

INF2199 Assignment 3

A Data Story related to COVID-19 pandemic

Stop Discriminating Against Asians

A year into the COVID-19 pandemic Anti-Asian Violence in Canada

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Introduction

Recently, there has been a noticeable rise in anti-Asian hate crimes across the United States and Canada. Most media connect this phenomenon with covid and believe that COVID-19 has enabled racism and created national insecurity. A study (Gover, A. R., Harper, S. B., & Langton, L., 2020) also mentions that anti-Asian racism and Xenophobia in the United States have been historically ingrained at the individual and institutional levels. The violence has re-emerged, fueled by the COVID-19 pandemic, thus impacting other Asian Americans and exacerbating their inequalities. More surprisingly, several news and articles indicate that anti-Asian hate crimes are even more severe in Canada. Therefore, in this project, I aim to compare the hate crimes against Asians in both the US and Canada and use data visualization tools to tell a story that centers on the anti-Asian racism and Xenophobia in Canada during the COVID-19 pandemic over the past year.

Design process (Methodology):

Known that Covid has spread in North America for more than a year; the purpose of this project is to add growth evidence to the topic of the relationship between anti-Asian hate crimes and the spread of COVID-19 and calls on people to be aware of and pay attention to this social issue. The detailed design process is as follows. In this project, I first performed comparisons towards hate crimes against Asians in the US and Canada on **Python**. I then created a dashboard on **Tableau** to visualize a data story about the hate crimes against Asian-Canadians since starting the pandemic (i.e., starting from March 2020). The path will be followed by data collection and preprocessing, comparing anti-Asian hate crimes between two countries, and building a data story.

1. Data collection and Data preprocessing

For this assignment, I put the data range for 2019 to 2021 to better compare hate crimes against Asians before and after the pandemic. This project also divided all collected datasets into three categories: US datasets, Canada datasets, and Youtube datasets.

a. US datasets:

The US data came from two resources: the March 2021 fact sheet of Anti-Asian prejudice created by the center for the study of Hate and Extremism at California State University and the 2020-2021 National Report released by a nonprofit organization called STOP AAPI Hate. The former was based on each city's police department, while the latter was collected through self-reporting of people who witnessed or experienced racist incidents in the past year. After cleaning those datasets, I created three new data frames. The first two rows of data frames show as follows.

Country	Year	Number of Anti-Asian	Ethnicity of Respondents	Percent	Gender of Respondents	Percent
United States	2019	49.0	Chinese	40.4	Female	0.695
United States	2020	120.0	Korean	15.7	Male	0.291

Table 1: The first two rows of data frames based on US datasets

b. Canada datasets:

Five datasets have been collected for this analysis, retrieved from Statistics Canada, COVID-19 Data Hub (Guidotti and Ardia, 2020), and the report released Fight Covid racism accordingly. To be specific, the first three datasets are

- the police-reported hate crime by type of motivation in Canada in 2019,
- the perceived increase in harassment or attack based on ethnicity since the start of the COVID-19 pandemic in Canada in 2020, and
- the police-reported hate crime by the most serious violation in Canada in 2019.

Moreover, the dataset retrieved from COVID-19 Data Hub indicates the covid situation in Canada **from March 15th, 2020, to March 30th, 2021**. The datasets collected from the report by Fight Covid racism reveal more detailed information of victims of anti-Asian attacks. The data frames based on the datasets show as below.

Number of hate crime incidents	Rate per 100,000 population	Region	Province
14	6.9	Abbotsford–Mission	British Columbia
8	3.1	Barrie	Ontario

Visible Minority Group	Percentage	Country	Year	Number of Anti-Asian
Chinese	30.4	Canada	2019	399
Korean	27.0	Canada	2020	643

REPORT_DATE	COUNTRY_SHORT_NAME	confirmed	deaths	Daily Positive Cases	Daily Deaths
2020-03-15	Canada	1.0	0.0	1.0	0.0
2020-03-16	Canada	1.0	0.0	0.0	0.0

Gender of Respondents	Percent
Female	0.5922
Male	0.3570

Table 2: The first two rows of the data frames based on Canada datasets

c. Youtube datasets:

Furthermore, I used YouTube Data Tools to collect related Youtube video info and statistics from 2019 to 2021. The search queries I used are #StopAsianHate and #StopAAPIHate. Figure 1 demonstrates the input parameters used to collect the 2019 dataset.

☒ Search query:

(this is passed to the search endpoint, check the "q" parameter [here](#) for for to use boolean operators)
 optional **ISO 639-1** relevance language:
 optional **ISO 3166-1 alpha-2** region code: (default = US)

Iterations: (max. 10, one iteration gets 50 items)

Published: ☒ limit search to videos published in a specific timeframe (format: yyyy-mm-ddThh:mm:ssZ - timezone: UTC):
 after:
 before:
☐ make a search for each day of the timeframe (can yield many more videos, use wisely)

Rank by:

Figure 1: The entered parameters used for YouTube Data Tools to collect the 2019 dataset

2. Comparisons towards hate crimes against Asians in the US and Canada using Python

This section conducted an exploratory data analysis to compare anti-Asians hate crimes in the United States and Canada. Five compelling data plots were drawn using a python package called Plotly. To start with, Figure 2 shows the top 4 cities with the highest cumulative hate crimes in the US and Canada. Interestingly, in 2019, the top 4 cities with the highest total crime amounts in both countries were similar.

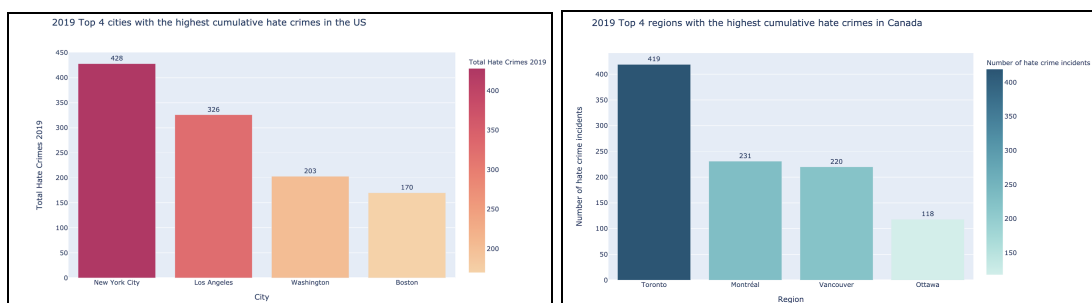


Figure 2: 2019 Top 4 cities with the highest cumulative hate crimes in the US and Canada

Second, Figure 3 illustrates the prejudice incidents rate targeting the US and Canadian population in 2020, broken down by the victims' race. Note that people designated as visible minorities are more likely to feel discriminated against during a pandemic. The difference is most pronounced among Chinese and Koreans in the two countries.

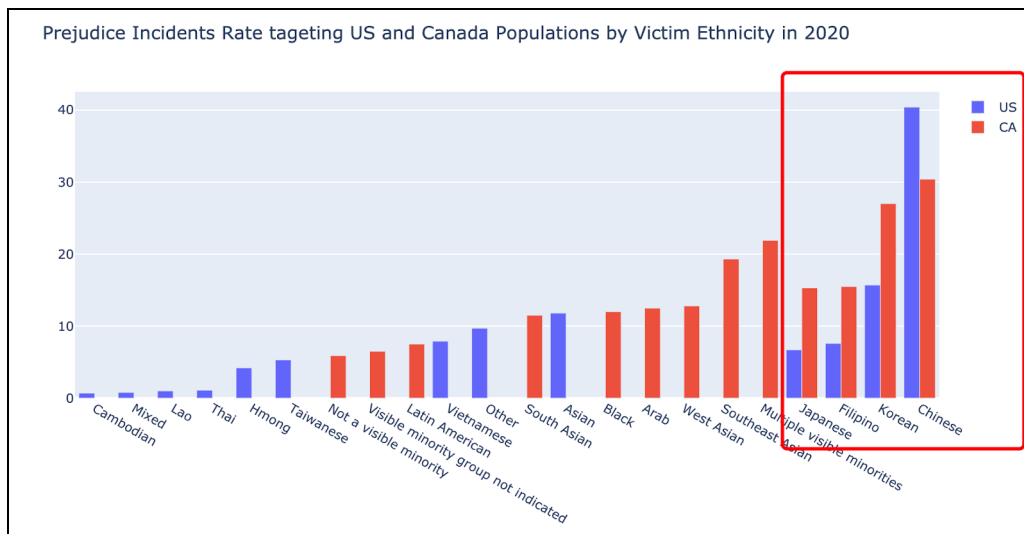


Figure 3: Prejudice Incidents Rate targeting US and Canada Populations by Victim Ethnicity in 2020

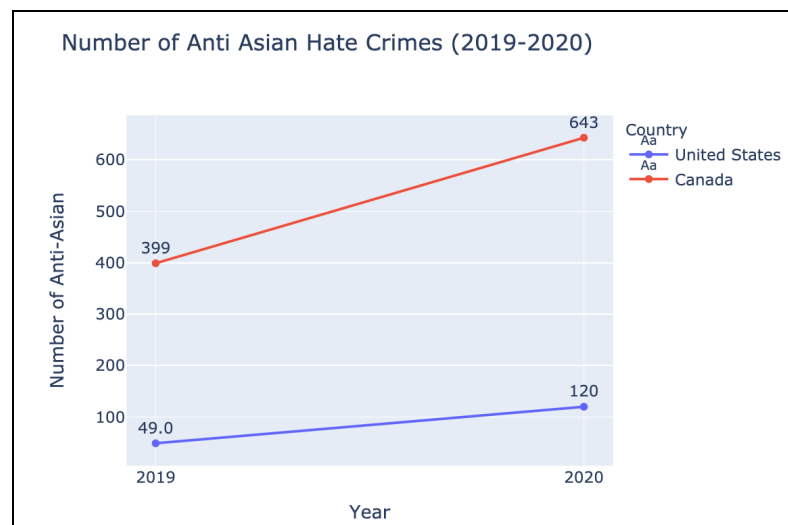


Figure 4: Number of Anti-Asian Hate Crimes (2019-2020)

Third, Figure 4 shows that the increasing rate of Anti-Asian hate crimes in Canada is higher than the one in the US as the slope of the red line is steeper than the blue one. One possible reason might be that Canada is a multicultural country with a diverse population. Indeed, around 22% of Canadians were designated as the visible minority population according to the 2016 Census.

Lastly, Figure 5 shows the gender of respondents in both countries, and Figure 6 takes an average on the gender of respondents for both countries. Based on both pie charts, it is clear that in both countries, people who identify as female significantly outpaced males in reporting racist incidents, accounting for nearly two-thirds of the total.

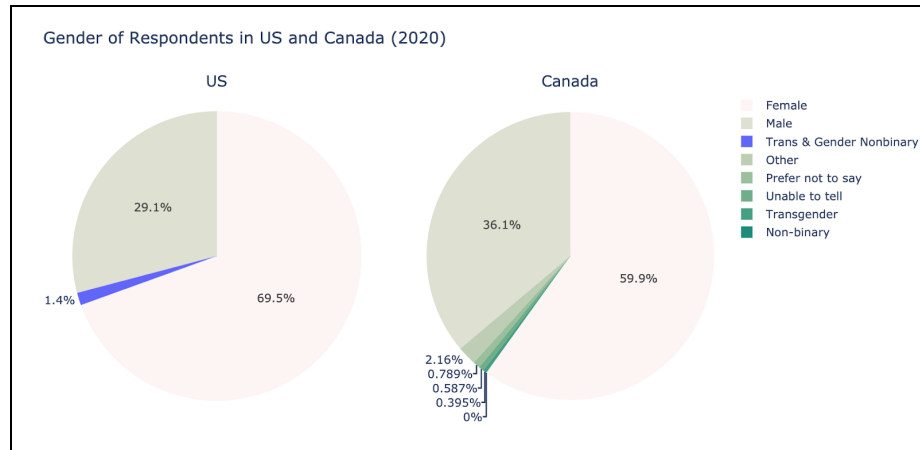


Figure 5: Gender of Respondents in US and Canada (2020)

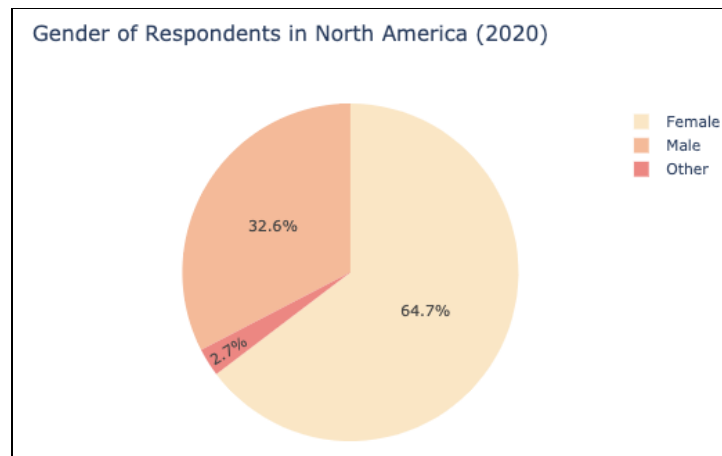


Figure 6: Gender of Respondents in North America (2020)

To conclude, the overall trend of anti-Asian hate crimes has increased in both countries over the past year as the COVID-19 epidemic has spread. Those who live in Canada and belong to visible minorities have a greater chance of experiencing anti-Asian attacks because the incidence of incidents in Canada is much higher than in the United States.

3. Data story: Create an Infographic-like dashboard using Tableau

After visualizing and exploring the datasets from the previous section, I decided to narrow down and focus on the Canada datasets and used Tableau to build a narrative-driven and human-centered data story related to the Asian hate violence in

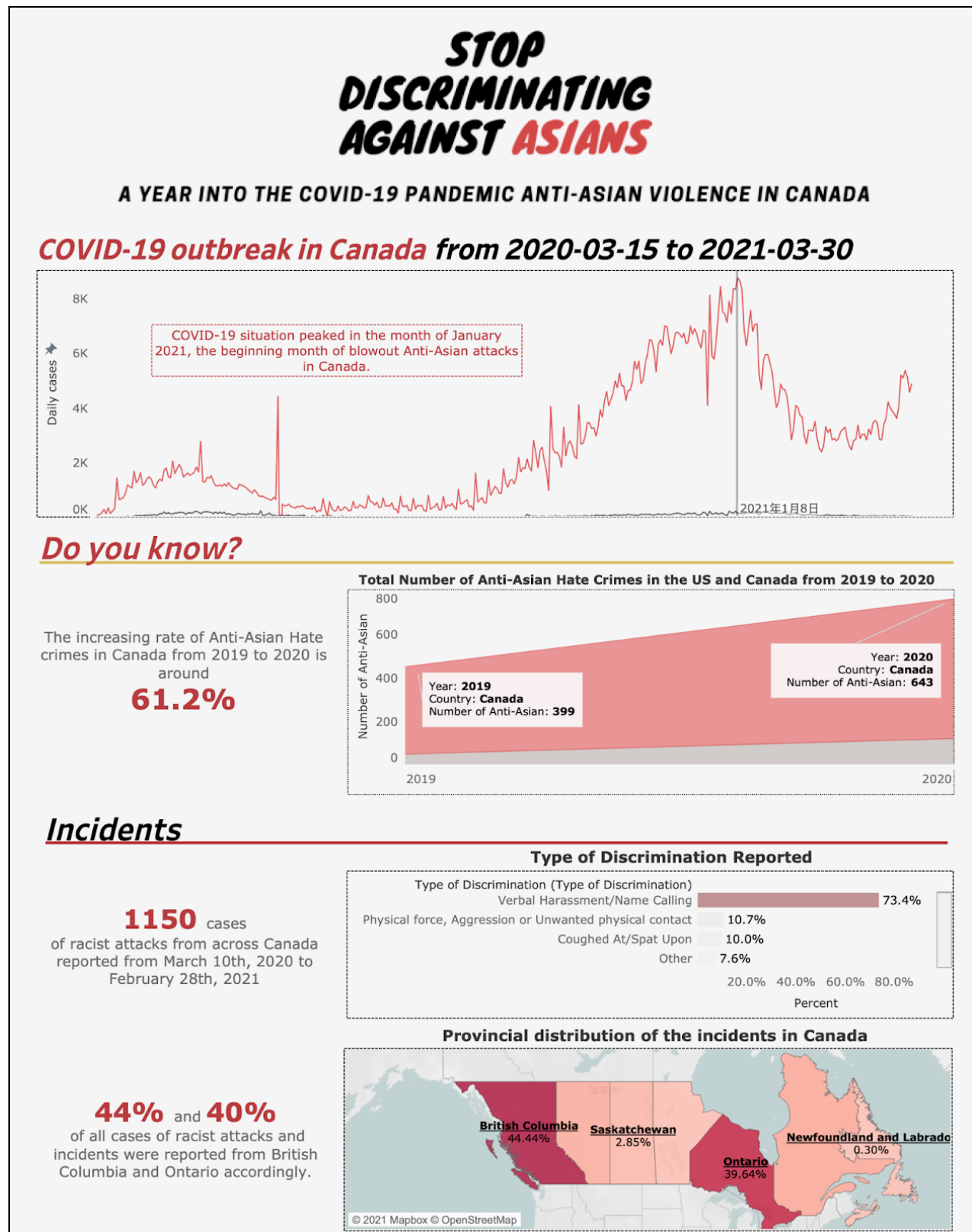
Canada during the pandemic. It is worth noticing that compared to Python, Tableau is a better visualization tool, aggregating all plots and creating an interactive dashboard. In this case, I chose to develop an infographic-like dashboard. One of the most important reasons is that this visualization targets all people who live in Canada. Many of them do not have relevant backgrounds in statistics or social science. An interactive infographic-like dashboard can make the information more compelling since it is easy to understand and eye-catching. The entire dashboard is divided into seven parts:

1. Covid-19 in Canada over a year
2. An interesting fact of hate crimes rate against Asians in the US and Canada from 2019 to 2020
3. Incidents (Including type of discrimination reported and provincial distribution of the incidents in Canada)
4. Victims (Including gender, ethnicity, and site of discrimination)
5. A timeline of anti-Asian hate crime incidents for the month of March 2021 in a pandemic
6. Word clouds that show the change in people's attitude towards this topic from 2019 to 2021
7. Resources where people can turn to for help

The detailed dashboard is shown in the next section.

The deliverable - Storytelling with Data: Stop Discriminating Against Asians

One can also find the interactive version of the dashboard at Tableau Public by clicking [this link](#).



Victims

Gender

59%

of people who reported are self-identified as **female**, which is

1.7x
more than **male**.

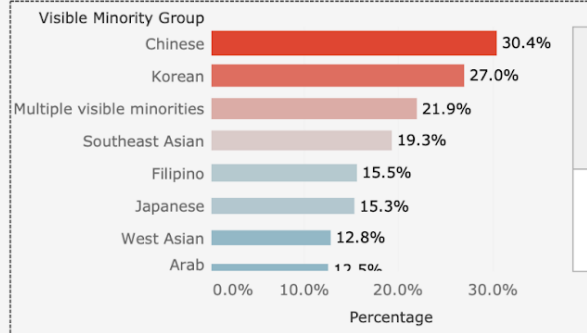
Male Respondents
35.70%

Female Respondents
59.22%

Ethnicity

Chinese and Korean

are the top 2 ethnicity who received the highest rate of racism attack since the start of COVID-19.



Perceived increase in racism attack on the basis of race since the start of COVID-19 in Canada

Site of Discrimination

49%

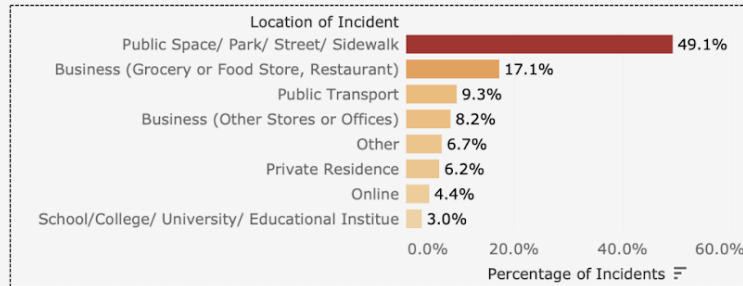
of all reported AAPI hate incidents occurred in public space/park/street/sidewalk

17%

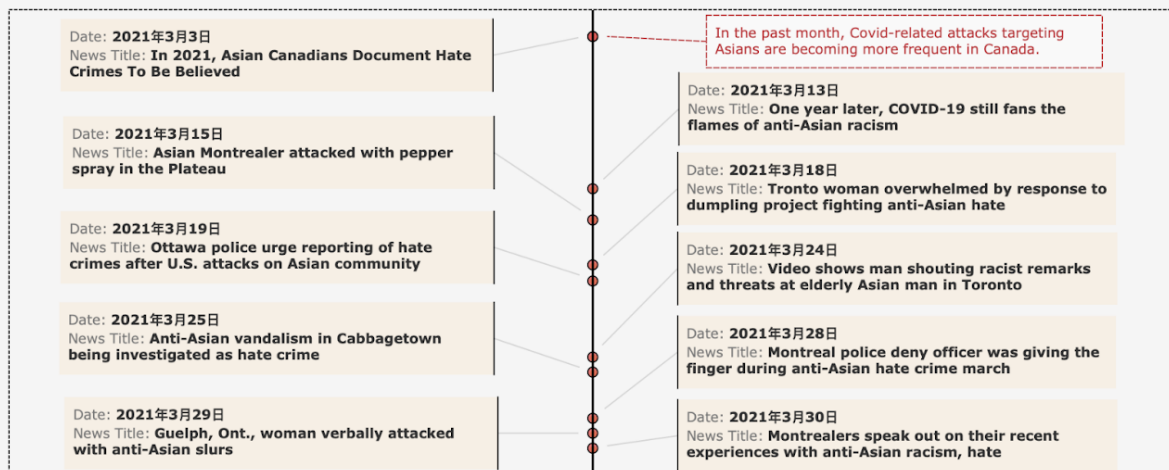
of all incidents occurred in grocery/food store/restaurant

9%

of all incidents occurred in public transit



2021 March Timeline of anti-Asian Hate Crime Incidents



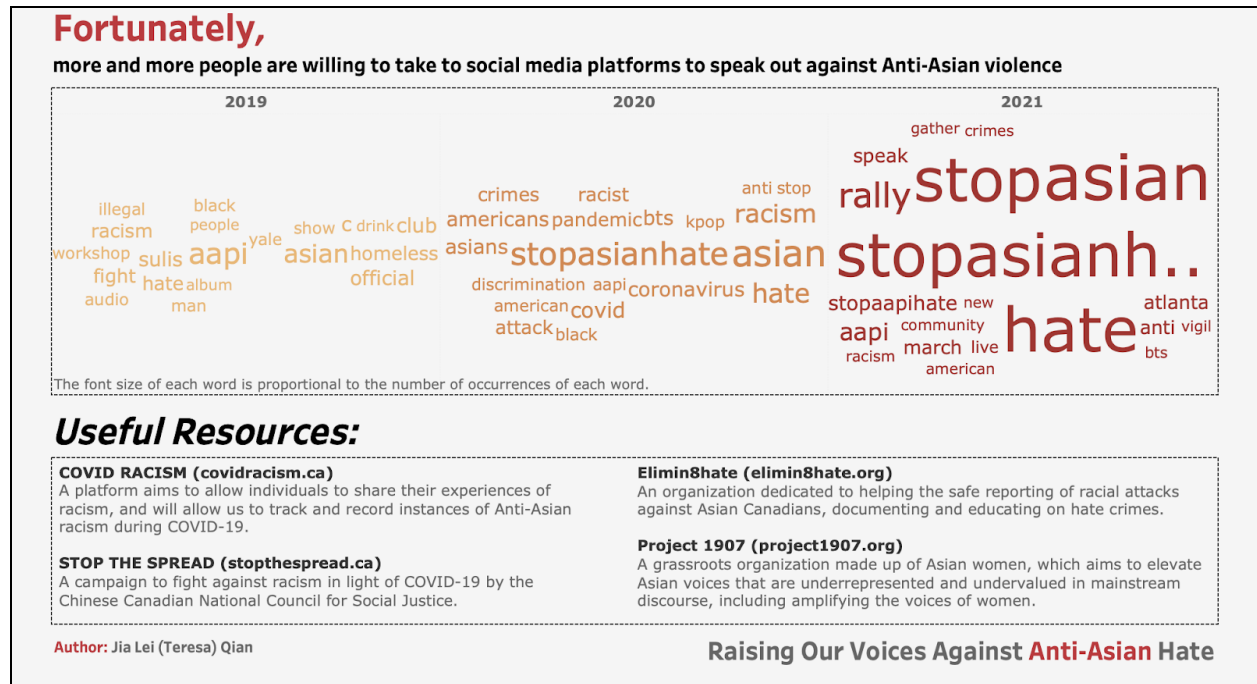


Figure 7: The image view of the infographic-like dashboard

Discussion:

This section will further discuss thinking and improvements regarding the interactive dashboard shown in Figure 7.

1. Visual Elements

In this project, in addition to the traditional plots, such as map, area, and bar charts, I want to emphasize four other visual elements. First, choosing theme colors is critical in data visualization because the color is an effective medium for conveying meaning and evoking emotions. According to Figure 7, it is clear that the theme colors of the dashboard are red and black. There are two reasons for choosing those colors. First, red can express feelings like strength, love, and anger, depending on the context. Second, the dashboard tells a data story in Canada, and red is one of Canada's official colors. The dashboard title has been illustrated as an example in Figure 8, and the tool I used for designing the title is a graphic design platform called Canva.



Figure 8: Title of the dashboard

Second, the point to highlight in the victims' section is that instead of the traditional pie charts, I used two diamonds to demonstrate the gender compositions of the victims. The visual elements are shown in Figure 9. Note that the diamond size representing the female respondents is almost twice the size of the male respondents, which is consistent as there are 1.7 times as many females reported as male.

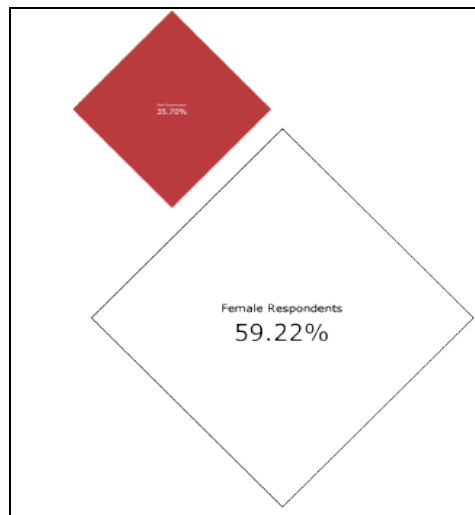


Figure 9: The distribution of gender of respondents in Canada

Third, to give people an intuitive visualization of recent anti-Asian incidents in Canada, I drew a timeline of anti-Asian hate crime incidents for the month of March 2021 in a pandemic. The vertical line represents the month of March, and the circles mean the news related to hate crimes against Asians. The detailed information is gleaned from the official website of Fight Covid Racism. As these circles appear more frequently from the top-down, one can conclude that Covid-related attacks targeting Asians are becoming more frequent in Canada recently.

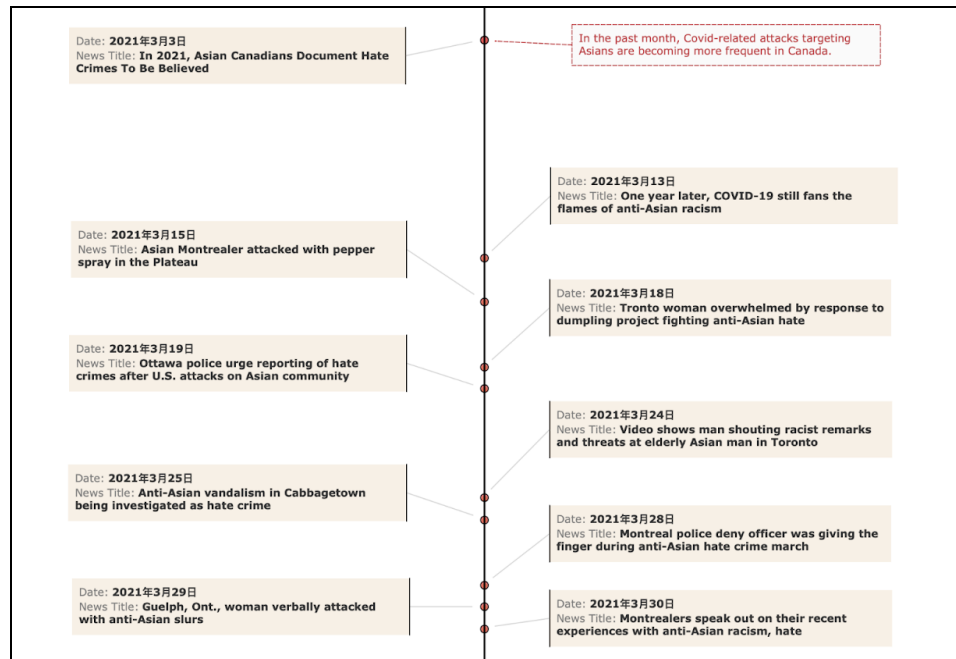


Figure 10: 2021 March Timeline of anti-Asian Hate Crime Incidents in Canada

Finally, I used the preprocessed Youtube datasets mentioned previously to create three word clouds showing how people's attitudes on this topic have changed from 2019 to 2021. Specifically, each word cloud provides the top 20 words recurring in the title of relevant Youtube videos for the corresponding year. The font size of each word is proportional to the number of occurrences of each word. With increasing the year, the size of words has also gotten bigger, suggesting that more people are willing to speak out against Anti-Asian violence on Youtube.

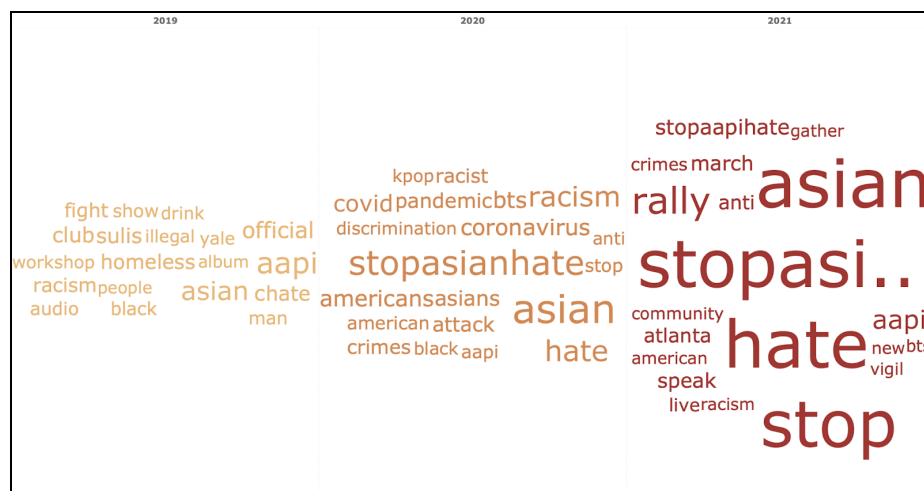


Figure 11: Word clouds that show the change in people's attitude towards this topic from 2019 to 2021

2. Thoughts on the Stop Discriminating Against Asians project

In this project, I intend to help people understand how the COVID-19 pandemic exacerbated Xenophobia and anti-Asian racism by analyzing and visualizing relevant datasets from the US and Canada. Throughout the design process, I would like to point out two things that make the design steps truthful and appropriate. The first is the data collection. All data sets are within the same annual range selected from official data sources, such as US Policy Departments, Statistics Canada, and government-accredited nonprofit organizations. The second is tool selection. This project used Python to perform data preprocessing and used Tableau to create a data story. The former has excellent performance and fast data processing speed. Simultaneously, the latter can provide background information and demonstrate the relationship between decision-making and outcomes.

Shortcomings and biases exist in this project as well. Although datasets are all collected from reliable sources, it is challenging to integrate the data under a unified standard, so the data is not consistently well. Also, hate crime data released by the police department might be underreported because long-standing distrust of law enforcement, language barriers, and immigration status all prevent reporting crimes to the police. In addition, for this project, Statistics Canada did not release the hate crimes data in 2020, so the area plot showing the total number of Anti-Asian hate crimes in the dashboard is based on the datasets from the US policy department and reports created by Fight Covid Racism. That might also be why the total number of hate crimes in Canada is much more than in the United States.

Conclusion

In this project, I performed an exploratory data analysis to compare the anti-Asian violence in the US and Canada and created an infographic-like dashboard to tell a data story about the hate crime against Asians in Canada during the pandemic. The project aims to call attention to the issue of racial discrimination from a human-centered perspective. As the next step, I would like to elongate the time range and observe segregation and hate crimes against Asians throughout history. Pandemic-related health crises have long been associated with stigmatization, and Asian immigrants have experienced verbal and physical violence at a personal and organizational level. I want to further analyze anti-Asian violence and verify that racist acts are not isolated incidents but part of a structural problem in society.

Reference:

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