



# GLOBAL MALNUTRITION TRENDS: A POWER BI ANALYSIS (1983–2019)

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# INTRODUCTION

Malnutrition among children under five years of age remains one of the most significant global public health challenges. To better understand patterns of child malnutrition across countries and income groups, ABC Company initiated this analytical project covering the period 1983–2019. The dataset, sourced from UNICEF/WHO/World Bank and downloaded from Kaggle through the provided project link, includes key indicators such as Stunting, Wasting, Severe Wasting, Underweight, and Overweight.

The primary goal of this project is to identify how malnutrition levels vary across different Income Classifications (Low, Lower-Middle, Upper-Middle, High) and special categories such as LDC (Least Developed Countries), LIFD (Low Income Food Deficient), LLDC (Land Locked Developing Countries), and SIDS (Small Island Developing States). Additionally, the project aims to determine which countries exhibit the highest malnutrition burden and how economic status influences child health outcomes.

Using Power BI, a series of interactive visualizations and KPIs were developed to derive insights from the dataset. The dashboard allows users to explore trends, compare metrics across nations and income groups, and understand the relative severity of malnutrition worldwide.

## DATASET DETAILS

The dataset was downloaded from Kaggle using the link provided in the project description.

It includes the following key fields:

- Country & ISO Code
- Survey Year & Year
- Income Classification (0,1,2,3 → Low to High)
- Survey Sample (N)
- Malnutrition Indicators:
  - Severe Wasting
  - Wasting
  - Stunting
  - Underweight
  - Overweight
- Special Categories: LDC, LIFD, LLDC or SID2
- U5 Population ('000s)
- Author, Source, Short Source, Notes

Total rows in dataset: 140 country-level observations.

This dataset provides a comprehensive snapshot of global malnutrition trends across several decades, enabling detailed comparison between countries of different income levels and developmental categories. Each row represents a specific country and survey year, making the dataset highly structured and suitable for time-series and cross-country analysis. The inclusion of special classifications such as LDC, LIFD, LLDC, and SID2 allows for deeper insights into how geographical and economic constraints influence child nutrition. Furthermore, the dataset integrates multiple forms of malnutrition indicators, which makes it valuable for identifying patterns, correlations, and disparities at both regional and global levels. This rich data foundation ensures that Power BI visualizations can effectively highlight meaningful trends and support evidence-based decision-making.

# DATA CLEANING & TRANSFORMATION

All data cleaning was done in Power Query after importing the Excel file into Power BI.

## 1. Changing Data Types

Several fields such as Survey Sample, Underweight, Wasting, Overweight, and U5 Population were incorrectly imported as text.

I converted them into:

- Whole Number
- Fixed Decimal Number where required

This ensured smooth aggregation and accurate mathematical calculations.

## 2. Handling Null & Missing Values

- Removed rows containing nulls in critical fields (Survey Sample, Underweight, Stunting).
- Replaced minor missing numerical values with 0 where appropriate.
- Cleaned text inconsistencies in Country and Source columns.
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## 3. Removing Duplicates & Noise

- Removed duplicate rows based on Country + Year.
- Eliminated blank rows and redundant descriptive notes.
- Ensured all numeric columns were correctly formatted for visuals.

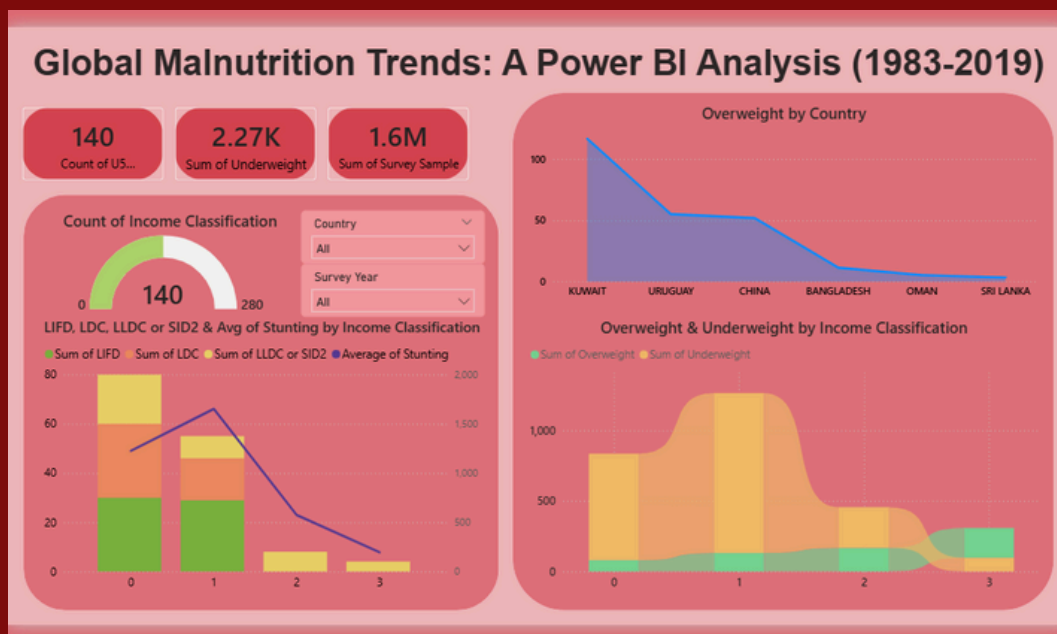
This resulted in a clean, analysis-ready dataset.

# DASHBOARD DEVELOPMENT

After completing the data cleaning process—which included converting values into fixed decimal format, removing null and duplicate records, and eliminating overall noise—the full analytical dashboard was developed in Power BI. The dashboard contains several key visual components:

- KPI Cards
- Gauge Chart
- Line Chart
- Stacked Column Chart
- Area Chart
- Country-wise Visualization
- Interactive Slicers (Country, Survey Year)

Each visual element is directly linked to the project scenarios, providing a complete analytical view of global malnutrition trends.



# DASHBOARD DEVELOPMENT

## Count of U5 Population (140)

A KPI Card highlights the total number of dataset observations related to the under-five population. This helps establish the dataset size used for the study.

## Sum of Survey Sample (11M)

A KPI Card displays the total survey sample count (~11 million), indicating a strong and reliable dataset for meaningful insights.

## Sum of Underweight (2.08K)

Another KPI Card shows the total underweight cases (~2080), reflecting the global burden of underweight children under five.

## LDC, LIFD, LLDC/SID2 & Average Stunting by Income Classification

A combined Stacked Column Chart with a Line Chart plots:

- Sum of LDC
- Sum of LIFD
- Sum of LLDC or SID2
- Average Stunting

## Sum of Overweight by Country

A country-level line/area visualization shows overweight counts across nations. For instance, Kuwait records the highest overweight values, exceeding 120. This helps identify regions facing rising overweight prevalence.

## Overweight vs Underweight by Income Classification

A Stacked Area Chart shows that underweight cases are highest in low-income groups, while overweight cases rise with higher income levels, illustrating the global “double burden of malnutrition.”

## INSIGHTS & FINDINGS

From the dashboard, several key insights were obtained:

### 1. Economic Status Influences Child Nutrition

- Low-income groups show extremely high stunting and underweight rates.
- High-income groups show lower stunting but higher overweight prevalence.

### 2. Kuwait Has Highest Overweight Cases

Overweight numbers exceed 120 in Kuwait, indicating a shift toward nutrition imbalance.

### 3. Total Survey Sample of 11M Ensures Strong Data Reliability

The large sample size enhances credibility of trends observed.

### 4. Underweight Cases (2080) Show Persistent Global Concern

Despite economic growth in many countries, underweight remains a significant issue.

### 5. LDC, LIFD, LLDC/SIDS Groups Show Severe Malnutrition Levels

These categories align with low economic development and food scarcity.

# CONCLUSION

This Power BI dashboard provides a clear and interactive analysis of global malnutrition trends among children under five from 1983 to 2019. Starting from dataset download, data cleaning, noise removal, transformation, and advanced visualization, the project successfully highlights the relationship between economic status and malnutrition.

The dashboard fulfills all project scenarios with accurate KPIs, comparative visuals, and meaningful insights. It serves as a valuable tool for policymakers, researchers, and health organizations to identify high-risk countries and prioritize interventions. Overall, this project demonstrates strong skills in data preparation, visualization, analytical thinking, and modern BI storytelling.

