Kyle Stanford
Data Analytics Immersion – Exercise 2.9

Storytelling with Data Presentations

Tableau Link:

https://public.tableau.com/shared/T8PB5ZX9S?:display_count=n&:origin=viz_share_link

Beginning

- ***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.
- **Provide brief outline of what influenza is and how it affects people**
- **Provide Line Chart – Influenza Deaths in the U.S. overtime**

Middle

1) Dashboard to show people 65 years or older are a vulnerable population
    - **Pie Chart** – Show proportion of influenza deaths in 65+ group and under 65 group
        - Add annotations to show percentages and exact number
    - **Column Graph** – Show proportion of influenza deaths between above groups across multiple years
        - Add year filter to look at all years or focus on specific years.
    - **Text to summarise** - 65 years or older population accounts for majority of influenza-related deaths across the U.S.
2) Dashboard to show distribution of vulnerable population
    - **Combination Map** – Show population of 65+ group across all states (colour) and number of deaths (symbol size)
        - Add highlighted to show state on map
    - **Bar Chart** – Show top states by population to make comparisons easier
        - Use bars as filter to isolate states on combination map
    - **Text to summarise** – highlight the states with the largest populations also have the greatest influenza deaths count of 65+ year old people.

3) Dashboard to show influenza seasonality
    - **Line chart** – shows trends in flu death count across different months between 2009 and 2017
        - Add year filter to switch between specific years or all years.
    - **Column chart** – shows influenza deaths by month
        - Year filter should also affect the columns
    - **Text to summarise** – key takeaways including the seasonality of influenza (starts in December and lasts until March/April)

End

- **Conclusion** – restate that influenza is seasonal and leads to high death rates amongst the elderly.
- **Recommendations** – split states into different priority levels for which staffing plans should be made in accordance to (high, medium, and low status).
    - States with high priority status should be listed and considered first for additional staffing.
    - States with a medium priority status should be listed and considered second for additional staffing.
    - Staff should be sent in November or December and relieved by March or April
    - Another map should be made to support this listing (priority based on state colour – colour based on deaths 65+)
- **Next steps** – advise that a further analysis into hospital staff-patient ratios could benefit this project by identifying where shortages are occurring across the states.

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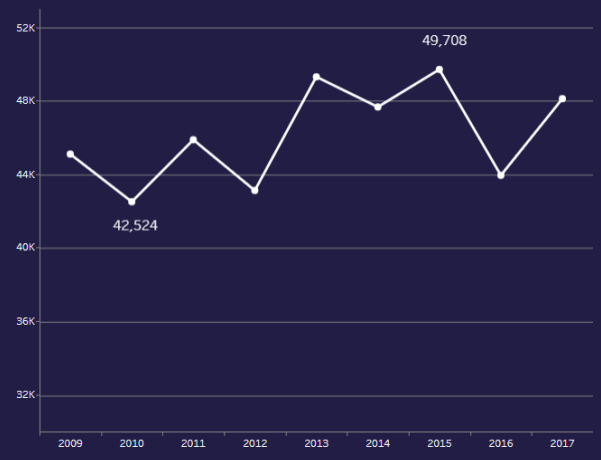
Project Overview - Staffing for Influenza Season

Deaths from Influenza in the U.S. (2009-2017)



Influenza is a viral disease affecting the respiratory system. In severe cases, influenza can be fatal. In the U.S., more than 40,000 people die from the virus each year.

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.

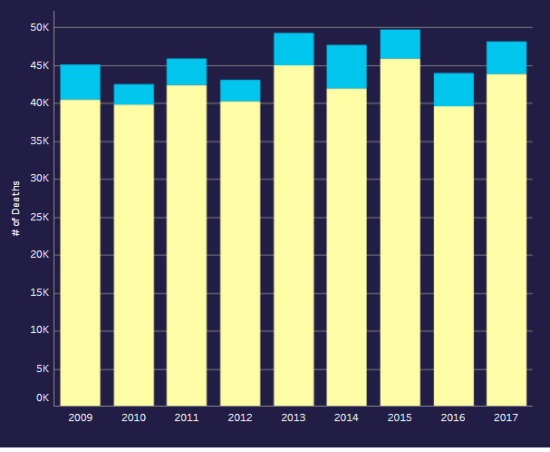
Scope

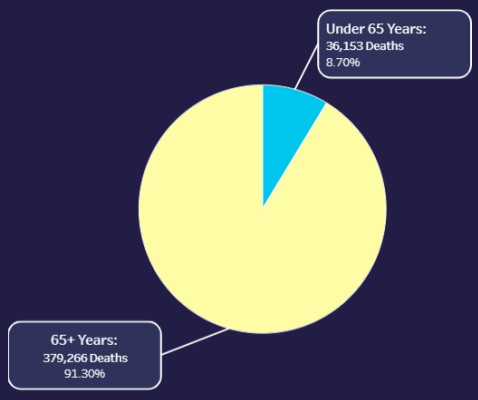
The agency covers all hospitals in each of the 50 states of the United States, and the project will plan for the upcoming influenza season.

Who is Affected by Influenza the Most?

Who can be affected?
Every person regardless of age, race, or any other identifying factor can become infected with influenza.

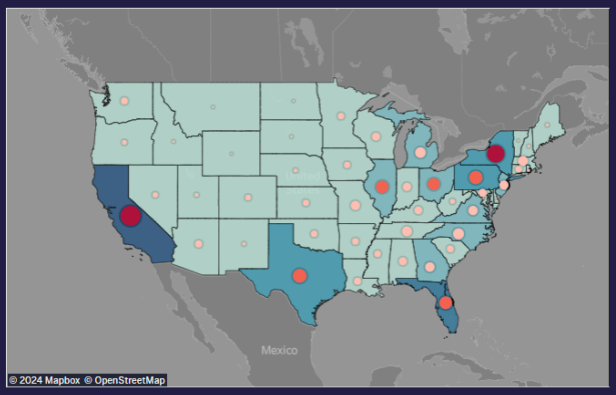
Who is most affected?
Some demographics, who will be referred to as **vulnerable populations**, have a greater risk of experiencing more serious medical complications from influenza, such as death. An analysis of the data highlighted **people over 65-years-old** to be a significant vulnerable population.





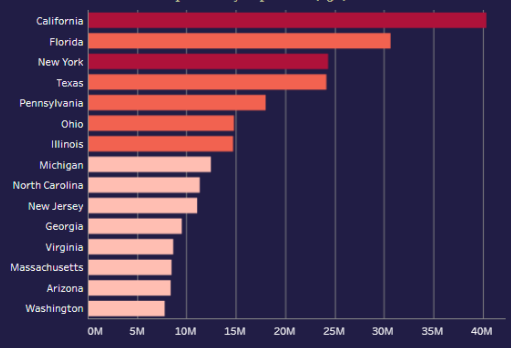
Distribution of Vulnerable Population (65+ Years) Across the U.S.

Population and Influenza Deaths in the U.S. (2009-2017) for 65+ Years People



*Click each bar to highlight the state on the map or use the search bar to the right

Top States by Population (65+)



Highlight State

Year
(All)
2009
2010
2011
2012
2013
2014
2015
2016
2017

Population (65+)
57,991 — 4,484,000

Influenza Deaths (65+)
0 — 47,483
0 10,000 20,000 30,000 40,000 47,483

Where is the vulnerable population (65+) located?

Perhaps unsuprisingly, the U.S. states with the largest 65 years and older populations also experience the greatest number of deaths for this group (this was previously supported through an analysis in Excel showing a strong correlation between these variables).

Is there an Influenza Season?

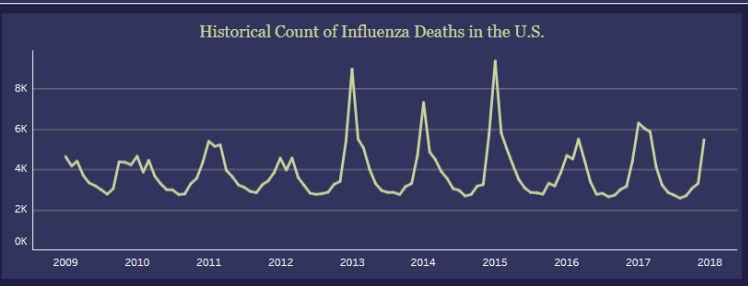
Key Takeaways

- Influenza is a seasonal illness that peaks in colder months.

- Influenza Season typically begins in December and finishes in March/April.

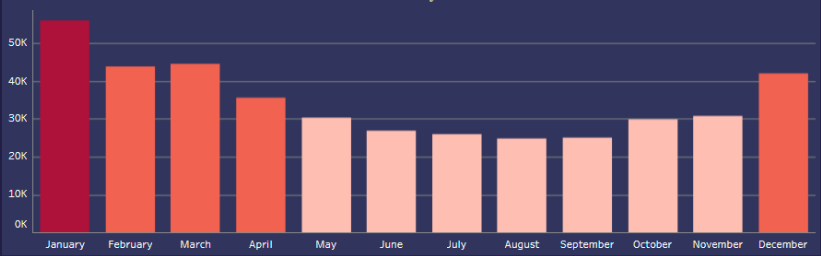
- The peak of influenza season, when the greatest number of deaths occur, is usually January

Historical Count of Influenza Deaths in the U.S.



Year
(All)
2009
2010
2011
2012
2013
2014
2015
2016
2017

Total Influenza Deaths by Month in the U.S.



Death Count
24,782 — 55,802

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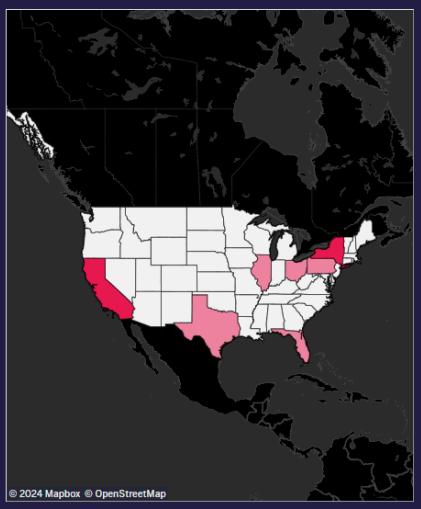
Project Overview | Who is Affected? | Where are Vulnerable Populations Located? | When is Influenza Season? | Conclusion, Recommendations, Next Steps

Where to from Here?

U.S. States by Staffing Priority



Priority (Assigned by 65+ Influenza Death Count)

0 — 47,483

Highlight State

Highlight State

State	Priority
California	1
New York	2
Texas	3
Pennsylvania	4
Florida	5
Illinois	6
Ohio	7
North Carolina	8
Michigan	9
Tennessee	10
Massachusetts	11
Georgia	12
Virginia	13
Missouri	14
New Jersey	15

Conclusion

This project found that citizens aged 65 years or older most significantly contribute to influenza deaths in each state.

Since influenza is a seasonal illness, hospitals and clinics will notice an increase in patients with the flu-like symptoms likely starting in **December** and finishing around **March/April.**

Recommendations

Where - States have been assigned priority levels based on the number of deaths caused by influenza in the 65+ age group. These levels are low, medium, and high.

States with a high priority status should be the first considered when constructing staffing plans. These states include California (1) and New York (2).

After high priority states, medium priority states should be considered in the construction of staffing plans. States in this category include Texas (3), Pennsylvania (4), Florida (5), Illinois (6), and Ohio (7).

When - Additional staff should be sent to hospitals and clinics during **November** to prepare for the upcoming influx of patients. Additional staff will be relieved between **March** and **April.**

Next Steps

Staffing prioritisation could be further aided by an analysis of hospitals' and clinics' staff-patient ratios. This will add an extra layer to the analysis, allowing the staffing agency to consider which hospitals and clinics are actually suffering shortages which negatively impact the quality of care being provided to patients.