Preparing for Influenza season

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.
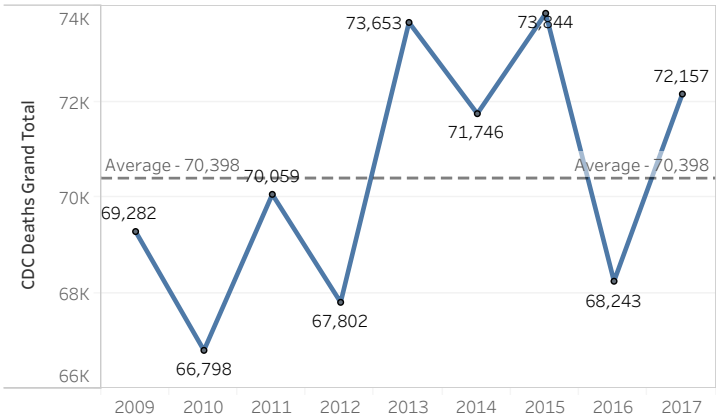
Objective
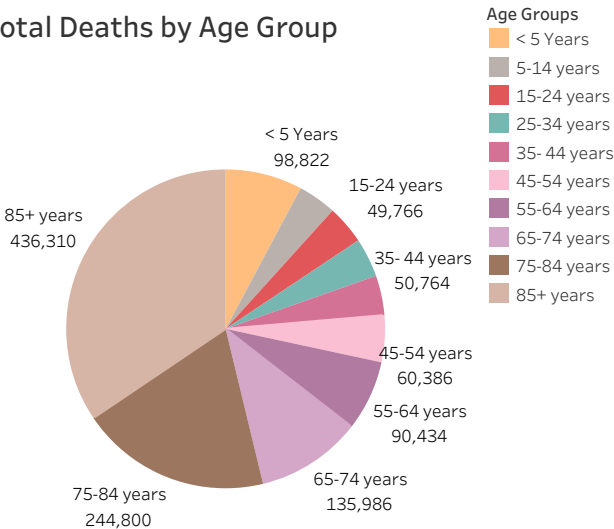Determine when to send staff, and how many, to each state.

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.

Annual Influenza Deaths

Total Deaths by Age Group
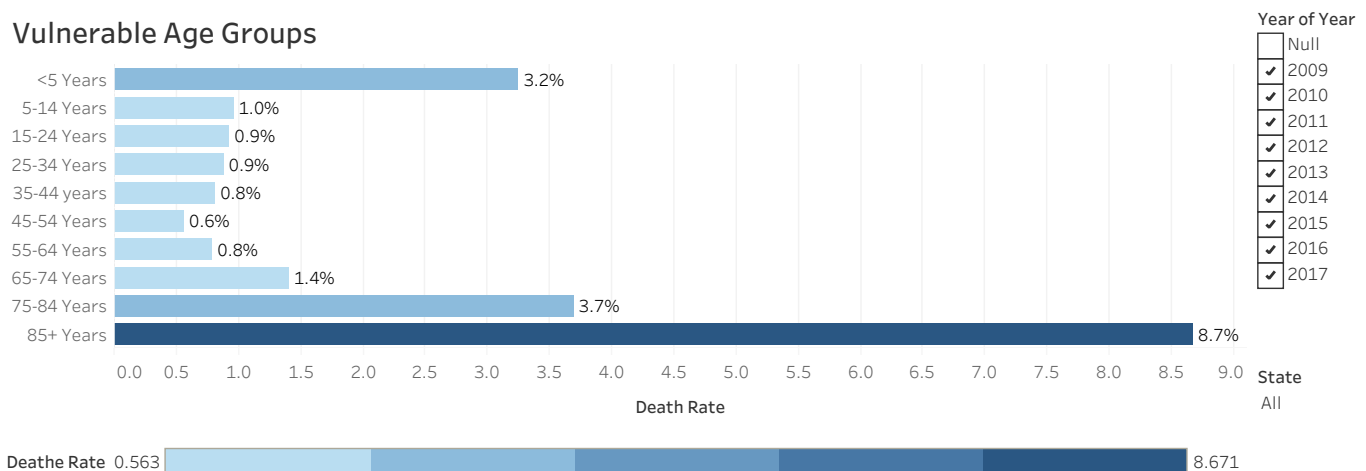
Preparing for Influenza Season

Vulnerable Groups

Who is at risk?

The Most vulnerable age groups are Children younger than 5 years old, with a mortality rate of 3.2% and people over the age of 65 years of age with an average mortality rate of 4.6%. 10 year age groups from 65 years see an exponential with 65-74 years olds having a 1.4% mortality rate, 75-84 year olds having a mortality rate of 3.7% and 85+ having a mortality rate of 8.7%

Vulnerable Age Groups

Age Group	Death Rate
<5 Years	3.2%
5-14 Years	1.0%
15-24 Years	0.9%
25-34 Years	0.9%
35-44 years	0.8%
45-54 Years	0.6%
55-64 Years	0.8%
65-74 Years	1.4%
75-84 Years	3.7%
85+ Years	8.7%

Death Rate (x-axis): 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0

Year of Year
- Null
- ✔ 2009
- ✔ 2010
- ✔ 2011
- ✔ 2012
- ✔ 2013
- ✔ 2014
- ✔ 2015
- ✔ 2016
- ✔ 2017

State
All

Deathe Rate 0.563 ──────── 8.671

Preparing for Influenza Season

Wher Are The Highest Regional Risks of Influenza

Regional Deaths Geopgraphically

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Anual Deat.. 1,000 ▬▬▬▬ 7,000
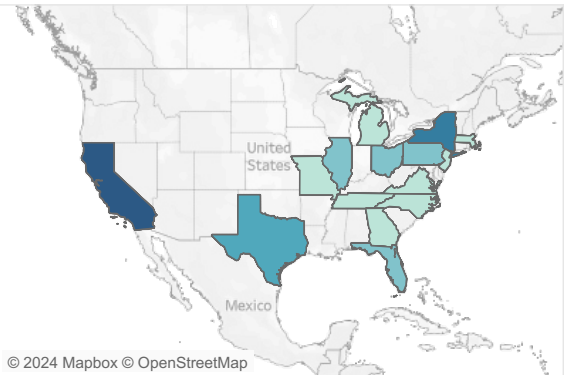
Population Census

© Mapbox © OSM

Total Census 1,000 ▬▬▬▬ 45,000,000
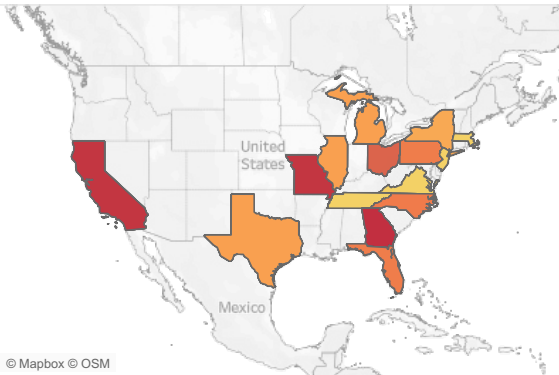
State
All

Year
- ✔ 2009
- ✔ 2010
- ✔ 2011
- ✔ 2012
- ✔ 2013
- ✔ 2014
- ✔ 2015
- ✔ 2016
- ✔ 2017

Top 15 States Split into vulnerable and Less Vulnerable
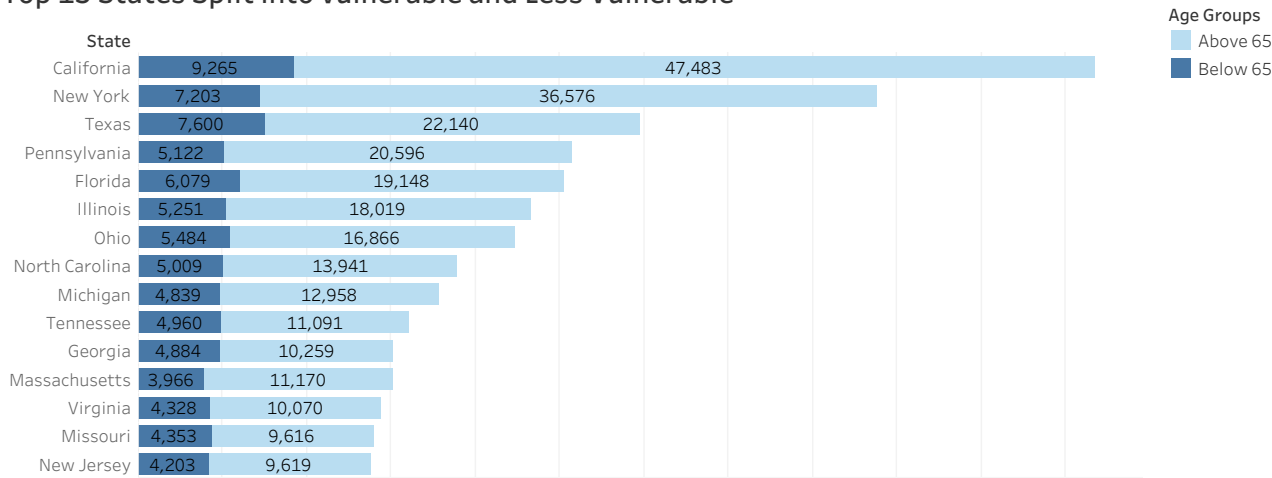
Age Groups
- Above 65
- Below 65

State	Below 65	Above 65
California	9,265	47,483
New York	7,203	36,576
Texas	7,600	22,140
Pennsylvania	5,122	20,596
Florida	6,079	19,148
Illinois	5,251	18,019
Ohio	5,484	16,866
North Carolina	5,009	13,941
Michigan	4,839	12,958
Tennessee	4,960	11,091
Georgia	4,884	10,259
Massachusetts	3,966	11,170
Virginia	4,328	10,070
Missouri	4,353	9,616
New Jersey	4,203	9,619

Preparing for Influenza Season

When Is Influenza Season?

Total Seasonal Influenza Deaths by Month
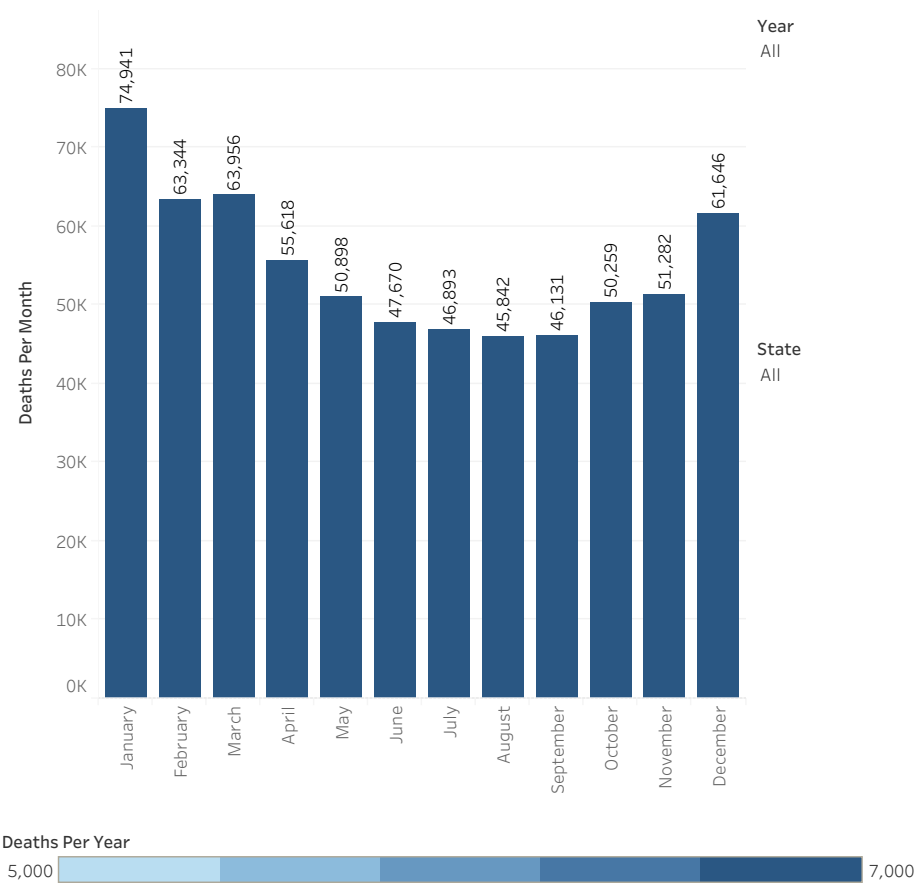
Influenza Season

Influenza season seems to start in **December**, Peak in **January** and drop off in in **March**.

These are the colder months of the year.

California, New York and **texas** have the highest number of deaths, considering they are the most densly populated and have th largest populations this is no surprise.

Year
All

State
All

Deaths Per Year

5,000   7,000

Preparing for Influenza Season

Staffing Needs For each State

Conclusion

we can see from the age group death rates, Geographical data and seasonality that ther are groups of people and places that need resources to be allocated more than others.

Recomendations

Age groups of **5 Years and under** as well as **65 Years and over** should recieve priority care and resources as the mortality rate is relatively high.

Seasonality heavily affects deaths and staffing should be particularly prepared for the winter season from **December** to **March.**

Given the Constraints we need to consider that priority states states such as **California, New York, Texas, pennyslvania and Florida** recive a majority of the resources. The remaining 10 states should recieve moderate resources.

Further analysis

Aditional data in the form of vaccine data, standard of living, nutritional information and illicit substance use could also greatly help understand the spread and surviabillity of individuals.

1,500 ▮▮▮▮▮▮▮▮▮▮ 6,500

Average Deaths for the Top 15 States

California 6,305	Texas 3,304	Illinois 2,586	Michigan 1,977	Tennessee 1,783	Georgia 1,683
New York 4,864	Pennsylvania 2,858	Ohio 2,483	Massachusetts 1,682	Missouri 1,552	New Jersey 1,536
	Florida 2,803	North Carolina 2,106	Virginia 1,600		

Ongoing monitoring and data limitations

Continue monitoring deaths rates.

Include vaccine death rate vs unvaccinated death rates.

Compare against other the top causes of death.

Data limitation, knowing general levels of health, fitness, diet, and hereditary factors.

Assessment of high population density states with low death rates to see what they are doing right.