Predicting Dengue

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Flat Iron - Data Science
Module 5

DengAI: Predicting Disease Spread

HOSTED BY DRIVENDATA

GLORY!

3 MONTHS LEFT

Challenge Summary

Can you predict local epidemics of dengue fever?

Dengue fever is a mosquito-borne disease that occurs in tropical and sub-tropical parts of the world. In mild cases, symptoms are similar to the flu: fever, rash, and muscle and joint pain. In severe cases, dengue fever can cause severe bleeding, low blood pressure, and even death.

Glory!

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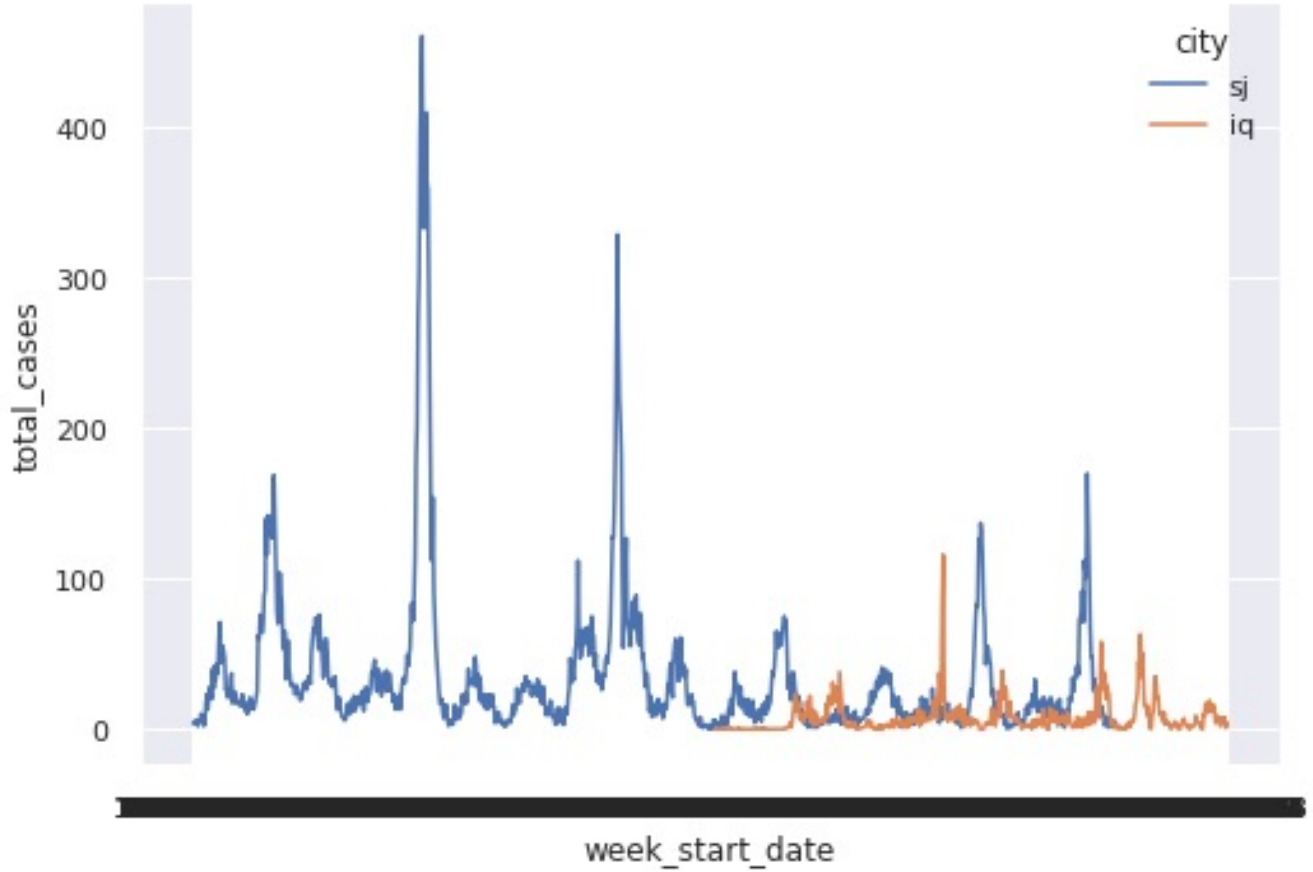
Research Question

Given weekly dengue case counts in Puerto Rico and Peru, can we accurately predict future weekly case counts?

Assessing the overall picture



Introducing outside variables using domain knowledge

- Wet season
- Global warming phases
- Mountainous

Compared models

Linear

Train r^2: 0.99975
Train MSE: 19.88174

Test r^2: 0.99987
Test MSE: 10.14023

GradientBoost

Train r^2: 0.99996
Train MSE: 3.52073

Test r^2: 0.99977
Test MSE: 17.93578

AdaBoost

Train r^2: 0.99508
Train MSE: 394.21235

Test r^2: 0.99418
Test MSE: 453.01727

Take-aways

- Cooler, drier conditions are less likely to see high dengue case counts.
- If you have a choice, avoid travel to tropical climates during wet season or take proper precautions.

Future avenues for exploration

- What is the influence of population density?
- What is the influence of mosquito net distributions?

Sources

- https://history.aip.org/climate/timeline.htm
- https://machinelearningmastery.com/how-to-use-statistics-to-identify-outliers-in-data/
- http://68.183.140.86:57267/notebooks/dsc-regression-assumptions-online-ds-sp-000/index.ipynb
- https://github.com/learn-co-curriculum/dsc-ols-statsmodels-lab/tree/solution

Thank you!