

# GLOBAL MATERNAL HEALTHCARE DISPARITIES ANALYSIS





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# INTRODUCTION—Maternal Health

## Maternal Health Overview:

- Focuses on well-being of the mother during pregnancy, childbirth, and postpartum
- Addresses factors like healthcare access, skilled attendance, prenatal, and postnatal care

## Key Factors in Maternal Health:

- Access to quality healthcare
- Skilled attendance during childbirth
- Prenatal and postnatal support





# INTRODUCTION—Why is maternal health important?

## **Essential for Women's Well-being:**

- Ensures health and survival of mothers
- Significantly impacts the overall well-being of families and communities

## **Barometer for Country's Effectiveness:**

- Reflects health policies and infrastructure
- Indicates commitment to social development

## **Multidimensional Indicator:**

- Goes beyond maternal health alone
- Reflects broader socio-economic context

# MOTIVATION



287,000

Appx. number of women losing their lives during  
and after pregnancy



# MOTIVATION—Causes of disparities in maternal health

## **Data Fragmentation:**

- Challenge: Maternal health data is scattered across diverse sources.
- Impact: Accessing and analyzing data becomes challenging.

## **Inefficient Retrieval:**

- Challenge: Difficulty in quickly retrieving specific maternal health data.
- Impact: Delays in accessing critical information can occur.

## **Complex Data Analysis:**

- Challenge: Analyzing trends, patterns, and correlations is complex without a structured approach.
- Impact: Gaining insights from data becomes a challenging task.

## **Delayed Monitoring:**

- Challenge: Timely intervention is crucial, but delayed access to information hinders effective monitoring.
- Impact: Monitoring maternal health becomes less responsive and efficient.



# PROJECT OBJECTIVE

**Project Objective: To Create a Centralized Maternal Health Database**

**Reasons:**

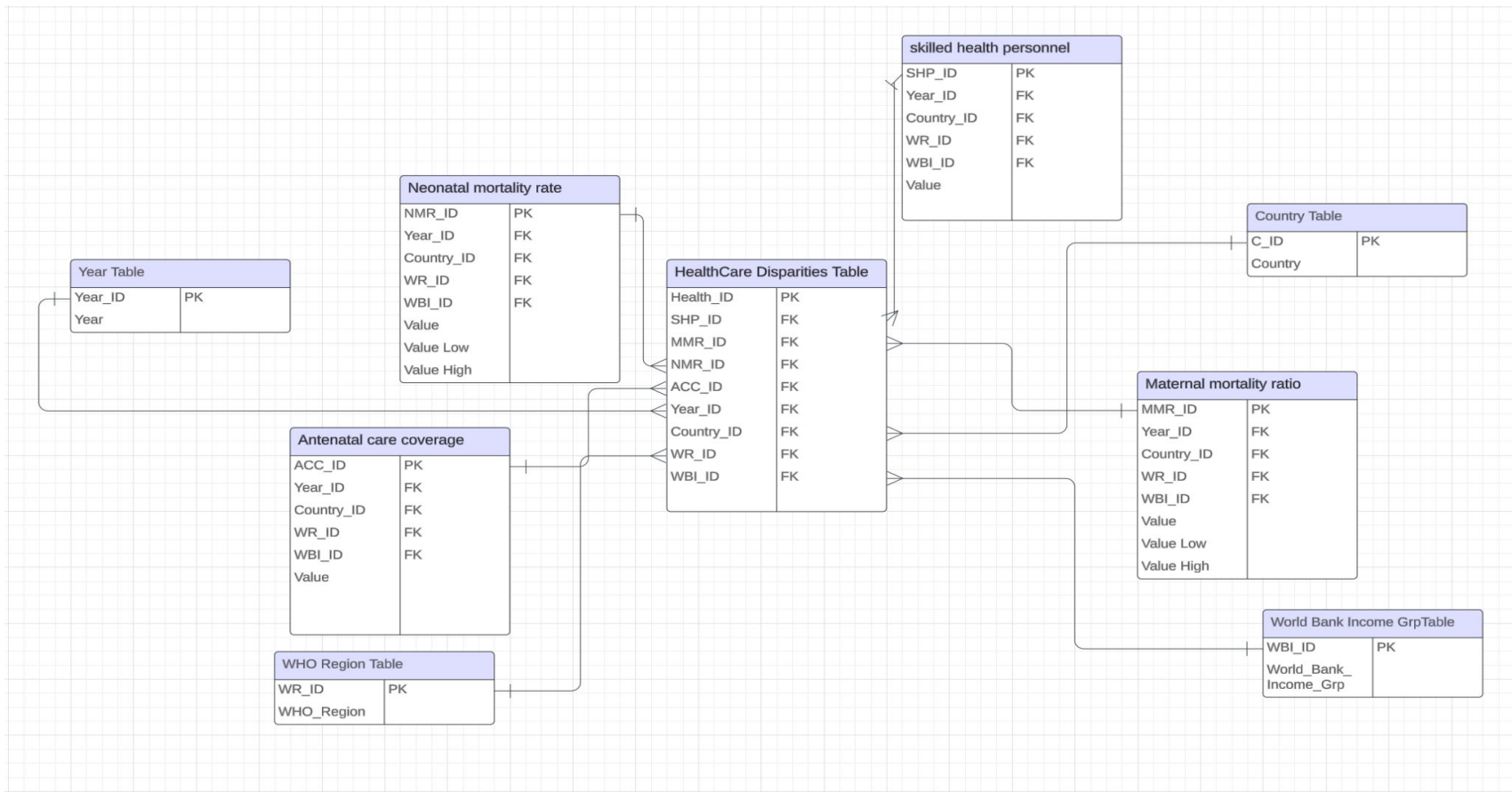
- For streamlined storage and management
- To enable efficient data retrieval
- Provide a unified database platform to facilitate systematic data analysis for researchers and policymakers
- To provide a foundation for evidence-based resource allocation
- To contribute to improved maternal health outcomes through informed policies



# DATA

- The World Health Organization (WHO) houses a vast repository of crucial data
- Demographic data, is instrumental in understanding population dynamics to identify vulnerable groups
- Our robust pipeline showcases a practical application of big data and analytics in the healthcare domain
- By transforming and visualizing this data, we aim to build a simple, user-friendly pipeline





# SOFTWARE TOOLS USED



## Airflow

Creating and managing  
the DAG and ETL process



## PostgreSQL

Managing the  
database



## ElephantSQL

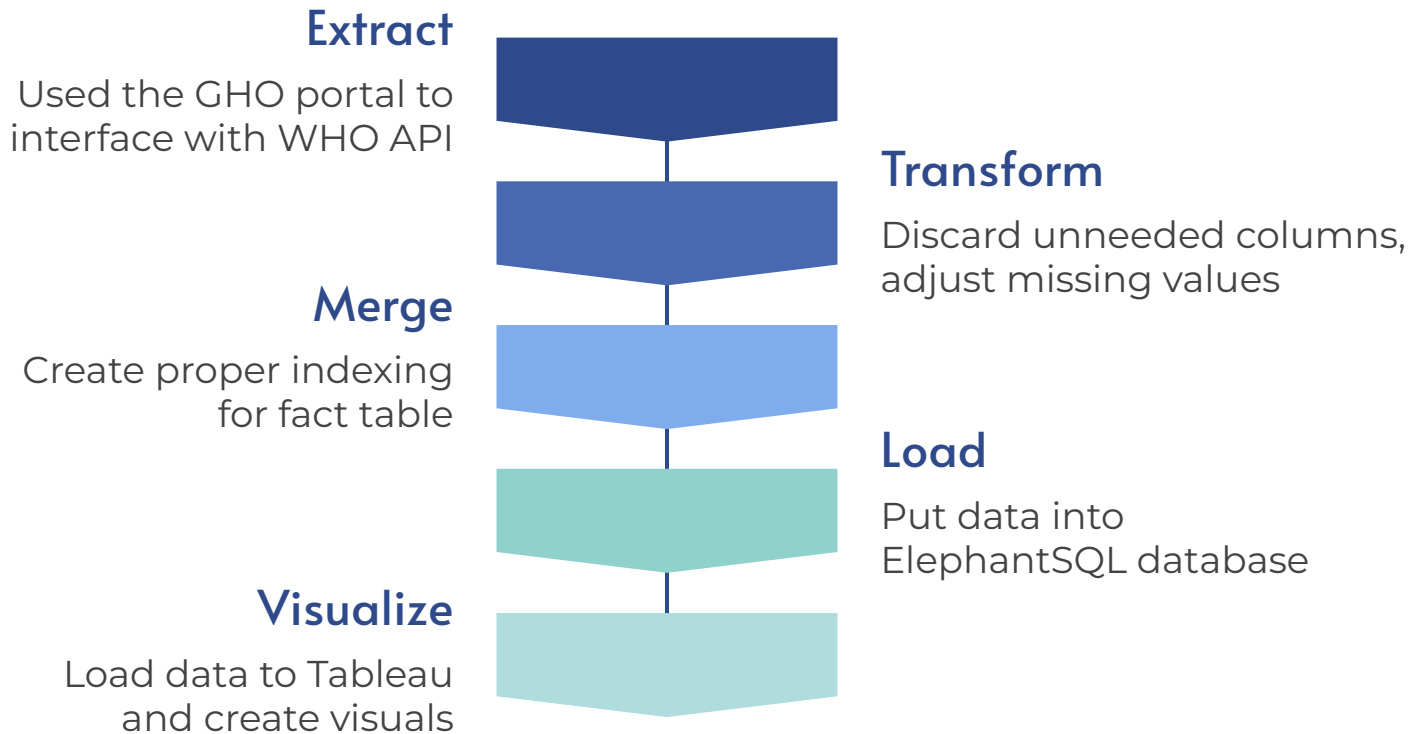
Hosting the  
database server



## Tableau

Understand and visualize  
the data

# Data Procedure



# DATABASE VISUALIZATIONS

```
SELECT * FROM "public"."region_dim" LIMIT 100
```

Table queries ▾

Previous queries ▾

Execute ▶

WHO\_Region\_Id

WHO\_Region

6	Africa
3	Americas
1	Eastern Mediterranean
0	Europe
4	Global
5	South-East Asia
2	Western Pacific

```
SELECT * FROM "public"."neonatal_dim" LIMIT 100
```

Table queries ▾

Previous queries ▾

Execute ▶

NMR_Id	NMR_Indicator	Year_Id	Country_Id	WHO_Region_Id	WB_Income_Group_Id	NMR_Value	NMR_Value_Low	NMR_Value_High
0	Neonatal mortality rate (per 1000 live births) (SDG 3.2.2)	39	87	6	0	44.81819	43.11747	46.81819
1	Neonatal mortality rate (per 1000 live births) (SDG 3.2.2)	40	87	6	0	44.81854	42.73753	46.41854
2	Neonatal mortality rate (per 1000 live births) (SDG 3.2.2)	41	87	6	0	44.12704	42.47141	46.01704

```
SELECT * FROM "public"."healthcare_disparities_fct" LIMIT 10000
```

Table queries ▾

Previous queries ▾

Execute ▶

SHP_Id	MMR_Id	NMR_Id	ACC_Id	Year_Id	Country_Id	WHO_Region_Id	WB_Income_Group_Id
		0		39	131	1	4
		1		40	131	1	4
		2		41	131	1	4
		3		42	131	1	4
		4		43	131	1	4
		5		44	131	1	4
		6		45	131	1	4
		7		46	131	1	4

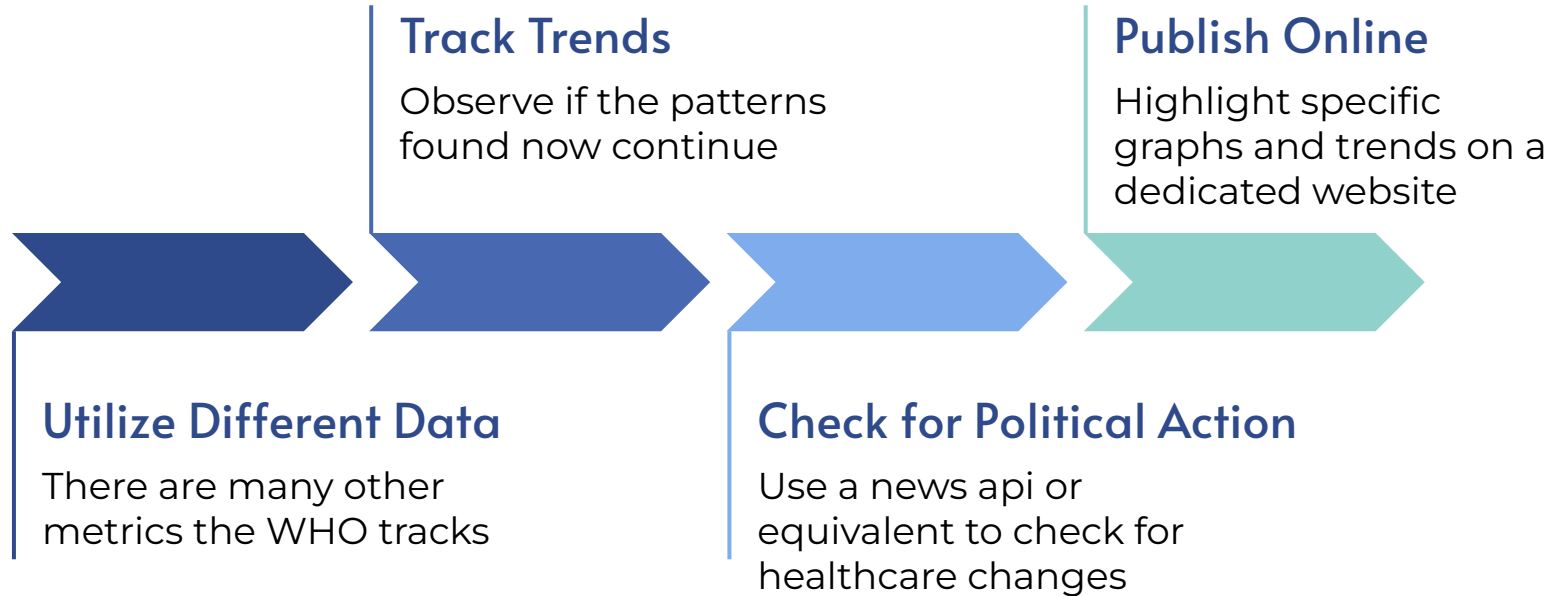
# Switching to TABLEAU



# CHALLENGES

- WHO API
  - Doesn't contain the income group column
- Apache Spark not needed
  - The scope of the project did not necessitate spark, so it went unused
- MongoDB vs PostgreSQL
  - It was much easier to to work with our data in PostgreSQL

# FUTURE SCOPE



# CONCLUSION

- Strategic Data Source Choice- WHO for maternal and newborn health
- Scalability and reliability of tools- Elephant SQL and Tableau
- Practical Application of Technology- User friendly and simple deployment
- Leveraging Big data tools to emphasize the practical application of big data in solving real-world challenges, particularly in the crucial domain of global health



# RESOURCES

## DATA

- <https://www.who.int/data/gho/data/indicators>
  - <https://data.who.int/indicators/i/AC597B1>
  - [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/births-attended-by-skilled-health-personnel-\(-\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/births-attended-by-skilled-health-personnel-(-))
  - [https://www.who.int/data/gho/data/indicators/indicator-details/GHO/neonatal-mortality-rate-\(per-1000-live-births\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/neonatal-mortality-rate-(per-1000-live-births))
  - <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/antenatal-care-coverage-at-least-four-visits>
- <https://github.com/KOcasey/CSCI-5283-Final-Project/tree/main/dags/data>

## SOFTWARE

- <https://airflow.apache.org>
- <https://www.postgresql.org>
- <https://www.elephantsql.com>
- <https://www.tableau.com>