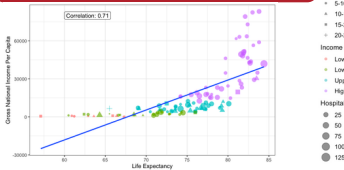# 4.5 Billion

Were not fully covered by essential health services in 2021[1]

Understanding the Disparity : Life expectancy and socio-economic status

Objective: "This infographic explores the critical role of equitable healthcare access in reducing economic disparities and enhancing societal well-being, aiming to inform policy decisions that align with SDG 3 and SDG 8.
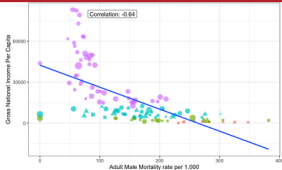
Does health increases proportionally with wealth?

Life Expectancy

Adult Mortality rate per 1,000

Unemployment Rate (Aggregated): 5-10(%), 10-15(%), 15-20(%), 20-25(%)

Income Level: Low-income, Lower-middle-income, Upper-middle-income, High-income

Hospital Beds: 25, 50, 75, 100, 125

Data source :Gross National Income (GNI) per capita*, Estimated Life expectancy*, Adult male mortality rate (per 1,000)*, Adult mortality rate* dataset was retrieved from World Bank Open database. Hospital beds* dataset was taken from World Health Organization. The income levels were classified from based on Gross National Income per capita and its income level threshold from World Bank*. Refer to footnotes for full citation. **Data displayed is from year 2019.**

Studies have shown that **higher income levels are associated with better access to healthcare resources**, leading to improved health indicators such as **lower mortality rates** and **higher life expectancy**[8]. The positive (0.71) and negative (-0.64) correlation of life expectancy and adult mortality rate from both scatter plot against Gross National Income (GNI) per capita proves this study .
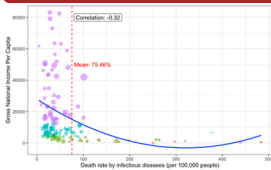
As the larger dots (more hospital beds per 10,000) tend to **cluster at higher life expectancy as income level increase,** where the number of hospital beds in higher income countries suggesting better healthcare infrastructure in wealthier countries.

From the two graph, there isn't a strong visible trend based on unemployment shapes alone, suggesting perhaps **unemployment may not directly impact the relationship between life expectancy**. There might be some other factor that plays an impact in life expectancy.

As income level increases, life expectancy remains stagnant and did not increase further and so did adult mortality rate. Meaning, the optimum estimated life expectancy and mortality rate is achieved with better healthcare from an increase in income levels. It changes into diminishing returns once it passes the threshold where **optimal income** level is achieved.

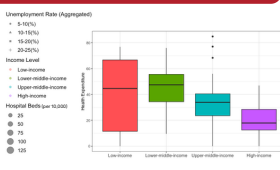## Wealth, Health, and Disease: The influence of Economic prosperity on Healthcare

Death by infectious disease per 100,000

Out-of-Pocket Health Expenditure

Out-of-pocket Health expenditure distribution

Unemployment Rate (Aggregated): 5-10(%), 10-15(%), 15-20(%), 20-25(%)

Income Level: Low-income, Lower-middle-income, Upper-middle-income, High-income

Hospital Beds (per 10,000): 50, 75, 100, 125

Data source : Out-of-pocket health expenditure dataset* was retrieved from World Bank Open database. Death by infectious disease dataset** was retrieved from IHME and processed from Our World in Data. Refer to footnotes for full citation. **Data displayed is from year 2019.**
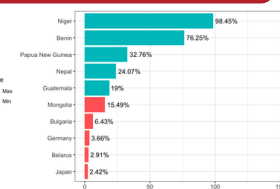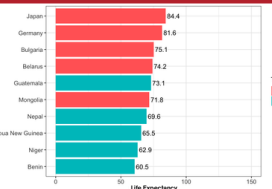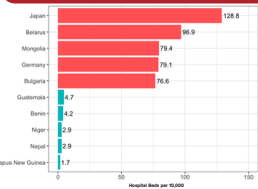
Research suggest, because poorer countries still have other important factors to work on to develop its count, they are more in burden to manage more for the country as developed country is already better off[11].

The moderate negative correlation from two scatterplots, suggests the **higher GNI per capita generally have lower death rates from infectious diseases**, but, wealthier **countries spend a smaller portion of out-of-pocket health expenditure**. Implying comprehensive healthcare coverage and better healthcare systems allow countries to efficiently **spend proportionally less as they get wealthier**.

The research is fu proven from decreasing trend in health expenditure from the box plot as the income level increases. The wide spread box plot of low income countries suggest variability in how much those countries can or **must** spend in health expenses since they still have other economic factors to improve and invest.

## A look through countries with most and least hospital beds: Further analysis of extreme values

Top 5 Countries with the Most hospital Beds and Top 5 Countries with the Least Hospital Beds per 10,000

Japan 128.8, Belarus 96.9, Mongolia 79.4, Germany 79.1, Bulgaria 78.6, Guatemala 4.7, Benin 4.2, Niger 2.9, Nepal 2.9, Papua New Guinea 1.7

Japan 84.4, Germany 81.6, Bulgaria 75.1, Belarus 74.2, Guatemala 73.1, Mongolia 71.8, Nepal 69.6, Papua New Guinea 65.5, Niger 62.9, Benin 60.5

Niger 98.45%, Benin 76.25%, Papua New Guinea 32.76%, Nepal 24.07%, Guatemala 19%, Mongolia 15.49%, Bulgaria 6.43%, Germany 3.66%, Belarus 2.91%, Japan 2.42%

Type: Max, Min

Data source : child mortality rate was retrieved from UNICEF database. Refer to footnotes for full citation. **Data displayed is from year 2019.**

Geographical distribution of mortality rate and income level : Who's affected?

Child Mortality Rate and Income Level

Child Mortality: 0.83

Income Level: High-income, Upper-middle-income, Lower-middle-income, Low-income, sizes 20.00, 40.00, 60.00, 80.00, 98.45

© 2024 Mapbox © OpenStreetMap

Data source : Under-five mortality rate* dataset was retrieved from UNICEF database. Refer to footnotes for full citation. **Data displayed is from year 2019.**
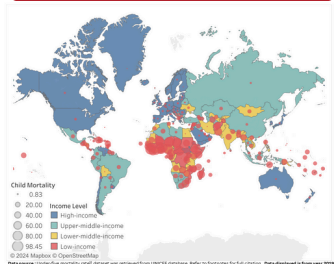
- **Health System Performance:**
Hospital Beds, Life Expectancy and Child mortality reflect the performance and capacity of a country's healthcare system. A higher number of hospital beds indicates better capacity to treat patients, while higher life expectancy and lower mortality rates suggest effective healthcare services and interventions[13]. Hence, we can see Japan and Guatemala has yields the highest life expectancy and lowest child mortality out of each respective group.

- **Health inequalities**
However, at the same time these indicators reveal health inequalities between countries. These indicators provide the general health status of a population whereas higher life expectancy and lower child mortality rates typically found with better health outcomes and living conditions[14]. Therefore, the child mortality rate size are much higher in lower income countries while individuals born in wealthier countries enjoy better living conditions, affordable healthcare system and higher life expectancy.

- **Resource Allocation:**
These indicators reflect how resources are allocated within the healthcare system. Including investments in medical infrastructure, public health programs, and social services. Which can be explained by the countries with least hospital beds are within the low-income level with the lowest life expectancy. However, Guatemala surpasses its life expectancy against Mongolia while having drastically less hospital beds, indicating other factors affect life expectancy.

- **Other factors**
While being poorer in income level status, Mongolia has drastically more hospital beds but lower life expectancy than Guatemala. Other factors could include, crime rate, environmental conditions, health behaviors and lifestyles, education level and government policies[15].

Education, Policy, Global aid: Recommendation to solve the disparities

3 GOOD HEALTH AND WELL-BEING

STUDY FOUND THAT

75%

Of avoidable deaths account from lack of education[16]

8 DECENT WORK AND ECONOMIC GROWTH

10-20%

of health outcomes are associated with healthcare

The rest have to do with **socio-economic** factors including wealth[19]

Education can empower individuals to make informed health choices and exposes them to better life opportunities, emphasizing the importance of preventive care for the nation[18]. By raising awareness about health inequalities and the socio-economic factors above, **it allows citizens in poorer countries to gradually develop and foster generations of health conscious society**[17].

Policy interventions allow societies to form systemic changes to ensure equitable access to healthcare around the globe while addressing underlying socio-economic factors. Policies such as **universal health coverage, social safety nets, and policies promoting education opportunity and income inequality** can indirectly enhance health by addressing the root causes of this disparity[18].

Lastly, government aid from different countries, healthcare initiative and donation allow poorer countries advantage in managing to develop its country[19], hoping to finally achieved the optimal income **to maximize life expectancy and minimize mortality rate.**

Conclusion

- Higher income are linked to better access to healthcare thus improving life expectancy and lowering mortality rates
- Unemployment alone does not directly affect life expectancy. However, education is able to affect avoidable death.
- Life expectancy and adult mortality rate increases and decreases in diminishing return, hence it is vital for poorer countries to achieve the optimal income level to reduce the unequal global health disparities.
- Poorer countries face greater challenges in managing healthcare alongside other developmental needs.
- Healthcare in wealthier countries are more efficient and affordable, while poorer countries individually bear higher expense.
- Mongolia exceeding Guatemala suggest other external factor such as crime rate, education level and government policies are important

Limitations
As mentioned previously, other factors come into play in life expectancy and mortality rate. The analysis explore the relationships between each predictor variable and life expectancy, but there are still qualitative variable that is difficult to be taken into account. It's important to note that these are also recorded data that is publicly available. other variables that is significant to this analysis can still deepen the analysis further.

Reference list