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.

Research Hypothesis:

''If most people were vaccinated, many people won't die. The more the vaccination the lesser the death.

Data Overview: Population data by geography & Influenza deaths

Source: the data was collected by US Census Bureau with various information which contains the following below:

County, Year, Total Population, Male and Female Total Population, Age group categories: Under 5, 5-9, 10-14, until 85 years and above

Influenza deaths data - Data was also collected by the US Census Bureau which has the following information of Influenza deaths across the states in the US. The details contained in the data are:

State, Year, Months, Ten - age groups, and Deaths

DATA LIMITATIONS

Data Set: After going through the data, I notice the dataset was gathered by surveillance systems which uses the online applications to have more details or monitors influenza data. There is every possibility of typos and errors during this collection of data. Also, there was a lot of suppressed records which indicates errors and missing values.

DESCRIPTIVE ANALYSIS:

	Influenza Death of under 5 and above 65years	*Total Population of under 5 and above 65years*
VARIANCE	1028483.747	1.77862E+12
STANDARD DEVIATION	1014.141877	1333650.734
MEAN	826.2875817	1223780.938

The above analysis shows the correlation between the Influenza Death and total population, which indicates a strong relationship (0.91), and this also implies that as the population increases, the Influenza death also increases.

RESULTS AND INSIGHTS:

My cleaned data and research hypothesis was used to carry out the hypothesis test using the sample data. A two-tailed test with a significance level of 0.05 alpha (95% confidence) was used to conduct this analysis which also indicates (P-value 5.79E-45 < 0.05) then we reject the null hypothesis.
Null Hypothesis - The influenza death rate of older people aged 65 years is less than or equal to younger people under 65 years old
Alternative Hypothesis - The influenza death rate of older people aged 65 years is more than people who are younger than 65 years old

REMAINING ANALYSIS AND STEPS:

- Get a feedback from your stakeholders regarding the interim report
- Prioritize states with low, medium, and high, based on their influenza death rate
- Create visualization, storyboard, and presentation

APPENDIX:

Requirement

- 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 analyses.

HYPOTHESIS DEVELOPMENT

- What triggered the flu?
- Where does the flu begin from?
- Why is the flu spreading all over the United States?
- How long has the flu rate been increasing?

Data Profile:
Population data by geography -
County, State, Year, Total Population, Population of Male, Total Population of Female, and Age groups from under 5 to 85 years and above.
Influenza Deaths:
State, Year, Month, Ten-year group, and Deaths
Time period:
2009 – 2017
Source:
https://www.cdc.gov/
https://www.census.gov/