

PREPARING FOR INFLUENZA SEASON - INTERIM REPORT

Project Overview

- **Motivation:** 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 end up in the hospital. Hospitals and clinics need additional staff to adequately treat these extra patients. The medical staffing agency provides this temporary staff.
- **Objective:** Determine when to send staff, and how many, to each state.
- **Scope:** The agency covers all hospitals in each of the 50 states of the United States, and the project will plan for the upcoming influenza season.

Data overview

Total population: This data shows the total population in a particular state.

Over 65 years population: This data shows the total population of people aged over 65 years in a particular state.

Data limitations

Total Population: This is an administrative data. The data is collected every ten years since 1970 by United States Census Bureau. The yearly data are estimations, it is entered manually and is prone to human errors.

Over 65 years population: It is an Administrative data, This data is extracted from the US Census data, it is collected every ten years since 1970 by United States Census Bureau. The yearly data are estimations, it is entered manually which makes it prone to human errors.

Descriptive Analysis

Data Spread

| Core Variables | Mean | Standard Deviation | Variance | Outlier % |
|--------------------------|---------------|--------------------|---------------|-----------|
| Total Population | 151 million | 6.9 million | 48.2 trillion | 0 |
| Over 65 years Population | 13.5 thousand | 30 thousand | 906 million | 0 |

Correlation

Proposed Relationship: Increase in the total population leads to increase in the population of people over 65 years.

Correlation Coefficient: 0.41

Strength of Correlation: Moderate

Usefulness/interpretation: This means if a state have a higher total population, then we should expect to have more population of people over 65 years.

Results and Insights

Null hypothesis: High population in a state leads to low population of over 65 years.

Alternative hypothesis: High population leads to high population of over 65 years.

P-value(2-tailed test) = 1.98E-58

Significance level(α) = 0.05(95% Confidence level)

P-value(2-tailed test) < Alpha(α)

With a confidence level of 95% I have been able to reject my null hypothesis.

Conclusion: The result of my analysis shows that, an increase in the state total population will lead to an increase in population of over 65 years and vice versa.

Remaining Analysis and Next Steps

- I still need repeat the analysis with additional data(such as ; flu shot received by the vulnerable, test result of the vulnerable after flu shot) because, the current data set does not support my initial hypothesis "If the vulnerable receive a flu shot, then their

chance of being infected with the flu is reduced" , i had to refine the hypothesis to the current one.

- Inclusion of spatial and temporal visualizations in the final deliverable.
- Prepare a presentation for the stakeholders.

Appendix

Project Requirements

- Provide information to support a staffing plan, detailing what data can help inform the timing and spatial distribution of medical personnel throughout the United States.
- Determine whether influenza occurs seasonally or throughout the entire year. If seasonal, does it start and end at the same time (month) in every state?
- Prioritize states with large vulnerable populations. Consider categorizing each state as low-, medium-, or high-need based on its vulnerable population count.
- Assess data limitations that may prevent you from conducting your desired analysis.

Hypothesis

Clarifying questions

- a. Which states have the most residents in vulnerable populations?
- b. How will the flu shot be administered.
- c. Which state have the highest number of staff available?

Funneling questions (b) How will the flu shot be administered.

- a. which state have the most vulnerable population.
- b. Which state have received the most flu shot?
- c. Is the ratio of flu shot given to vulnerable the same in every state.

Sources

www.cdc.gov

www.census.gov

Data Overview/Illustration

Top Ranked States by Percentage Ratio of Over 65 years to Total Population (2017)

| State | Over 65 / Total Population |
|---------------|----------------------------|
| Connecticut | 3.9206% |
| Delaware | 2.8963% |
| Hawaii | 2.5484% |
| Wyoming | 1.0550% |
| Massachusetts | 0.8959% |
| Rhode Island | 0.8861% |
| California | 0.5384% |
| New Jersey | 0.4886% |
| New Hampshire | 0.4368% |
| Maine | 0.4304% |

