Preparing For The Influenza Season

Medical Staff Agency

Overview

Objective

The objective is to help a USA fictitious Medical Agency to determine where to send staff and how many to each state to plan the next influenza season.

Context

The United States has an influenza season where more people than usual suffer from the flu. Some people, particularly those in vulnerable populations, develop serious complications and are hospitalised. Hospitals and clinics need additional staff to treat these extra patients adequately. The medical staffing agency provides this temporary staff to clinics and hospitals on an as-needed basis.

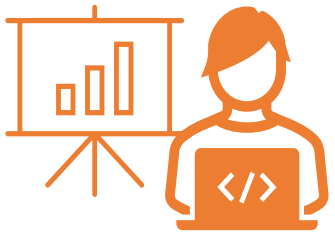
Questions to answer to the Medical Team

1. How to determine where to send medical staff?
2. How is the mortality risk according to Vulnerable and Non-vulnerable populations?
3. Are there any hotspots or more vulnerable states?
4. Which are the predictions for 2018?

Data

1. Influenza deaths by geography, time, age, and gender Source: CDC
2. Population data by geography Source: US Census Bureau

Skills



- Transalating business requirements
- Data cleaning
- Data integration
- Data transformation
- Statistical hypothesis testing
- Visual Analysis
- Forecasting
- Storytelling
- Presenting results to an audience

Tools

GitHub

Click here

Challenges

I took a systematic and detail-oriented approach to overcome the challenge of evaluating influenza data. I familiarized myself with diverse sources of influenza data, developed a comprehensive framework to assess its reliability, and collaborated with experts to validate my interpretations. These strategies enabled me to confidently evaluate the data, leading to informed decisions and recommendations for effective public health measures.

Analysis

Research Hypothesis: If the patient's age is less than 65 years, then influenza does not present a mortality risk because it is not a vulnerable population.

t-Test: Two-Sample Assuming Unequal Variances

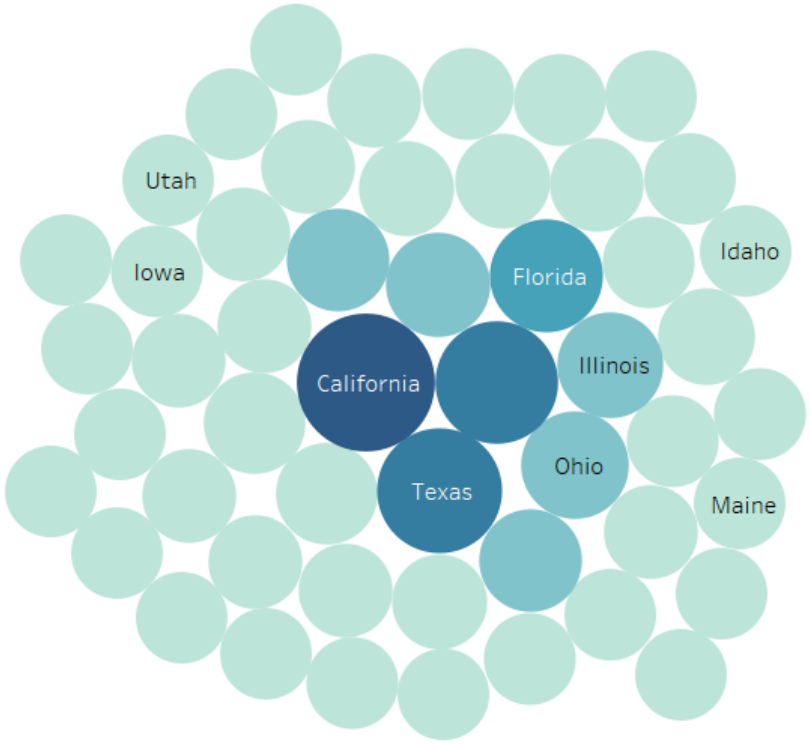
	No- Vulnerable	Vulnerable
	Influenza mortality rate (0-64 years)	*Influenza mortality rate (65+ years)*
Mean	0.0257%	0.1284%
Variance	6.57359E-08	2.24741E-07
Observations	459	459
Hypothesized Mean Difference	0	
df	705	
t Stat	-40.85938537	
P(T<=t) one-tail	2.24E-188	
t Critical one-tail	1.647017862	
P(T<=t) two-tail	4.4883E-188	
t Critical two-tail	1.963334594	

	Population data (0-64 years)	Influenza deaths (0-64 years)	Population data (65+ years)	Influenza deaths (65+ years)
Mean	5278878	541	829430.2	925.5
Standard Deviation	5973747	123	892630.23	1010
Outlier Percentage	4%	6%	0%	4%
Correlation Coefficient	0.93		0.94	

- Mean influenza deaths for elderly people (65+) are almost twice that of people younger (0-64)
- Vulnerable populations (65+ years) will experience higher influenza deaths. Therefore, medical staff will be likely to be located in those areas.

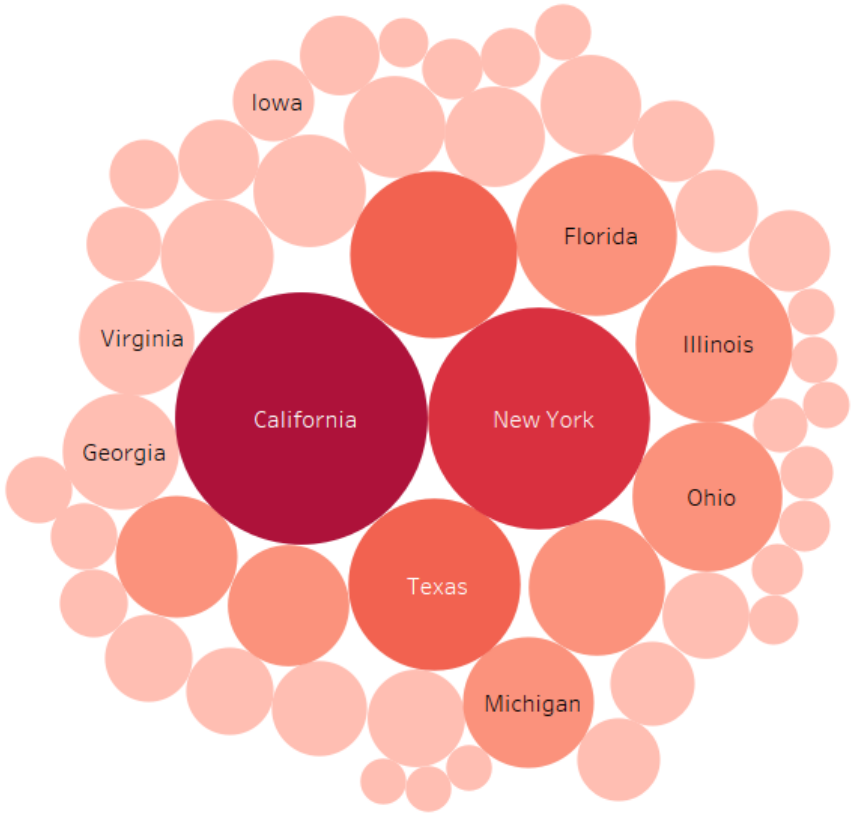
Findings

Non-Vulnerable



Avg. FluDeaths(0-64 years)
480.0 1,090.4

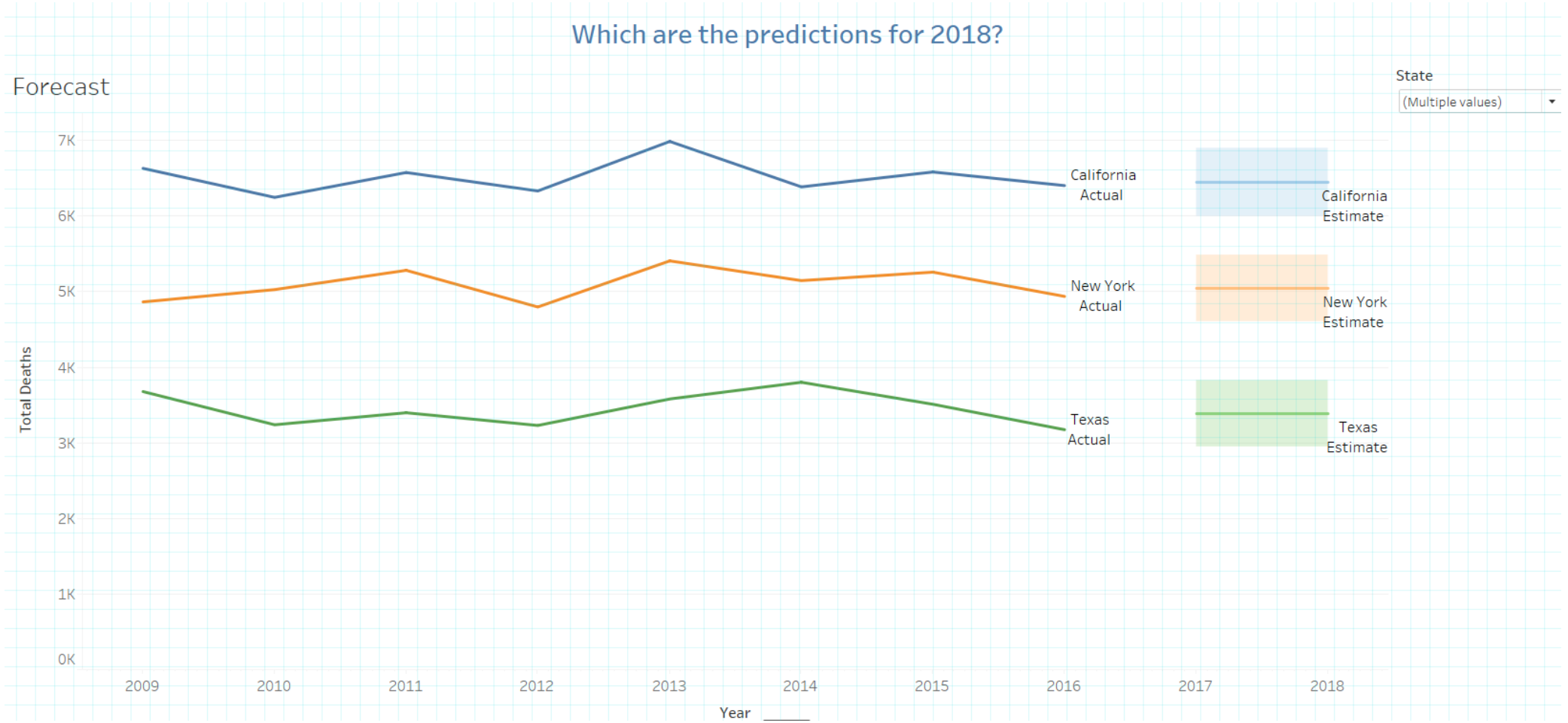
Vulnerable



Avg. FluDeaths(65+ years)
180 5,464

•Average deaths are higher for the Vulnerable population •California, New York, and Texas are the main hotspots.

Findings



- **There will be an increase of at least 40 deaths in 2018 in the three main hotspots**

Recommendations

Report here

01 — 02 — 03

Target market

- Determining where to send more medical staff could be directed according to hotspot states.

Target

- Distribution of medical staff should be done according to the number of vulnerable people in each state.

Future Plan

- Medical staff forecasting should be done before the beginning of every influenza season.