

Influenza Forecasting in Canada

Presented by: Jessica Moloney



About Me



Psychology, Business
Analytics and Quality
Management



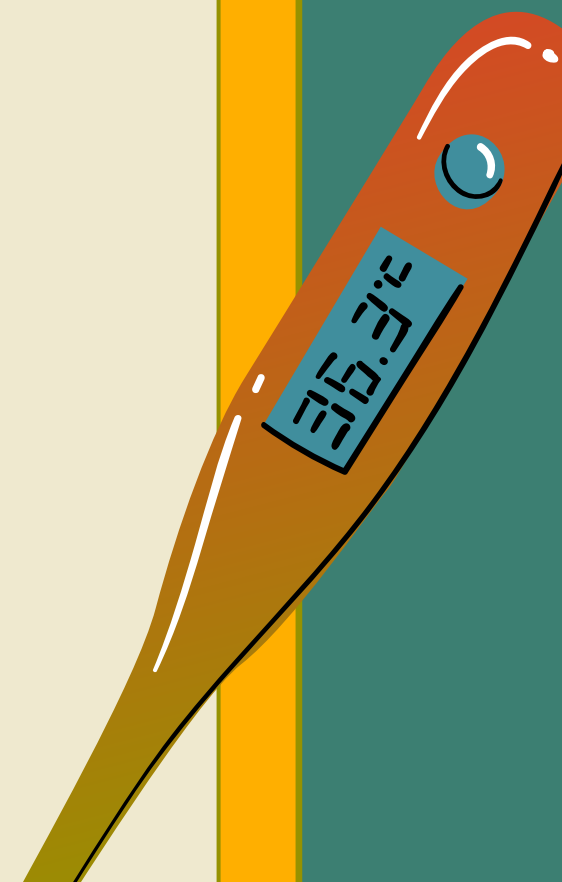
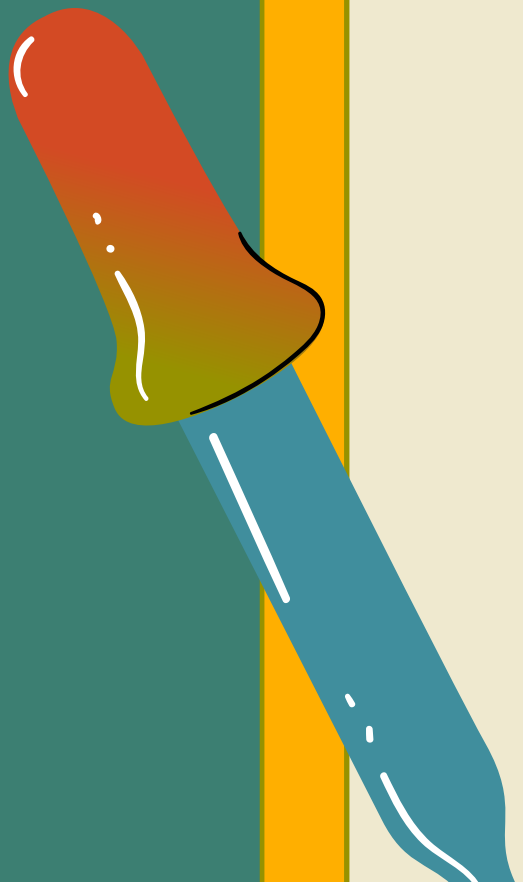
Passion for Public Health



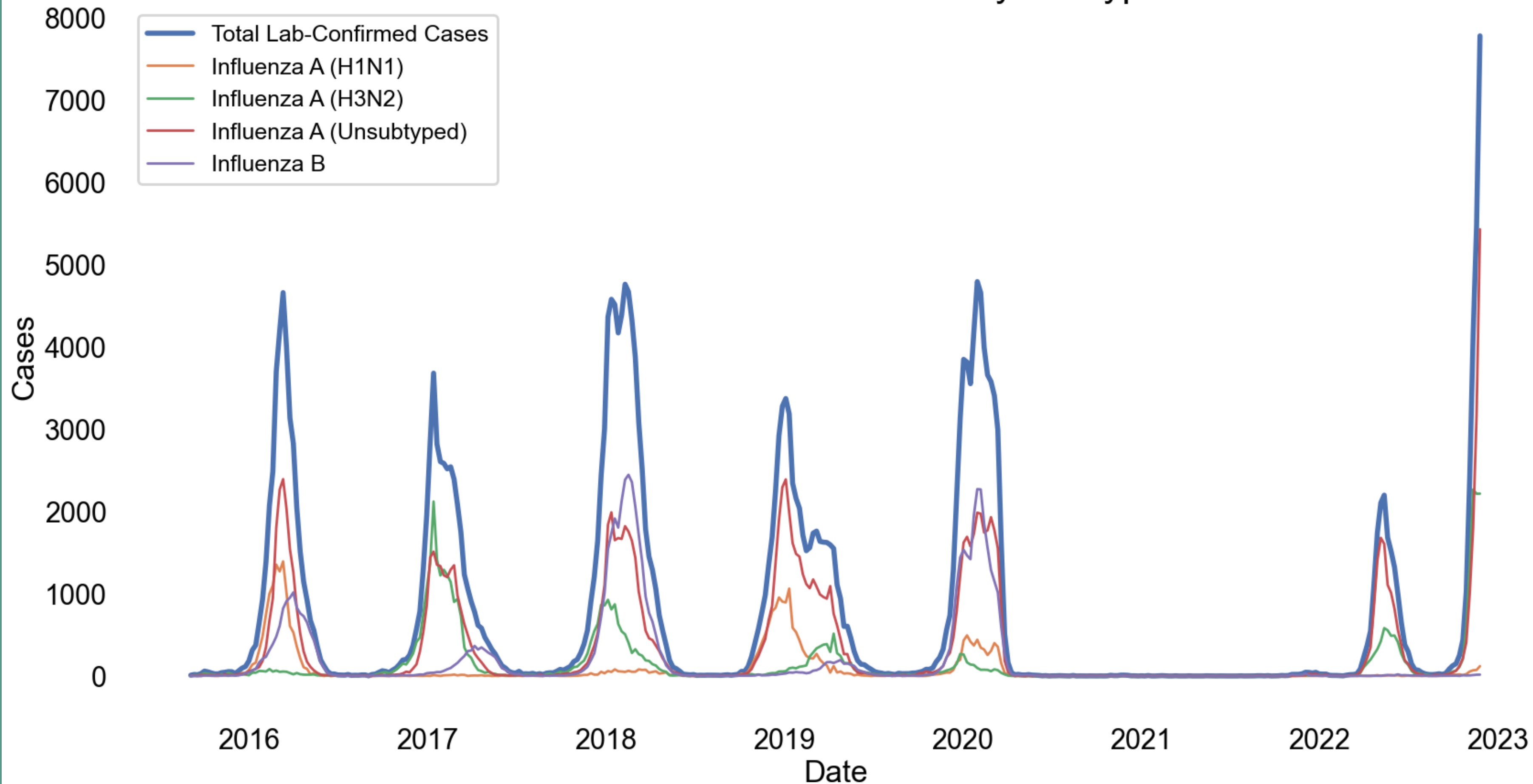
Fiddle Player!

Why Forecast Flu?

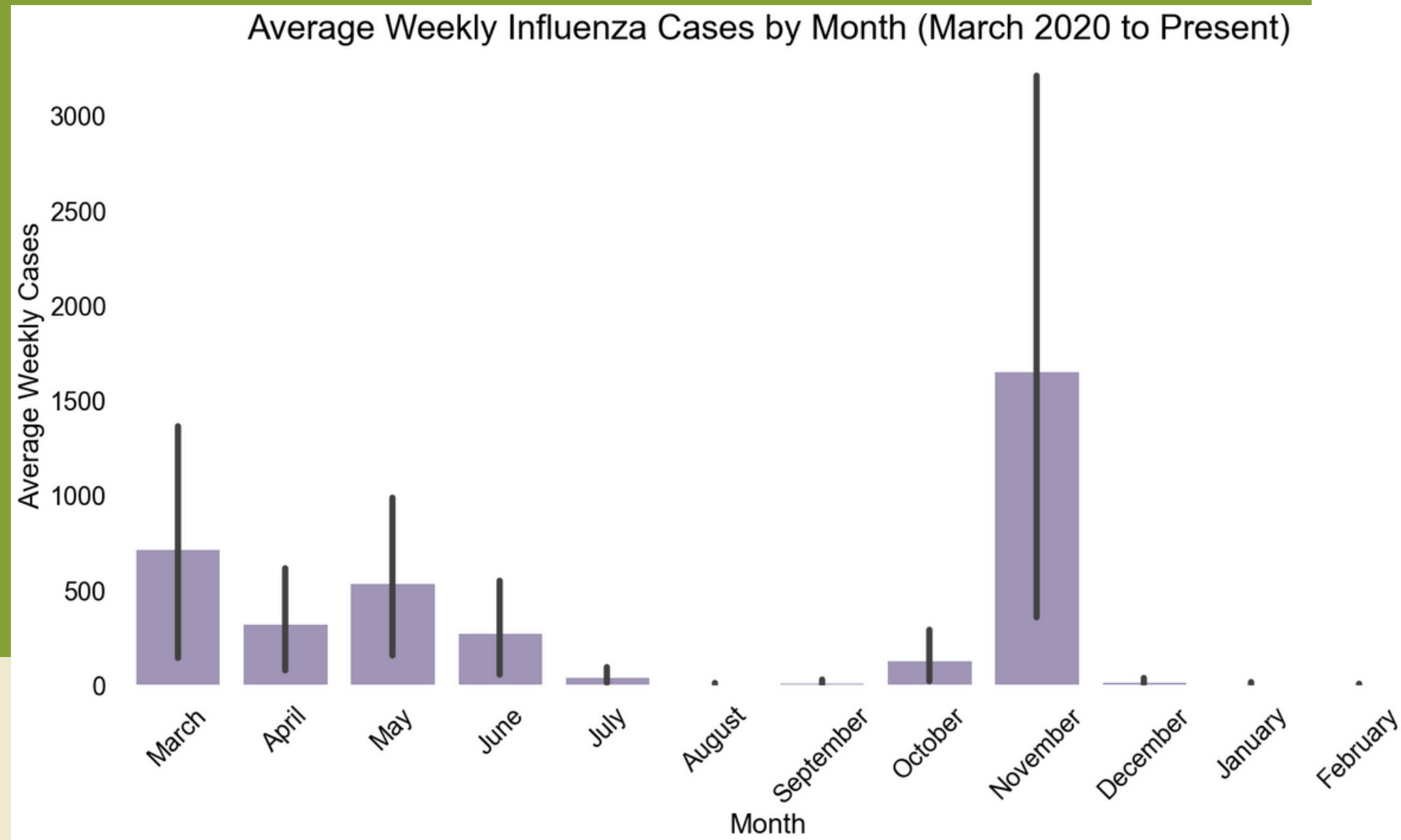
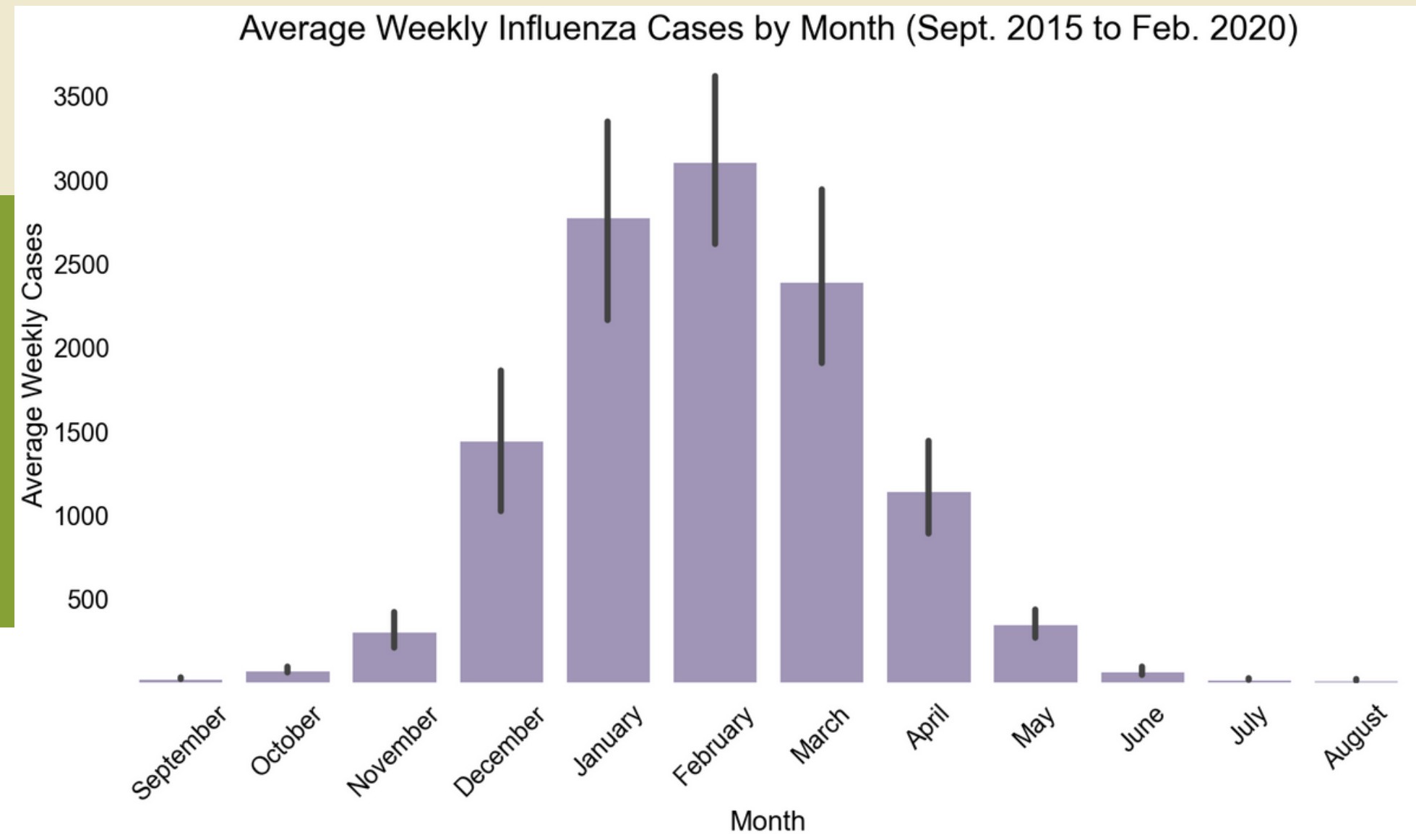
- 7,000 influenza deaths every year in Canada
- Accurate influenza predictions = more effective interventions



Influenza Cases in Canada by Subtype

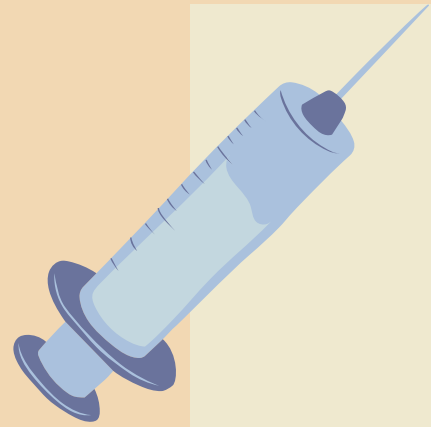


Before March 2020



After March 2020

Correlated with Flu?



Influenza Vaccination



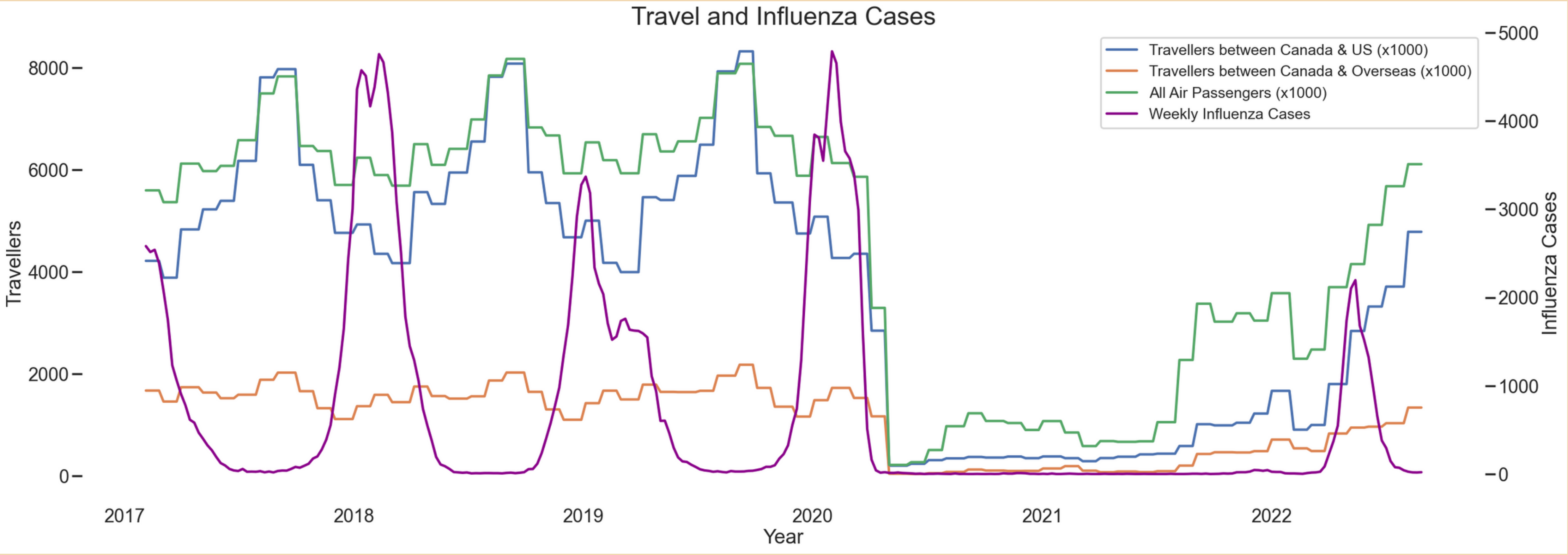
Flu Symptom Google Search



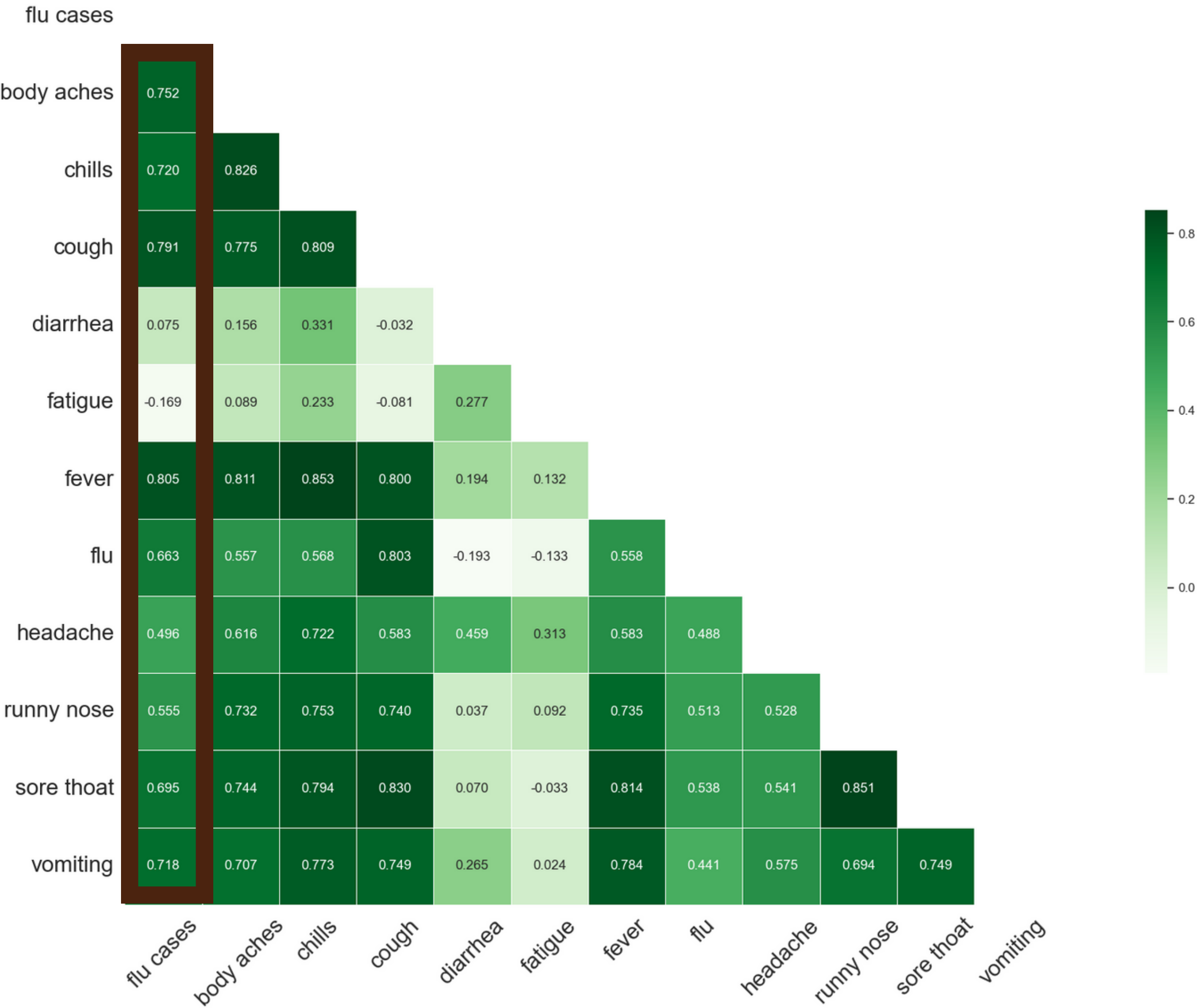
Movement of People



COVID term Google Search

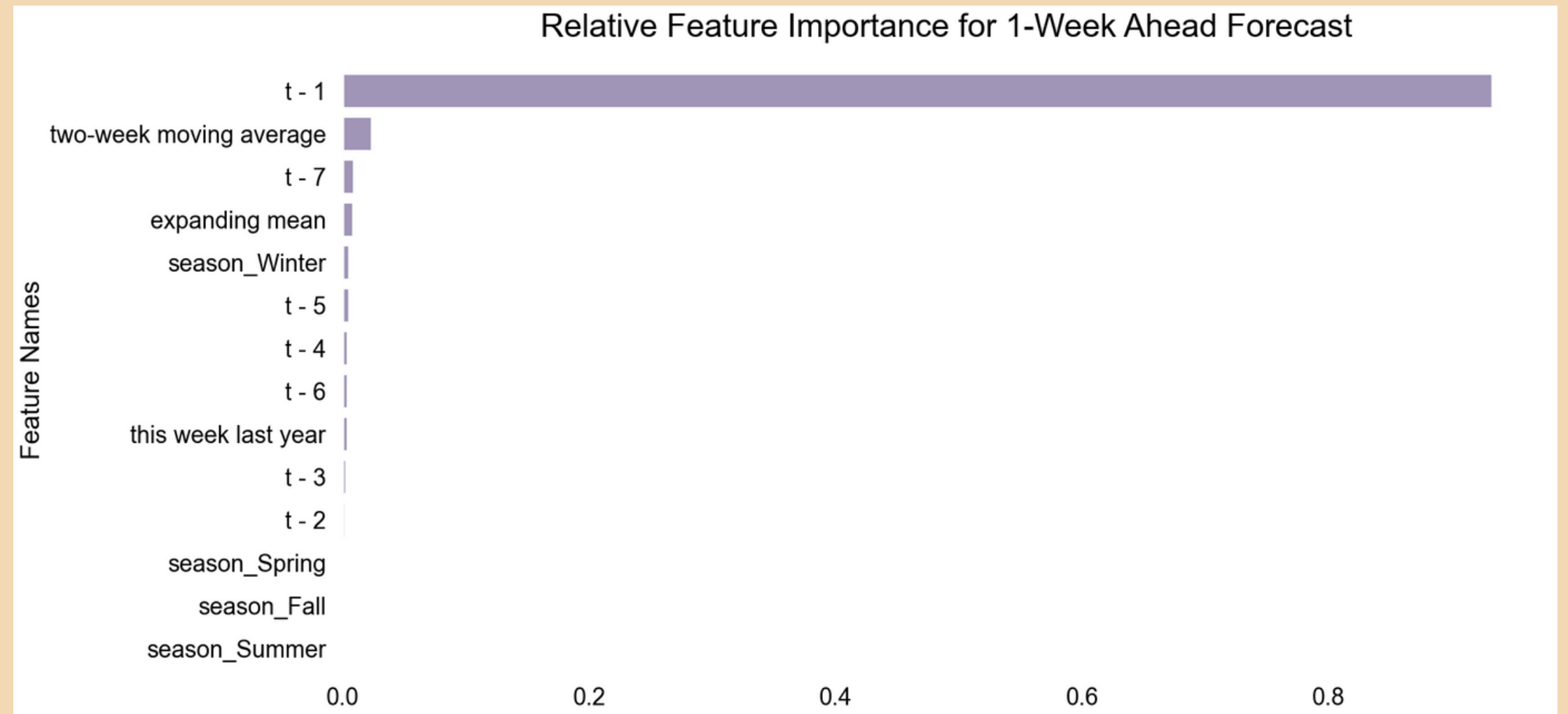


Flu Symptom Searches & Cases



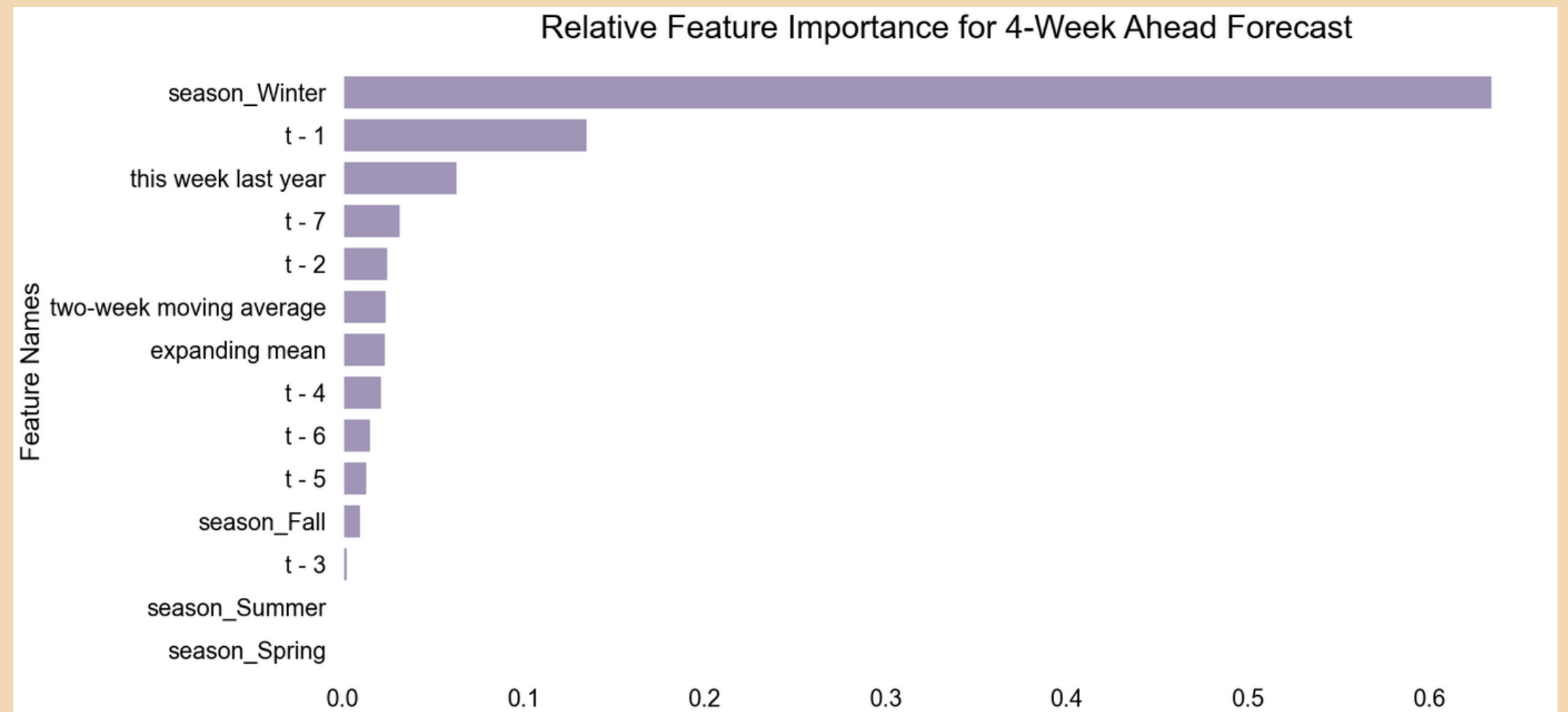
1-week forecast:

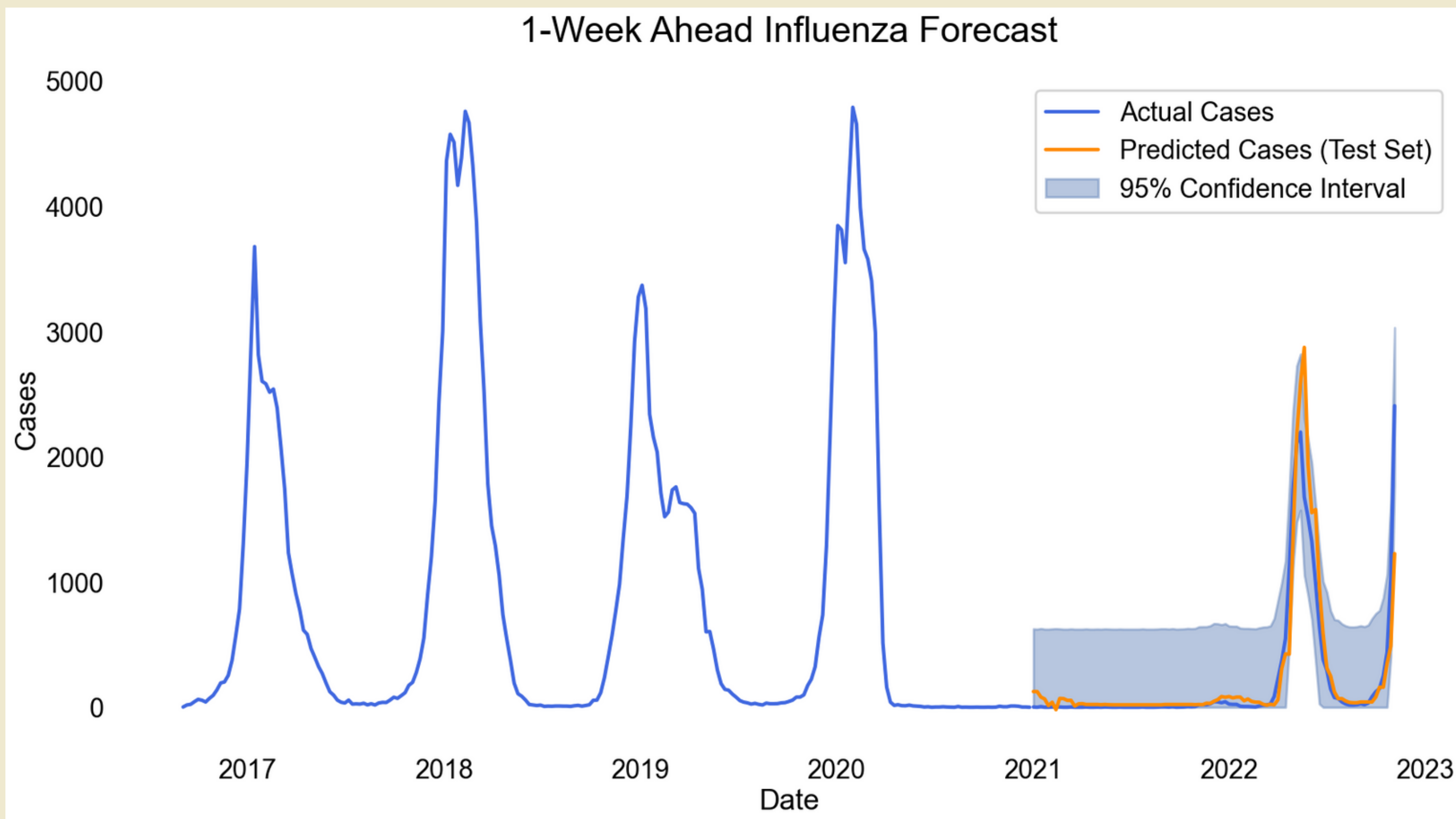
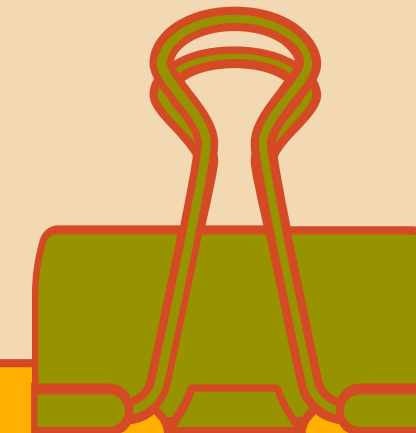
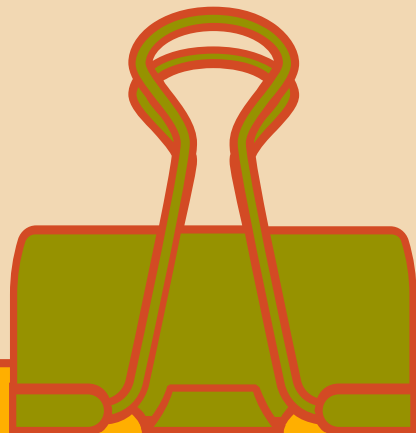
Most important
feature =
previous week



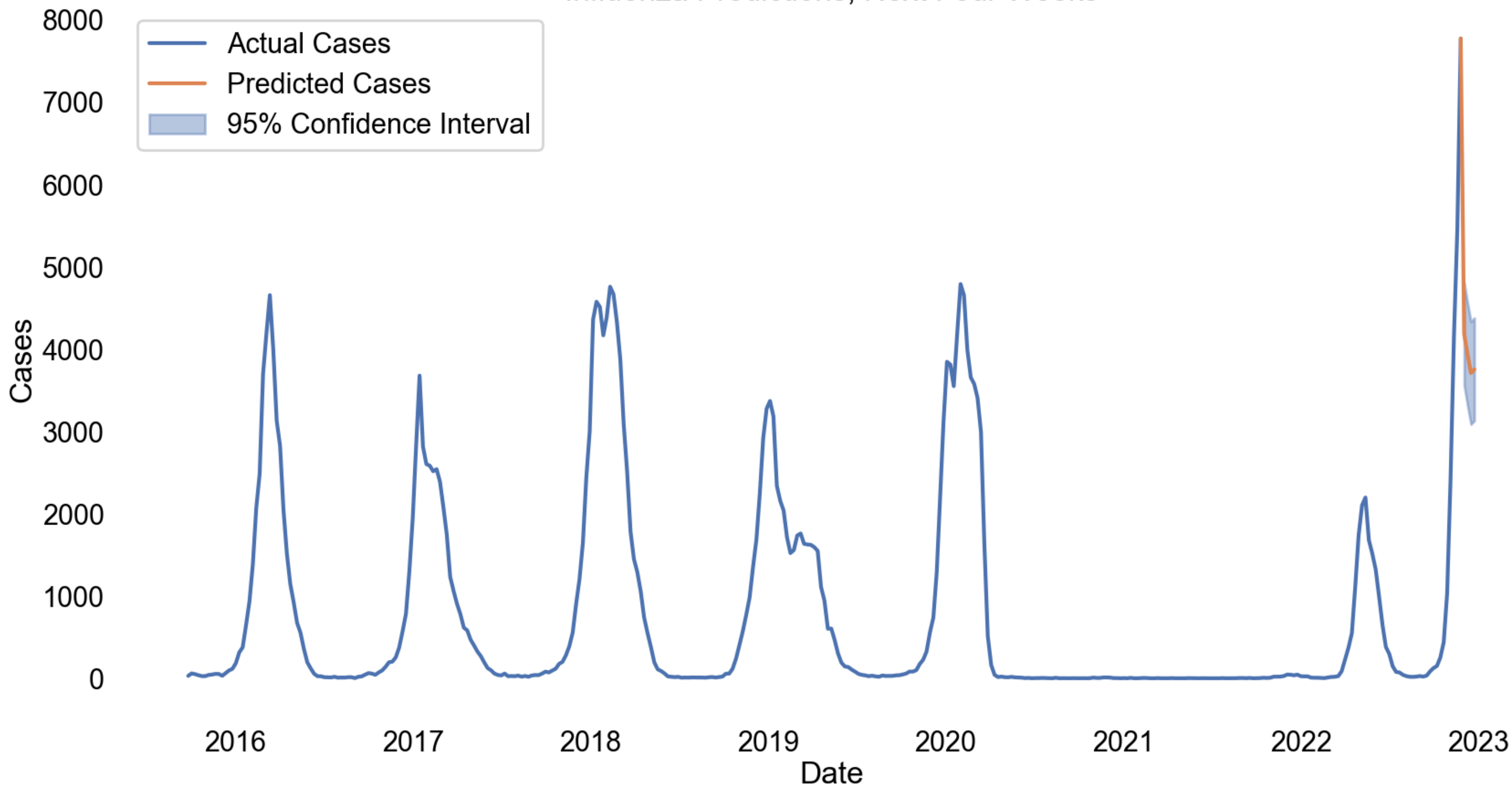
4-week forecast:

Most important
feature = **winter**





Influenza Predictions, Next Four Weeks





Model	RMSE	MAE	R Squared
Gradient Boosting Regressor	222.63	94.66	0.81

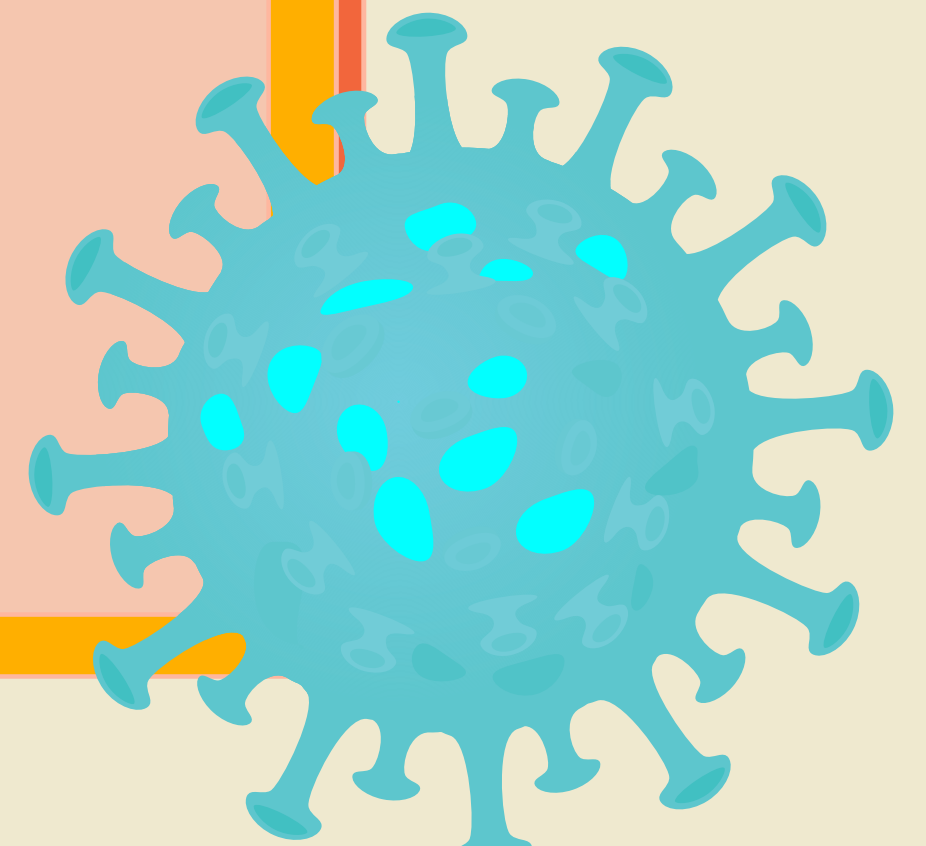
Compared With

Baseline – Moving Average	481.41	190.93	0.73
Benchmarks Viboud C, Boëlle PY, Carrat F, Valleron AJ, Flahault A. Prediction of the spread of influenza epidemics by the method of analogues. Am J Epidemiol. 2003 Nov 15;158(10):996-1006. doi: 10.1093/aje/kwg239. PMID: 14607808. Xia Jiang, Garrick Wallstrom, Gregory F. Cooper, Michael M. Wagner, Bayesian prediction of an epidemic curve, Journal of Biomedical Informatics, Volume 42, Issue 1, 2009, Pages 90-99, ISSN 1532-0464, https://doi.org/10.1016/j.jbi.2008.05.013 .			0.81 – 0.96



Next Steps

- Try other models:
 - Compartmental model with particle filtering
 - Transformer model
- Try other features:
 - Health news article titles





Thank you for listening!

Don't hesitate to ask any questions!

Topic Outline



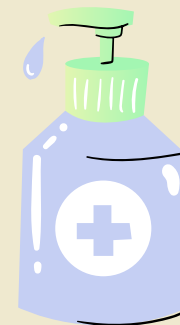
INTRODUCTION



MOTIVATION



WALK-THROUGH



FURTHER
DEVELOPMENTS