

The background of the slide features a close-up of a person's face, partially obscured by a white surgical mask. The person's eyes are visible and looking slightly to the side. The entire image has a blue tint. Overlaid on the image are several stylized, glowing blue virus-like particles with spherical bodies and protruding spikes, resembling coronaviruses. The text "COVID-19 Impacts on North America" is centered in a large, white, sans-serif font.

COVID-19 Impacts on North America

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Motivation & Summary

Hypothesis

- Study the impact of COVID 19 on the global economy with an emphasis on North America.

Questions

- What does the data tell us about COVID-19 impacts, and what trends or conclusions can we draw from this?

Summary

- We were able to answer most of our questions to our satisfaction and understand the relations between different variables.
- COVID has severely impacted the economy of all the countries around the world
- Unemployment rates have increased, which in turns affects the economy as a whole
- Several industries have been severely affected by the effects of COVID.

Questions

People Impacts:

- Which countries reported the highest COVID-19 cases globally? How does the case count compare between Canada and the US (on a per capita basis)?
- How has COVID-19 impacted different demographics in Canada? Which demographic groups are at a higher risk of developing a severe illness from COVID-19 in Canada?
- How has COVID-19 impacted unemployment in Canada? In which provinces does COVID-19 most impact unemployment?

Industry Impacts:

- What is the magnitude of the economic impact of COVID-19 on the tourism industry in Canada (measured in terms of dollars and jobs)?
- What is the impact of COVID-19 on the real estate market in six major cities in Canada?
- How has COVID-19 impacted technology companies (as measured by stock performance since January)?

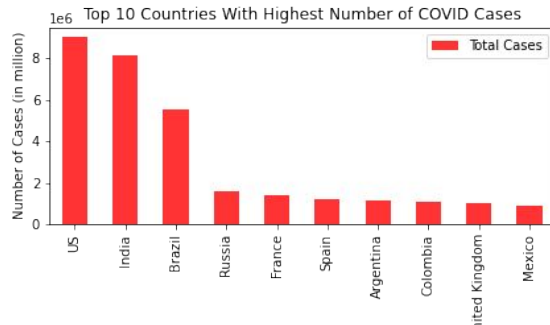
Data Sources



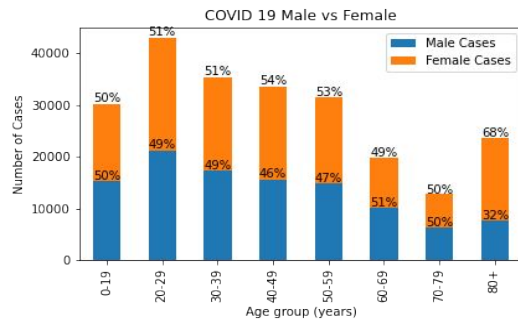
Data Cleanup & Exploration

- **transpose()** - to pivot the columns and rows in data in preparation of plotting
- **linregress()** - to calculate the line equation of past data and extrapolate to hypothetical scenario without COVID
- **pd.merge()** - to merge various datasets together for final analysis
- **.iloc()** - to locate columns using the index
- **pd.to_numeric()** - to convert data type to numeric for plotting
- **df.drop()** - to drop the null/blank values and clean up the dataset
- **ax.annotate** - to calculate the percentage for demographic data within a loop
- **df.pct_change()** - to calculate percentage of change for month end stock df
- **dt.strftime("%YY-%m-%d")** - to convert stock price Date column from string to time format

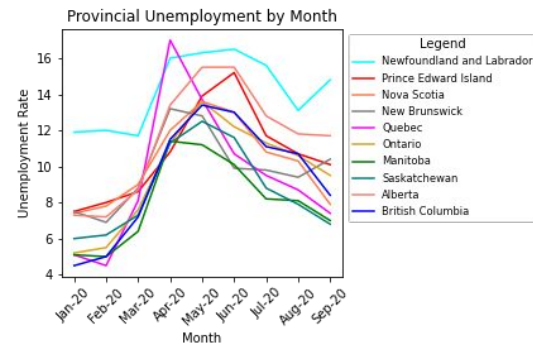
Data Analysis - People Impact



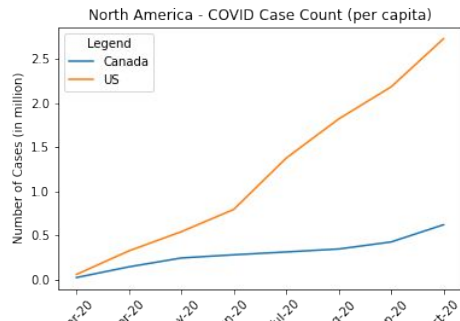
Global: US, India and Brazil have the highest number of cases and deaths due to COVID 19.



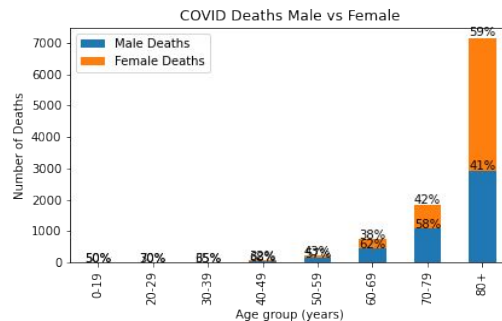
COVID 19 Cases: COVID 19 cases appear to be higher in younger demographics in Canada. The highest number of cases have been recorded between the age of 20-29.



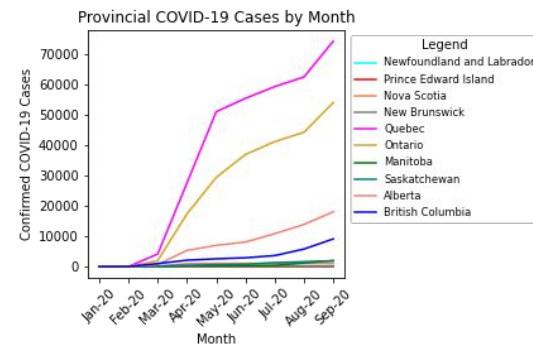
Provincial Unemployment: All provinces experienced a spike in unemployment starting in March, with Quebec experiencing the highest peak in April.



North America: US has approximately two times as many cases as Canada (on a per capita basis)

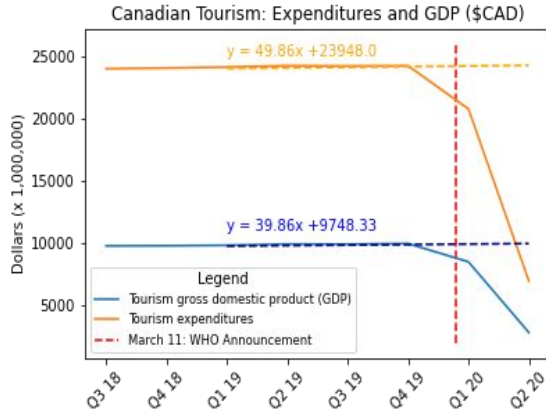


COVID-19 Deaths: Deaths appears to be worse in older age demographics as most of the deaths are 80+.

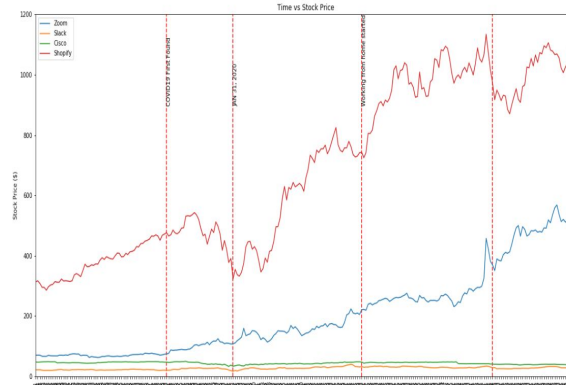


Provincial Cases: Quebec and Ontario have the highest number of COVID-19 cases with sharp increases in Mar-May and Aug- Sept.

Data Analysis - Industry Impact

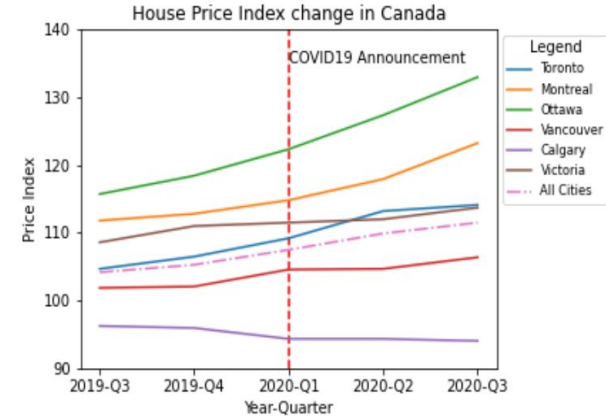


Canadian Tourism: COVID-19 resulted in an \$8.7 billion decline in GDP and a \$21 billion decline in expenditures during the first two quarters of 2020.



Tech Stock Performance:

COVID-19 has a positive impact on technology stocks performance. Especially on those companies focus on remote working technology and online shopping, such as Zoom and Shopify.



Real Estate Market:

COVID-19 did not affect the real estate prices in Canada, Price Index of most cities continues to grow during COVID-19 except for Calgary.

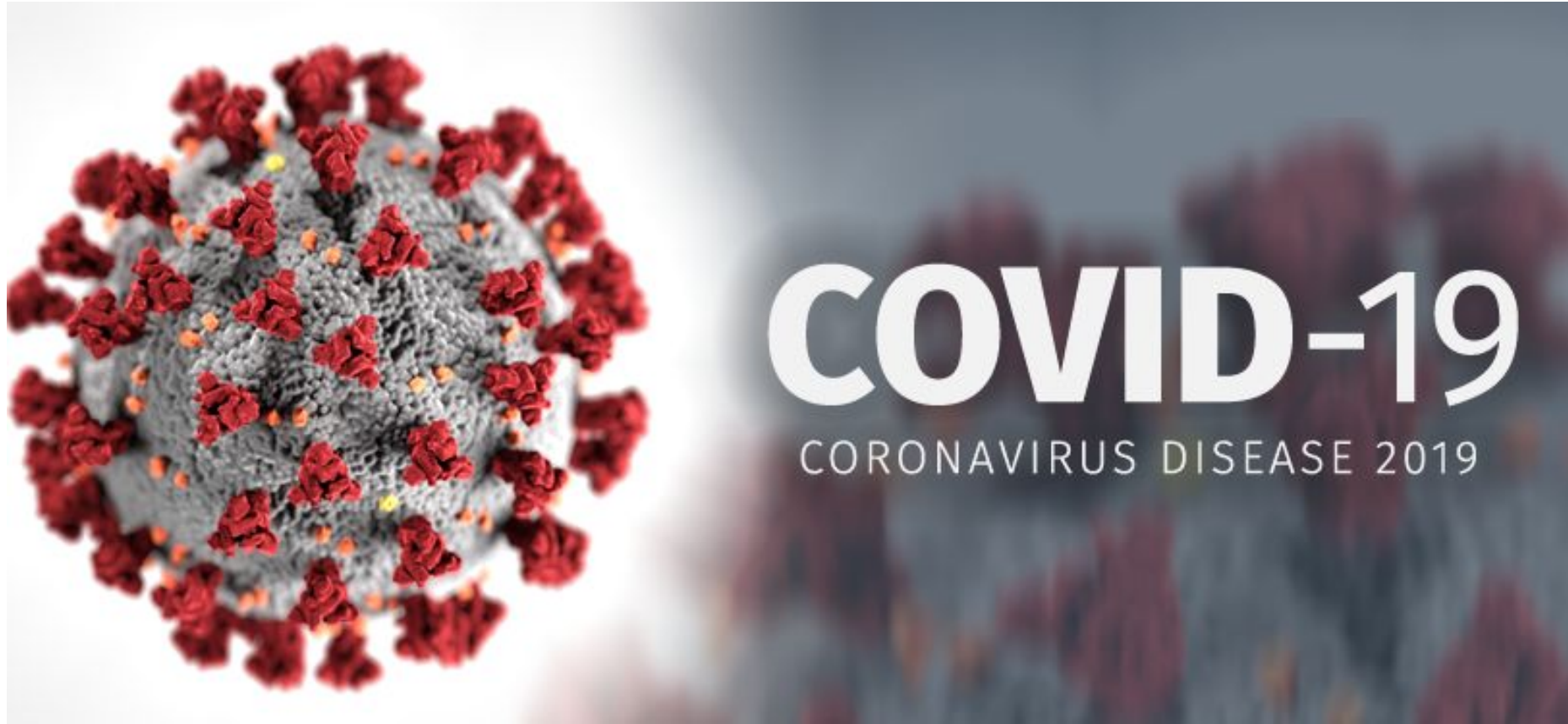
Discussion

- COVID has a severe impact at the global level
- Canada's economy has seen a downturn from March 2020 due to a rising number of cases and a spike in unemployment
- COVID has had an economic impact on several industries, with real estate being an exception.
- Technology stocks have seen a spike as work from home, and virtual classes have become the new trend throughout the world
- COVID's impact on Canadian demographics has been drastically different such as mortality rate within older demographics have been significantly higher.

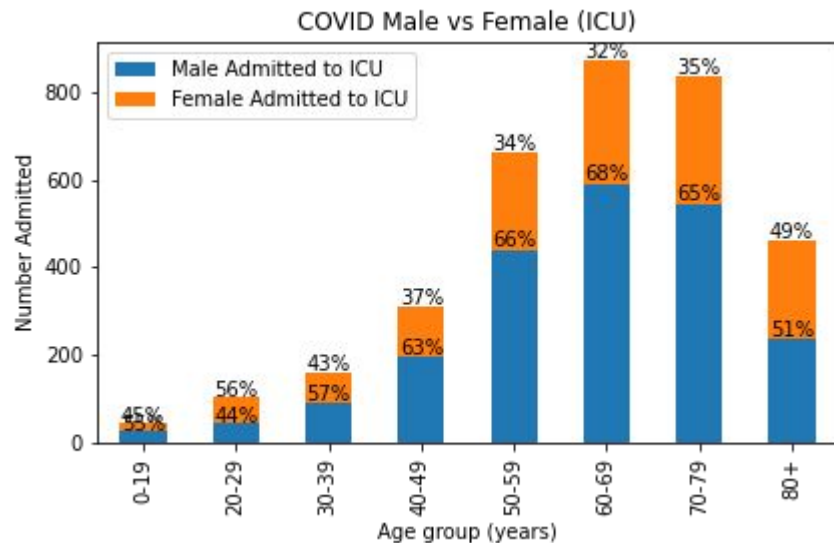
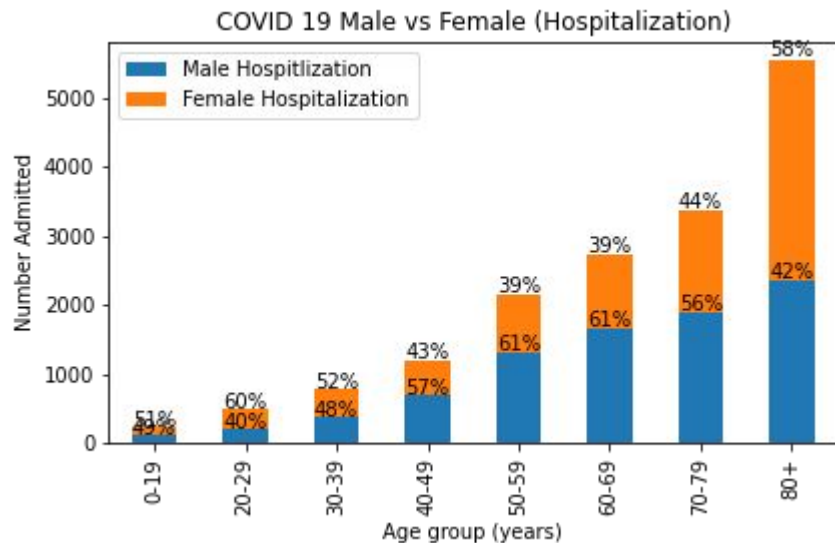
Post Mortem

- Brushed the surface on these broader questions, and our analysis has spurred additional questions that we can continue to dig deep in.
 - Could focus on a smaller scope for a further project and increase the depth of analysis.
- Potential Shortcoming: attributing all changes during the time period to COVID-19 when additional factors could also influence the changes.

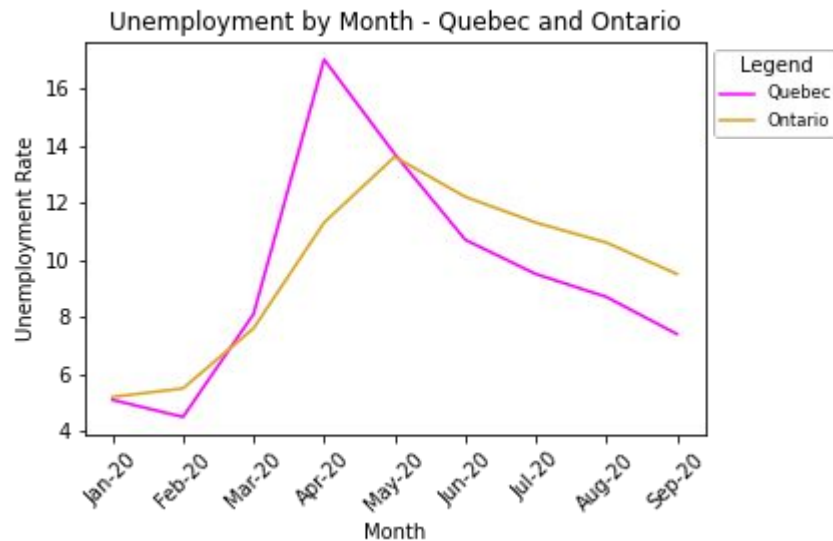
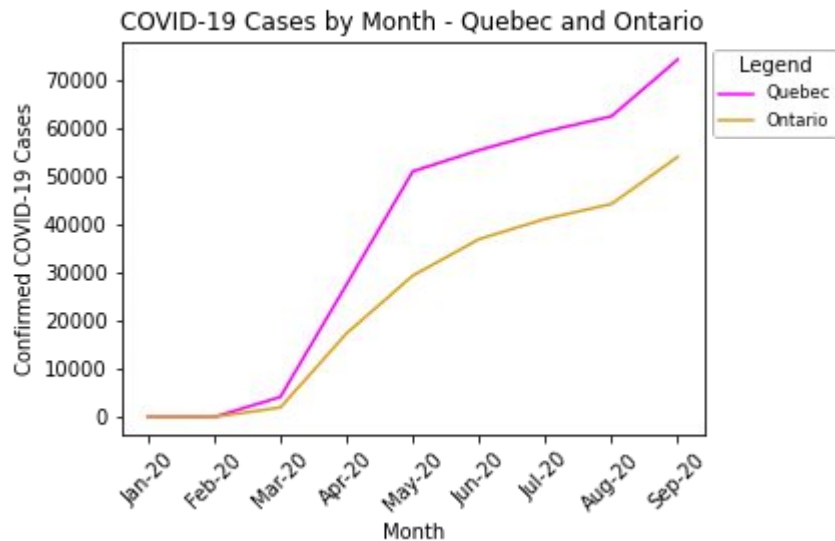
Questions



Appendix - Additional Analysis



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