



ANALYSIS OF **HIV** INCIDENCE RATES IN SUB-SAHARAN AFRICAN NATIONS

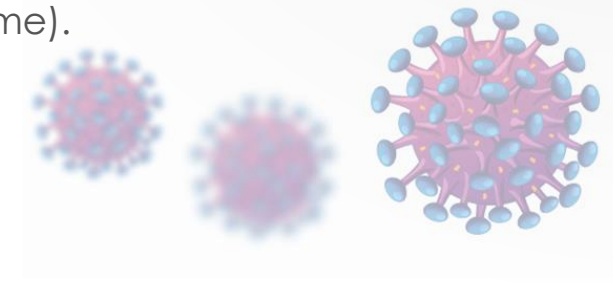
By

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CONTEXT AND ANALYSIS GOALS

⌘ What is HIV?

- ⌘ **Human Immunodeficiency Virus** attacks cells that help the body fight infection, making a person more vulnerable to other infections and diseases.
- ⌘ It is spread by contact with certain bodily fluids.
- ⌘ If left untreated, HIV can lead to the **disease AIDS** (acquired immunodeficiency syndrome).
- ⌘ AIDS **life expectancy** without medicine \pm **3 years**.
- ⌘ There is no cure, but it is treatable with medicine: **antiretroviral therapy** or **ART**





⌘ Context

- ⌘ Sub-Saharan Africa remains the global epicenter of the **HIV epidemic**.
- ⌘ **Young people** aged 10–19 are a **critical focus group** due to unique vulnerabilities and challenges.
- ⌘ **Gender dynamics** play a significant role in shaping the impact and spread of HIV.
- ⌘ December 1st: **World AIDS Day** – an opportunity to reflect on progress and areas needing urgent action.

⌘ Key questions guiding the analysis

- ⌘ What are the **trends in new HIV infections** across countries?
- ⌘ How many **young people** are living **with HIV**?
- ⌘ Are there **significant differences between males and females** in HIV prevalence and impact?

THE DATASET

 HIV-Infections.csv 

Country	UNICEF Region	Year	Sex	Age	Estimated incidence rate of new HIV infection per 1 000 uninfected population	Estimated number of annual AIDS related deaths	Estimated number of annual new HIV infections	Estimated number of people living with HIV	Estimated rate of annual AIDS related deaths per 100 000 population
...
...

5 categoric fields

5 numeric fields

⚠ 10 columns & 2640 rows

⚠ Data limitations:

- **Region:** Sub-Saharan Africa (44 countries)
- **Age:** 10 – 19 years old (female & male)
- **Time period:** 1990 – 2019

⚠ Analyzed Metrics

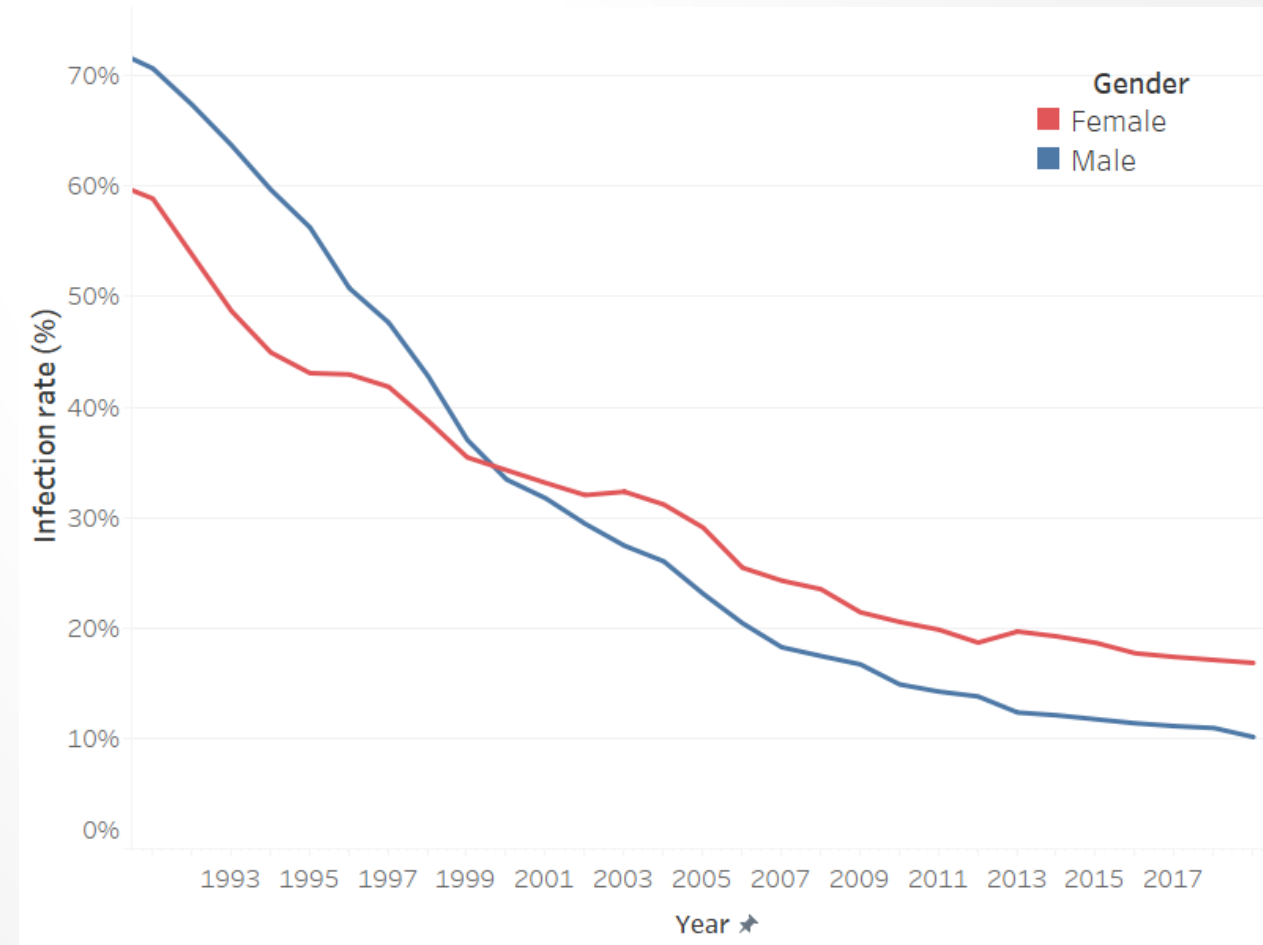
- Estimated HIV incidence rate per 1,000 population
- Estimated number of AIDS-related deaths
- Estimated new HIV infections per year
- Estimated number of people living with HIV
- Estimated AIDS mortality rate per 100,000 population

HIV INFECTION RATE CURVE

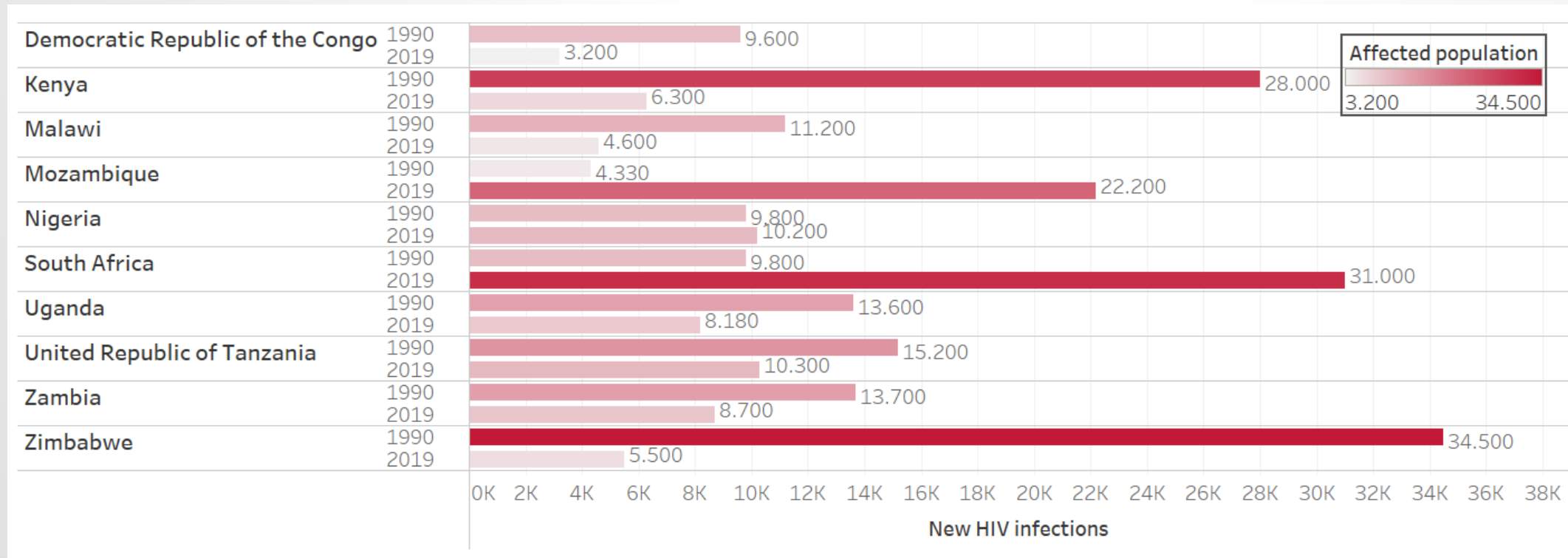
- ⚠ To determine the proportion of **new infections** relative to the total infected population:

$$\text{Infection rate (\%)} = \frac{\text{new infections}}{\text{infected population}} \times 100$$

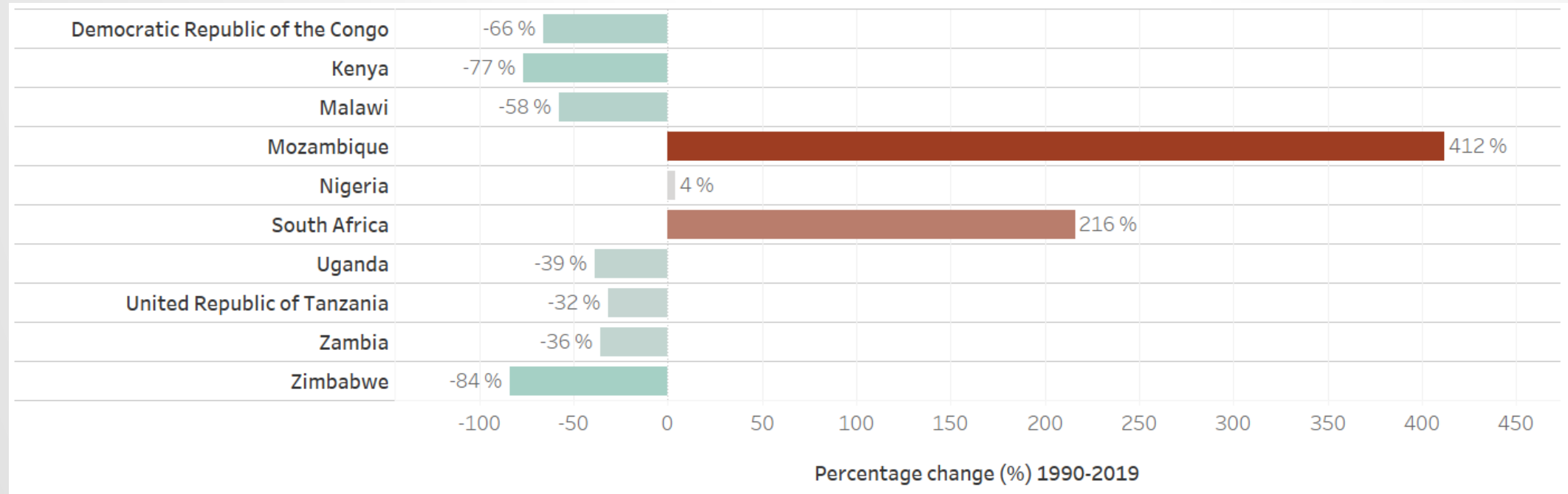
- ⚠ This allows us to see the **speed** at which the **infection grows** relative to the already infected population.
 - The **infection rate has decreased** significantly over the years, especially for males.



EVOLUTION OF INFECTIONS BY COUNTRY (TOP 10)



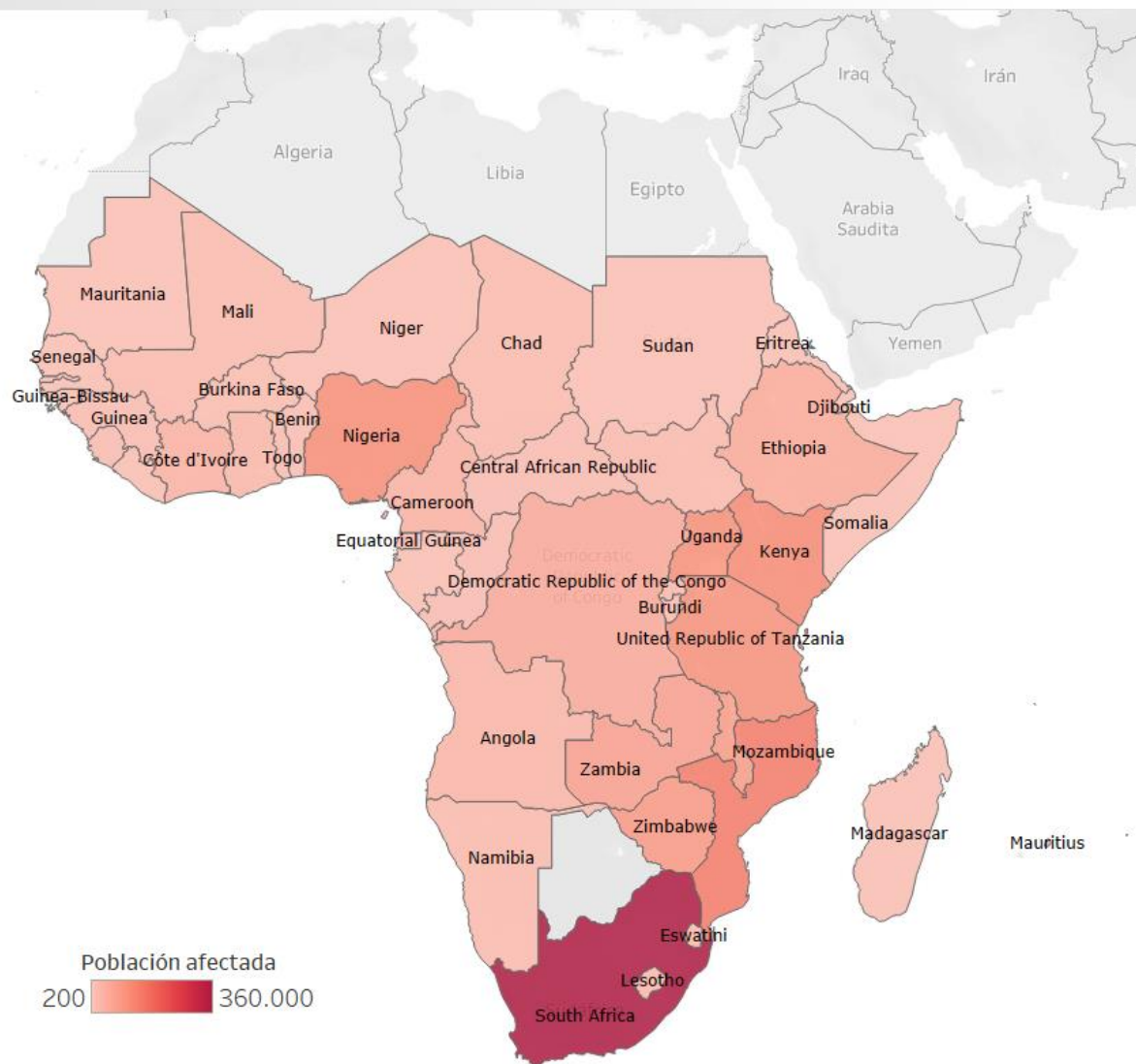
EVOLUTION OF INFECTIONS BY COUNTRY (TOP 10)



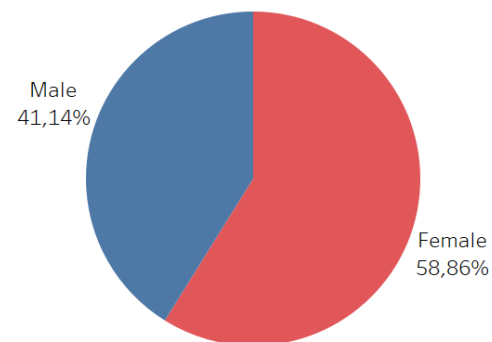
$$\text{Percentage change (\%)} = \frac{\text{new infections in 2019} - \text{new infections in 1990}}{\text{new infections in 1990}} \times 100$$

🚫 Highest infections → **South Africa & Mozambique**

GEOGRAPHICAL DISTRIBUTION OF PEOPLE LIVING WITH HIV IN 2019

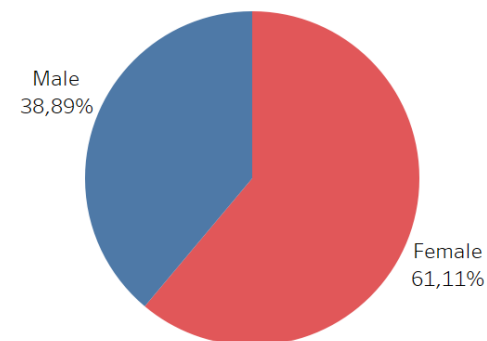


Sub-saharian African population living with HIV in 2019 by gender



🚫 **South Africa** has the highest rate of affected population.

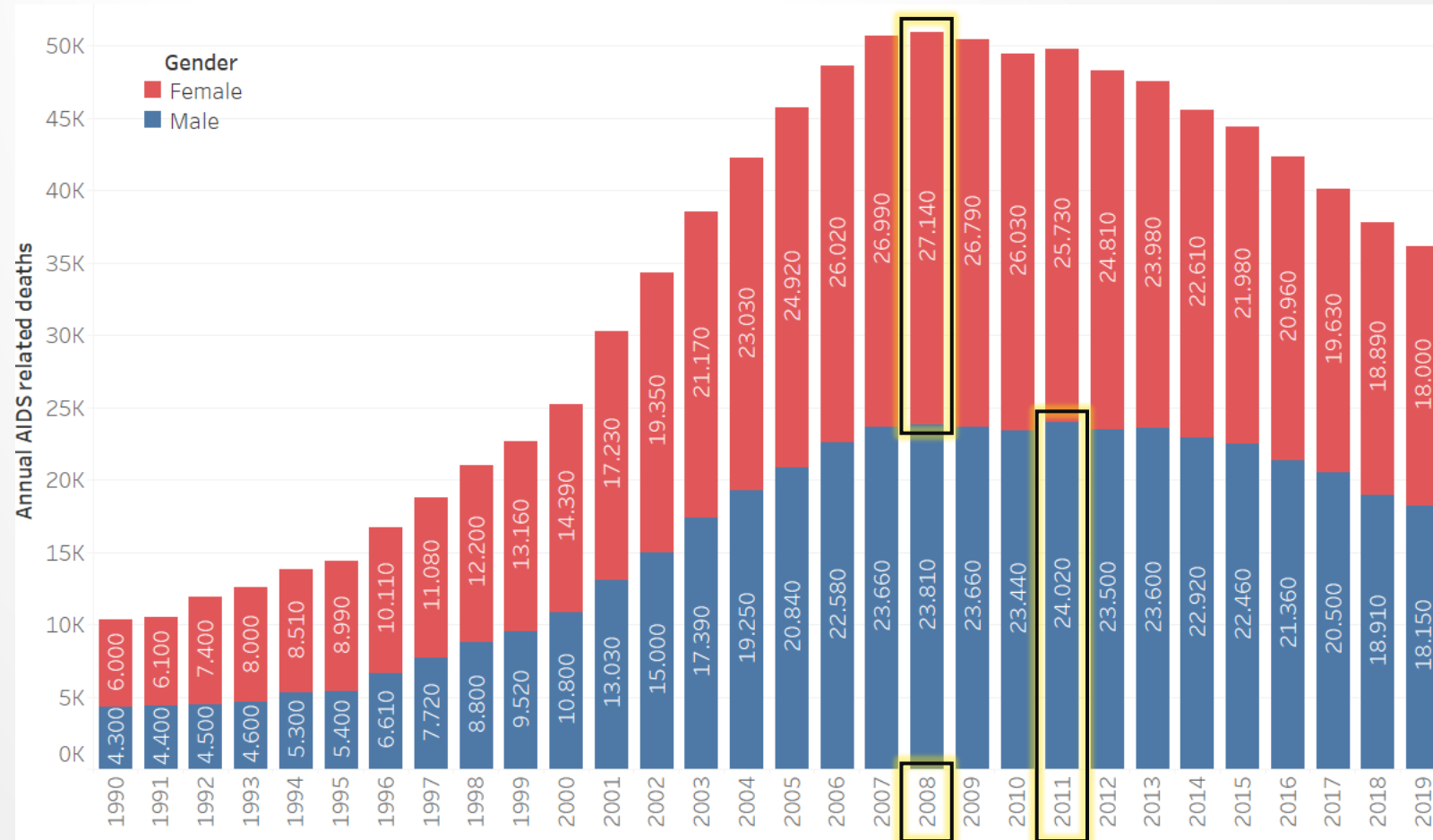
Population of **South Africa** living with HIV in 2019 by gender



🚫 **Women** are more likely to be infected with HIV than men.

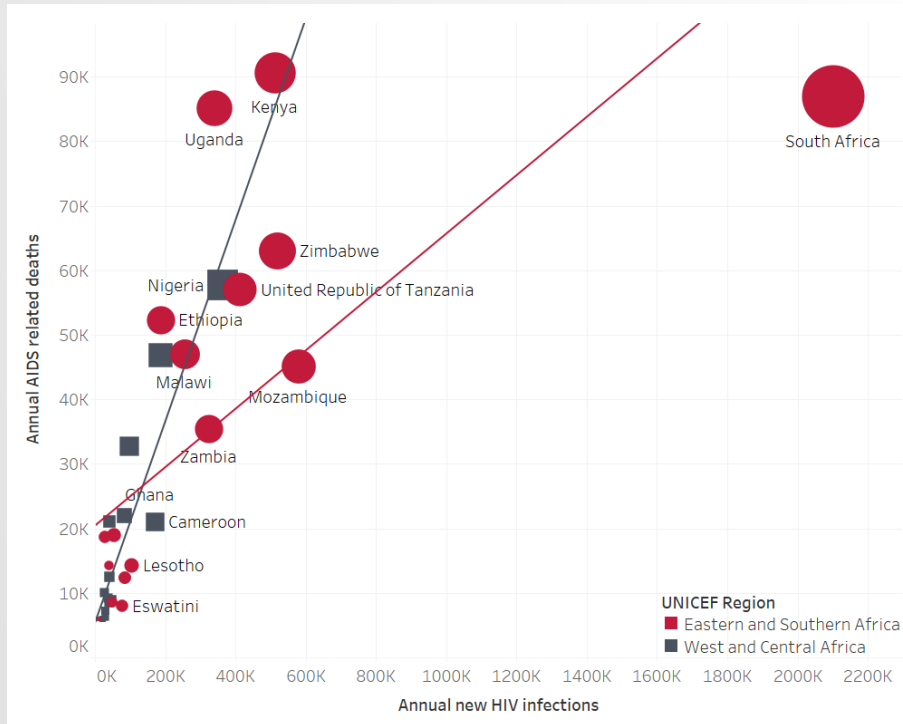
ANALYSIS OF AIDS-RELATED DEATHS

- A higher number of AIDS-related deaths is observed in **women**.
- Death rates initially rose but have **decreased in recent years**, likely due to advancements in treatment and increased testing.
- The **peak in deaths** occurred earlier for **women (2008)** than for **men (2011)**.



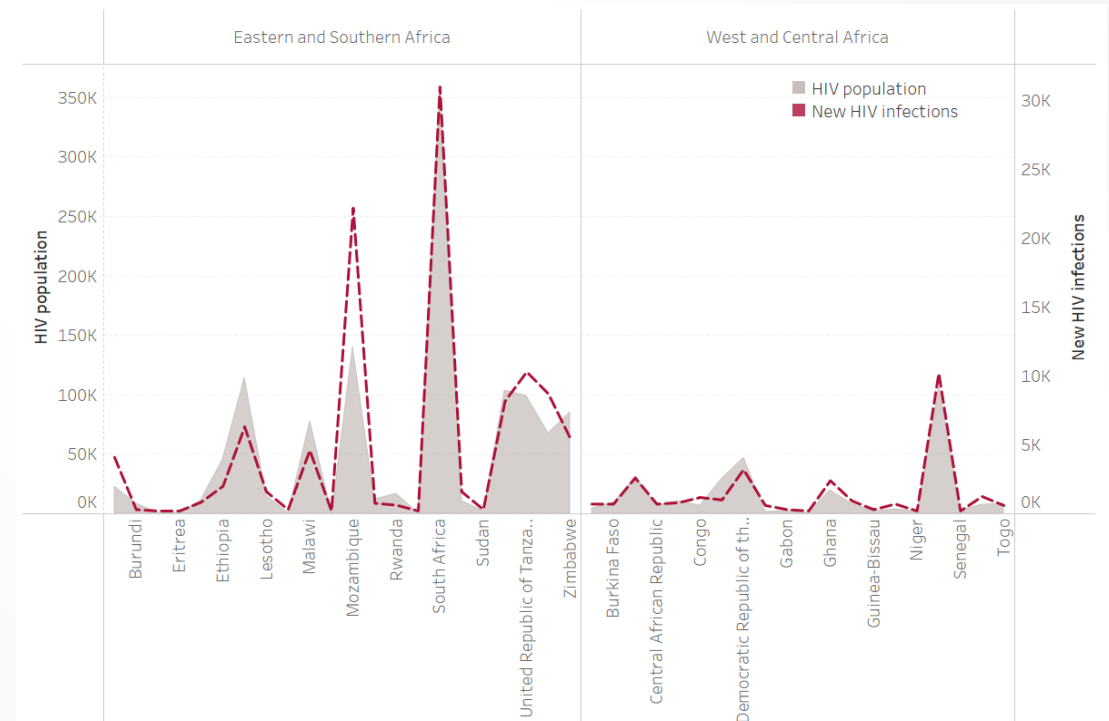
COMPARISON BETWEEN ES-AFRICA AND WC-AFRICA IN 2019

HIV population vs. Mortality



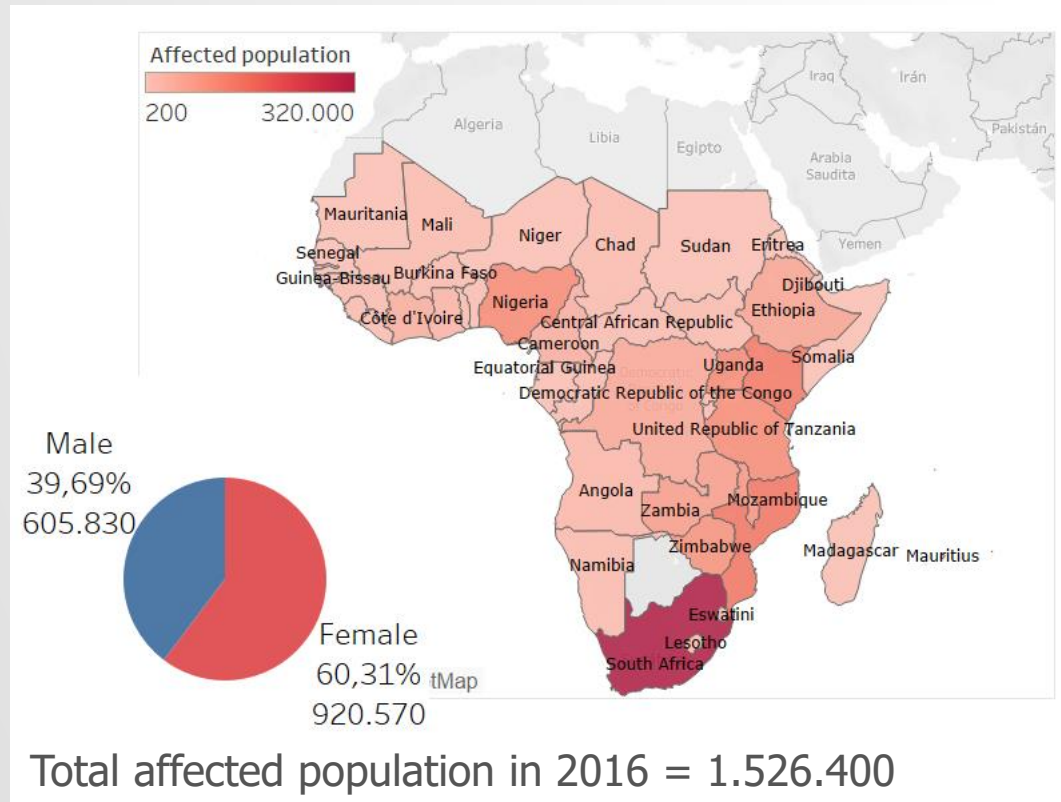
- ✂ Higher impact in **E&S Africa** (red).
- ✂ **Kenya & Uganda** – highest ratio of deaths to new affected population. [outliers]
- ✂ **South Africa** – highest number of affected population and AIDS-related deaths.

HIV population vs. New infections



- ✂ Countries in **E&S Africa** have a higher burden of infections.
- ✂ If new infections exceed the HIV population, the infected population will grow faster. [tendency]
- ✂ If the dashed lines decline, it means there are fewer new infections.

GEOGRAPHICAL DISTRIBUTION OF PEOPLE LIVING WITH HIV IN 2016

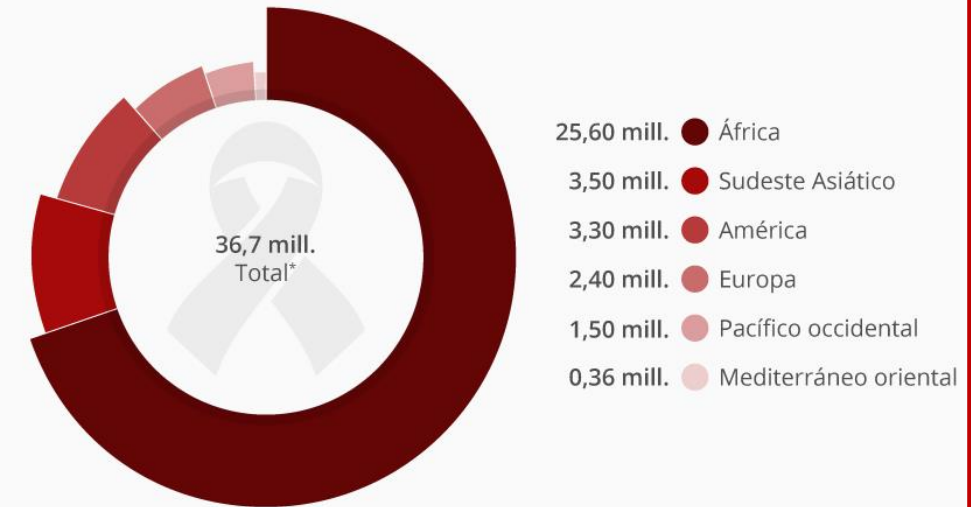


- ⚠ The HIV data for sub-Saharan Africa in 2016 differ from those reported in the literature.
- ⚠ Please note that **these data do not represent the entire continent or population.**

Infographic from literature:

La distribución de la epidemia del SIDA

Región de residencia de las personas infectadas por el VIH en 2016



@Statista_ES

* El total no coincide con la suma de las partes debido al redondeo.
Fuente: Organización Mundial de la Salud

statista

Infographic of the global distribution of people living with HIV in 2016. Created by Statista using WHO data.

Gráfico: El 70% de los afectados por el SIDA viven en África | Statista

CONCLUSIONS

- ⚡ The **infection rate decreased considerably over the years**, likely due to greater accessibility to testing and antiretroviral treatments.
- ⚡ A higher incidence is observed in **women** compared to men, probably because the **main mode of transmission** occurs through **heterosexual relationships**.
- ⚡ There are **regions** or countries where the impact of the infection is greater and even increases over time, indicating that **prevention policies need to be strengthened** in these areas.



Source: <https://elpublicotv.com/africa-espera-acabar-con-el-sida-infantil-en-el-2023/>

References

- [What Are HIV and AIDS? | HIV.gov](#)
- [La epidemia del sida en Africa subsahariana: poner el foco en la salud masculina para que hombres y mujeres salgan ganando - Blog – ISGLOBAL](#)
- [HIV in Africa | Institute for Health Metrics and Evaluation](#)

Thank you for your attention.

