Preparing for Influenza Season: Interim Report

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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 patients are adults aged 65 years and over, then they are more likely to be affected by influenza mortality.

Data Overview

Data	US Census Data Set
Source	US Census Bureau
Contents	The data contains annual population records from 2009 to 2017 by geographic and demographic characteristics such as state, county, age and gender.
Limitations	Since the data is entered manually, this makes it subject to possible typos and is prone to erroneous data. On the other side, as there are annual periods between data collection, these gaps might affect the data.

Data	Influenza Deaths
Source	Centers for Disease Control and Prevention (CDC)
Contents	The data contains total influenza death records from 2009 to 2017 by geography, time, age, and gender.
Limitations	The data is a survey data collected at times and manually, this makes it subject to time lag and possible typos. Since there might be information gathered from a specific group, it could be biased.

Descriptive Analysis

Core Variable	Population over 65 years old	Deaths over 65 years old
Mean	826.267,51	910,63
Standard Deviation	890.687,84	963,45

Correlation between Population over 65 years old and Deaths over 65 years old:

Correlation Coefficient	0,94
Strength of Correlation	Strong
Usefulness/Interpretation	It supports the suggested hypothesis that old people are more likely to be affected by influenza mortality.

Results & Insights

Statistical hypothesis and interpretation:

Independent Variable	Age Group
Dependent Variable	Influenza Death Rate
Null Hypothesis	The influenza death rate of people under 65 years is greater than or equal to the death influenza rate of people aged 65 years and over.
Alternative Hypothesis	The influenza death rate of people aged 65 years and over is greater than the death influenza rate of people under 65 years.
Two-tailed or one-tailed test?	One-tailed
Significance Level	Alpha = 0,05
P-value	3,9363E-141
Significance Level Assessment	The p-value is significantly less than 0.05. Thusly, we can reject our null hypothesis and state that the influenza death rate of people aged 65 years and over is greater than the death influenza rate of people under 65 years at confidence level of 95%.

Remaining Analysis & Next Steps

To prepare for the coming influenza season overall and to steer our medical staff effectively to decline influenza mortality rates, some additional steps are required.

- Analyzing states to find out where there are more people aged 65 years and over.

- Examination of the data set, which includes the number of medical staff available for the coming influenza season and the historical medical conditions of the past flu seasons.

- To investigate the flu shots data in relation to people are from stated age group and determine how the flu shot affect mortality rates in this population.

- Creating dynamic reports or dashboards by using Tableau to visualize results and keep stakeholders up to date.

- To prepare presentation regarding to final obtained results of analysis in an attempt to help decision makers to designate possible interventions.

Appendix & Additional Resources

Data Research Project

Statistical Hypothesis Testing

Centers for Disease Control and Prevention (CDC): https://www.cdc.gov

US Census Bureau: https://www.census.gov

Glossary

Influenza: a contagious viral infection, often causing fever and aches.

Vulnerable populations: patients likely to develop flu complications requiring additional care, as identified by the Centers for Disease Control and Prevention (CDC). These include adults over 65 years, children under 5 years, and pregnant women, as well as individuals with HIV/AIDs, cancer, heart disease, stroke, diabetes, asthma, and children with neurological disorders.