Presentation Outline

SCRIPT

Project Brief
Welcome, and thank you for making time for this presentation on how to effectively deploy additional medical staff during the influenza season, or more commonly known as the flu season. My name is Mindy, and I am a data analyst contracted by the medical staffing agency to help plan for the upcoming flu season by conducting research and analysis and providing relevant information and recommendations to help you make data-driven decisions.

According to the Center for Disease Control, or CDC, tens of thousands of people have died from the flu, and millions have had flu-related medical visits and hospitalization, so it is essential we get the appropriate resources, such as additional medical staff, to the most impacted areas to reduce these numbers.[1]

Influenza Season
In short, the flu season is during the months of December through March; in other words: winter. These will be the best months to deploy additional medical staff to states with the most vulnerable population.

But why winter? To answer that, we first need a basic understanding of what the flu is. The flu is a highly contagious viral respiratory illness.[2] Unless you're into winter sports, live alone, or work remotely, you're more likely to be indoors with the windows sealed where you may be near someone sick with this highly contagious disease. According to Harvard University, the lack of Vitamin D we get from the sun compromises our immune system making it more difficult to fight against diseases, and as you know, the sun sets sooner during the winter months.[2]

Vulnerable Population
On top of that, our immune system unfortunately gets weaker as we age, putting our senior citizens, among others, more at risk at catching the flu and potentially dying from it. As you can see from the stacked bar graph at the bottom of this page, those 65 and older make up more than half of the flu-related deaths every month since 2009. You can see the rates for each respective year by sliding the bar at the bottom of this graph.

The graph above reinforces the hypothesis that senior citizens are at a higher risk by demonstrating that the higher the population of 65 and older people, the higher the death count is across all states.

[1] Center for Disease Control (CDC). 2021. Source: https://www.cdc.gov/flu/about/burden/2017-2018.htm#:~:text=The%20overall%20burden%20of%20flu,related%20deaths%20(Table%201).
[2] Harvard University. 2014. Source: https://sitn.hms.harvard.edu/flash/2014/the-reason-for-the-season-why-flu-strikes-in-winter/

Influenza Deaths in the US (Vulnerable Population)
So, where do we go from here? As you can see on the screen, there is a handy interactive map of the United States that shows where the most senior citizens live as well as where the most flu-related deaths of senior citizens have occurred since 2009. To pan around the map, hover over the "play button" icon to the left, then select the crosshair icon labeled "Pan (F)," or hold the "F" button on your keyboard as you hold the left-click button on your mouse. You can zoom in and out of the map by using the scroll wheel on your mouse, or the plus and minus icons on the left tool bar.

The top five states include California, New York, Texas, Pennsylvania, and Florida. These states have a much greater population compared to other states, thus their medical staff to patient ratio is much more spread apart. While there are laws that mandate a certain ratio such as one staff for every five patients, these laws may not account for the influx of patients during the flu season. Deploying additional medical staff to these five states would not only help with their mandates, but also help reduce the overall flu-related deaths for those 65 and older.

Influenza Deaths 2018 Forecast
Reminder that this is an interactive presentation, so you can hover over each point to see additional detail for the historical flu-related deaths from 2009 to 2017. The first thing you may have noticed are the peaks for the top five states we are looking at – each of these peaks happen, without fail, between December through March, which we've established is flu season.

Based on the data from the past eight years, it is highly likely that this pattern would continue unless we intervene quickly and effectively. Another aspect to consider is that we will have larger population of those in the vulnerable category in the coming years with many baby boomers, the second largest population behind millennials, reaching the age of 65 and older. Our efforts would ensure our senior citizens are well cared for and not be lost to this disease.

Recommendations
To summarize, additional medical staff should be deployed between December through March to California, New York, Texas, Pennsylvania, and Florida. This will address the medical staffing shortages these states will face when there is an influx of patients during the flu season.

Additionally, it is highly recommended that vaccine outreach and education take place during the months leading up flu season to increase the chance of survival and decrease the strain on the medical staff and facilities during the season itself.

Lastly, it is pertinent we monitor the results of the deployment on a monthly basis to ensure our efforts are having a positive impact on the situation and adjust accordingly if it isn't.

I hope this has been informative and helpful for your decision-making. Please let me know if you have any questions. Again, my name is Mindy, and I appreciate the opportunity to speak to you about this important, life-saving matter.

[1] Center for Disease Control (CDC). 2021. Source: https://www.cdc.gov/flu/about/burden/2017-2018.htm#:~:text=The%20overall%20burden%20of%20flu,related%20deaths%20(Table%201).
[2] Harvard University. 2014. Source: https://sitn.hms.harvard.edu/flash/2014/the-reason-for-the-season-why-flu-strikes-in-winter/

REFLECTION

1. **Were there any limitations that prevented you from conducting an analysis? Think of these in terms of a future project or wish list (i.e., "If I had x, I would have been able to do y.").**
   Prevented me from conducting an analysis? No. From conducting an *accurate* analysis? Yes. Influenza death data was one of the primary data sets used for this analysis, but unfortunately death counts under 10 were reported as "suppressed," causing me to use five (5) as a stand-in for the analysis.

   For future projects, it would be interesting to conduct this analysis again post-COVID era as the discussion of vaccines were a hot topic. Plus, so many people claimed to have had the flu instead of COVID, so it'd be interesting to see if they acted on it by getting the influenza vaccine instead of the COVID vaccine. Another interesting approach would be to conduct this with other vulnerable populations, such as pregnant people, immunocompromised people, etc.

   While we established that those above 65 years old in the United States were at a higher risk for influenza deaths, it would be interesting to compare our results with other countries, and how they're handling it. I'm curious to see if and how climate, food, lifestyle, and free access to healthcare affect influenza death rates (and vaccinations).

2. **Did your data have any limitations that may have affected your results? Consider this in terms of data quality and data bias.**
   US Census Data: The dataset is dependent on a variety of methods for its collection, so these are as accurate as possible, but are still an estimate of reality. The dataset should not be bias as it is simply a general demographic breakdown; however, the collection method may be considered biased, which in turn make the data itself subsequently bias. The Bureau is dependent on people responding, which not only causes a lag, but also manual errors.

   Influenza Deaths Data: Those 65 years and older may have a myriad of health concerns that might lead to death; however, on their death certificate, only one cause of death may be listed, and influenza may not be selected if other (more serious) concerns were present (e.g., diabetes, AIDS, old age, etc.). While influenza may have been a contributing or aggravating factor in these deaths, if it is not listed, the data cannot be captured appropriately. Additionally, the dataset suppressed any death count of 10 or less, leading to five (5) as a stand-in number for the calculations.

3. **How might you monitor the impact of the staffing changes you recommended?**
   We can monitor vaccination rates, hospital and medical clinic visits, and influenza death rates monthly for each state – what we're hoping for is increased vaccination, especially for those in the vulnerable population category, lowered staff turnover, and decreased

[1] Center for Disease Control (CDC). 2021. Source: https://www.cdc.gov/flu/about/burden/2017-2018.htm#:~:text=The%20overall%20burden%20of%20flu,related%20deaths%20(Table%201).
[2] Harvard University. 2014. Source: https://sitn.hms.harvard.edu/flash/2014/the-reason-for-the-season-why-flu-strikes-in-winter/

influenza deaths. After the influenza season is over, and the temporary staff have return home, we can conduct an evaluation survey for both medical staff and patients to gauge the impact of our efforts.

On a quarterly basis, we can administer an anonymous survey to the medical staff and patients on the quality of care and services they receive regarding influenza treatments. If the responses are generally positive based on a sentiment analysis, then we can proceed as planned; if the responses are generally negative, then we need to reevaluate our strategies and devise a contingency plan to address the issue(s). If the general response is neutral, we can continue with the plan, but have a discussion with the stakeholders to identify areas of improvement.

4. **Is there a metric that could be used for monitoring this impact?**
   Yes, we can use influenza death count by state monthly and compare it to the death count during the same time previous year (e.g., December 2018 vs December 2017). While we want to look at all the states, particular focus should be on the top five states identified that have the largest population of vulnerable people.

   We can also review the relationship between number of medical staff deployed and available and influenza death count – the theory being that the more medical staff available, the lower the influenza death count.

VIDEO PRESENTATION

https://vimeo.com/795765503

TABLEAU STORYBOARD

https://public.tableau.com/app/profile/mindy.duong/viz/DataImmersionTask2_9Storyboard/InfluenzaSeasonStoryboard?publish=yes

[1] Center for Disease Control (CDC). 2021. Source: https://www.cdc.gov/flu/about/burden/2017-2018.htm#:~:text=The%20overall%20burden%20of%20flu,related%20deaths%20(Table%201).
[2] Harvard University. 2014. Source: https://sitn.hms.harvard.edu/flash/2014/the-reason-for-the-season-why-flu-strikes-in-winter/