

# Meaningful Trends in COVID-19 Death Quantity

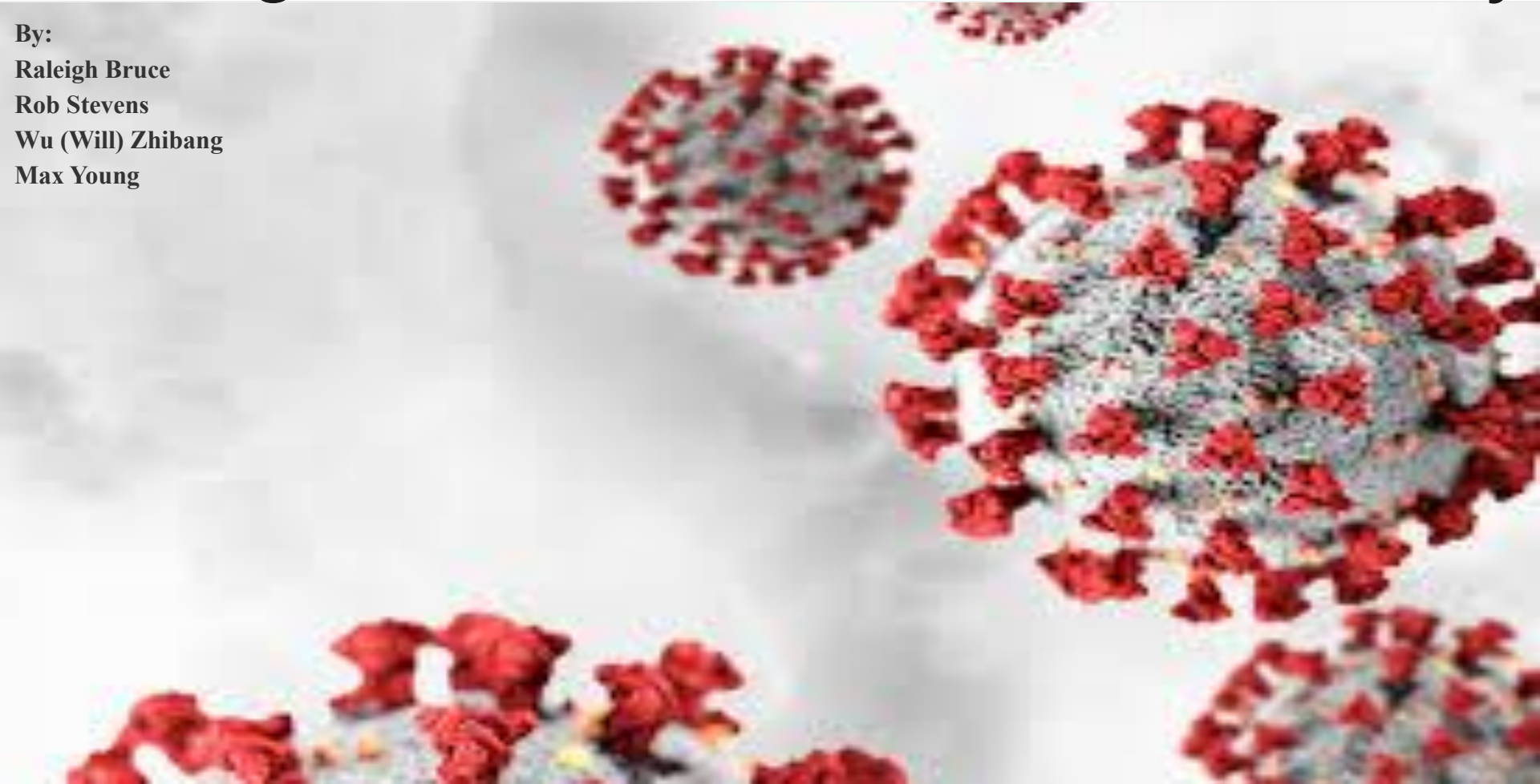
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# Research Questions

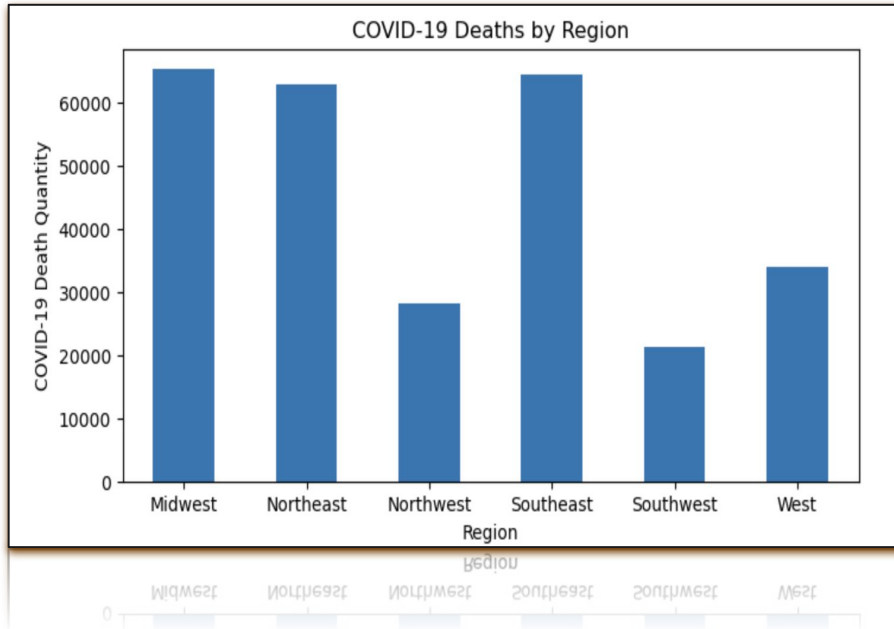
- How did the following impact COVID-19 death quantity?:
  - Regionality
  - Seasonality
  - Regionality & Seasonality
  - Specific condition group
  - Affinity for Public Transit



# Data Sources

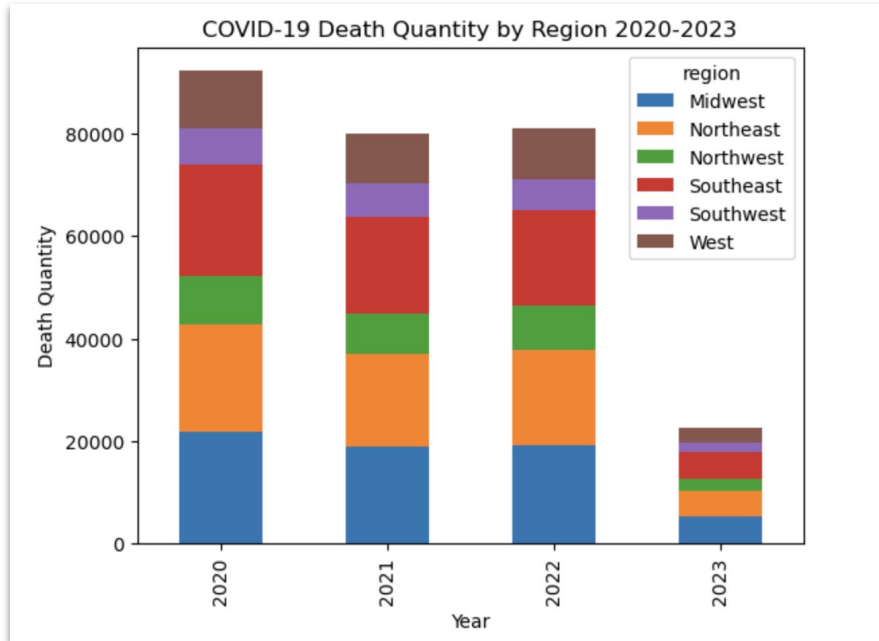
- **“Conditions Contributing to COVID-19 Deaths, by State and Age, Provisional 2020-2023”**
  - <https://catalog.data.gov/dataset/conditions-contributing-to-deaths-involving-coronavirus-disease-2019-covid-19-by-age-group>
- **United State Census Bureau API**
  - <https://www.census.gov/data/developers.html>

# COVID-19 Deaths Highest in the Midwest, Northeast, and Southeast



- COVID-19 Mortality quantity and subsequent rates fluctuated between the various regions in the United States
- As we can see, based off of pure quantity, the death counts were highest in the Midwest, NorthEast, and Southeast.

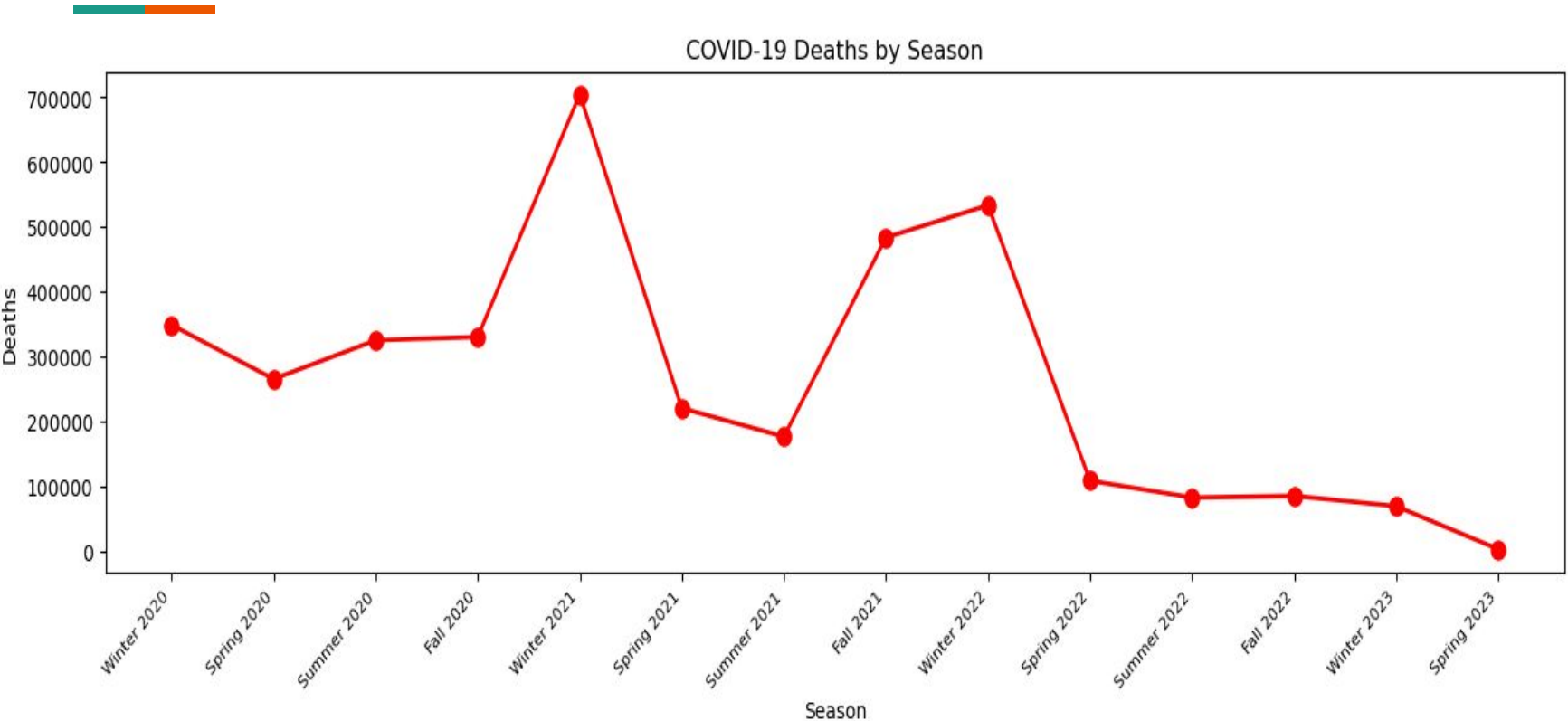
# COVID-19 Death Quantity by Region Through the Years



- We see that death quantity trends fluctuate year by year with the largest deduction in quantity between year 2022 - 2023 for all regions.
  - Likely due to vaccine adoption rates across regions and limited 2023 data for when the dataset was compiled
- Consistently see that the Midwest, Northeast, and Southeast exhibit the highest quantity of deaths year over year

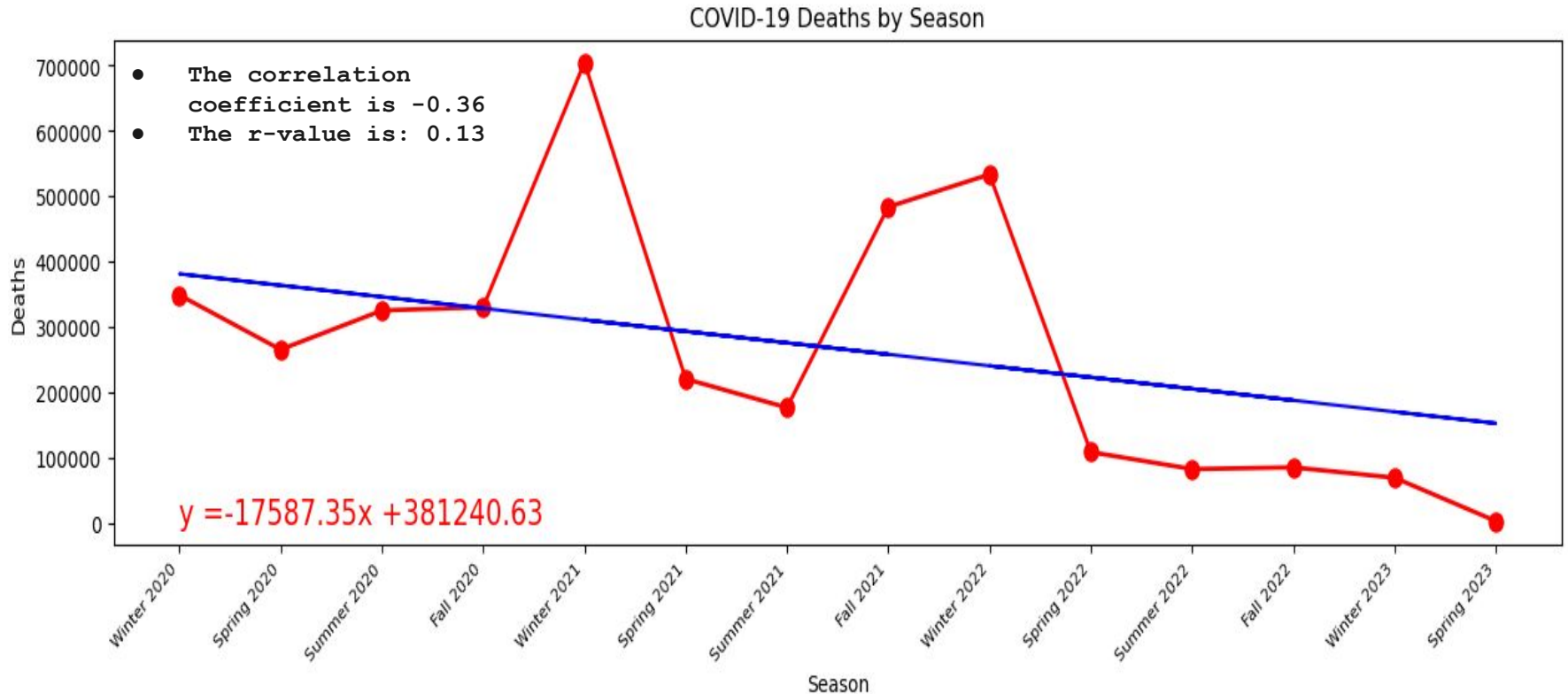
# COVID-19 Death Rate Per Season 2020 - 2023.

The COVID-19 death rate has been recorded across four seasons from 2020 to 2023. The data suggests a downward trend over this period, with spikes observed in the fall and winter of 2021, and the winter of 2022.



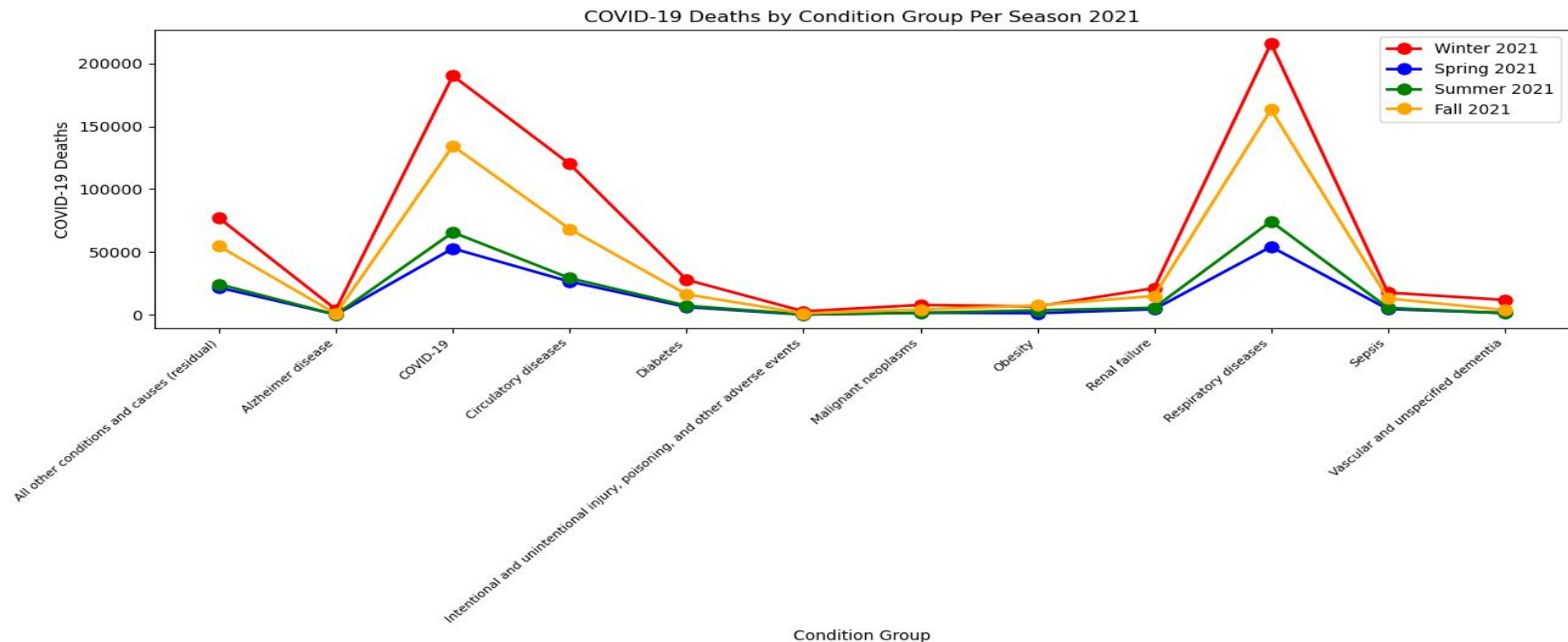
## Linear regression model

There is a linear relationship between the death rate and the seasons, with a downward trend over time. However, upon calculating and plotting the linear regression, a negative correlation coefficient of -0.36 and a weak positive r-value of 0.13 were obtained, suggesting that the relationship is not strong.



## COVID-19 Death Rate by Condition Group 2021

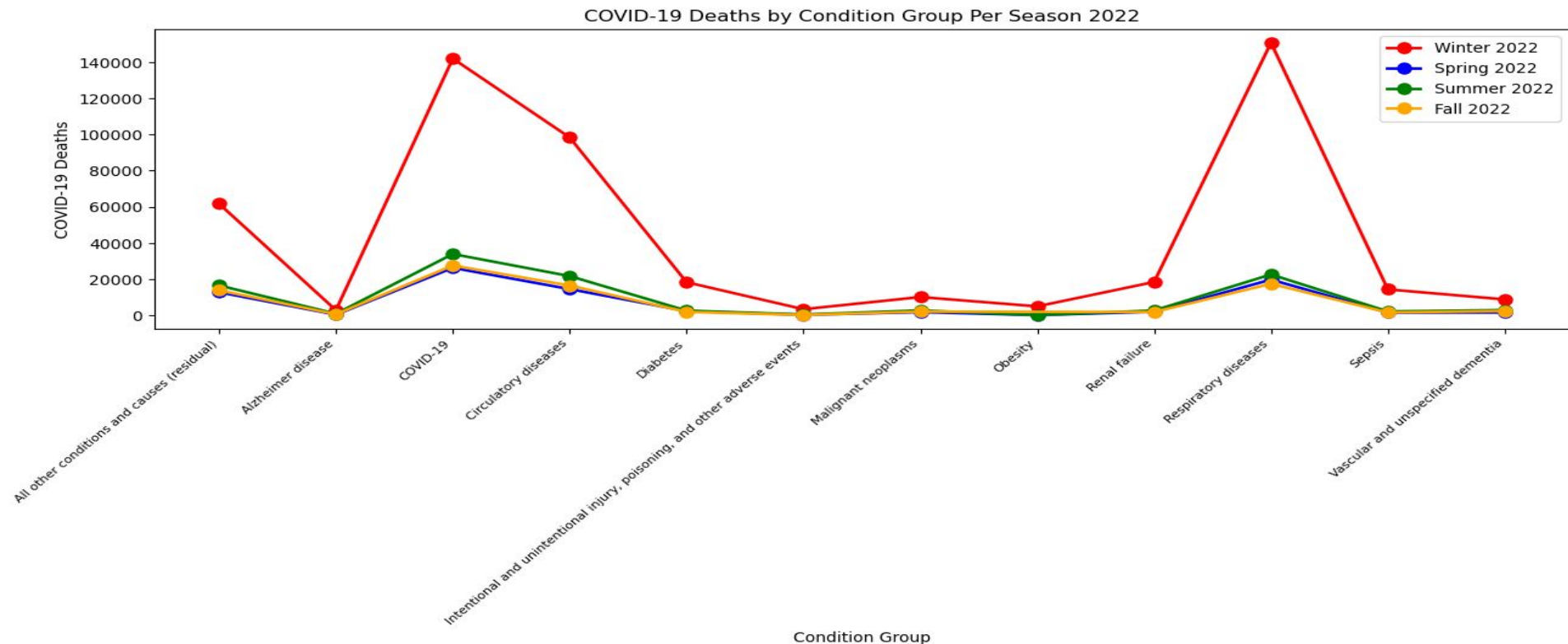
The main contributing factors to the cause of death during the winter and fall of 2021 were COVID-19, Respiratory Diseases, and Circulatory Diseases. Among these factors, Respiratory Diseases had the greatest impact, with 215,862 deaths in winter and 163,244 deaths in fall.



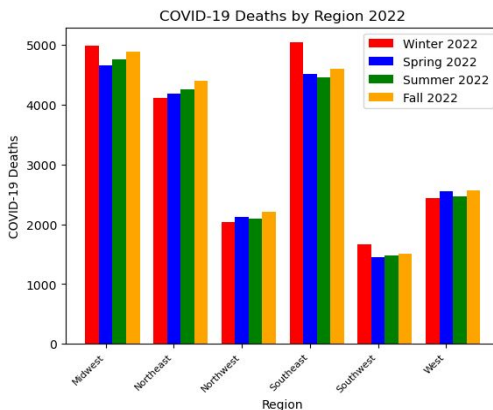
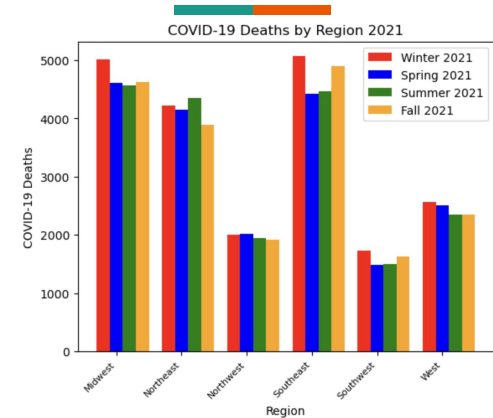


## COVID-19 Death Rate by Condition Group 2022

In 2022, there was a significant decrease in the death rate for Respiratory Diseases in the fall, with a reduction of 89.3% compared to the previous year. However, in the winter, the death rate for Respiratory Diseases remained high, with 150,693 deaths, although this represented a decrease of 30.2% compared to 2021.

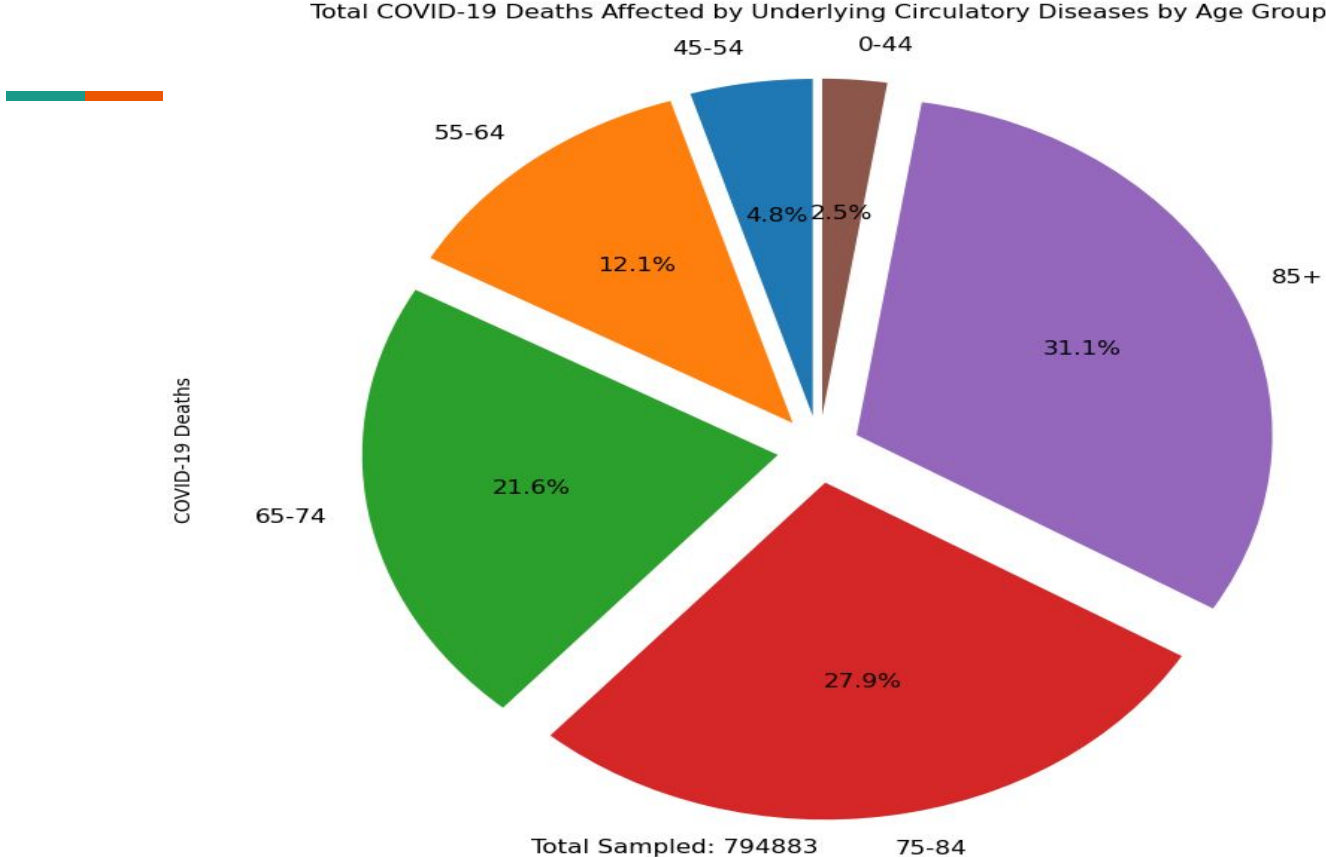


# Seasonality and Regionality's Impacts on COVID-19 Death Quantity (2021 & 2022)

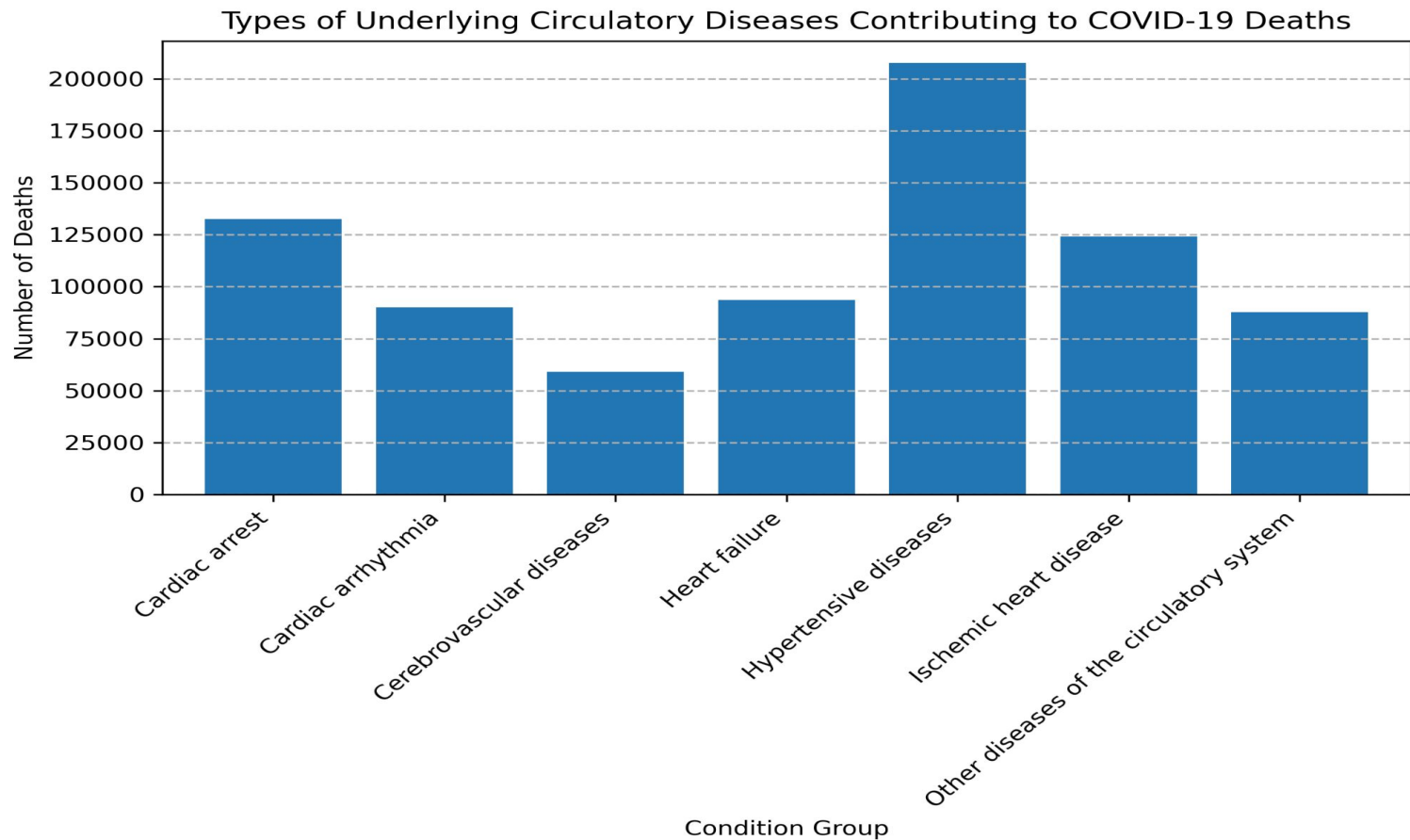


- Combining our data by region and by season, we deduced the following graphs for the years of 2021 and 2022
  - Midwest - Winter was the most lethal season for both years, however the seasonal death quantities were more uniform in 2022 with Fall just right behind Winter 2022.
  - Northeast - Summer had the highest death quantity in 2021, where as Fall was the leading season in 2022.
  - Northwest - Spring had the highest death quantity in 2021, where as Fall was the leading season in 2022. Data was fairly synonymous between years for this region.
  - Southeast - Winter was the most lethal season for both years with Fall being 2nd for both years.
  - Southwest - Winter was the most lethal season for both years with Fall being 2nd for both years.
  - West - Winter had the highest death quantity for 2021 with Spring falling right behind. In 2022, Fall was the most lethal season with Spring falling right behind again.

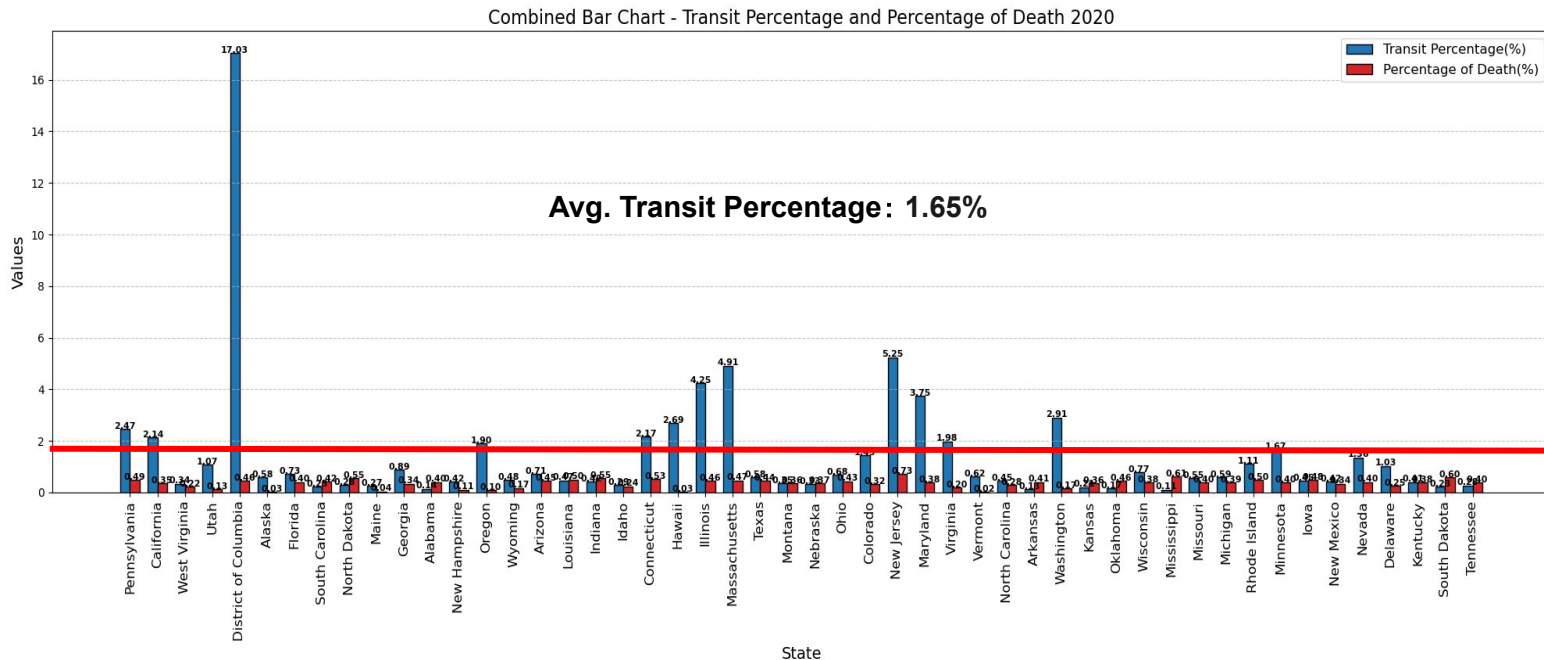
# Circulatory Diseases by Age Group



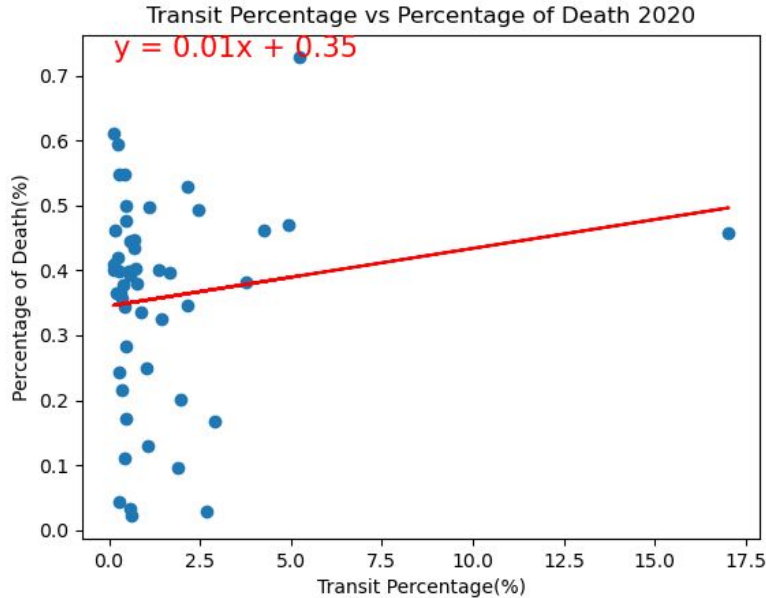
# Types of Underlying Circulatory Diseases



# Transit Percentages vary from region to region



# The Correlation was Positive During 2020

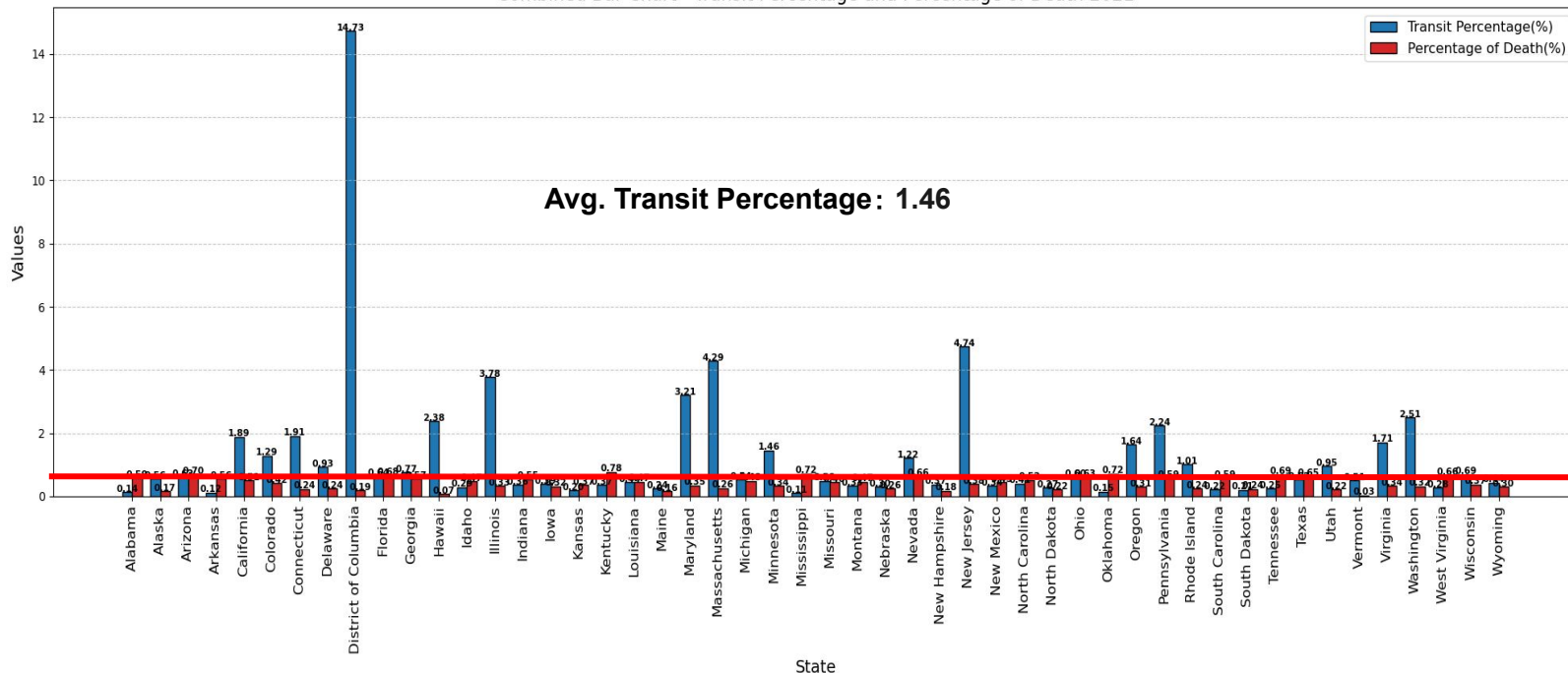


- Increased exposure:
- Higher population density
- Difficulty maintaining social distance
- Inadequate ventilation

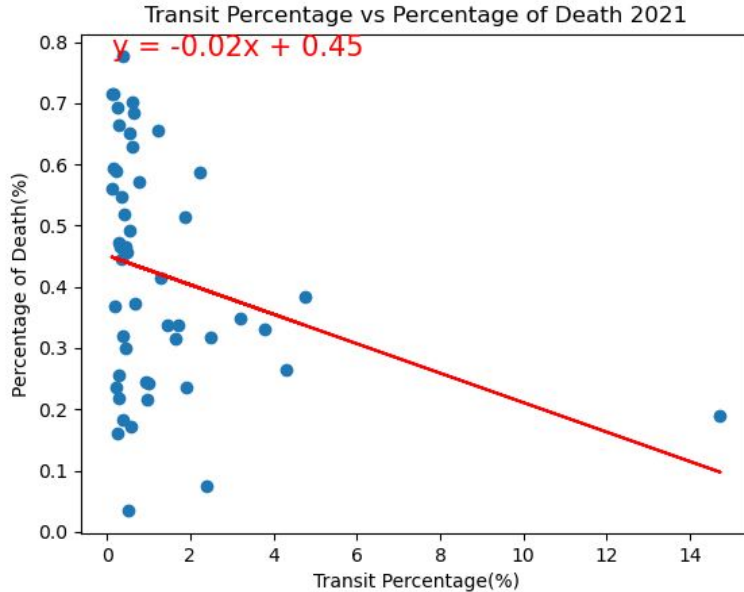
# Average Transit Percentage dropped in 2021

1.4633834551664981

Combined Bar Chart - Transit Percentage and Percentage of Death 2021



# The Correlation became Negative During 2021



- Public health measures
- Vaccination rollout
- Changes in public transit usage
- Changes in population behavior



**Thank You!**

