Good evening everyone.

Connor and I have chosen to investigate the impacts of covid 19 on different countries aawell as age groups within Australia and see if vaccination rates had a positive health impact.

We are looking at data showing population vaccination rates, total cases, total deaths, hospital and ICU occupancy and age brackets

We have sourced our data for our analysis from , the Australian government department of health, our world In data (OWID) and bureau of statistics.

We are focusing our investigation on how covid has affected 4 specific countries, Australia, the united states, India and Mexico. These countries have varying public health priorities and various levels of covid response.

We were interested in these countries specifically because of hearing through the news the way in which America and india were affected through covid. and with both having incredibly high case numbers especially one being a developed and the other is a developing country.

Australia not just being our home but a country with one of lowest covid death rate and strongest response to covid made it a great comparison.

And lastly I chose also to investigate Mexico. due to its lack of health response I was able to visit there during the pandemic when most other countries had strict covid restrictions and I am interested to see the health impact there because of this.

The Owid data I was looking at, was found on Kaggle, the same as the last groups. It’s huge data set with over 166000 rows and 67 columns. And from the 36 countries we decided to pick 4, Australia, The United States, India and Mexico.

1. I wanted to represent the data in a way where the number of people vaccinated can be compared to the country’s population size. The expectation prior to our analyse, was that more developed countries such as Australia and the United States will have lower deaths from covid, ICU numbers and higher vaccination rates. Vaccines are safe and effective at protecting people from getting seriously ill, being hospitalised or dying. From our analysis of the 4 countries, Australia had the highest average number of vaccinations, with roughly 86% of our population being vaccinated, And as I’m sure we are all well aware, the tough health and social restrictions promoted people to be vaccinated which correlates to our figure. America follows close behind with a population of 76% being vaccinated. This satisfies our hypothesis as India and Mexico did have the lowest average of 69 and 65% of the population being vaccinated.
2. Even though our line graph shows India administering 44 times the vaccines Australia has administered. With 967 million vaccines administered by India it still only correlates to 69% of the population. We noticed the trends in an increase in vaccine rates in April 2021 and January 2022. These correlate to the introduction of new variants such as Delta which was first discovered in March 2021 and Omicron in Dec 2021.

So does this data satisfy our hypothesis, well let’s look at case numbers and hospitalisations before we conclude our answer.

1. Cases compared to the population; our analysis concluded that surprisingly, India has the lowest percentage of cases as a percentage of their population size, with only 3% of people contracting covid, but still registering a massive 4 and half million people. And Australia and the United states having a larger proportion of their population having contracted covid, 13 and 24%, all data is between Jan 2020 and March 2022. Now this was not what we expected for certain countries.
2. Notice the patterns of large jumps in case numbers again in the United States and India in April 2021 and Jan 2022, we correlated these spikes to new variants.
3. Our hypothesis at the start required us to compare the number of deaths and total cases. We predicted that Australia would have the lowest number of deaths as our approach to covid was much more conservative and placed a significant emphasis on reducing community transmission as much as possible. Unsurprisingly Australia had the lowest number of deaths of only 5416 people. As a percentage, less than .17 percent of people who contracted the virus, passed away. And compared to Mexico where over 5.76% of people who contracted the virus passed away, Richard was in Mexico during covid and he confirmed the government’s response to restrictions was very Lasse a faire. As we commented prior the information provided on India, it doesn’t correlate, and we felt we needed to get a better idea of the hospital admissions to come to our conclusion.
4. So we analysed how many ICU patients passed as a result from Covid. The Australian medical journal confirms patients were supported by defibrillators and are in a critical state when in ICU. Unfortunately, only Australia and the US had data on the ICU admissions and deaths in ICU in our dataset. However, due to the lack of data, we cannot conclude ICU hospitalisation deaths across all countries. This could be due to developing countries not having access or the resources to track the distribution of ICU patients, and therefore may not accurately reflect the countries covid situation. Now onto the data, like before we compared the ICU admission deaths to the total deaths as a percentage. Australia’s deaths in ICU represented roughly 8% of their total deaths, surprisingly higher compared to the US of 3%. A number of factors we have considered prior to our conclusion in our hypothesis is our extremely specific sample size and the access and availability of the vaccines, covid tests and hospitals. We understand that some countries may not fully fund the covid vaccine, hence could hinder people from getting it and fund hospital visits.

Australian data sources allowed us a much more detailed insight than the data we found for other countries in our investigation. We had begun to build a report with a couple other data sources but they failed to meet our requirements to be a reliable consistent source. So we have decided to focus on Australia by itself

The first chart we made is an alalysis on the number of deaths in Australia over time for each age group. Every age group in ascending order is increasing in number of deaths except for the 90+ age group which sits 1 place below the top spot.

This is most likely due to the smaller number of people that live past 90 and not an indication that your immune system becomes stronger when you hit 90 years old

This data shows a clear trend between age and an increase in the number of covid deaths.

Our vaccination data source gives a time series comparison showing the % of people , in 10 year age brackets, who had received the full vaccination over the course of the pandemic.

Here we see the older ages receiving vaccinations first which we know was due to the way Australian government allowed people to access the vaccination.

However there is also a trend visible showing that younger people were more resistant to getting vaccinated than the older groups.

The groups with ages 70+ all achieved a 100% or higher vaccination %. This is of course not actually possible so the data most likely comes from a count of the number of vaccines administered and is divided by two to give a “full vaccination” and once people began getting booster shots it increased above 100%.

children aside because their opinion is usually not the main influence on whether or not they get vaccinated.

We can see that 20 -29 year olds receive the lowest rate of vaccination of all adults sitting just above 80% at the end date of the data source.

The right chart is a line plot of ICU and general hospital admissions.

We can see that with every spike of general admissions there is also a rise in ICU admissions.

When vaccines function as they are marketed to we should see a lower spike in ICU admissions for the same size spike in general admissions.

In preparing the data I expected to see this correlation be strongly present.

The first major spike of hospital admissions that happened in ~october 2021, the same time as vaccinations rates were beginning to reach their peak, was accompanied by a large spike in hospital and ICU admissions.

A few months later we there were multiple more spikes all with decreasing amount of ICU admission comparative to the amount of hospital admissions.

This follows the hypothesis that vaccinations impact the severity of covid 19’s health impact on a patient reducing their need for urgent medical support.

So we can see that the countries with the lowest covid 19 vaccination rate suffered the worst health impact on their people with a higher death rate