6_Antigua_and_Barbuda

September 23, 2025

1 Does female survival to age 65 coincide with changes in male survival to age 65 in Antigua and Barbuda between 1960 and 2020?

1.1 Abstract

Using World Bank World Development Indicators, this study investigates the relationship between female and male survival to age 65 in Antigua and Barbuda from 1960 to 2020. The descriptive evidence reveals that both female and male survival rates improved dramatically over the six-decade period; however, male survival consistently remained approximately 10 percentage points below female survival. This persistent gap highlights enduring gender differences in longevity despite broad improvements in population health. The findings underscore that even when overall health outcomes improve, gender disparities can remain structurally entrenched, emphasizing the importance of targeted public health policies and interventions that address differences in male and female mortality.

1.2 1. Question

Does female survival to age 65 coincide with changes in male survival to age 65 in Antigua and Barbuda between 1960 and 2020?

- **Measure of female survival**: Female survival to age 65 (% of cohort)
- **Measure of male survival**: Male survival to age 65 (% of cohort)

1.3 2. Data

- **Source**: World Bank World Development Indicators (WDI)
- **Indicators**:
  - Female survival to age 65 (% of cohort)
  - Male survival to age 65 (% of cohort)
- **Coverage**: Antigua and Barbuda, 1960–2020
- **Notes**: National-level data only

1.4 3. Method

1. Filtered dataset for Antigua and Barbuda.
2. **Selected relevant columns**: Year, Indicator Name, Value.
3. Pivoted indicators into separate columns and sorted by year.
4. Produced a line graph comparing female and male survival rates over time.

(Analysis is descriptive; no causal inference applied.)

1.5 4. Results

- **Female survival to age 65**: Increased steadily and substantially across the 1960–2020 period.
- **Male survival to age 65**: Also increased sharply but remained consistently around 10 percentage points lower than female survival.
- **Comparison**: Both sexes experienced major health gains, yet the persistent survival gap demonstrates enduring gender disparities in longevity.

(Figure 1. Female vs Male Survival to Age 65 in Antigua and Barbuda, 1960–2020)

(Table 1. Pivoted dataset)

1.6 5. Interpretation

- Antigua and Barbuda achieved large improvements in life expectancy for both sexes over six decades, reflecting better healthcare access, public health interventions, and socioeconomic development.
- The persistent 10-point gap between female and male survival indicates that biological, behavioral, or social determinants continue to produce systematic differences in longevity.
- These trends suggest that broad health improvements alone do not automatically eliminate gender disparities, highlighting the need for policies that address male-specific mortality risks or health behaviors.

1.7 6. Limitations

- Only two indicators analyzed; multidimensional poverty dynamics not fully captured.
- National-level data may obscure important regional or urban–rural variation.
- No causal relationships tested.

1.8 7. Next Steps / Extensions

- Investigate underlying causes of gender mortality differences (e.g., cardiovascular disease, occupational hazards).
- Incorporate subnational or cohort-level data to examine heterogeneity in survival trends.
- Explore correlations with social, economic, or behavioral variables to understand drivers of male-female survival gaps.
- Compare Antigua and Barbuda's trends to other Caribbean nations to assess regional patterns of gendered longevity.

[1]:
```
# Does female survival to age 65 coincide with changes in male survival to age␣
↪65 in Antigua and Barbuda between 1960 and 2020?

import pandas as pd
import matplotlib.pyplot as plt
import os

# Folders
```

```
data_raw_folder = "data_raw/"
data_clean_folder = "data_clean/"
figures_folder = "figures/"

# Load CSV
filename = "health_ant_filtered.csv"  # Filtered dataset with only relevant rows
df = pd.read_csv(os.path.join(data_raw_folder, filename))

# Keep only needed columns
df = df[["Year", "Indicator Name", "Value"]]

# Convert Year and Value to numeric, drop invalid rows
df["Year"] = pd.to_numeric(df["Year"], errors="coerce")
df["Value"] = pd.to_numeric(df["Value"], errors="coerce")
df = df.dropna(subset=["Year", "Value"])

# Pivot indicators into separate columns
df_pivot = df.pivot(index="Year", columns="Indicator Name", values="Value").
 ↪reset_index()
df_pivot = df_pivot.sort_values("Year")

print("Pivoted Antigua and Barbuda dataset:")
display(df_pivot)

# Interpolate missing values for smooth plotting (optional)
df_plot = df_pivot.interpolate(method='linear')

# Plot the two indicators
plt.figure(figsize=(10,6))
plt.plot(df_plot["Year"], df_plot["Survival to age 65, female (% of cohort)"],
         marker='o', linestyle='-', label="Survival to age 65, female (% of␣
 ↪cohort)")
plt.plot(df_plot["Year"], df_plot["Survival to age 65, male (% of cohort)"],
         marker='o', linestyle='-', label="Survival to age 65, male (% of␣
 ↪cohort)")

plt.title("Antigua and Barbuda: Female Survival to Age 65 vs Male Survival to␣
 ↪Age 65 (1960-2020)")
plt.xlabel("Year")
plt.ylabel("Percentage")
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.savefig(os.path.join(figures_folder,␣
 ↪"antigua_and_barbuda_female_survival_age_65_vs_male_surival_age_65.png"))
plt.show()
```

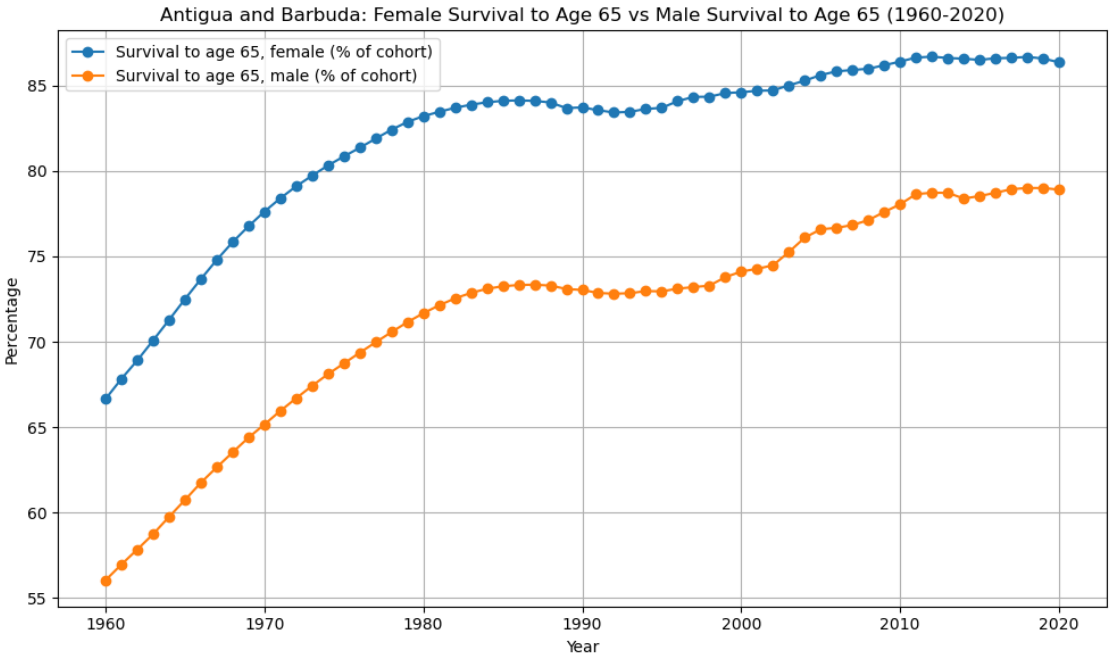
```
# Save cleaned CSV
df_pivot.to_csv(os.path.join(data_clean_folder,␣
 ↪"antigua_and_barbuda_female_survival_age_65_vs_male_surival_age_65"),␣
 ↪index=False)
```

Pivoted Antigua and Barbuda dataset:

```
Indicator Name  Year  Survival to age 65, female (% of cohort)  \
0               1960                                  66.648934
1               1961                                  67.830801
2               1962                                  68.909523
3               1963                                  70.085490
4               1964                                  71.280401
..               …                                        …
56              2016                                  86.593330
57              2017                                  86.613240
58              2018                                  86.672876
59              2019                                  86.572816
60              2020                                  86.354627

Indicator Name  Survival to age 65, male (% of cohort)
0                                            56.048271
1                                            56.967675
2                                            57.847533
3                                            58.751516
4                                            59.758109
..                                                 …
56                                           78.720523
57                                           78.930068
58                                           79.000381
59                                           79.000184
60                                           78.902061

[61 rows x 3 columns]
```


Antigua and Barbuda: Female Survival to Age 65 vs Male Survival to Age 65 (1960-2020)
Survival to age 65, female (% of cohort)
Survival to age 65, male (% of cohort)
Percentage
Year
85
80
75
70
65
60
55
1960
1970
1980
1990
2000
2010
2020