

# IAT 355 Report

Eivan Nisperos  
Vickie Yim

## Overview

This report is to outline the process of the 13-week long project that sought to explore what might affect the lowering vaccination rates across Vancouver. We created an interactive vis, designed as a tool to help understand the query above, and thus this report will go further into the following: our target audience and scope, the questions and problems we want to address about our topic, the data sources and dimensions, the actual design of the project, and reflections about the project - whether it be things we found out or things we wanted to do but could not.

## Introduction

Vaccination rates are falling across Canada, and we wanted to explore why this might be. Our scope was to look at the falling vaccination rates in Vancouver, particularly in elementary schools where vaccination is relatively easy to acquire for children. This included the exploration of Vancouver's subdivision, like Killarney and Oakridge.

Our target audience is for the Vancouver Coastal Health, because they are the organization that provide and at the same time, monitor vaccination administration and rates amongst children in elementary school within Vancouver. We created this project as a tool for them to explore how might environmental factors, such as income and ethnicity, might affect vaccination rates.

## Problem/Domain Questions

We wanted to explore what factors might affect lower vaccination rates in Vancouver's elementary schools. For this, we wanted to address the following questions:

1. Does household income affect vaccination rates?
2. Does poverty affect vaccination rate? A neighborhood might have lower average income but that does not mean that they are affected by poverty.
3. Which type of schools have lower vaccination rates? Public or private?
4. Does ethnicity affect vaccination rates?

## Data

We needed to collect data sources that gave us the following:

- The subdivisions of Vancouver
- Their respective average household income and,

- Their respective crime rates.
- Each elementary school in Vancouver and,
- If they are either a private or public school as well as
- Their respective vaccination rates.
- Ethnic make up of each subdivision in Vancouver

We created a map for our vis, and therefore we needed a geoJSON file that outlined the borders of each subdivision in Vancouver so that it is interactable, through using Leaflet. This was harder said than done, as the official geoJSON file of Vancouver provided by Vancouver Census data was completely inaccurate. We ended up using [https://github.com/codeforamerica/click\\_that\\_hood/blob/master/public/data/vancouver.geojson](https://github.com/codeforamerica/click_that_hood/blob/master/public/data/vancouver.geojson) and filling out some empty links ourselves.

We wanted to simulate poverty through high crime rates, because poverty rates were not made available to us. Thus, we collected the crime rates of each subdivision through <http://data.vancouver.ca/datacatalogue/>.

Elementary school vaccination rates were provided by Vancouver Coastal Health while the location of each school was provided by <http://data.vancouver.ca/datacatalogue/> or Open Data Vancouver, as well as their respective category of either being a private or public school.

Collecting the ethnic makeup of each subdivision was a little trickier. It was never given to us in one whole file but we had to collect it ourselves piece wise using various websites, primarily Statistics Canada - <http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CMACA&Code1=933&Geo2=PR&Code2=59&Data=Count&SearchText=vancouver&SearchType=Begin&SearchPR=01&B1=All&TABID=1>

The names of the subdivision required cleaning - each data set spelt each name of each subdivision differently, which often malfunctioned our code and we wouldn't know what would be wrong with it until we checked the data we were feeding it. Approximately 60% of this project required us to clean the data. On top of this, generating geoJSON shapes for some subdivisions were tricky, but was made easier with the use of <http://geojson.io/>.

## Visualization

We created a choropleth map, assisted by bar charts on the right. Since schools admit students based on **geographical proximity** to the school, we thought it was appropriate to create a vis which was dominantly a map. Each school served a particular neighborhood, which is why we based our data sets on each neighborhood. A choropleth map did the job of showing instantaneously which neighborhoods had higher income, for example. A map also showed which neighborhoods had schools falling below the 90% line, the threshold to which herd immunity would only be possible. The bar charts allowed the user to compare each

neighborhood to one another - examining dominant ethnicities. Bar charts allowed the user to see which dominant ethnicity resided in one neighborhood.

## Further Work

We wanted to include more data, more specifically religion, but we could not find the appropriate data, such as location of church, as well as their religious affiliation - unless if we had to make it ourselves: generating both the geoJSON file (coordinates) of each religious building, as well as their religious affiliation. We also wanted to include different rates and price, if applicable, of other types of vaccination for adults, but this was outside of our scope.

## References

<https://bl.ocks.org/d3noob/bdf28027e0ce70bd132edc64f1dd7ea4>

<https://bl.ocks.org/syncopika/f1c9036b0deb058454f825238a95b6be>

<https://stackoverflow.com/questions/22052694/how-to-update-d3-js-bar-chart-with-new-data>

<https://bl.ocks.org/RandomEtc/cff3610e7dd47bef2d01>

<https://stackoverflow.com/questions/39649975/having-problems-selecting-svg-child-elements-using-d3>

<https://stackoverflow.com/questions/37962943/how-to-extract-top-10-data-in-d3-js>

<https://stackoverflow.com/questions/35641503/d3-how-to-show-only-top-3-of-6-items-in-bar-chart>

<http://leafletjs.com/examples.html>



