

DSCI 532 - Lecture 1

Dashboard intro

- Understand what dashboards are
- Know when to use them
- Design effective dashboards
- Identify when interactivity is beneficial

What is a
dashboard?

Total Cases

 **56,632**

 Laboratory Diagnosed **56,131** | Epi-Linked **501**

Currently Hospitalized

 **358**

Total to Date: 3,165

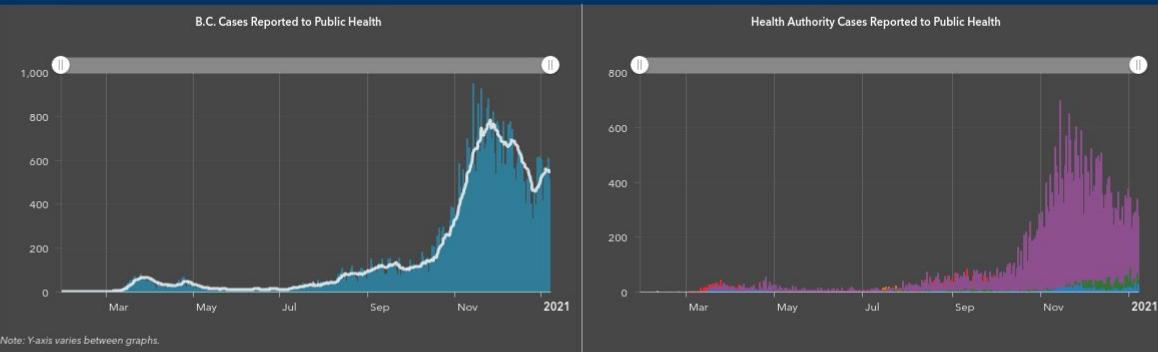
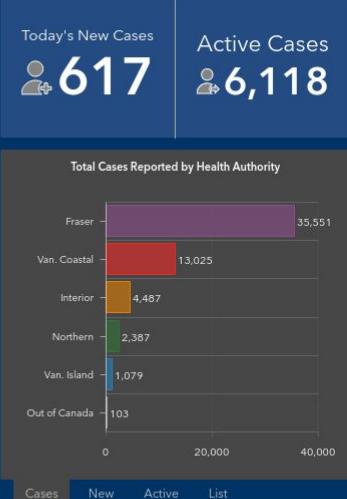
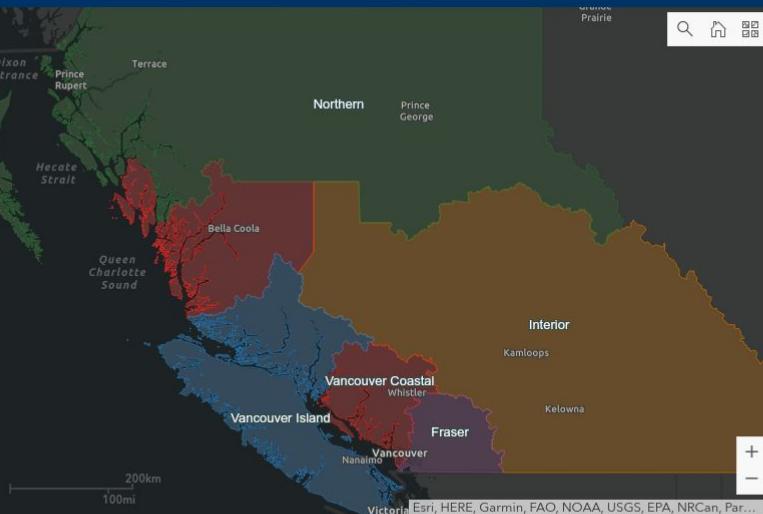
Currently in Critical Care

 **75**

Confirmed Deaths

 **988**

Recovered

 **48,205**
Last Update
1/8/2021, 4:30 PM

Note: In an effort to provide as current information as possible, "Today's New Cases" (as shown on this dashboard and reported publicly through daily media statements) are calculated at different points in time and may not align exactly to what is reported on the graphs. See the Data Notes for details.

[Cases by Day](#) [Cases \(Moving Avg.\)](#) [New Tests](#) [Turn-Around](#) [Positivity](#)

Total Tests **1,518,311** | **New Tests** **9,345**

B.C. Testing Rate **194,070** People per 1,000,000 | **Canadian Testing Rate** **381,241** People per 1,000,000

Note: As of January 7, 2021, the number of cases over time are reported by the result date of the client's first positive lab result where available; otherwise by the date they are reported to public health. Please refer to the data notes below for additional information.

Data notes, terms of use, disclaimer and limitations of liability

BCCDC COVID-19 Epidemiology App

Date Range
2020-03-01 to 2021-01-09

Select Comparison Groups:
 Pre-selected Groups
 Custom Groups

Select Comparison Group:
BC Health Service Delivery Areas

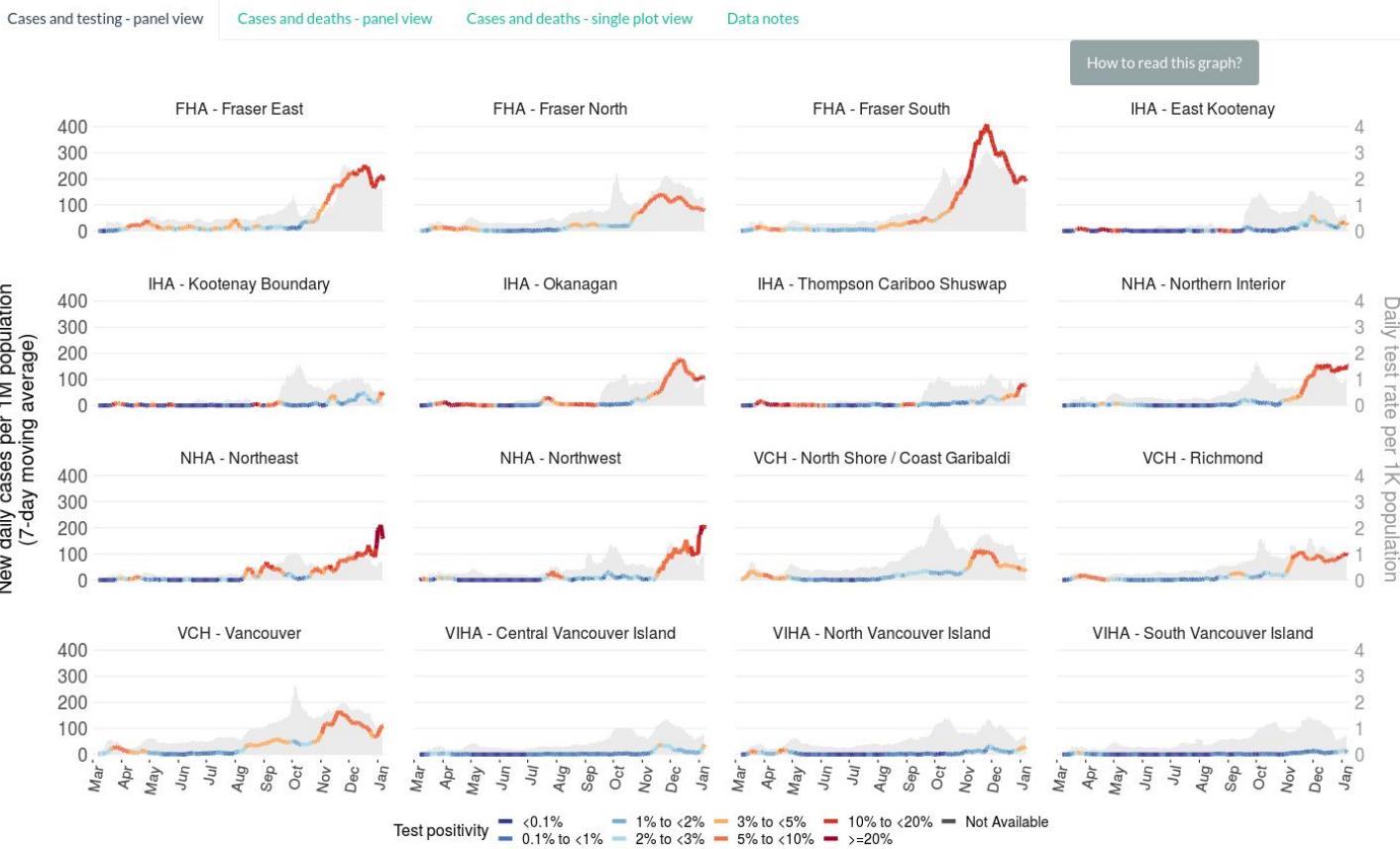
Select Y Scale
 Single Scale Individual Scales

Click the button below to download the figure shown:
[Download graph](#)

For more BC data, please visit BCCDC COVID-19 data page:
<http://www.bccdc.ca/health-info/diseases-conditions/covid-19/data>


BC Centre for Disease Control
Provincial Health Services Authority


Provincial Health Services Authority
Province-wide solutions. Better health.



Cities with at least **5** breweries within **20** miles based on **all** beers.

Average rating of all beers

55%

Number of breweries nearby

45%

Closer to here
the better

QUALITY →

QUANTITY →

BEST CITIES

01. San Diego, CA
02. Denver, CO
03. Portland, OR
04. Santa Rosa, CA
05. Minneapolis, MN
06. Chicago, IL
07. Austin, TX
08. Seattle, WA
09. Anchorage, AK
10. St. Louis, MO
11. Bend, OR
12. Ann Arbor, MI
13. Philadelphia, PA
14. Salt Lake City, UT
15. San Francisco, CA
16. Oceanside, CA
17. Asheville, NC
18. Madison, WI
19. Richmond, VA
20. New York, NY
21. Frederick, MD
22. Washington, DC
23. Albuquerque, NM
24. Baltimore, MD
25. Columbus, OH
26. Pittsburgh, PA
27. Cincinnati, OH
28. Duluth, MN
29. Atlanta, GA
30. Dallas, TX
31. Boulder, CO
32. Wilmington, DE
33. Fort Collins, CO
34. Charlotte, NC
35. St. Paul, MN

[HIDE FILTERS](#)

SORT BY

Position: Ascending

CATEGORY

Decor

- [Wall Art & Paintings](#)
- [Cushions & Throws](#)
- [Mirrors](#)
- [Lanterns & Candleholders](#)
- [Vases, Bowls & Trays](#)
- [Storage & Baskets](#)
- [Bedding](#)
- [Rugs](#)
- [Planters, Artificial Plants & Flowers](#)
- [Home Accents & Sculptures](#)
- [Curtains & Curtain rods](#)
- [Dinnerware & Table Linen](#)
- [Lightbulbs](#)

PRICE RANGE



AVAILABILITY

- In Stock online (8)
- In Store (6)

SPECIAL OFFERS

- On Sale (3)
- Last Chance (7)


BAUHAUS
basket 37cm

\$24
IN STOCK
[ADD TO CART](#)
MICAH
dinnerware set

(\$39) \$29
IN STOCK
[IN STORE ONLY](#)
LUCE
porcelain mug

(\$2) \$1
IN STOCK
[ADD TO CART](#)
SHANA
dinnerware set

(\$49) \$39
IN STOCK
[IN STORE ONLY](#)
RIPPLE
set of 4 tumblers

\$13
IN STOCK
[ADD TO CART](#)
SWIRL
set of 4 wine glasses

\$16
IN STOCK
[ADD TO CART](#)

In essence, a dashboard is a board that displays information, usually as some key numbers and a few panels of plots.



Why is it called
dash-board?



DASHBOARD

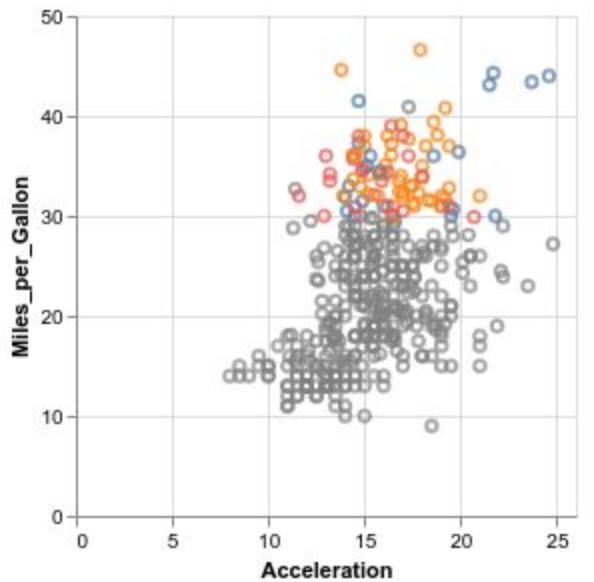
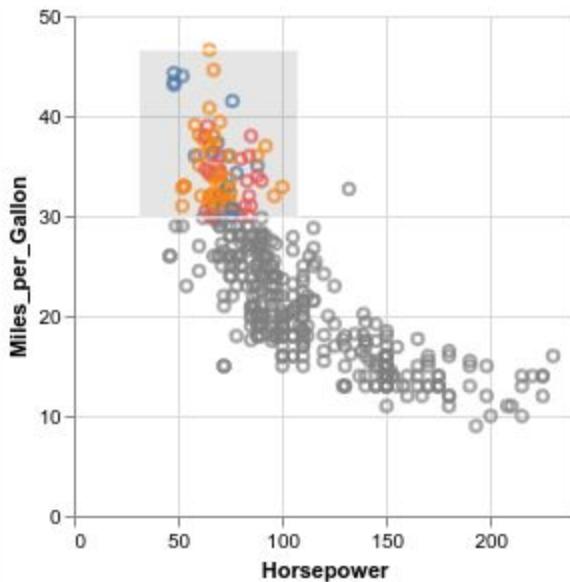
532 =



Interactivity

Multi-panel Scatter Plot with Linked Brushing

This is an example of using an interval selection to control the color of points across multiple panels.



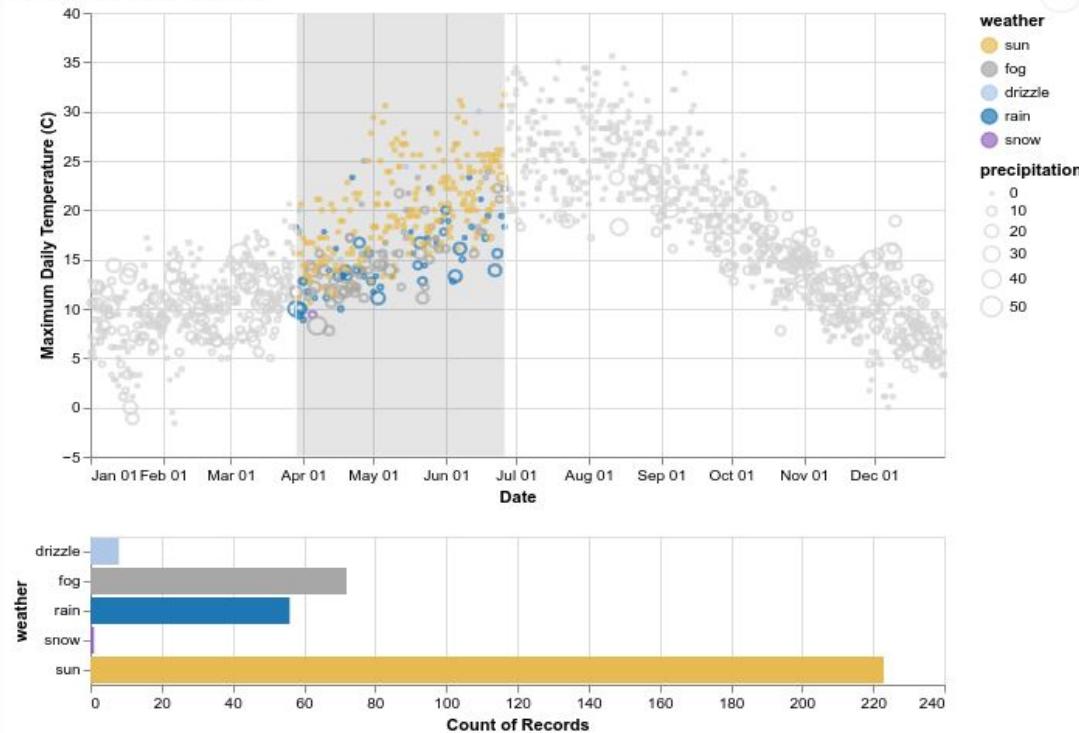
Origin
Europe
Japan
USA



Seattle Weather Interactive

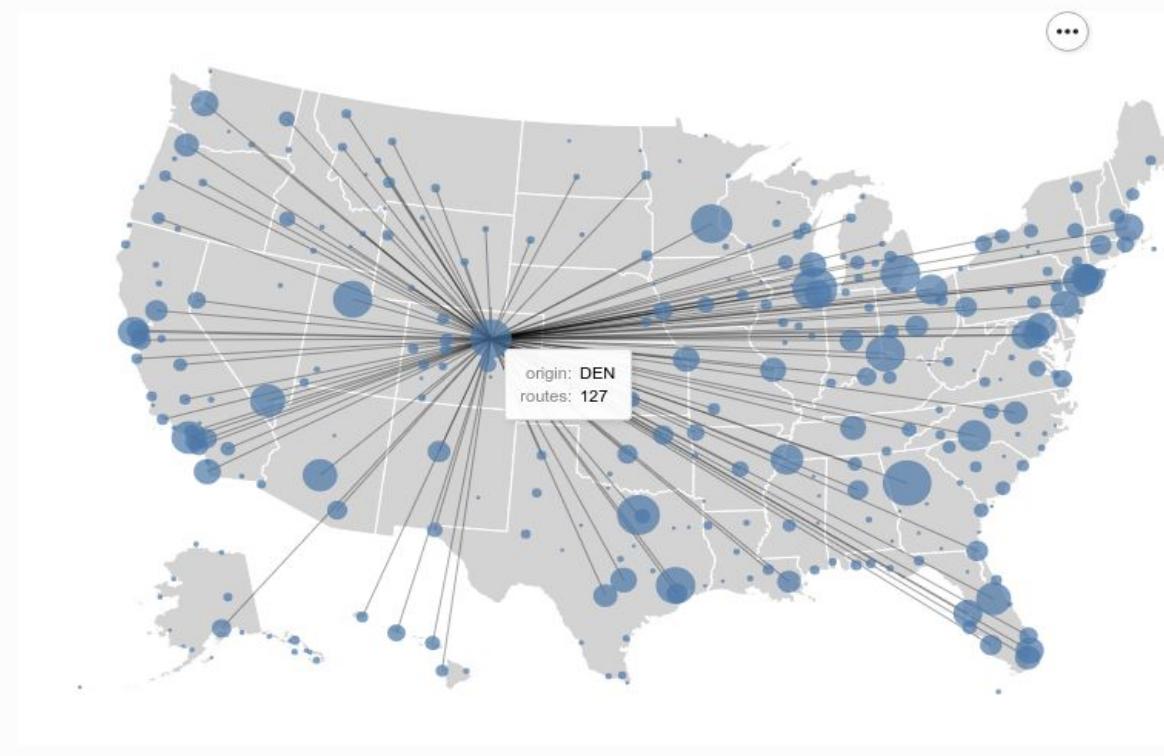
This chart provides an interactive exploration of Seattle weather over the course of the year. It includes a one-axis brush selection to easily see the distribution of weather types in a particular date range.

Seattle Weather: 2012-2015



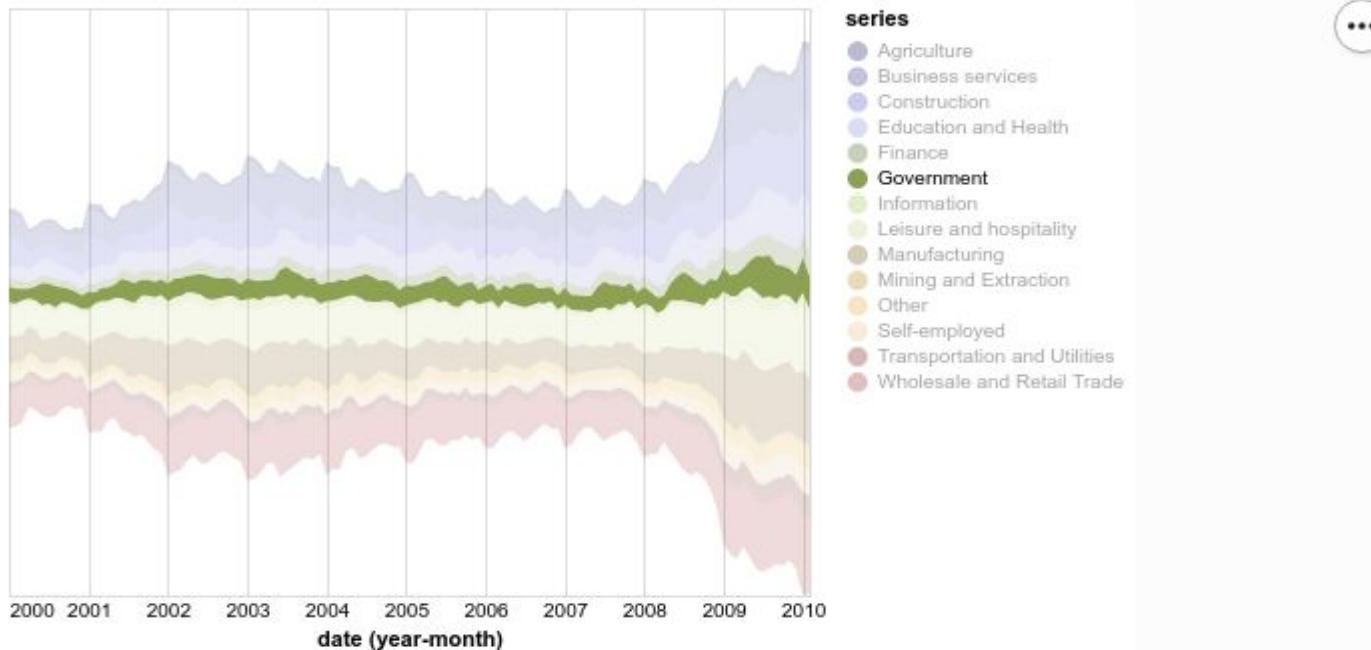
Connections Among U.S. Airports Interactive

This example shows all the connections between major U.S. airports. Lookup transformations are used to find the coordinates of each airport and connecting airports. Connections are displayed on mouseover via a single selection.



Interactive Legend

The following shows how to create a chart with an interactive legend, by binding the selection to `"legend"`. Such a binding only works with `selection_single` or `selection_multi` when projected over a single field or encoding.



PARABLE OF THE POLYGONS

A PLAYABLE POST ON THE SHAPE OF SOCIETY

by vi hart + nicky case

[español](#) | [deutsch](#) | [français](#) | [português](#) | [日本語](#) | [中文](#) | [italiano](#)
[magyar](#) | [nederlands](#) | [हिन्दी](#) | [čeština](#) | [Русский](#) | [العربية](#) | [Українська](#) | [עברית](#)



This is a story of how harmless choices can make a harmful world.

Why use
dashboards?

1. Quicker exploration than with coding
2. Can enable people without programming skills to explore and understand data better.
3. Can engage users more than static viz
4. Can lead to more engaging storytelling in data journalism.
5. When there is too much data, interactivity can allow us to look at subsets.
6. People can be interested in different things when they look at the same data.

How to design an effective dashboard?

1. Understand the data
2. Identify the use case and target audience of the dashboard.
3. Speak with the target audience to find out exactly what they want.
4. Test the dashboard

1. Choose appropriate visualizations.
2. Identify the story for your default app state.
3. Show only relevant info, not everything possible.
4. Place global widgets together and local widgets close to the plots they control.
5. Think about the flow you want the end customer to follow
6. Include some key numbers on cards.
7. Design about your app in a grid layout.
8. Think about the text formatting.
9. Use style sheets with premade css template
10. Contact info, link to source code, link to raw data, last updated.

How NOT to design an effective dashboard?



OUR NEW DASHBOARD HAS ALL OF THE DIFFERENT KPI'S WE CAN TRACK NOW.



WHAT'S THAT KPI TRENDING TO ZERO?



IT MEASURES HOW WELL WE UNDERSTAND THEM ALL.

A few examples

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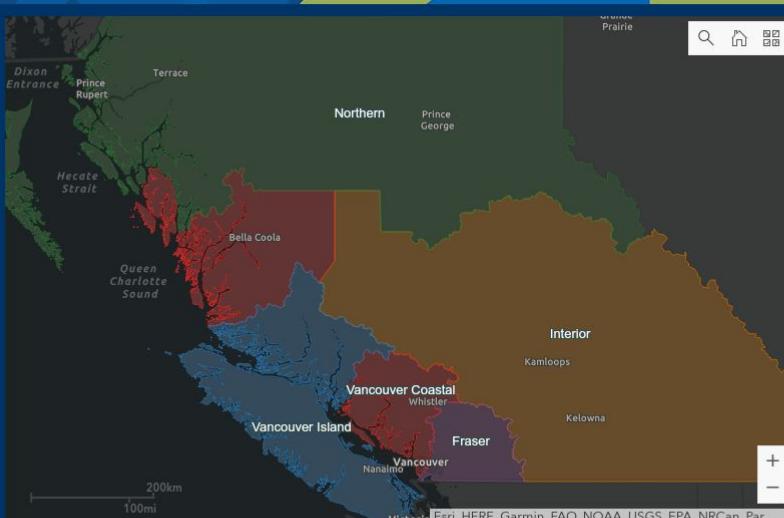
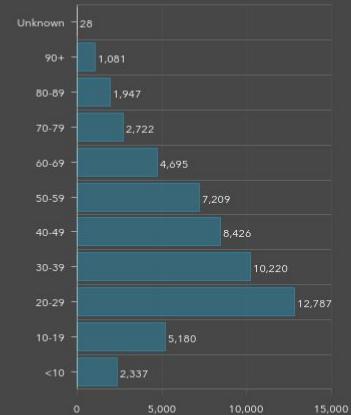
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Cases by Day

Distribution by Age



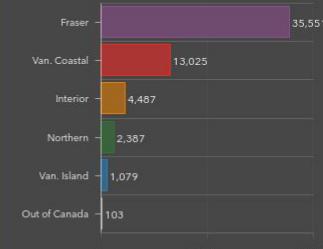
Today's New Cases

617

Active Cases

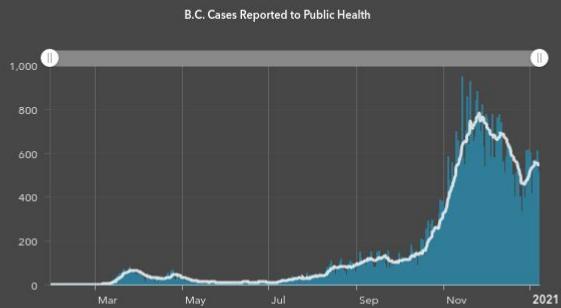
6,118

Total Cases Reported by Health Authority

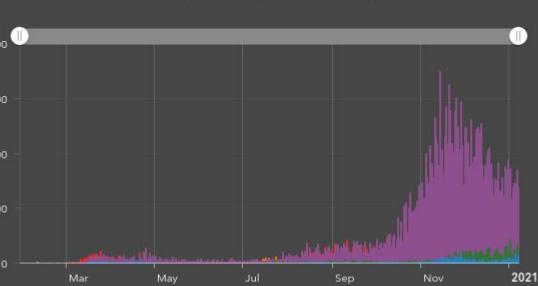


Cases New Active List

B.C. Cases Reported to Public Health



Health Authority Cases Reported to Public Health



Note: Y-axis varies between graphs.

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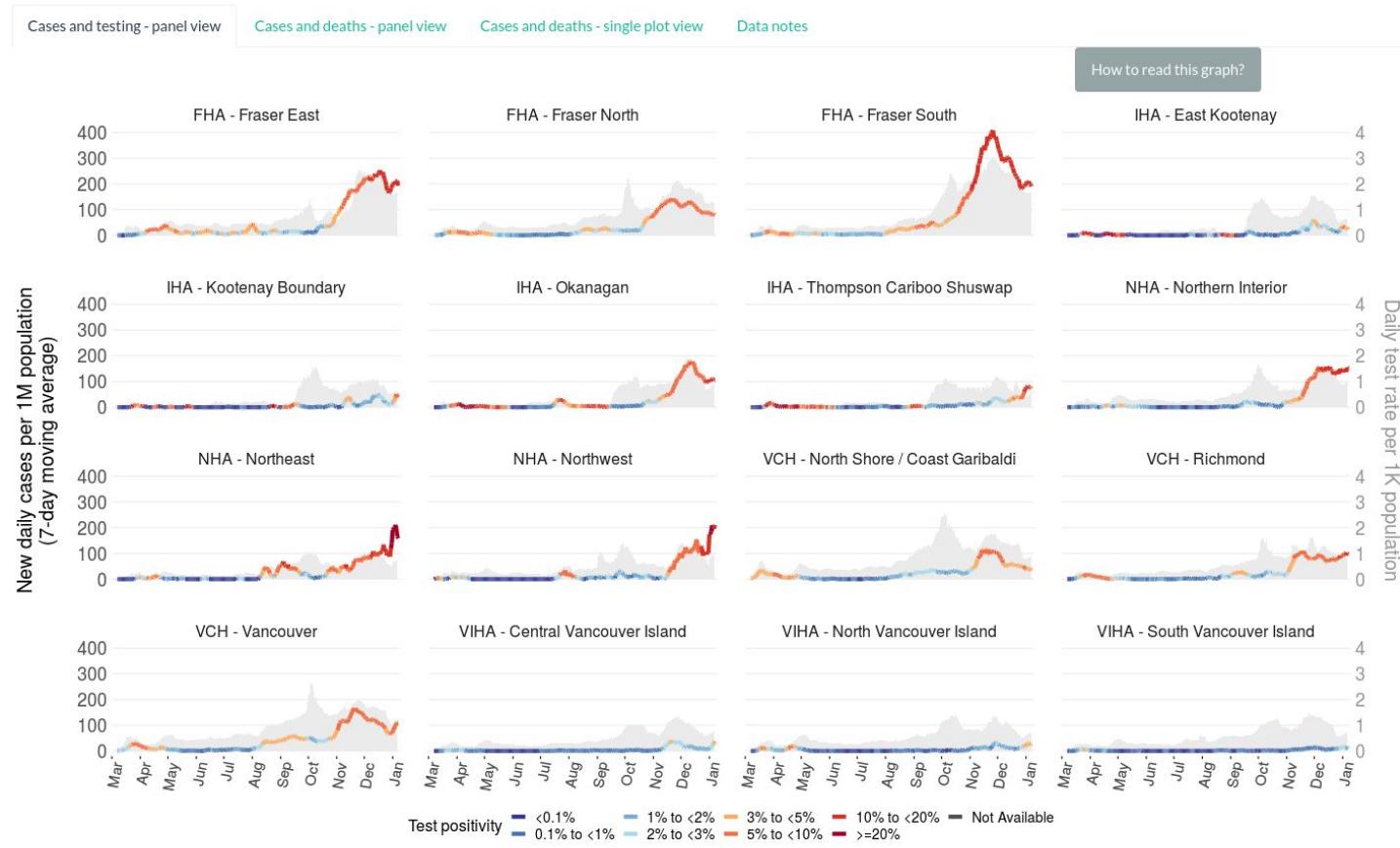
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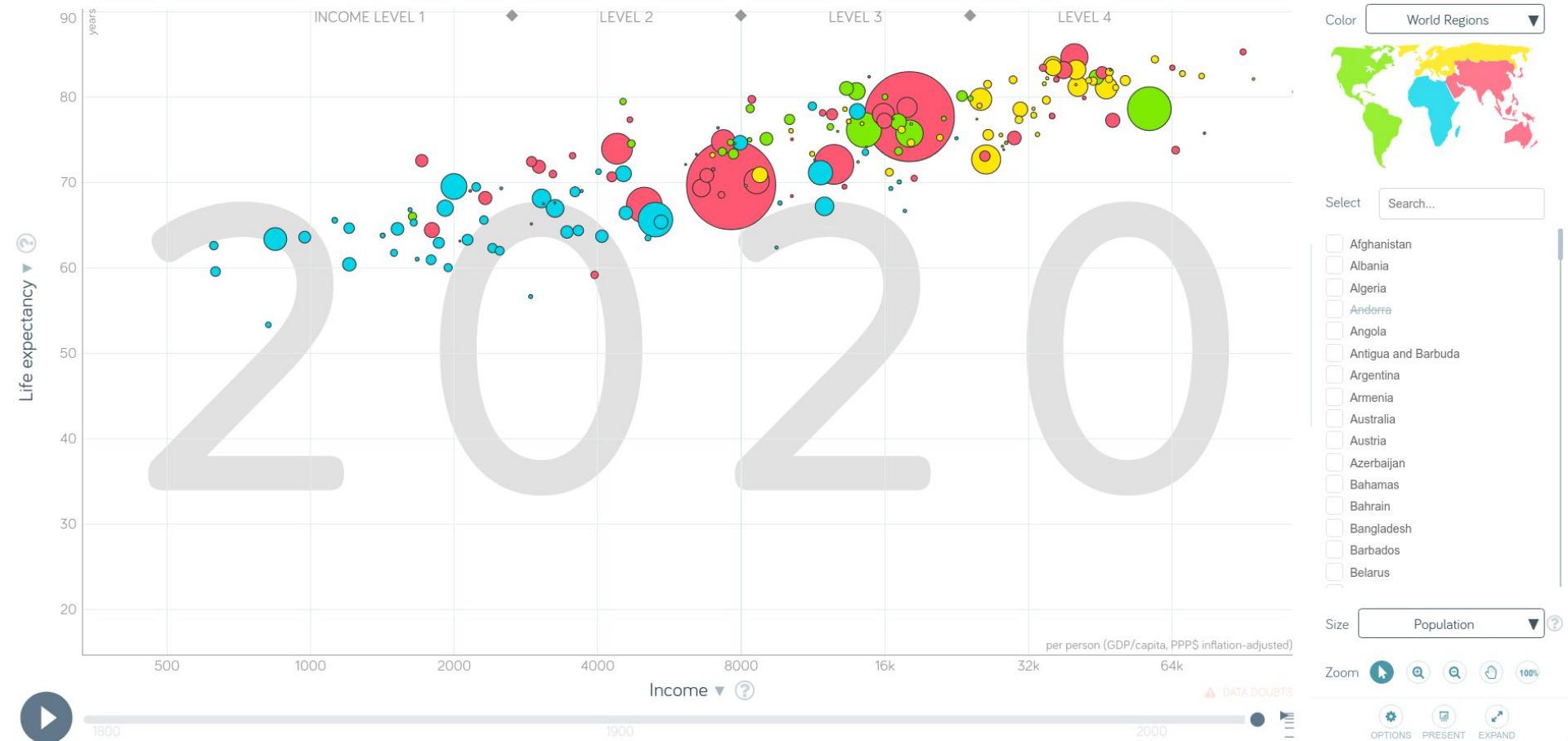
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 BC Centre for Disease Control
Provincial Health Services Authority
 Provincial Health Services Authority
Province-wide solutions. Better health.





Who Should Get Parole?

Even the best risk assessments yield probabilities, not certainties. That means they label as "high risk" some people who won't commit another crime and label as "low risk" some people who will. This simulation lets you sort offenders into risk categories based on the results of an assessment. Think we should rarely lock up anyone who wouldn't reoffend? Set the "low risk" threshold high and the "high risk" threshold even higher. Have little tolerance for recidivism? Try the opposite. In the real world, policymakers have to strike a balance. [Read more »](#)

1

The prisoners in this simulation are up for parole. Some will reoffend if released and some won't. They each take an assessment, which estimates the chance they will reoffend.

2

Prisoners are placed in one of three categories based on these estimates. [Move the slider](#) to change the cutoffs for each category. "Low risk" prisoners will be awarded parole. "High risk" prisoners will be denied.

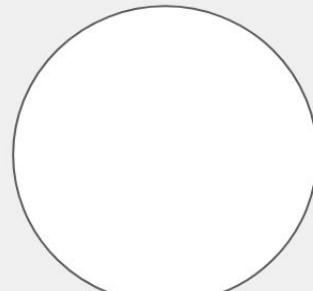


3

Some people you let out reoffended. Some people you left in prison wouldn't have. [Are you OK with the results?](#)

Start

PAROLE-ELIGIBLE PRISONERS



- Will reoffend
- Will not reoffend

LOW RISK

AWARDED PAROLE

0%

AWARDED PAROLE AND THEN REOFFENDED

MEDIUM RISK

DENIED PAROLE

HIGH RISK

0%

DENIED PAROLE BUT WOULDN'T HAVE REOFFENDED

Executive Insights

What is driving performance?



Total Profit



Profit Margin

Select a measure:



Average Order Quantity



Total Quantity

Select a perspective:



Total Revenue

How is our Total Profit distributed geographically?

USA	149M
Japan	65M
China	57M
Canada	55M
France	52M
United Kingdom	50M
Germany	47M
South Korea	36M
Malaysia	36M
Finland	34M
Italy	34M
Netherlands	33M
Mexico	30M
Spain	30M
Austria	26M
Brazil	25M
Belgium	21M
Australia	20M
Switzerland	18M
Sweden	17M
Denmark	11M



Total Profit
 Total Quantity
 Total Revenue

2

Product Category

All

Order Type

All



What is our YoY% change in Total Profit?



How close are we to our planned Total Profit?



What is my Running Total by Total Profit?



What are my Top 5 products by Total Profit?

Freya Alpha	24M
Achilles Zeta	23M
Perseus Kappa	23M
Zeus Pi	21M
Achilles Chi	21M

Top 5



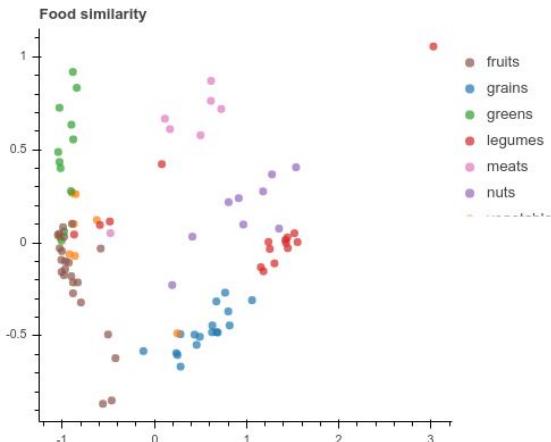
Filter

Nutrimap

This dashboard facilitates comparisons of nutrient composition between common food items to give an overview of which foods are high and low in what nutrients. I think colors are more efficient at presenting overviews than tables with numbers, so I chose to present this information as heatmaps. The data is from USDA, who don't yet collect phytonutrients, which are generally abundant in plant-based foods. Eventually I want to add more options computing the RDI, but for now, the RDI is based on a 70 kg male in his 30s. This is a minor issue since the dashboard mainly use RDI to provide a reference value for coloring the heatmap rather than recommending how much of a certain food item one should eat. For the latter, I highly recommend [Cronometer](#).

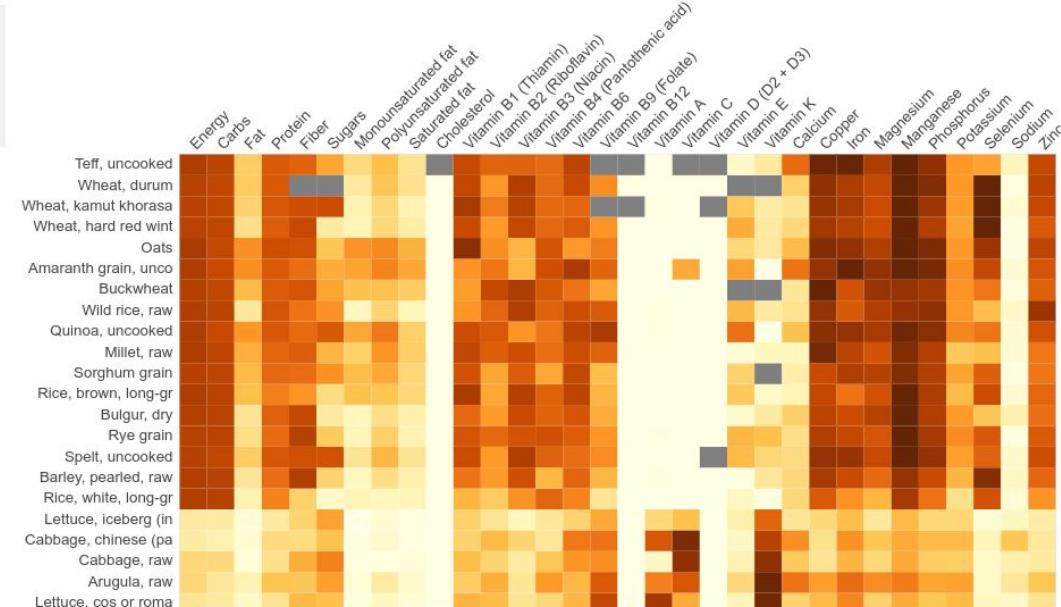
Selection tools

Pick nutrients and food groups to visualize using the lists or select individual food items in the food similarity scatter plot by dragging with the mouse or clicking to select. Ctrl and shift can be used to select multiple items.



Nutrient visualization

The nutrients for 100g of each food are shown (dry weight for grains and legumes, wet weight for everything else). The colors are normalized to RDI and capped at 100% by default.



Examples from MDS
previous years

World Wide Arms and Ammunition Movement and GDP Effects

This app is designed to explore how the movement of weapons globally has changed over the last 30 years, and how imports and exports of arms and ammunition relate to a country's GDP.

Choose statistic:

- Import
- Export

Choose country:

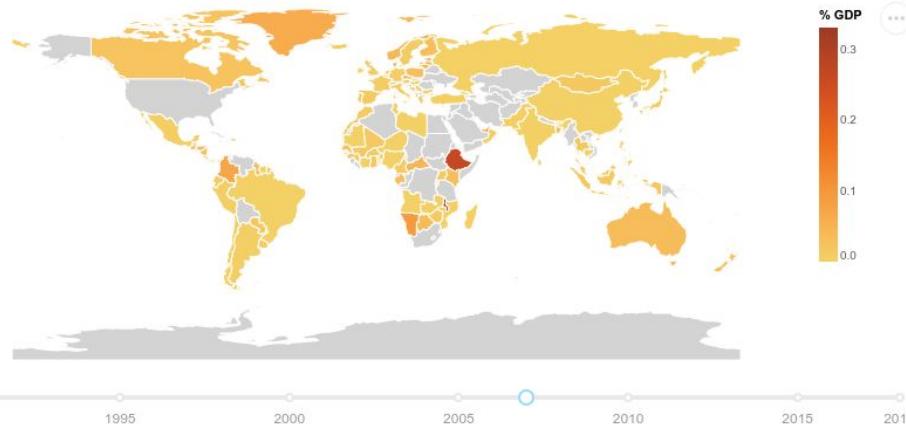
Togo

Explore changes through time of a single country using the lowermost visualizations.

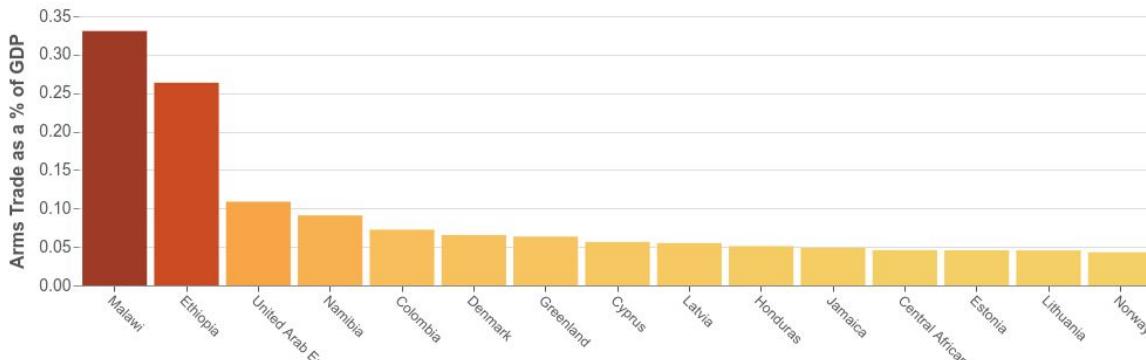
Include USA

Remove the outlier USA to better visualize differences between other nations.

% of GDP



Arms Trade as a Percentage of GDP for Major Importers in 2007

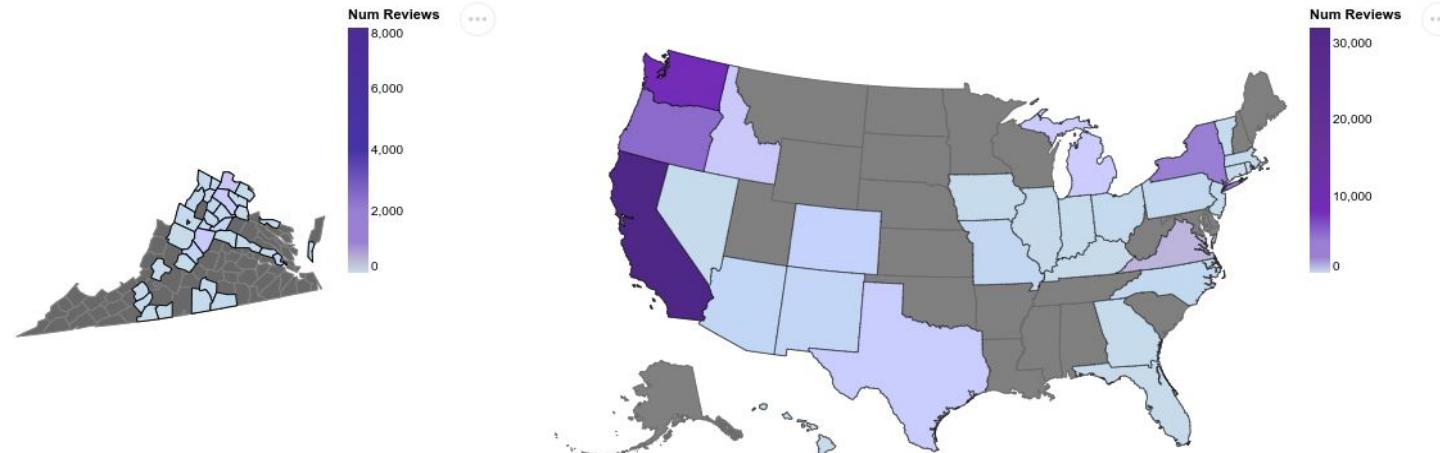


WINE REVIEWS BY GEOGRAPHIC LOCATION

See how wine is distributed across the U.S. Hover over a particular state or county to see some summary information for things like average price, points, or value rating. Use the dropdown menu to take a closer look at a particular state, where you can see a breakdown by county. Hover over a county to get more summary information. In no time at all you'll be an expert on where you can find the best wine's at the best prices in America.

TOTAL NUMBER OF REVIEWS

CHOOSE A STATE

 X ▼

Compare safest cities in the US

Select the Cities: ▾

Select your desired year range:



Dashboard

Description

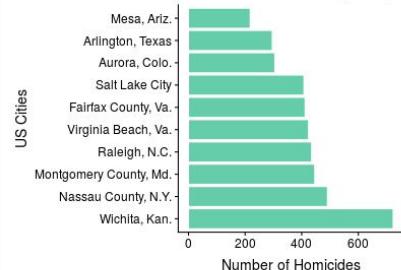
TOTAL REPORTED CRIMES
359524

AVERAGE NUMBER OF CRIMES
35952

SAFEST CITY OVER SELECTED TIME FRAME
Virginia Beach, Va.

Compare your choice of cities

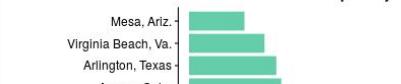
Number of Homicides per city



Number of Rapes per city



Number of Robberies per city



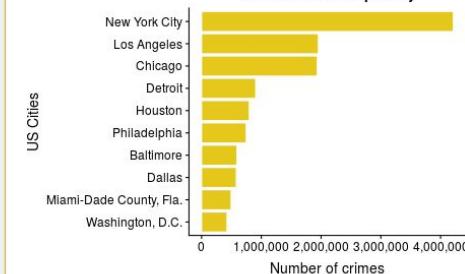
Top ten cities with minimum crimes

Number of crimes per city



Top ten cities with maximum crimes

Number of crimes per city



World Wine Explorer

This application will help you explore the world of wine!

*Reviews are only published for wines rated 80+ points

Rating range



Price range (\$USD).

(\$11 - \$30) Popular

Country

Canada

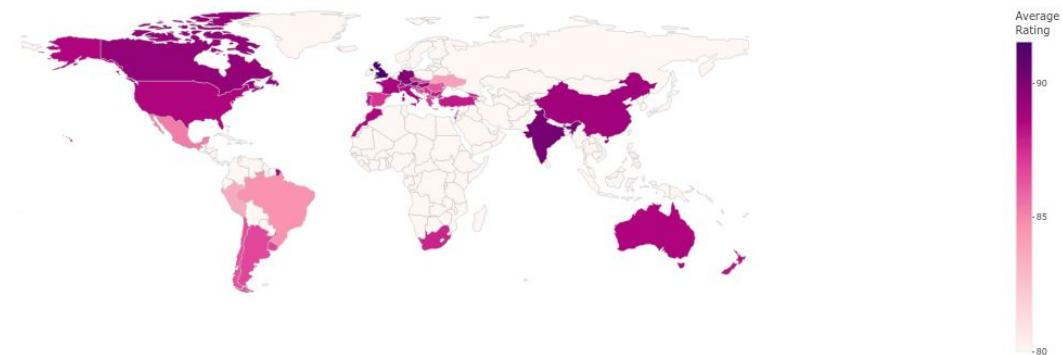
Region

Nothing selected

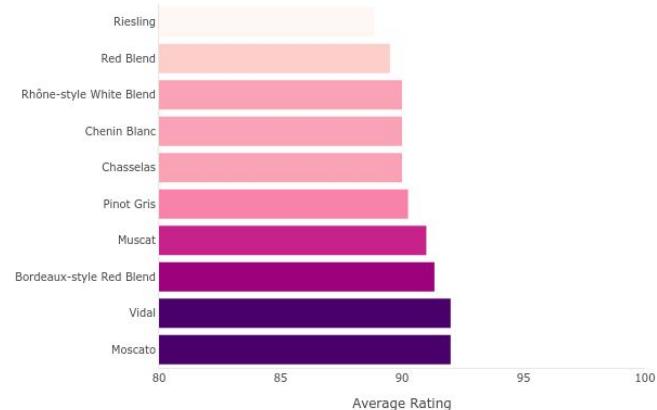
Vintage

Nothing selected

Average Wine Ratings by Country



Which Varieties have the highest ratings?



Price vs. Ratings



More MDS examples

<https://dsci-532-group203-maintenance.herokuapp.com/>

https://panntingq.shinyapps.io/mental_health_app_3_0/

https://hfboyce.shinyapps.io/dsci_532-boston-crime-rate/

<https://adityashrm21.shinyapps.io/us-police-shootings-analysis/>

<https://g105-milestone3.herokuapp.com/>

<https://dsci-532-l02-gr212-milestone3.herokuapp.com/>

<https://dsci532group114milestone3.herokuapp.com/>

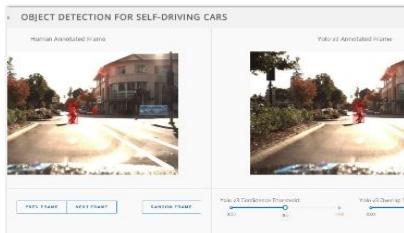
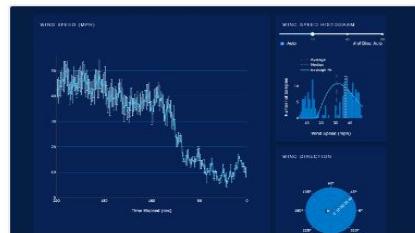
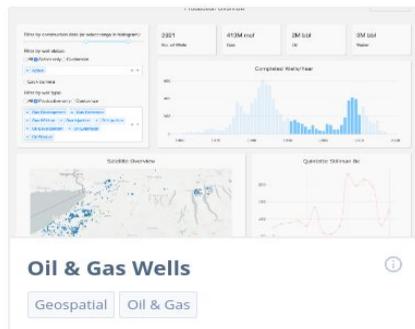
Dash Enterprise App Gallery

This public instance of the [Dash Enterprise](#) app manager runs >60 Dash apps for 100s of concurrent users on Azure Kubernetes Service. Click on a Dash app's name below for more info and links to [Python & R source code](#) on GitHub.

[Aerospace](#) | [Automotive](#) | [Energy](#) | [Finance](#) | [Manufacturing](#) | [Medical Imaging](#) |
[Pharma](#) | [Retail](#)

All Apps (92)

Search applications...



Support Vector Machine (SVM) Explorer

Select Dataset:

Moons

Sample Size:

100 200 300 400 500

Noise Level:

0.2 0.4 0.6 0.8

Threshold:

0.013

RESET THRESHOLD

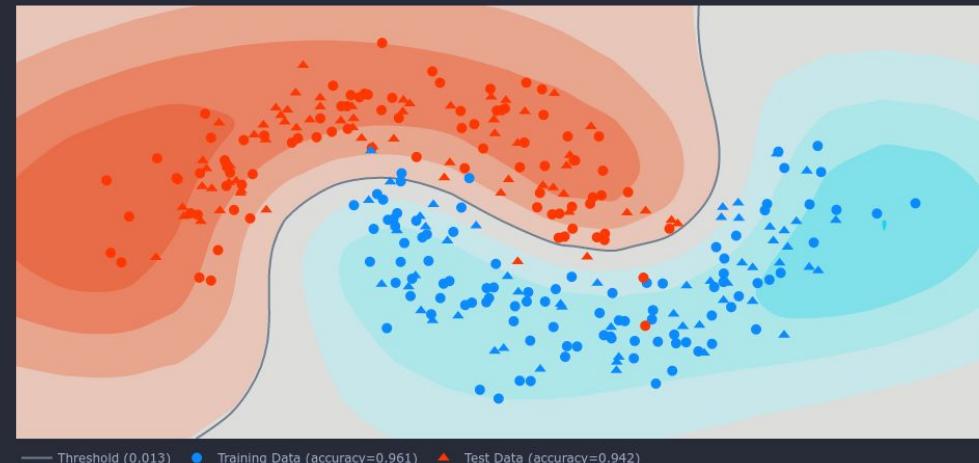
Kernel:

Radial basis function (RBF)

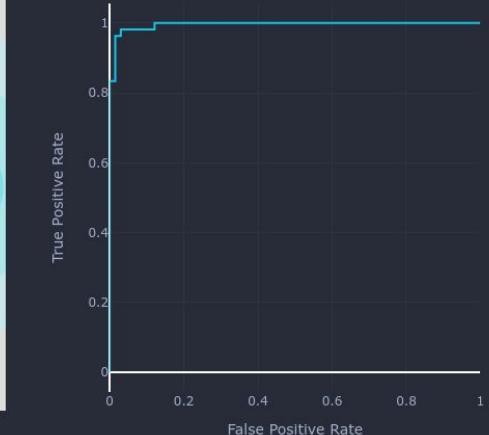
Cost (C):

0.01 0.1 1 10 100 1000 10000

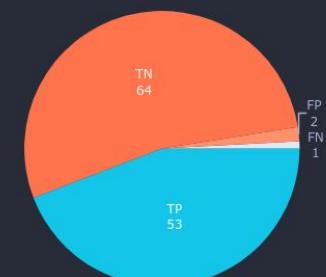
1 3 5 7 9



ROC Curve (AUC = 0.995)



Confusion Matrix



Human Annotated Frame



Yolo v3 Annotated Frame



Find a frame containing:
pedestrian

PREV FRAME

NEXT FRAME

RANDOM FRAME

Yolo v3 Confidence Threshold:



Yolo v3 Overlap Threshold:

