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The Influence of Number of Physicians on Infant Mortality Across Nations

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The Impact of Number of Physicians on Infant Mortality Across Nations

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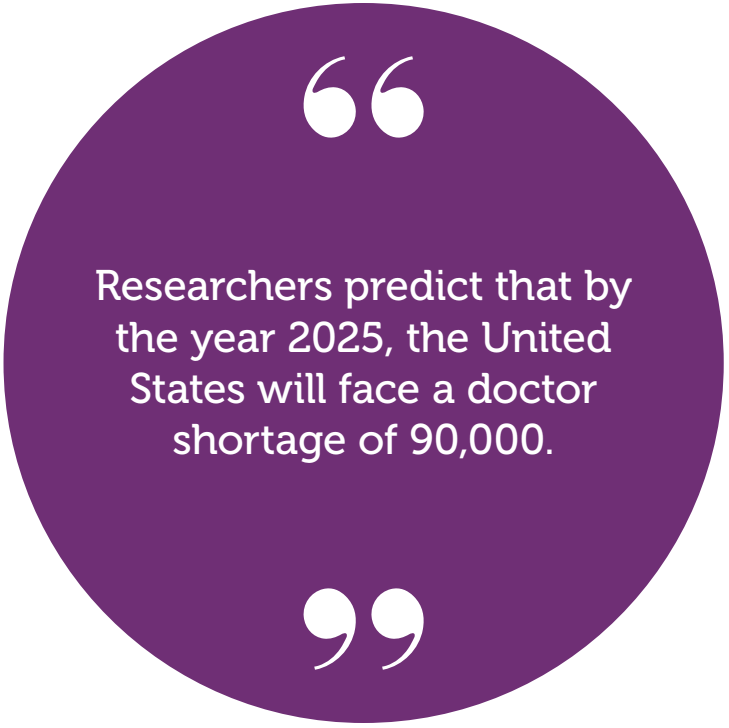
The United States will be facing a 90,000-physician shortage by 2025. In order to determine what this may do to the health of the community, it is imperative to analyze the relationship between number of physicians in a population and the population's infant mortality rate. Previous studies have found that some of the factors that affect infant mortality are debt dependence, economic disarticulation theory, social inequality, and female access to education. Using bivariate regression on 147 countries, this study found a significantly strong negative relationship between number of physicians and infant mortality across nations, and that the number of physicians in a population could explain 46% of the variability in infant mortality across nations. Data was derived from World Bank for two specific years, 2010 and 2013. Further studies need to be conducted to determine what other variables have an effect on infant mortality since this study was limited to the amount of physicians in a population. Additionally, other dependent variables, like life expectancy rate and maternal mortality rate, should be included in these studies in order to determine the effect the number of physicians have on those health outcomes.

Introduction

Researchers predict that by the year 2025, the United States will face a doctor shortage of 90,000.[1] Not all countries have a large quantity of doctors, yet they still acquire good health outcomes. Since this is predicted to be a problem for the United States in the next ten years, it is important to look at the impact that physicians have on a country's health. It would be necessary to compare across countries in order to have a better idea of the effect physicians have on the health of their nation. By doing this, I would be able to ascertain how much the physician shortage will impact the health of the United States. The typical measure to look at when it comes to determining the health of a country is infant mortality. It is a common indicator of health for a population because it is connected to education, economic development, and the accessibility of health services in that country.[2] Just as the whole population can be affected by environmental changes, so can infants since they can be too weak to counter the effects of the environment, further indicating the poor health of the population. Countries with significantly high rates of infant mortality also tend to have bad environmental conditions, like poor waste sanitation, malnourishment, lack of clean water, etc.[3]

Various studies have been conducted looking at various indicators that affect infant mortality. All of these indicators are important because they can all relate to one another and aid in the research that is being done in order to determine the effects of physician density across all nations. However, the rate of infant mortality varies throughout countries. The countries tied with the lowest infant mortality are Luxembourg and Iceland at 1.60 infants per 1000 live births. Meanwhile, the highest infant mortality rates were found in Sierra Leone and Somalia with 93.8 and 90.1 infants per 1000 live births, respectively. What was intriguing was the physician density across nations. The lowest physician density was in Tanzania, with a rate of 0.08 physicians per 1000 people, and Liberia, with a rate of 0.014 physicians per 1000 people. Meanwhile, the highest physician density was found in Qatar, with a 7.74 physicians per 1000 people, and Cuba, with 6.72 physicians per 1000 people. Since variability exists in these mentioned extremes, it was necessary for this study to look transnationally at the data available in order to acquire a clearer picture of the relationship between physicians and infant mortality. Before looking at the data transnationally, it was necessary to be aware of additional factors that may play a role in infant mortality as well as the social theory behind those variables.



Modernization Theory on Infant Mortality

Modernization theory explains the effect of a country's economic state on its development. This theory says that all nations fall on the economic spectrum between traditional societies with limited production of agriculture and no emphasis on profit and modern societies that emphasize the importance of the population's welfare and quality of life.[4]

Modernization theory says there would be a decline in infant mortality during and immediately after Take-Off, the second economic stage of modernization theory, when countries are focused on developing economically. As a society economically develops, more resources become available, like better education, housing, food quality, and medical care, thus decreasing infant mortality rate.[5] When countries reach the last economic stage, High Mass Consumption, the emphasis is on quality of life

through better sanitation, education, housing, and so on. Societies at this stage can prosper because they have the resources that they need.[6]

Numerous studies have looked at a variety of variables pertaining to modernization theory including industrial employment, GDP per capita, urbanization, energy consumption, capita, and agricultural density.[7] All of these variables were found to not be predictors of infant mortality, signifying that there was no significant support for modernization theory having an effect on infant mortality rates. Ferrarini and Norström's study made suggestions as to why these factors did not have an effect on infant mortality rates. They found that economic growth decreased the infant mortality rate in the earlier part of the twentieth century, but during the postwar time period economic growth either had a negative effect, or no effect on infant mortality. This suggested that, after a certain level of development in a nation's economy, there would be a decrease in the possible amount of improvement in health outcomes. That was why, in some of the eighteen welfare democracies, there was no significant effect on health. Meanwhile, in those welfare democracies that saw a negative effect between development of economy and decreases in infant mortality rate, it was suggested that it could be related to increased work-related stress, by-products of work like air pollution, and participation in unhealthy habits like drugs.[8]

Dependency Theory/World-System's Theory on Infant Mortality

The dependency/world-system's theory opposes the viewpoint of modernization theory by not attributing countries' development or wealth to going through the five economic stages; it says that some countries are rich because other countries are poor. This theory organizes each country into three different classifications: periphery, semi-periphery, and core countries. Periphery countries are those that are underdeveloped whose main source of exports tends to be agriculture. Core countries are richer countries that exploit "lesser" countries. Semi-periphery countries have characteristics of both the core nations and the periphery nations; they exploit "lesser" countries but are also exploited by richer countries.[9] Modernization theory would say that underdeveloped countries are in their current position because of their own economic, cultural, social, and political characteristics while dependency theory would argue that those countries are a product of past and current economic relations between underdeveloped or periphery countries.[10] Regardless if a periphery country goes through the economic growth stages, it will not become a core country because it will be exploited by core countries in order to lose their surplus.[11] Core countries have exploited periphery and semi-periphery countries by "forc[ing] them onto political and social paths [making] technological advancement and competition with the core difficult, if not impossible."[12]

When applied to infant mortality, dependency/world-systems theory would say that the underdeveloped countries' economic dependency on core countries causes core countries to take their resources and surpluses, causing an increase in infant mortality rate.[13] As core countries take their surpluses, they are affecting the growth of periphery and semi-periphery countries since those benefits could have promoted economic growth and creation of public health programs.[14]

A study looked at the economic dependence of low and middle-income countries because previous studies had found that this was a common factor that reduced human welfare and increased the infant mortality rate.[15] Researchers found that debt dependence has a positive relationship with infant mortality of 0.44 and concluded it was the main way core countries took peripheral countries' surplus. This was used as partial support for the dependency/world-systems theory.[16] Export commodity concentration, a proportion of the largest commodity to total exports, was found to not have a significant effect on infant mortality.[17] Yet, Jorgenson and Burns found that it does have a significant positive relationship with organic water pollution of 0.44, which has a positive relationship with infant mortality rates of 0.43, thus indicating an indirect relationship of export commodity concentration and infant mortality rate.[18]

Previous studies have found that economic and social inequalities have an effect on the health of a community.[19] In order to test the effects of economical inequalities, researchers used factors that tested the economic disarticulation theory. This theory argues that, when a country's economic sectors are not evenly developed, it results in unfavorable effects on the population's health. Disarticulation tends to occur because of the over-reliance on foreign capital and external markets, which

results in fewer funds towards health and human well-being. This study found a strong positive relationship between the factor for economic disarticulation theory and infant mortality.[20] This finding was further supported by another study that looked at the socioeconomic status of a country and its infant mortality rate. Researchers found that poorer households both in low-income and middle-income countries had high infant mortality rates, and countries with a higher income had lower rates of infant mortality. However, the richer countries' poor households tended to have worse infant mortality rates compared to poorer countries' poor households.[21] Dependency/world-system's theory would explain this as a result of the relationship between periphery countries and core countries where some sectors of the country are exploited so the country as a whole can move towards modernization.

Studies have found that social inequality has an effect on infant mortality across all types of nations.[22] The Whitehall studies of British civil servants further supported the relationship between health and the social inequality since it found that a person lower in economic hierarchy had poorer health compared to a person higher in economic hierarchy.[23] Healthcare financing was found to decrease the extent of wage inequality, thus causing a decrease in the communities' social inequalities. By improving the community's overall health care system, it would correct the negative consequences from social inequalities, as well as decrease the infant mortality rate.[24]

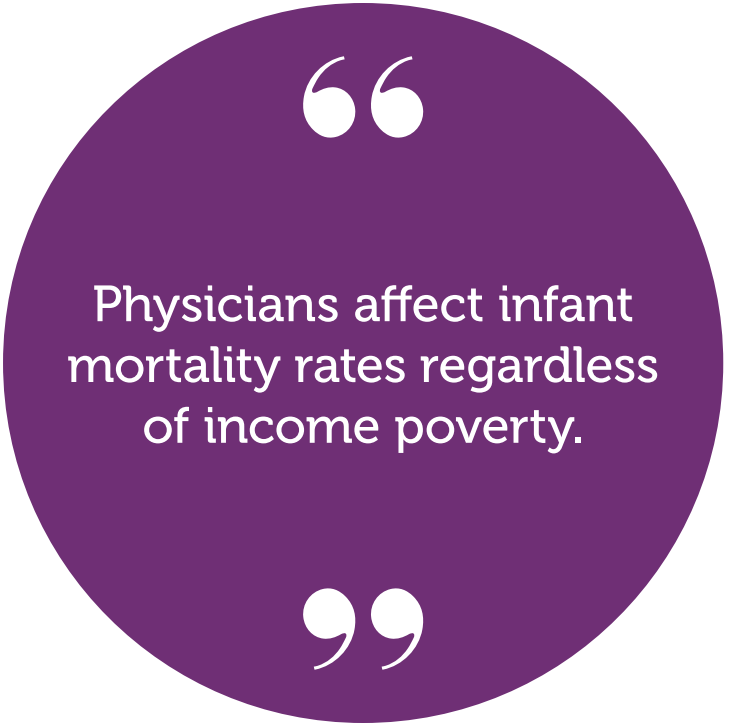
Gender Stratification Theory on Infant Mortality Rate

The gender stratification theory is a subset to many theories. It has a focus on division of labor between males and females where males tend to be thought of as the provider and more important than women who have responsibility for other labor acts. However, as industrialization grew, female social status started shifting so women became enthused in doing paid work rather than being a housewife. This interest resulted in a decline in the birth rate.[25]

A previous study tested the gender stratification theory on infant mortality and hypothesized that, by increasing the status of females through access to education, employment, health care status, and nutrition, there would be a decrease in the infant mortality rate.[26] Frey and Field cited that previous studies found that from all of the different components that make up female status like political, economical, educational, and other factors, female education was the most impactful.[27] The reasoning behind that finding was that educated mothers were more likely to seek health care for their child, be able to speak to health care providers, and have positive effects on the family balance in terms of child care. These findings caused the Frey and Field study to look at the percent of secondary school age females who were in secondary school.[28] It found, like previous studies, that female education had a strong negative relationship with infant mortality. The higher the status of a female, the lower the infant mortality rate.[29]

Importance of Looking at Quantity of Physicians

There is a need to investigate the effects of physicians on infant mortality because their knowledge and advice is what promotes and changes health behaviors in the population. Physicians give pregnant women advice about what they should and should not do during



pregnancy, like take prenatal vitamins, stop drinking alcohol, breastfeed, use bed nets if the area is susceptible to malaria, etc. Furthermore, they inform mothers about the consequences of their actions if they do not follow the recommendations. Health care has been found to be a determinant of population health with physicians playing a significant role in it.[30] A previous study looked at the effects of physicians cross-country both with and without income poverty and found that physician density was an important indicator of infant mortality. For people without income poverty, the effect was -0.183 while for people with income poverty it was -0.174.[31] This shows that physicians affect infant mortality rates regardless of income poverty.

Hypothesis

I predict that there is a negative relationship between the number of physicians and the infant mortality rate across countries, where nations with a larger quantity of physicians will have a lower rate of infant mortality in comparison to countries with a smaller quantity of physicians. The reasoning behind this hypothesis is that it is believed that if more health care is available to the population, it is more likely that the population will get the help it needs to be healthier.

Methods

Sample

The unit of analysis is the independent nation state. My sample consists of 147 both developed and less developed countries with complete data for both variables. This data was acquired from the World Bank.

Characteristics of the Sample

The two variables that I am using to conduct this study are number of physicians per 1000 people in 2010, and infant mortality rate per 1000 live births in 2013. In order for this study to be an indication of the actual effects that the number of physicians in a population has on infant mortality, I made the decision to acquire the data from two separate years since the effect of number of physicians in a population would not be noticeable within the same year.

The original sample contained 215 countries, but list-wide deletion was performed on the sample because there were twenty-three missing cases for infant mortality in 2013 and sixty-eight missing cases for the number of physicians in 2010. Because of the need to perform these list-wide deletions, sixty-eight countries were excluded from the analysis in order to have a comprehensive analysis and conclusion on the data. This data was not further changed through log transformation because the means for either variable were not double the median. The analytic strategy used was bivariate regression, which tested out the relationship and potential association between the two variables, the infant mortality rate (2013), and the number of physicians (2010) across nations.

Independent Variable

The independent variable in this study was number of physicians per 1000 people in 2010. The long definition from the World Bank is "Physicians include generalist and specialist medical practitioners."[32] Additionally, the World Health Organization (WHO) has found that at least 2.5 physicians, nurses, and midwives per 1000 people are needed in order to properly attend to patients in a primary care setting.[33] This data was collected from

household and labor force surveys, censuses, and administrative records.

Dependent Variable

The dependent variable of this study was infant mortality rate per 1000 live births in 2013. The World Bank defines this variable as "the number of infants dying before reaching one year of age, per 1000 live births in a given year."[34] This data was collected through vital registration systems and estimates made both directly and indirectly on sample surveys and censuses. Infant mortality rate is a measure most often used to look at how a country is doing overall health-wise since the incidence and prevalence of diseases is not always available.[35]

Results

Table 1 presents descriptive statistics for the independent variable, number of physicians per 1000 people in 2010, and dependent variable, infant mortality rate in 2013. This table shows that the average number of physicians per 1000 people in 2010 for surveyed countries was 1.83 physicians. Meanwhile, over 50% of countries reported more than 1.60 doctors per 1000 people in 2010. There are no extreme outliers since the mean is not being pulled significantly in either direction. Additionally, both of these measures fall below the World Health Organization's recommendation of 2.5 physicians per 1000 people. Because there are no extreme outliers, this may mean

Table 1

Measures of Central Tendency for Number of Physicians in 2010 & Infant Mortality in 2013			
Variables	Mean	Median	Mode
Number of Physicians (2010)	1.83	1.60	0.02 0.06 0.30 2.07 3.78
Infant Mortality Rate (2013)	22.61	14.10	3.10 3.20 3.30

"These measures fall below the World Health Organization's recommendation of 2.5 physicians per 1,000 people."

that many countries have the less than recommended 2.5 physicians.

The common values found in this data set were 0.02, 0.06, 0.30, 2.07, and 3.78 physicians per 1000 people. The countries that had a rate rounded to 0.02 physicians per 1000 people were Malawi, Niger, Sierra Leone, and Ethiopia. Countries that had a rate of 0.06 physicians per 1000 people were Benin and Senegal, while the countries of Cabo Verde and Bangladesh had the rate of 0.30 physicians per 1000 people. Countries that had the higher rates of physicians per 1000 people were Poland and Canada with a rate of 2.07 physicians and Azerbaijan and Belgium with a rate of 3.78 physicians. It is noticeable that the countries that had less than 2.5 physicians per 1000 people tended to be low- or low-middle-income countries while the countries that had more than 2.5 physicians per 1000 people were middle-high- or high-income countries. Additionally, of these values, only one value was above the recommendation, which was 3.78 physicians for the countries of Azerbaijan and Belgium.

The second row of Table 1 shows that the average infant mortality rate was 22.61 infants per 1000 live births over

Table 2

Measures of Variability for Number of Physicians in 2010 & Infant Mortality in 2013							
Variables	Standard Deviation	Variance	Highest Data Point	Lowest Data Point	Range	Interquartile Range	Skew
Number of Physicians (2010)	1.60	2.56	7.74	0.01	7.73	2.62	0.79
Infant Mortality Rate (2013)	21.71	471.40	93.80	1.60	92.20	30.80	1.18

surveyed countries. Over 50% of countries reported more than 14.10 infant deaths over 1000 live births in 2013. It is evident that an eight-point difference exists between the mean and median, signifying that there are outliers pulling the mean up away from the median.

The common values in this dataset were 3.10, 3.20, and 3.30 infants per 1000 live births for surveyed countries. The countries that have an infant mortality of 3.10 infants per 1000 live births were Denmark, Italy, and Portugal. Countries with an infant mortality of 3.20 infants per 1000 live births were Austria, Ireland, and the Republic of Korea. The highest mode for infant mortality was 3.30 infants per 1000 live births in the Netherlands, Germany, and Israel. These values are significantly lower than both the mean and median, which would imply that it is more common for countries to have a lower infant mortality rate.

Table 2 presents the measures of variability for the independent variable, number of doctors per 1000 people in 2010, and dependent variable, infant mortality rate in 2013. The variance for the number of physicians, the average of the squared differences from the mean, was 2.56. This measurement is used to ensure that the calculated standard deviation, 1.60, is accurately portraying all of the data points' deviations from the mean. The standard deviation for number of physicians per 1000 people, 1.60, looks at the average variance from case to case.

The highest data point measured was 7.74 physicians per 1000 people, and the lowest data point was 0.01 physicians per 1000 people in 2010. The country with the largest number of physicians was the high-income country of Qatar, and the country with the least number of physicians was the low-income country of Tanzania. This sample ranges by 7.73 physicians across all surveyed countries, but range is not the best indicator of variability because outliers can change the sample's overall distribution variability. For this reason, interquartile range was calculated, 2.62 physicians per 1000 people, which was not affected by outliers.

On Table 2, the calculated skew is 0.79. Skew is a measurement of variability that gives a better idea of what the data signifies. It is a representation of potential imbalance and asymmetry from the mean of the data distribution. Although the skew falls between the allowed -1.5 and +1.5, which would not affect the variable's data drastically, there is a slight right hand skew since it is more than halfway between 0 to +1.5 on this scale. This skew of 0.79 is a result of Qatar's number of physicians pulling the data's mean up and away from the median, which can be confirmed through Table 1's recorded mean and median.

Table 2 shows that the infant mortality rate's variance, which is the squared deviations of the data points from the mean, is 471.40. This measurement confirms that the standard deviation of this dataset, 21.71, is accurately represents all of the data points' deviations from the mean. The standard deviation of 21.71 is the average variance from case to case in this dataset. The country with the highest infant mortality rate was Sierra Leone with 93.80 infant deaths per 1000 live births.

The countries with the lowest infant mortality rate of 1.60 infant deaths per 1000 live births were Iceland and Luxembourg. The range of infant mortality is 92.20. Yet, like stated previously, range is not the best indicator of variability because of the effects that outliers can have, which was why interquartile range was calculated.

The calculated interquartile range was 30.80 infant deaths per 1000 live births. The skew of 1.18 in Table 2 indicates that there are outliers. Although the skew falls within the allowed -1.5 to +1.5, it is still closer to +1.5 then it is to 0 thus meaning there is a right-hand skew. Additionally, looking at Table 1's reported mean and median shows how the outlier countries affect the mean of this variable resulting in a difference between the mean and median.

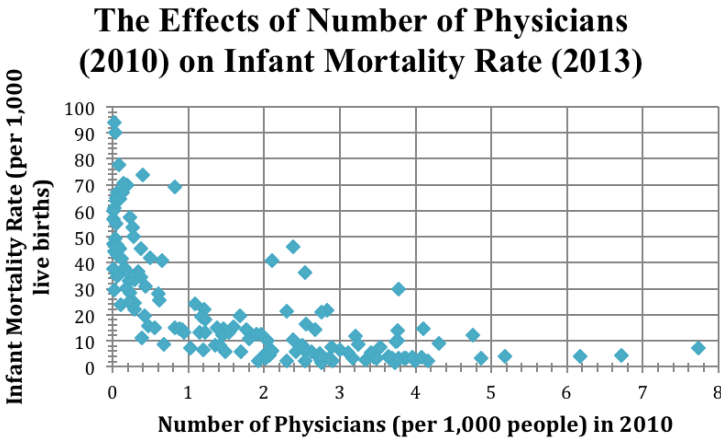
After looking at each variable individually in order to understand the patterns that exist within their own dataset, it is necessary to look at the relationship they have with each other. Graph 1 visually shows the negative relationship between the quantity of physicians per 1000 people and infant mortality per 1000 live births. The data points move from the upper left to lower right, yet there are a few data points on the lower right extreme that are away from the majority of the data points. This visual signifies that the more physicians there are per 1000 people, the lower the infant mortality rate is, while the lower the quantity of physicians per 1000 people, the higher the infant mortality is. Additionally, the few

Table 3

OLS Regression Predicting Infant Mortality	
Number of Physicians	-9.21*** (0.83)
Intercept	39.45
R^2	0.46
r	-0.68
N	147

Notes: Regression coefficient flagged for statistical significance, where p < .05*, .01**, .001***; standard error reported in parentheses.

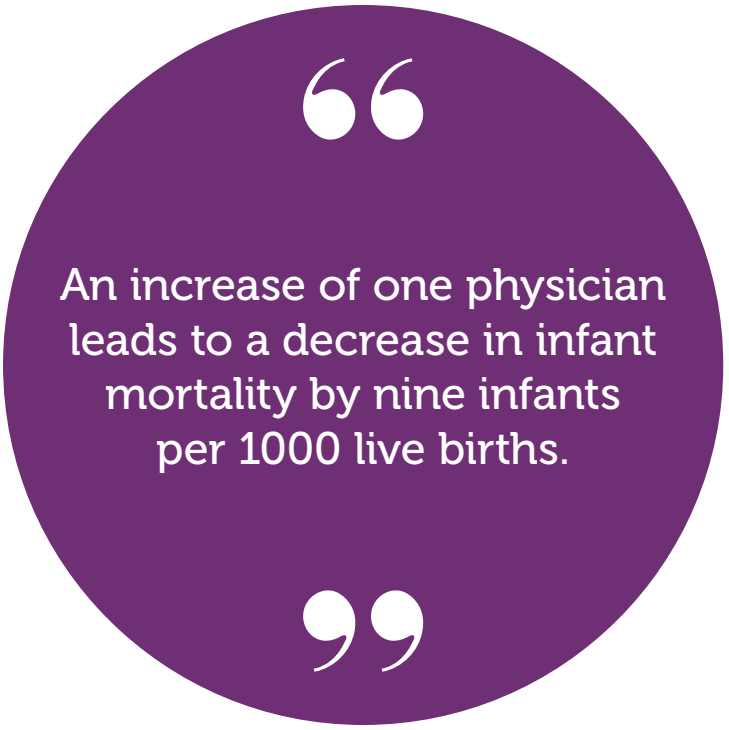
Graph 1



data points that stray from the main consensus of data are outliers that have significantly high numbers of physicians and low infant mortality rates.

Table 3 presents the regression results between infant mortality per 1000 live births and number of physicians per 1000 people across 147 countries. Pearson's r, or the correlation coefficient, is -0.68, suggesting that there is a strong negative relationship between infant mortality and number of physicians across nations. This result can be visually seen on Graph 1 as the data points move from the upper left to lower right, therefore indicating a negative relationship. The bivariate regression analysis indicated that the number of physicians per 1000 people in 2010 was found to have a statistically significant relationship with infant mortality rate per 1000 live births in 2013. It can be said with 99.99% confidence that a relationship exists between number of physicians and infant mortality rate across all nations. This means that the null hypothesis, that states there is no relationship between infant mortality in 2013 and number of physicians in 2010 across countries, can be rejected.

The regression coefficient, -9.21, indicates that an increase of one physician in a community results in a decrease of infant mortality rate by nine infants per 1000 live births across nations. The coefficient of determination, which reveals the total variation in the dependent variable explained through the independent variable, is 0.46. This signifies that the number of physicians per 1000 people explains 46% of the variation in infant mortality rate



across nations. What this means is that the number of physicians in a population is not the only factor that contributes to infant mortality rate, but it does represent almost half of what does affect infant mortality rate. Lastly, the recorded intercept on Table 3 was 39.45, which means that when a country does not have access to any physicians, the infant mortality is expected to be 39 infant deaths per 1000 live births.

Conclusion

It was hypothesized that there would be a negative relationship between the number of physicians per 1000 people in 2010 and infant mortality per 1000 live births in 2013 across nations. Through the analysis of the data obtained from the World Bank, it is safe to say that the null hypothesis can be rejected although outliers were found in my individual datasets. The country that affected the quantity of physicians' data set was Qatar, a high-income, non-OECD country. The countries that affected the infant mortality data set were Somalia and Sierra Leone, with more than 90 infant mortality deaths per 1000 live births. These outliers skewed the datasets slightly to the right as was seen in Table 2. Regardless of the skew that was found in the data, it did not affect the overall findings through regression analysis.

The regression bivariate analysis through different components came to find a significant strong negative relationship between infant mortality rate and number of physicians in a population. I am 99.99% confident that the relationship between infant mortality and number of physicians is generalizable across all nations, including those countries that were excluded initially. Additionally, it was found that the number of physicians per 1000 people explains nearly 50% of the variation in infant mortality across nations, which means that it is a key determinant in infant mortality rate. Lastly, an increase of one physician leads to a decrease in infant mortality by nine infants per 1000 live births.

These findings indicate that the quantity of physicians is an important factor in determining the rate of infant mortality, but it only contributes to 46% of the rate. What this means is that there are other factors that have an effect on infant mortality and make up more than 50% of the variation in infant mortality. Although the United States is heading towards a physician shortage, which, as can be seen through the data, will impact the U.S. population strongly, there are other factors that contribute to the health of the population. When looking at the data specific to the United States, the average number of physicians per 1000 people is 2.42. That is below the recommended 2.5 physicians per 1000 people from the WHO, but it is above the mean and median of the whole dataset, and falls in the first 75% of the cases. When looking at the United States' infant mortality rate of 5.9 infants per 1000 live births, it has been found to be significantly below the mean and median of the whole dataset. By comparing the United States to the sample, it is evident that the United States is doing well in comparison to other countries. This means that, although a physician shortage will occur in the next decade, the health of the U.S. should not deteriorate to the levels of other countries, not to mention that there could be an initiative by the American Medical Association to increase the number of physicians in the U.S.

A possible solution to counterbalance the effects of a physician shortage is to conduct further studies on the effects of other factors that contribute to infant mortality. As was previously mentioned, studies have

found that factors like debt dependence and economic disarticulation theory will cause increase infant mortality rates, but improvement of social inequalities and female access to education will decrease infant mortality rates. What these future studies may conclude is unknown to me, but there is a need for them in order to better understand what affects infant mortality rate and the health of the population. However, with the results from this study, it could also be necessary for the U.S. public to demand more from the government in order to neutralize the effects of a physician shortage. Possible changes they can demand are incentives to be given to medical students to become primary care physicians or that state laws be changed so that other health personnel, like physician assistants or nurse practitioners, can be given the right to treat and diagnose patients independently.

Strengths

The most important strength of this study was the use of time order. By using the 2010 data for number of physicians per 1000 people, I was able to see the effects that this had on infant mortality in 2013. This allowed my conclusions to be more accurate than if I had used data from the same year. Although sixty-eight countries were dropped from the sample initially, the data did not go through further changes like log-transformation, which allowed the conclusions made about this data to be the most accurate possible.

Limitations

My study has limitations that may have an effect on the findings and overall conclusions. My first limitation was that I had to drop sixty-eight countries from my sample because of attrition, which was a loss of about 32% of my sample. Although this was a limitation, the results found were still generalizable to all countries, including the ones I excluded from the beginning. It could be argued that this study could have a problem with measurement validity since not all countries have physicians nor do all patients go to physicians for help, so my measurement may not have been accurate, not to mention that this variable included generalist and specialist medical practitioners, which was not what I expected to measure with this variable.[36] This would be considered a limitation for operationalization since it was not the best measurement for primary care physicians.

Another limitation had to do with data collection where the number of physicians per 1000 people may not be the most accurate measurement when describing a country since health personnel tend to concentrate in urban areas.[37] This could have resulted in a skew of data within the same measurement per country, thus resulting in incorrect conclusions being made about the sample and overall generalizability of the overall population. Additionally, another limitation to data collection had to do with the infant mortality measurement since data was collected through vital registration systems, sample surveys, and censuses, and this is not considered to be the most accurate method of data collection.[38] Since developing countries do not have complete vital registration systems, the infant mortality data was estimated through a statistical method created by United Nations Inter-agency Group for Child Mortality Estimation (IGME), United Nations Children's Fund (UNICEF), the World Health Organization (WHO), the United Nations Population Division, the World Bank, and other universities and research institutes. Although the statistical method is probably the best indicator of developing countries' infant mortality rates, it is still not the actual data values for these countries.[39]

Another limitation is that this study only analyzed the relationship between one independent variable, number of physicians per 1000 people in 2010, and the dependent variable, infant mortality per 1000 live births in 2013, across all nations. Further analysis of other variables, like debt dependency, economic disarticulation theory, social inequality, and female access to education, may be found to have an effect on infant mortality across nations. Additionally, there was a limitation in operationalization for the infant mortality rate. This variable was used because previous studies had found that this was the best indicator of a community's health. It is possible that looking at different health indicators like maternal mortality and life expectancy rate may have allowed for better conclusions to be made about the effects that physicians have on the health of a community.