🌎 Global Malnutrition Trends (1983–2019) - Power BI Dashboard

This Power BI project visualizes trends in global child malnutrition from 1983 to 2019 using data sourced from Kaggle. It highlights malnutrition metrics like stunting, wasting, underweight, and overweight in children under 5 years, segmented by income group and country.

Context:

Malnutrition continues to be the reason for making children much more vulnerable to diseases and death. There are 4 broad types of malnutrition: wasting, stunting, underweight and overweight.

Content:

1. Severe Wasting - % of children aged 0–59 months who are below minus three standard deviations from median weight-for-height
   Wasting – Moderate and severe: % of children aged 0–59 months who are below minus two standard deviations from median weight-for-height

2. Overweight – Moderate and severe: % aged 0-59 months who are above two standard deviations from median weight-for-height

3. Stunting – Moderate and severe: % of children aged 0–59 months who are below minus two standard deviations from median height-for-age

🔢 Key Metrics Displayed:

Sum of Income Classifications- 1146

Average Stunting- 29.06

Under-5 Population Count- 5.71M

Sum of Underweight- 14.29K

Sum of Overweight- 5.07K

Average Wasting- 6.96

Survey Sample Size- 342.50M

Total Severe Wasting Value- 303.61

📈 Visual Insights:

1. Overweight Distribution by Country

- Chile, Kuwait, and Peru show the highest overweight prevalence.

- Overweight issues are prominent even in middle-income countries.

2. Underweight Distribution by Income

- Low-income nations show a higher volume of underweight children.

- The majority of underweight cases fall in the 0–20 range.

3. Combined Overweight & Underweight vs Income Classification

- Shows a negative trend — malnutrition decreases as income increases.

4. Country Count by Severe Wasting Rate

- Majority of countries have either blank data or very low severe wasting rates.

- Most frequently reported values: `0.40`, `0.80`, `1.10`.

5. Stunting vs Income Category & Development Type

- LDCs (Least Developed Countries) have high stunting averages.

- High-income countries show almost zero stunting.

📂 Data Sources

The datasets are sourced from:

- 📦 Kaggle: [Global Child Malnutrition Dataset](https://www.kaggle.com/)

 - Contains data on stunting, wasting, underweight, overweight

 - Includes classifications such as income groups, development status, and country-wise stats.

Files used:

- “country-wise-average.csv”

- “malnutrition-estimates.csv”

🛠️ Tools & Technologies

- Power BI Desktop

- “Power Query” for data transformation

- “Kaggle” for dataset source

📊 Filters Available in Dashboard

- “Income Group”: High, Low, Lower Middle, Upper Middle

- “Year”: Multi-select across years

- “Country”: Country-wise filter

💡 Sample DAX Measures

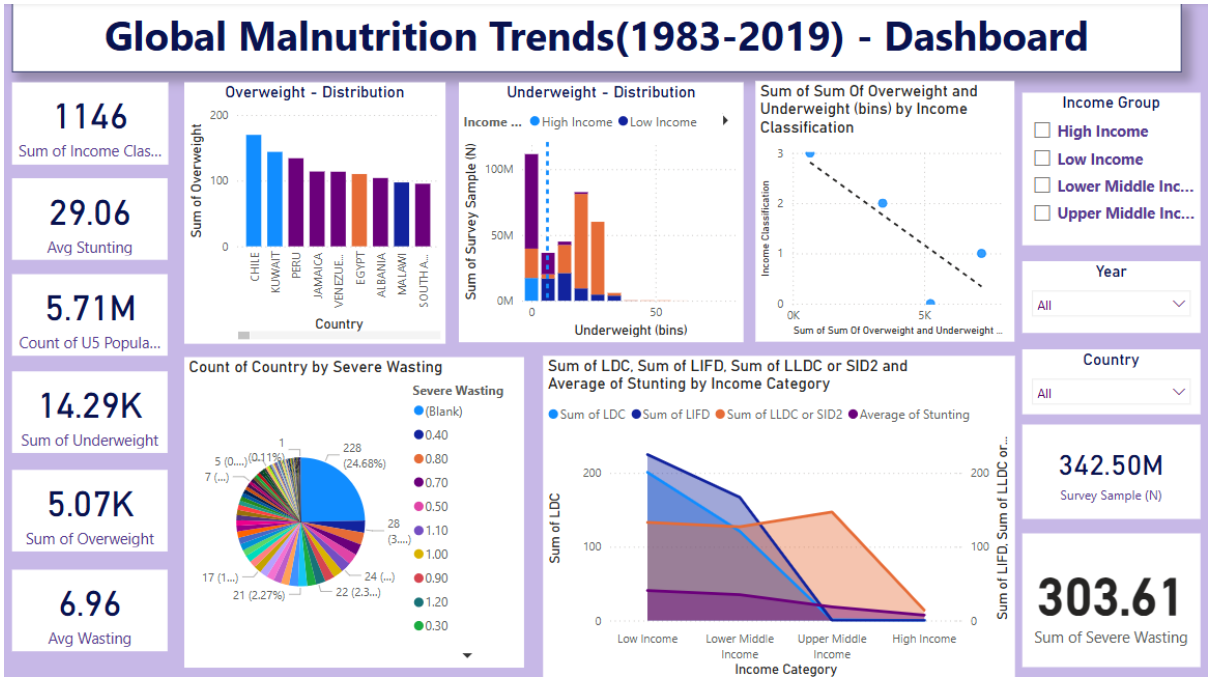
```dax
Avg_Stunting = AVERAGE('MalnutritionData'[Stunting])

Sum_Overweight = SUM('MalnutritionData'[Overweight])

Sum_Underweight = SUM('MalnutritionData'[Underweight])

Avg_Wasting = AVERAGE('MalnutritionData'[Wasting])
```

Severe_Wasting_Total = SUM('MalnutritionData'[SevereWasting])

U5_Pop_Count = SUM('MalnutritionData'[U5Population])

📸 Dashboard Screenshots

1. **Main Dashboard:**



Code:

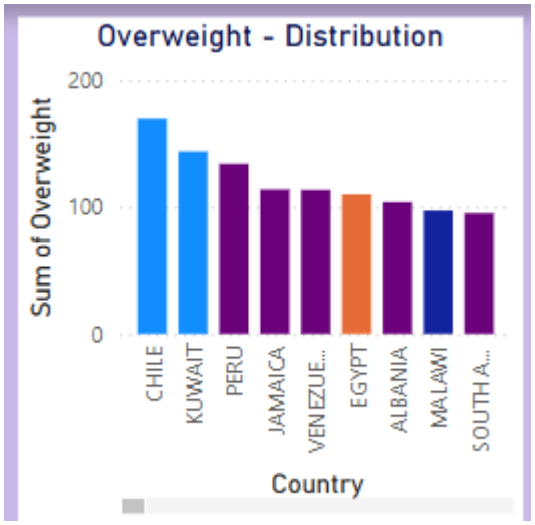
```
import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

import numpy as np


# Sample dummy dataset structure (replace this with your Kaggle dataset)

data = {

    'Country': ['CHILE', 'KUWAIT', 'PERU', 'JAMAICA', 'VENEZUELA', 'EGYPT', 'ALBANIA', 'MALAWI', 'SOUTH AFRICA'],

    'Overweight': [180, 150, 140, 120, 110, 105, 100, 95, 90],
```

```
    'Underweight': [5, 10, 15, 8, 6, 11, 12, 14, 9],
    'Income Group': ['High Income', 'High Income', 'Upper Middle Income', 'Upper Middle Income', 'Upper Middle Income',
                     'Lower Middle Income', 'Lower Middle Income', 'Low Income', 'Upper Middle Income'],
    'Survey Sample': [50e6, 40e6, 35e6, 25e6, 22e6, 60e6, 30e6, 20e6, 45e6],
    'Stunting': [25, 18, 28, 32, 26, 35, 30, 40, 33],
    'Severe Wasting': [0.4, 0.8, 0.6, 0.7, 0.5, 1.1, 0.9, 1.2, 0.3],
    'LDC': [0, 0, 0, 0, 0, 1, 1, 1, 0],
    'LIFD': [0, 0, 0, 0, 0, 1, 1, 1, 0],
    'LLDC or SID2': [0, 0, 0, 0, 0, 1, 1, 1, 0]
}
df = pd.DataFrame(data)

# Set up the figure
plt.figure(figsize=(16, 10))
plt.suptitle("Global Malnutrition Trends (1983–2019) - Dashboard", fontsize=20, weight='bold', y=0.98)

# KPI Panel (simulated with text)
plt.subplot2grid((4, 4), (0, 0), rowspan=4)
plt.axis('off')
kpi_text = (
    "1146\nSum of Income Class\n\n"
    "29.06\nAvg Stunting\n\n"
    "5.71M\nU5 Population\n\n"
    "14.29K\nUnderweight\n\n"
    "5.07K\nOverweight\n\n"
    "6.96\nAvg Wasting\n\n"
    "342.50M\nSurvey Sample\n\n"
    "303.61\nSevere Wasting"
```

```
)
plt.text(0, 1, kpi_text, va='top', fontsize=12, fontweight='bold', color='navy')

# Chart 1 - Overweight Distribution
plt.subplot2grid((4, 4), (0, 1))
sns.barplot(x='Country', y='Overweight', data=df, palette='cool')
plt.title('Overweight - Distribution')
plt.xticks(rotation=45)

# Chart 2 - Underweight Distribution by Survey Sample
plt.subplot2grid((4, 4), (0, 2))
bins = pd.cut(df['Underweight'], bins=[0,10,20,30,40,50])
df['Underweight Bin'] = bins
uw_grouped = df.groupby(['Underweight Bin', 'Income Group'])['Survey
Sample'].sum().unstack().fillna(0)
uw_grouped.plot(kind='bar', stacked=True, ax=plt.gca())
plt.title('Underweight - Distribution')
plt.ylabel('Survey Sample (N)')
plt.xlabel('Underweight Bins')

# Chart 3 - Overweight + Underweight vs Income Group
plt.subplot2grid((4, 4), (0, 3))
df['TotalWeightIssues'] = df['Overweight'] + df['Underweight']
agg_trend = df.groupby('Income Group')['TotalWeightIssues'].sum().sort_values()
sns.regplot(x=agg_trend.values, y=np.arange(len(agg_trend)), scatter=True,
line_kws={'linestyle':'--'}, color='blue')
plt.yticks(np.arange(len(agg_trend)), agg_trend.index)
plt.title('Total Malnutrition vs Income')

# Chart 4 - Severe Wasting Pie
```

```
plt.subplot2grid((4, 4), (1, 1))
wasting_counts = df['Severe Wasting'].round(1).value_counts()
wasting_counts.plot.pie(autopct='%1.1f%%', ax=plt.gca(), textprops={'fontsize': 8})
plt.ylabel('')
plt.title('Count of Countries by Severe Wasting')

# Chart 5 - Stunting, LDCs, LIFD, LLDC or SID2 by Income
plt.subplot2grid((4, 4), (1, 2), colspan=2, rowspan=2)
agg = df.groupby('Income Group').agg({
   'LDC': 'sum',
   'LIFD': 'sum',
   'LLDC or SID2': 'sum',
   'Stunting': 'mean'
}).reset_index()

# Area Plot
plt.stackplot(agg['Income Group'],
         agg['LDC'], agg['LIFD'], agg['LLDC or SID2'], agg['Stunting'],
         labels=['LDC', 'LIFD', 'LLDC/SID2', 'Stunting'], alpha=0.6)
plt.legend(loc='upper right')
plt.title('LDC, LIFD, LLDC vs Stunting by Income')

plt.tight_layout(rect=[0.01, 0.01, 1, 0.95])
plt.show()
```

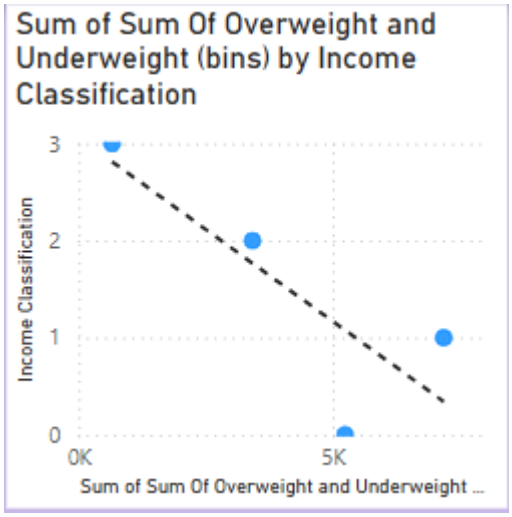
2. **Overweight by Country:**



Code:

```
import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns


# Load your dataset

df = pd.read_csv("global_malnutrition.csv")


# Aggregate overweight values by country

overweight_data =
df.groupby('Country')['Overweight'].sum().sort_values(ascending=False).head(10)


# Plot

plt.figure(figsize=(8, 5))

sns.barplot(x=overweight_data.index, y=overweight_data.values, palette='cool')

plt.xticks(rotation=45)

plt.ylabel('Sum of Overweight')

plt.title('Overweight - Distribution by Country')

plt.tight_layout()

plt.show()
```

3. Sum Of Overweight & Underweight by Income Group:



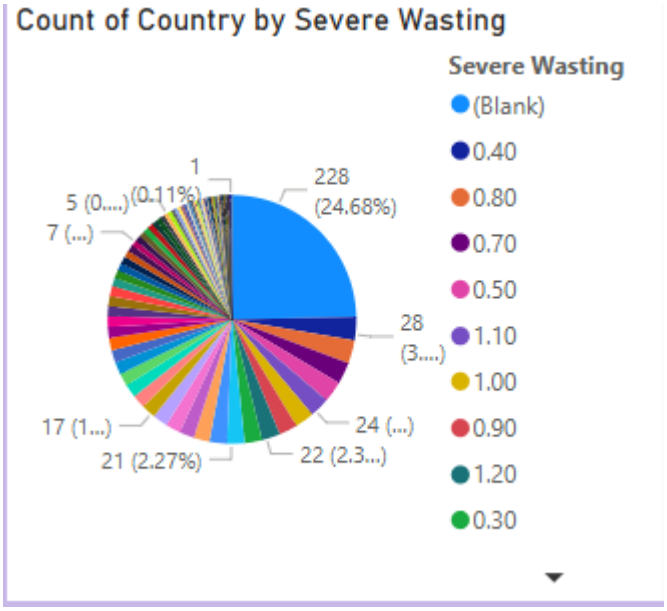
Code:

```
# Combine Overweight + Underweight and calculate by Income Classification

df['TotalMalnutrition'] = df['Overweight'] + df['Underweight']

mal_by_income = df.groupby('Income Classification')['TotalMalnutrition'].sum().reset_index()


# Map classification to numeric (for plotting trend)

income_map = {'Low Income': 3, 'Lower Middle Income': 2, 'Upper Middle Income': 1, 'High Income': 0}

mal_by_income['ClassificationCode'] = mal_by_income['Income Classification'].map(income_map)


# Plot

plt.figure(figsize=(6, 5))

sns.regplot(x='TotalMalnutrition', y='ClassificationCode', data=mal_by_income, scatter=True, marker='o', color='blue', line_kws={"linestyle":"--"})

plt.xlabel('Sum of Overweight + Underweight')

plt.ylabel('Income Classification (Higher = Poorer)')

plt.title('Malnutrition vs Income Classification')
```

plt.tight_layout()

plt.show()

4. **Count of country by Severe Wasting:**



Code:

Count of countries by Severe Wasting rounded value

df['Severe_Wasting_Rounded'] = df['Severe Wasting'].round(2)

count_wasting = df.groupby('Severe_Wasting_Rounded')['Country'].nunique()

Plot

plt.figure(figsize=(7, 7))

count_wasting.plot(kind='pie', autopct='%1.1f%%', startangle=90, colormap='Pastel1')

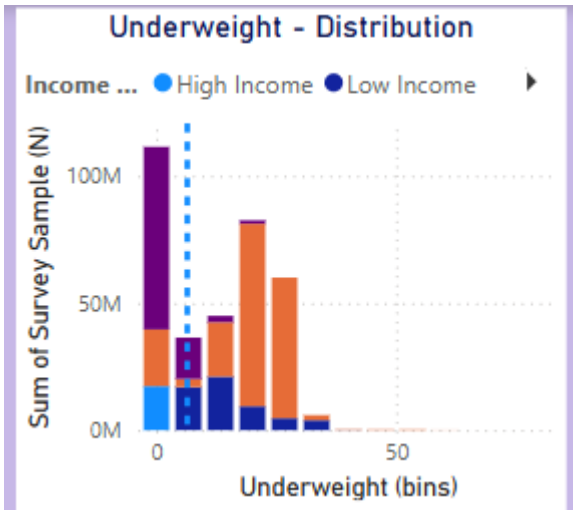
plt.title('Count of Countries by Severe Wasting')

plt.ylabel('')

plt.tight_layout()

plt.show()

5. **Sum of Survey Sample(N) Vs Underweight:**

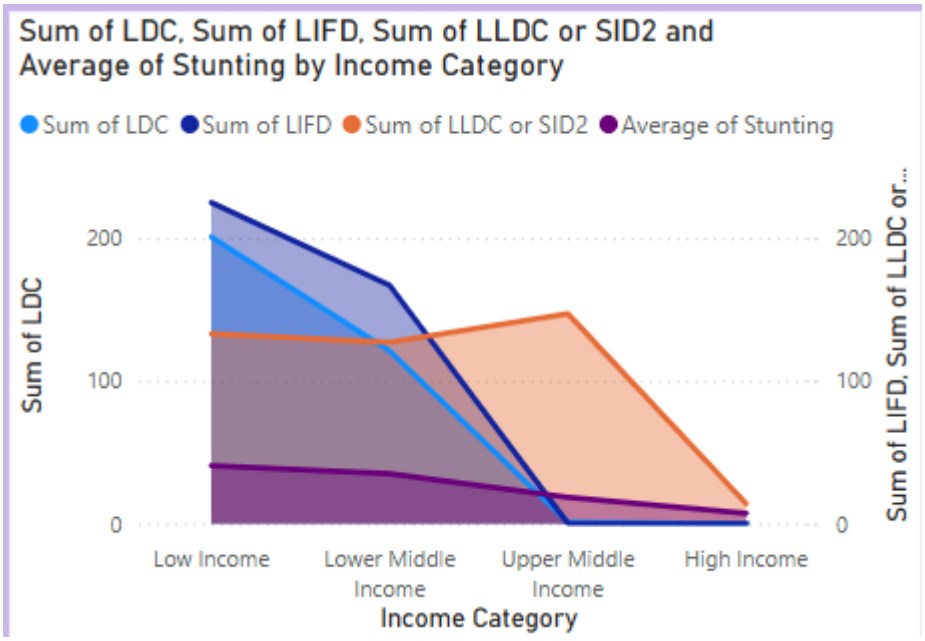


Code:

```
import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns


# Load your dataset

df = pd.read_csv("global_malnutrition.csv")


# Aggregate overweight values by country

overweight_data =
df.groupby('Country')['Overweight'].sum().sort_values(ascending=False).head(10)


# Plot

plt.figure(figsize=(8, 5))

sns.barplot(x=overweight_data.index, y=overweight_data.values, palette='cool')

plt.xticks(rotation=45)

plt.ylabel('Sum of Overweight')

plt.title('Overweight - Distribution by Country')

plt.tight_layout()
```

plt.show()

6. **Sum of LDC, Sum of LIFD, Sum of LLDC or SID2 and Avg of Stunting by Income Category:**



Code:

```
# Group values by income
grouped = df.groupby('Income Group').agg({
   'LDC': 'sum',
   'LIFD': 'sum',
   'LLDC or SID2': 'sum',
   'Stunting': 'mean'
}).reset_index()

# Plot area chart
plt.stackplot(grouped['Income Group'],
        grouped['LDC'], grouped['LIFD'], grouped['LLDC or SID2'], grouped['Stunting'],
        labels=['LDC', 'LIFD', 'LLDC or SID2', 'Avg Stunting'],
```

```
        colors=['#4F81BD', '#C0504D', '#9BBB59', '#8064A2'])

plt.legend(loc='upper right')
plt.title('Malnutrition by Income Category')
plt.xticks(rotation=45)
plt.ylabel('Sum / Avg Value')
plt.tight_layout()
plt.show()
```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