THE PREVALENCE OF TUBERCULOSIS

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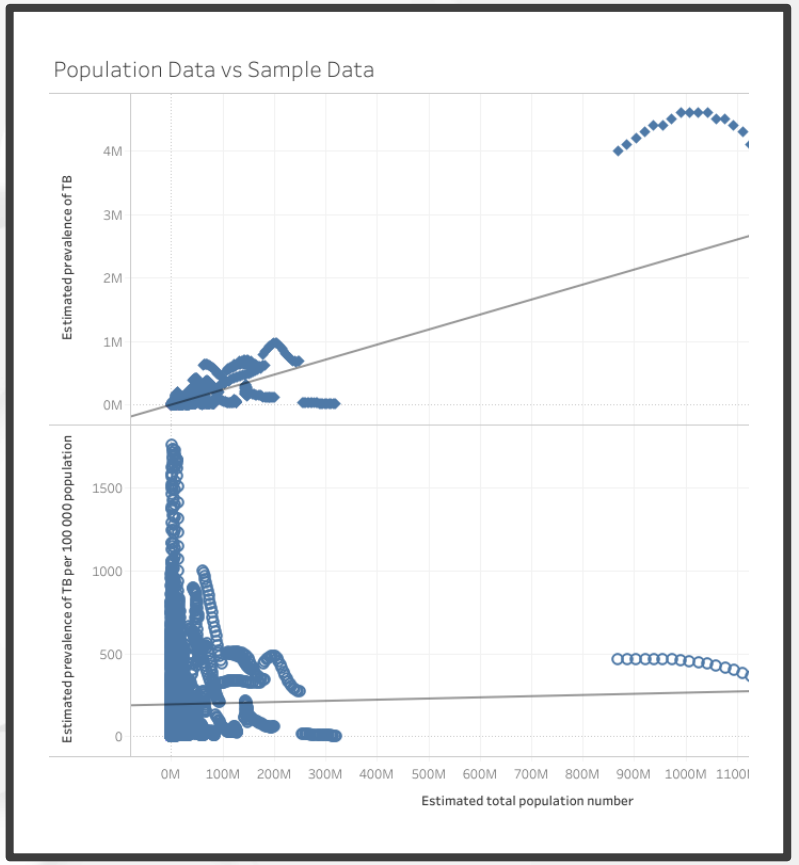
MAIN OBJECTIVE

- Find out why tuberculosis is still prevalent in todays age
  - Tuberculosis is a bacterial infection that can be easily treated with antibiotics
- Identify regions/countries where tuberculosis is most prevalent
- Explore characteristics of these regions that cause an increase in TB cases
- Identify the methods used to collect/estimate data on TB in these regions and see if there is a correlation

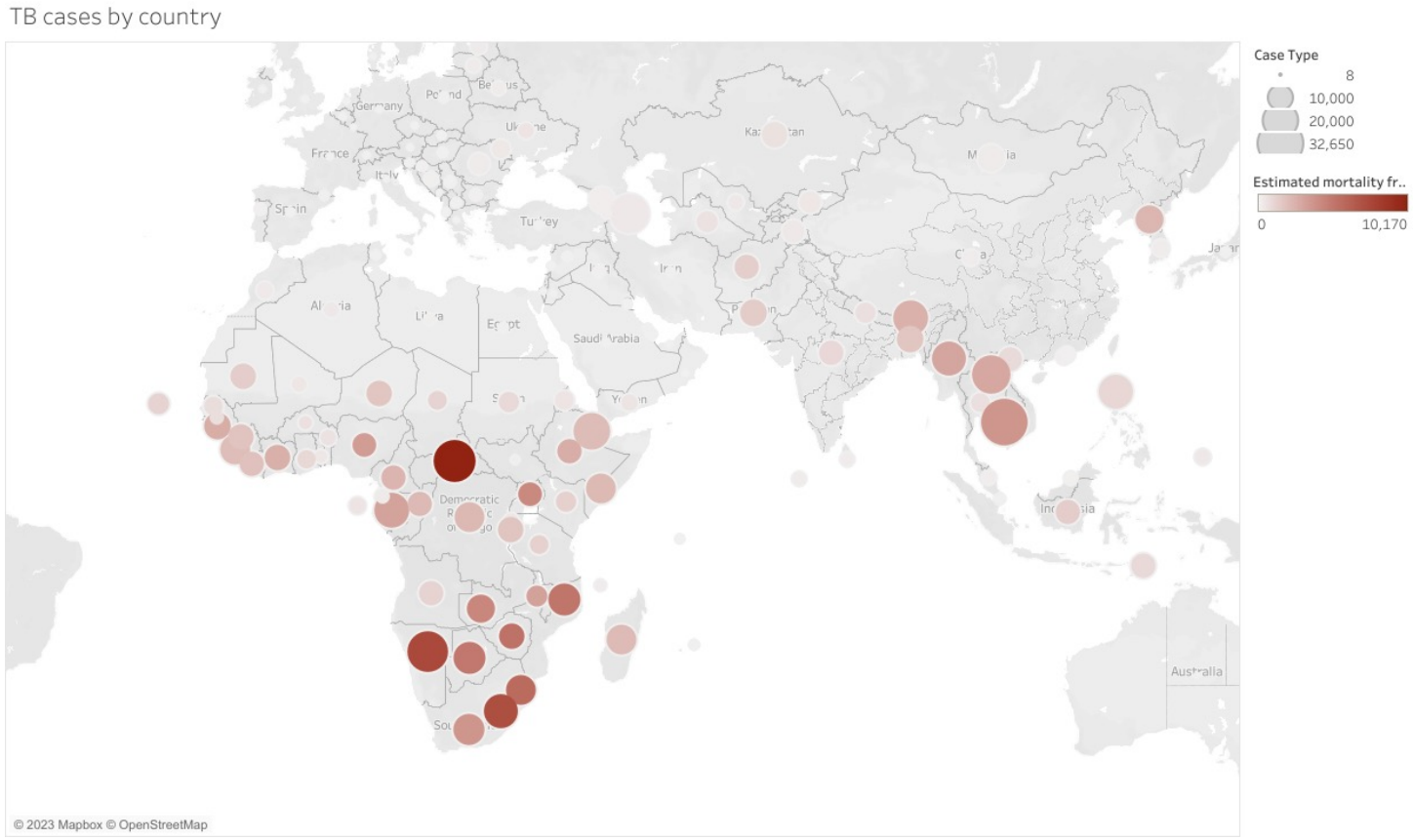
RESULTS

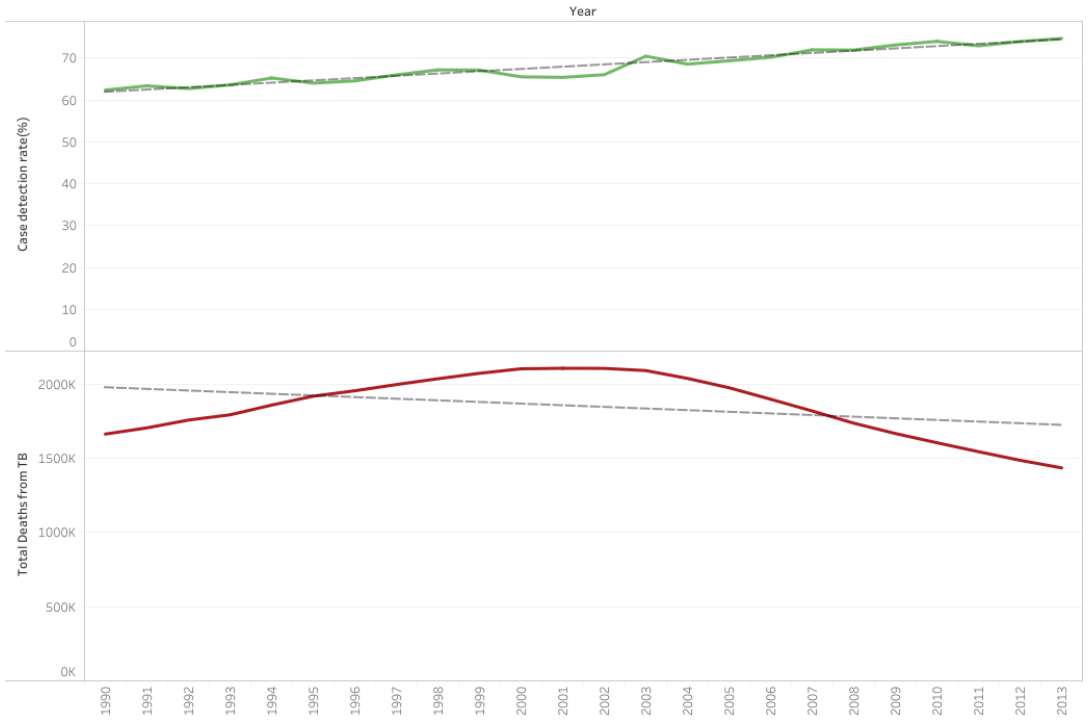
- Generally, as population size increases so does the chances of contracting TB
  - TB is an airborne illness
- We won't be able to make inferences of other factors that might affect the prevalence of TB especially when comparing countries
- Therefore, we will be using samples of 100,000 in every country to determine what is causing the prevalence and mortality of TB

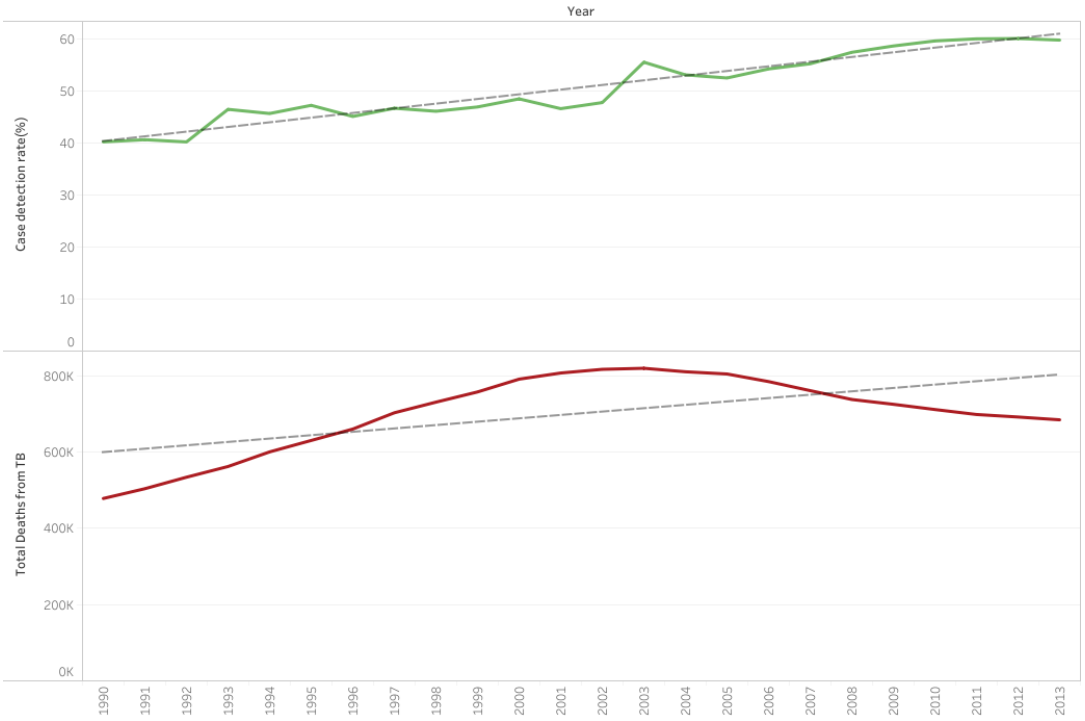


CONTD…

- TB is significantly denser in the regions of Africa
- The AFR region also sees to largest number of deaths throughout history
- What could be causing this?

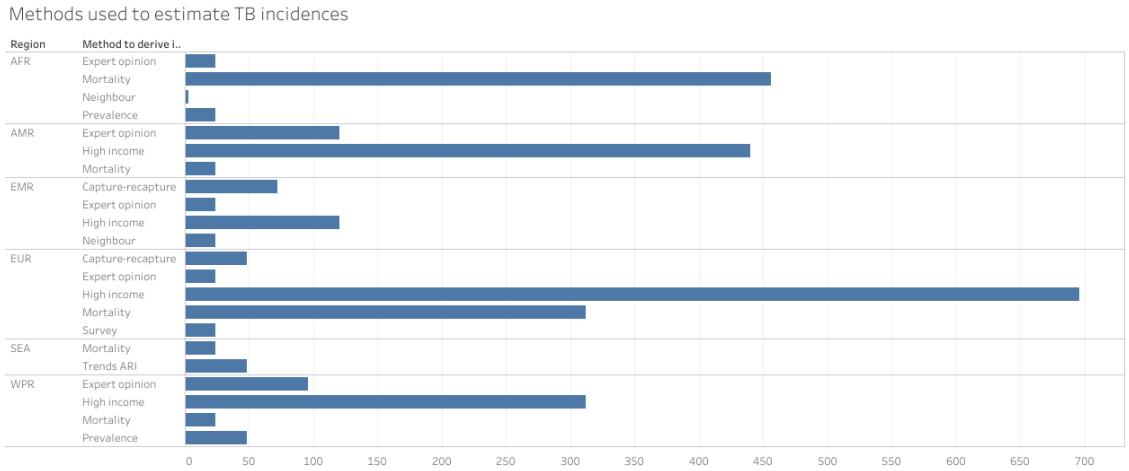


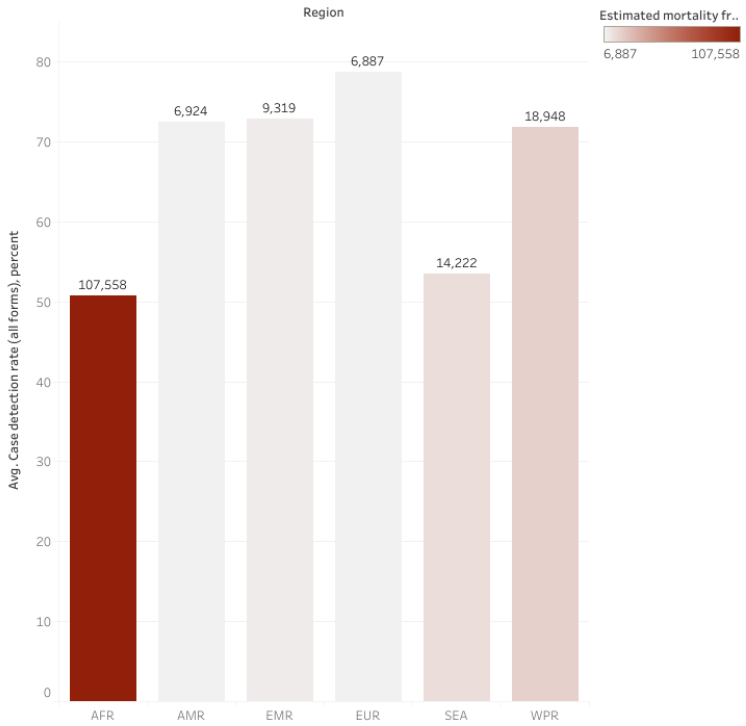




TB THROUGH TIME

- As the detection rate of TB increased over the years, the global number of deaths decreased (right)
- However, the death rates in the AFR region have increased compared to the early 1990's
  - Could inefficient detection methods be causing this?





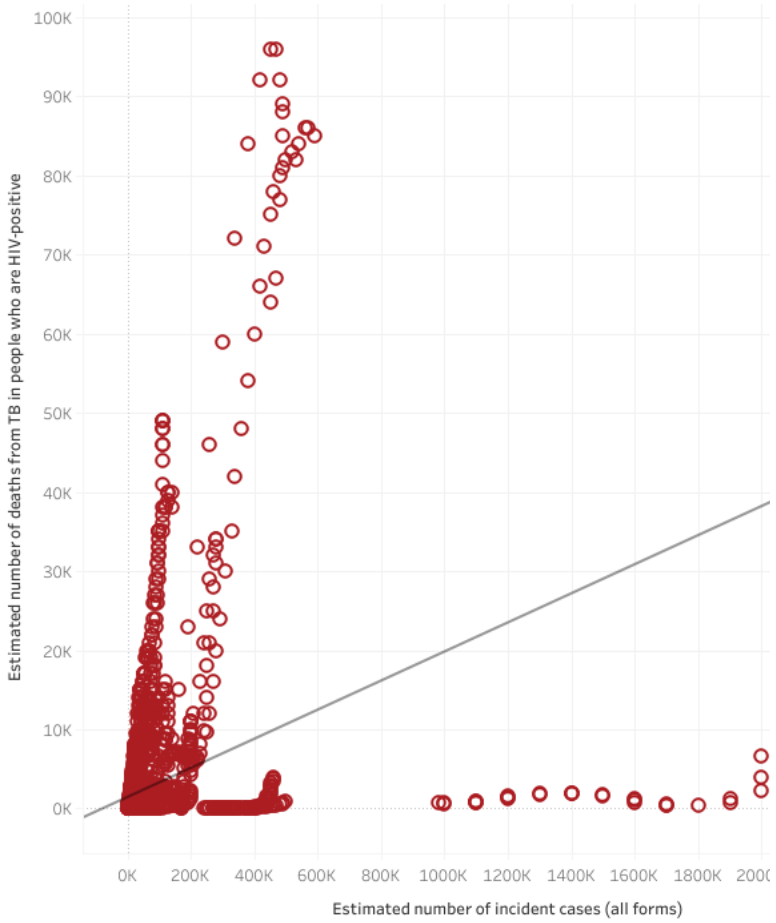
CONTD…

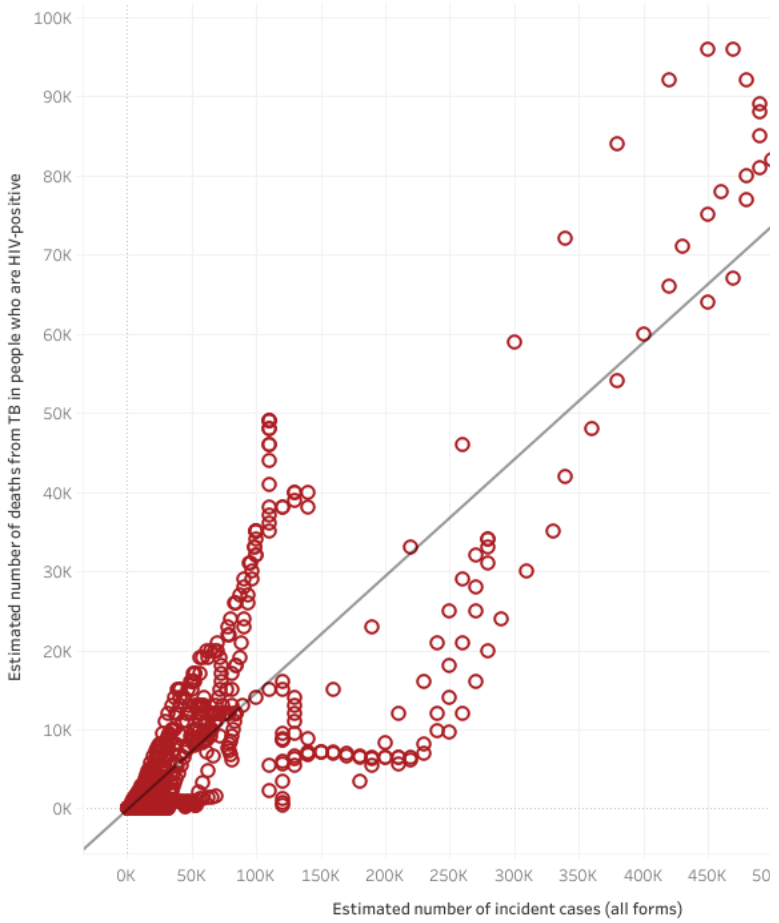
- In the AFR region, the most common method to estimate incidences of TB was looking at mortality rates
  - Could be the reason there's lower detection rates in the AFR region (right) because not everybody dies from TB
  - But what is causing this high mortality rate from such a curable disease as TB

HIV

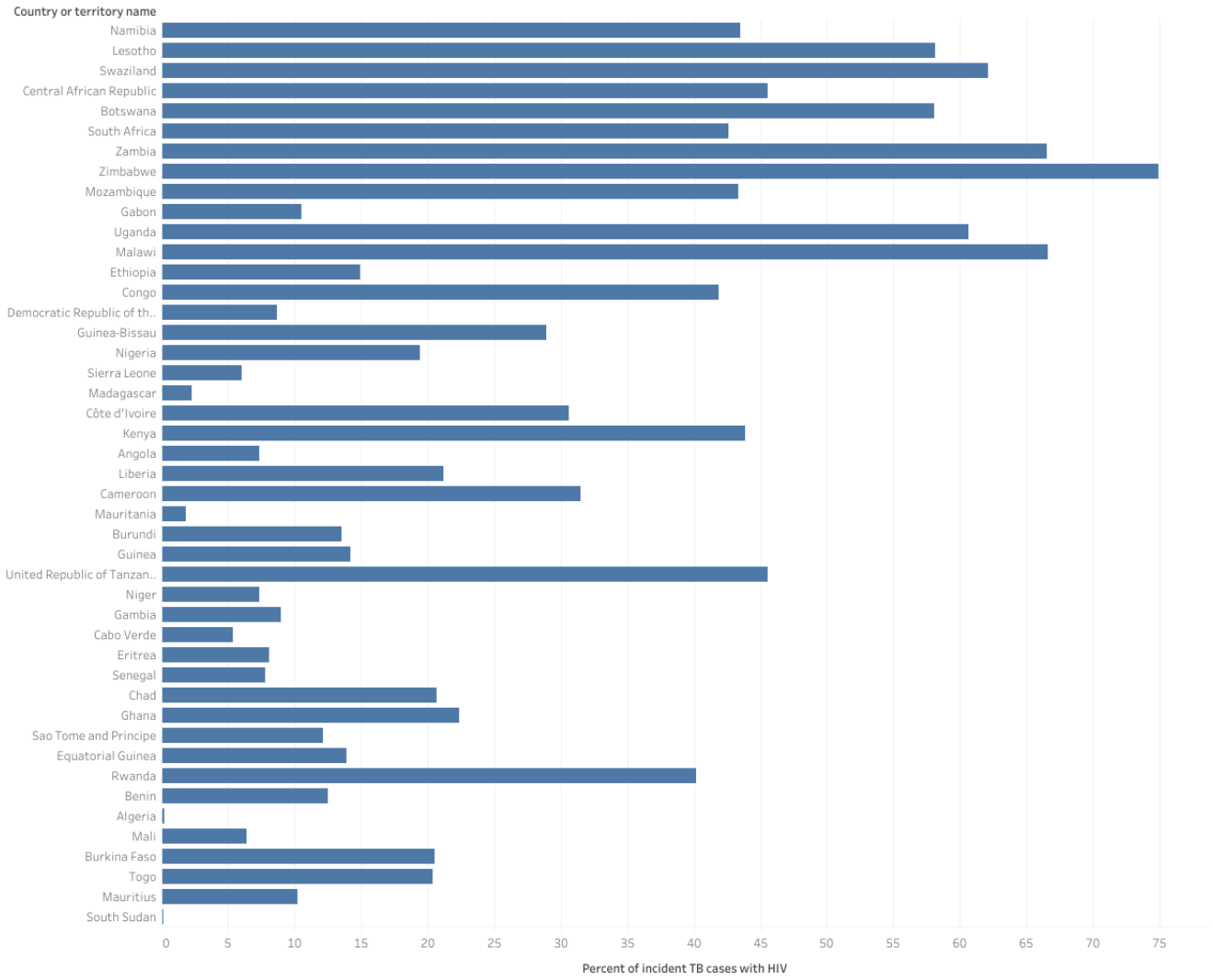
- HIV is a viral infection that targets the hosts immune system
- Currently there is no cure for HIV
- HIV does not directly cause death
- Death is caused by secondary infections such as TB (due to lack of an immune response)

MORTALITY OF TB CASES WHO ARE HIV+





- There is a stronger linear relationship b/w the number of incident cases of TB and the increasing number of deaths from TB in HIV+ individuals in the AFR region (right) than globally (left).
- What does this mean?
  - HIV is driving the deaths from incident cases of TB in AFR

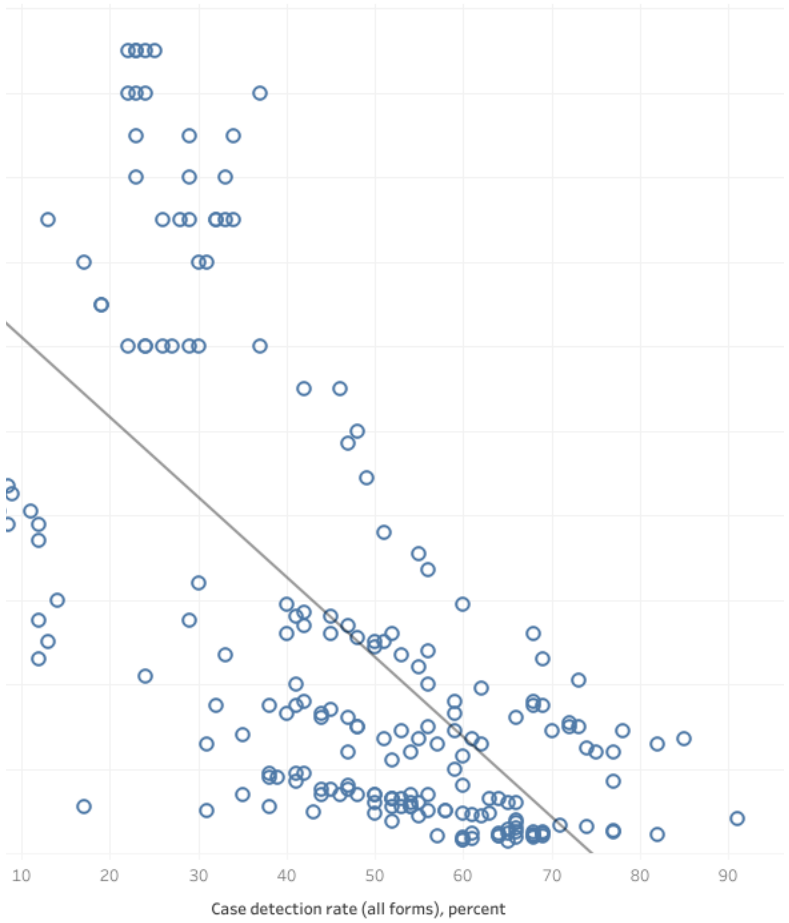


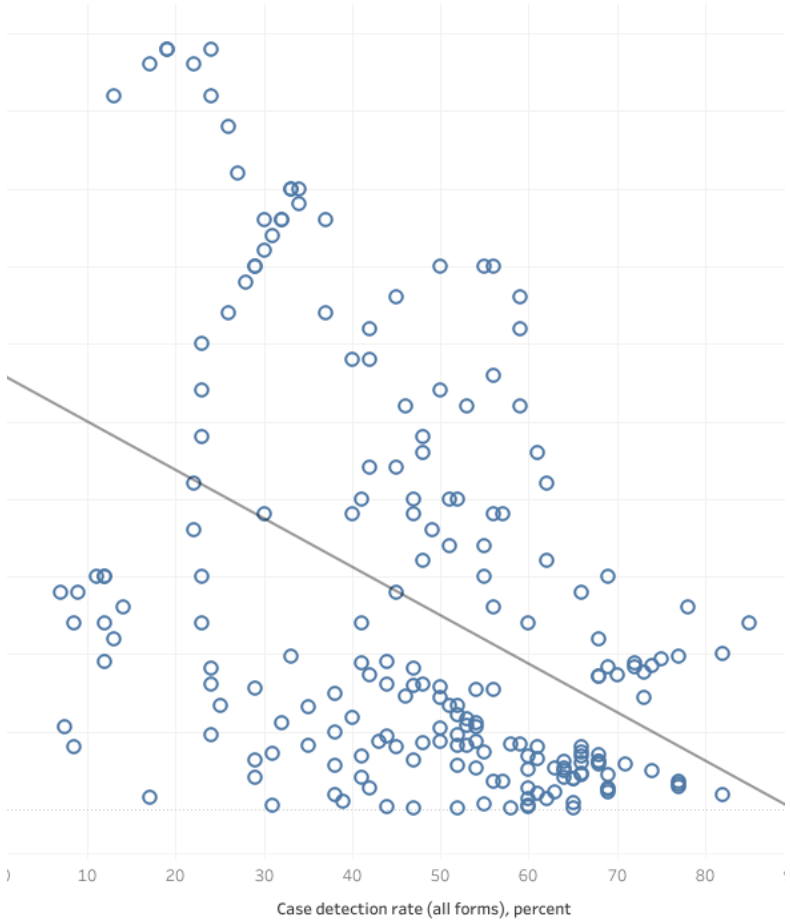
COUNTRIES IN THE AFR

- Presence of HIV in incident TB cases (percent) by country

TB DETECTION RATE

- By filtering for the top 10 countries in AFR with highest % if HIV in incident TB Cases we see:
- As the rate of detection of TB cases increase
  - Death from normal TB cases excluding HIV (left) decreases
  - Death from TB in those with HIV (right) generally goes down but is more variable





WHAT DOES THIS MEAN?

- Although Tuberculosis is a highly curable disease, its prevalence and mortality in countries could arise from TB being difficult to detect
- In countries in the AFR region which are heat zones for HIV, people could end up dying from TB due to lack of an immune response
  - This would consequently lower the detection rates of TB because patients initially diagnosed as HIV + would end up dying because of TB.

FUTURE GOALS

- During the period of 1995 – 2002, there was a global uptick in the deaths from Tuberculosis
  - Given more time, I would like to investigate the reasons for this uptick