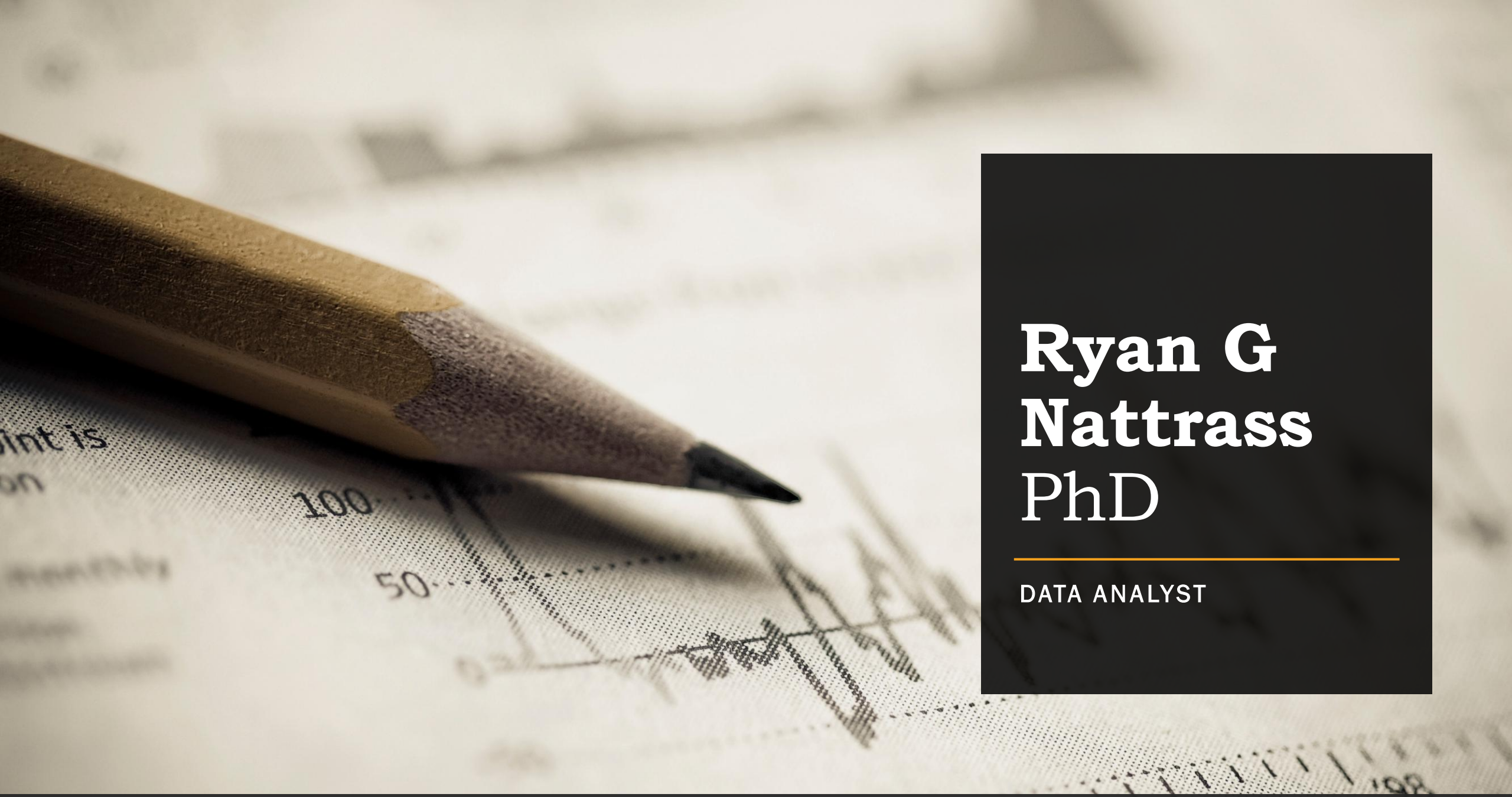


Ryan G Nattrass PhD

DATA ANALYST

2 Influenza Staffing Forecasting

Background: A U.S.-based temporary medical staffing agency needed help planning resource distribution ahead of flu season.

Objective:

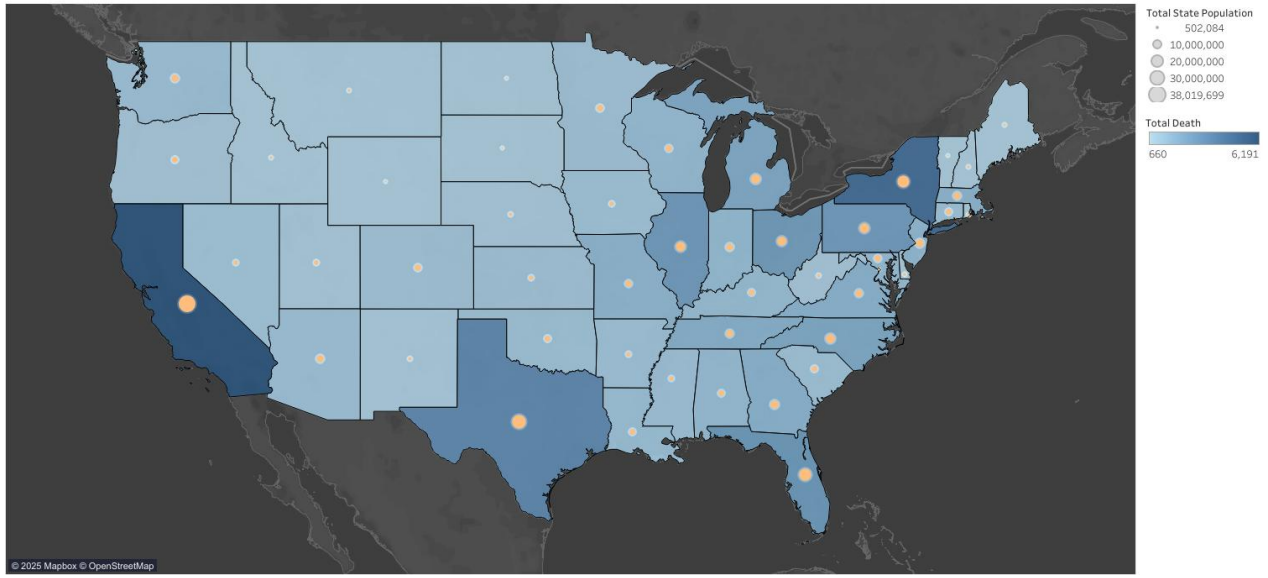
- Determine where, when, and how many staff to deploy based on historical influenza mortality trends.
- Forecast Seasonality
- Rank states on any potential vulnerable populations

Dataset:

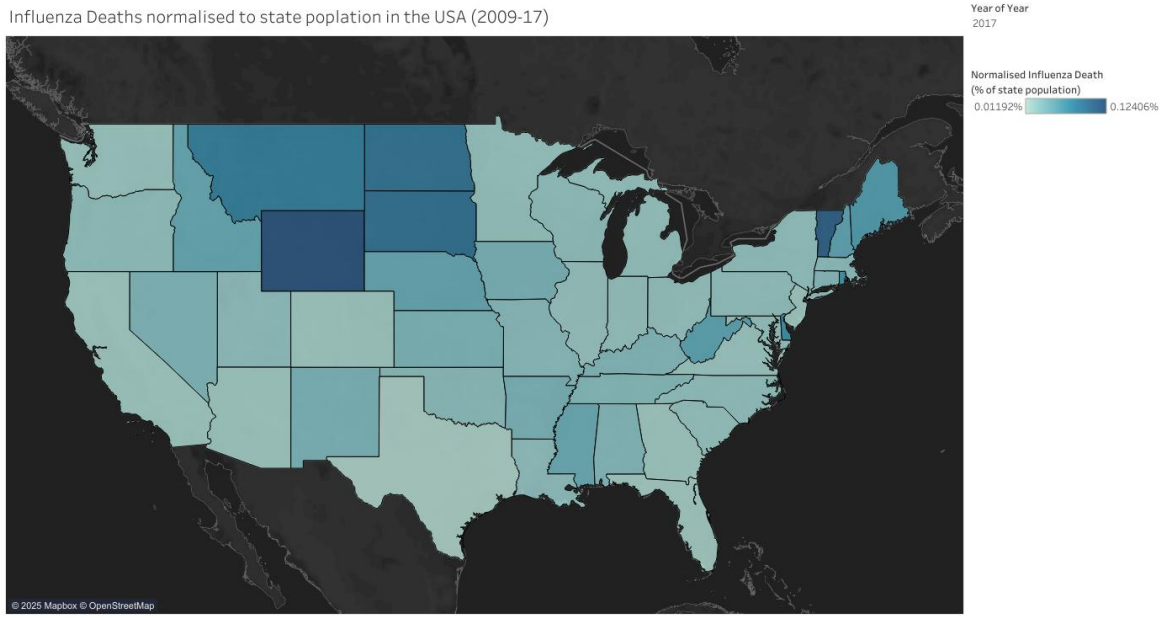
- Influenza death records from CDC (2009–2017)
- U.S. Census population data (by state and age)

2 Normalising Influenza deaths according to state population

Influenza Deaths and state populations in the USA (2009-17)



Influenza Deaths normalised to state poplation in the USA (2009-17)

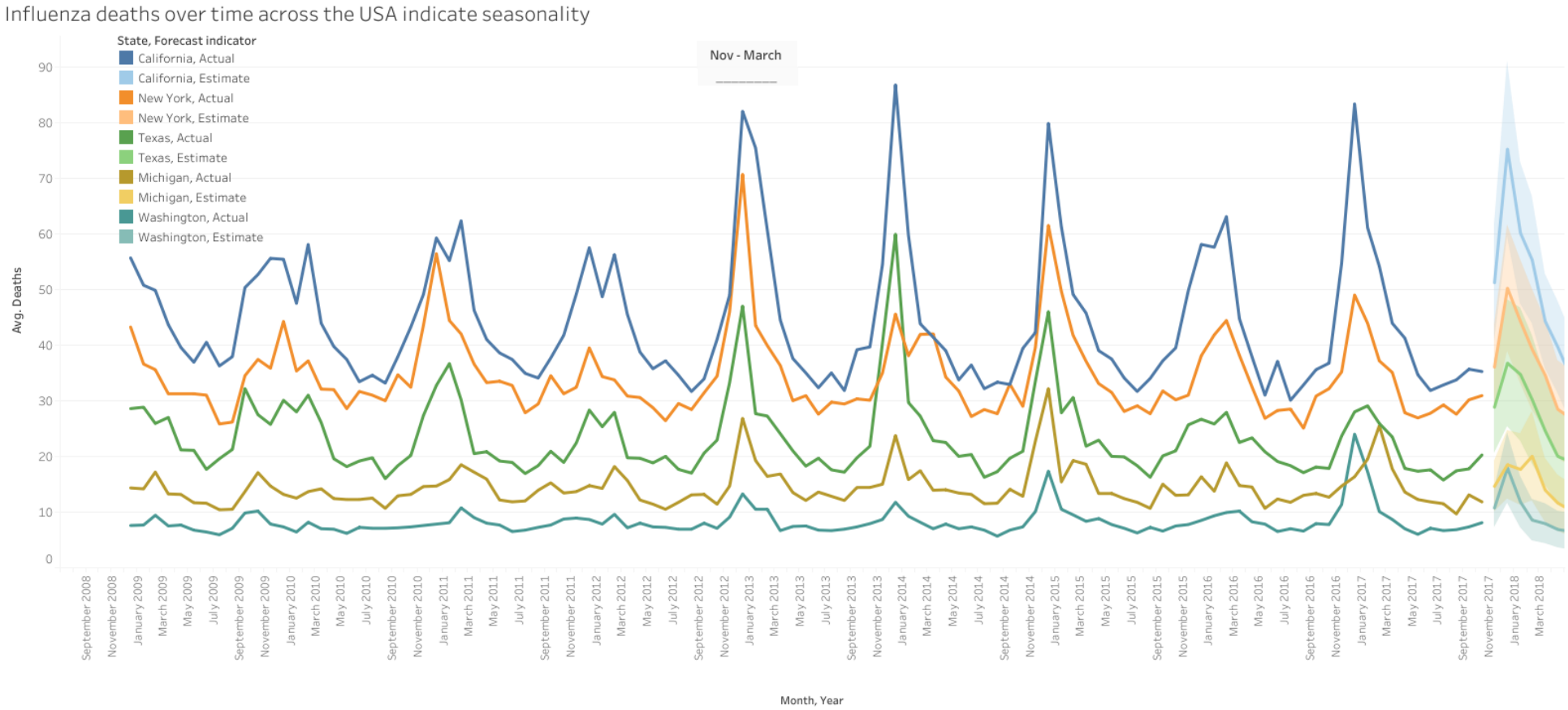


Without normalization the states with highest population have highest deaths

With normalization, states with highest relative influenza death can be distinguished

https://public.tableau.com/app/profile/ryan.nattrass/viz/E2_7Maps/NormDUALSh

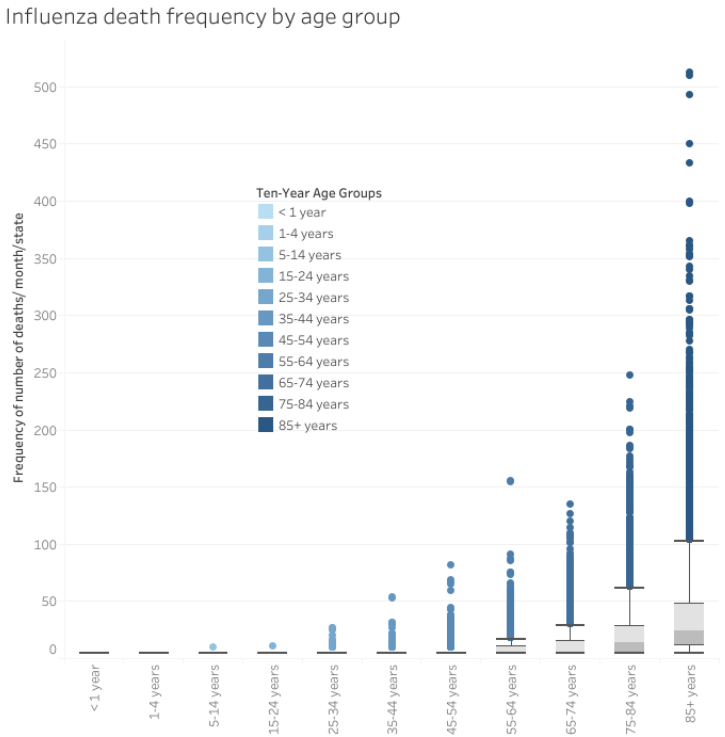
2 Forecasting indicates flu season is between November - March

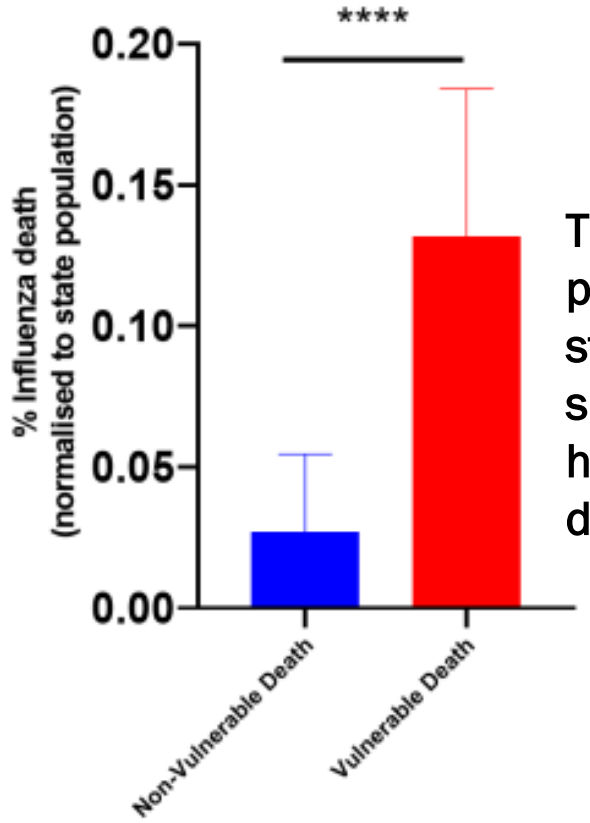


https://public.tableau.com/app/profile/ryan.nattrass/viz/DeathsForecastbyMonth/FinalSh

2 Age indicates influenza vulnerability

Vulnerable population deemed to be over 65 years-of-age





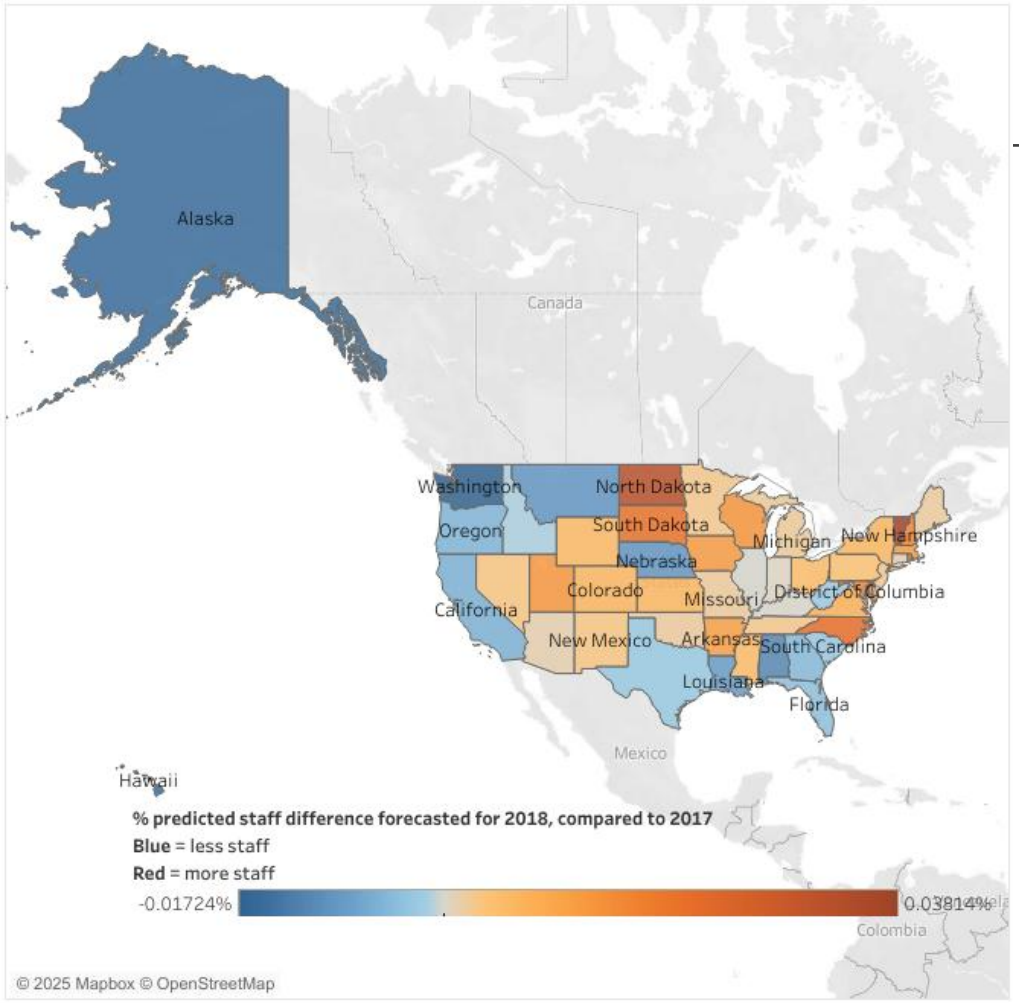
This vulnerable population has statistically significantly higher influenza death

https://public.tableau.com/app/profile/ryan.nattrass/viz/HistoBox/BoxSh

Staffing requirement forecasting

2

Predicted increase in vulnerable population death in 2018 compared to 2017



State	Difference in 2018 from 2017
Washington	-0.0172%
Alaska	-0.0154%
Hawaii	-0.0152%
Alabama	-0.0112%
Nebraska	-0.0094%
Montana	-0.0093%
Louisiana	-0.0084%
California	-0.0056%
Oregon	-0.0052%
Georgia	-0.0045%
Florida	-0.0034%
South Carolina	-0.0023%
Texas	-0.0022%
West Virginia	-0.0018%
Idaho	-0.0013%
Illinois	-0.0001%
Kentucky	0.0000%
Indiana	0.0003%
Connecticut	0.0010%
Arizona	0.0011%
District of Columbia	0.0017%
Maine	0.0017%
Oklahoma	0.0018%
Missouri	0.0018%
Michigan	0.0020%
New Jersey	0.0024%
Tennessee	0.0025%
Minnesota	0.0025%
New Mexico	0.0029%
Nevada	0.0029%
Pennsylvania	0.0036%
Ohio	0.0050%
Mississippi	0.0050%
Wyoming	0.0055%
New York	0.0057%

Blue - Reduce Medical staff
Grey - No suggested change
Orange - Increased medical staff
Red - Significantly increased medical staff

-0.01714% 0.04000%

State	Difference in 2018 from 2017
Colorado	0.0059%
Kansas	0.0060%
Virginia	0.0071%
Delaware	0.0072%
Arkansas	0.0104%
Massachusetts	0.0111%
Iowa	0.0113%
Utah	0.0122%
Wisconsin	0.0125%
Rhode Island	0.0151%
New Hampshire	0.0152%
Maryland	0.0153%
South Dakota	0.0197%
North Carolina	0.0204%
North Dakota	0.0325%
Vermont	0.0381%

Recommendations are that these changes are implemented before November 2018

https://public.tableau.com/app/profile/ryan.nattrass/viz/E2_9Storyboard_RGN_FINAL/DIffinVulnFULLTable