

1. Opening

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Indicators & Definitio..

4. Current State Life
Expectancy Ages by C..

5. Current State DALYs
by Continent

6. Current State Death
Rate by Continent

7. Correlations Health
Outcomes

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The Link between Health Expenditure & Outcomes

An overview of the correlations between health expenditures and outcomes such as Life Expectancy, Death Rates, and DAYLs.

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Objectives:

In this story an overview of the ***health factors and the health determinants*** (healthcare investments) is provided.

1. To determine the current situation of Heath outcomes, and Health Expenditures.
2. To determine if there is a correlation between the Health Outcomes and Health Expenditures.

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Key Performance Indicators + Definitions

Health Determinants

The total Health spending measures the final consumption of health care goods and services. **Out-of-pocket payments (OOPs)** are defined as direct payments made by individuals to health care providers at the time of service use while **Government & Private** spending counts towards the amount that the government spent to make healthcare more available through their plans. Together added up, they form the total health expenditure (OECD, 2020).

Expenditure as a pertengage of total GDP (Gross Domestic Product) is an important factor as it shows how much a country prioritizes healthcare in their overall spending. (OECD, 2020).

Health Measurements

According to (Roser & Ritchie, 2016), assessing health factors should be done on both a mortality *and* morbidity level, therefore, the following KPI's are chosen:

- **Life Expectancy Age** is the numbers of years a person can expect to live. This number represents an average of the all the ages at which people that have died. (Estepan Ortiz-Ospina, 2017) → Preferably High

- **The Death Rate per 1000 people** is the number of deaths in a given period divided by the population exposed to risk of death in that period (Organisation for Economic Co-operation and Development, 2003) → Preferably Low

- **Burden of Disease (Disability Adjusted Life Years, or DALYs.)** is measured by estimating the number of 'lost' years due to poor health. It is calculated as the sum of years of potential life lost due to premature mortality, disease, and disability (Estepan Ortiz-Ospina & Roser, 2016) . → Preferably Low

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Life Expectancy Age



Range
(low - light colors | high - bright col..
62.00 83.00

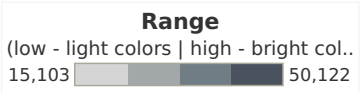
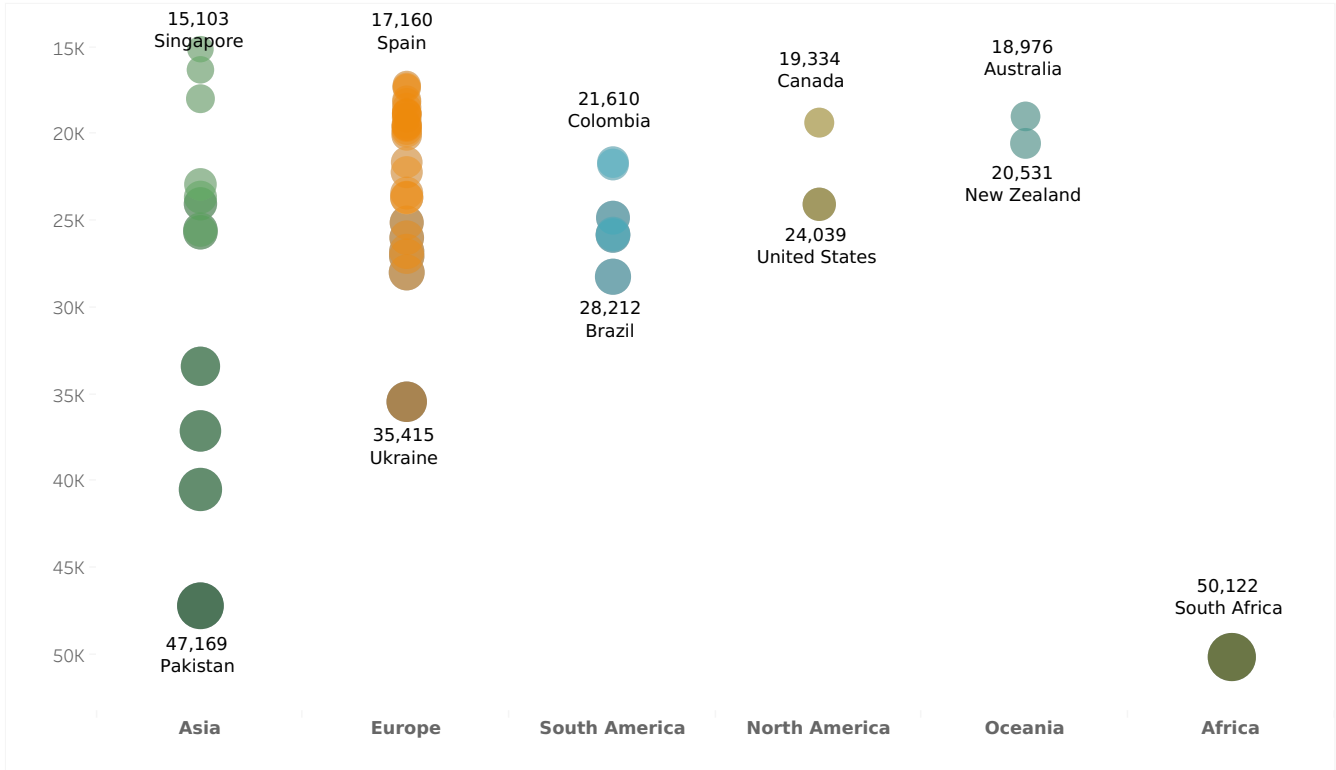
Key Insights Life Expectancy Age

1. South Africa has on average the lowest life expectancy (62 years).
2. Japan has the highest life expectancy (83 years).
3. Asia has the most variation, followed by Europe.

Overall Trend:
Higher income countries have higher life expectancies.

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DAYLS



Key Insights
DAYLS

1. South Africa is the country with the most years lost (50,122) compared to the rest of the world.

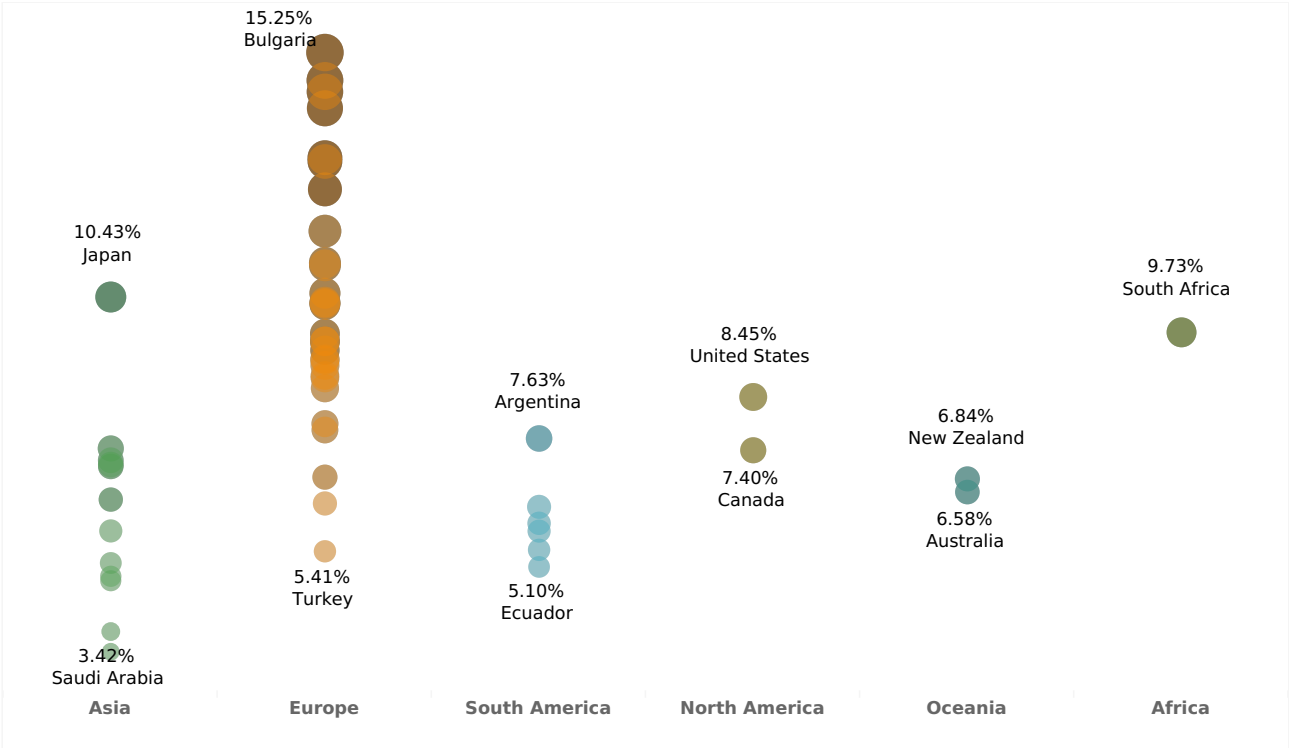
2. Asia has the most variation in the years lost (15,103 - 47,169).

3. Singapore is country that has the least years lost (15,103) , followed by Japan (16,293).

Overall Trend:
Developed countries have few..

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Death Rate



Key Insights

1. Bulgaria has the highest death rate (15.25%)

2. Europe has the most variation within its death rate, followed by Asia. Europe also has on average the highest death rate compared to other continents.

3. Saudi Arabia (3), followed by Jordan (4) have the lowest death rate.

Overall Trend:

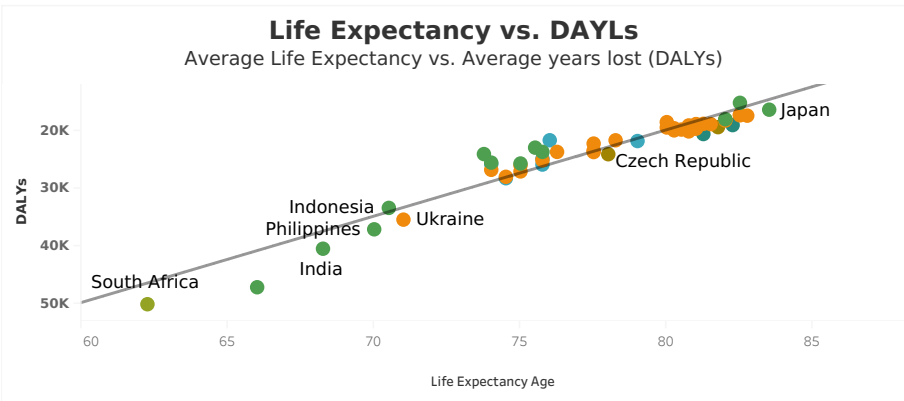
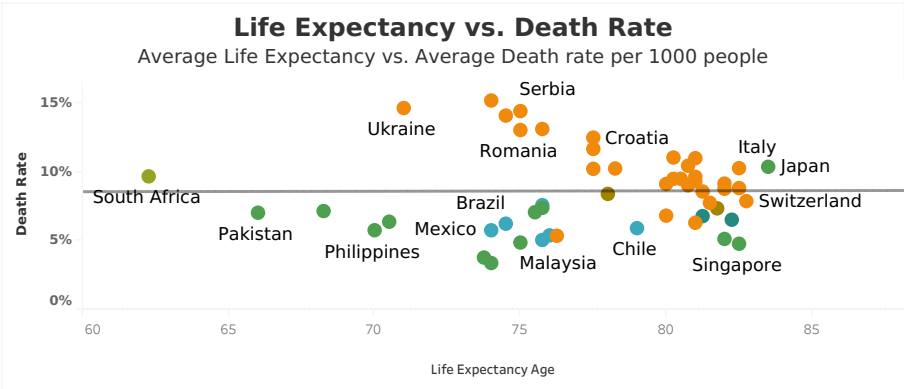
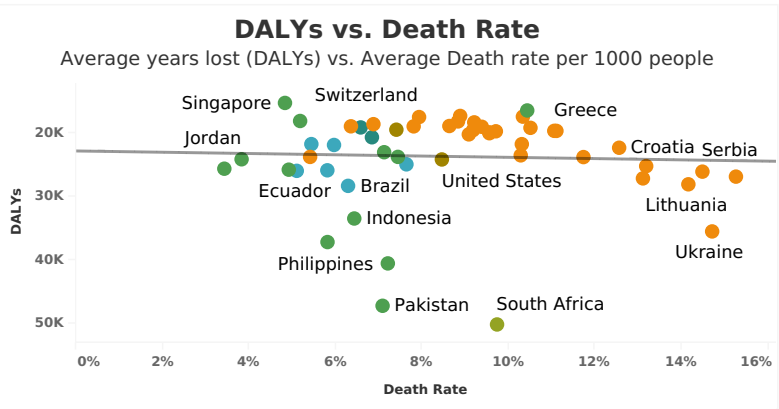
There is no distinct difference between developed and undeveloped countries. Eastern Europe has the highest death rates.

Correlations Health Outcomes

Key Insights

1. There seems to be a strong correlation between the years lost and the life expectancy age ($R\text{-squared } 0.92$). When the age increases less years are lost.
2. Taking all countries into consideration, there is no correlation between other outcomes and the Death Rate ($R\text{-squared } 0.0016$ and 2.58).
3. Correlations do vary by continent. Europe has a stronger correlation in ..

Year of Year		Continent	
Year	All	Continent	All

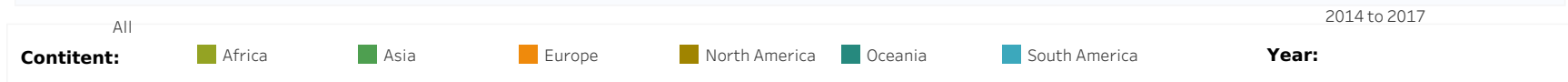


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Total Global Health Expenditures

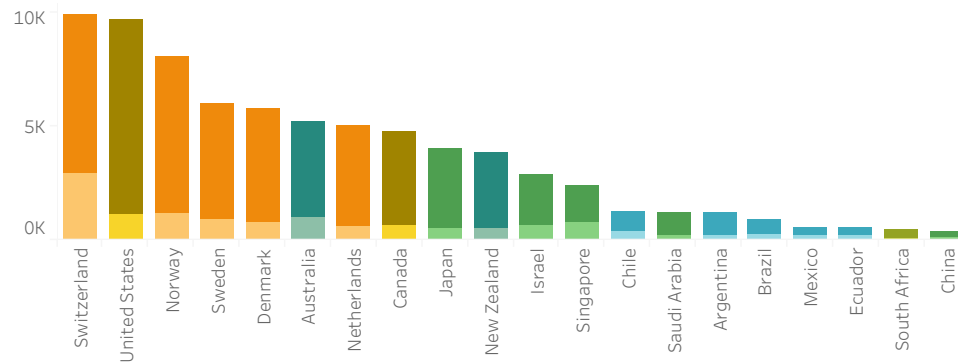
Key Insights

1. The Western European countries, North America, and Oceania tend to have higher government spending per person compared to most countries in South America, Africa, and Asia (with the exception of Japan and Singapore). **2. The Eastern European countries tend to have 50% ratio for both expenses**, which means that the government is paying less. **3. The overall healthcare expenditure decreased in the year 2015**, but it is slowly increasing again. North America, particularly the US, steadily increased their expenditure in all years.



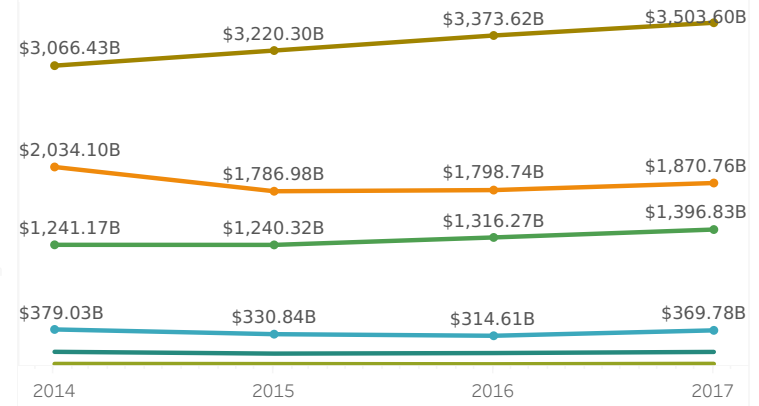
Health Expenditure Per Capita (\$) by Country

Average spending by year(s) for Government / Private Spending & Out-of-pocket Spending for the top 5 countries per continent.



Health Expenditure by Continent Per Year

Total spending for all countries in continent in Billion (\$).



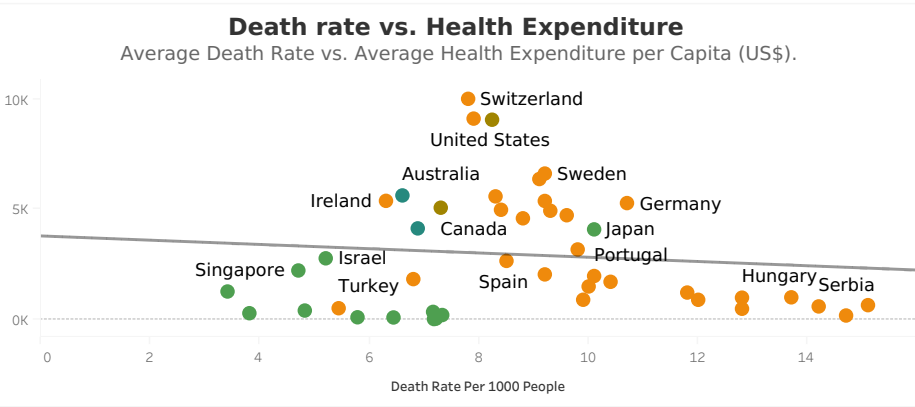
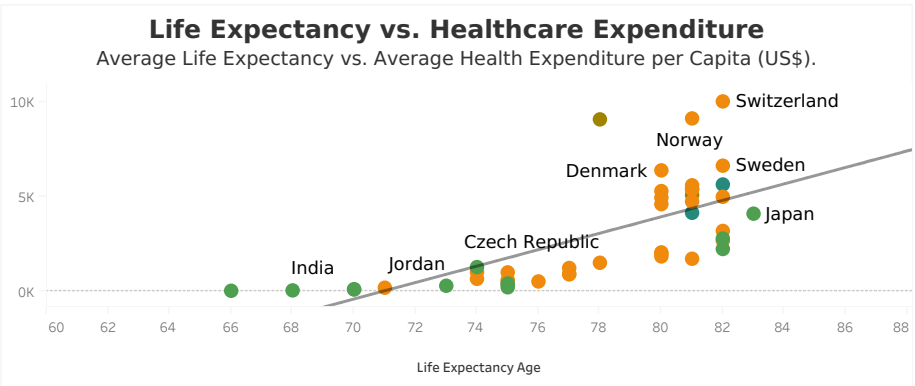
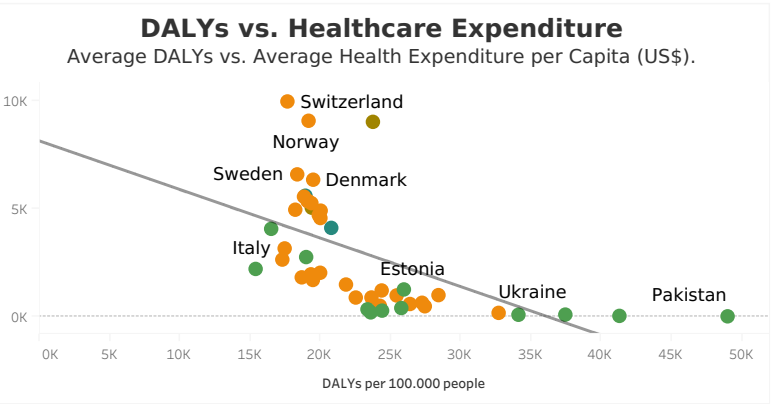
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Correlations Health Expenditures & Health Outcomes

Key Insights

- 1. There seems to be stronger correlation between health expenditure and life expectancy ($R\text{-squared } 0.84$). The more the country spends on healthcare, the older the age seems to get looking at the trend line.
- 2. There is an insignnicant correlation when looking at the DALYs trendline ($R\text{-squared } 0.36$). If countries spend more on healthcare, the numbers of years lost seems to be less.
- 3. There is no clear correlation between death rate and health expenditure as the correlation is less than 0.01 it is most likely correlated wi..

2014
Year
Continent
Multiple values

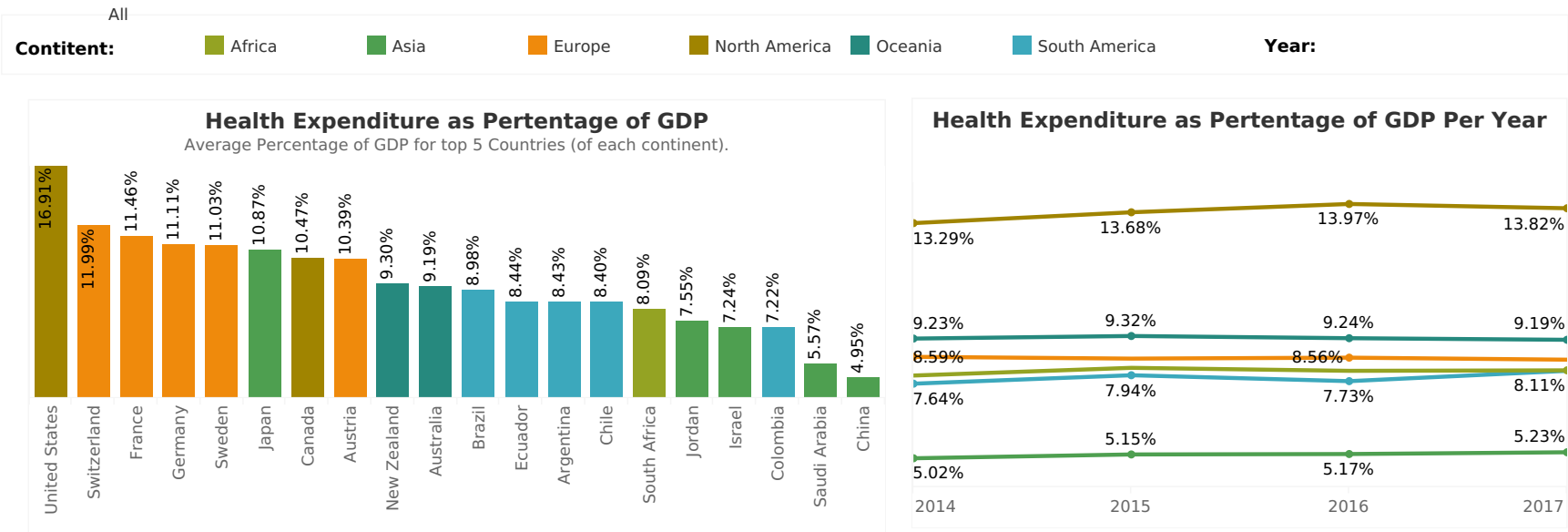


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Health Expenditures as Percentage of GDP

Key Insights

- 1. The **United States** (16.91%) is one of the countries that spends the most on Healthcare as a percentage of their GDP. This also counts for the Western European countries, followed by Oceania and South Africa. In there, Japan is one of the Asian countries that belongs to this list.
- 2. The Spending % fluctuates per year but is stays within the same percentage range. Oceania, South America, and Africa did increase their..



5. Current State DA..	6. Current State Death Rate by Continent	7. Correlations Health Outcomes	8. State of Global Health Expenditures	9. Correlations Health Factors and Expendit..	10. State of Health Expenditure as % of G..	11. Correlations Health Expenditures ..	9. Conclusion	10. References
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Correlations Health Expenditures GDP % & Health Outcomes

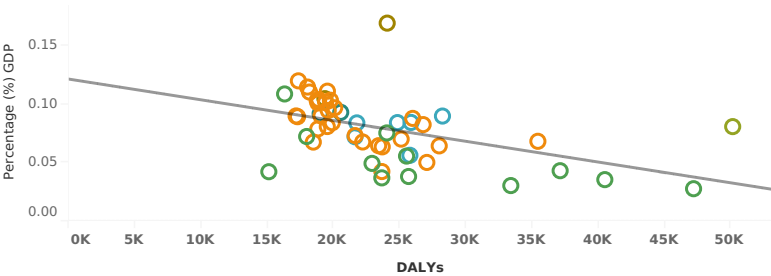
Key Insights

- 1. There seems to be a moderate correlations between health expenditure % of GDP and life expectancy (*R-squared 0.32*) as well as for DAYLs (*R-squared 0.23*). The more the country spends on healthcare, the older the age seems to get looking at the trend line (*R-squared 0.42*).
- 2. There is no clear correlation between death rate and health expenditure as a % of GDP, it is most likely correlated with other factors (*R-squared 0.043*).

All
YearContinent

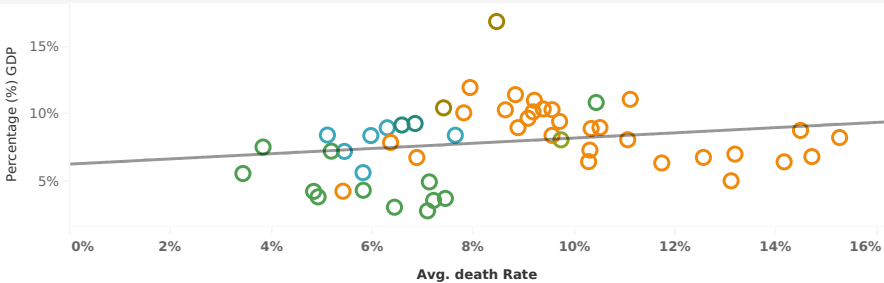
DALYs vs. Healthcare Expenditure %

Average DALYs years lost vs. Average Health Expenditure Spending as percentage of GDP (%).



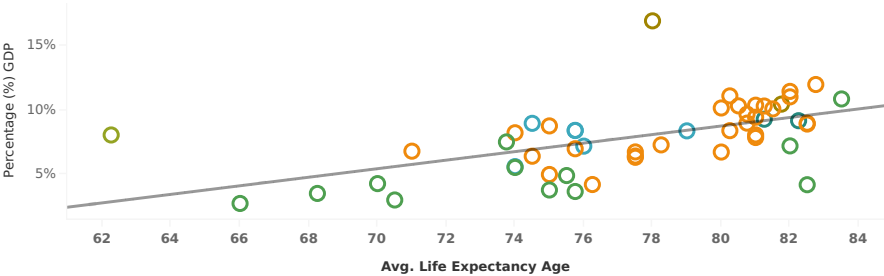
Death Rate vs. Healthcare Expenditure %

Average Death Rate per 1000 people vs. Average Health Expenditure Spending as percentage of GDP (%).



DALYs vs. Healthcare Expenditure %

Average DALYs years lost vs. Average Health Expenditure Spending as percentage of GDP (%).



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Conclusion:

In general it is difficult to determine the causes of Health Factors and their correlation with Healthcare. This is mainly because there are other components that influence the quality of health such as the environmental conditions, modifiable Behavioral factors (tabaco, alcohol, unhealthy diet), and medical errors (WHO, 2018; WHO, 2019; WHO, n.d).

For a country to determine its performance and make possible improvements, the following can be stated:

1. Higher percentage spent per GDP does not directly corelate to favorable health factors. Rather, the total amount spent is tied to favorable health factors *(further research needs to be conducted for the reasons for the weak correlations in order to be 100% correct about this claim).*

2. Increases in spending lead to increases in life expectancy and decreases in DAYL's to some extent.

This can be achieved through two means:

- If the percentage GDP spending stays the same, increasing the GDP will lead to a net increase in spending towards healthcare.

- Increasing the percentage of GDP spent on healthcare will increase the overall amount spent on healthcare *(further research needs to be conducted for the reasons for the moderate correlations in order to be 100% correct about this claim).*

3. There is a strong positive correlation between life expectancy age and years lost from deceases. As people life longer, there will be less years lost *(further research needs to be conducted for the reasons for the strong correlations in order to be 100% correct about this claim).*

5. The country that has the highest performance in health factors is Japan.

They have the highest average life expectancy, second in low DALYs and an average death rate. These standards for healthcare could potentially be a model for Asia and the rest of the world *(further research needs to be conducted into the reasons for these health factors tin order to be 100% correct about this claim).*

5. South Africa, is the on the other hand the opposite; high daysl, low life expectancy, and high death rates. This is most likely the case for the majority of African countries *(further research needs to be conducted for other countries in order to be 100% correct about this claim).*

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