COVID-19 ANALYTICS

WHAT QUESTION LED OUR ANALYSIS?

How effectively is Canada dealing with the pandemic and vaccinating its population in comparison to Australia?

What factors have influenced their past success, or lack thereof, and how is this expected to affect the future of this pandemic?
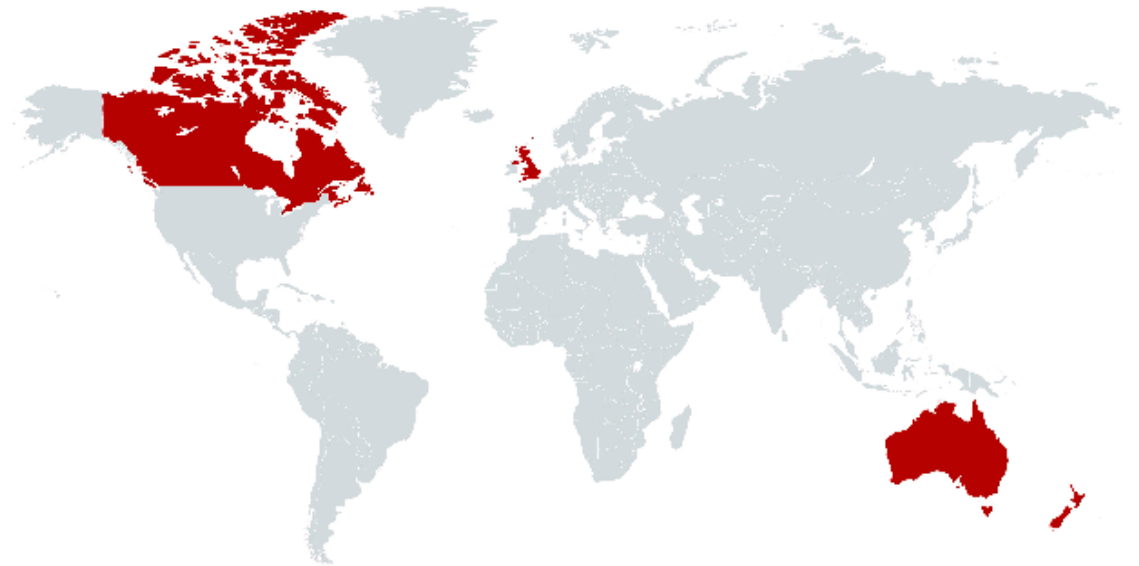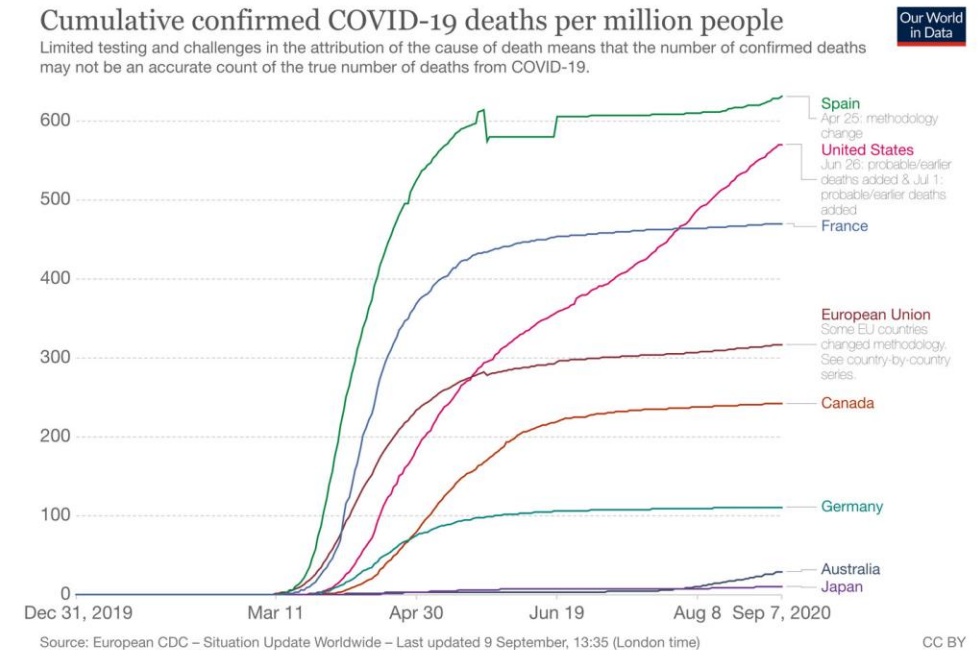
DATA AND METHODOLOGY

ABOUT OUR DATA

- Where data came from --> see citations

- Why we chose that data
  - Used government data as it most reliable with updates on cases, deaths, recovery, and vaccinations

- What we did to manipulate the data
  - Standardize the data, to make it cover the same time frame
    - parsed the data to cover largest time frame possible (Jan 22- Jul 10)

- filtering the countries

Cumulative confirmed COVID-19 deaths per million people
Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.

Source: European CDC – Situation Update Worldwide – Last updated 9 September, 13:35 (London time)

CC BY

CHALLENGES TO DATA EXTRACTION

- Time series data - when to begin showcasing the spread of COVID 19 in Canada and Australia (March 2020 or earlier)?

- Would using data that spans a shorter period of time give us more inaccurate visualizations?

- Will country specific data reporting changes skew the overall outcome of the data?

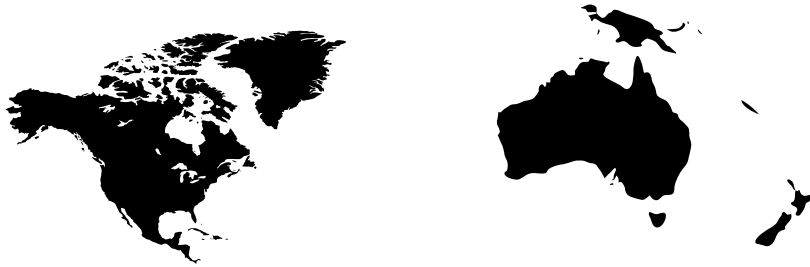- Dealing with Big Data and making sure the data was clean before making visualizations.
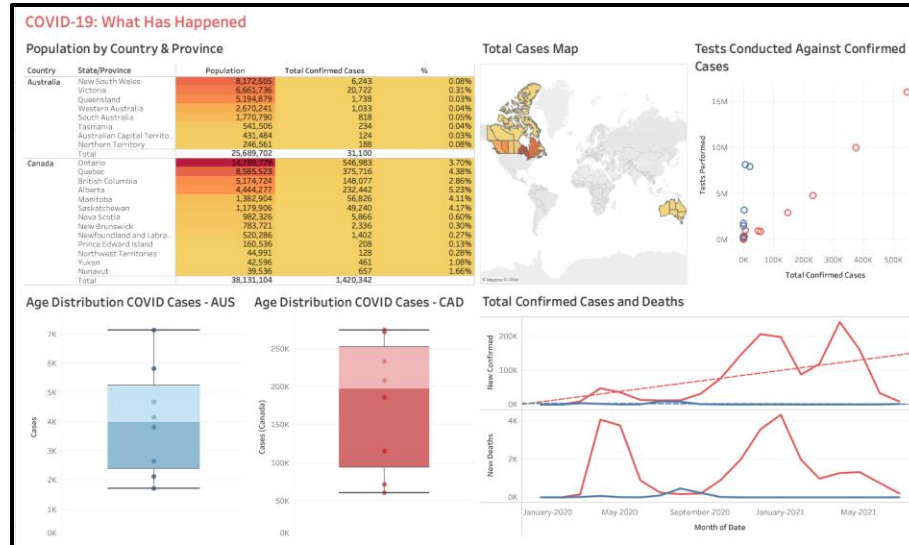
DASHBOARDS

RATIONALE

Nation Profile

✓ Similar populations

✓ Region by Provinces

✓ Similar social-economic characteristics

✓ Commonwealth countries

✓ Able to mitigate extremely high COVID cases

The emergence of COVID 19 and how this pandemic impacted Canada and Australia by highlighting all active cases recovered and deaths to date within each nation's provinces.
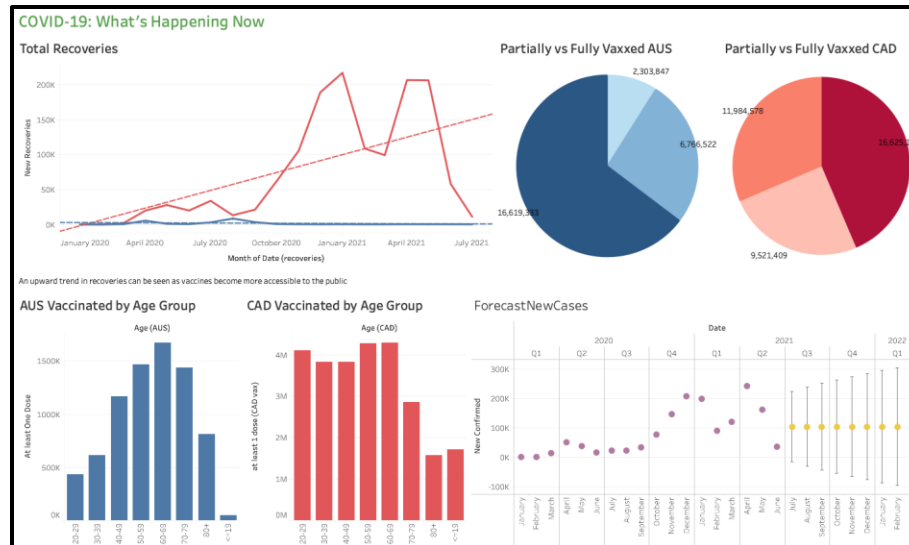
Shows how Canada and Australia is flattening the curve by administering vaccines to its citizens . In addition, we focused on future projections regarding the number of cases we will see in the future and whether the measures we are taking right now will payoff in the future.

CROSSTAB AND CHOROPLETH MAP

Objective: Look at the the number of COVID-19 cases of all time within each province in Canada and Australia to highlight regions with high infection rates.

We decided to include a crosstab in our analysis to show total population and the number of individuals that have been affected by the virus. Choropleth maps allow us to visualize which regions have high confirmed cases by colour intensity.

Canada: Ontario and Quebec were province with the highest number of cases.

Australia: New South Wales and Victoria lead in confirmed cases.

From our population tables, we can see that these four locations have the highest population, suggesting that areas with greater population density are prone to have more COVID cases and are likely to spread quicker.

Country	State/Province	Population	Total Confirmed Cases	%
Australia	New South Wales	8,172,505	6,243	0.08%
	Victoria	6,661,736	20,722	0.31%
	Queensland	5,194,879	1,738	0.03%
	Western Australia	2,670,241	1,033	0.04%
	South Australia	1,770,790	818	0.05%
	Tasmania	541,506	234	0.04%
	Australian Capital Territo..	431,484	124	0.03%
	Northern Territory	246,561	188	0.08%
	Total	25,689,702	31,100	
Canada	Ontario	14,789,778	546,983	3.70%
	Quebec	8,585,523	375,716	4.38%
	British Columbia	5,174,724	148,077	2.86%
	Alberta	4,444,277	232,442	5.23%
	Manitoba	1,382,904	56,826	4.11%
	Saskatchewan	1,179,906	49,240	4.17%
	Nova Scotia	982,326	5,866	0.60%
	New Brunswick	783,721	2,336	0.30%
	Newfoundland and Labra..	520,286	1,402	0.27%
	Prince Edward Island	160,536	208	0.13%
	Northwest Territories	44,991	128	0.28%
	Yukon	42,596	461	1.08%
	Nunavut	39,536	657	1.66%
	Total	38,131,104	1,420,342	
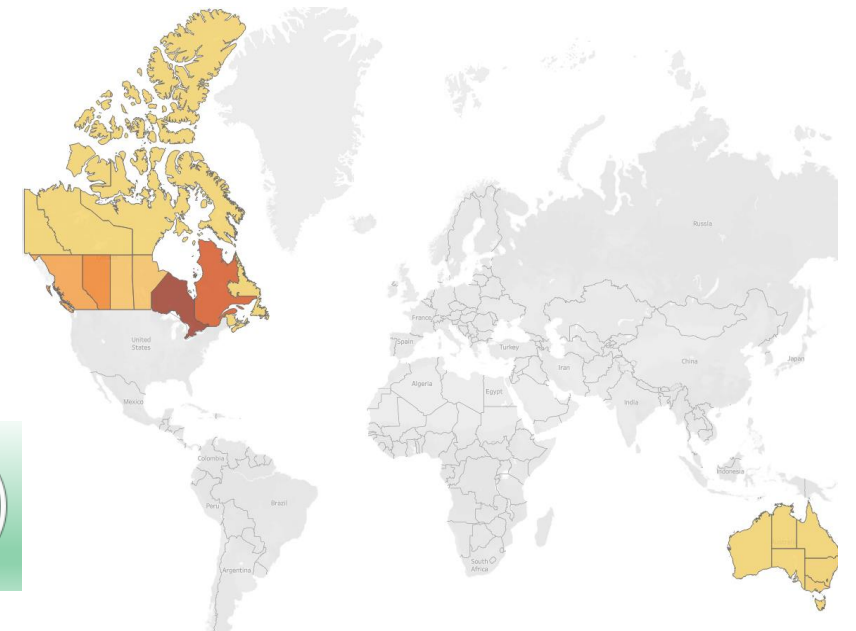
BOX PLOT

Objective: To see the which ages within Canada and Australia were being impacted the most from this virus.

- The upper whiskers from the boxplot shows the age group that had the highest number of COVID cases.

Majority of the cases in Australia: 20-29

Majority of the cases in Canada: 19-29

This information can help us determine which age group is likely to suffer the most from COVID.

- With these results, we can prepare to keep this demographic protected as much as possible by emphasizing social distancing and recommending citizens to take their vaccine.

Age Distribution COVID Cases - CAD
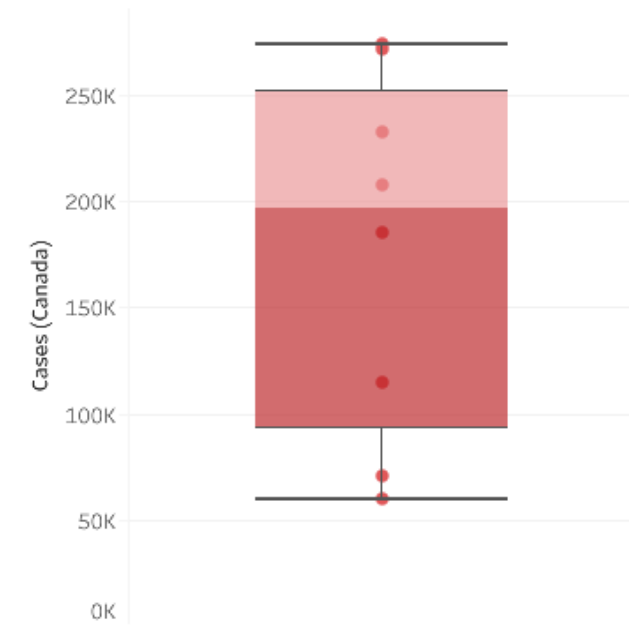
Age Distribution COVID Cases - AUS
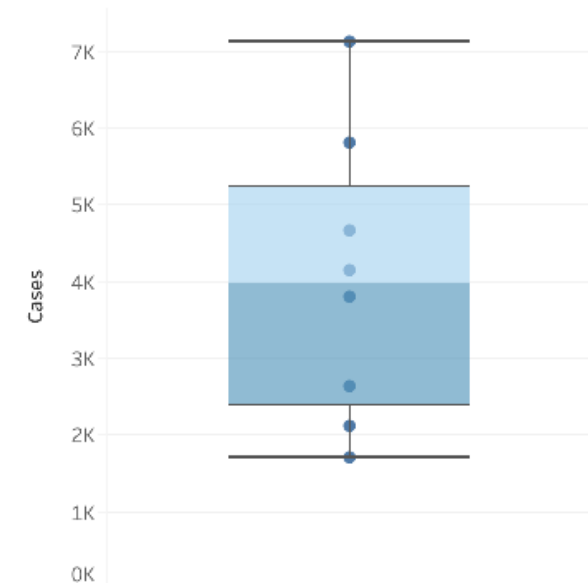
TREND LINE

Objective: To understand how COVID-19 as grown from the beginning of the pandemic in January 2020 to today in Canada and Australia.

Because the dataset we chose was a time series, the line graph allows us to easily pinpoint areas of high and low COVID cases as well as confirmed deaths and recoveries from the virus. Identifying any peaks within our data can help us determine any seasonal patterns and understand the nature of the virus.

Canada COVID cases spikes: April 2020, January 2021, and April 2021
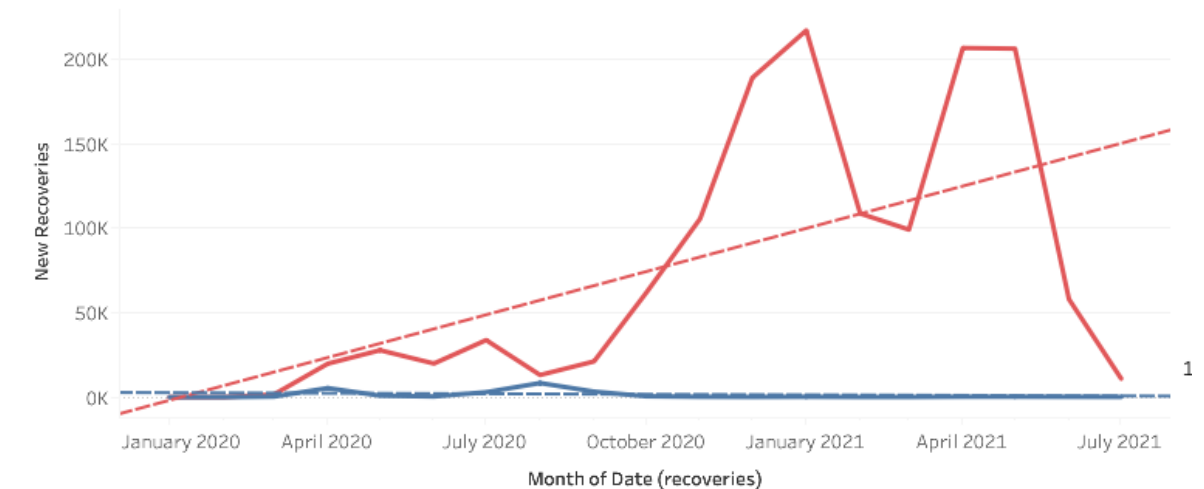
Australia COVID cases spikes: April 2020 and January 2021
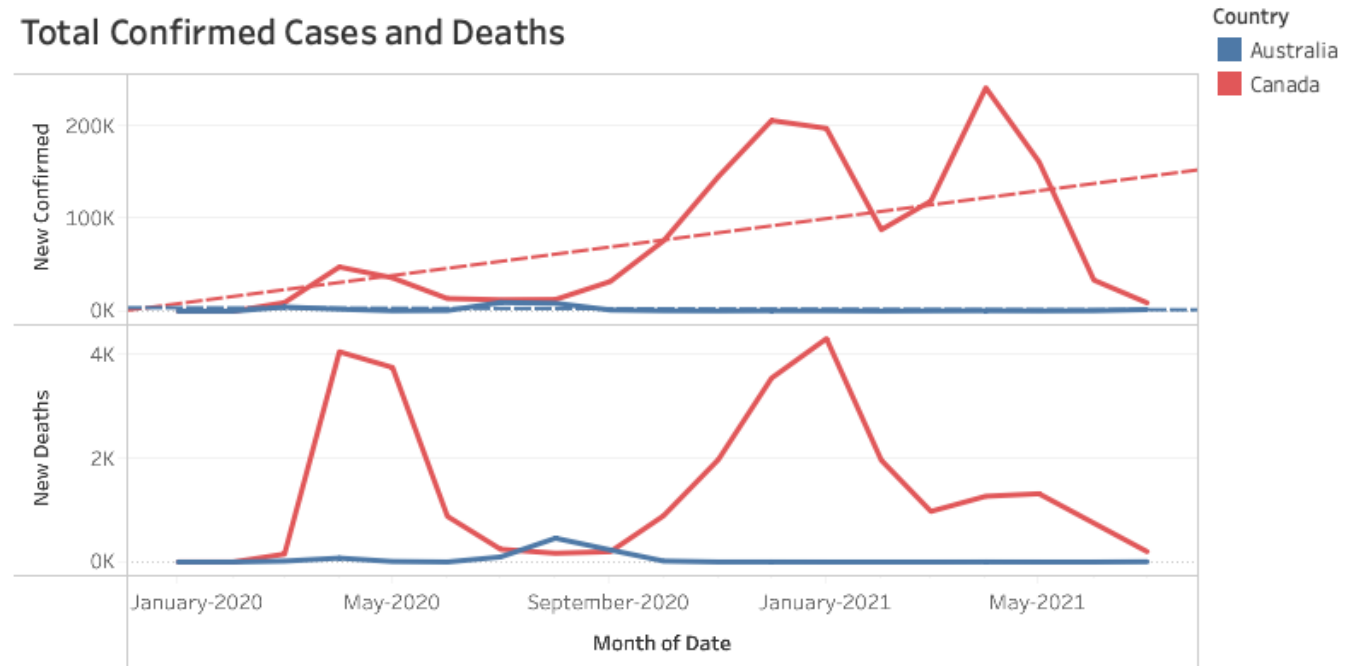
PIE CHART

Vaccination status --> rates of infection and death, projections of future cases

Unvaccinated, partially vaccinated, and fully vaccinated

Doesn't show trends over time --> data from the same time period

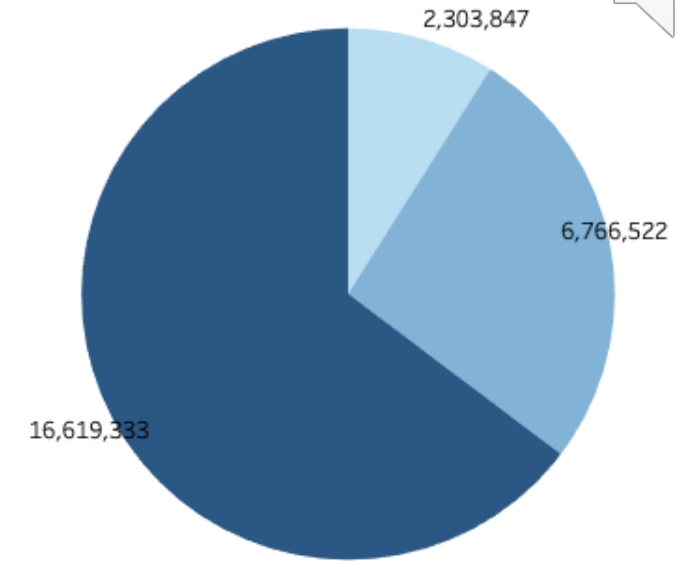Largest portion of Canada's population = fully vaccinated @ 16,625,117

Largest portion of Australia's population= unvaccinated @ 16,619,333

Australia % > Canada %, but Canada 9,521,409 > Australia 6,766,522.
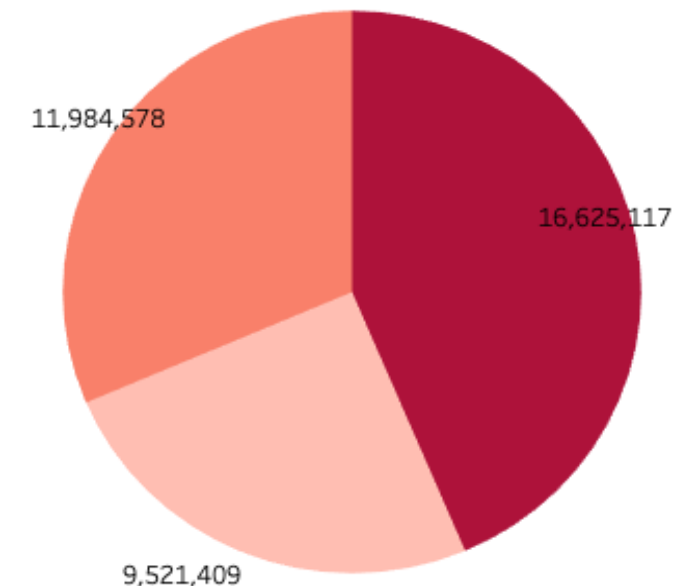
Canada = 11,984,578 unvaccinated

Australia = 2,303,847 fully vaccinated

Partially vs Fully Vaxxed AUS

2,303,847

6,766,522

16,619,333

Partially vs Fully Vaxxed CAD

11,984,578

16,625,117

9,521,409

BAR GRAPS

Objective: Observe the behaviors of vaccine administration among each age group in Canada vs Australia.

The bar graphs show the number of COVID-19 vaccines given to each age group. The main focuses was to see if each country prioritized vaccine roll out to a certain age group over another.
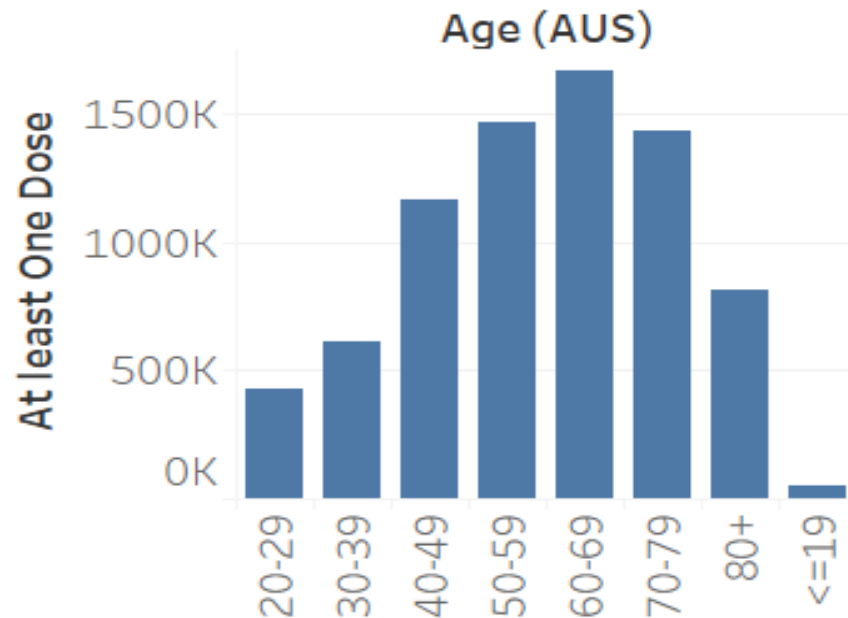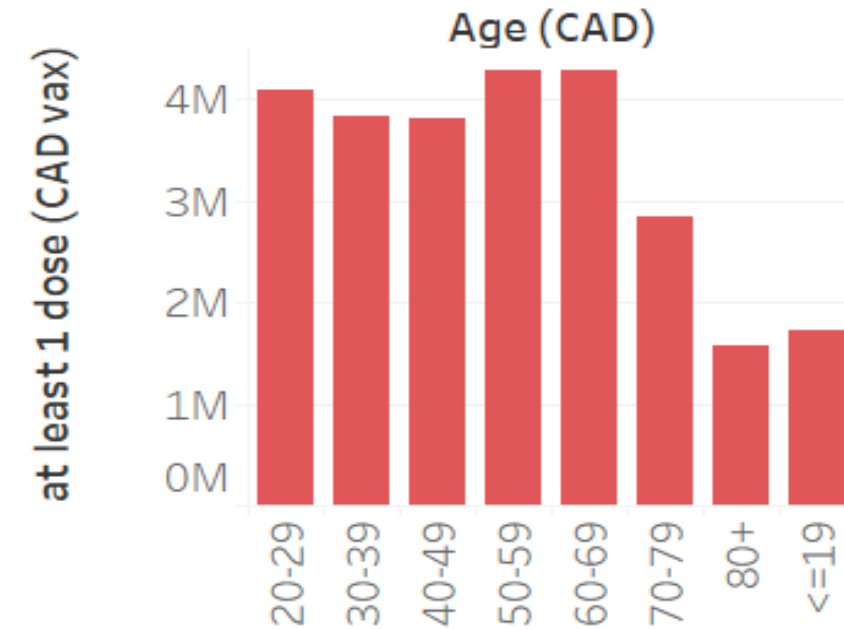

Canada: Majority of vaccinations belong to the age groups blow 70

Australia: Majority of vaccinations belong to the60-69 age group

SCATTERPLOT

- Relationship between COVID tests and confirmed cases

- Canada's trajectory shows a clear relationship
  "Total confirmed cases" increase as
  our corresponding "Test performed" increase

- Australia --> slight increase in cases = massive jump.

- Canada's hardest hit provinces = Ontario and Quebec
  = two largest provinces by population

- Australia's two largest provinces by population = New
  South Wales and Victoria = hit the hardest

- Testing done > confirmed cases

Tests Conducted Against Confirmed Cases
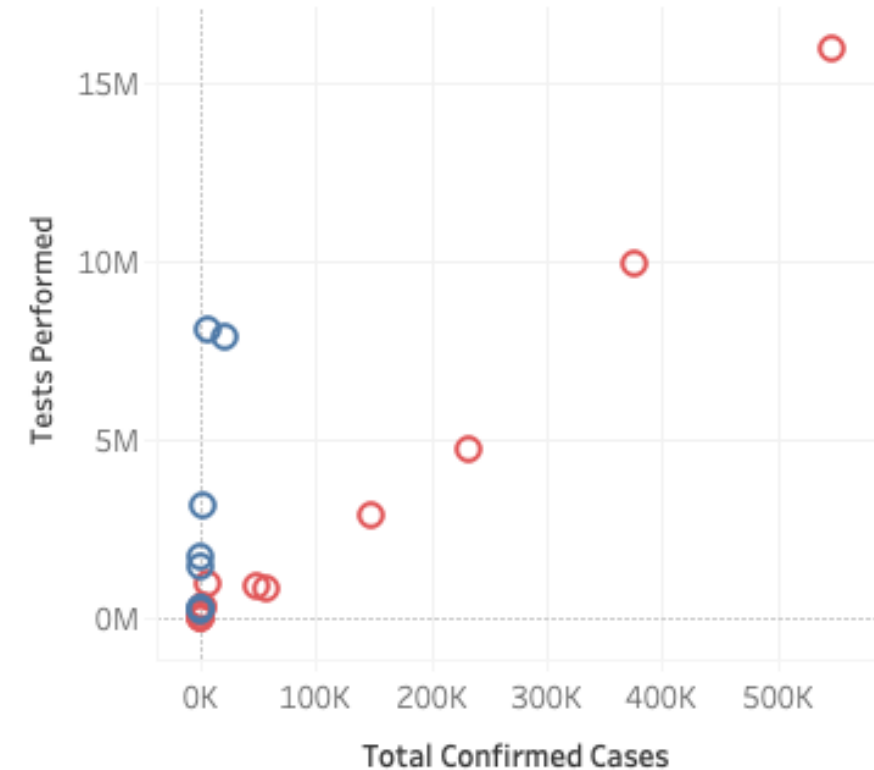
FORECAST OF NEW CASES

Purple: Historical   Yellow: Predicted/Estimate
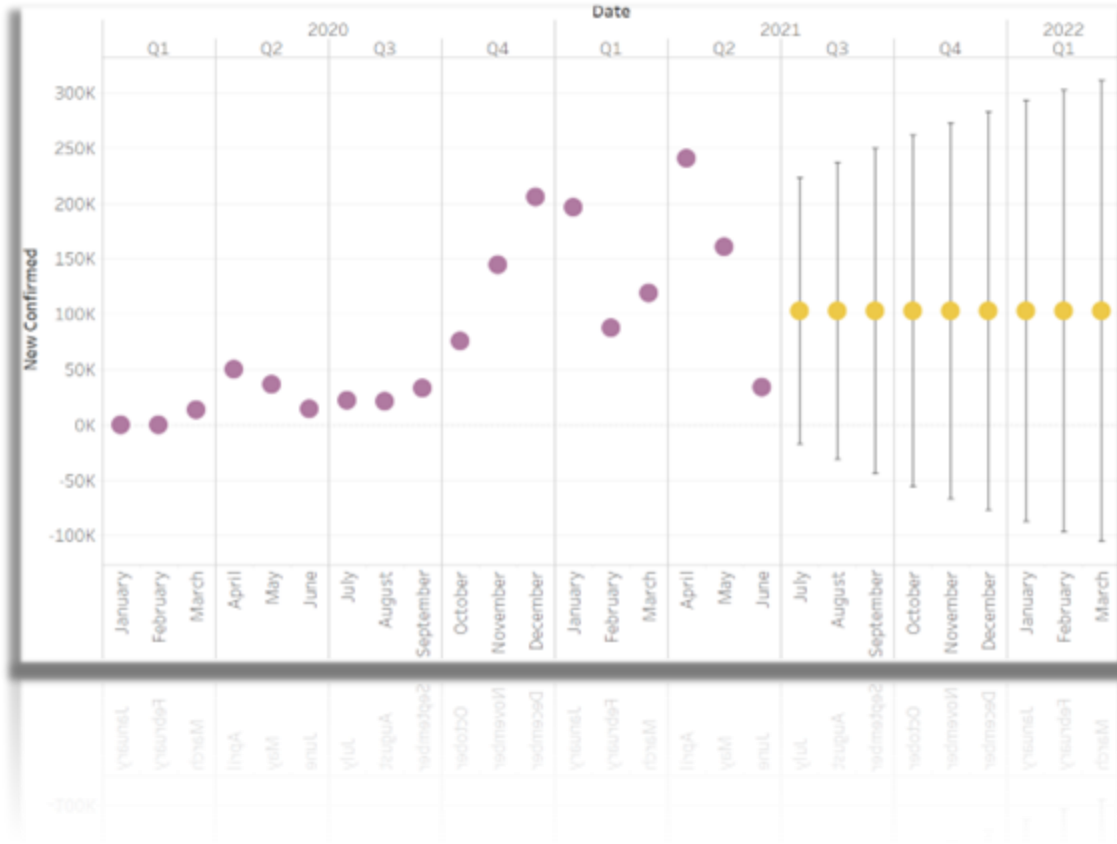
Objective: showcase projection of new COVID-19 Cases in Canada and Australia.

- The forecast will be using the historical cases statistics

- The model projects the number of confirmed cases three quarters into the future

- With great success of the COVID-19 vaccination programs and some success of government stay-home policies, we observe a large confidence interval

- The model is predicting either an increase or decrease in confirmed cases. For things to "get back to normal" the curve must be flattened (number of cases significantly reduced)

INSIGHTS, "FLATTENING THE CURVE", PREDICTION

Percent of Population — Downside* Expected Vaccination Timeline — Percent of Population

UK
US
Canada
Japan
Australia
EU

under age 12 vaccinations begin

*For the downside scenario, we assume that AstraZeneca and J&J vaccines do not get approved. We expect this to weaken demand and so do not make positive adjustments to the October Ipsos survey as in our baseline.

Source: Goldman Sachs Global Investment Research

COVID-19 illness has led to death, economic crises, long-term uncertainty.

- From January 2020 cases went up significantly and proved especially fatal to the older generations.

- Introduction of COVID-19 vaccines ha shown an upward trend in recoveries

- High efficacy rate of the vaccine has caused rate of infection to decrease however, breakthrough cases still exist

Australia and Canada has found it's own way of flattening the curve

- Australia = successful at contact tracing, lockdowns, and border control

- Canada = struggled with lockdowns, border control, and variants = successful through mass vaccination

- There is no definitive prediction as we are bound to see waves of the virus and we will have to continue developing vaccines against variants.

CITATIONS

https://covid19tracker.ca/vaccinationtracker.html
https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901 – population as of July 10th
https://health-infobase.canada.ca/covid-19/vaccination-coverage/ - *min age 12 to get vaxxed - vaccinations as of July 10th
https://data.humdata.org/dataset/novel-coronavirus-2019-ncov-cases - cases as of jan 22 – jul 10 (CAD and AUS) – AUS confirmed, death, recovered
https://health-infobase.canada.ca/covid-19/epidemiological-summary-covid-19-cases.html - cases, tests, deaths, recovered
https://www.health.gov.au/sites/default/files/documents/2021/07/covid-19-vaccine-rollout-update-11-july-2021.pdf - AUS vax info ("other" territories not included) **min age 16 yr for vax
https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/latest-release#data-download – AUS population – not including "other territories" Includes Other Territories comprising Jervis Bay Territory, Christmas Island, the Cocos (Keeling) Islands and Norfolk Island.