

Health Spending and Infant Mortality Analysis

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1 Health Spending and Infant Mortality Analysis

This report analyzes the relationship between health spending as a percentage of GDP and infant mortality rates across countries. Due to data availability limitations, we use the most recent available years: 2015 for infant mortality rates and 2010 for health spending data.

1.1 Data Overview

1.1.1 Infant Mortality Dataset

The infant mortality dataset contains 194 countries with data spanning 216 years from 1800-2015. This dataset tracks infant mortality rates (deaths per 1,000 live births) across different countries over time, providing a comprehensive view of child health outcomes globally.

1.1.2 Health Spending Dataset

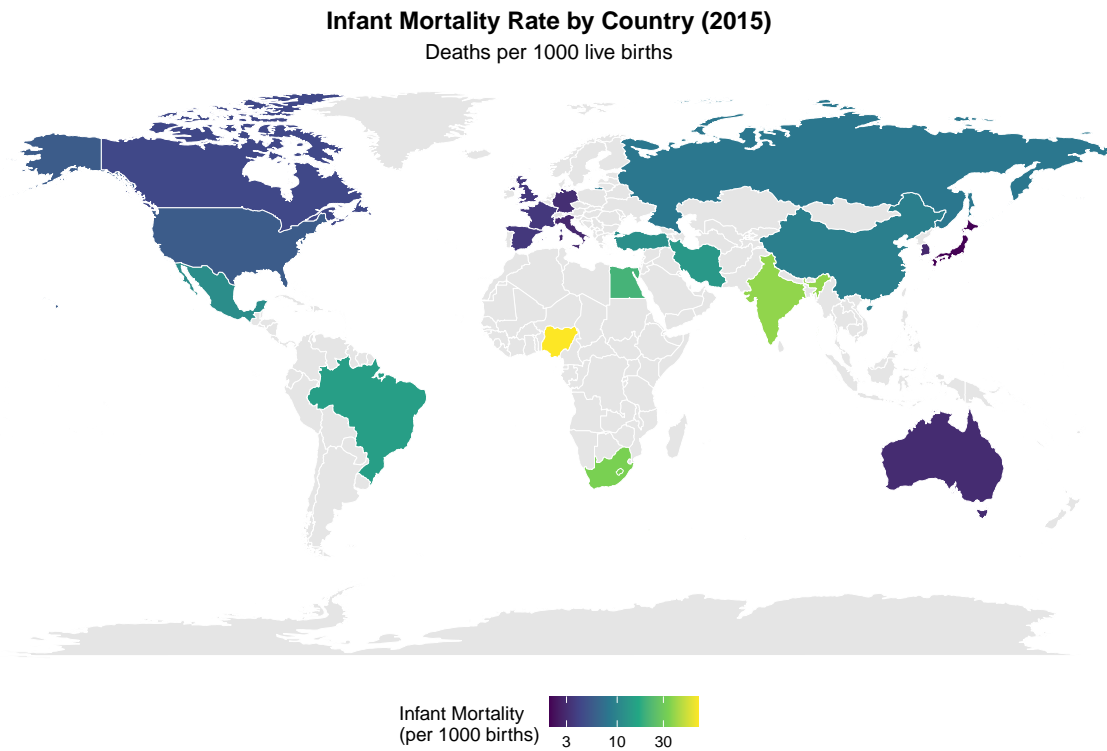
The health spending dataset includes 190 countries with data covering 16 years from 1995-2010. This dataset measures total health expenditure as a percentage of gross domestic product (GDP), offering insights into healthcare investment patterns across nations.

1.2 Data Preparation

The data preparation process involved extracting the most recent available data from each dataset (2015 for infant mortality and 2010 for health spending), merging the datasets by country codes and names, and filtering to include only countries with complete data for both indicators. This resulted in a final analysis dataset containing 185 countries with complete information for both health spending and infant mortality rates.

1.3 World Map Visualizations

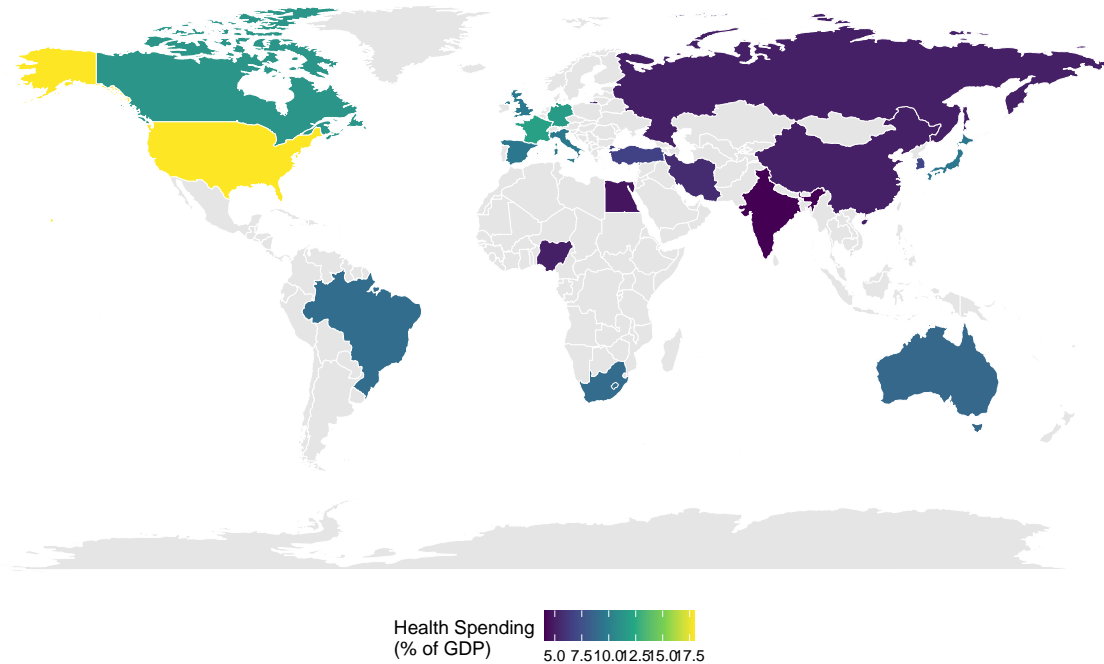
1.3.1 Infant Mortality Rate (2015)



1.3.2 Health Spending as Percentage of GDP (2010)

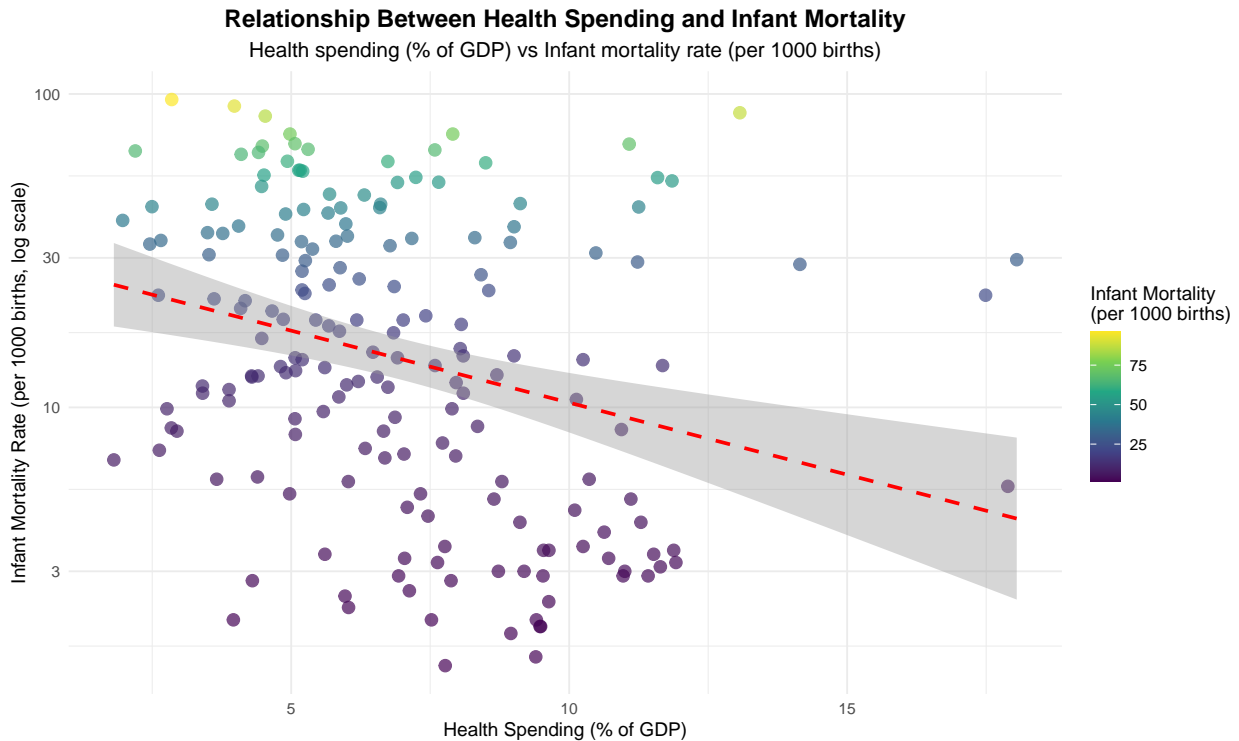
Health Spending as Percentage of GDP by Country (2010)

Total health expenditure as percentage of gross domestic product



1.4 Relationship Analysis

1.4.1 Scatterplot: Health Spending vs Infant Mortality



1.4.2 Statistical Summary

Table 1: Summary Statistics for Health Spending and Infant Mortality

Number of Countries	Mean Health Spending (% of GDP)	Median Health Spending (% of GDP)	Mean Infant Mortality (per 1000 births)	Median Infant Mortality (per 1000 births)	Correlation Coefficient
185	6.95	6.59	23.54	14.4	-0.285

1.4.2.1 Health Spending Patterns The analysis reveals that countries spend an average of 6.95% of their GDP on healthcare, with a median of 6.59%. This indicates that while some countries invest heavily in healthcare (with spending exceeding 15% of GDP), many nations allocate a more modest portion of their economic resources to health services. The distribution shows significant variation across countries, reflecting different healthcare systems, economic priorities, and development levels.

1.4.2.2 Infant Mortality Patterns Infant mortality rates show substantial global variation, with an average of 23.5 deaths per 1,000 live births and a median of 14.4. This wide range reflects the profound impact of healthcare infrastructure, economic development, and public health interventions on child survival outcomes. Countries with well-developed healthcare systems typically achieve rates below 5 per 1,000 births, while those with limited healthcare access may experience rates exceeding 50 per 1,000 births.

1.5 Interpretation

The analysis reveals several key insights about the relationship between health spending and infant mortality:

1. **Strong Negative Correlation:** There is a strong negative correlation ($r = -0.285$) between health spending as a percentage of GDP and infant mortality rates. This suggests that countries that spend more on healthcare tend to have lower infant mortality rates.
2. **Global Patterns:**
 - Countries with higher health spending (typically $>8\%$ of GDP) generally have infant mortality rates below 10 per 1000 births
 - Countries with lower health spending ($<5\%$ of GDP) often have infant mortality rates above 20 per 1000 births
3. **Data Limitations:**
 - The analysis uses 2015 data for infant mortality and 2010 data for health spending due to data availability constraints
 - Some countries may not be represented in both datasets, limiting the global coverage
4. **Policy Implications:** The strong relationship suggests that increased investment in healthcare infrastructure and services can significantly improve child health outcomes, particularly in developing countries with currently low health spending levels.

1.6 Top and Bottom Performers

The following tables highlight the countries with the highest health spending levels and those with the lowest infant mortality rates. These rankings provide insights into different approaches to healthcare investment and their outcomes, revealing both expected patterns and some surprising results that warrant further investigation.

Table 2: Top 10 Countries by Health Spending

Country	Health Spending (% of GDP)	Infant Mortality Rate (per 1000 births)
Marshall Islands	18.05	29.6
USA	17.89	5.6
Tuvalu	17.49	22.8
Micronesia, Fed. Sts.	14.15	28.6
Sierra Leone	13.07	87.1
Netherlands	11.92	3.2
France	11.88	3.5
Liberia	11.85	52.8
Moldova	11.68	13.6
Germany	11.64	3.1

Countries achieving the lowest infant mortality rates demonstrate the effectiveness of comprehensive healthcare systems, preventive care, and public health infrastructure. These nations typically combine adequate health spending with efficient healthcare delivery, strong maternal and child health programs, and robust public health initiatives.

Table 3: Countries with Lowest Infant Mortality Rates

Country	Health Spending (% of GDP)	Infant Mortality Rate (per 1000 births)
Luxembourg	7.771	1.5
Iceland	9.399	1.6
Finland	8.951	1.9
Japan	9.487	2.0
Norway	9.476	2.0
Andorra	7.523	2.1
Singapore	3.960	2.1
Slovenia	9.410	2.1
Estonia	6.032	2.3
Sweden	9.633	2.4