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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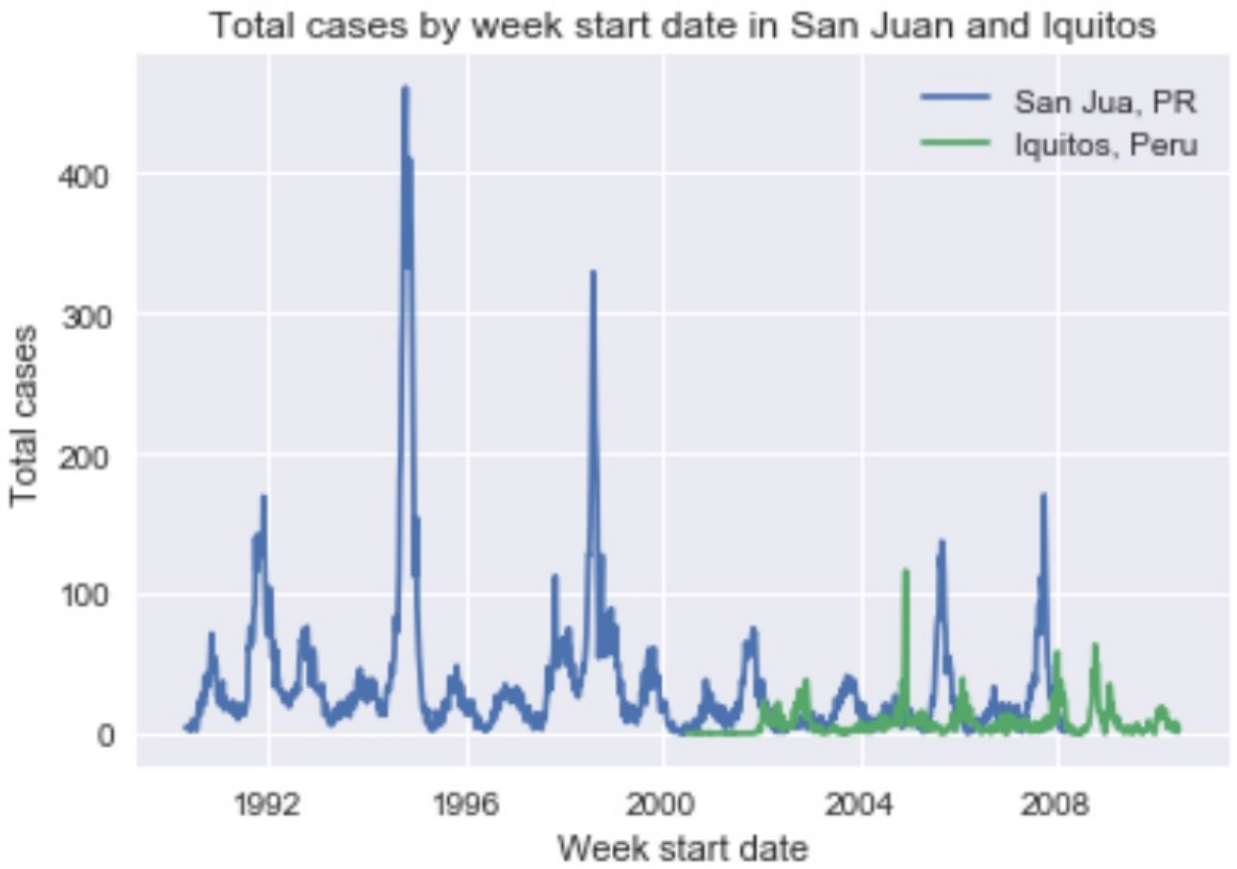
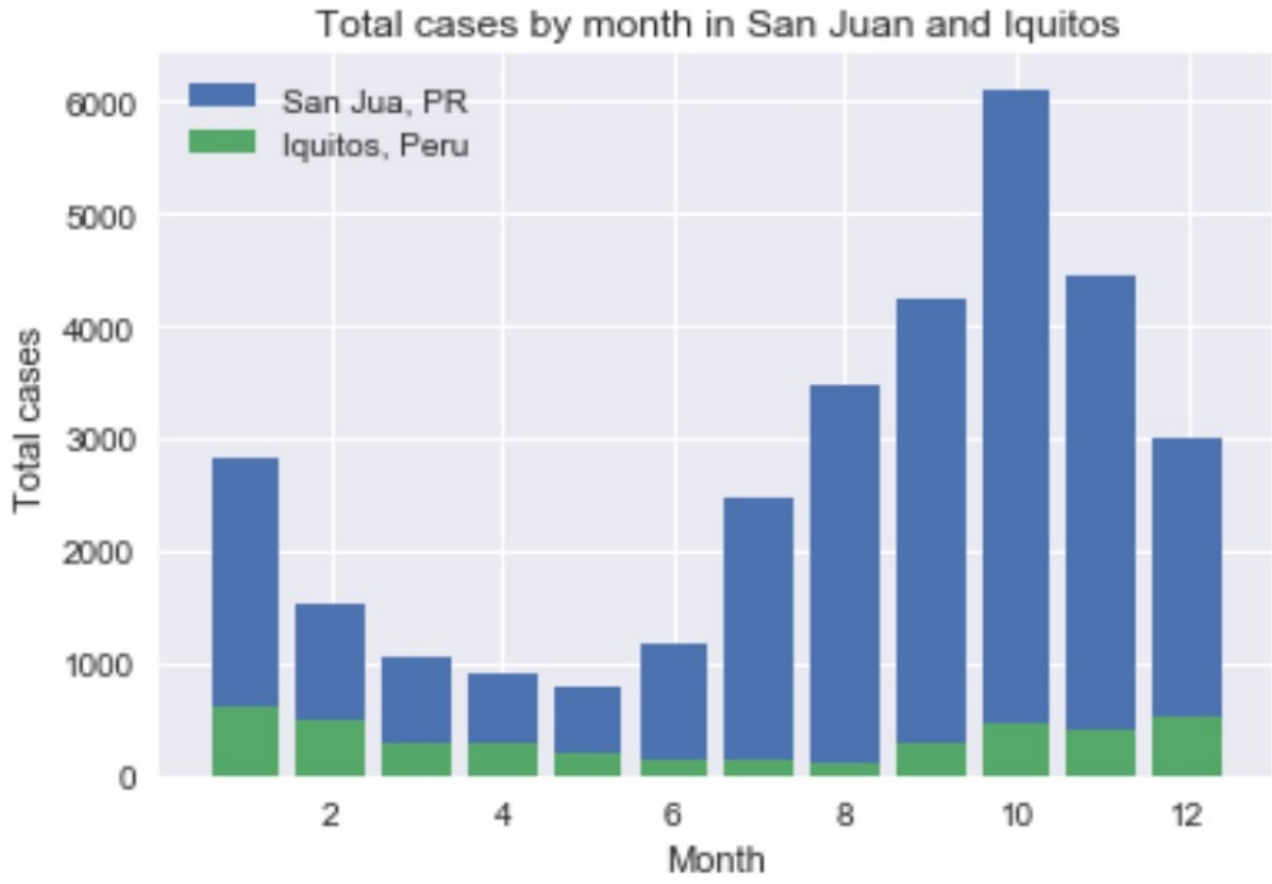
Research Question

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

Assessing the overall picture



Assessing the overall picture



Introducing outside variables using domain knowledge

- Wet season
- Global warming phases
- Mountainous

Compared models

Linear

Train r^2: 0.771
Train MSE: 6.78303
Train MAE: 2.20818

Test r^2: 0.75631
Test MSE: 7.10791
Test MAE: 2.25338

GradientBoost

Train r^2: 0.8886
Train MSE: 3.29981
Train MAE: 1.50684

Test r^2: 0.80121
Test MSE: 5.79827
Test MAE: 2.00905

AdaBoost

Train r^2: 0.79614
Train MSE: 6.03833
Train MAE: 2.12837

Test r^2: 0.765
Test MSE: 6.85441
Test MAE: 2.26498

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!