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Task 1.10, A1

Interim Report: "Preparing for Influenza Season"

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.

Hypothesis:

"If the populations of 65+ years age increases, then the higher the risk of hospitalization and death of that same age group."

Data Overview

- Population data: It contains the census data of population of U.S. from the year 2009 to 2017
- Influenza Death data: It contains monthly death counts for influenza-related deaths in the United States from 2009 to 2017.

Limitation of Data:

- The Problematic issue is that deaths on a death certificate only list one cause of death which create some discrepancies within vulnerable populations who suffer from other diseases such as AIDs.
- One other issue that most of death counts are suppressed because of patients' privacy.

Descriptive analysis

Variables	Data Death 65+ Y	Data Population 65+Y
Data type	Sample	Sample
Distribution	left skewed	left skewed
Variance	1035285.836	5.41636E+11
Standard Deviation	1017.489968	735959.4042
Mean	842.8133333	626542.176

Correlation

Variables	Data Death 65+ Y & Data Population 65+Y
Proposed Relationship	Positively correlated means as population increases vulnerable 65+ age death increases
Correlation Coefficient	0.87
Strength of Correlation	strong correlation
Usefulness / Interpretation	as the population of 65+ years age increases, the more the death of people of that same age will be.

Results and insights

Hypothesis: "If the populations of 65+ years age increases, then the higher the risk of hospitalization and death of that same age group."

Null hypothesis H0: increasing of population of 65+ years age does not lead to increase the death of that same 65+ years age.

Alternative hypothesis Ha: increasing of population of 65+ years age increases death of that same 65+ years age.

- **This is a one tailed test** because I am focusing on detecting the effect in one direction. In other words, detecting if the increase in 65+ aged Population will increase the death of that same 65+ age group.
- **p value**= 2.43147E-45 which is much lower than the significance level of α= 0.05.
- **T- test:** since the p value is lower than the significance level 0.05, the null hypothesis will be rejected. That means we accept the (Ha):" population of 65+ age are more likely to die from Influenza than the age group under 65+".

Remaining analysis and next steps

- In order to determine how many medical staffing who have to be sent to each state of U.S., states with higher vulnerable 65+ age group should be identified.
- For the final presentation, the results will be presented nicely using spatial, and temporal visualizations.

Appendix

- Project brief: Project Brief
- Influenza deaths by geography CDC: https://wonder.cdc.gov/
- Population data by geography, time, age, and gender, US Census Bureau: www.census.gov/topics/population.html