23560444_Assignment1

C Twaddle

1 Assignment 1
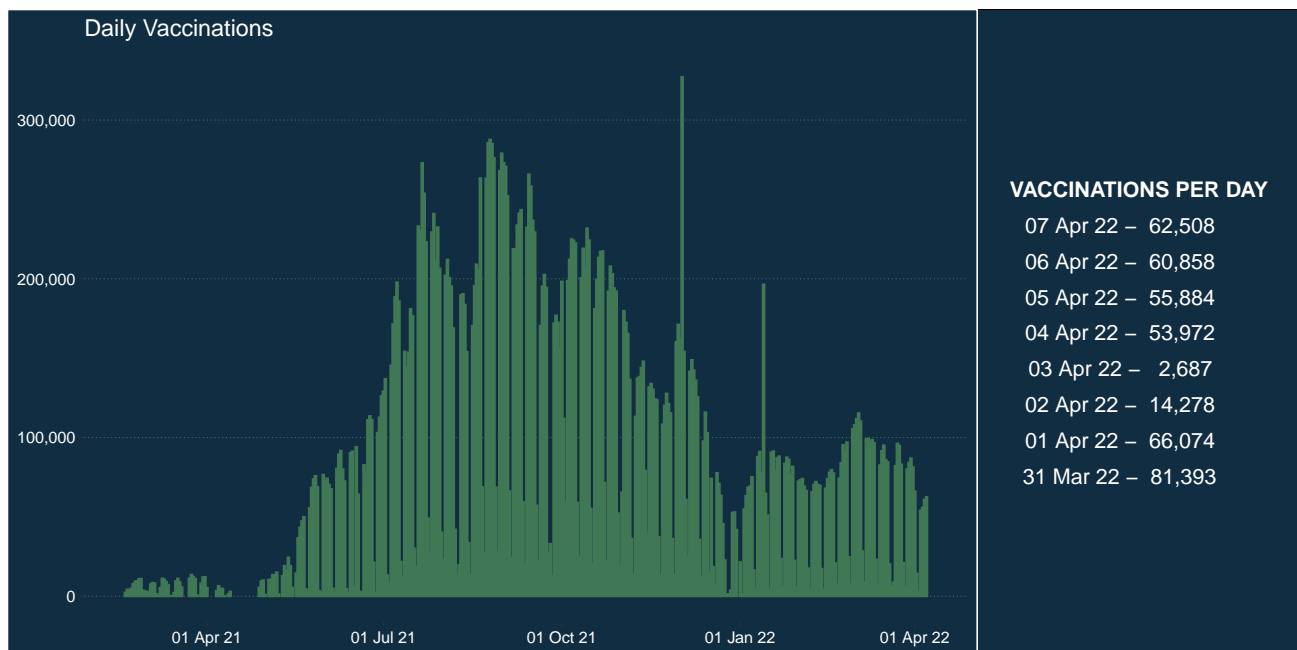
1.1 Part A: Figure reproduction

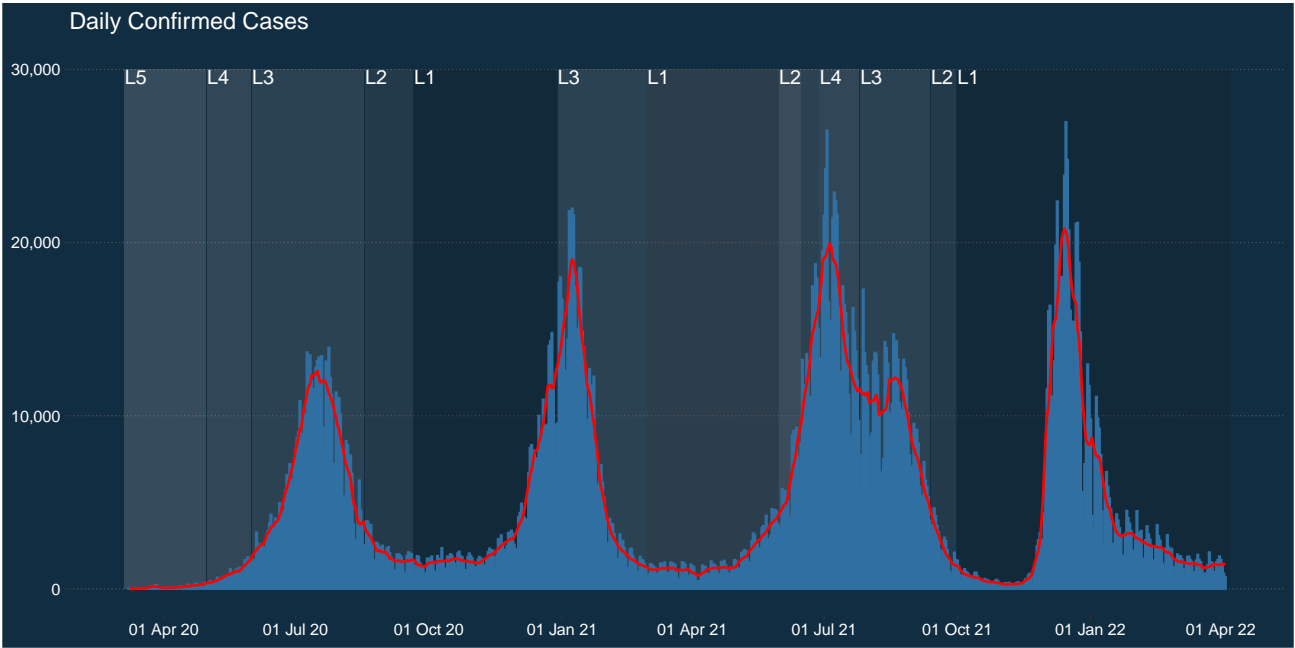### 1.1.1 Data Wrangling

All data inputting and most editing happens in this chunk.

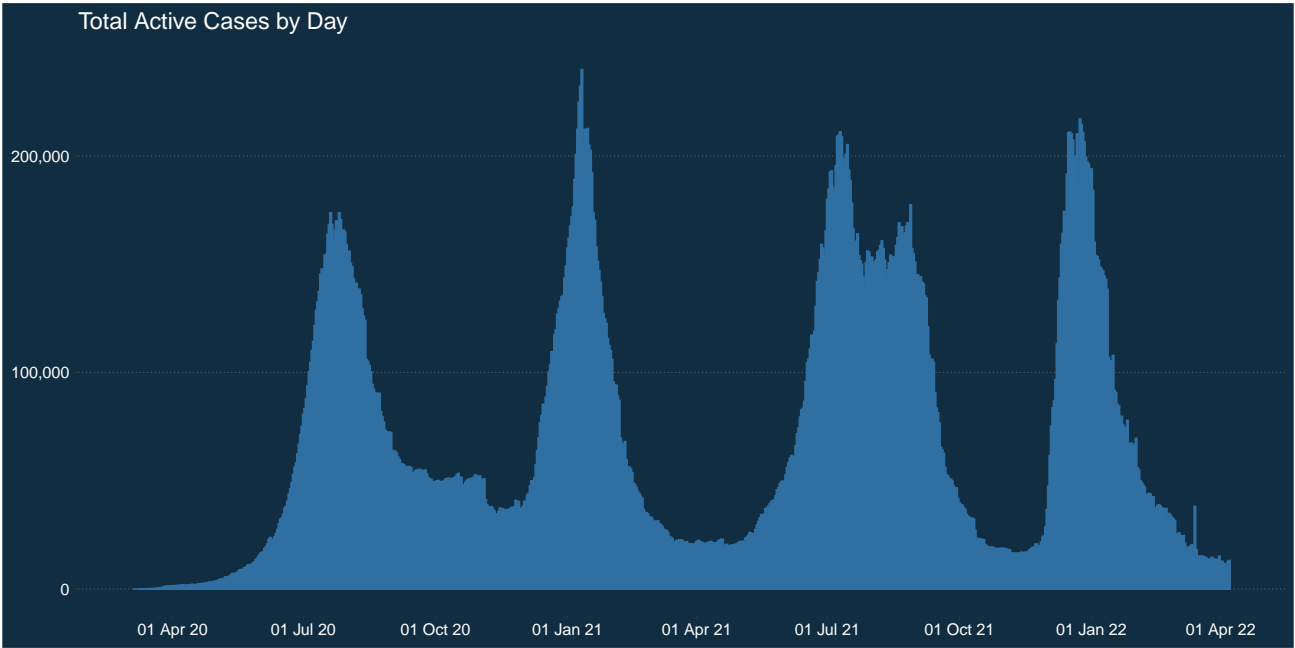- Province data obtained from: https://health.google.com/covid-19/open-data/raw-data
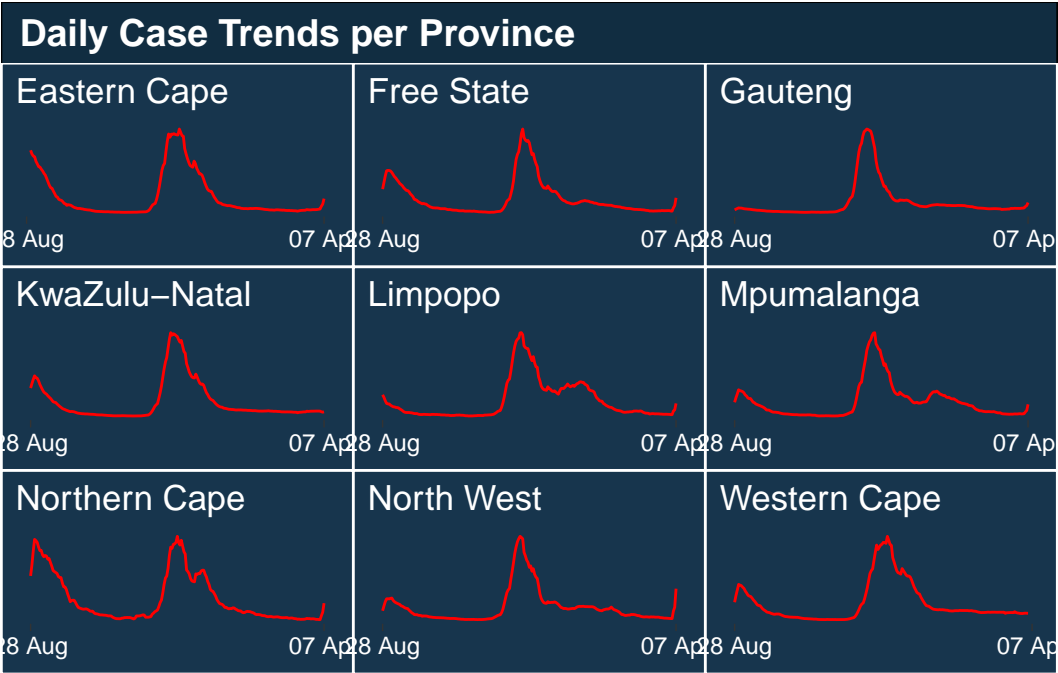
1.1.2 Graph 1: Daily Vaccinations

1.1.3 Graph 2: Daily Confirmed Cases

Daily Confirmed Cases

1.1.4 Graph 3: Total Active Cases by Day

Total Active Cases by Day

1.1.5 Graph 4: Daily Case Trends per Province

Daily Case Trends per Province

Eastern Cape	Free State	Gauteng
8 Aug — 07 Ap	8 Aug — 07 Ap	8 Aug — 07 Ap
KwaZulu–Natal	Limpopo	Mpumalanga
8 Aug — 07 Ap	8 Aug — 07 Ap	8 Aug — 07 Ap
Northern Cape	North West	Western Cape
8 Aug — 07 Ap	8 Aug — 07 Ap	8 Aug — 07 Ap

1.1.6 Graph 5: Active Cases vs Confirmed Cases

Active Cases vs Confirmed Cases

Active
Confirmed

3,000,000

2,000,000

1,000,000

0

3,728,68

13,083

01/01/21   01/01/22
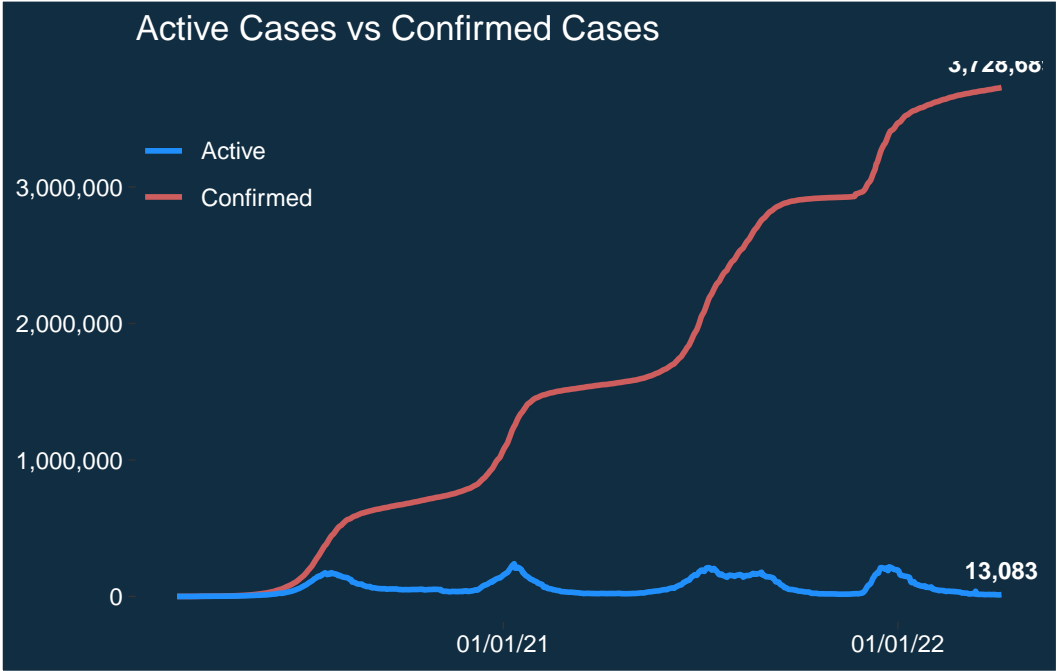
1.1.7 Graph 6: Provincial Infection per 100 000 People

Provincial Infection per 100 000 People

Province	Infection per 100 000
Western Cape	9,894.6
Northern Cape	8,863.69
Gauteng	8,412.41
Free State	7,383.06
KwaZulu–Natal	6,242.88
North West	5,773.89
Eastern Cape	5,463.45
Mpumalanga	4,275.25
Limpopo	2,962.31
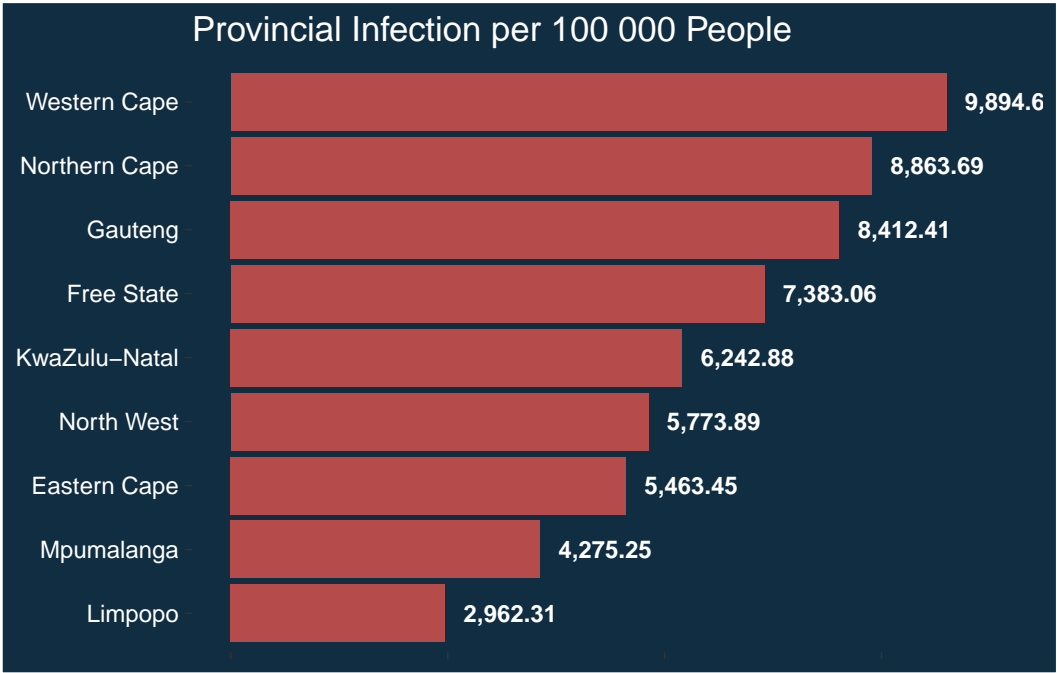
1.1.8 Graph 7: Estimated Reproduction Rate

Estimated Reproduction Rate for South Africa

90% Credible Interval
21 Feb
Rt: 0.67
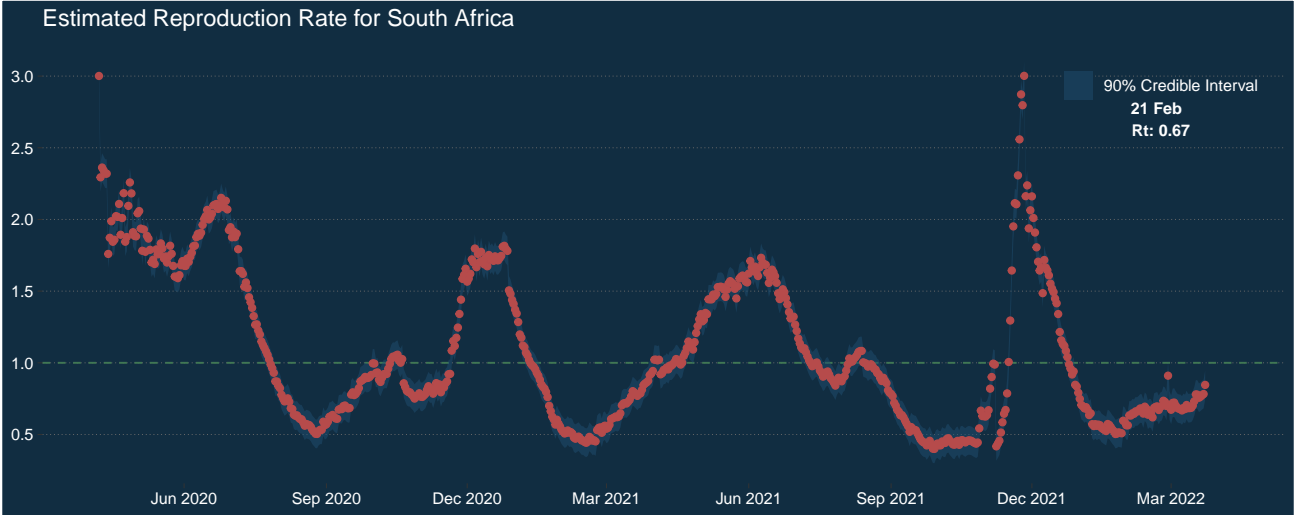
The following is an Rt graph made with an external data source (https://github.com/owid) that already computed the reproduction rate. This graph was left in because it is closer to the screenshot and it looks nice.

4

Estimated Reproduction Rate for South Africa
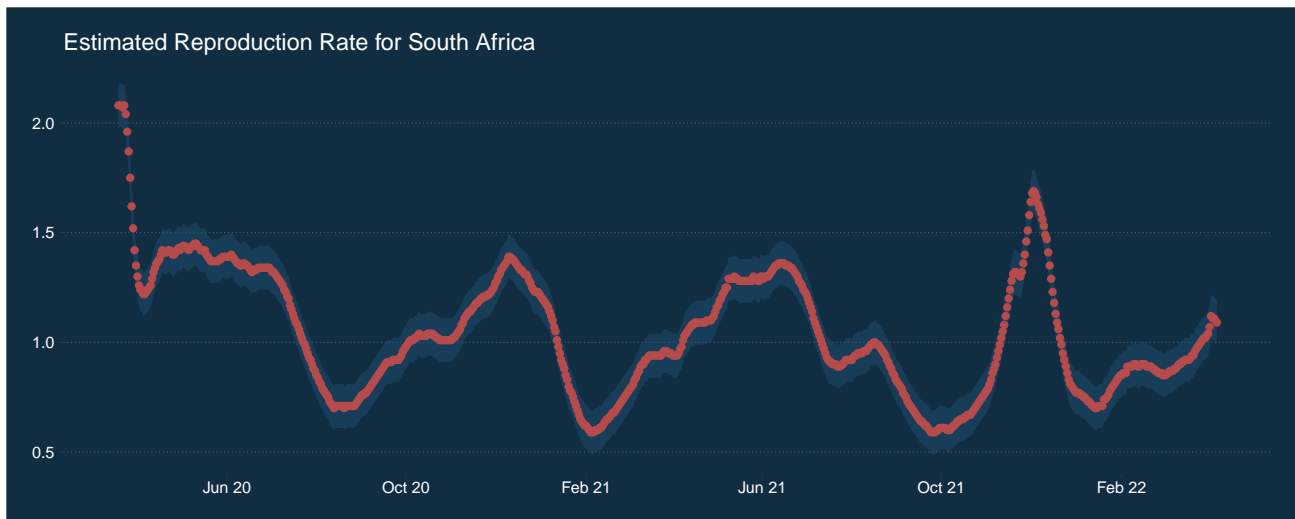
1.2 Part B: Figure Design

1.2.1 Data Wrangling

I used a combination of world wide data and South African data to make the following graphs. These are the links to the data sources I gathered:

- World data: https://github.com/owid

- United States data: https://data.cdc.gov/NCHS/Provisional-COVID-19-Deaths-by-Sex-and-Age/9bhg-hcku/about_data

- Province vaccinations data: https://www.statista.com/statistics/1245767/total-number-of-covid-19-vaccination-doses-in-south-africa-by-province/

- Excess mortality data: https://github.com/owid

My aim with the following graphs is to first explore the state of the world during COVID and eventually narrow it down to a South African context.

1.2.2 Graph 8

This graph models the GDP per capita on the y-axis and the total number of COVID cases per million on the x-axis. Each bubble represents a country and the size represents the population of that country. Country's are coloured based on their continents. Please over hover a bubble for more information.
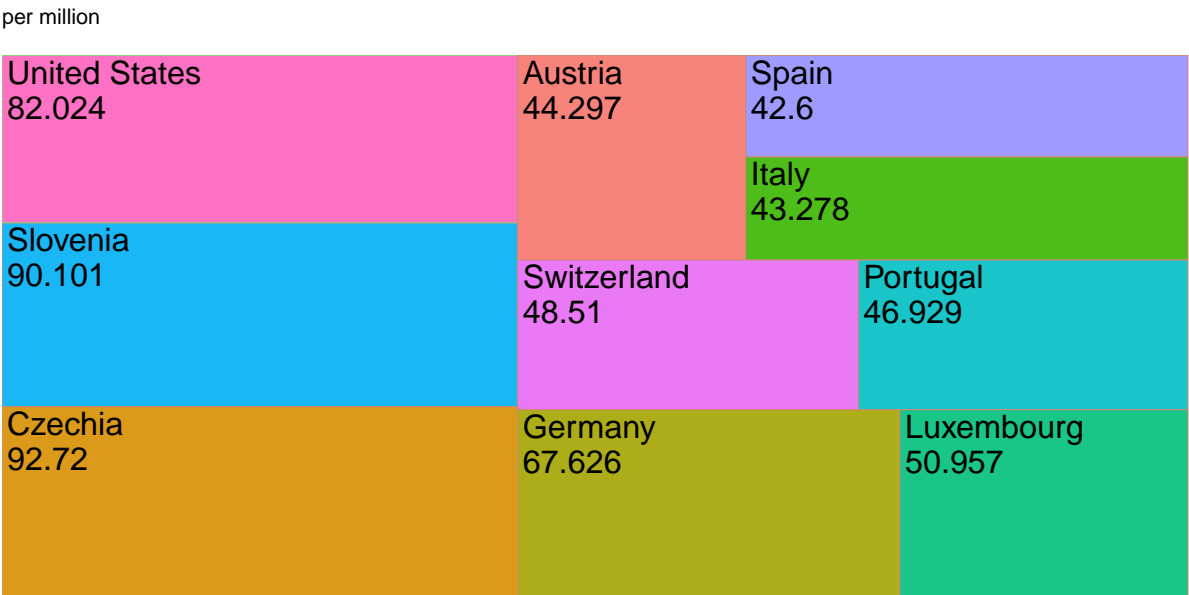
GDP by COVID cases per million per Country

On December 31st 2020. Sized by population

Data Source: Our World in Data
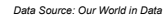
1.2.3 Graph 9

This treemap models the 10 countries with the most patients in the ICU per million on December 31 2020. Each block is sized based on the number of patients, and are coloured based on their continents. This shows how many patients were critic by the end of the first year of the pandemic.

**Top 10 Countries with the most ICU Patients on December 31st 2020**

per million

United States 82.024	Austria 44.297	Spain 42.6
Slovenia 90.101		Italy 43.278
	Switzerland 48.51	Portugal 46.929
Czechia 92.72	Germany 67.626	Luxembourg 50.957

Data Source: Our World in Data

1.2.4 Graph 10

Graph 10 shows the excess mortality of South Africa, the United Kingdom, Japan and Brazil. These countries were chosen to show the difference in excess morality between developed and developing countries.

Projected Excess Mortality in SA, UK, Japan and Brazil

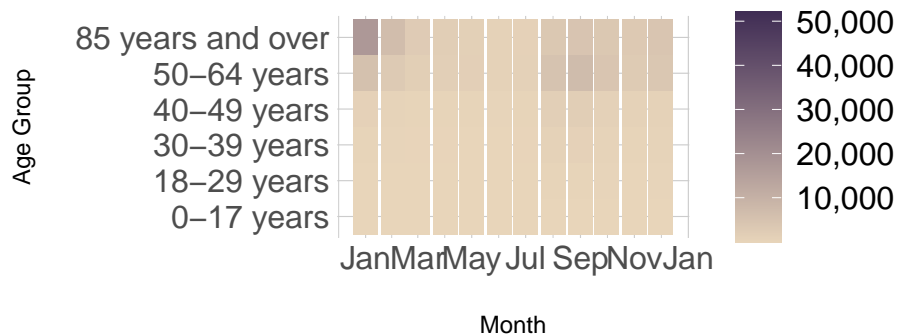Excess mortality refers to the number of deaths above and beyond the 'normal' expected morality.
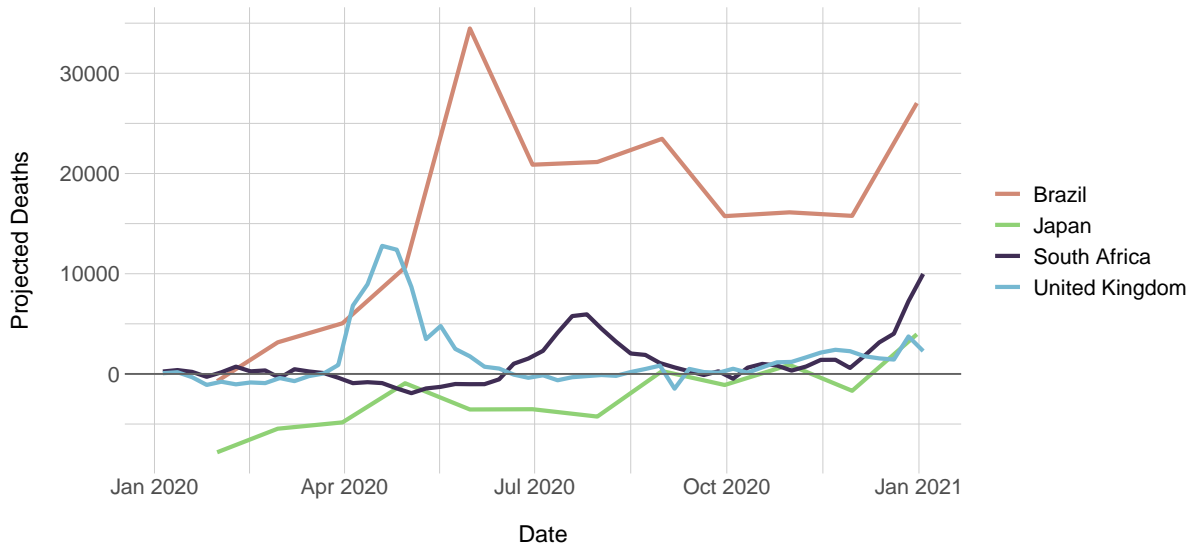
Data Source: Our World in Data

1.2.5 Graph 11

This graph is a heatmap to show the progression of deaths of females per age group due to COVID in the United States.

Heatmap of Female Deaths b

### by Age Group and Month in 2021 in the US

Data Source: Centre for Disease Control and Prevention

1.2.6 Graph 12

This graphs maps two data points to each South African province. The lighter bubble represents the population of that province, and the darker bubble shows the number of confirmed cases for that province. Please hover over each bubble for more information. *Also please be aware the size has been hard coded to fit into the window which may cause the map to be slightly distorted, this can be adjusted for a better view.*
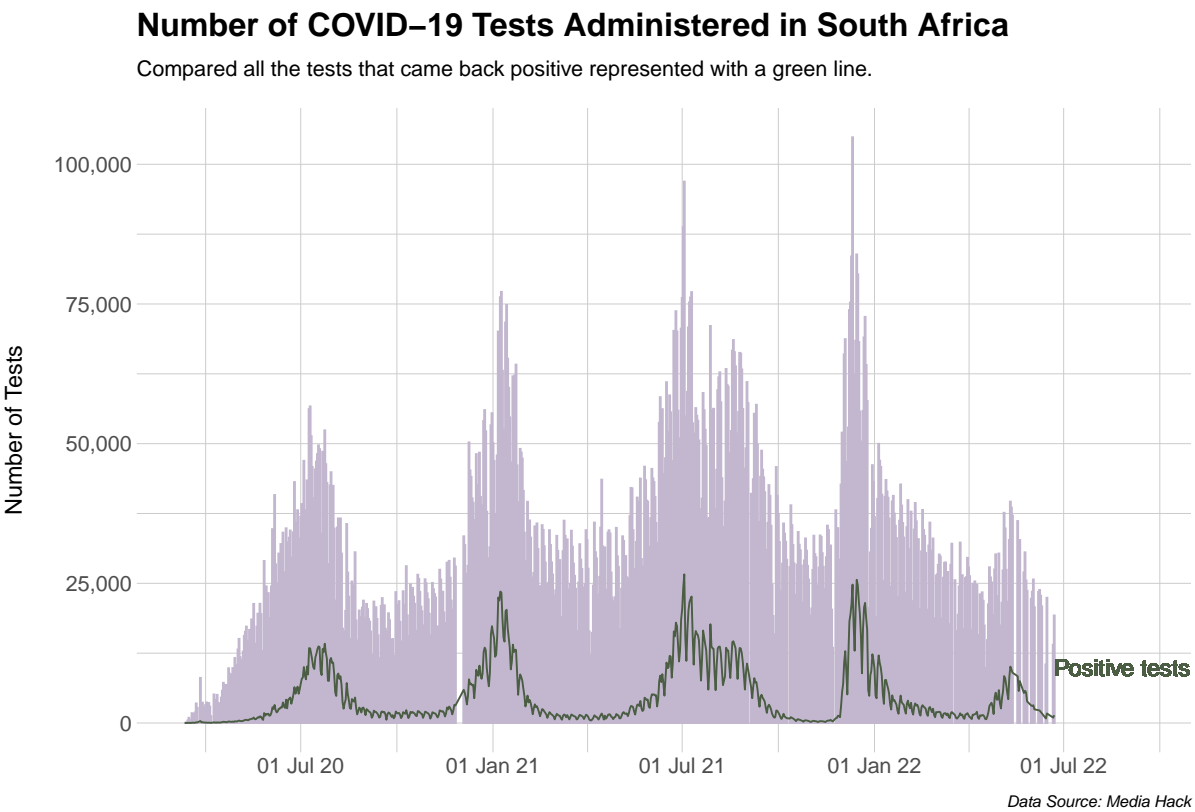
Total Confirmed COVID-19 Cases per Province

Compared to Population per Province
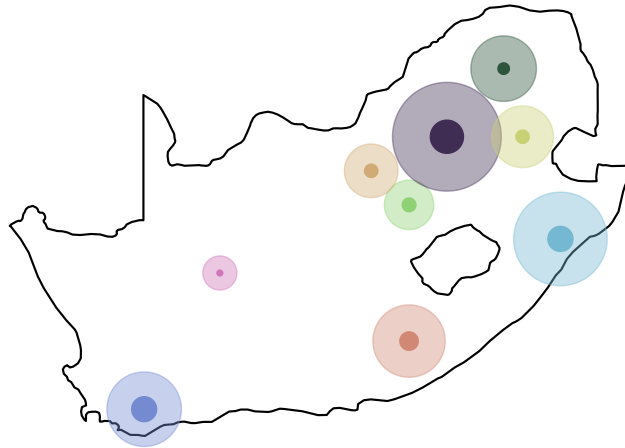
Data Source: Our World in Data

1.2.7 Graph 13

This graph plots the number of COVID test administered in South Africa from 2020 to 2022. An additional line is plotted to show the number of positive tests.
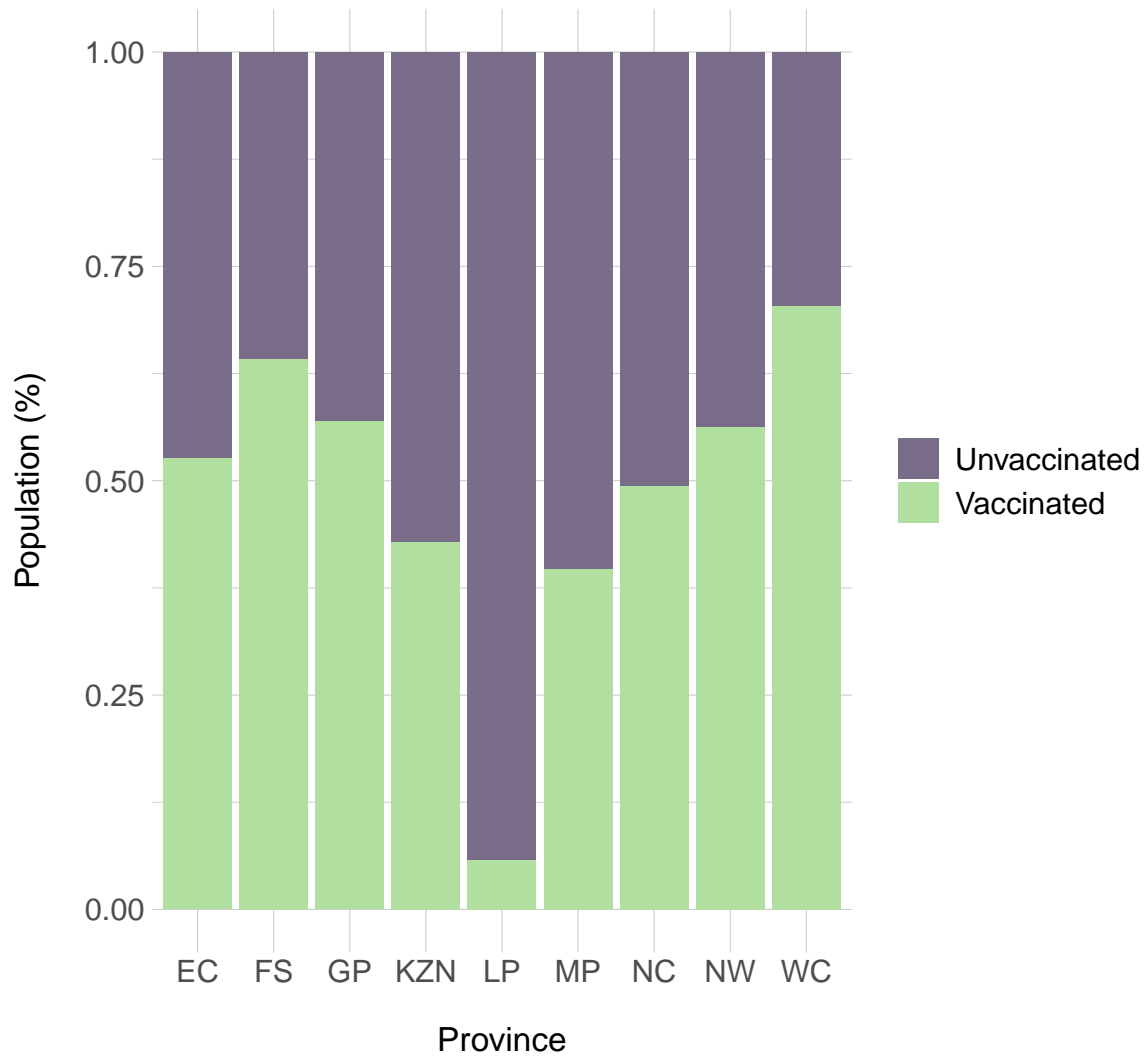
Number of COVID–19 Tests Administered in South Africa

Compared all the tests that came back positive represented with a green line.

Data Source: Media Hack

1.2.8 Graph 14

The following graph plots the proportion of each province's population that is vaccinated as a percentage.

Proportion of Vaccinated Population

Per South African Province