-0.003* (0.002)	0.080*** (0.017)	-0.002 (0.002)	0.070*** (0.018)
LABORPARTICIPATION	-0.029 (0.037)	0.127 (0.092)	-0.014 (0.042)	0.083 (0.096)
IMPWATER	-0.022 (0.030)	-0.308*** (0.069)	-0.033 (0.033)	-0.347*** (0.081)
VIOLENCE	-0.056 (0.146)	0.220 (0.167)	-0.098 (0.152)	0.169 (0.172)
FEMALEEDU	-0.005 (0.014)	0.012 (0.018)	0.000 (0.014)	0.017 (0.019)
POLEFF	-0.114 (0.207)	0.064 (0.215)	-0.164 (0.207)	0.130 (0.230)
UNDERNOURISHED	-0.139*** (0.030)	-0.218*** (0.046)	-0.155*** (0.032)	-0.212*** (0.046)
SOCEFF	-0.921*** (0.303)	-0.239 (0.290)	-0.819*** (0.303)	-0.019 (0.307)
UNDER14POP	-0.046 (0.069)	0.083 (0.108)	-0.049 (0.073)	0.180 (0.135)
Cons	11.766** (5.383)	9.875 (10.728)	9.777	16.368
Fixed Effects	No	Yes	No	Yes
Time Effects	No	No	Yes	Yes
Clustered Standard Errors	No	Yes	Yes	Yes
F-Statistics Testing Exclusion of Groups of Variable				
Fixed Effects		8.48 (0.000)		5.8 (0.000)
Time Effects			13.39 (0.100)	1.07 (0.387)
R ²	0.525	0.74	0.519	0.115

Standard errors are given in parentheses under the coefficients, and p-value are given in parentheses under the F-statistic. The individual coefficient is statistically significant at the *10%, **5% or ***1% significance level.

Access to improved water sources and prevalence of undernourishment both had higher coefficients than the key indicator variables and were highly significant, indicating that these variables are important to the change in child mortality rate. This regression seems to have the best fit with an R^2 of 74%, though omitted variable bias may still be a threat. In order to account for the possibility that funds for one year may make an impact on health outcomes the following year, each model was run with a lag on external resources for health as a percentage of health spending and general government expenditure on health as a percentage of total government expenditure (see Table 2). Once again, fixed effects are important, though time effects are not significant to this analysis. Therefore, the focus will again be on the regression run with fixed effects.

The lagged fixed effects regression shows that population density, access to improved water sources, and undernourishment are significant at the 1% level. Malaria is significant at the 10% level. The R^2 is rather low at 38.6%. This indicates that the best regression for this analysis is the non-lagged, fixed effects regression.

Table 2: Regression analysis of external resources for health as a percentage of total health expenditure from the previous year on child mortality rate.

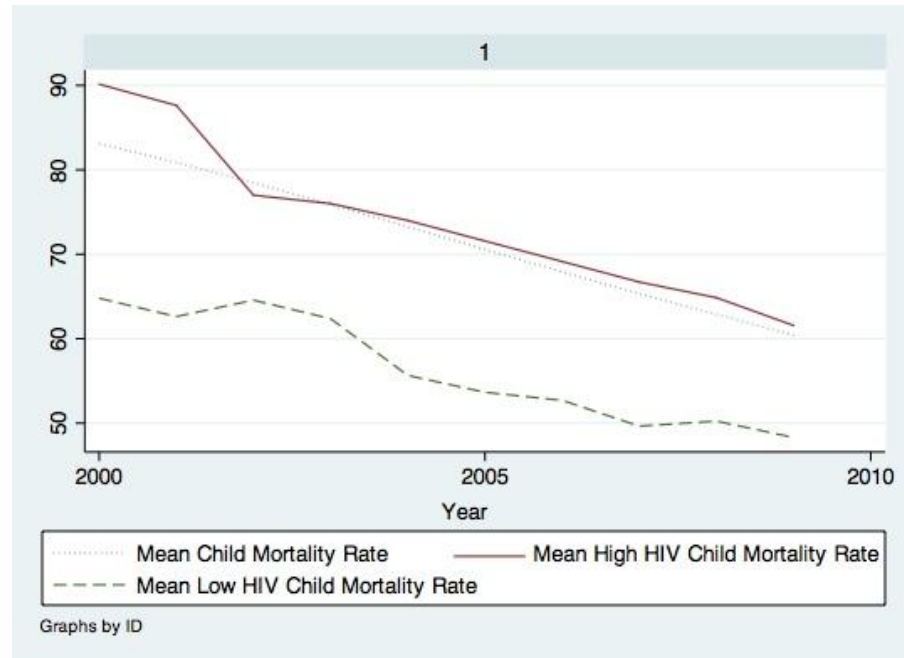
	1	2	3	4
lagEXTHEALTHRESOURCES	-0.005 (0.016)	-0.008 (0.020)	-0.004 (0.016)	-0.009 (0.020)
lagGOVTHEALTHRESOURCES	-0.021 (0.046)	-0.072 (0.050)	-0.017 (0.047)	-0.061 (0.052)
lnGDP	-0.447 (0.404)	-0.257 (0.556)	-0.059 (0.529)	-0.881 (0.683)
MALARIA	-0.037 (-0.031)	-0.066* (-0.038)	-0.035 (-0.032)	-0.065* (-0.039)
HIV	0.039 (0.057)	-0.325 (0.295)	0.022 (0.061)	-0.302 (0.299)
POPDENS	-0.003 (0.002)	0.094*** (0.018)	-0.002 (0.002)	0.088*** (0.019)
LABORPARTICIPATION	-0.036 (0.037)	0.092 (0.092)	-0.024 (0.040)	0.045 (0.095)
IMPWATER	-0.026 (0.030)	-0.377*** (0.072)	-0.035 (0.032)	-0.389*** (0.085)
VIOLENCE	-0.047 (0.153)	0.271 (0.179)	-0.107 (0.158)	0.204 (0.186)
FEMALEEDU	-0.003 (0.014)	0.034* (0.019)	0.003 (0.014)	0.039** (0.019)
POLEFF	-0.254 (0.212)	0.014 (0.226)	-0.288 (0.213)	0.042 (0.242)
UNDERNOURISHED	-0.154*** (0.030)	-0.245*** (0.047)	-0.161*** (0.031)	-0.242*** (0.048)
SOCEFF	-0.711** (0.323)	-0.211 (0.304)	-0.635* (0.328)	-0.052 (0.325)
UNDER14POP	-0.040 (0.071)	0.110 (0.116)	-0.044 (0.073)	0.158 (0.144)
Cons	11.919 (5.521)	11.365 (11.368)	-1.720 (71.922)	396.974 (59.600)
Fixed Effects	No	Yes	No	Yes
Time Effects	No	No	Yes	Yes
Clustered Standard Errors	No	Yes	Yes	Yes
F-Stat				
Fixed Effects		8.76 (0.000)		5.9 (0.000)
Time Effects			12.41 (0.134)	0.93 (0.494)
R ²	0.41	0.386	0.517	0.115

Standard errors are given in parentheses under the coefficients, and p-value are given in parentheses under the F-statistic. The individual coefficient is statistically significant at the *10%, **5% or ***1% significance level.

CHAPTER FOUR: DISCUSSION

Using the fixed effects regression with no lag, the coefficients on prevalence of malaria, prevalence of HIV and prevalence of undernourishment are all significant and negative. The negative sign indicates that an increase in the prevalence of malaria, HIV, and undernourishment actually lead to a decrease in change in child mortality rate. However, the child mortality rates in countries with high levels of HIV, malaria and undernourishment decreases at a faster rate than the average child mortality rate of countries with low HIV, malaria and undernourishment. Due to the fact that, on average, countries that have high child mortality rates seem to also have high rates of HIV, malaria and undernourishment, it makes sense that the child mortality rates in those countries would decrease at a faster rate. As HIV, malaria and undernourishment increase, it appears that child mortality decreases but this may be because where those are very high; the child mortality rate is very high so in fact it is decreasing at a faster rate. This may explain why the negative signs appear on those control variables.

Figure 1: Line Graph of Mean Child Mortality Rate in Countries with High HIV Incidences



Since there appears to be a good explanation for the questionable signs on the coefficients of HIV, malaria and undernourishment, conclusions can be made from this analysis about the effectiveness of health aid on child mortality rates. The coefficient of the key indicator would signify that a 100% increase in external health resources as a percentage of total health spending would lead to a decrease of four deaths per thousand children under five in the child mortality rate each year. This means that over the course of ten years, child mortality would be reduced by forty deaths per thousand children under five. While this is still not a very large number given the required increase in external resources as a percentage of health spending in these countries, it does show that aid for health appears to be effective, perhaps just not as effective as donors would hope.

In addition to understanding the effectiveness of foreign aid for health on health outcomes, there are other questions I would like to be able to answer using regression

analysis if the data is available. Given the arguments about vertical and horizontal programs, I would like to understand which is more effective in improving health outcomes. This would require data on how foreign aid for health is spent. It may be helpful to pursue some of these questions by looking at health delivery in developing countries. In order to answer questions about vertical and horizontal programs, an understanding of the access and use of primary care is necessary. Vertical programs are desirable for their measurable results, yet it is difficult to measure long-term results. If sustainability is truly a priority, much more information is needed to decide which type of program is more effective.

Gathering data on important indicators of development is a challenge because the governments in developing countries may not be especially focused on collecting data and development institutions may not have access to some populations in order to capture the best data. While these institutions have prioritized measurable results, it is difficult to gather information on countries that do not have the administrative and organizational strengths that developed countries have had. Additionally, the goals of the World Bank and UNICEF were made relatively recently so the collection of data does not date back in time much further than the establishment of these recent development goals. Previous studies mentioned in the literature review were able to make conclusions about the impact of foreign aid on health outcomes. They used several different variables spanning a time period of over thirty years. It is not clear on how they filled in the blanks in the data but it is possible that they had strongly unbalanced panel data and had to interpolate. I chose to do this analysis using consistent data, using countries and years that had data

for my variables. Unfortunately, this eliminated the possibility of using other variables that could be important to this study. Nonetheless, the significance of the key indicators and the important control variables allows me to make some conclusions about the effectiveness of foreign aid on child mortality rates.

CHAPTER FIVE: CONCLUDING REMARKS

In my research, I used data from forty-seven developing countries from 2000-2009. I was able to find consistent data for several control variables and my key indicator, external health resources as a percentage of total health spending. Controlling for fixed effects, I found that external health resources as a percentage of total health spending decreased child mortality, but only by a very small amount. The signs on the coefficients for prevalence of HIV, malaria and undernourishment were negative, which at first caused some concern, however can be explained by the much faster decrease in child mortality rate from countries with high prevalence of HIV, malaria and undernourishment. In the future, I would like to be able to study this question further perhaps including other variables such improved sanitation, more reliable HIV and malaria data, literacy rates, access to vaccines, access to primary care, etc. Unfortunately, the data for these variables are not robust as of this study but can be improved in the future.

This study sought to find an answer to the question of how effective foreign aid is in improving health outcomes in developing countries. Using child mortality rate as the dependent variable and external health resources as a percentage of total health spending as a key indicator, I found that drastically increasing external resources as a percentage of total health spending will lead to fairly small reductions in the child mortality rate. This

backs up the results of Mishra and Newhouse's study as well. While decreasing the child mortality by forty children per thousand under five is still a good result, it is likely not enough to reach the goals set by the UN and other donors. Whether solving some of the challenges the MDGs face will increase effectiveness was not determined by this study. Though this study provides empirical analysis of the effectiveness of aid for health on child mortality, it is important to keep in mind all social, political, religious, and anthropological differences between countries when attempting to make policies for development. What may be effective for one country is not always effective for others. This study looked at 47 countries and controlled for many variables across the key groupings that are important to mortality studies, but the nuances of each individual country are still very important to policy-making. Nonetheless, it is important to note that this study shows that the status quo is not leading to major decreases in child mortality.

The importance of this topic, the effectiveness of foreign aid on health outcomes in developing countries is certain. For donors, having their money used in the most efficient and equitable way is important since they would likely want to know their return on investment is high. For recipients, leveraging their limited resources in order to create better and more sustainable outcomes is essential to development aid. Based on the results of this study, there is a fairly minimal improvement in child mortality rates with a very large increase in external resources as a percentage of health spending. This does not mean that all foreign aid is ineffective but it does indicate that foreign aid directed at health does not have the impact necessary to meet the MDGs. This question will continue to be heavily debated, but that is necessary because it affects many stakeholders.

Continuing to study how foreign aid directed at health affects health outcomes will help institutions can craft better policies.

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APPENDIX

Table A1: Summary of Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
CHILDM~Y	overall	71.86809	52.73589	6	203	N = 470
	between		52.22517	7	193.1	n = 47
	within		10.29296	21.96809	134.9681	T = 10
EXTHEA~S	overall	8.099036	13.96574	0	78.6	N = 415
	between		13.72904	0	73.3	n = 47
	within		4.468366	-30.25096	37.64904	T-bar = 8.82979
GOVTHE~S	overall	10.78827	4.685713	2.9	30.6	N = 469
	between		4.330318	4.89	24.17	n = 47
	within		1.89042	2.678273	17.77827	T = 9.97872
MALARIA	overall	0.0876749	0.1524192	2.15E-06	2.128473	N = 396
	between		0.1276728	0.0001247	0.6989985	n = 42
	within		0.0817186	-0.3096037	1.51715	T-bar = 9.42857
HIV	overall	3.137442	5.951922	0.1	28.2	N = 430
	between		6.001501	0.1	26.13	n = 43
	within		0.4037153	0.6674419	5.207442	T = 10
GDP	overall	2196.326	2144.18	91.70108	15853.46	N = 468
	between		1970.612	138.7028	8269.351	n = 47
	within		883.1057	-2357.468	9780.436	T = 9.95745
POPDENS	overall	120.6588	186.3088	2.627433	1148.522	N = 470
	between		187.9037	3.012604	1088.172	n = 47
	within		8.982857	49.48921	181.0083	T = 10
LABORP~N	overall	64.83426	10.04267	42.7	86	N = 470
	between		10.0856	43.06	85.19	n = 47
	within		1.042928	61.08426	69.18426	T = 10
IMPWATER	overall	78.03252	16.18029	28.9	99.7	N = 452
	between		16.31904	37.17	99.45	n = 46
	within		2.411621	69.74252	86.30252	T = 9.82609
VIOLENCE	overall	0.6888889	1.654073	0	9	N = 450
	between		1.486641	0	7.4	n = 45
	within		0.7550867	-1.711111	5.788889	T = 10
FEMALE~U	overall	97.30348	19.69521	26.08993	132.4962	N = 405
	between		18.45659	41.12073	126.3003	n = 47
	within		6.707335	72.98893	120.1991	T-bar = 8.61702
POLEFF	overall	1.317778	1.059013	0	3	N = 450
	between		0.9831048	0	3	n = 45
	within		0.4175973	-0.3822222	2.617778	T = 10
UNDERN~D	overall	18.41756	12.47968	5	53.5	N = 450
	between		12.30707	5	46.86	n = 45
	within		2.704496	5.627556	30.62756	T = 10
SOCEFF	overall	1.746667	1.004577	0	3	N = 450
	between		0.9495453	0	3	n = 45
	within		0.3544185	0.6466667	2.646667	T = 10
UNDER1~P	overall	36.8202	7.538764	17.71474	48.56982	N = 470
	between		7.513347	19.69578	47.75906	n = 47
	within		1.210724	32.2252	41.20166	T = 10

Table A2: List of Countries used in Panel Data

Albania	Guinea
Algeria	Guyana
Angola	Honduras
Argentina	India
Bangladesh	Indonesia
Belize	Jamaica
Benin	Libya
Botswana	Mauritania
Burkina Faso	Mauritius
Cabo Verde	Mexico
Central African Republic	Morocco
Colombia	Nicaragua
Congo	Nigeria
Costa Rica	Peru
Cote d'Ivoire	Rwanda
Cuba	Sao Tome and Principe
Dem Rep of Congo	South Africa
Djibouti	Sri Lanka
Ecuador	Swaziland
El Salvador	Thailand
Ethiopia	Togo
Gambia	Yemen
Ghana	Zambia
Guatemala	

Table A6: Description of Variables

CHILDMORTALITY	Under five mortality rate	World Bank
EXTHEALTHRESOURCES	External resources for health as a percentage of total expenditure on health	WHO
GOVTHEALTHRESOURCES	General government expenditure on health as a percentage of total government expenditure	WHO
MALARIA	Cases of Malaria, % of Population	WHO
HIV	Cases of HIV, % of Population	World Bank
GDP	GDP per Capita (current USD)	World Bank
POPDENS	Population density (people per sq. km of land area)	World Bank
LABORPARTICIPATION	Labor participation rate, total (% of total population ages 15+)	World Bank
IMPWATER	Improved water source (% of population with access)	World Bank
VIOLENCE	Total summed magnitudes of all (societal and interstate) episodes	Polity
FEMALEEDU	School enrollment, primary, female (% gross)	World Bank
POLEFF	Political Effectiveness	Polity
UNDERNOURISHED	Prevalence of Undernourishment (%)	World Bank
SOCEFF	Social Effectiveness	Polity
UNDER14POP	Population ages 0-14 (% of total)	World Bank

Figure A1: Scatter plot of average external resources as a % of total health spending and average child mortality

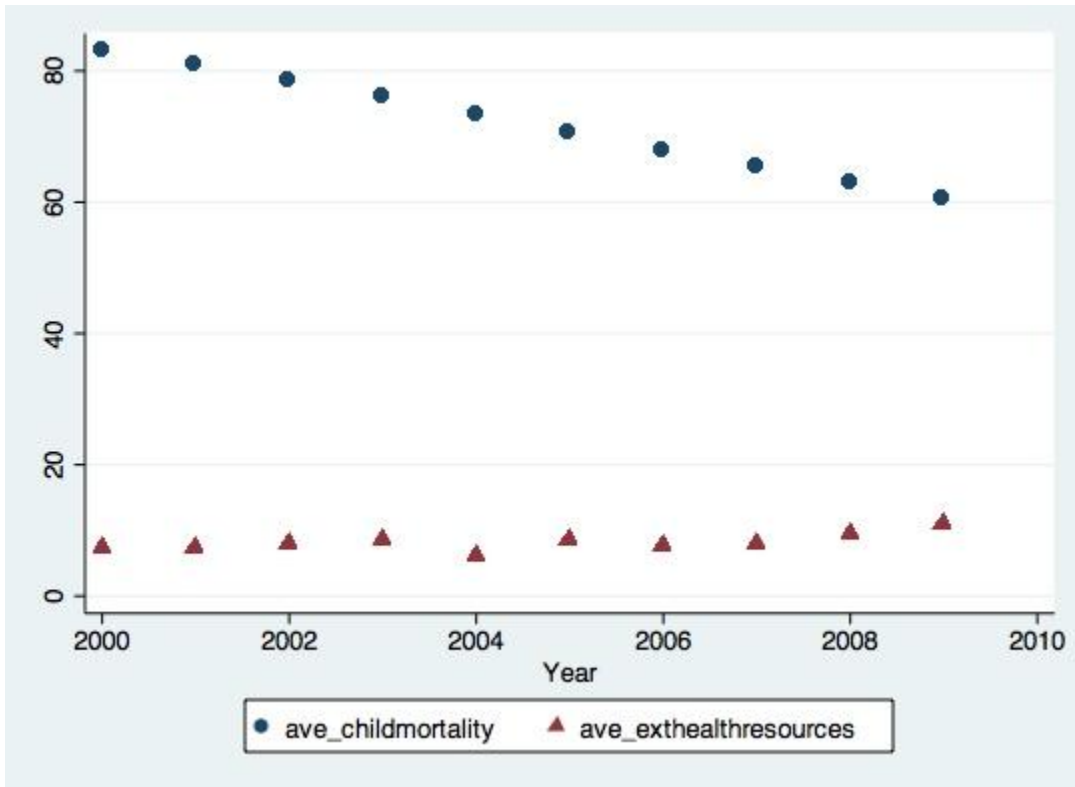


Figure A2: Line Graph of Mean Child Mortality Rate in Countries with High Malaria Incidences

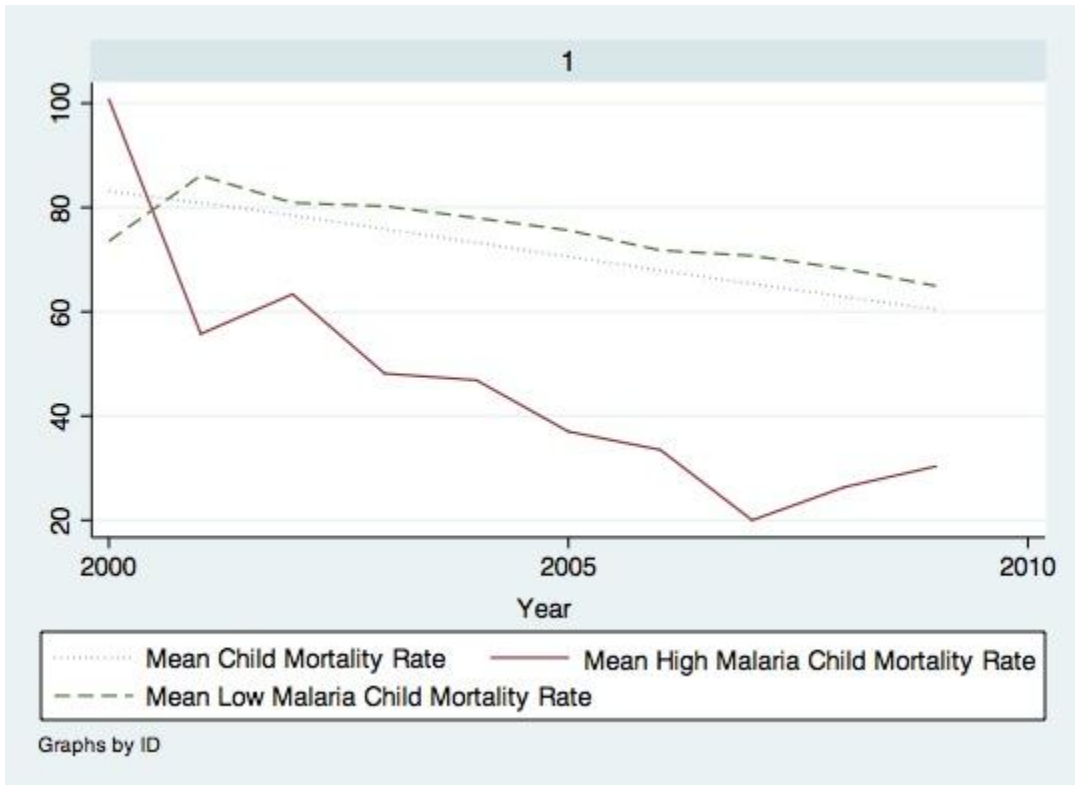


Figure A3: Line Graph of Mean Child Mortality Rate in Countries with High Undernourishment

