



# Analyzing the Relationship Between Current Health Expenditure and GDP Growth in South America

**Md Abdullah Al Mahmud Khosru – 23070520**

# Contents:

1. Introduction
2. Datasets
3. ETL Pipeline
4. Methodology
5. Results
6. Conclusion
7. References

# Introduction

## Objective:

What is the influence of current health expenditure, as a percentage of GDP, on the economic growth of South American countries between 2014 and 2023?

Focus: Highlight trends and provide insights for policymakers





# Datasets

## 01. Current health expenditure (% of GDP)

- Source Name: World Bank Open Data
- Tracks current health spending as % of GDP.
- 2014 -2023
- CSV

## 02. GDP growth (annual %)

- Source Name: World Bank Open Data
- Tracks annual growth rates.
- 2014 -2023
- CSV



License: CC BY 4.0

# Method - ETL Pipeline

## ETL Pipeline Process:

- **Extract:** World Bank API → ZIP files → CSV extraction.
- **Data Cleaning:** Remove irrelevant columns; Handle missing values (NaN, bfill); Filter for 12 countries (2014–2023).
- **Transform:** Reshape data using Merge datasets on Country Name and Year.
- **Load:** Store in SQLite databases and CSV files for analysis.

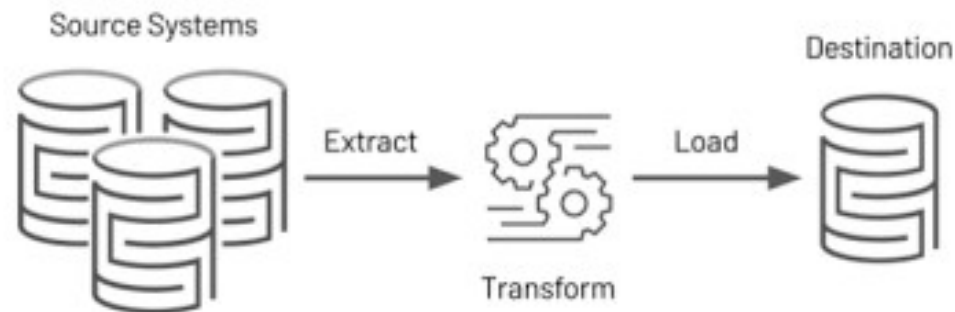


Fig: The ETL data pipeline architecture

# Pipeline output

Health Expenditure Data Table (Top 6 rows):

	Country Name	Country Code	Year	Value
0	Argentina	ARG	2014	9.6713
1	Bolivia	BOL	2014	5.89614
2	Brazil	BRA	2014	8.39644
3	Chile	CHL	2014	7.8415
4	Colombia	COL	2014	7.18553
5	Ecuador	ECU	2014	6.832

Fig: Health Expenditure data

GDP Data Table (Top 6 rows):

	Country Name	Country Code	Year	Value
0	Argentina	ARG	2014	-2.51262
1	Bolivia	BOL	2014	5.46057
2	Brazil	BRA	2014	0.503956
3	Chile	CHL	2014	1.79265
4	Colombia	COL	2014	4.49903
5	Ecuador	ECU	2014	4.22607

Fig: GDP Data

# Methodology

## **1. Time Series Analysis:**

- Examined trends in health spending and GDP growth over time.

## **2. Correlation Analysis:**

- Explored relationships between variables.

## **3. Country-wise Trends:**

- Analyzed data for individual countries.

# Results and Interpretation 1/3

## 1. Time Series Analysis:

- GDP growth varied across countries.
- Guyana showed a sharp GDP rise (2020–2022).

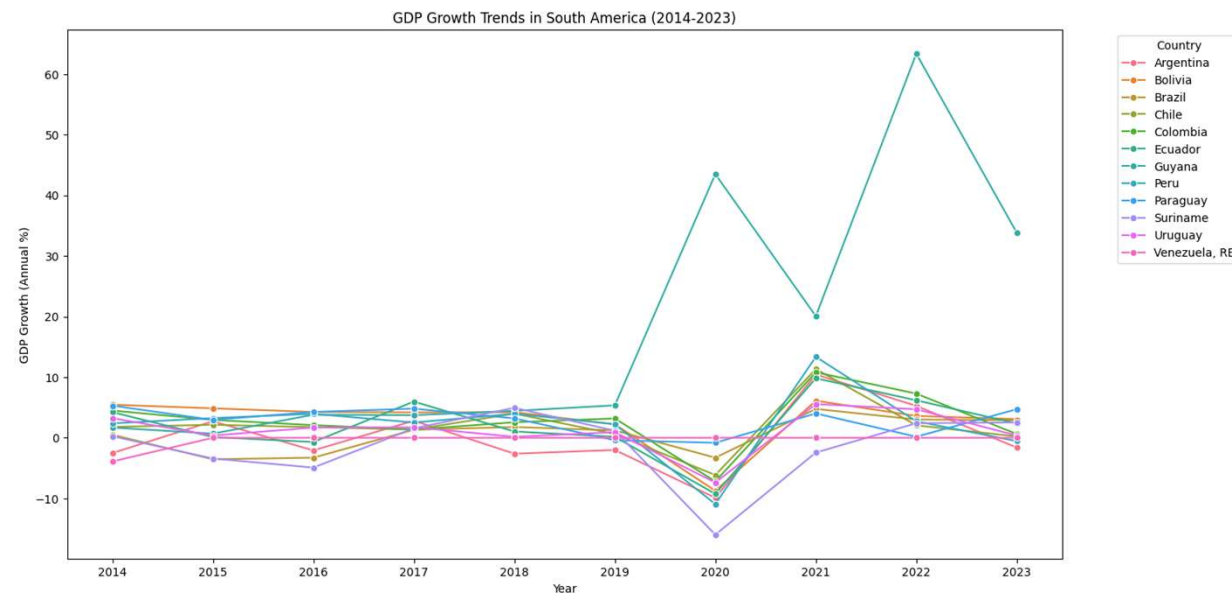


Fig: GDP Data- Time Series Analysis



# Results and Interpretation 1/3

## 1. Time Series Analysis: Health Expenditure data

- Health expenditure generally increased.
- Venezuela faced consistent economic contraction.

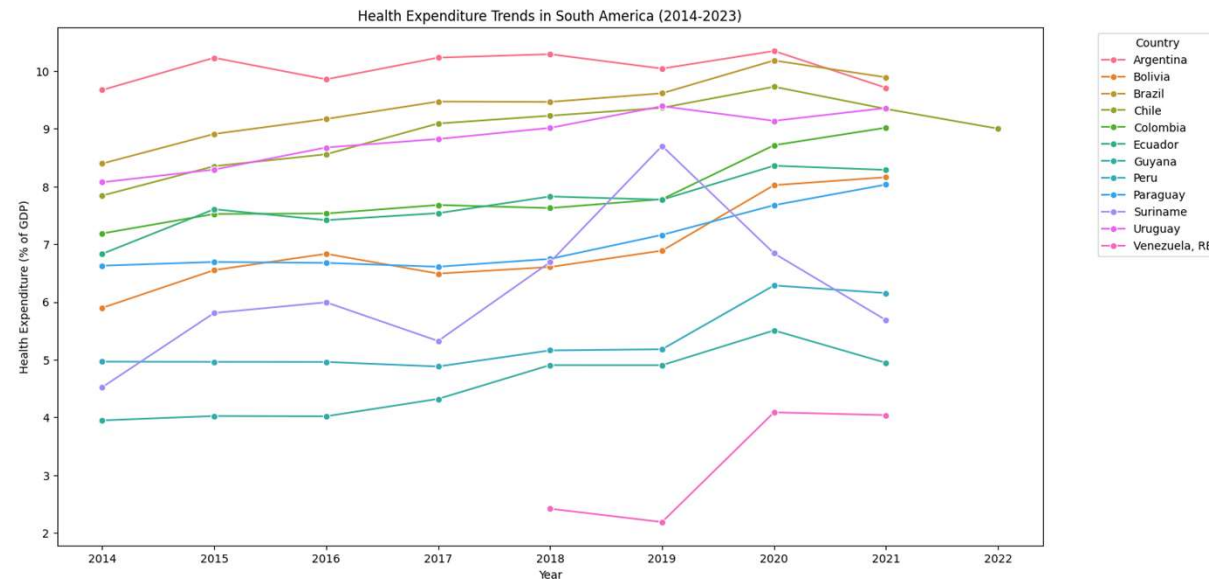


Fig: GDP Data- Health Expenditure data

# Results and Interpretation 2/3

## 1. Correlation Analysis:

- Weak negative correlation (-0.16) between health expenditure and GDP growth.
- Implies other factors that significantly influence GDP growth.

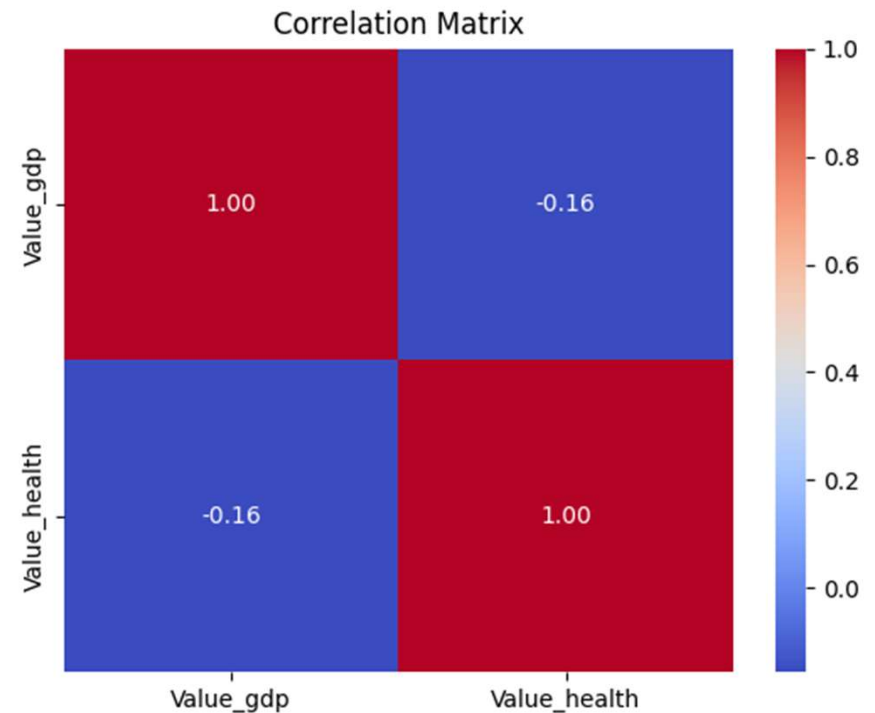


Fig: Correlation Analysis

# Results and Interpretation 3/3

## 1. Country-wise Trends :

- Guyana: High GDP growth with low health spending.
- Argentina, Brazil, and Chile: Stable health spending with GDP fluctuations.
- Venezuela: Economic decline with flat health expenditure trends.

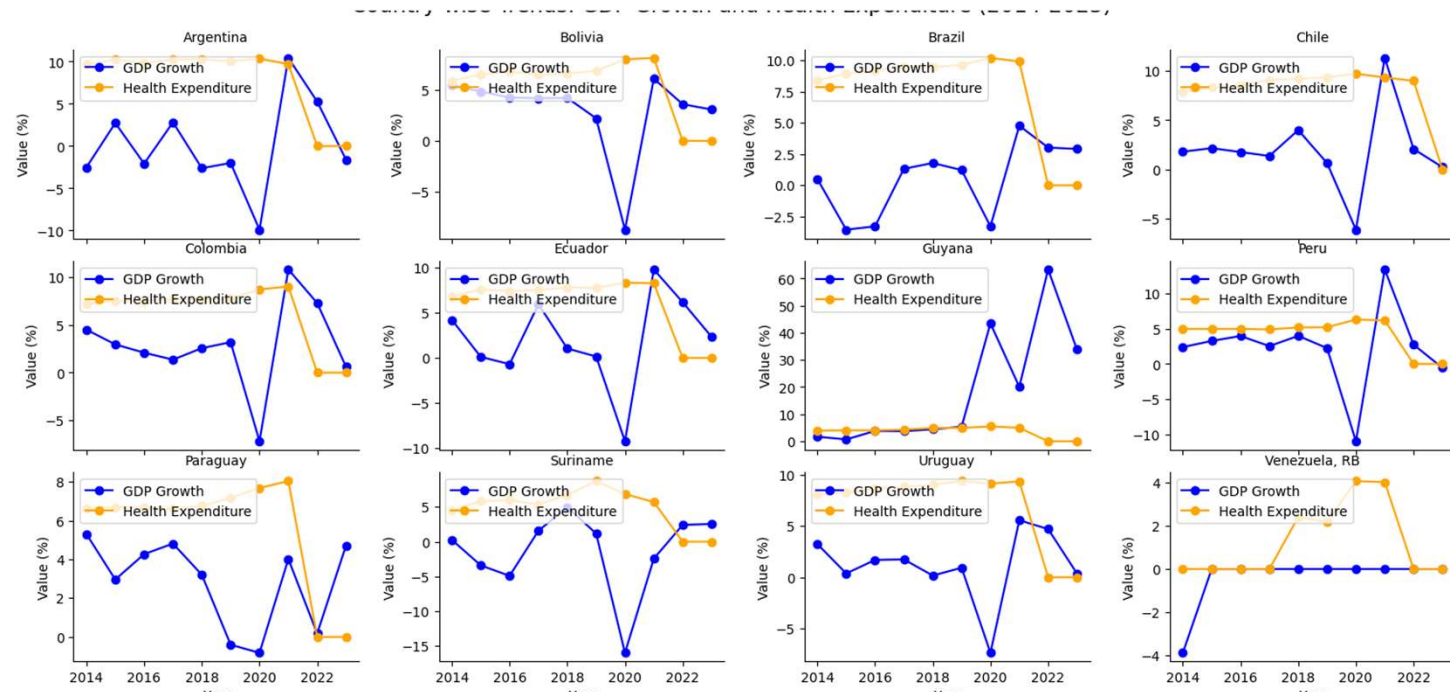


Fig: Country-wise Trends

# Conclusion

- No strong correlation between health expenditure and GDP growth.
- Countries with higher health spending showed greater resilience during downturns



# References

- [1] World Bank Open Data: <https://data.worldbank.org>
- [2] Creative Commons Attribution License:  
<https://creativecommons.org/licenses/by/4.0/>
- [3] “Data Pipeline Architecture - A Deep Dive — StreamSets,” SoWare AG.  
(accessed 28-Nov, 2024)