34_Chad

October 15, 2025

1 How has the prevalence of anemia among women of reproductive age evolved relative to the prevalence of anemia among children in Chad between 2000 and 2018?

1.1 Abstract

Using World Bank World Development Indicators (WDI), this study examines the evolution of anemia prevalence in Chad between 2000 and 2018, focusing on differences between women of reproductive age and children under five. The analysis compares two key indicators: prevalence of anemia among women ages 15–49 and prevalence of anemia among children ages 6–59 months. Over this eighteen-year period, both indicators decreased moderately, reflecting gradual improvements in nutrition, health interventions, and access to medical services. Notably, the decline among women and children underscores progress in addressing micronutrient deficiencies, public health campaigns, and broader socio-economic development. These trends highlight the country's evolving health landscape, the narrowing gap between adult and child anemia prevalence, and the broader implications for maternal and child health outcomes, labor productivity, and long-term human capital development in a low-resource context.

1.2 1. Question

How has the prevalence of anemia among women of reproductive age evolved relative to the prevalence of anemia among children in Chad between 2000 and 2018?

- **Women's anemia proxy**: Prevalence of anemia among women ages 15–49 (%)
- **Children's anemia proxy**: Prevalence of anemia among children ages 6–59 months (%)

1.3 2. Data

- **Source**: World Bank World Development Indicators (WDI)
- **Indicators**:
    - Prevalence of anemia among women ages 15–49 (%)
    - Prevalence of anemia among children ages 6–59 months (%)
- **Coverage**: Chad, 2000–2018
- **Notes**: National-level data only

1.4 3. Method

1. Filtered dataset for Chad and the relevant anemia indicators.
2. **Selected relevant columns**: Year, Indicator Name, and Value.

3. Pivoted women's and children's anemia data into separate series, ordered chronologically from 2000 to 2018.
4. Produced a dual-line graph comparing prevalence trends to visualize relative improvements and structural health dynamics over time.

(Analysis is descriptive; no causal inference applied.)

1.5 4. Results

- **Prevalence of anemia (women ages 15–49)**: Decreased moderately between 2000 and 2018, reflecting improvements in maternal nutrition, health services, and supplementation programs.
- **Prevalence of anemia (children ages 6–59 months)**: Declined at a similar pace, indicating progress in infant and child nutrition interventions, malaria control, and access to fortified foods.
- **Comparison**: Both groups experienced moderate decreases, with the gap between women and children narrowing slightly, suggesting coordinated improvements in household and community health initiatives.

(Figure 1. Chad: Prevalence of Anemia Among Women vs Children, 2000–2018)

(Table 1. Pivoted dataset summary)

1.6 5. Interpretation

- The parallel moderate declines in anemia prevalence for women and children suggest that national nutrition and health programs have had measurable impact, particularly through supplementation, fortified foods, and malaria control efforts.
- Improvements in maternal health likely contributed to better child nutrition outcomes, illustrating the intergenerational effects of targeted interventions.
- While progress is evident, anemia remains a significant public health concern, highlighting ongoing challenges in food security, healthcare access, and micronutrient deficiency management.
- Understanding these trends is critical for designing policies that simultaneously address adult and child health to optimize long-term human capital development.

1.7 6. Limitations

- National-level data may conceal significant regional disparities in anemia prevalence and program effectiveness.
- WDI estimates rely on national surveys and modeled projections, which may contain uncertainty, particularly in areas with limited health monitoring infrastructure.
- Descriptive analysis does not identify causal mechanisms behind declines in anemia prevalence, such as policy interventions, economic improvements, or disease control measures.

1.8 7. Next Steps / Extensions

- Disaggregate anemia data by region and socio-economic status to target interventions more effectively.
- Compare Chad's anemia trends with neighboring Sahelian countries to contextualize progress in regional nutrition outcomes.

- Examine the relationship between anemia reductions and maternal-child mortality, school performance, and labor productivity.
- Assess the impact of targeted programs — such as iron-folic acid supplementation, fortified food distribution, and malaria prevention — on continued declines in anemia prevalence among vulnerable populations.

```
[1]: # How has the prevalence of anemia among women of reproductive age evolved␣
     ↪relative to the prevalence of anemia among children in Chad between 2000 and␣
     ↪2018?

     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_tcd_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 Chad 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["Prevalence of anemia among women of␣
      ↪reproductive age (% of women ages 15-49)"],
```

```
            marker='o', linestyle='-', label="Prevalence of anemia among women of␣
    ↪reproductive age (% of women ages 15-49)")
plt.plot(df_plot["Year"], df_plot["Prevalence of anemia among children (% of␣
    ↪children ages 6-59 months)"],
            marker='o', linestyle='-', label="Prevalence of anemia among children␣
    ↪(% of children ages 6-59 months)")

plt.title("Chad: Prevalence of anemia among women of repoductive age vs anemia␣
    ↪among children (2000-2018)")
plt.xlabel("Year")
plt.ylabel("Percentage")
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.savefig(os.path.join(figures_folder,␣
    ↪"chad_prevalence_of_anemia_among_women_of_reproductive_age_vs_anemia_among_children.
    ↪png"))
plt.show()

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

```
Pivoted Chad dataset:

Indicator Name  Year  \
0                2000
1                2001
2                2002
3                2003
4                2004
5                2005
6                2006
7                2007
8                2008
9                2009
10               2010
11               2011
12               2012
13               2013
14               2014
15               2015
16               2016
17               2017
18               2018
```
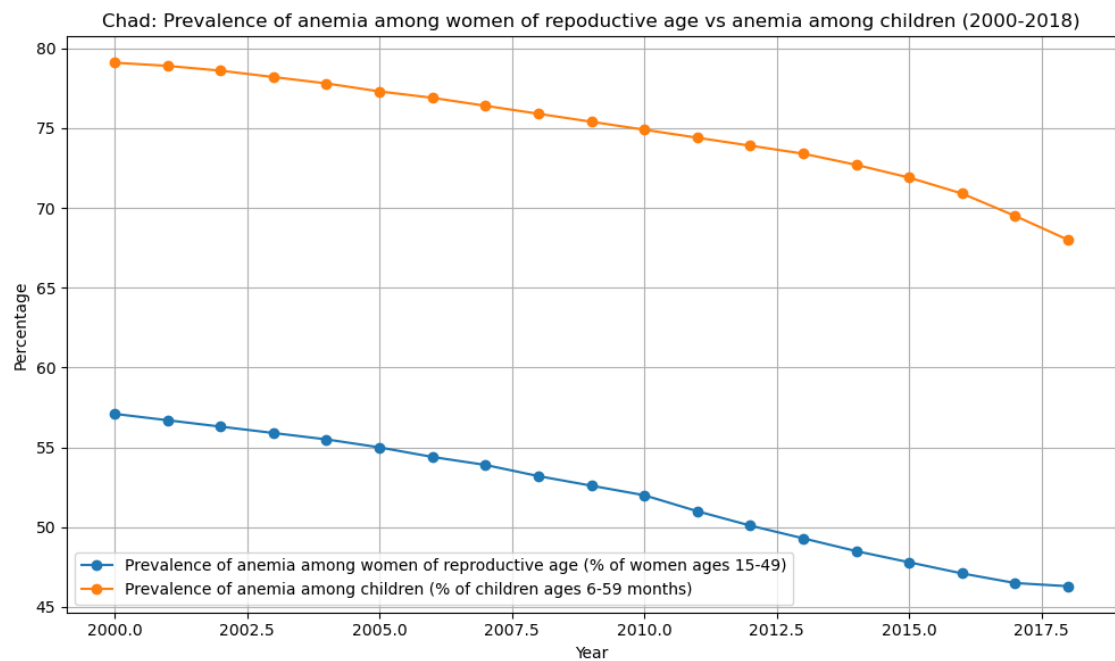
```
Indicator Name   Prevalence of anemia among children (% of children ages 6-59␣
 ↪months)  \
0                                                               79.1
1                                                               78.9
2                                                               78.6
3                                                               78.2
4                                                               77.8
5                                                               77.3
6                                                               76.9
7                                                               76.4
8                                                               75.9
9                                                               75.4
10                                                              74.9
11                                                              74.4
12                                                              73.9
13                                                              73.4
14                                                              72.7
15                                                              71.9
16                                                              70.9
17                                                              69.5
18                                                              68.0

Indicator Name   Prevalence of anemia among women of reproductive age (% of women␣
 ↪ages 15-49)
0                                                               57.1
1                                                               56.7
2                                                               56.3
3                                                               55.9
4                                                               55.5
5                                                               55.0
6                                                               54.4
7                                                               53.9
8                                                               53.2
9                                                               52.6
10                                                              52.0
11                                                              51.0
12                                                              50.1
13                                                              49.3
14                                                              48.5
15                                                              47.8
16                                                              47.1
17                                                              46.5
18                                                              46.3
```

Chad: Prevalence of anemia among women of repoductive age vs anemia among children (2000-2018)

Prevalence of anemia among women of reproductive age (% of women ages 15-49)
Prevalence of anemia among children (% of children ages 6-59 months)

[ ]: