How Does Access Affect Health Care Outcomes?
A Study of 60 Countries' Health Care Systems

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Abstract

How does health care policy access and expenditure affect health care outcomes? In this study, I set out to answer just this question through a literature and statistical analysis of health care outcomes. In order to do this, I first examine the pros and cons of Universal Health Care/ Public Access, the current trend within health care access. Here one will find that while financially, public access is more responsible, there are serious questions when it comes to the effect the system has on health outcomes. Moving from this, I look at the internal system structure and how policy makers are working to improve health outcomes from within. However, we find here that while there are approaches to improving the system addressed, there is a failure to define which outcomes are being examined, which is the same within the examination of the Public system. Based on the lack of definition and quantitative analysis in the current literature, I introduce a 60 country, cross- regional sample that examines not only access within each country, but the effect of such on health outcomes. In this analysis, I will come to a conclusion on not only the effect of the access system in place on health outcomes, but also the effect of expenditure and private supplements.

Introduction:

Within the last four years, the state of health care within the United States has become a major talking point. In the last World Health Organization (WHO) Health Care System Ranking in 2000, the United States ranked 37th among all of the nations who were included in this list (Source List 3). When thinking about this in terms of all the countries in the world, one may not think that this is a bad place, since it falls well in the top third of all systems. However, when one considers the fact that the United States is one of the top powers in the world, this number is indeed nothing to brag about. In early 2000, 70 percent of people were satisfied with the health care they were receiving but this ranking caused a lot of second guessing for the decade to come with multiple calls for reform (Chard 2011, 48). In 2010, this reform finally came about in the Affordable Health Care Act (AHCA) or otherwise known as "Obamacare" (Chard 2011, 48; Jacobs & Skocpol 2010, 11). With this introduction of AHCA, there would not only be a re-definition in the way in which the system was accessed, moving from a private- insurance based system into a governmental mandated system, but also a reassurance that the outcomes within the system would be greater than that of its predecessor (Jacob & Skocpol 2010, 128).

Before we can truly begin a discussion on what AHCA is referring to with "improved outcomes" or what health outcomes are in general, it is important to understand what health care actually is and the definition of such. In the policy arena, "health" is understood in the context of public health. Public health is best described by Hardcastle, who states that it is "*a focus on identifying and preventing the underlying causes of illness and the effect of such illness on the broader community*" (2011, 319). In basic terms, public health stands for the overall health of the community and a lack of disease within society. This is an important definition to remember since many consider public health to be the "cornerstone" of health care policy in general (Bryant 2002, 89; Hardcastle 2011, 319). By understanding the underlying goal of public health, one can better

grasp what political actors, and by extension their constituents, are trying to accomplish designing health care policy (Kingdon 2003, 33; Mintrom & Norman 2009, 649- 50).

With the notion of public health still in mind, we can now examine what exactly health care is, and by extension, health care policy. By examining and combining the mainstream definitions of health care, we arrive at the following: *the promotion of public health through improved individual outcomes through delivery of personal medical services* (Hardcastle 2011, 320; Bryant 2002, 89). The principle of health care policy simply builds on this last definition, charting the government with responsibility; accordingly health care is a "*combined federal- state responsibility for the promotion of public health, with substantial federal oversight and funding, imbued with state innovation and implementation*" (Weissert 2006, 297). By charging the government with this kind of mission based on the definition in place, we are giving them the freedom to act on our behalf to ensure public health. With AHCA, policy makers were attempting to complete the mission put forth here; policy actors were attempting to improve public health and therefore, health outcomes by revamping the current system in place (Jacobs & Skocpol 2010, 128). However, the actors fail to fully explain their actions and in what areas of health we will come to see improved "outcomes" through AHCA (Jacobs & Skocpol 2010, 129).

Now that we have an understanding of what "health care" actually is, we can move forward to discussing what President Obama and those involved with AHCA actually mean when discussing "outcomes" within the health care system. For many, when referring to health care outcomes, they are looking at quality within the system itself, often referring to better preventative care, higher life expectancy, and an overall better experience when one does have to go to the doctors (Jacob & Skocpol 2010, 129). Palmer et al. in *Striving for Quality in Health Care* formalize this definition by stating that quality in health care "originated from the need to provide the best patient care and to ensure competence with all those in the profession" (1991, 7). This not only brings forth the fact that

the healthcare system in place should lend itself well to overall quality, but also to quality at every level that a patient may come into contact with on a daily basis. Furthermore, while this issue can be exemplified in the example of AHCA, it can be seen in many other countries and systems around the world.

While improved outcomes have become important in America within the last four years, other countries around the world are also looking for ways to continue improvement within the healthcare system (Weissert 2006, 296; Palmer et al. 1991, 101; Hunnicutt 2010, 156). For this reason, this paper will examine which health care system, public or private, produces the best health outcomes, while evaluating how expenditure affects outcomes as well. In order to fully investigate the matter, we will first look at literature pertaining to the topic of Universal Health Care. From here, we will investigate current trends in improving health outcomes, focusing on fixing the micro- and macro- systems. In order to fill in the gaps of knowledge we will find from the current literature on the topic, we will look at my original study of 60 countries, cross- regionally and their health outcomes. At the end of this, we will be able to draw conclusions, determining whether private or public access leads to better overall outcomes.

Literature Review:

Universal Public Health Care- Positive Financial Gains:

In many countries today, the current trend within health care is a move toward a governmental mandated, publically funded health care system, universal in application, or otherwise known as the Universal Health Care System or Public Access (Hunnicutt 2010, 123). While there has been a general move towards this type of system by most developed and under- developed countries alike, there is still a lot of contention when it comes to whether Universal Health Care is actually good for the public or not (Hunnicutt 2010). First and foremost in the argument as to whether Universal Health Care and Public Access is beneficial is the financial means by which the program is run.

In 2000, it was predicted that by 2030, the United States would be spending 25 percent of its national budget on health care expenses, with little improvement to the current trends within the system (Morris 2000). With this rising cost, people would not be getting better delivery or outcomes within the system, but rather just a rise in cost due to the market and a lack of competition within health care technology (Morris 2000, 8; Hunnicutt 2010, 129). Because of this, many of the theorists in this area suggest that by moving to a Universal System, the government will have more control and are able to control costs (Morris 2000, 7; Thompson 2011, 746). As Thompson (2011) suggests, the government could easily create a payment structure that would promote better public outcomes (735). This "fee- for- performance" system would allow there to be a bonus for professionals who had improved outcomes over those who simply responded to volume, which the current system currently nurtures (Thompson 2011, 736). However, this would also cause an increase in volume and wait-times, which is already a source of angst for those in Universal Systems today (Armstrong 2008).

In addition to having the option to change the payment schedule, the government could also potentially lower the rate of debt pertaining to health care (Hunnicutt 2010, 123; Morris 2000, 7). With funding for health care now coming from taxes, rather than out of pocket to insurance companies, the government could ensure that there are no uninsured people going to the doctors or at least cut back drastically on the number of people who do (Morris 2000, 8). Because of this, the government will gain financial resources in the long run, helping to off- set the overall expense that the system does incur (Hunnicutt 2010, 153). However, while many people do argue that Universal Health Care provides the resource question to health care, many more argue that by turning to the Public system, the government is turning their backs on quality and overall health outcomes (Hunnicutt 2010; Armstrong 2008).

Universal Public Health Care- The Downfall of Health Care Outcomes:

Since the health care system is governmentally run, the outcomes of the system become easier to track than in a private system (Kisely et al. 2010, 435). With this idea, one would think that this would lead to better health care outcomes, since they could easily gage and spot the problem, then implementing some sort of policy in order to improve that given area (Kisely et al. 2010, 436). However, despite what theorist project should happen in these cases, there is often little to no response to the areas lacking in positive outcomes, therefore leaving us with multiple things that come up for debate frequently in the Universal Health Care Arena. The most frequent of these topics brought to light is a discussion of access to doctors within the system, followed by a lack of focus on primary care, which often leads to better overall outcomes/ quality in health care (Armstrong 2008; Morris 2000, Hardcastle 2011; Hunnicutt 2010).

In many of the well- established Universal Health Care Systems, a long "wait-time" to see doctors is one of the main grievances within the general public (Armstrong 2008, 91; Hunnicutt 2010, 129). This should come as no surprise since the sheer number of people able to access the system alone would be enough to over-whelm even well employed health care systems (Armstrong 2008, 91). Most of the countries today with public access to health care do not have a sufficient amount of primary care physicians, let alone specialists (Hunnicutt 2010, 123). Because of this, many countries have "gate- keeper" physicians who decide if a person is indeed sick enough to receive a referral to go to a specialist, who then needs an appointment and receive an additional wait time as well (Hunnicutt 2010, 124; Armstrong 2008, 90). Because of this increased volume and thus, wait time, many people become very sick before they have a chance to even see a specialist, creating a downfall of the overall health within a nation (Armstrong 2008, 91). Therefore, some argue that with a private system, while it may cost more, creates an environment where less people are competing for appointments and the doctor's attention (Morris 2000, 55; Hardcastle 2011, 319; Hunnicutt 2010, 155). From this, there are improved health outcomes because people remain healthier overall,

allowing for quicker recovery times and more general knowledge when it comes to the proper care a patient should receive (Morris 2000, 55; Hardcastle 2011, 319; Hunnicutt 2010, 155).

Along the same line as the wait- time debate, many argue that Universal Health Care leads to a lack of attention to not only primary care, but also preventative care measures. Again, this idea goes back to a lack of a sufficient amount of doctors available to support the demands of the system (Hunnicutt 2010, 124; Armstrong 2008, 90). With so many people competing for so few appointments each day, priority must be given to not only those who are the most in need of care, but also those that will bring the highest dollar value to the doctor who sees them (Armstrong 2008, 36). When the doctor is paid on a "fee- for- service" basis, they will often provide preferential treatment to those who will bring them in the most money (Armstrong 2008, 36). With this, those who are coming in for immunizations or yearly check- ups take low priority and therefore, primary and preventive care fall to the wayside, providing a low mark of overall health outcomes (Hunnicutt 2010, 129- 30; Armstrong 2008, 36). With this in mind, it is easy to see why many of the "better off" in a given public access system will opt to have a private supplement, opening the doors to doctors who practice on a private basis only (Armstrong 2008, 37). The people who can afford this private supplement will often be seen to have better health outcomes in many instances, because they not only receive the primary care, but also preventative care methods that others in the public system struggle to receive (Armstrong 2008, 37).

Overall, while there are some positives that can come financially in a Universal or Public Access system, there are many issues that can arise and prevent positive outcomes within health care. Although many countries are converting to this system, like the United States with AHCA, we must question whether this is the right move when trying to achieve better overall outcomes and quality within the system.

Trends in Health Care System Reform for Improved Outcomes:

Fixing the Micro- System[1]:

Now that we have discussed the pros and cons of the Public Access system, it is important to look within the system itself and see what can be improved upon. In the introduction, we discussed that outcomes could further be defined as quality within the system. For this definition, we turned to Palmer et al. (1991) who stated that "quality is the idea that the health care industry and all of its parts need to provide the best patient care, while ensuring the competence and knowledge of each professional working within the industry" (Palmer et al. 1991, 7). Like many, Palmer et al. believe that the key to ensuring quality is to look at each individual aspect of the smaller systems and work from the bottom up in order to ensure quality at all levels (Palmer et al. 1991, 103). This idea of "micro-system" management is furthered by both Pol and Thomas in *The Demography of Health and Health Care*, by Nelson et al. in *Microsystems in Health*, and Lovaglio & Monzani in "*Validation aspects of the health of the nation outcome scales."*

At the Marco- level, health care policy is the "actions of national, state, and/ or local organizations" but also, the health care industry as a whole, with all of the doctors, facilities, and insurers of individual care (Pol & Thomas 1992, 353; Nelson et al. 2002, 474). However, as a whole, this system is failing because it has been unable to provide the beneficiaries of such (the citizens) a successful means for receiving both personally effective and cost effective care (Pol & Thomas 1992, 354; Lovaglio & Monzani 2011, 2). However, when broken down, the macro- system turns into a multitude of smaller systems in which the problems are easier to both pinpoint and fix (Nelson et al. 2002, 474). These "micro-systems" are more susceptible to change and are more sensitive to the demands of the public on a day to day basis (Pol & Thomas 1992, 368; Lovaglio & Monzani 2011, 2). Thus, the micro- systems are the smaller systems that individuals encounter on a daily basis.

[1] This section is from Aminto- Seminar Paper Fall 2011, with some additions providing additional information to the topic at hand.

From these encounters, people begin to form opinions on how the system as a whole operates, which can stem from either a good or bad experience with just one part of the system (Nelson et al. 2002, 473). As more people work their way through this system, it becomes more susceptible to criticism and therefore, diminishes the overall perceived outcomes (Lovaglio & Monzani 2011, 1). Because of this projection of the macro-system based in the finding of the micro-system, both Pol & Thomas (1992) and Nelson (2002) suggest that the way in which to fix our current health care system is to focus our energy into fixing each of the individual micro-systems that feed into the macro-system (356; 474). By fixing the smaller parts that people come into contact with on a daily basis, not only will the outcomes actually be greater, but the perceived (and often measureable) outcomes reported by the patients will also be greater (Pol & Thomas 1992, 356). Overall, we can see that these studies point to a need to re-evaluate the systems in place at this time, from the smallest to the largest parts in order to have better outcomes (Pol & Thomas 1992; Nelson 2002; Lovaglio & Monzani 2011). However, the studies fail to address what factors need to be considered in order to reach improved outcomes, including which type of system, public or private, leads to the best overall health outcomes.

Argument and Hypothesis:

As we can see from the studies discussed above, while there is a large discussion about the health care system itself, there is lack of priority given not only to health outcomes and how to investigate them, but also on which system provides a better environment for improved health outcomes/ quality. Not only this, but the literature lacks an in- depth quantitative study, both when discussing the different systems of health care access and the outcomes that are a result of the system. Based on this, I have designed a cross- regional study of 60 different health care systems, in a quest to answer the question the current literature lacks: what form of health care access provides the best health care quality and outcomes? For each of these countries, I will not only examine their

form of health care access, but also a variety of dependent variables that are commonly classified as common measures of quality by the WHO (2005- 2011). From here, I introduce my hypotheses and arguments below:

Access to Health Care (H1): *A Private Access System to Health Care within a country will provide better health outcomes.* Based on the current literature, it becomes clear that while a Universal/ Public System of health care may be more financially responsible, it fails to address key issues with health care providers. In many cases, due to an overwhelming volume of patients, both primary and preventative care become lost attributes within the system (Armstrong 2008, 91; Hunnicutt 2010, 56). In addition to a larger volume of patients in a public system, doctors often prioritize patients on the basis of who will make them the most money in the time allotted (Thompson 2011, 733). In most public systems, doctors are paid on a "fee- for- service" schedule (Armstrong 2008, 46; Thompson 2011, 733). With this, not only do doctors prioritize the patients with needs that will provide them with the highest fee, but this also leads to them often rushing through patient visits in order to receive more money (Thompson 2011, 734). With this prioritization of doctors in the public system, people are often very sick before they even see the doctor, in addition to often lacking a quality visit when they are finally obtain an appointment (Armstrong 2008, 47).

From this, it is clear that the public system fails to focus on overall quality and positive outcomes of the community, but rather waits until a person is sick to see them for a higher "fee" and to control volume (Morris 2000, 8; Hunnicutt 2010, 155; Armstrong 2008, 46; Thompson 2011, 734). Based on these observations, we can see that the public system fails to provide the access to the doctors and a focus on the overall health of the community that the private health system does. For this reason, I arrive at the hypothesis, H1, presented above (Hardcastle 2011, 323).

Expenditure (H2): *A higher expenditure per capita within a country will provide better health outcomes.* As presented in the literature review, a public system of access has been proven to reduce the cost of health care within a country (Jacobs & Skocpol 2010, 123; Morris 2000, 8; Hunnicutt 2010, 123). By the government supporting the system and providing the public at large with health care, they are reducing the number of people who must be provide care with no source of payment (Hunnicutt 2010, 124; Armstrong 2008, 37; Hardcastle 2011, 319). With a private system, not only will the cost of health insurance continue to rise, costing up to 25 percent of the US national budget by 2030, but we will continue to have issues of the un-insured needing care but not being able to pay (Morris 2000, 7; Thompson 2011, 748; Jacobs & Skocpol 2010, 127). Based on this, one can deduce that a private system will cost more in the long run than a public system. Since in H1 I predict that a private system will produce better outcomes, I also will support this further in my hypothesis here. Based on the information presented here, I predict that high expenditures will produce better health outcomes.

Private Supplement (H3): *Access to a Private Supplement within a Public Access system will provide better health outcomes.* As stated in the literature, those with resources to buy a private supplement within a public access system often will (Hunnicutt 2010, 155; Armstrong 2008, 47). As discussed in H1, doctors within a public system often become overwhelmed by the volume of patients that need to see them on a daily basis (Armstrong 2008, 91; Hunnicutt 2010, 56). For this reason, some doctors decide to move into a private sector within the public system, only providing services to those with a private supplement (Hunnicutt 2010, 155). These doctors will often charge a much higher rate than the public doctors, but in return, can take a smaller case load, allowing each patient to receive more individualized attention (Hunnicutt 2010, 155; Armstrong 2008, 48). In addition to more individualized attention, these doctors are often more flexible in their schedule, allowing patients who feel they are becoming sick see their doctor before they are too ill to really receive treatment (Hunnicutt 2010, 156). As one may guess, these doctors also tend to focus more on

primary and preventative care for their patients, often making those with a private supplement healthier than those without one (Armstrong 2008, 47; Hunnicutt 2010, 155). Based on this information, we can deduce that people with a private supplement within a public system will have better health outcomes than those simply within the public system, due to more frequent, more open visits, and individualized attention from their health care providers.

The data I collect and present below not only helps to evaluate my hypotheses, but helps determine the health care access system and expenditure that provides the best overall health care outcomes through quantitative measurements unavailable in the current literature.

Methodology:

Research Design:

In order to fully investigate an applicable sample of health outcomes, I completed a cross-regional study of 60 countries, comprising the top 30 and the bottom 30 health care systems in the world as last ranked by the World Health Organization[2] (Source List 3). This sample represents various types of governments, economic systems, and varying levels of stability for each country. By examining various countries with a multitude of backgrounds, not only will there be an attempt to capture all aspects of health outcomes, good and bad, but it allows for a broad application of the conclusions we come to through our analysis. Using access and expenditure as a leveler between the countries, we will come to find that one type of access produces greater outcomes than the other, with expenditure often furthering the explanation of improved outcomes.

With the sample countries decided, there was then a decision to be made about what variables we would use to measure outcomes within a country. For this we used neonatal mortality, three

[2] As one can see, the last ranking the World Health Organization did was in 2000, not only because of the time it took to devise the list, but because they believed that the list was not allowing people to capture a complete understanding of what went into the rankings. Now, the WHO produces their *World Health Statistics* every year, allowing people to examine various statistics for each country, making their own determinations about which country indeed has the best outcome.

immunization measurements (DTP3, HepB, and Measles), and life expectancy at birth for both males and females (WHO 2006- 2011). Not only are these variables comparable across the various countries, but there are good measures of health outcomes early on in the life of a human being, when there is often the most care offered and chances to receive care. By examining these outcomes, we will begin to see trends develop as to what explanatory variables support the better outcomes within each country. After both the explanatory and dependent variables were determined, I then moved into the collection and subsequent analysis of the data for the years 2006 through 2011. These are the years not only provided by the WHO, but also that provide the most complete and accessible set of data for each country within the sample.

Collection of Data:

After determining my country sample and the variables I was going to use to measure outcomes, I first had to gather all the data for access in each country. For this, I had to go country by country and find individual sources about the system they had in place (Source List 3 & Source List 1). From each of these sources, I was able to determine if a country had no system, a public system, or a private system. After this variable was collected and coded, it was then broken apart in to the public access variable and private access variable, and recoded to fit each category (Source List 1). After devising each of these variables, I then turned to the WHO's World Health Statistics for the rest of my data (2006- 2011). For expenditure and each of my dependent variables from 2006 to 2011, I entered the corresponding data from the WHO dataset into my own data set (Source List 2). The collection of this data brought forward a comprehensive sample that allows for the full analysis of the data and the drawing of conclusions about the effect of access on health care outcomes. The estimation sample has a total maximum of 352 observations.

Dependent Variable Operationalization:

The following is an explanation as to not only what each dependent variable is in this study is, but how it was coded and its univariant statistics (Appendix A):

1.) **Neonatal Mortality:** This is an interval measurement that represents the number of neonatal deaths for every 1,000 live births, gathered from the World Health Organization's (WHO) *World Health Statistics* (2006- 2011). In this sample, the variables range from a maximum value of 70 (i.e. Mauritania in 2006) to a minimum value of 0 (i.e. San Marino in 2010), with a mean of 22 neonatal death per 1,000 live births.

2.) Immunizations- DTP3[3]: This is an interval measurement that represents the percentage of one year olds within a country that have received their DTP3 immunization, gathered from the World Health Organization's *World Health Statistics* (2006- 2011). In this sample, the variables range from a maximum of 99 (i.e. Monaco in 2006) to a minimum of 20 (i.e. Chad in 2007), with a mean of 83% of one year olds having received the immunization.

3.) Immunizations- HepB: This is an interval measurement that represents the percentage of one year olds within a country that have received their Hepatitis B immunization, gathered from the World Health Organization's *World Health Statistics* (2006- 2011). In this sample, the variables range from a maximum of 99 (i.e. Monaco in 2006) to a minimum of 4 (i.e. Sweden in 2009), with a mean of 81% of one year olds having received the immunization.

4.) Immunizations- Measles: This is an interval measurement that represents the percentage of one year olds within a country that have received their Measles immunization, gathered from the World Health Organization's *World Health Statistics* (2006- 2011). In this sample, the variables range from a maximum of 99 (i.e. Japan in 2006) to a minimum of 23 (i.e. Chad in 2007), with a mean of 81% of one year olds having received the immunization.

5.) Life Expectancy- Male: This is an interval measurement that represents the average expected age at birth of a male in the given country for the given year, gathered from the World Health Organization's *World Health Statistics* (2006- 2011). In this sample, the variables range from a maximum of 82 (i.e. San Marino in 2011) and a minimum of 36 (i.e. Swaziland in 2006), with a mean of 63 years of life expected at birth.

6.) Life Expectancy- Female: This is an interval measurement that represents the average expected age at birth of a female in the given country for the given year, gathered from the World Health Organization's *World Health Statistics* (2006- 2011). In this sample, the variables range from a maximum of 86 (i.e. Japan in 2007) to a minimum value of 37 (i.e. Swaziland in 2007), with a mean of 67 years of life expect at birth.

[3] DTP3 stands for Diphtheria, Tetanus, and Pertussis vaccinations all combined into one immunization.

Each of the dependent variables represents an outcome within the Health Care System. By comparing these variables with a set of explanatory variables (to be explained next), we can come to draw conclusions about which system fosters the best health outcomes.

Explanatory Variable Operationalization:

The following is an explanation as to not only what each explanatory variable in this study is, but how it was coded and its univariant statistics, where applicable (Appendix A):

1.) **Access:** This is a nominal measurement of how people come to access the health care system in each given country, gathered on an individual country basis from the sources listed in *Source List 1*. This variable is coded either 0, 1, or 2, and represents no health care system[4] (0), a public health care system[5] (1), or a private health care system[6]. It is from this variable that we derive the "Public Access" and "Private Access" variables that help us further compare the actual effects of the system on our dependent variables.

2.) **Private Supplement:** This is a nominal measurement representing whether or not a country with public access to health care has the option to privately supplement the government-mandated insurance benefits, gathered from the individual country sources on *Source List 1*. This variable is coded so that (0) represents no private supplement and (1) represent the option to privately supplement the government's plan. This variable helps us to gain a better picture of how the system is truly accessed within each sample country.

3.) **Public Access:** This is a nominal measurement representing if a country does or does not have a public access health care system in place, derived from the Access variable and the sources for each respective country on *Source List 1.* This measurement if broken into two categories, either public access or no/private access, and is coded as follows: (0) being no/private access and (1) being public access. By breaking up the original "Access" variable in this light, it allows up to individually compare the effects of the public access on each dependent variable, separate from the private access variable.

[4] No health care system in place shows that there is neither a government run system nor a privately run system in place.

[5] A public health care system is a system that is not only mandated by the government, but also funded by the government, through taxes or other means, by- in- large.

[6] A private health care system is a system that may be regulated by the government, but is run by private companies that provide insurance to patients on an individual, as requested basis.

4.) **Private Access:** This is a nominal measurement representing if a country does or does not have a private access health care system in place, derived from the Access variable and the sources for each respective country on *Source List 1.* This measurement if broken into two categories, either private access or no/public access, and is coded as follows: (0) being no/public access and (1) being private access. By breaking up the original "Access" variable in this light, it allows up to individually compare the effects of the private access on each dependent variable, separate from the public access variable.

5.) **Expenditure:** This is an interval measurement that represents the amount in international dollars that each country spends per capita on health care each year, gathered from the World Health Organization's *World Health Statistics* (2006- 2011). This variable allows us to examine the effect of dollars spent on outcomes of the health care system and if it truly does have an effect. In this sample, the variables range from a maximum value of $8019 (i.e. Norway in 2011) to a minimum value of $1 (i.e. North Korea in 2009), with a mean of $1452.99 international spent of health care per capita.

By using these explanatory variables, we will come to see that some have a greater effect than others on the outcomes within the system. By comparing these to the dependent variables, we will be able to draw conclusions about not only which of these variables has the greatest effect on the outcomes of health care, but also which access system will produce the best outcomes.

Analysis of Data:

Before we can analyze the data set as a whole, it is important to evaluate each model brought forward in Appendix A on an individual basis. Each model follows with a dependent variable and then looks at each explanatory variable and the statistics that explain it. The analysis of each Appendix A model is as follows:

Model 1- Neonatal Mortality: Based on my sample for Model 1, Private Access, Public Access, and Expenditure all have a significant effect on neonatal mortality, with 99% confidence in its application (Appendix A: Model 1). Additionally, we can say that Private Supplement also has a significant effect on neonatal mortality, but with 90 % percent confidence due to a slightly high p- value. To further this application, we can look at each explanatory variable and the effect it has on this dependent variable (Appendix A: Model 1):

1). In countries with private access to health care, neonatal mortality decreases by 16.72 deaths per 1,000 live births, compared to countries with no access. (Also see Appendix C: Graph 1)

2.) In countries with public access to health care, neonatal mortality decreased by 9.26 deaths per 1,000 live births, compared to countries with no access.

3.) For every dollar spent on health care in any given country, the neonatal mortality rate decreases 0.01 deaths. (Also see Appendix D: Graph 1)

4.) In countries with the options of a private supplement, neonatal mortality decreases by 3 deaths per 1,000 live births, compared to countries with no private supplement.

As we can see from these results, a private access system is most successful when reducing neonatal deaths with in a country, leading support to the hypothesis that private access will be more successful in providing better outcomes. Additionally, expenditure also positively affects this outcome, with more spending leading to lower neonatal mortality. From this model, we also receive an R- squared value for Model 1 of .617, giving us a strong probability of being applicable to the population at large (Appendix A: Model 1).

Model 2- DTP3 Immunizations: Based on my sample for Model 2, Private Access, Public Access, and Expenditure all have a significant effect on immunization rate for DTP3, with 99% confidence in its application (Appendix A: Model 2). To further this application, we can look at each explanatory variable and the effect it has on this dependent variable (Appendix A: Model 2):

1.) In countries with private access to health care, the immunization rate increase by 13.8 % compared to countries with no access. (Also see Appendix C: Graph 2)

2.) In countries with public access to health care, the immunization rate increase by 8.34 % compared to countries with no access.

3.) For every addition dollar spent on health care, the immunization rate increases by .005%. (Also see Appendix D: Graph 2)

As we can see from these results, a private access system is most successful in increasing immunization rates of DTP3 vaccination, leading support to the hypothesis that private access will be more successful in providing better outcomes. Additionally, expenditure also positively affects this outcome, with more spending leading to a slightly higher immunization rate. From this model, we receive an R- squared value for Model 2 of .271, meaning that this lacks a large application to the population at large (Appendix A: Model 2).

Model 3- HepB Immunizations: Based on my sample for Model 3, Private Access has a significant effect on immunization rate for HepB, with 99% confidence in its application (Appendix A: Model 3). Additionally, Public Access has a significant effect on immunization rates for HepB, with 95% confidence in its application (Appendix A: Model 3). To further this application, we can look at each explanatory variable and the effect it has on this dependent variable (Appendix A: Model 3):

1.) In countries with private access to health care, the immunization rate increase by 18.12 % compared to countries with no access. (Also see Appendix C: Graph 3)

2.) In countries with public access to health care, the immunization rate increase by 11.87 % compared to countries with no access. (Also see Appendix D: Graph 3)

As we can see from these results, a private access system is most successful in increasing immunization rates of HepB vaccination, leading support to the hypothesis that private access will be more successful in providing better outcomes. From this model, we receive an R- squared value for Model 3 of .043, meaning that this result lacks application to the population at large (Appendix A: Model 3).

Model 4- Measles Immunizations: Based on my sample for Model 4, Private Access, Public Access, and Expenditure all have a significant effect on immunization rate for Measles, with 99% confidence in its application (Appendix A: Model 4). To further this application, we can look at each explanatory variable and the effect it has on this dependent variable (Appendix A: Model 4):

1.) In countries with private access to health care, the immunization rate increase by 16.4 % compared to countries with no access. (Also see Appendix C: Graph 4)

2.) In countries with public access to health care, the immunization rate increase by 9.26 % compared to countries with no access. (Also see Appendix C: Graph 4)

3.) For every addition dollar spent on health care, the immunization rate increases by .005%. (Also see Appendix D: Graph 4)

As we can see from these results, a private access system is most successful in increasing immunization rates of Measles vaccination, leading support to the hypothesis that private access will be more successful in providing better outcomes. Additionally, expenditure also positively affects this outcome, with more spending leading to a slightly higher immunization rate. From this model, we receive an R- squared value for Model 2 of .280, meaning that this lacks a large application to the population at large (Appendix A: Model 4).

Model 5- Life Expectancy (M): Based on my sample for Model 5, Expenditure has a significant effect on Life Expectancy among males, with 99% confidence in its application (Appendix A: Model 5). Additionally, Private Access has a significant effect on Life Expectancy among males, with 95% confidence in its application (Appendix A: Model 5). To further this application, we can look at each explanatory variable and the effect it has on this dependent variable (Appendix A: Model 5):

1.) In countries with private access to health care, Life Expectancy among males increase by 5.61 years, compared to countries with no access. (Also see Appendix C: Graph 5)

2.) For every addition dollar spent on health care, Life Expectancy among males increases by .01 years. (Also see Appendix D: Graph 5)

As we can see from these results, a private access system is most successful in increasing life expectancy among males; leading support to the hypothesis that private access will be more successful in providing better outcomes. Additionally, expenditure also positively affects this outcome, with more spending leading to a slightly higher life expectancy. From this model, we receive an R- squared value for Model 2 of .627, giving us a strong probability of being applicable to the population at large (Appendix A: Model 5).

Model 6- Life Expectancy (F): Based on my sample for Model 6, Expenditure has a significant effect on Life Expectancy among females, with 99% confidence in its application (Appendix A: Model 6). Additionally, Private Access has a significant effect on Life Expectancy among females, with 95% confidence in its application (Appendix A: Model 5). To further this application, we can look at each explanatory variable and the effect it has on this dependent variable (Appendix A: Model 6):

1.) In countries with private access to health care, Life Expectancy among females increase by 5.38 years, compared to countries with no access. (Also see Appendix C: Graph 6)

2.) For every addition dollar spent on health care, Life Expectancy among females increases by .01 years. (Also see Appendix D: Graph 6)

As we can see from these results, a private access system is most successful in increasing life expectancy among females; leading support to the hypothesis that private access will be more successful in providing better outcomes. Additionally, expenditure also positively affects this outcome, with more spending leading to a slightly higher life expectancy. From this model, we receive an R- squared value for Model 2 of .619, giving us a strong probability of being applicable to the population at large (Appendix A: Model 6).

Overall, as we can see from Appendix A: Models 1 through 6, both private access and expenditure have the most significant effect on the given outcomes. While public access does have significant positive effects in most cases, private access simply takes the outcomes a little more in the positive direction (Appendix A: Models 1- 6). Therefore, based on the models presented, I feel confident that these results lend strong support to our hypotheses, H1 & H2, that state a private access system and higher expenditures will lead to improved health care outcomes. However, except for in the case of Neonatal mortality (Appendix A: Model 1), private supplement has no significant effect, giving us little to no support for the hypothesis, H3, presented above.

Discussion and Conclusion:

As Palfreyman said in his 2011 study, "there is simply not enough going into gathering data on the [health care] system and its outcomes." As we have seen from the beginning of this study, the literature on health care access and its outcomes fails to provide solid answers as to what is the best system of overall public health (Morris 2000, 55; Hardcastle 2011, 319; Hunnicutt 2010, 155). Additionally, we came to see that while the literature addresses that the system needs to be re-evaluated, starting at the smallest parts to ensure better outcomes, there has been a lack of effort to clearly define or apply these measures (Pol & Thomas 1992; Nelson et al. 2002; Lovaglio & Monzani 2011). In my study, I set out to fill in the gaps that the literature left regarding which health care access system would provide the best outcomes in a quantitative manner, which the current literature also fails to do.

While I do feel that this study comes to strong and clear conclusions about how health care access affects outcomes, if given more time and resources, I would like to apply more dependent variables/ outcomes to the explanatory variables. Not only would this expand my data set and make it even more applicable, but it would also allow me to make stronger conclusions about which health

outcomes truly are affected by the system. While I did originally have some other dependent variables, such as hospital beds available and the percentage of the population with health care coverage, there was simply not enough reliable and measurable information available to fully evaluate and apply these variables to the sample at hand.

Overall, the study I have presented here addresses the issues that the current literature and available studies on the topic fail to address. Most of the studies that we examined focus solely on one type of system or the other, identifying either the pros or cons, without addressing or providing data that supports the other system or the statements they provide (Armstrong 2008; Hunnicutt 2010; Morris 2000; Pol & Thomas 1992; Hardcastle 2011). Additionally, while the current literature does discuss health care outcomes and their application to the system, they fail to identify what these outcomes may be and which system leads to the improvement of such (Pol & Thomas 1992; Lovaglio & Monzani 2011). In my study, I not only examine both systems at play, providing a sample of 60 countries and the systems they have in place, but also identifiable outcomes and the effects each type of system has on these outcomes. Through my analysis, while we find that both private and public access systems have a positive effect on most of the outcomes, the private system often provides more of a positive effect on the given outcomes. In line with this, a higher expenditure per capita also provides a positive effect on the given outcomes. Based on this analysis, we find that data lends strong support to both the Access and Expenditure hypotheses (H1 & H2). This allows us to conclude that with Private Health Care Access and an increased Expenditure there will be a positive effect on health care policy outcomes, as presented in this study.

Appendix A: Dependent Variable Models

Independent Variables	Model 1- Neonatal Mortality	Model 2-DTP3 Immunizations	Model 3- HepB Immunizations	Model 4- Measles Immunizations	Model 5- Life Expectancy (Male)	Model 6- Life Expectancy (Female)
Private Access	**-16.72 .000*** **	**13.80 .001*** **	**18.12 .006*** **	**16.40 .000*** **	**5. 61 .025** **	**5.38 .051** **
Public Access	**-9.26 .000*** **	**8.34 .009*** **	**11.87 .020** **	**9.26 .001*** **	**.73 .689**	**.07 .972**
Private Supplement Expenditure	**-3.00 .058* **	**2.273 .242**	**4.35 .198**	**-.550 .757**	**-.002 .999**	**.37 .764**
	-.01 .000* **	**.005 .000*** **	**-.001 .397**	**.005 .000*** **	**.007 .000*** **	**.01 .000*** **
R- Squared	**.617**	**.271**	**.043**	**.280**	**.627**	**.619**
MAX	**70**	**99**	**99**	**99**	**82**	**86**
MIN	**0**	**20**	**4**	**23**	**36**	**37**
MEAN	**22**	**83**	**81**	**81**	**63**	**67**
MEDIAN	**18**	**91**	**88**	**86**	**68**	**73**
SAMPLE SIZE	**352**	**352**	**243**	**352**	**352**	**352**

Notes:

Note 1: Set up of Each Model

Line 1- B- value
Line 2- P- Value

Note 2:P- Value Explanation

*P- Value < 0.10 = 90 % Confident in General Application
** P- Value < 0.05 = 95 % Confident in General Application
*** P- Value < 0.01 = 99 % Confident in General Application

Note 3:

Values highlighted in red refer to the *dependent variable* in each model.

Appendix B: Linear Regression Results

Data 1: Neonatal Mortality:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.786[a]	.617	.613	12.568

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	88359.038	4	22089.760	139.841	.000[a]
	Residual	54813.436	347	157.964		
	Total	143172.474	351			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	44.568	2.295		19.421	.000
	Public Access to Care	-9.257	2.574	-.165	-3.597	.000
	Private Access to Care	-16.722	3.506	-.209	-4.770	.000
	Amount Spent on Health Care in International Dollars	-.009	.000	-.702	-19.019	.000
	Private Supplement	-3.002	1.580	-.074	-1.900	.058

a. Dependent Variable: Neonatal Mortality

Data 2: DTP3:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.521[a]	.271	.263	15.441

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30776.277	4	7694.069	32.270	.000[a]
	Residual	82735.166	347	238.430		
	Total	113511.443	351			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	67.539	2.819		23.955	.000
	Public Access to Care	8.339	3.162	.167	2.637	.009
	Private Access to Care	13.801	4.307	.194	3.204	.001
	Amount Spent on Health Care in International Dollars	.005	.001	.434	8.530	.000
	Private Supplement	2.273	1.941	.063	1.171	.242

a. Dependent Variable: DTP3 % of 1 year olds with vaccine

Data 3: HepB:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.207[a]	.043	.027	19.848

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4177.660	4	1044.415	2.651	.034[a]
	Residual	93755.081	238	393.929		
	Total	97932.741	242			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	68.740	4.554		15.095	.000
	Public Access to Care	11.868	5.062	.212	2.344	.020
	Private Access to Care	18.118	6.579	.236	2.754	.006
	Amount Spent on Health Care in International Dollars	-.001	.001	-.067	-.848	.397
	Private Supplement	4.345	3.365	.108	1.291	.198

a. Dependent Variable: HepB % of 1 year olds with vaccine

Data 4: Measles:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.529[a]	.280	.271	14.127

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26893.977	4	6723.494	33.691	.000[a]
	Residual	69247.978	347	199.562		
	Total	96141.955	351			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	66.215	2.579		25.671	.000
	Public Access to Care	9.259	2.893	.202	3.201	.001
	Private Access to Care	16.399	3.941	.250	4.161	.000
	Amount Spent on Health Care in International Dollars	.005	.001	.457	9.027	.000
	Private Supplement	-.550	1.776	-.017	-.309	.757

a. Dependent Variable: Measles % of 1 year olds with vaccine

Data 5: Life Expectancy (M):

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792[a]	.627	.622	8.909

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46241.373	4	11560.343	145.667	.000[a]
	Residual	27538.397	347	79.361		
	Total	73779.770	351			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	52.573	1.627		32.321	.000
	Public Access to Care	.732	1.824	.018	.401	.689
	Private Access to Care	5.606	2.485	.098	2.256	.025
	Private Supplement	-.002	1.120	.000	-.002	.999
	Amount Spent on Health Care in International Dollars	.007	.000	.782	21.455	.000

a. Dependent Variable: Life Expectancy (M)

Data 6: Life Expectancy (F):

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.787[a]	.619	.614	9.858

ANOVA[b]

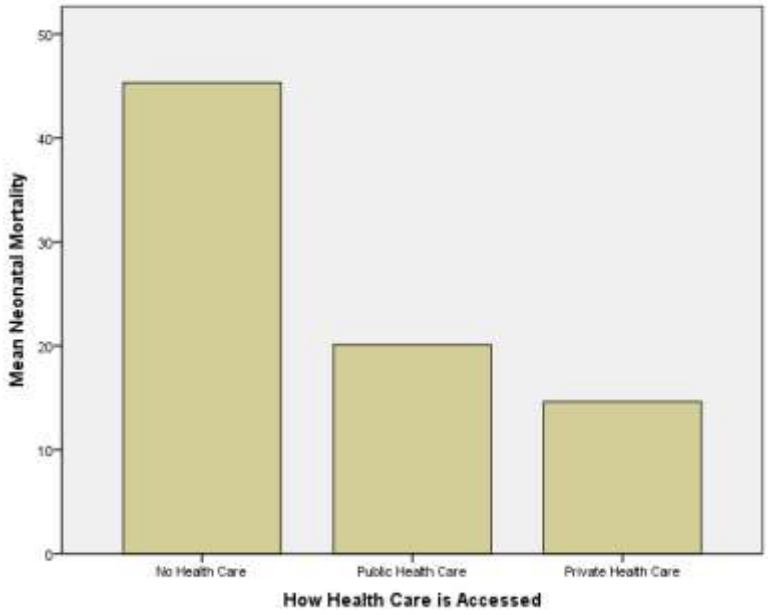
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54688.928	4	13672.232	140.701	.000[a]
	Residual	33718.844	347	97.172		
	Total	88407.773	351			

Coefficients[a]

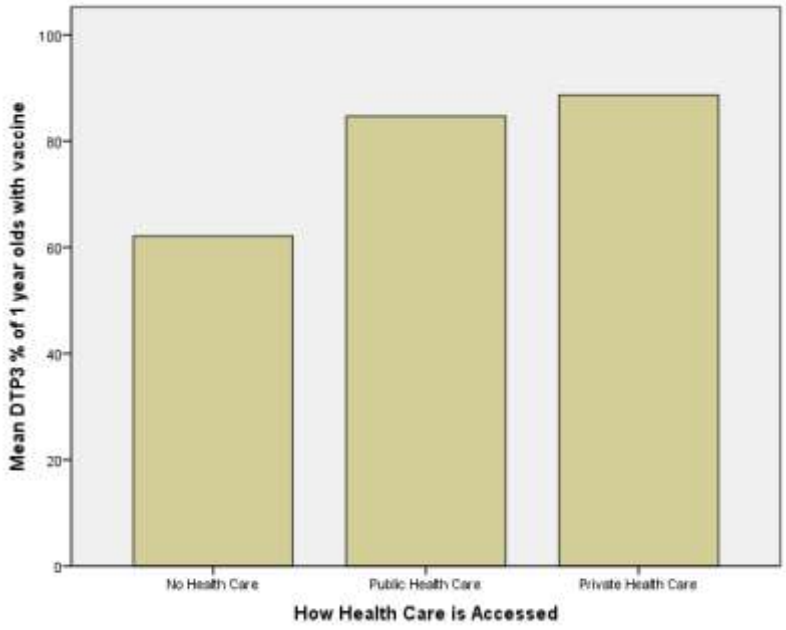
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	55.969	1.800		31.096	.000
	Public Access to Care	.071	2.019	.002	.035	.972
	Private Access to Care	5.382	2.750	.086	1.957	.051
	Amount Spent on Health Care in International Dollars	.007	.000	.776	21.060	.000
	Private Supplement	.372	1.239	.012	.300	.764

Appendix C: Bar Graphs- Dependent Variable vs. Access

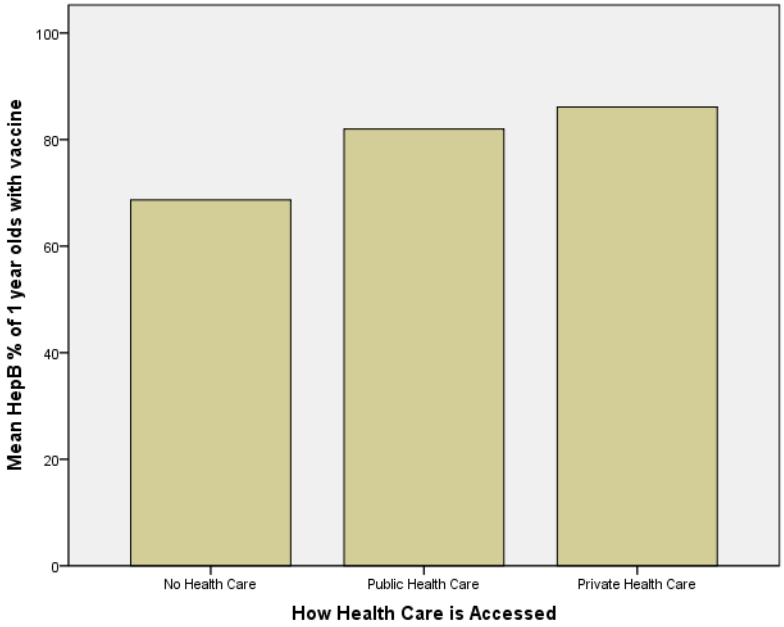
Graph 1: Neonatal Mortality and Access:



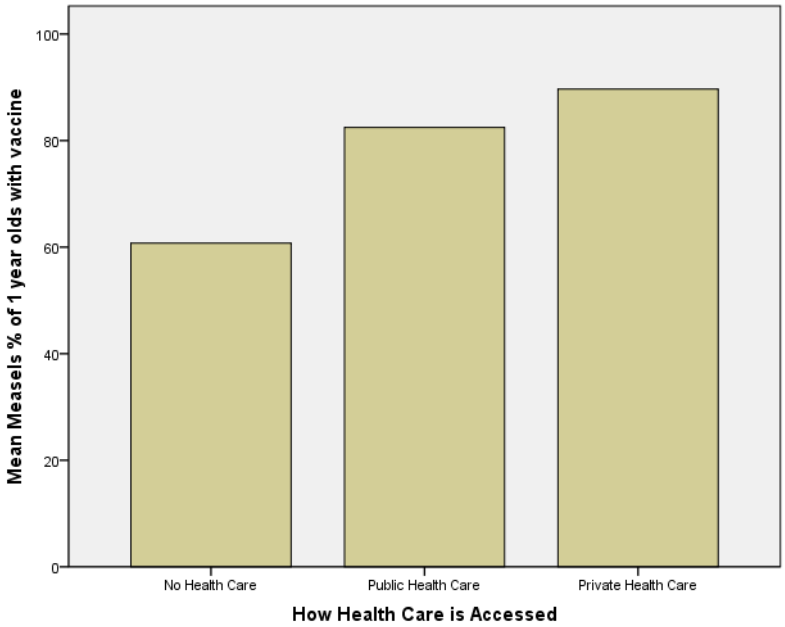
Graph 2: DTP3 and Access:



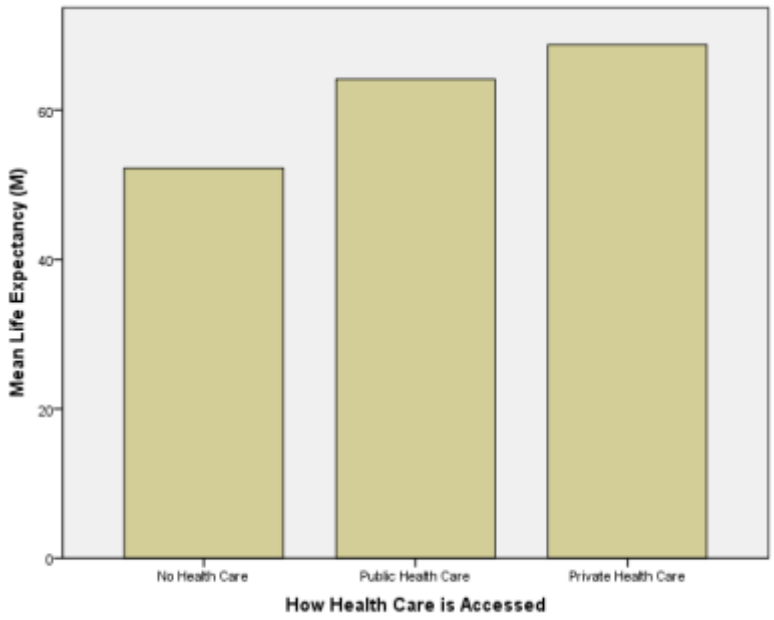
Graph 3: HepB and Access:



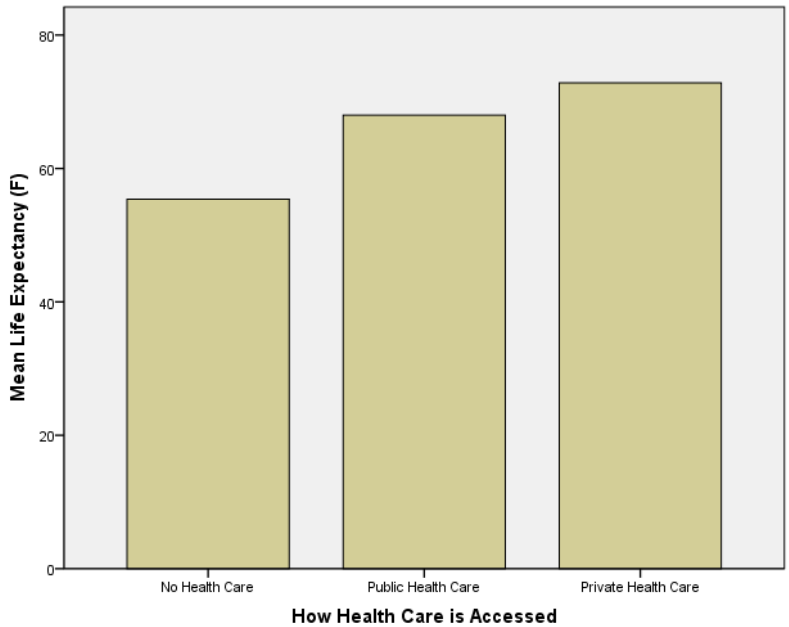
Graph 4: Measles and Access:



Graph 5: Life Expectancy (M) and Access:

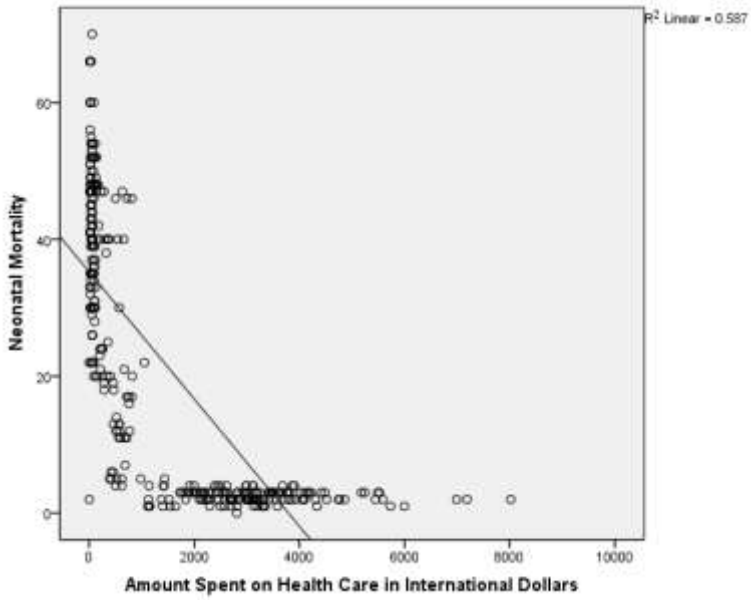


Graph 6: Life Expectancy (F) and Access:

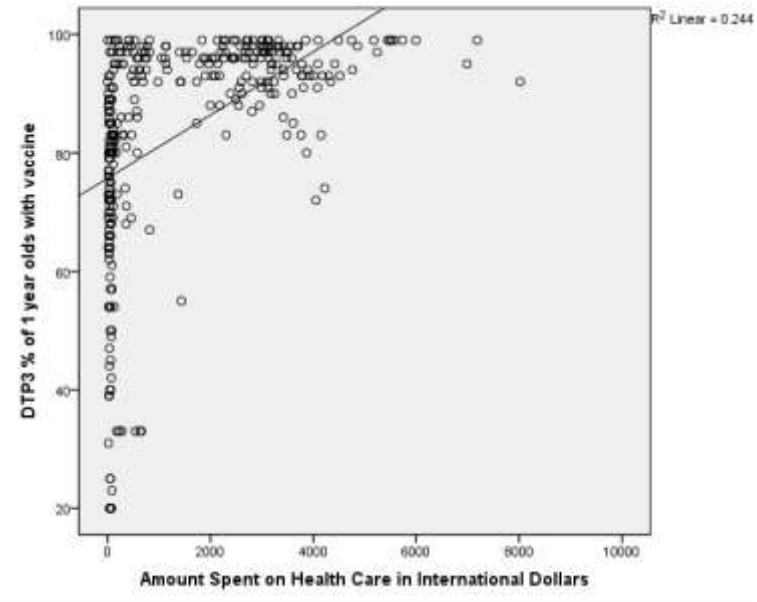


Appendix D: Linear Scatter Plots- Dependent Variables vs. Expenditure

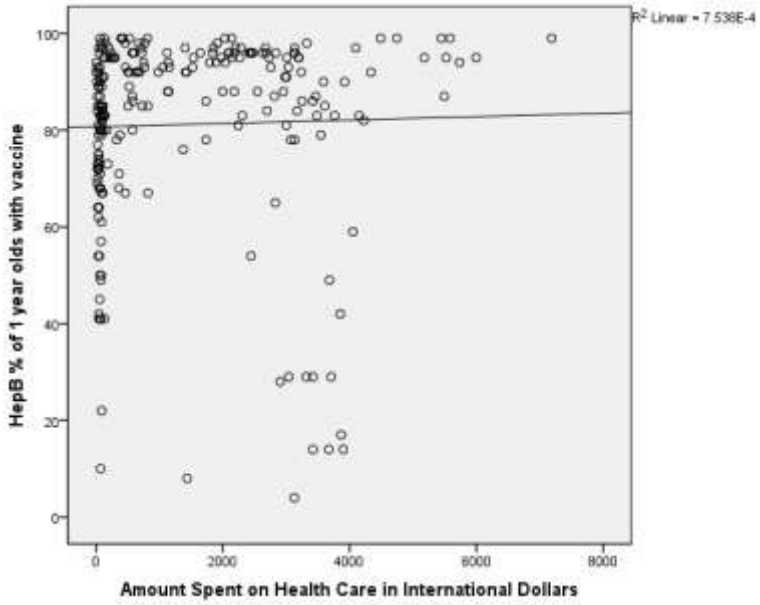
Graph 1: Neonatal Mortality and Expenditure:



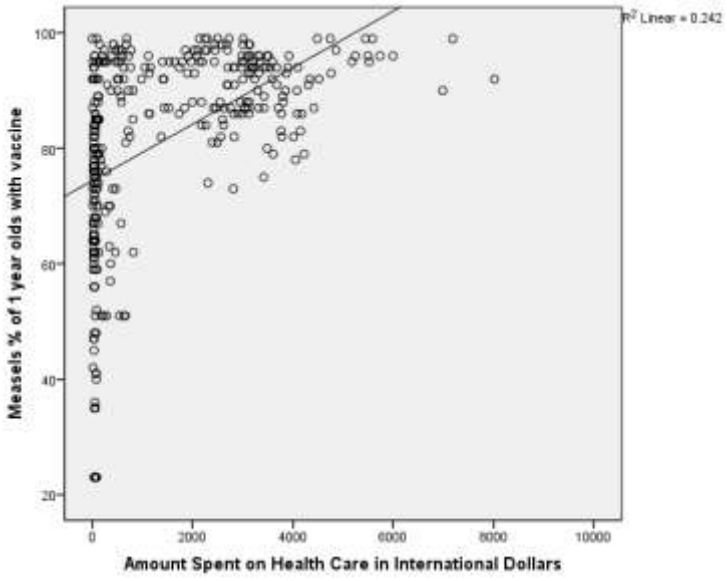
Graph 2: DTP3 and Expenditure:



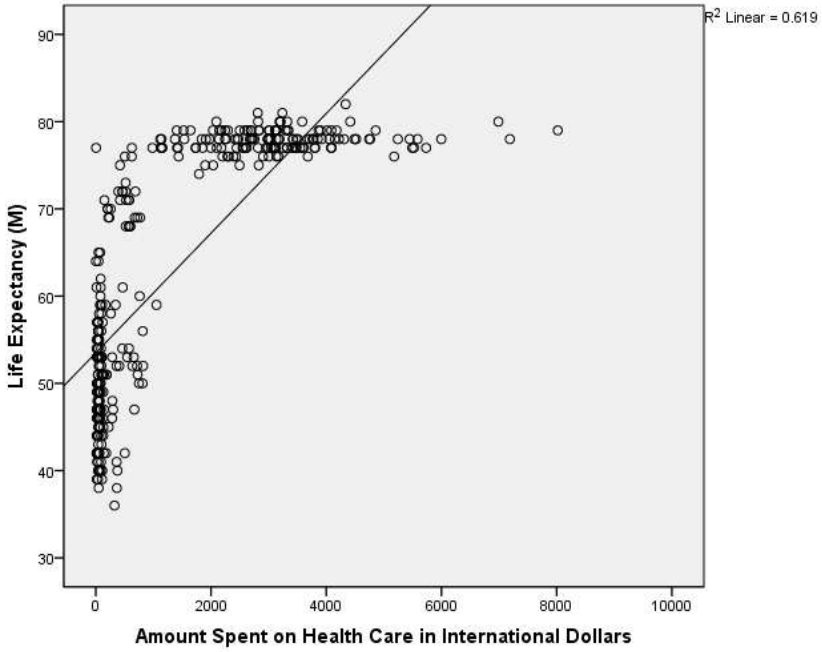
Graph 3: HepB and Expenditure:



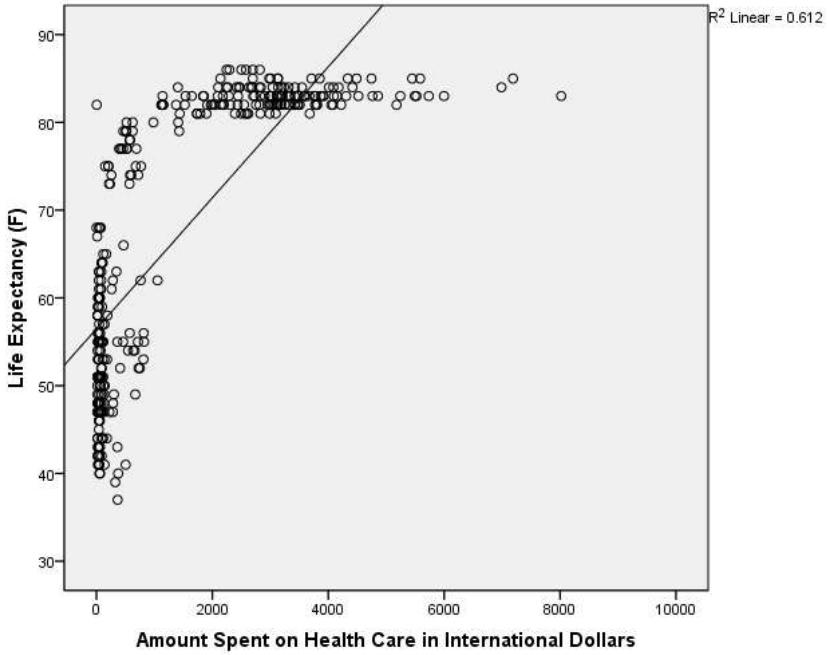
Graph 4: Measles and Expenditure:



Graph 5: Life Expectancy (M) and Expenditure:



Graph 6: Life Expectancy (F) and Expenditure:



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Source List 1: Sources for Coding Access Variables

Afghanistan: http://amec.glp.net/c/document_library/get_file?p_l_id=844072&folderId=1038976&name=DLFE-20312.pdf
Andorra: http://www.europe-cities.com/en/633/andorra/health/
Angola: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CGMQFjAA&url=http%3A%2F%2Fwww.healthsystems2020.org%2Ffiles%2F2616_file_Angola_HSA_Report_Final_7_9_2010.pdf&ei=uDdmT8LoBaLw0gH95Lm3CA&usg=AFQjCNG8xrGZrdMUV6UDhdnELV_M1v9M-w&sig2=nCQReSv2sGqm7daa0uwUpg
Austria: http://www.europe-cities.com/en/633/austria/health/
Belgium: http://www.europe-cities.com/en/633/belgium/health/
Botswana: http://www.gov.bw/en/Ministries--Authorities/Ministries/MinistryofHealth-MOH/About-MOH/About-MOH/
Cambodia: http://www.globalmedicine.nl/index.php/global-medicine-1/185-cambodia-building-a-health-system
Cameroon: http://www.usc.es/~economet/reviews/ijaeqs323.pdf
Canada: http://www.canadian-healthcare.org/
CAR: http://www.unhco.org/country-profile-central-african-republic/
Chad: http://www.unhco.org/country-profile-chad/
Colombia: http://www.unhco.org/country-profile-colombia/
Congo: http://www.unhco.org/country-profile-congo/
Cyprus: http://www.europe-cities.com/en/633/cyprus/health/
DR of Congo: http://www.globalsurance.com/resources/democratic-republic-congo/
Equatorial Guinea: http://www.globalsurance.com/resources/equatorial-guinea/
Ethiopia: http://www.globalsurance.com/resources/ethiopia/
France: http://www.europe-cities.com/en/633/france/health/
Germany: http://www.europe-cities.com/en/633/germany/health/
Greece: http://www.europe-cities.com/en/633/greece/health/
Guinea: http://www.globalsurance.com/resources/guinea/
Guinea- Bissau: http://www.globalsurance.com/resources/guinea-bissau/
Iceland: http://www.europe-cities.com/en/633/iceland/health/
Ireland: http://www.europe-cities.com/en/633/ireland/health/

Israel: http://www.euro.who.int/__data/assets/pdf_file/0007/85435/E92608.pdf
Italy: http://www.europe-cities.com/en/633/italy/health/
Japan: http://www.kaiseredu.org/Issue-Modules/International-Health-Systems/Japan.aspx
Laos: http://www.aaahrh.org/reviewal/Lao%20-%20All.pdf
Lesotho: http://www.globalsurance.com/resources/lesotho/
Liberia: http://www.unhco.org/country-profile-liberia/
http://www.who.int/hac/donorinfo/cap/Liberia_compendium_Jan06.pdf
Luxembourg: http://www.europe-cities.com/en/633/luxembourg/health/
Malawi: http://www.malawiproject.org/about-malawi/the-nation/hospitals-healthcare/
Mali: http://www.unhco.org/country-profile-mali/
Malta: http://www.europe-cities.com/en/633/malta/health/
Mauritania: http://www.mapsofworld.com/mauritania/healthcare/
Monaco: http://www.europe-cities.com/en/633/monaco/health/
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Sweden: http://www.europe-cities.com/en/633/sweden/health/
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Source List 2: Source for Dependent Variables

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Source List 3: Source for WHO Country's System Rank:

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