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POLS 408

Due June 24th, 2020

**Introduction:**

The purpose of this analysis is to provide an overview of the variation in infant mortality around the world using basic descriptive and inferential statistical methods. The analysis has two parts. Part one describes the distribution of infant mortality, highlighting what states have the highest and lowest rates. Part one also presents continent-level distribution of infant mortality to include corresponding tables and figures showing what regions have the highest and lowest rates. Part two looks at conditions which appear to reduce infant mortality. One hypothesis claims that in a comparison of countries, those with higher levels of the percentage of women in parliament will have lower rates of infant mortality. Part two presents the findings of a regression analysis of the percentage of women in parliament with infant mortality.

**Part I: State and Region-Level Distribution of Infant Mortality**

Table 1. Mean and Median amounts for Infant Mortality

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Median | Mean | Min | Max |
| Infant mortality | 17.45 | 25.41 | 1.50 | 96.00 |

*Data from World Development Indicators.*

Several states are representative of the mean and median. With respect to the mean, Cambodia, Dominican Republican, Guatemala, and Iraq represent the typical values. For the median value, Honduras, Paraguay, Trinidad and Tobago, Venezuela, and Vietnam represent the typical value for infant mortality rates. [[1]](#footnote-0)

The table below shows a histogram of infant mortality rates. Other than Angola, there were no extreme outliers.[[2]](#footnote-1) The states with the lowest rates of infant mortality were Luxemburg, Finland, Japan, Norway, and Slovenia. The states with the highest rates were Angola, Central African Republic, Sierra Leone, and Chad.

The distribution is skewed to the right, meaning that the more countries are clustered around the median than the mean. For this reason, the median value is more representative than the mean in portraying typical rate of infant mortality in the world because this is where the distribution of countries is concentrated.

Figure 1. Distribution of Infant Mortality

A screenshot of a cell phone

Description automatically generated

*Data from World Development Indicators 2016*

**Part II: Building Tables and Analyzing Subsets**

The tables below and the graph in figure 2 show the mean variation in infant mortality by continent. Africa has the highest average infant mortality. Africa has the highest mean percentage of infant mortality. It is also the continent with the most variation among its countries. For example, Africa has the highest standard deviation for infant mortality across African countries. Additionally, the difference between the lowest and highest country is 90.4, compared to the continent average, which is 46.92.

Europe has the lowest average infant mortality. When looking at the variation within each continent, Europe is the most homogenous. The standard deviation is low, meaning that infant mortality in each country in Europe does not deviate that far from the mean value. The difference between in the lowest and highest reported values also suggest that Europe’s infant mortality rates are similar. The difference between the minimum and maximum for Europe is 12.1 points, compared to 46.92—the average difference among the six continents

Table 2. Infant mortality in Africa

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Africa | Obs | Mean | Median | Std. Dev. | Min | Max |
|  |  |  |  |  |  |  |
| Infant mortality | 53 | 48.48 | 47.6 | 21.69 | 5.6 | 96 |

Table 3. Infant mortality in Europe

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Europe | Obs | Mean | Median | Std. Dev. | Min | Max |
|  |  |  |  |  |  |  |
| Infant mortality | 40 | 4.88 | 3.5 | 3.13 | 1.5 | 13.6 |

Table 4. Infant mortality in Asia

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Asia | Obs | Mean | Median | Std. Dev. | Min | Max |
|  |  |  |  |  |  |  |
| Infant mortality | 43 | 21.47 | 18.0 | 16.31 | 2 | 66.3 |

Table 5. Infant mortality in South America

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| South America | Obs | Mean | Median | Std. Dev. | Min | Max |
|  |  |  |  |  |  |  |
| Infant mortality | 17 | 16.53 | 14.6 | 7.065 | 7 | 32 |

Table 6. Infant mortality in Oceana

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Oceana | Obs | Mean | Median | Std. Dev. | Min | Max |
|  |  |  |  |  |  |  |
| Infant mortality | 4 | 17.82 | 11.9 | 19.19 | 3 | 44.5 |

Table. 7 Infant mortality in North America

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| North America | Obs | Mean | Median | Std. Dev. | Min | Max |
|  |  |  |  |  |  |  |
| Infant mortality | 7 | 17.94 | 13.5 | 16.77 | 4 | 52.2 |

Figure 2. Mean of Infant Mortality by Continent

**A picture containing drawing

Description automatically generated**

*Data from World Development Indicators, 2016*

**Part III: Regression Analysis**

A regression analysis demonstrated that there is a negative relationship between the percentage of women in parliament and infant mortality. For each one-unit change in the percentage of women in parliament, there was a .257 decrease in a given country’s infant mortality rate. However, the p-value for the regression analysis was .093, which is above the accepted threshold for rejecting the null hypothesis. Additionally, the r-squared value was .02. This means that the percentage of women in parliament only explains 2% of the variation in infant mortality.

Table 9. Relationship between women in parliament and infant mortality rates.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Infant mortality | Coef. | Std. Err. | t-statistic | P>t | [95% Conf. | Interval] |
|  |  |  |  |  |  |  |
| Pct women in parliament | -.257 | .15 | -1.69 | 0.093 | -.5588 | .043 |
| \_cons | 30.74 | 3.76 | 8.17 | 0.000 | 23.312 | 38.17 |
|  |  |  |  |  |  |  |

*p-value= 0.093; r-squared=0.02*

In addition to women’s representation in parliament, a number of other independent variables are plausibly related to infant mortality. For this reason, it is important to control for these variables to see rule out rival explanations for the variation in infant mortality around the world. While the first regression demonstrated that more women are in parliament is associated with a decrease infant mortality, it is plausible that a country’s political stability is influencing infant mortality. Additionally, there may be region specific effects that explain infant mortality. Given these assumptions, it follows to run a second regression to control for political stability and continent to see if the percentage of women in parliament continues to have the same effect on infant mortality.

The table below shows that by controlling for these additional variables, the effect of women representation in parliament on infant mortality decreased. The p-value also increased to well above the accepted threshold for rejecting the null hypothesis. Incidentally, the r-squared value increased substantially to .6201, meaning that the combined effect of all three independent variables explained 62% of the variation in infant mortality. Given the reduced effect of women’s representation in parliament, it appears that political stability and region have the bigger influence on infant mortality

Table 9. Relationship between women in parliament and infant mortality rates, controlling for political stability and region.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| infant\_mortality | Coef. | Std. Err. | t | P>t | [95% Conf. | Interval] |
|  |  |  |  |  |  |  |
| Pct women in parliament | -.0483917 | .1030832 | -0.47 | 0.639 | -.2520526 | .1552692 |
| Political stability | -6.909271 | 1.364084 | -5.07 | 0.000 | -9.604283 | -4.214259 |
|  |  |  |  |  |  |  |
| continent |  |  |  |  |  |  |
| Europe | -36.33414 | 3.326984 | -10.92 | 0.000 | -42.90725 | -29.76104 |
| Asia | -26.6617 | 3.044236 | -8.76 | 0.000 | -32.67618 | -20.64723 |
| South America | -27.9154 | 4.187163 | -6.67 | 0.000 | -36.18795 | -19.64284 |
| Oceana | -21.95408 | 7.660318 | -2.87 | 0.005 | -37.08852 | -6.819634 |
| North America | -24.85069 | 5.889041 | -4.22 | 0.000 | -36.48564 | -13.21575 |
|  |  |  |  |  |  |  |
| \_cons | 65.69371 | 4.221699 | 15.56 | 0.000 | 57.35292 | 74.03449 |

*P= 0.0000; R-squared=0.6201*

1. For the mean, Plus, or minus 5% falls between 26.68-24.14. For the median the range was between 18.32-16.58 [↑](#footnote-ref-0)
2. To calculate the outliers, I used Q1-(1.5XIQR) and Q3+(1.5XIQR); -44.925 and 92.28 [↑](#footnote-ref-1)