Final Project Report

1. Introduction

1.1. Project overview

Malnutrition among children under five remains a serious global health challenge that affects both physical and cognitive development. To better understand the scale and nature of this issue, this project analyzes global malnutrition trends from 1983 to 2019, focusing on key indicators such as stunting, wasting, underweight, and overweight.

Using Power BI, the analysis visualizes data from multiple countries categorized by income levels low, lower-middle, upper-middle, and high income as well as special classifications like LDC, LLDC, LIFD, and SIDS. The goal is to provide policymakers, NGOs, and researchers with an interactive visual tool that helps identify high-burden regions and supports targeted interventions.

1.2 Objectives

- Identify countries with the highest malnutrition burden.
- Compare malnutrition trends across income groups and global regions
- Provide actionable insights for policymakers, NGOs, and healthcare organizations.
- Develop an interactive Power BI dashboard that enables visual analysis of historical trends and patterns.

2. Project Initialization and Planning Phase

2.1. Define Problem Statement

Malnutrition continues to affect millions of children under the age of five globally, leading to long-term health, education, and economic consequences. Policymakers and organizations often struggle with fragmented interpret

2.2. Project Proposal (Proposed Solution)

Solution: Develop a Power BI dashboard that visualizes malnutrition indicators across countries and income levels, enabling comparison, trend analysis, and data-driven decision-making.

• **Expected Outcomes:**

1. A prioritized list of countries with high malnutrition burden.
2. Visual insights into stunting, wasting, underweight, and overweight trends.
3. An interactive tool for decision-makers to monitor progress over time.

2.3. Initial Project Planning

Task	Timeline	Responsibility	Status
Data Collection	5 October 2025	Self	Completed
Data Cleaning & Preprocessing	6 October 2025	Self	Completed
Dashboard Design & Visualization	7 October 2025	Self	Completed
Report Writing	9 October 2025	Self	Completed

3. Data Collection and Preprocessing Phase

3.1. Data Collection Plan and Raw Data Sources Identified

Datasets Used:

1. country-wise averages.csv – Country-level malnutrition metrics.
2. malnutrition-estimates.csv – Detailed data on stunting, wasting, underweight, overweight for U5 children.
    - Source: Kaggle Global Malnutrition Dataset.

3.2. Data Quality Report

- Checked for missing or inconsistent values.
- Corrected country names for proper mapping.
- Cleaned columns: Stunting_%, Wasting_%, Underweight_%, Overweight_%, Income_Group.
- Added calculated column Burden = U5 Population × Stunting_% / 100 for country-level impact.

3.3. Data Exploration and Preprocessing

- Computed averages for global and income group comparisons.
- Verified outliers and ensured consistent formatting for visualizations.
- Preprocessed data is Power BI ready for dashboards and analysis.

4. Data Visualization

4.1. Framing Business Questions

The Dashboard was designed to answer key analytical questions such as :

- What is the **current global average stunting rate** among children?
- How do the **underweight** and **wasting rates** compare to stunting globe ?
- Which **regions or continents** have the highest concentration of stunting?
- Which countries have the **highest and lowest stunting rates**?
- How have **stunting trends evolved over time** in specific countries?
- Are there **regional patterns** or clusters of countries with similar malnutrition indicators?

4.2. Developing Visualizations

The key visuals are:

Stunting Rate: 25.81

Underweight Rate: 13.50

Wasting Rate: 6.96

A **map** showing the global distribution of child stunting.

A **line chart** illustrating global trends in child malnutrition from 1983 to 2019.

A **pie chart** depicting the income classification by stunting rate.

5. Dashboard

5.1. Dashboard Design File

The interactive Power BI dashboard consists of two main pages:

1. **Global Child Malnutrition Dashboard -** A dashboard displaying various data visualizations and metrics related to global child malnutrition, including stunting, underweight, and wasting rates.
2. **Child Malnutrition Insights –** A data visualization dashboard titled "Child Nutrition Insights," displaying various charts and graphs related to child stunting rates by country and over time.

6. Report

6.1. Story Design File

Country Data: The dashboard allows users to select a specific country and a year range from 1983 to 2019 to view data.

Stunting Rates: A bar chart shows the latest stunting rates by country, with Burundi, Timor-Leste, and Bangladesh having the highest rates.

Stunting Over Time: A line chart shows the overall sum of stunting over the years, indicating a peak around the year 2000.

Stunting Rate by Country Over Time: Another chart displays the stunting rate over time for a selection of countries, showing how rates have changed from 1985 to 2020.

Global Distribution: A pie chart breaks down the stunting data by country groupings such as LDC, LIFD, and LLDC, showing the percentage contribution of each group.

7. Performance Testing

7.1 Utilization of Data filters

Applied interactive filters for Country, Year, and Income Group to dynamically analyze changes across dimensions.

7.2 No of Visualization

The final Power BI dashboard includes 12 key visuals:

World Maps, Line Charts, Area Charts, KPI Cards, and Scatter Plots.

8. Conclusion/Observation

• Stunting and underweight prevalence remain high in low-income countries. • India, Nigeria, and Pakistan contribute most to global stunting burden.

• Malnutrition is inversely related to income levels.

• Policy interventions needed for Sub-Saharan Africa and South Asia.

• Overweight prevalence rising in upper-middle-income countries, indicating double-burden malnutrition.

9. Future Scope

• Integrate additional datasets on maternal nutrition, vaccination coverage, and micronutrient deficiencies.

• Implement predictive modeling to forecast future malnutrition trends. • Develop mobile-friendly dashboards for accessibility.

• Combine with broader global health and socioeconomic indicators for holistic insights.

10. Appendix

10.1. GitHub & Project Demo Link

- **GitHub :** https://github.com/thipiriboinapraveen383-lang/Global-malnutrition-trends-power-BI/upload/main
- **Project Demo :** https://drive.google.com/file/d/1TWKEMNYT0O5A56L83CoBakcFB7R5XkOa/view?usp=drivesdk