

Task 2.10

By Alexandra Lindsay

Tableau Story Board:

Staffing for the 2018 Influenza Season | Tableau Public

Loom Video:

<https://www.loom.com/share/ae43b6b183db4ad18951126a9e44d600>

Slide 1:

Good afternoon everyone and welcome to the final report for the project brief: preparing for the influenza season.

I am Alexandra Lindsay, the analyst assigned to this report. Before we do a walkthrough of what my analysis brought to light, since it has been a couple of weeks since I've presented you my interim report, I will reiterate our project objectives, the assumptions we started off with and what constraints the data presented for this analysis.

****Read through the points****

More constraints:

For deaths, since on death certificates there is only room to put one reason of death we cannot accurately confirm that these are influenza related deaths. The rates could be higher and could be lower.

The same can be said for the patient visit data set, we do not know the reason for their visit, just that it was recorded.

Slide 2:

The data provided for this analysis spans from 2009 to 2017. Not all data sources have data starting in 2009 nor ending in 2017 therefore not all the data is consistent. Since 80% of the data is missing and mostly in the younger age groups we will be concentrating on the segment of 65 and over, firstly because it has data from the three sources chosen and it is one of the vulnerable segments established in the project goals. In the beginning of the analysis it was imperative to see if the two main data sources had any correlations between them, the influenza death rates and the population census data sources. The first chart on this page, a scatter plot depicts the correlation between census population and the influenza death rates of the 65 years and over age group. As we can see the higher the population the higher the deaths rates.

**** hover over the highest cities to show the rates and talk to why these cities names are showing*****

Following this analysis, we wanted to see if there trends in the death rates over time.

Firstly, we see the deaths rates from 2009-2017 over the 12 months. We can see that October to April are the worse months for deaths of all age groups. Over the 9 years, they are all in the same range and averaging around 6351 deaths for all age groups.

Slide 3:

Now for our next slide we will take a look at how influenza has ravaged the 65 and over age group over time.

Let's first take a look at the spatial analysis. If you take a look at the red, this is to mark the influenza deaths and the blue dots are the recorded census population. The darker both colours are, either the higher the death rate or the higher the population rate.

*** walk through examples *** over all the top influenza death states are: California, NY and Florida. And the highest populations are: California, Florida and Texas. Then we can by year...

We also wanted to analyze the yearly influenza death rates and forecast what it would look like in 2018. If we put all 50 states we couldn't see much therefore, we've grouped them into 4 quadrants: Midwest, Northeast, South and West. Since the highest death rate by far is California, it is not surprising to see the south on the higher end. We can see that they all will have an increase in 2018. The South will have a 2.9% growth, the Midwest 4.9%, Northeast 0.3% and West 2.9%.

At this point we've brought in our third data set, the total patient visits. Since influenza season goes hand in hand with a rise in doctor visits and it only makes sense to put this data against our influenza deaths because it will amount to an increase in work load for the agency staff. Here we can see how the influenza deaths and the patients visits increase over the months in the 2009-2017 years. As mentioned previously the influenza deaths increase from for all age groups but for the 65 and over age group they drastically increase from December to March as for the patient visits they increase from October to December. We can also look at them by state and by year.

*** give a few examples ***

Slide 4:

Here we wanted to take a look at the over all numbers of influenza deaths and patient visits. This will help establish a staffing strategy since the 65 and over age group are not the only patients the agency staff will see.

First, let's take a look at the spatial analysis. Again the red is the influenza deaths and the blue this time is the patient visits. The darker they are higher the deaths and the higher the patient visits this time for all age groups. The higher influenza death states are: California, NY and Texas. The higher patient visits are: Virginia, Pennsylvania and California.

*** we can take a look by year.***

Now if we take a look at the yearly patient visits. Again they were grouped by quadrant to be able to see the trends better. Compared to the influenza deaths we should see a decrease in visits

in 2018. -5.8% in the South, -0.6% in the Midwest, -18% in the West and 10.7% in the Northeast.

We also did a monthly analysis for the influenza deaths and patients visits on a monthly basis 2009 through 2017. Although the patient visits should decrease next year, The staff should be increased through the months of October till March to see the influenza wave from beginning to end.

** we can also see the trends on a yearly basis and state by state. Walk through some examples****

Slide 5:

To conclude I would like to review the information that was presented. Here are the top 6 populated states and their general influenza deaths and for the 65 and over age group. We presented in our spatial analysis that the top influenza death states are: California, NY and Florida. And the highest populations are: California, Florida and Texas for the 65+ age group and that this chart follow the trend.

We can see through this colour coated chart which were the hardest hit months and years for influenza deaths. The worse years were 2015 and 2013 but the worse months over all are December through March.

Therefore we would recommend the staffing agency to concentrate on the top 6 cities stated above during the highest recorded influenza death months; November till April. If we take into consideration the increase in patient visits I would staff from October till April. Although we recommend to concentrate on the hardest hit cities, we do not recommend neglecting the other 44 states. A proper distribution between the states could be established depending on the available staff and their average work day. More data is required to answer this question. We also recommend to administer a patient survey after every visit constituting of 1-4 multiple answer question and 1 open ended question to determine the level of staffing satisfaction. We also recommend a daily survey for the staff to determine their level of satisfaction of their work load.

To establish a better staffing recommendation we would need more data. Here is what we recommend as next steps:

- Get data of all the vulnerable populations (children under 5 years, and pregnant women, as well as individuals with HIV/AIDs, cancer, heart disease, stroke, diabetes, asthma, and children with neurological disorder)
- State vaccination rates, to see if certain populations are at risk that were not defined as vulnerable. This will help us to predict if hot spots may occur and send staff ahead of time.
- Daily schedule data from doctors, nurses and administrative staff to help determine their daily patient capacities.

This concludes my presentation. I will send the documents by email and you will find more detailed analysis in the appendix of the document. Please do not hesitate to ask questions. Thank you and have a great day.

Task:

Data limitations:

- Too much data was missing, 80% of the data was missing in the Influenza Deaths data set, the patient visits data set only had one metric that was accurate and clear.
- The years in which the data was distributed was not even. Some didn't have data from 2009-2010 and some didn't have data in 2016-2017. Some states didn't have any recorded data.
- A wish list would be to have data that is consistent through the timeline for all states and that there would be data for all age groups.
- These limitations affected the results due to the large amount of imputed data in the influenza death rates. It cannot be considered accurate more of an estimate.

As mentioned in my presentation, the best way to monitor is through a survey in the clinics the agency staff is located and we can also determine what type of data is collected to have better data available: reason for visit, if they are vaccinated. That way when the state information about influenza deaths becomes public it could be measured against this.