



# PREPARING FOR INFLUENZA SEASON

## Interim Report

IBIYEYE TOSIN

# Table of *Content*



<b>01</b>	<b>Project overview</b>
<b>02</b>	<b>Hypothesis</b>
<b>03</b>	<b>Data overview</b>
<b>04</b>	<b>Data limitations</b>
<b>05</b>	<b>Descriptive analysis</b>
<b>06</b>	<b>Results and insight</b>
<b>07</b>	<b>Remaining analysis and next steps</b>
<b>08</b>	<b>Appendix</b>

**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.

## Hypotheses:

Patient with age above 65 if infected with Influenza flu have high risk level of death if not well treated and managed. \_ **“if patient with age above 65 is infected with Influenza flu they more die from the infection.”**

## Data Overview:

**Influenza Deaths Data Set:** This dataset comprises monthly counts of deaths attributed to influenza in the United States spanning the years 2009 to 2017. The counts are categorized by state and 10-year age groups.

**Population Census Data Set:** This dataset from the Census presents population statistics for the United States spanning the years 2009 to 2017. The counts are categorized by age, gender, month, and year.



# Data limitations



## Limitations Influenza Deaths Data Set

**Inaccuracies:** the influenza data set contained suppressed values for any death count that was less than 10.

**Inaccuracies:** The influenza data set was collected via manual survey method, the survey introduces the potential for human error

## Limitations Population Census Data Set

**Inaccuracies:** Census data set are estimates and may not be completely accurate

**Inaccuracies:** Census data set was collected from surveys, data might be missing or surveys also introduce bias into data set.

# Descriptive analysis

A descriptive analysis to assess the data quality, calculating the mean, standard deviation, and percentage of outliers to evaluate the spread of the data.

	Influenza Death 65+	Population Census 65+	non-vulnerable Influenza death (5 - 64 )	non-vulnerable Population Census (5 - 64 )
Mean	895.45	810474.52	387914.01	4715713.33
Standard Deviation	977.31	888804.44	457945.52	5049070.36
Outliers Count	18	29	18	18
Outlier Percentage	4%	6%	4	4

A study on correlation coefficients was undertaken to examine the connection between the population.

The correlation between Coefficient the total population of people aged 65+ with the number of deaths for influenza in the same age range is 0.945311993, very strong correlation.

The correlation between Coefficient the total population of people aged between 5 -64 with the number of deaths for influenza in the same age range is 0.993145089, very strong correlation.

# Results and insight



## Hypothesis.

### Null Hypothesis :

There is no difference in the Influenza flu Mortality rate between Vulnerable population (65 Year Above) and Non Vulnerable population (5 - 64 years) Age grouping

### Alternative Hypothesis :

The patient with age 65 above if infected with influenza flu have significant higher risk mortality than those Non Vulnerable population (5 - 64 years)

t-Test: Two-Sample Assuming Unequal Variances		
	Vulnerable Influenza Death 65 Above	Influenza Death non-vulnerable (5 - 64 years)
Mean	895.4539474	385.3004386
Variance	955142.7363	15682.25459
Observations	456	456
Hypothesized Mean Difference	0	
df	470	
t Stat	11.05637666	
P(T<=t) one-tail	1.02148E-25	
t Critical one-tail	1.648102128	
P(T<=t) two-tail	2.04296E-25	
t Critical two-tail	1.965024172	

## P-value (one-tailed):

The  $P(T \leq t)$  one-tail value is  $1.02148086405311E-25$ , the P-value is below the significance level of 0.05, which means we can reject the null hypothesis with a 95% confidence level. the interpretation is that there is a significant difference in the influenza flu mortality rates of the two age group, the influenza flu mortality rate in the Vulnerable Population (65 above) and is significant higher than the Non Vulnerable population (5 - 64 years)

## Results of test:

We have proven that Vulnerable Population (65 above) have a higher chance of dying from the influenza flu than Non Vulnerable population (5 - 64 years).





# Suggestion and and next steps

Conduct further analysis of the US Population to determine the state and region with higher Vulnerable Population (65 above) for adequate frontline staffing

Conduct an investigation to determine underlying risk factor for the high mortality rate for age group 65 above

Create a plan that prioritizes the vaccination of Vulnerable Population (65 above)