Tableau Project

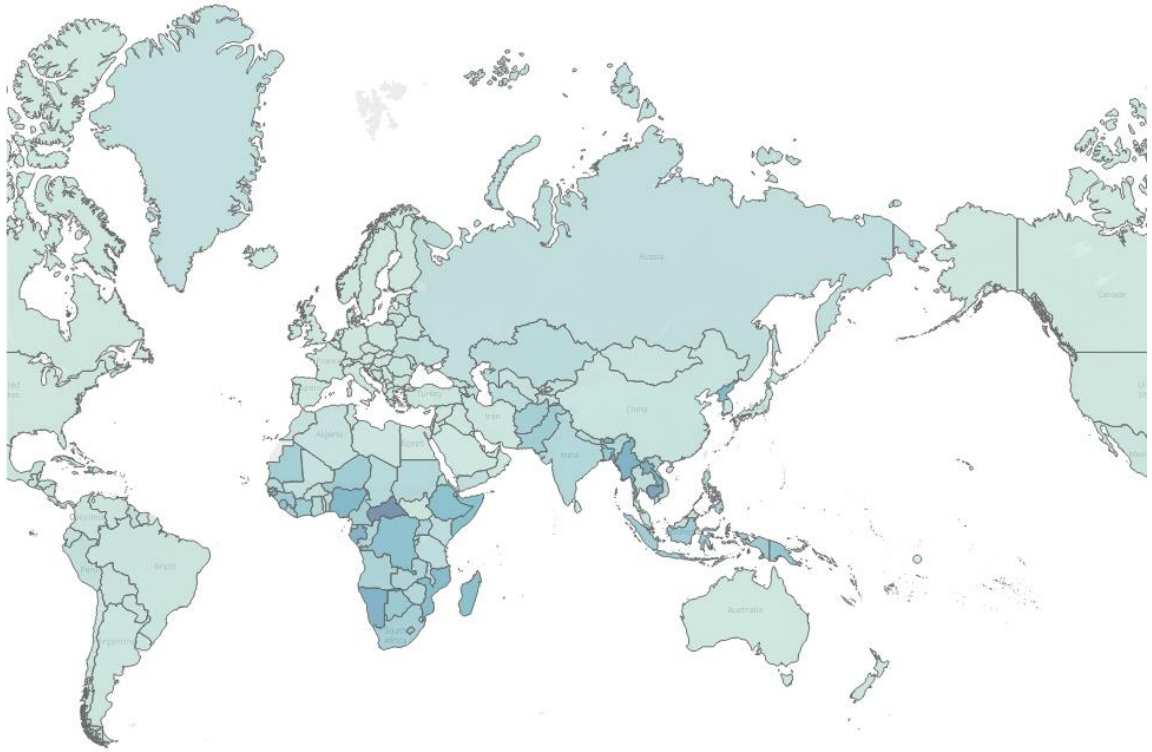
Tuberculosis Burden by Country

Zoey

AGENDA

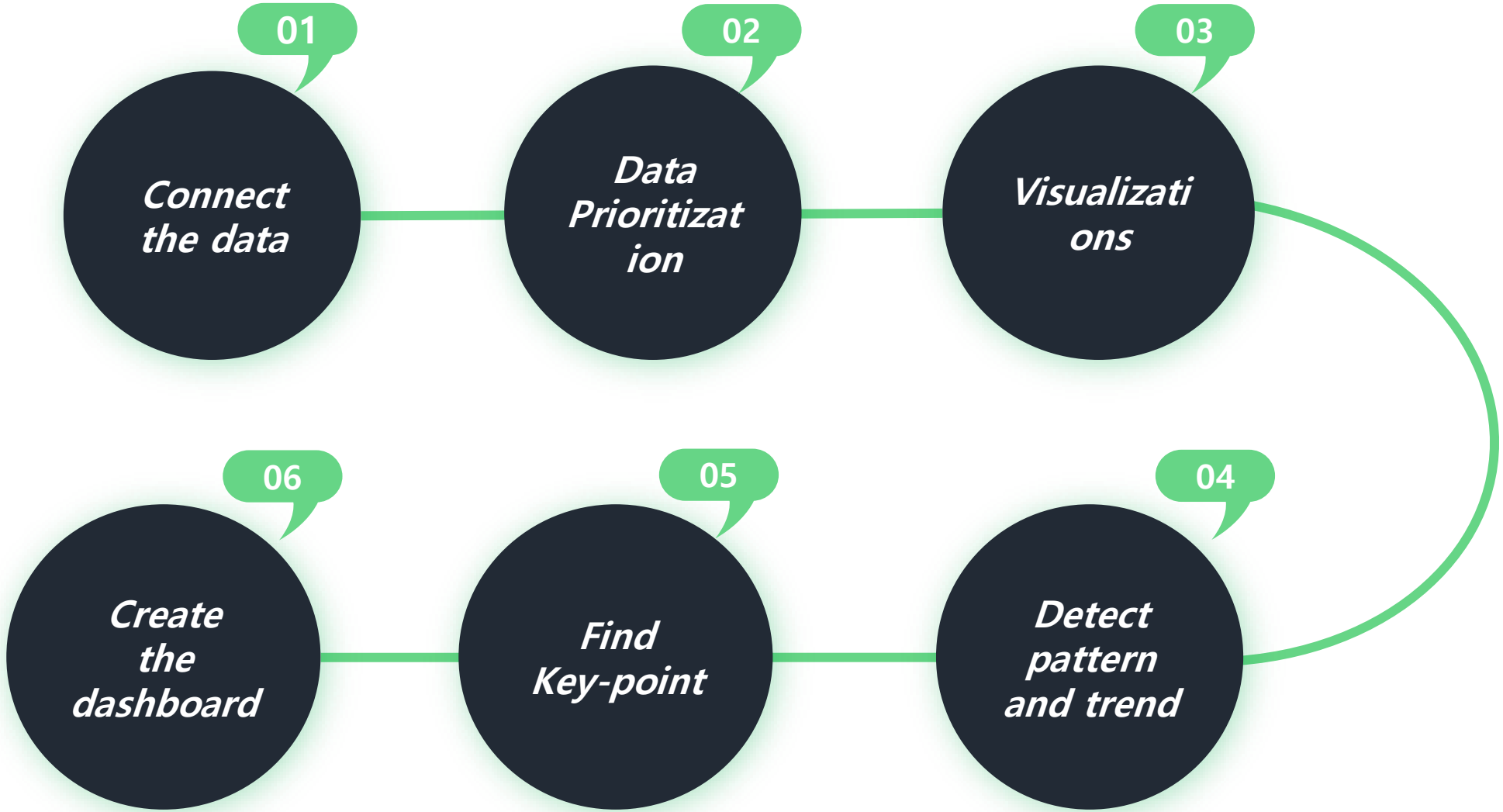
1. Goal
2. Project Flow
3. Data Analysis
4. Result
5. My challenge

1. Goal



Understand the factors influencing tuberculosis by studying Africa, the continent with the most significant number of tuberculosis-related fatalities.

2. Project Flow



2. Project Flow-Data Prioritization

Country or territory name
ISO 2-character country/territory code
ISO 3-character country/territory code
ISO numeric country/territory code
Region
Year
Estimated total population number

Method to derive prevalence estimates
Method to derive mortality estimates
Method to derive incidence estimates
Method to derive TBHIV estimates

Estimated prevalence of TB (all forms) per 100 000 population
Estimated prevalence of TB (all forms) per 100 000 population, low bound
Estimated prevalence of TB (all forms) per 100 000 population, high bound

Estimated prevalence of TB (all forms)
Estimated prevalence of TB (all forms), low bound
Estimated prevalence of TB (all forms), high bound

Estimated mortality of TB cases (all forms, excluding HIV) per 100 000 population
Estimated mortality of TB cases (all forms, excluding HIV), per 100 000 population, low bound
Estimated mortality of TB cases (all forms, excluding HIV), per 100 000 population, high bound

Estimated mortality of TB cases who are HIV-positive, per 100 000 population
Estimated mortality of TB cases who are HIV-positive, per 100 000 population, low bound
Estimated mortality of TB cases who are HIV-positive, per 100 000 population, high bound

Estimated number of deaths from TB (all forms, excluding HIV)
Estimated number of deaths from TB (all forms, excluding HIV), low bound
Estimated number of deaths from TB (all forms, excluding HIV), high bound

Estimated number of deaths from TB in people who are HIV-positive
Estimated number of deaths from TB in people who are HIV-positive, low bound
Estimated number of deaths from TB in people who are HIV-positive, high bound

Estimated incidence (all forms) per 100 000 population
Estimated incidence (all forms) per 100 000 population, low bound
Estimated incidence (all forms) per 100 000 population, high bound

Estimated number of incident cases (all forms)
Estimated number of incident cases (all forms), low bound
Estimated number of incident cases (all forms), high bound

Estimated HIV in incident TB (percent)
Estimated HIV in incident TB (percent), low bound
Estimated HIV in incident TB (percent), high bound

Estimated incidence of TB cases who are HIV-positive per 100 000 population
Estimated incidence of TB cases who are HIV-positive per 100 000 population, low bound
Estimated incidence of TB cases who are HIV-positive per 100 000 population, high bound

Estimated incidence of TB cases who are HIV-positive
Estimated incidence of TB cases who are HIV-positive, low bound
Estimated incidence of TB cases who are HIV-positive, high bound

Case detection rate (all forms), percent
Case detection rate (all forms), percent, low bound
Case detection rate (all forms), percent, high bound

Country or territory name
Region
Year
Estimated total population number

Method to derive prevalence estimates
Method to derive mortality estimates
Method to derive incidence estimates
Method to derive TBHIV estimates

Estimated prevalence of TB (all forms) per 100 000 population
Estimated mortality of TB cases (all forms, excluding HIV) per 100 000 population
Estimated mortality of TB cases who are HIV-positive, per 100 000 populatio
Estimated incidence (all forms) per 100 000 population
Estimated HIV in incident TB (percent)
Estimated incidence of TB cases who are HIV-positive per 100 000 population

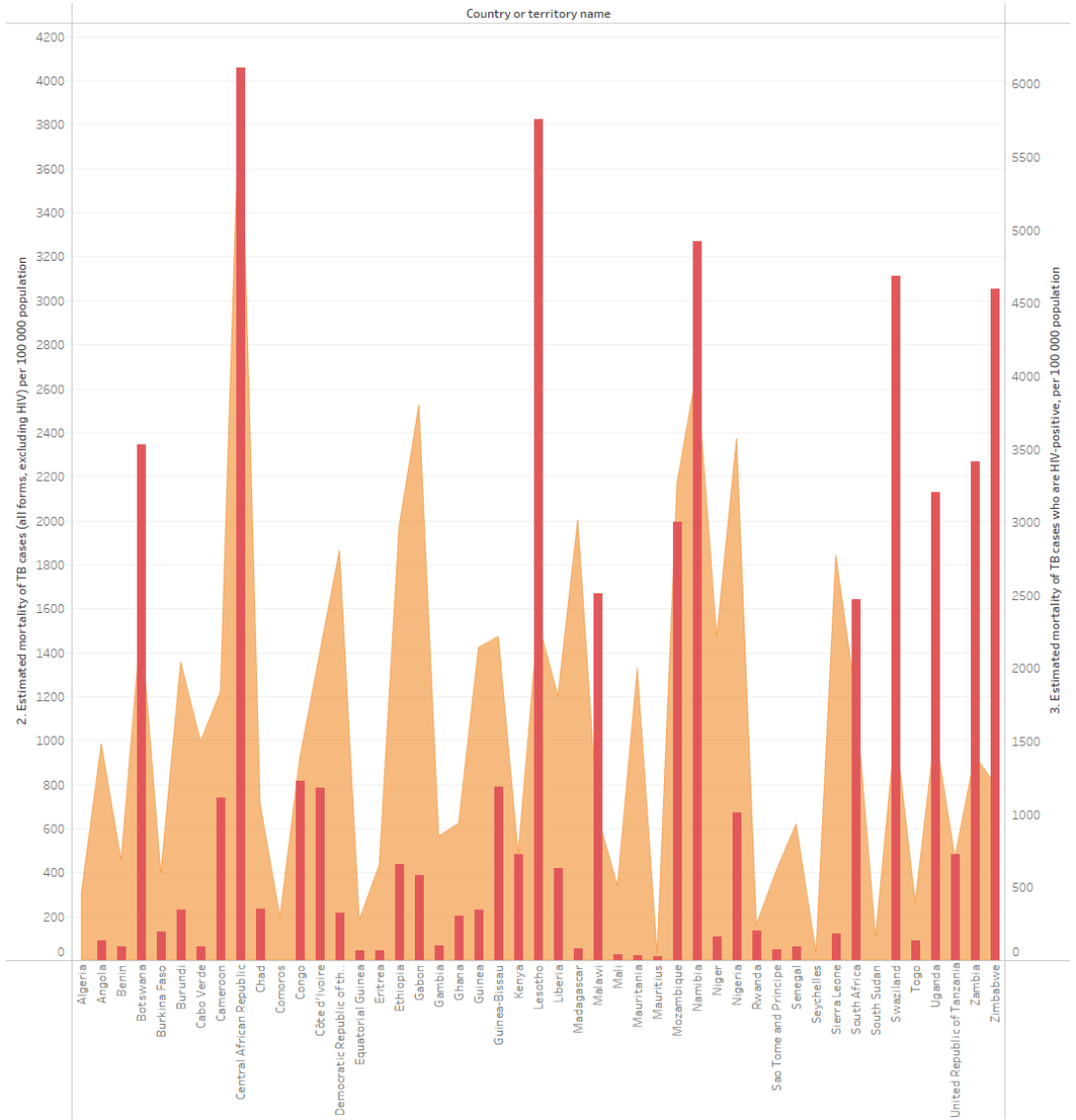
Case detection rate (all forms), percent

3. Data Analysis-Visualizations (Tuberculosis rate)

Country or territory name	Region	2. Estimated mortality of TB c..	3. Estimated mortality of TB case..
Central African Republic	AFR	4,059	6,111
Cambodia	WPR	3,361	336
Lao People's Democratic ..	WPR	2,783	137
Namibia	AFR	2,682	4,922
Myanmar	SEA	2,637	334
Gabon	AFR	2,526	587
Bhutan	SEA	2,511	0
Nigeria	AFR	2,373	1,015
Democratic People's Repu..	SEA	2,326	3
Mozambique	AFR	2,169	3,001
Somalia	EMR	2,069	92
Madagascar	AFR	2,003	80
Ethiopia	AFR	1,971	659
Democratic Republic of th..	AFR	1,863	326
Sierra Leone	AFR	1,843	185
Djibouti	EMR	1,744	323
Bangladesh	SEA	1,634	1
Papua New Guinea	WPR	1,620	154
Lesotho	AFR	1,541	5,755
Botswana	AFR	1,529	3,531
Tuvalu	WPR	1,499	0
Niger	AFR	1,472	165
Guinea-Bissau	AFR	1,472	1,189
Guinea	AFR	1,422	348
Micronesia (Federated St..	WPR	1,418	0

➔ Estimated mortality of TB cases per 100 000 There are many cities in **Africa** with high population rates.

3. Data Analysis-Visualizations (HIV-TB)



The link between TB and HIV by comparing TB-related deaths to deaths associated with both HIV and TB.

➔ Our findings revealed no distinct correlation between the two diseases, and the mortality of HIV and TB varies across different countries.

3. Data Analysis-Visualizations (CDR- mortality worldwide)

CDR

Country or territory name	Region	
Iraq	EMR	2,937
United Kingdom of Great ..	EUR	2,136
Jordan	EMR	2,114
The Former Yugoslav Rep..	EUR	2,100
Canada	AMR	2,095
Belgium	EUR	2,095
Republic of Korea	WPR	2,093
Norway	EUR	2,091
Singapore	WPR	2,089
Netherlands	EUR	2,089
United States of America	AMR	2,088
Switzerland	EUR	2,088
Nicaragua	AMR	2,088
Kuwait	EMR	2,088
China, Hong Kong SAR	WPR	2,088
Slovenia	EUR	2,087
Portugal	EUR	2,087
Oman	EMR	2,087
Slovakia	EUR	2,086
Poland	EUR	2,086
Japan	WPR	2,086
Ireland	EUR	2,086
Croatia	EUR	2,086
Chile	AMR	2,086
Germany	EUR	2,085
Finland	EUR	2,085
Estonia	EUR	2,085
Uruguay	AMR	2,084
Sweden	EUR	2,083
Denmark	EUR	2,083
Luxembourg	EUR	2,082
New Zealand	WPR	2,081
Belize	AMR	2,081

Country or territory name	Region	
Bonaire, Saint Eustatius a..	AMR	87
Anguilla	AMR	122
South Sudan	AFR	140
Nigeria	AFR	243
Aruba	AMR	348
Curaçao	AMR	348
Sint Maarten (Dutch part)	AMR	348
Tokelau	WPR	348
West Bank and Gaza Strip	EMR	379
Central African Republic	AFR	391
Lao People's Democratic ..	WPR	418
Greenland	EUR	435
US Virgin Islands	AMR	435
Monaco	EUR	522
Montserrat	AMR	609
Niue	WPR	609
Azerbaijan	EUR	618
Mozambique	AFR	669
Pakistan	EMR	683
Somalia	EMR	693
British Virgin Islands	AMR	696
Cabo Verde	AFR	726
Niger	AFR	728
Suriname	AMR	741
Afghanistan	EMR	756
Bangladesh	SEA	762
Cameroon	AFR	766
Madagascar	AFR	771

$$\text{CDR (\%)} = \frac{\text{Estimated number of new and relapse TB}}{\text{Number of new and relapse TB cases notified}} \times 100$$

The Case Detection Rate (CDR) is a measure used to understand how eff ectively a health system is identifying cases of a specific disease.

Are CDRs valuable data?

➔ Countries with a higher number of deaths displayed significantly lower CDR values, indicating a correlation between CDR and tub erculosis fatalities.
This suggests that nations with less effective tuberculosis control measures tend to have more tuberculosis cases.

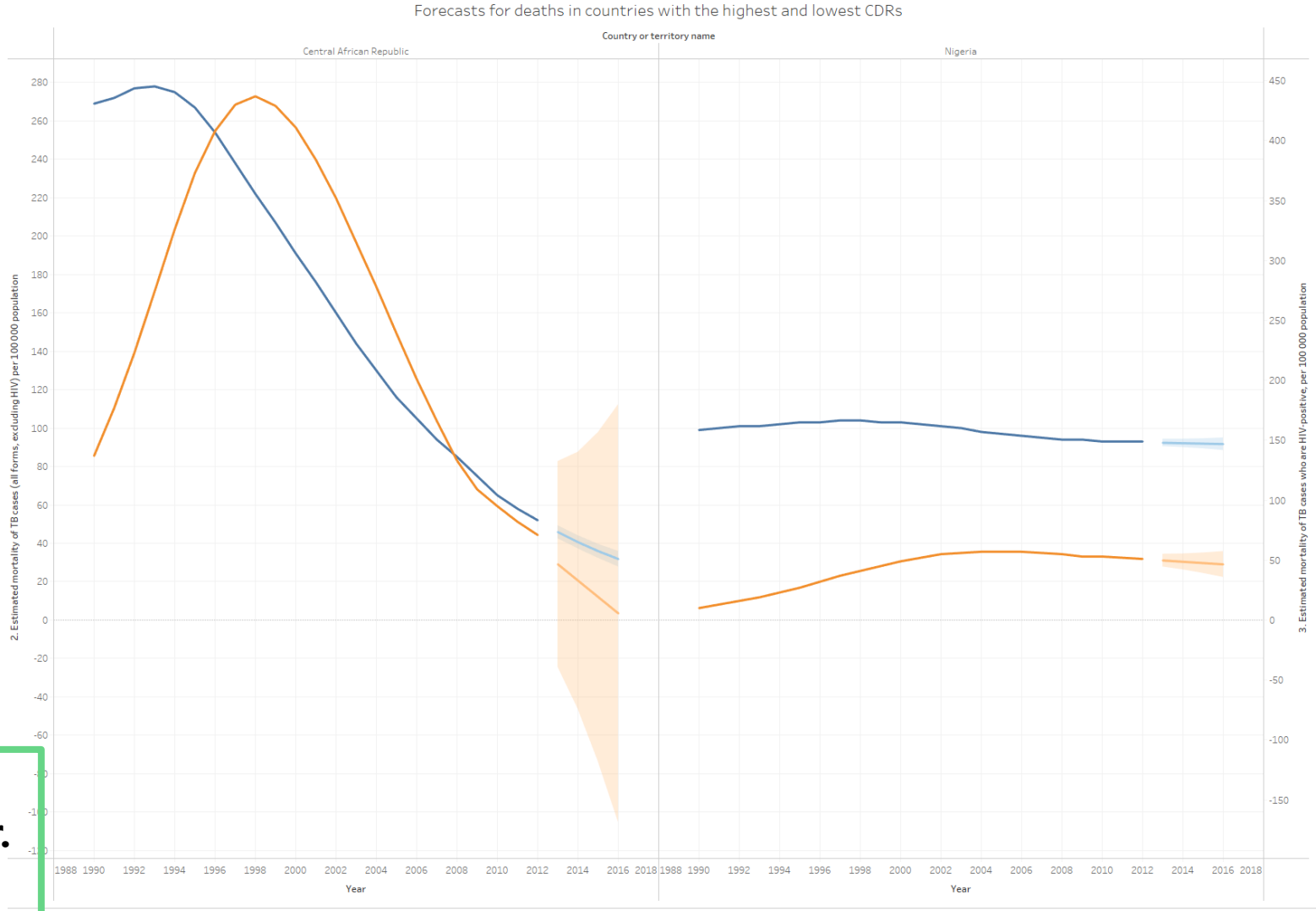
3. Data Analysis-Visualizations (CDR- mortality Africa)

Will CDR help with mortality?

➔ The country on the left exhibits a notably | low CDR, while the one on the right has a con siderably high CDR.

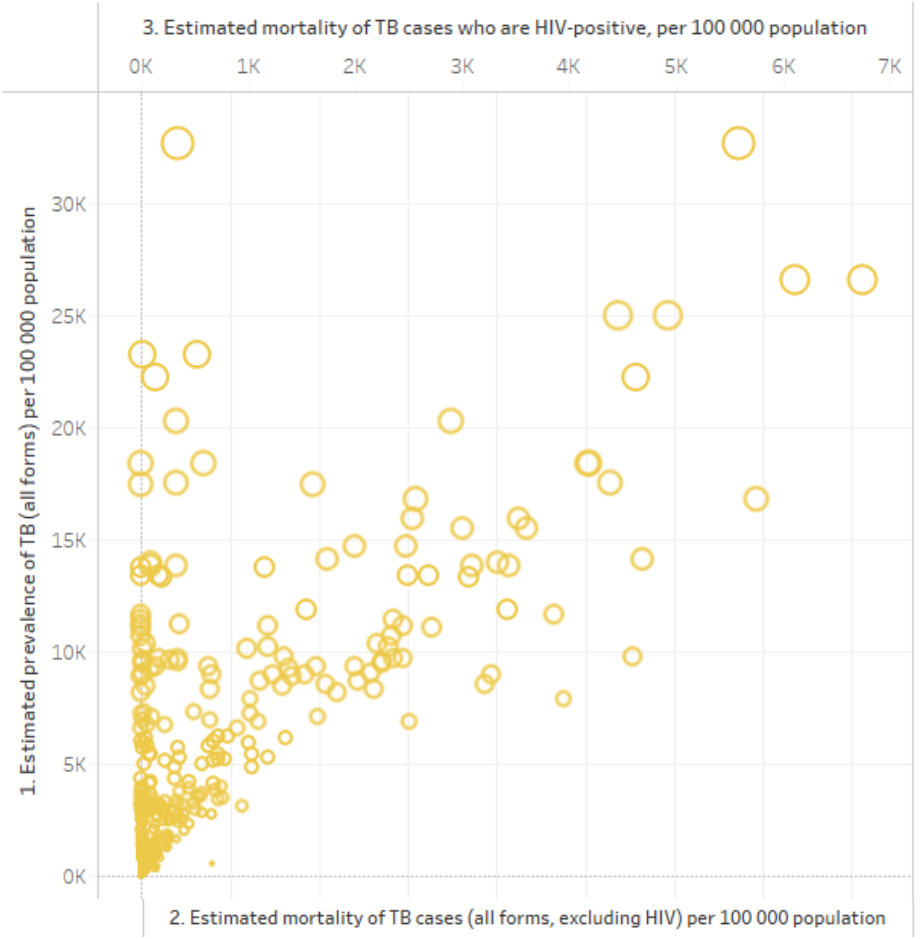
This suggests that the country on the right might possess more precise data about tuberculosis.

However, upon analyzing both datasets, the projected mortality rates decline in each nation. Hence, it's deduced that CDR doesn't play a substantial role in this context.



These data values are very different from the global trends mentioned earlier. Therefore, I analyzed this as a characteristic unique to Africa.

3. Data Analysis-Visualizations (Tuberculosis fatality rate)



➔ The spread of points indicates the relationship between the **mortality** rate of TB and the **prevalence** of TB

➔ The spread of points indicates the relationship between the **mortality** rate of TB and the **incidence** of TB

➔ Both data are concentrated at the bottom of the x-axis, which means that deaths may not occur even if the prevalence and incidence rates are high. Therefore, it appears that the fatality rate is not high.

3. Data Analysis-Visualizations

Incidence rate : Mortality rate

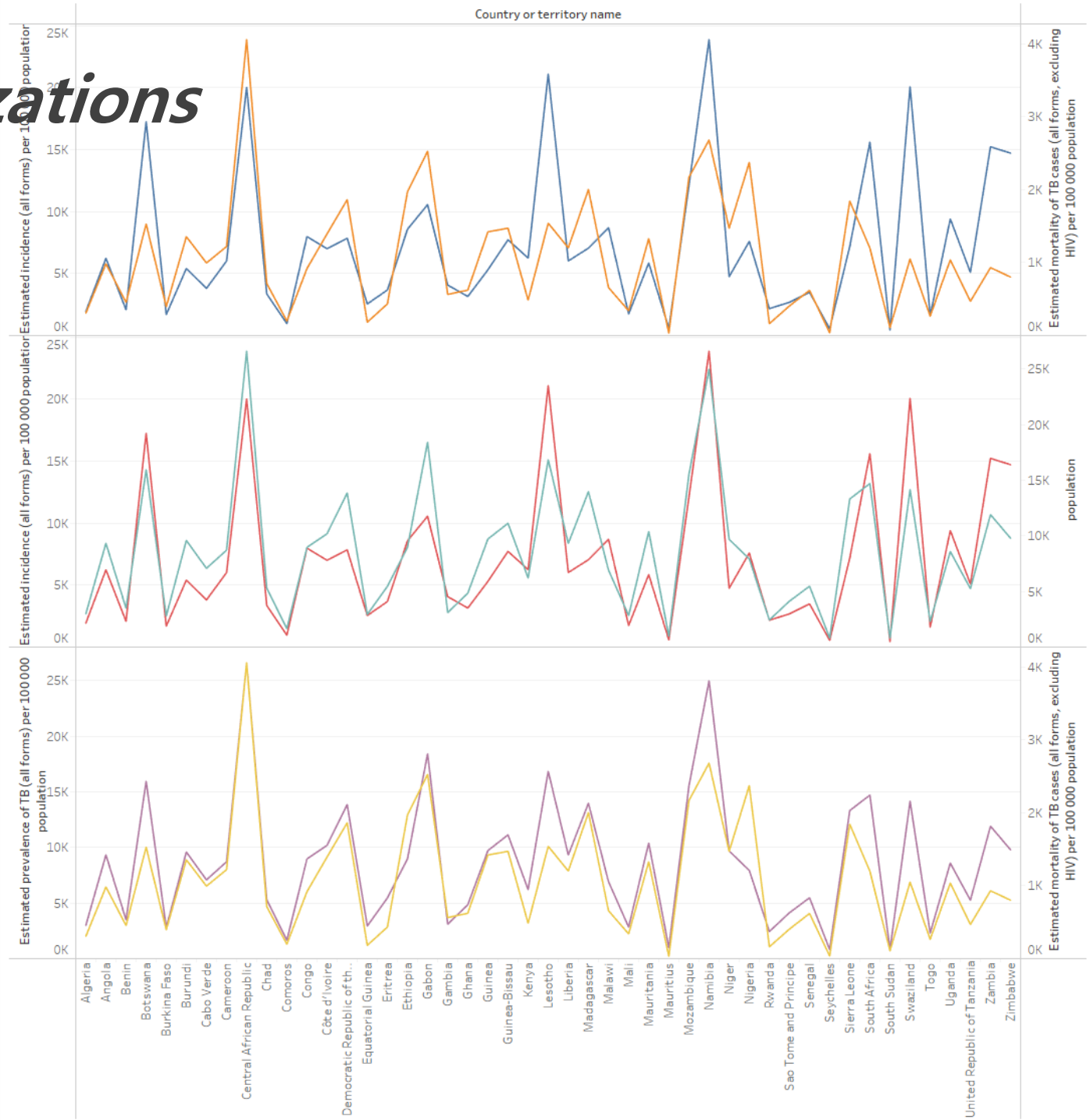
➔ In some countries, the TB prevalence rate consistently exceeds the mortality rate, indicating many are infected but fewer die relative to its prevalence.

Prevalence rate : Incidence rate

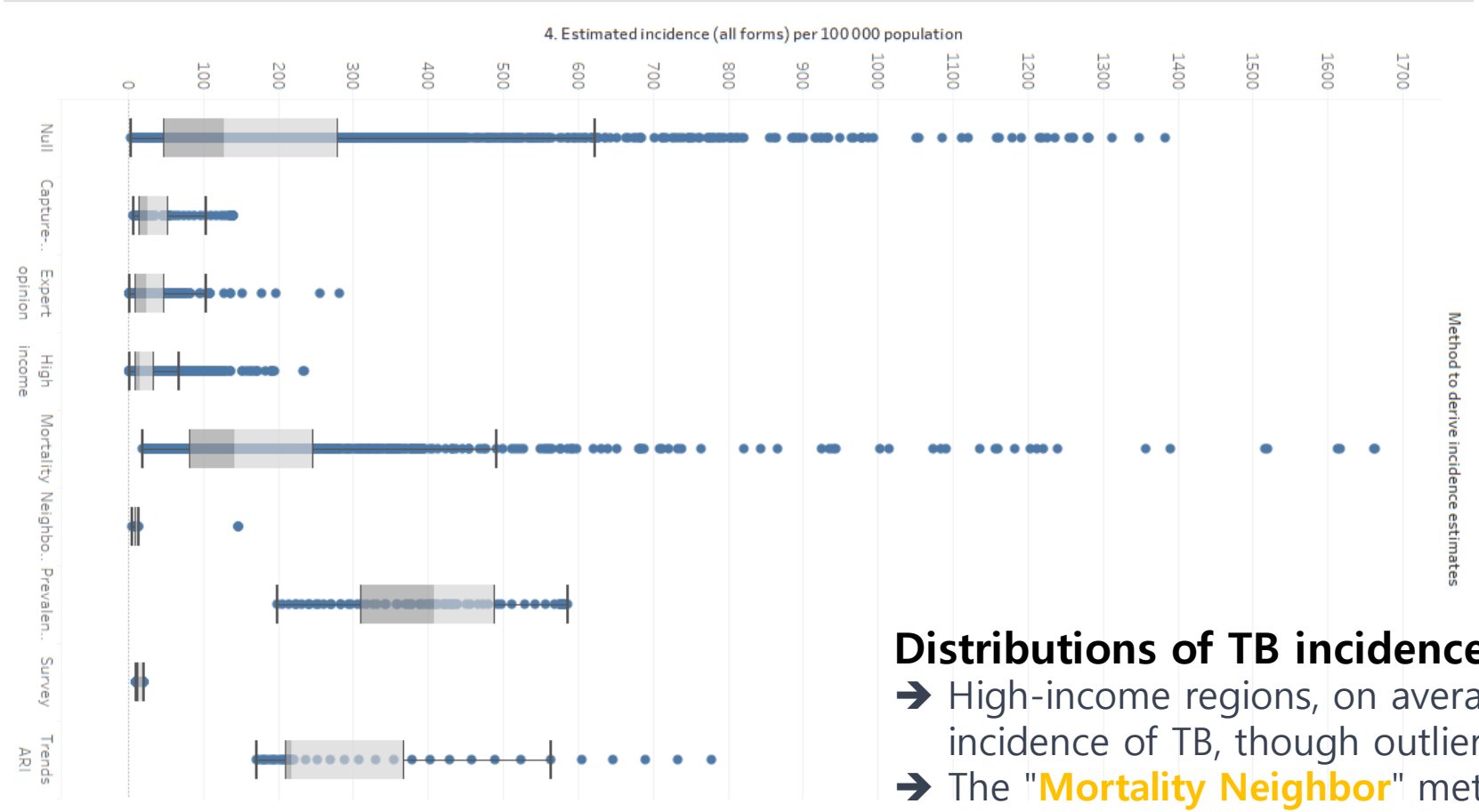
➔There's no strong correlation between the two, with some countries showing higher mortality than prevalence for a time, possibly due to delayed responses or lack of timely medical intervention.

Mortality rate- Prevalence rate

➔The consistently lower death rate, as compared to the prevalence rate suggests that even in high-prevalence regions, the death rate is relatively contained. This could be attributed to medical interventions, awareness, or other socio-economic factors.



3. Data Analysis-Method(Incidence)

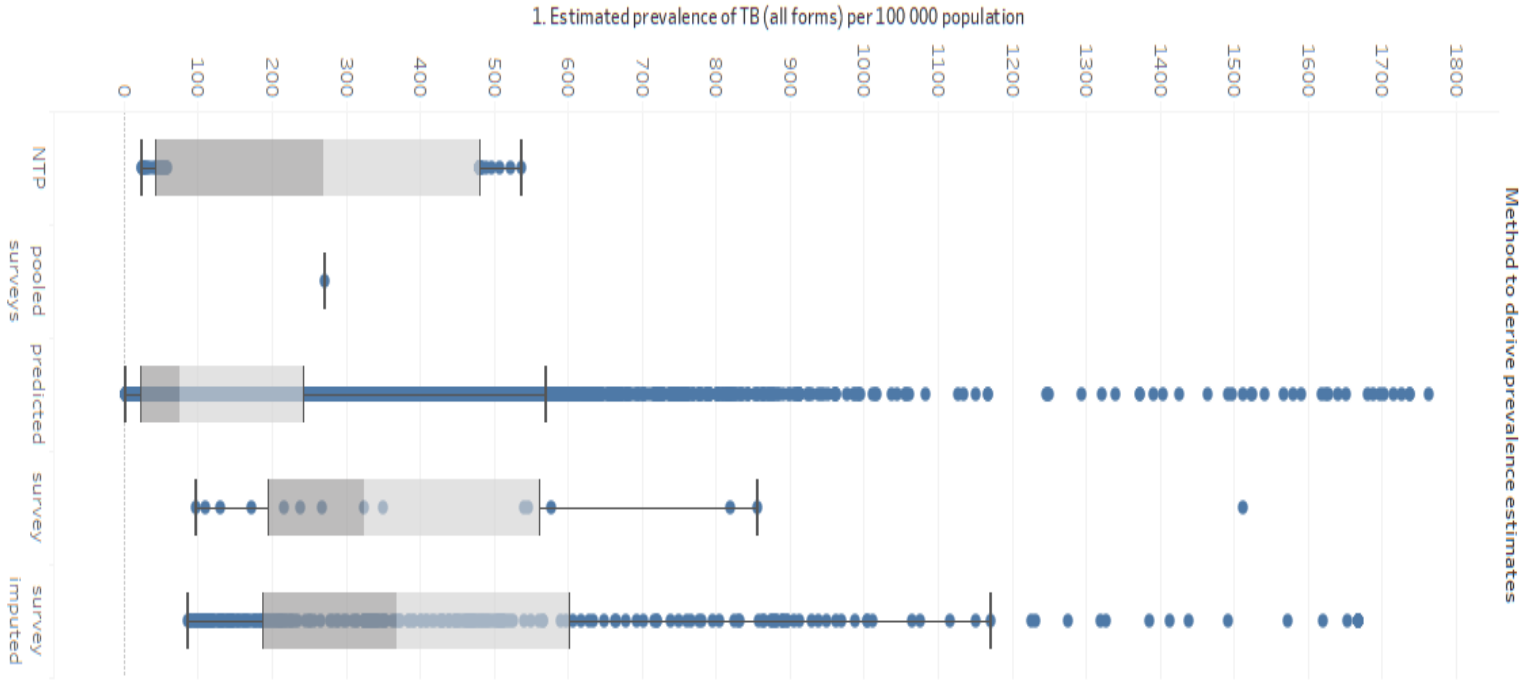


Distributions of TB incidence rates

➔ High-income regions, on average, seem to have a lower incidence of TB, though outliers exist.

➔ The "**Mortality Neighbor**" method shows a broader distribution, suggesting that some regions might have high incidence rates, while others have much lower rates.

3. Data Analysis-Method(Prevalence)

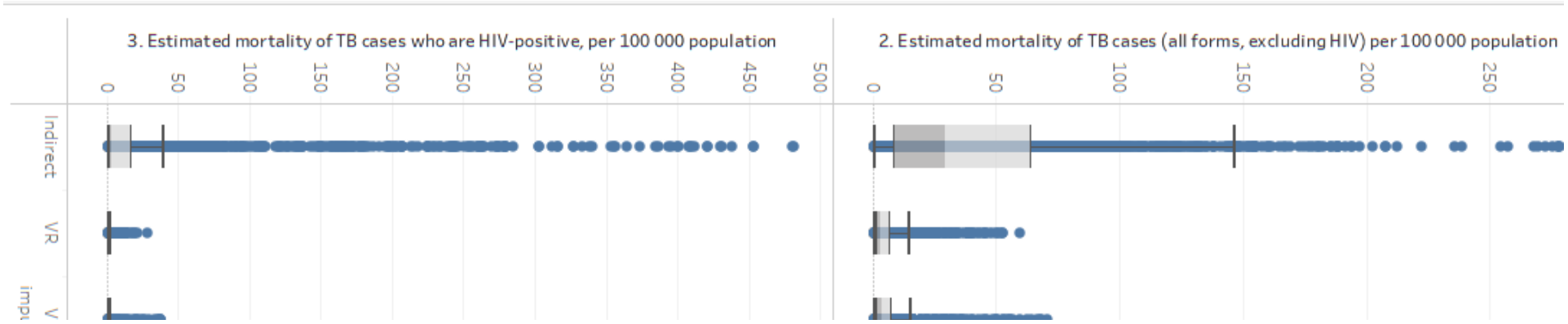


Distributions of TB prevalence rates

➔ The various methods of estimating prevalence produce different results, with some methods having a wider spread of estimates than others.

➔ The "**Predicted**" method seems to produce the most consistent results, with the smallest variation in estimates.

3. Data Analysis-Method(mortality)

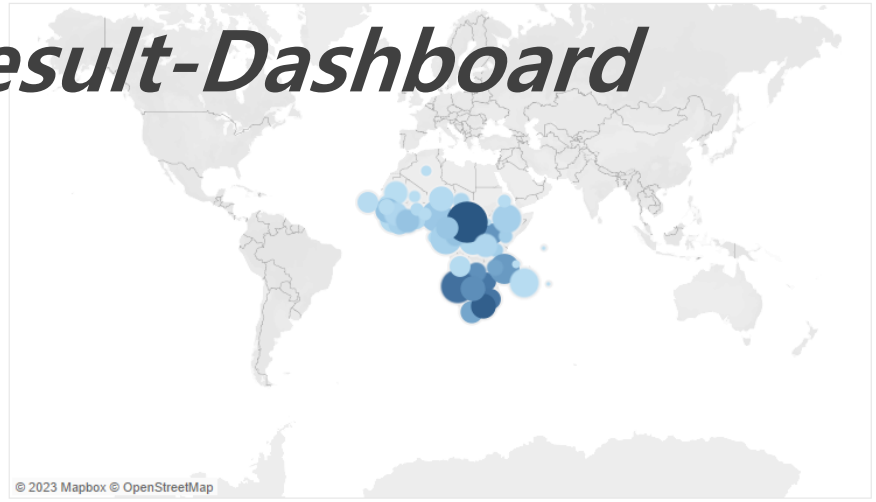


Distributions of TB mortality rates

➔ "**VR imputed**" has the least variability, with almost all of its data points being clustered very closely at the lower end of the scale.

4. Result-Dashboard

Current tuberculosis death rates in Africa



List of countries by number of deaths

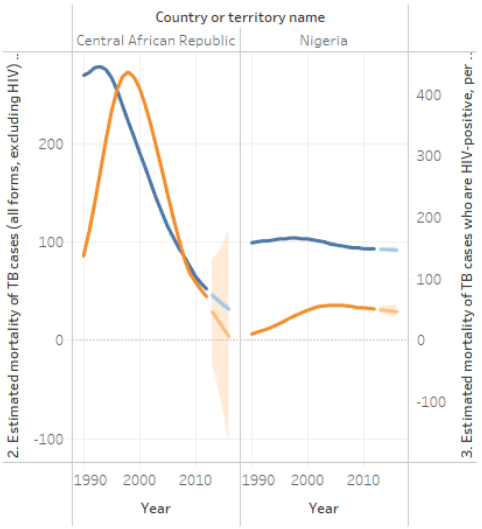
Country or territory name	Region	2. Estimat..	3. Estimated ..
Zimbabwe	AFR	802	4,596
Chad	AFR	714	351
Malawi	AFR	657	2,513
Ghana	AFR	623	309
Senegal	AFR	620	93
Gambia	AFR	564	105
Kenya	AFR	487	723
United Republic of Tanzan..	AFR	469	725
Benin	AFR	455	98
Eritrea	AFR	433	68
Sao Tome and Principe	AFR	406	74
Burkina Faso	AFR	395	200
Mali	AFR	340	40
Algeria	AFR	306	1
Togo	AFR	266	134
Comoros	AFR	198	0
Equatorial Guinea	AFR	183	68
Rwanda	AFR	163	206
South Sudan	AFR	107	0

Case detection rate (all forms), pe..
140 2,070

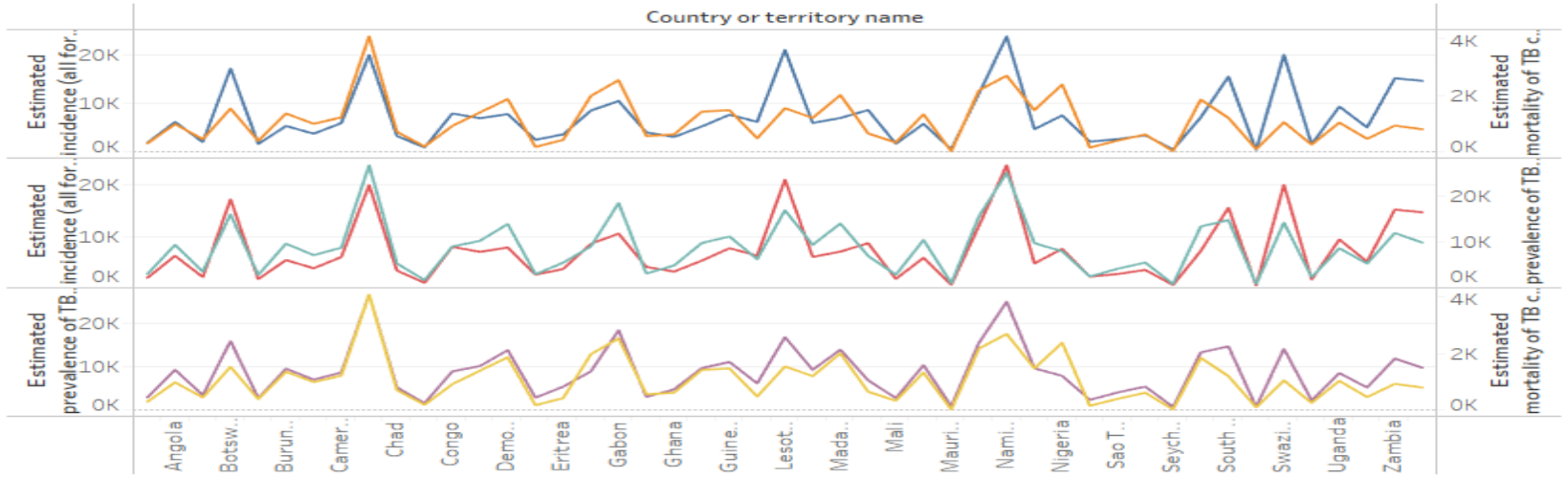
3. Estimated mortality of TB cases..
0 6,111

Measure Names
- Estimated incidence ..
- Estimated incidence ..
- Estimated mortality ..
- Estimated mortality ..
- Estimated prevalenc..
- Estimated prevalenc..

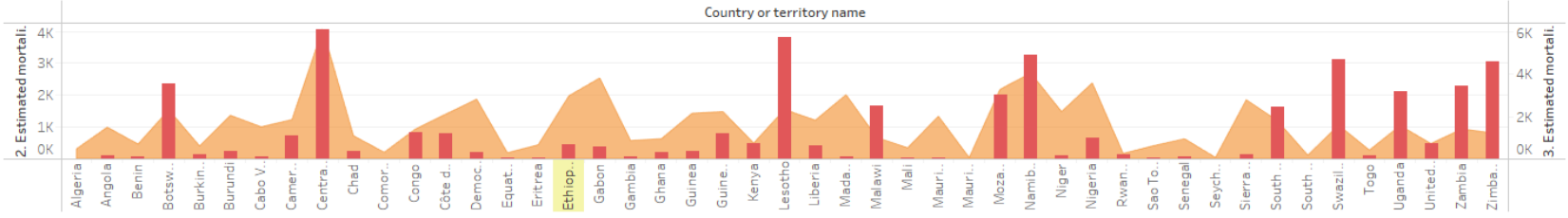
Forecasts for deaths in countries with the highest and lowest CDRs



Prevalence rate-Death rate-Incidence rate **correlation**



TB-HIV **correlation**



Case Detection Rate (CDR)

Country or territory name	Region	
South Sudan	AFR	140
Nigeria	AFR	243
Central African Republic	AFR	391
Mozambique	AFR	669
Cabo Verde	AFR	726
Niger	AFR	728
Cameroon	AFR	766
Madagascar	AFR	771
Guinea	AFR	787
Burkina Faso	AFR	805
Liberia	AFR	810
Chad	AFR	851
Guinea-Bissau	AFR	868
Sierra Leone	AFR	902
Côte d'Ivoire	AFR	921
Gabon	AFR	928
Burundi	AFR	940
Uganda	AFR	951
Ethiopia	AFR	986
Mauritania	AFR	997
Democratic Republic of th..	AFR	1,023
Mauritius	AFR	1,096
Benin	AFR	1,147
Ghana	AFR	1,173
Zimbabwe	AFR	1,190
Namibia	AFR	1,202
Equatorial Guinea	AFR	1,214
Comoros	AFR	1,225
Malawi	AFR	1,252
Lesotho	AFR	1,263
Togo	AFR	1,286

5. My challenge

Massive data

Analyzing the vast amount of data presented challenges in pinpointing the exact metrics necessary for the analysis.

Limitations graph function

While Tableau offers a wide range of visualization types, there are limits to how much I can customize them without resorting to more complex workarounds.

Hard to control

Fine-tuning the data visualizations in Tableau posed certain difficulties, especially in achieving precise representations.

Thank you