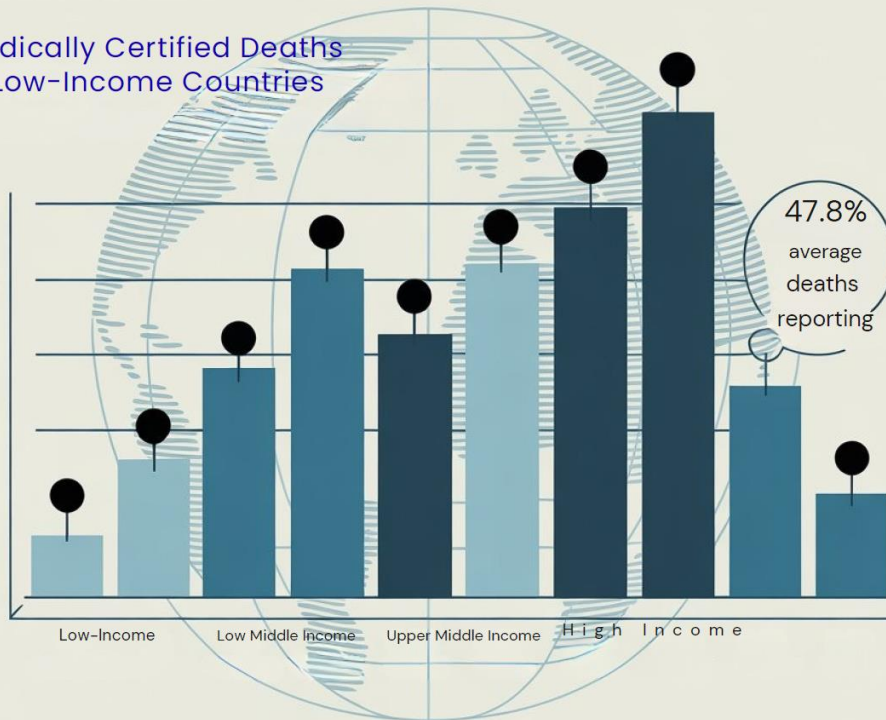


## The Vital Link: Income, Data & Saving Lives

Causes of Death in Low Income Countries

Medically Certified Deaths  
in Low-Income Countries



**Why Accurate Death Data Matters?**

# Poster

## Calling for Actions for Improving Mortality Reporting

Chu Hong Anh

# Why Medically Certified Causes of Death Matter

- Governments can't prioritize health interventions.
- Public health risks are underestimated or missed entirely.

2020:

Only 1 in 3 deaths globally has a medically certified cause.

- Much lower rates in low-income countries (8%)

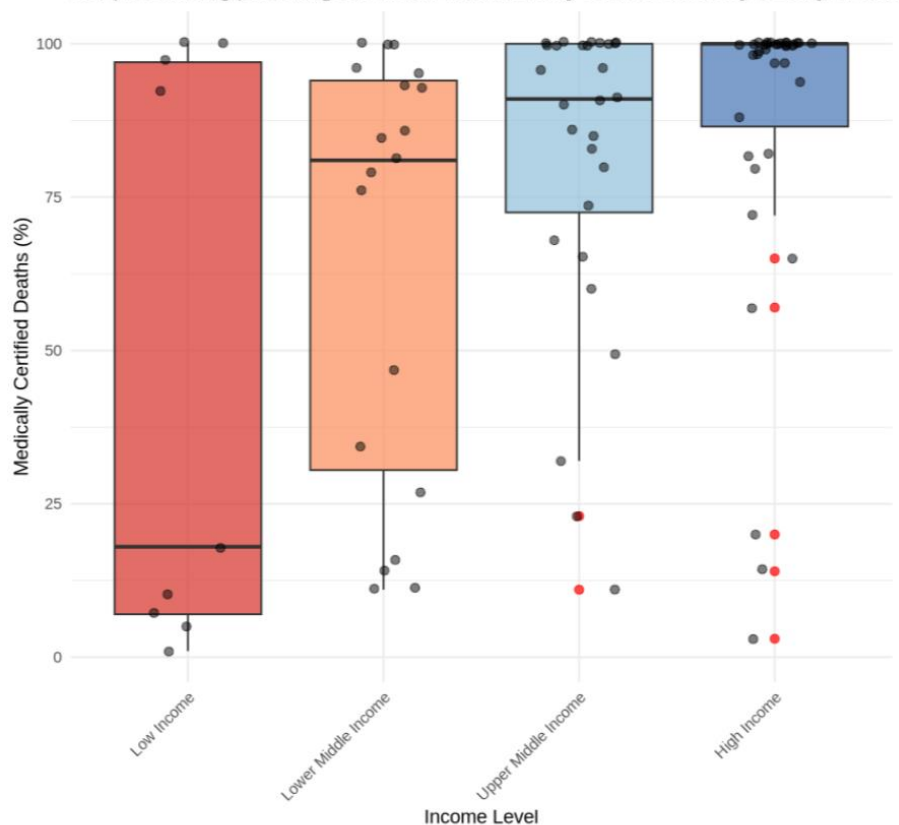
2024:

78% deaths with Medical CoD registered

STILL 8% in low-income countries

**Distribution of Medically Certified Deaths by Income Level**

Box plot showing percentage of deaths with medically certified cause by country income



# Poster: Call for Action to Improve Reporting Mortality/COD

Source:

- WHO. Global excess deaths associated with COVID-19, January 2020 - December 2021. <https://www.who.int/data/stories/global-excess-deaths-associated-with-covid-19-january-2020-december-2021>
- WHO. Global report on health data systems capacity, 2020. <https://iris.who.int/bitstream/handle/10665/339125/9789240018709-eng.pdf>

Tool: chartGPT, Gemini for build the html codes.

<https://gemini.google.com/share/9c676beb8650>

## The Vital Link

How Income, Data, and Health Outcomes are Inextricably Connected

### Why Accurate Death Data Matters



#### Essential for Health Policy

Accurate cause-of-death data is the bedrock of public health strategy, guiding funding, research, and interventions to where they are most needed.



#### Crucial for Pandemic Response

To fight global health crises effectively, we must understand mortality patterns in real-time. Gaps in data are gaps in our defense.

### The Global Data Gap

While the WHO dataset is extensive, a significant portion of countries lack the complete data needed for a full analysis, revealing a critical gap in our global health knowledge.

**151**

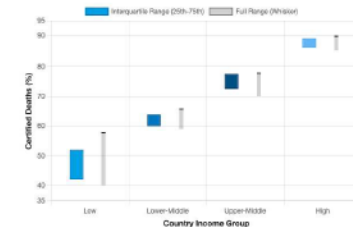
Countries in WHO Dataset

**92**

Countries in This Analysis

### Certification Rates by Income Group

A clear trend emerges when comparing income levels: higher national income strongly correlates with higher rates of medically certified deaths. The chart below visualizes the distribution of these rates.



This chart uses floating bars to represent the interquartile range (25th to 75th percentiles) and whiskers for the full range from the source data, illustrating a box plot.

### Key Takeaways: A Tale of Two Tiers

#### Low-Income Countries



47.8%

With an average certification rate of just **47.8%**, there is a massive opportunity for improvement. Income and certification rates show the strongest correlation ( $r=0.64$ ) in this group.

#### High-Income Countries



87.4%

These nations achieve a high average certification rate of **87.4%**. The weak correlation within this group suggests that once a high income level is reached, certification becomes standard practice.

### Call to Action: A Roadmap to Better Data



"Better data saves lives."

Source: Analysis based on data from the WHO Dataset and World Bank (GDP per capita).

# Use of AI Tools

ChatGPT: summarises contexts from various global reports and database

Julius.ai: analyses data from the WB, WHO SCORE dB: income classification; correlation between income groups and % of causes of death reported.

Ideogram.ai, canvas.com: ideas and infographic design of the poster

ChatGPT/Gemini: transfer to html and for PDF;

Common steps via GitHub for link to the website

This code snippet cleans column names, checks data types and missing values, and filters for complete cases and medically certified deaths data.

Text  
Click to view

Great! Now I can see we have 92 countries with complete data for both GDP per capita and medically certified deaths percentage. Let me proceed with the analysis:

[1] "Summary statistics:"

Summary ^

Country	Country_Code	GDP_per_capita	Births_registered_pct
Length:151	Length:151	Min. : 193	Min. : 0.00
Class :character	Class :character	1st Qu.: 2006	1st Qu.: 71.25
Mode :character	Mode :character	Median : 5839	Median : 98.50
		Mean : 15844	Mean : 81.38
		3rd Qu.: 21668	3rd Qu.:100.00
		Max. :128678	Max. :100.00
		NA's :8	NA's :21

Deaths_registered_pct	Medically_certified_deaths_pct
Min. : 0.00	Min. : 1.00
1st Qu.: 58.50	1st Qu.: 68.00
Median : 99.00	Median : 95.00
Mean : 76.09	Mean : 77.71
3rd Qu.:100.00	3rd Qu.:100.00
Max. :100.00	Max. :100.00
NA's :28	NA's :54

## Julius

I'll help you analyze the relationship between GDP per capita and the percentage of medically certified causes of death. Let me start by loading and examining the dataset

### run\_r\_code

```
# Load the dataset and examine its structure
df <- read.csv("Final Prj dataset.csv", stringsAsFactors = FALSE)

# Check the structure and first few rows
print("Dataset structure:")
print(str(df))
print("\nFirst few rows:")
print(head(df))
print("\nColumn names:")
print(colnames(df))
```

[1] "Testing basic R functionality" [1] 2

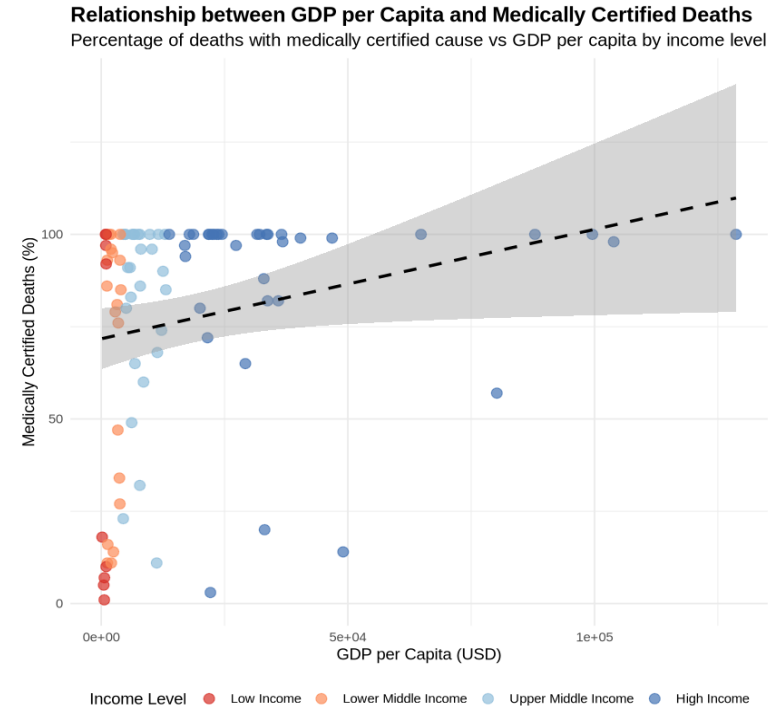
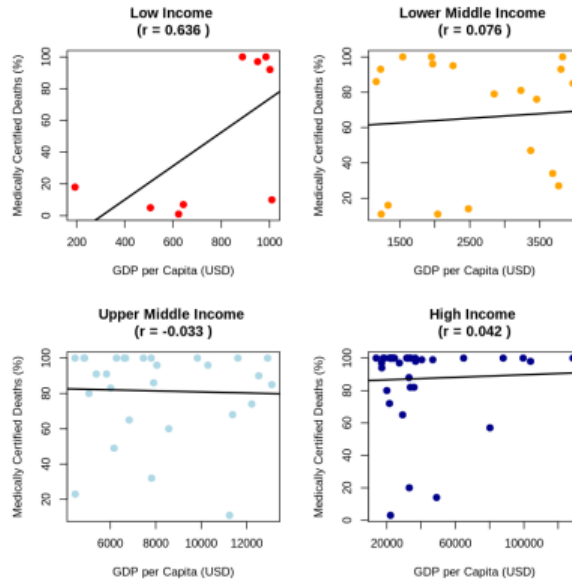
Great! The R environment is working. Let me continue with the analysis:

### run\_r\_code

```
# Work with the cleaned dataset
df_clean <- df[!is.na(df$Medically_certified_deaths_pct) & !is.na(df$GDP_per_capita), ]

print(paste("Countries with complete data:", nrow(df_clean)))
```

# Analysis Outputs:



</> Generated Code

Possibly the 'sf' package is not installed on your system.

R

Rerun code

Edit code

Copy

```
1 library(viridis)
2
3 # Get world map data
4 system("mamba install r-rnaturalearth r-rnaturalearthdata -y")
5 library(rnaturalearth)
6 library(rnaturalearthdata)
7
8 # Get world map
9 world <- ne_countries(scale = "medium", returnclass = "sf")
10
11 print("World map data loaded successfully")
```

Code Explanation

This code snippet installs necessary packages and retrieves world map data using the rnaturalearth package.

Error in library(sf): there is no package called sf  
Traceback:

```
1 library(sf)
```

Also, evaluate what went wrong and consider options for how to fix it. Break the execution up into cell blocks.

# Observations

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**What works:** Julius is very helpful for inexperienced analyst

Challenges

To learn more about LLM for researching text/ products

ChatGPT, Gemini, GitHub and webpage, Chatbot

Experimenting and trying/testing with different prompts and tools are essential

**Can be expensive & time-consuming (esp. for beginners)!**

**NEED PRACTICE – LOTS OF IT!**

Managing Expectation: Need to know well what to look for and expect



THANK YOU!



I'VE REALLY ENJOYED THE COURSE AND  
WILL CONTINUE THE EXPERIMENTS!