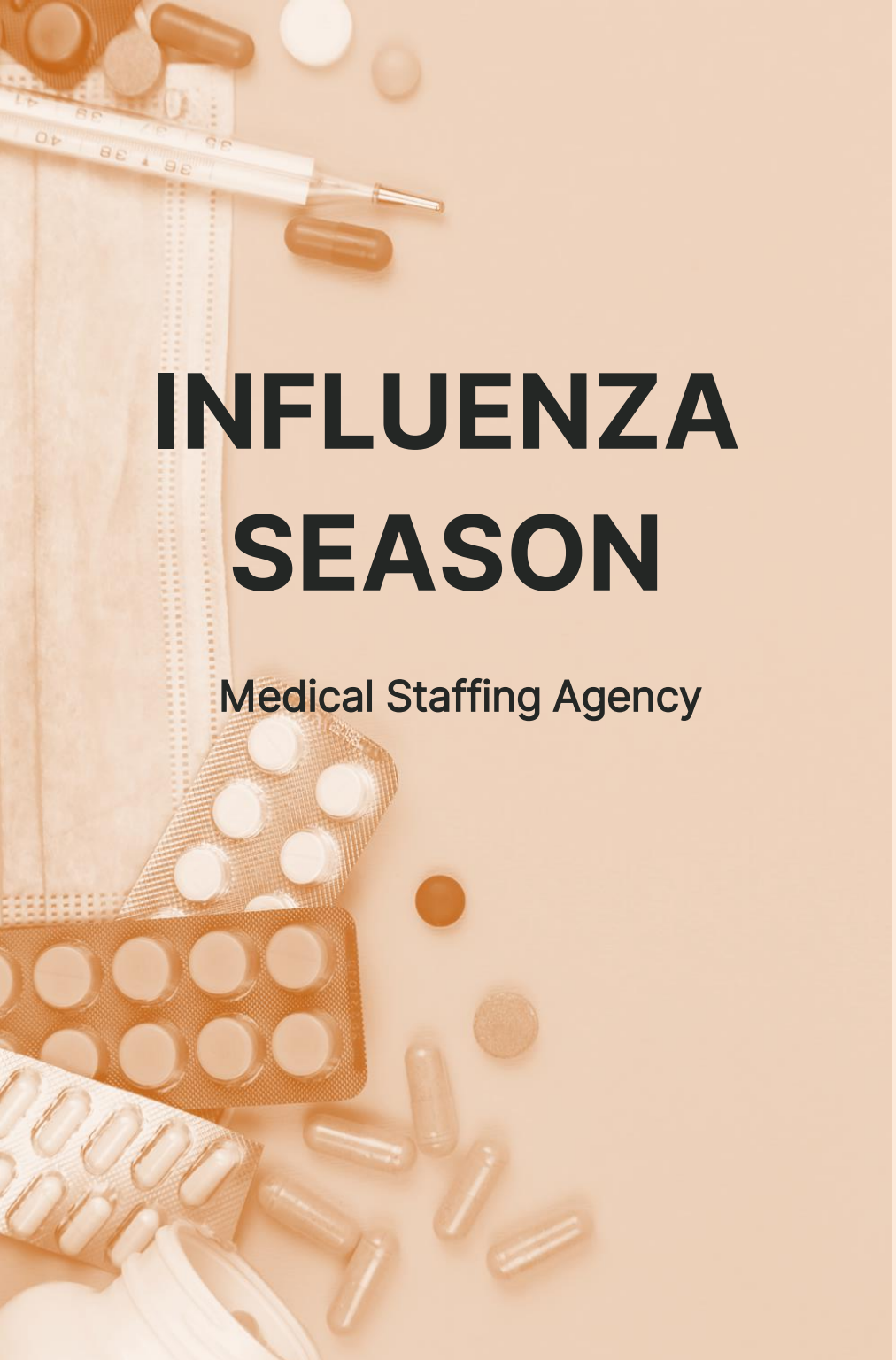


INFLUENZA SEASON

Medical Staffing Agency

3

A medical staffing agency needs to plan for the number of temporary staffs they should send to hospitals and clinics across U.S. to adequately treat patients with serious complications in the upcoming influenza season.

Click the links to view:

Tableau Storyboard | Video Presentation

Interim Report

Project Overview

Medical needs Analysis

- Census population and deaths in ten-year age groups of different states (2009-2017)
- Comparison of medical staffing needs in counties
- Influenza Season in 2018 prediction

Data

- Dataset: Influenza death data and Population data (Excel-CSV).
- Data source: Totally around 100,000 entries from CDC and U.S Census Bureau.
- Region: U.S.
- Information: State, County, Year, Population in age groups, Deaths

Skills

• Excel • Tableau • Word • Data cleaning • Data integration • Data transformation • Statistical hypothesis testing • Visual analysis • Forecasting • Tableau dashboards • Presenting results

Hypothesis Testing

Hypothesis Formulation

If there is more vulnerable population in a state, then the flu-related deaths would also be higher.
A standard-level significance level, alpha = 0.05 would be applied.

Null Hypothesis:

When a state has more vulnerable people, there will be less or equal deaths cases.

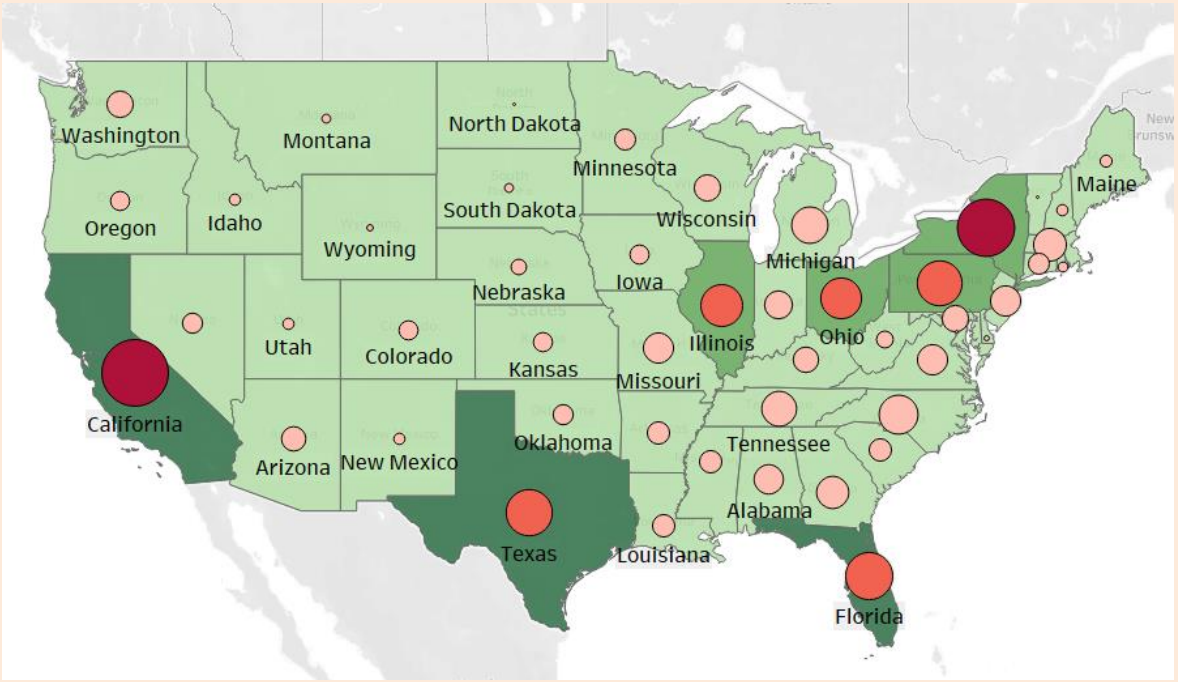
Alternative Hypothesis:

When a state has more vulnerable people, there will be more deaths cases.

Interpretation:

Since P-value is way smaller than alpha, we can reject null hypothesis accordingly and conclude that it is not by chance vulnerable people with higher death risk. Therefore, states with higher vulnerable population should be assigned with more additional staffing.

t-Test: Two-Sample Assuming Unequal Variances		
	Vulnerable population	*Total Death*
Mean	1193271.579	905.0522876
Variance	1.76152E+12	1332863.727
Observations	459	459
t Stat	19.24742351	
P(T<=t) one-tail	3.14E-61	
t Critical one-tail	1.648187415	

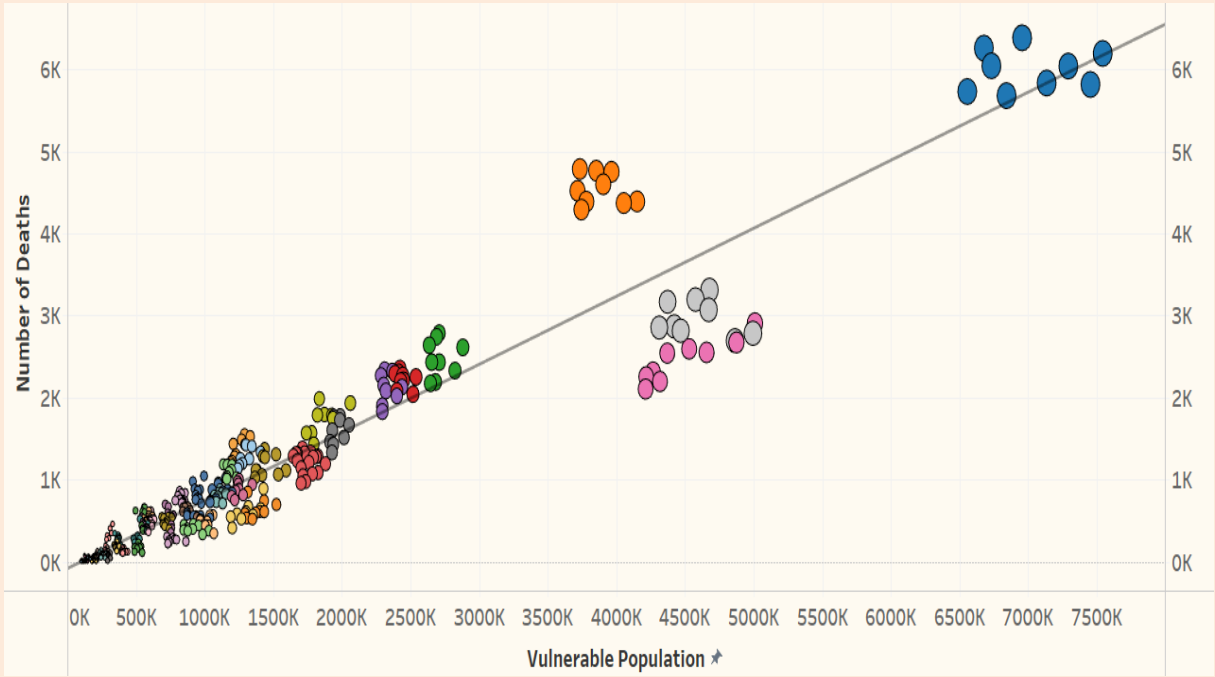


Spatial Analysis

I have integrated the number of vulnerable population and total deaths from 2009 -2017 in a map chart to have a general view of high-needed states. We can see inconsistency between these two variables, so their relationship would be investigated further in statistical visualization.

Statistical Visualization

Scatterplots and bubble charts are integrated to investigate the relationship between two key variables. We can use the distance between the circles and the line to tell exactly to which state and how many temporary staffs should be sent.



Conclusion

Insights and Recommendations

Insights

- Vulnerable population only make up 20 % of total population, but they consist of 90% of total deaths.
- Vulnerable population and total deaths have strong positive relationship. That is, we can use the number of population to presume medical staffing needs in each state.
- Vulnerable population count adjusts the staffing and prioritizes California, Texas and Florida over New York although it has higher deaths.

Recommendations

- **90% staffs** should be assigned to **New York**
- **10% staffs** should be sent to **California**
- If extra staffs are still available, they should then be assigned to **Pennsylvania, Illinois, and Ohio**.

They have relatively high vulnerable population and deaths.

- Staffs should be sent out to the high-needed states **before December 2017**, so that they can help the hospitals in time.

Further Step

See if there are data sets concerning vaccinated population by age group, flu-related hospitalization and average staff-patient ratio during flu-season by state. Further analyzing these data sets can help us improve the staffing plan.