Global HIV/AIDS Prevalence: An Analytical Review of 2024-2025 Estimates

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Abstract— *The global burden of HIV/AIDS continues to pose significant challenges to healthcare systems. This study analyzes recent estimates of HIV/AIDS prevalence across 193 countries, focusing on adult prevalence rates, number of affected individuals, and associated annual deaths. Using descriptive statistics and data visualizations, the study identifies regional patterns and high-burden areas, offering insights for public health policy and future interventions.*

I.   INTRODUCTION

HIV/AIDS remains a critical global health issue, particularly in sub-Saharan Africa where adult prevalence rates often exceed 20%. Despite medical advances, disparities persist due to socioeconomic factors, stigma, and limited access to treatment. Understanding current data trends is essential to tailor interventions, allocate resources, and monitor progress toward global targets like the UNAIDS 95-95-95 goals.

II.   LITERATURE REVIEW

Previous studies have emphasized the regional concentration of HIV/AIDS in developing countries. For example, UNAIDS reports consistently highlight high prevalence in Eswatini, Lesotho, and Botswana. Studies such as Kharsany & Karim (2016) have shown that interventions must be adapted to cultural and economic contexts. Furthermore, global surveillance by WHO underscores the importance of real-time data analytics for epidemic control.

III.   METHODOLOGY

This research adopts a descriptive and visual analytics approach using a CSV dataset containing prevalence estimates. The analysis includes:

- Data cleaning and type conversions

- Exploratory Data Analysis (EDA)

- Visualizations (bar plots and choropleths)

- Identification of top affected countries

Tools used: Python (Pandas, Matplotlib, Seaborn)

IV.   DATASET DESCRIPTION

- **Source**: International HIV/AIDS estimates dataset (uploaded by user)

- **Attributes**:

o   Country/Region: Name of the country

o   Adult prevalence of HIV/AIDS: Percentage of adults affected

o   Number of people with HIV/AIDS: Approximate count

o   Annual deaths from HIV/AIDS: Mortality due to HIV

o   Year of estimate: Either 2024 or 2025

V.   PYTHON RESULTS & DISCUSSION
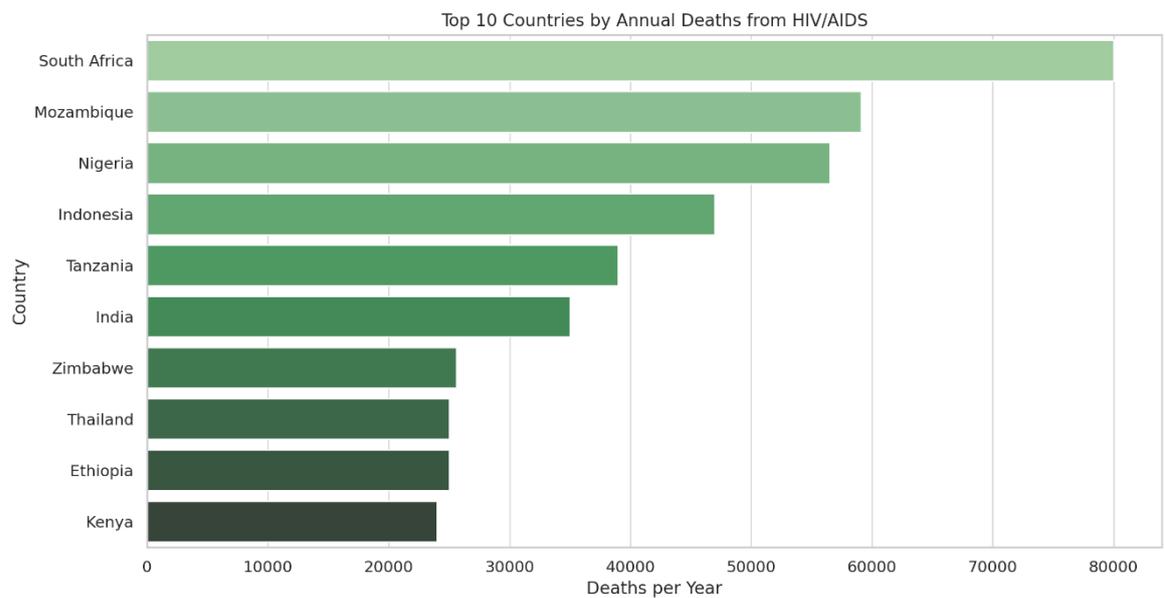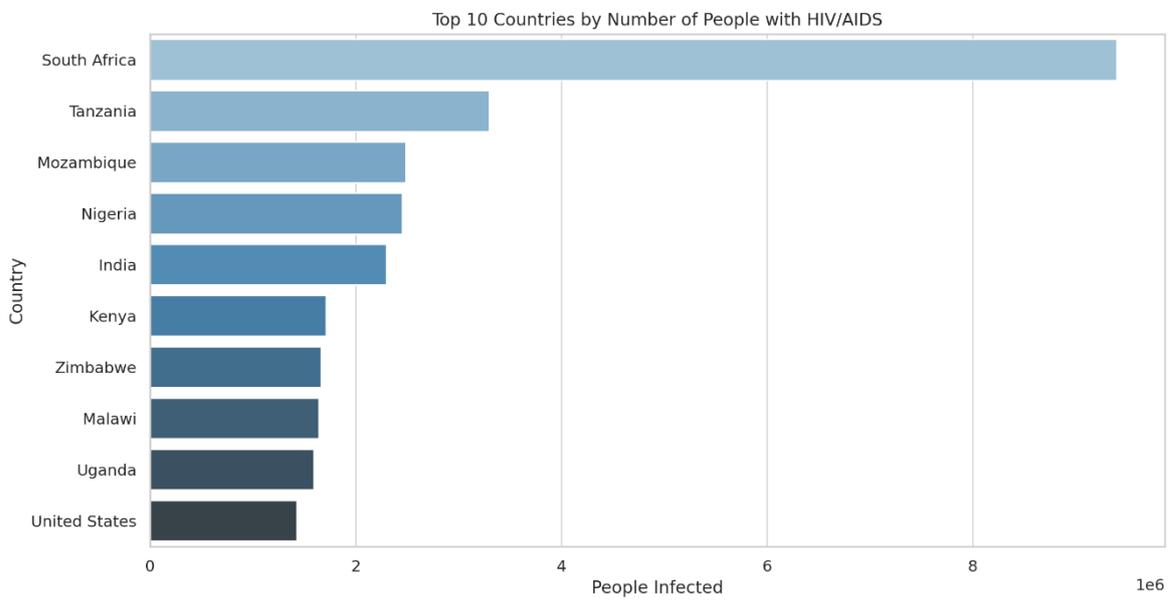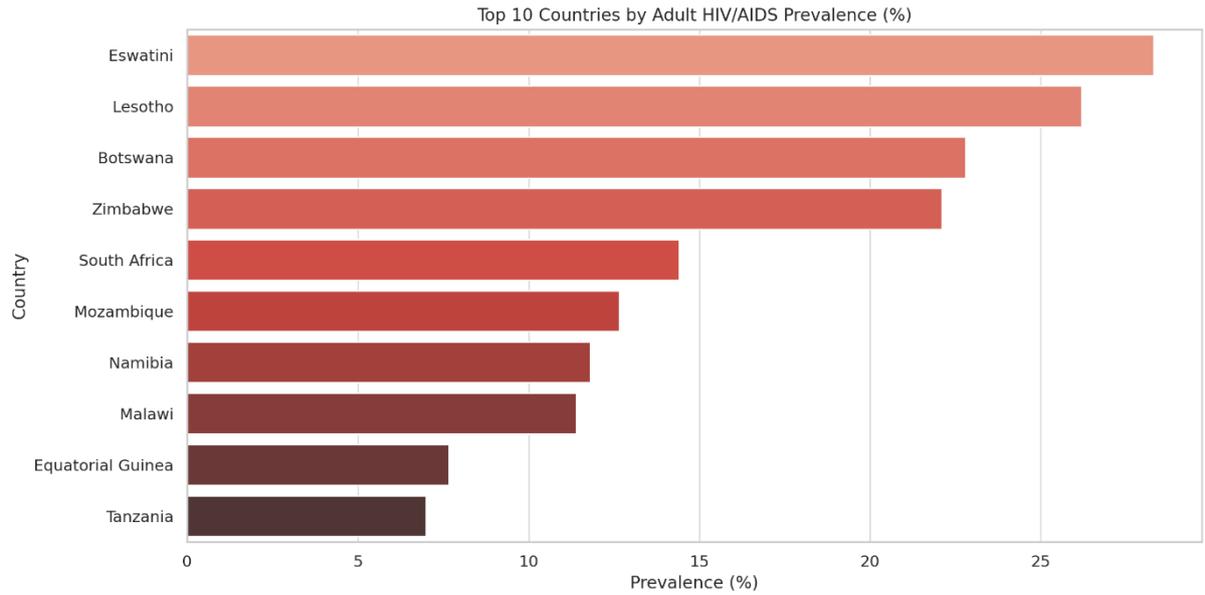
Let's clean and analyze the dataset.

The error is due to a data entry like '11.8[14]' in the Adult prevalence of HIV/AIDS column, which isn't a valid float. This appears to be a prevalence estimate with uncertainty (e.g., 11.8% with a possible range). We'll strip out the extra characters like brackets and try again.

Let's clean those values properly and re-run the analysis.

Here are the top 10 countries by **Adult HIV/AIDS prevalence**:

Country	Prevalence (%)	People with HIV/AIDS	Annual Deaths
Eswatini	28.3	240,000	3,000
Lesotho	26.2	445,000	7,000
Botswana	22.8	399,100	5,275
Zimbabwe	22.1	1,660,000	25,600
South Africa	14.4	9,400,000	80,000
Mozambique	12.65	2,485,000	59,100
Malawi	11.4	1,642,570	15,270
Eq. Guinea	7.66	74,165	2,400
Tanzania	7.0	3,300,000	39,000
Togo	5.2	220,440	6,600

These results strongly reflect known regional trends, with **Southern and Eastern Africa** experiencing the highest burdens of HIV/AIDS.

Top 10 Countries by Adult HIV/AIDS Prevalence (%)

Top 10 Countries by Number of People with HIV/AIDS

Top 10 Countries by Annual Deaths from HIV/AIDS

Here are the visualizations:

1. **Top 10 Countries by Adult HIV/AIDS Prevalence (%):** Eswatini, Lesotho, and Botswana lead with the highest prevalence rates.

2. **Top 10 Countries by Number of People with HIV/AIDS:** South Africa and Nigeria have the highest absolute numbers.

3. **Top 10 Countries by Annual Deaths from HIV/AIDS:** Again, South Africa and Nigeria have the most deaths, reflecting both infection rates and healthcare challenges.

VI.   CONCLUSION

This study confirms the ongoing HIV/AIDS crisis in parts of Africa, especially Eswatini and Lesotho where adult prevalence exceeds 25%. Countries like South Africa and Mozambique also show alarmingly high numbers of infected individuals and annual deaths. Data analysis such as this is crucial in informing policy decisions, supporting at-risk populations, and allocating global healthcare resources effectively.

Future research should incorporate:

- Temporal trends to see how prevalence is changing

- Gender and age breakdowns

Access to treatment statistics.

REFERENCES

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[3] World Health Organization (2024). HIV/AIDS Surveillance Report.