Analyzing COVID-19 Trends

GROUP 13

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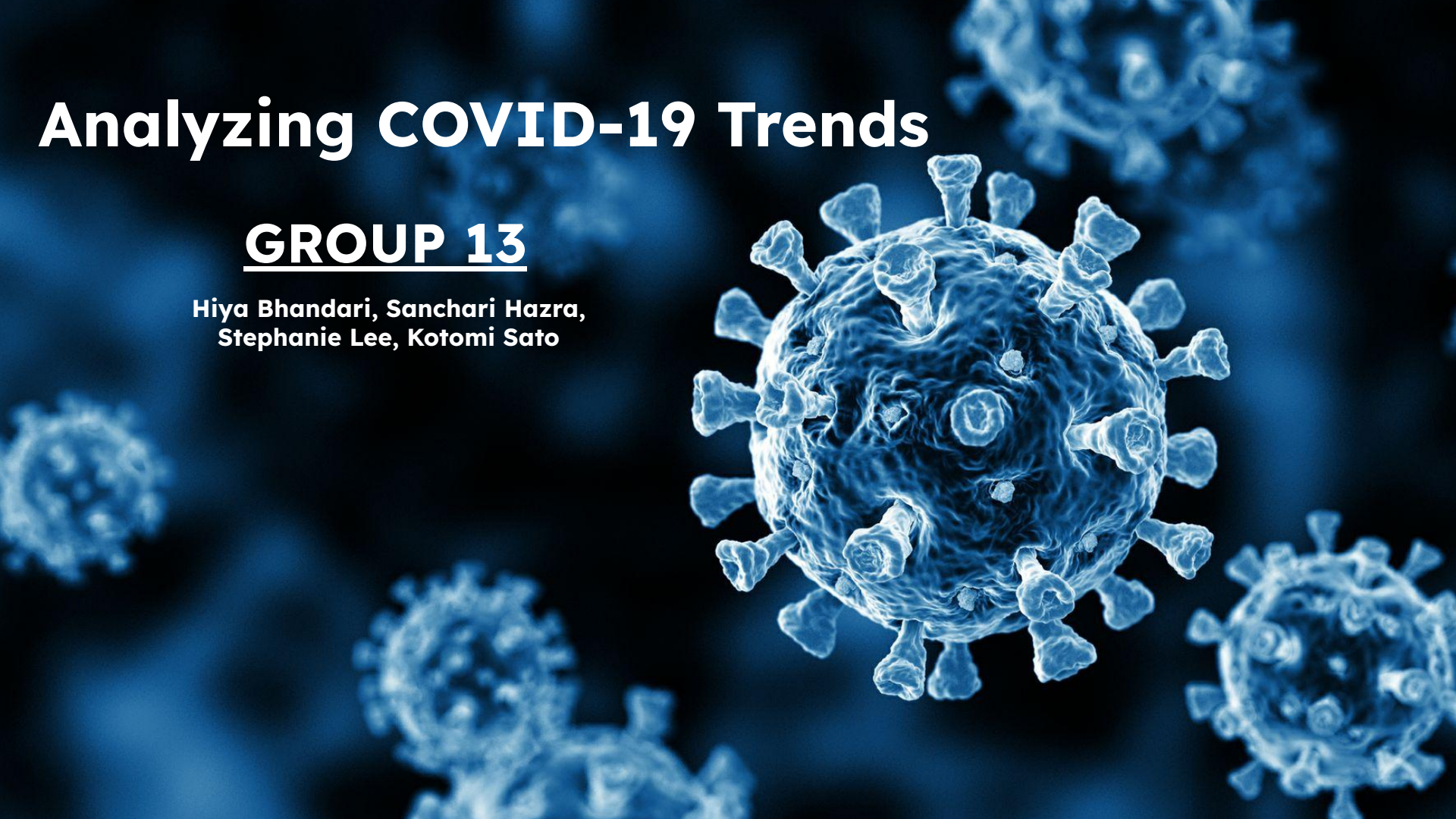


Introduction

We performed an examination of particular aspects of the COVID-19 pandemic

CASE COUNTS

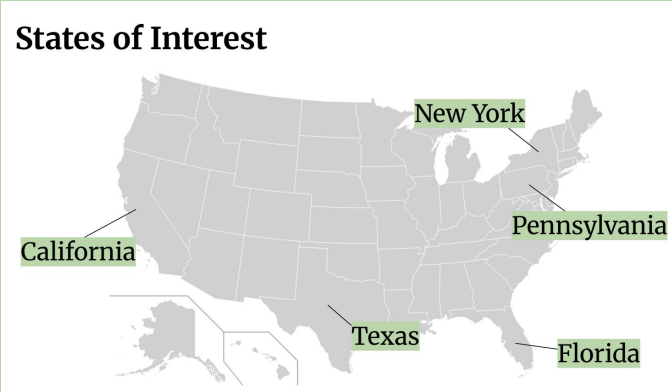
ASSOCIATED CONDITIONS

VACCINATION RATES

DEATH COUNTS

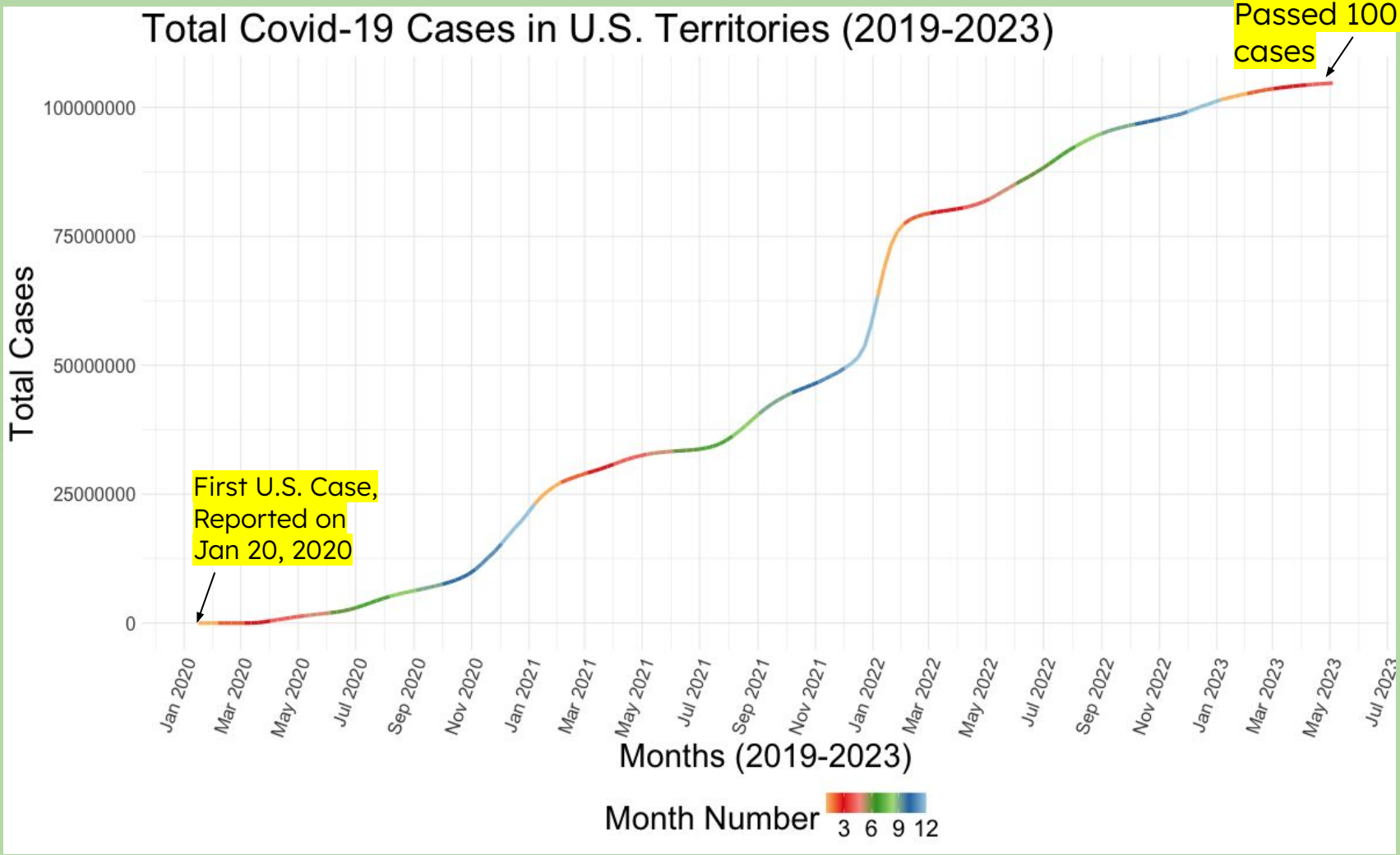
Methods

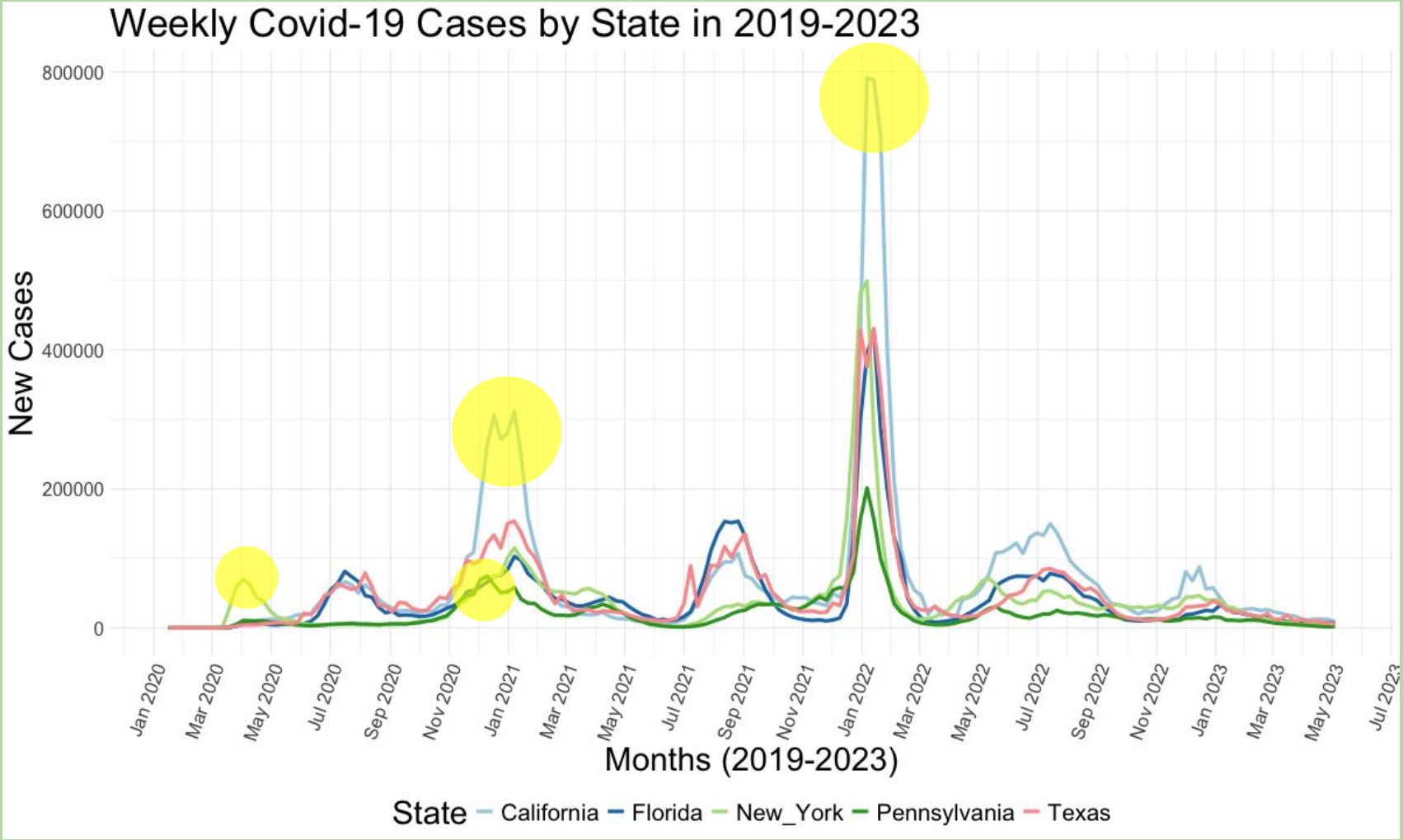
- Three government datasets from the Centers for Disease Control and Prevention and Department of Health and Human Services
- Cleaning state names (ex. NY+NYC)
- Use of lubridate package to prepare data for time-based plots



U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION

DEPARTMENT OF HEALTH & HUMAN SERVICES · USA ·


Total Covid-19 Cases in U.S. Territories (2019-2023)
Passed 100 million cases
First U.S. Case, Reported on Jan 20, 2020
Total Cases
100000000
75000000
50000000
25000000
0
Jan 2020
Mar 2020
May 2020
Jul 2020
Sep 2020
Nov 2020
Jan 2021
Mar 2021
May 2021
Jul 2021
Sep 2021
Nov 2021
Jan 2022
Mar 2022
May 2022
Jul 2022
Sep 2022
Nov 2022
Jan 2023
Mar 2023
May 2023
Jul 2023
Months (2019-2023)
Month Number
3 6 9 12


Weekly Covid-19 Cases by State in 2019-2023
800000
600000
400000
200000
0
New Cases
Jan 2020
Mar 2020
May 2020
Jul 2020
Sep 2020
Nov 2020
Jan 2021
Mar 2021
May 2021
Jul 2021
Sep 2021
Nov 2021
Jan 2022
Mar 2022
May 2022
Jul 2022
Sep 2022
Nov 2022
Jan 2023
Mar 2023
May 2023
Jul 2023
Months (2019-2023)
State
California
Florida
New_York
Pennsylvania
Texas

The data

from data.gov

- Government data– USDHHS
- “This dataset shows health conditions and contributing causes mentioned in conjunction with deaths involving coronavirus disease 2019 (COVID-19) by age group and jurisdiction of occurrence.”
- Deaths reported by month, from 2020-2023

The conditions

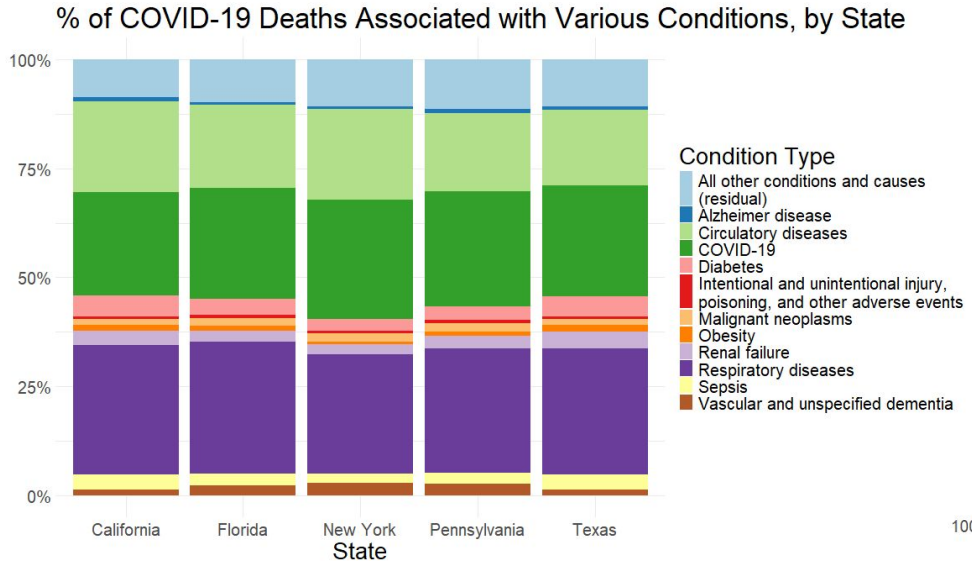
- **Respiratory diseases**

  - Influenza and pneumonia
  - Chronic lower respiratory diseases
  - Adult respiratory distress syndrome
  - Respiratory failure
  - Respiratory arrest
  - Other diseases of the respiratory system

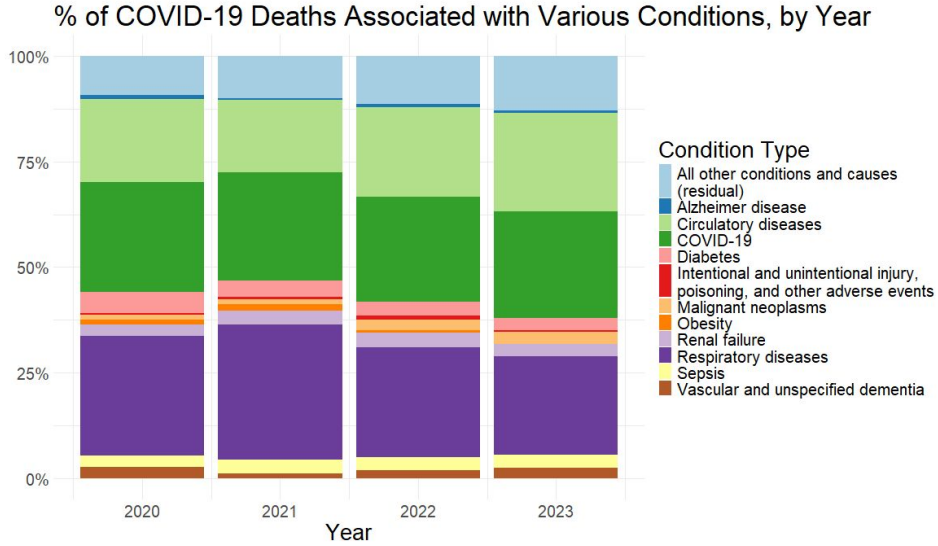
- **Circulatory diseases**

  - Hypertensive diseases
  - Ischemic heart disease
  - Cardiac arrest
  - Cardiac arrhythmia
  - Heart failure
  - Cerebrovascular diseases
  - Other diseases of the circulatory system

- **COVID-19:** indicated in cases where no additional disease was mentioned in conjunction with death
- Sepsis
- Malignant neoplasms
- Diabetes
- Obesity
- Alzheimer disease
- Vascular and unspecified dementia
- Renal failure
- Intentional and unintentional injury, poisoning, and other adverse events
- All other conditions and causes (residual)

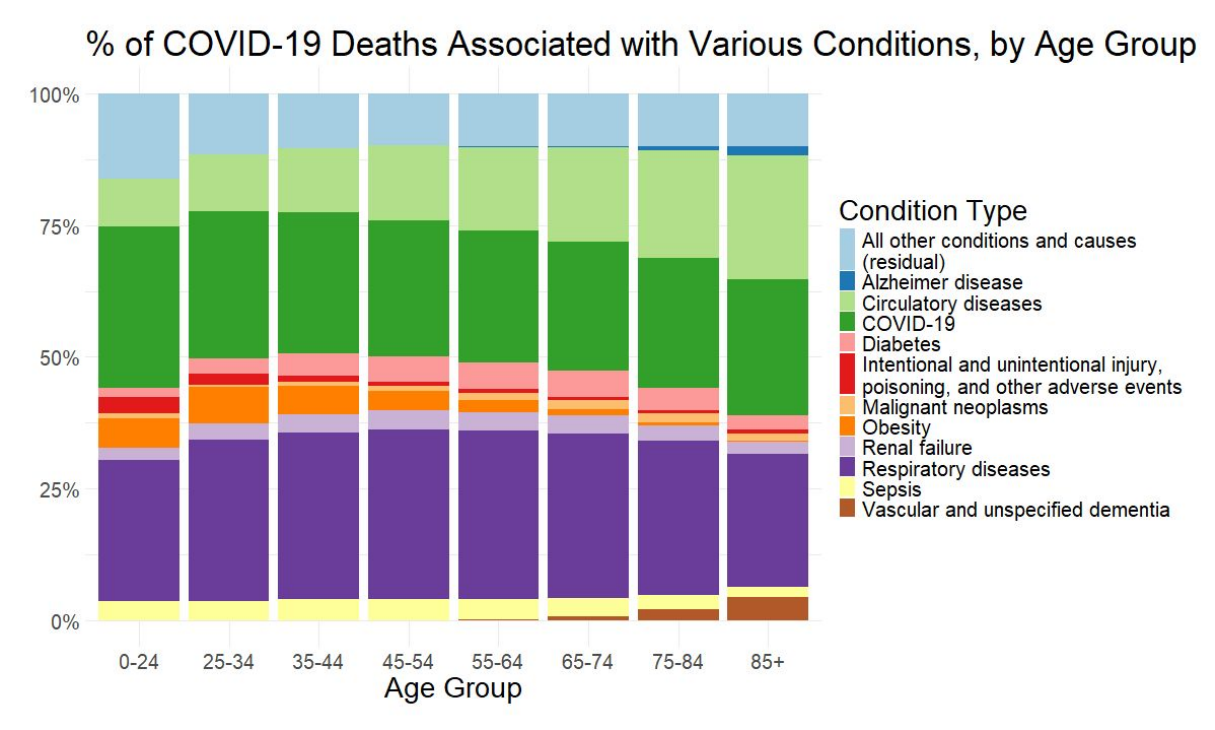


- **Larger proportion of respiratory-disease associated deaths in 2021**



- **Totaled across three years of recorded data (2020-2023)**
- **Consistent composition across states**
- **Respiratory and circulatory disease are dominant non-COVID-19 contributors to mortality**

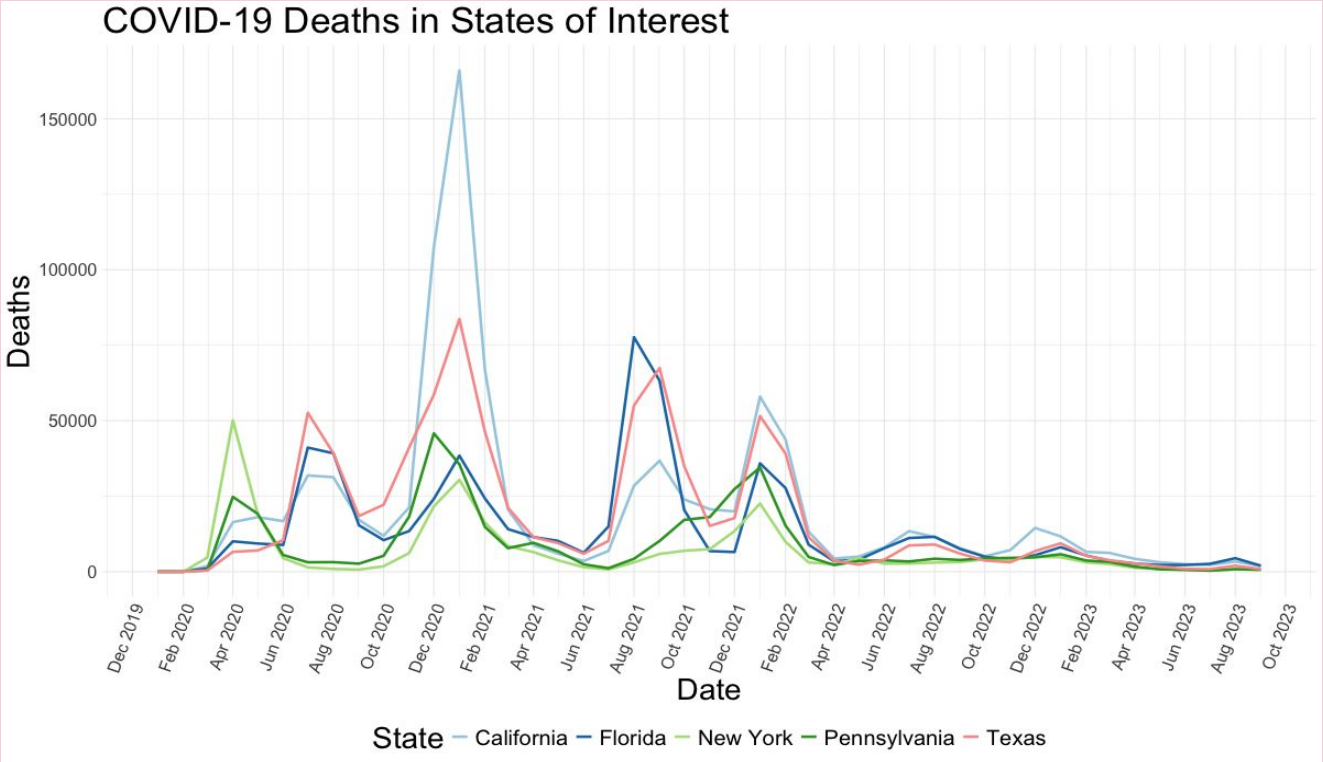
Trends observed over age group



Trends generally align with expectations:

- prevalence of circulatory disease association increases with age; same with Alzheimer's and dementia
- obesity-associated deaths less prevalent in older age groups

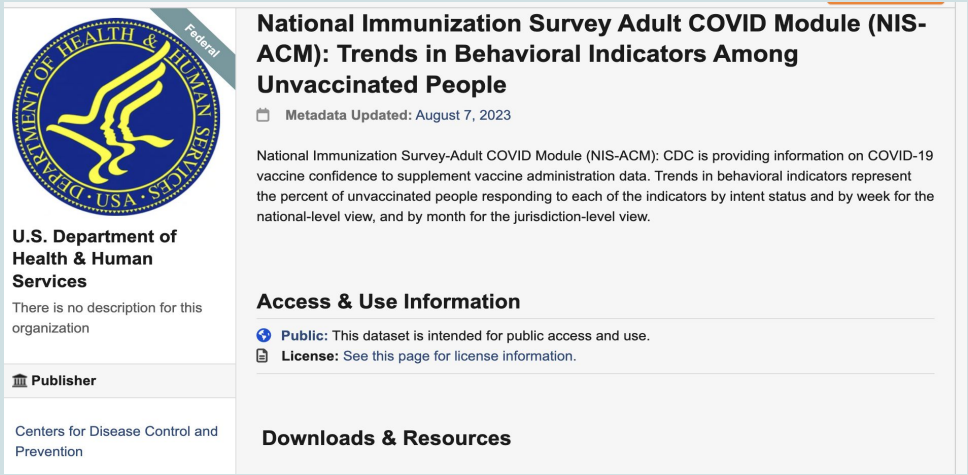
Shiny App



Reasons for Increased COVID-19 Deaths from Dec - Feb

- **Holiday Events**
- **Weakened Immunity**
- **Healthcare Strain**

The data



National Immunization Survey Adult COVID Module (NIS-ACM): Trends in Behavioral Indicators Among Unvaccinated People

Metadata Updated: August 7, 2023

National Immunization Survey-Adult COVID Module (NIS-ACM): CDC is providing information on COVID-19 vaccine confidence to supplement vaccine administration data. Trends in behavioral indicators represent the percent of unvaccinated people responding to each of the indicators by intent status and by week for the national-level view, and by month for the jurisdiction-level view.

U.S. Department of Health & Human Services

There is no description for this organization

Publisher

Centers for Disease Control and Prevention

Access & Use Information

Public: This dataset is intended for public access and use.

License: See this page for license information.

Downloads & Resources

Indicator.Category <chr>
Received updated bivalent booster dose (among adults who completed primary series)
Vaccinated (>=1 dose)

2 rows | 1–1 of 2 columns

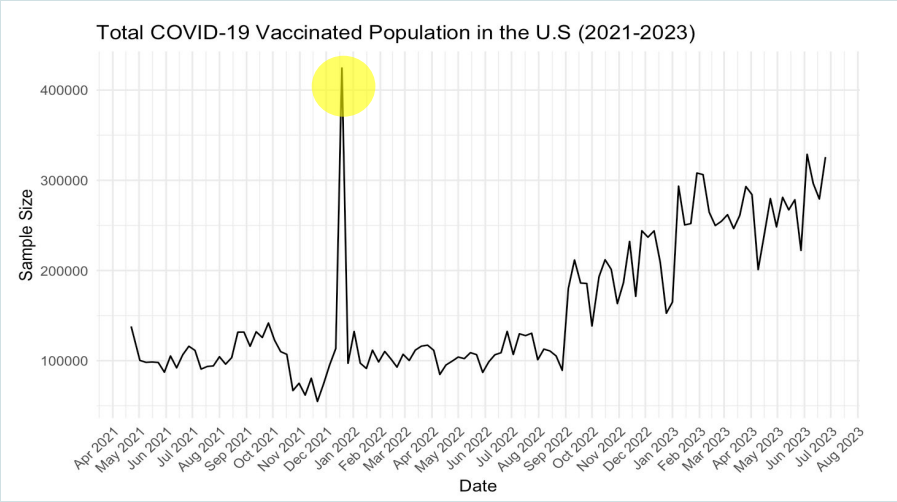
Data.gov

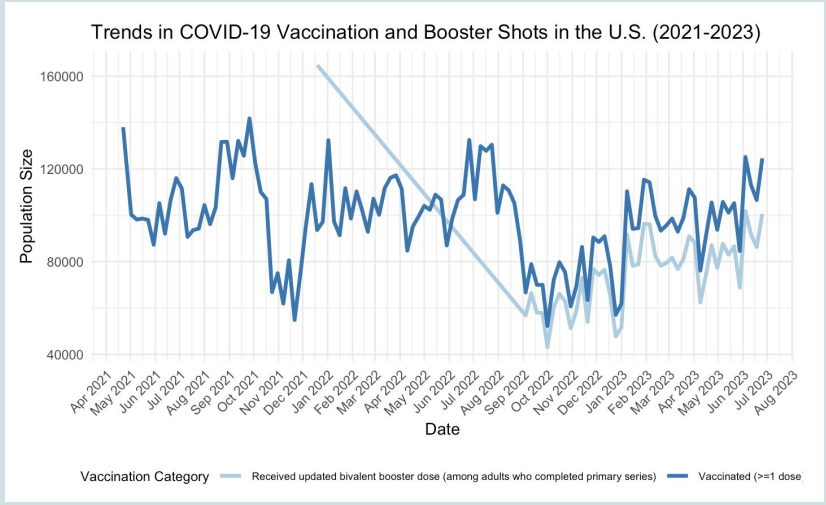
- Government data: **U.S department of Health and Human services.**
- The dataset primarily tracks the behaviors of unvaccinated individuals but also includes data on those who have been vaccinated or/and received the booster dose.

In my analysis, I focused on two categories:

- Those who have received at least one dose
- Those who have received the bivalent booster dose

TRENDS IN COVID-19 VACCINATION ACROSS THE U.S

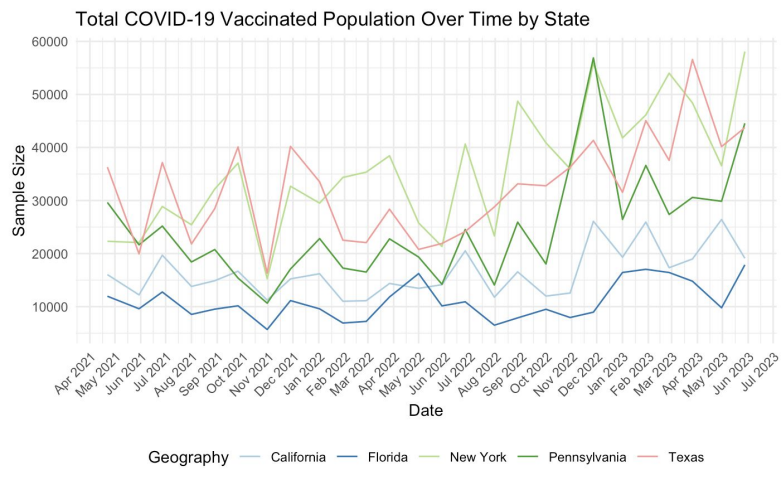


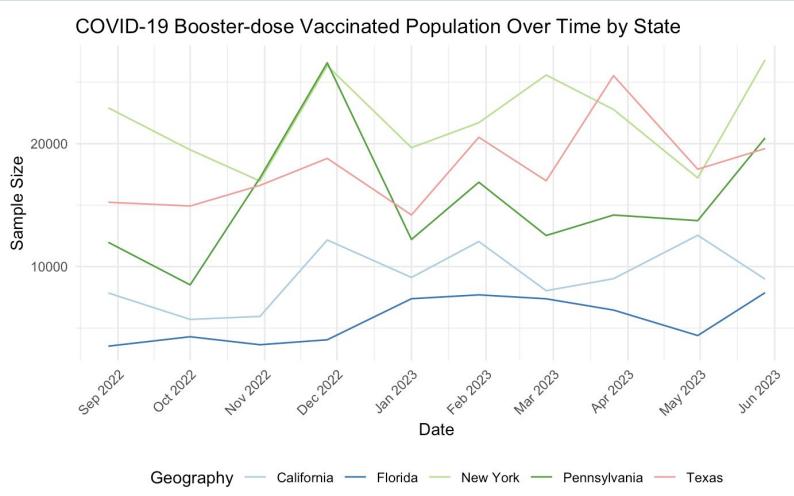


In the United States, 81% of the population has received at least one dose, and 70% is considered fully vaccinated. Of those, 30% has received a booster dose.

WHY THE PEAK?

FDA authorized COVID-19 booster shots for all individuals 18 years of age and older in November 2021.





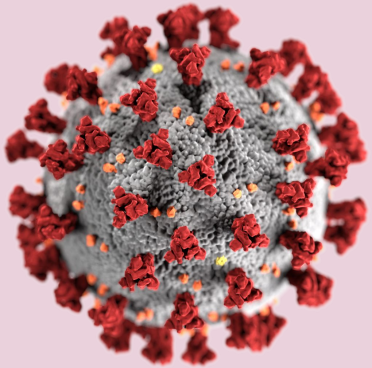
VACCINATION TRENDS BY STATES:

- Over 90% of NY residents were vaccinated with at least one dose. And over 82% of NY residents received the two-dose primary series.
- In Texas, 77% of the state's population received at least one dose. A possible reason for the higher vaccination trend is that Texas has the highest number of counties in the U.S.
- 85% of California state has received at least one dose. And 75% of California's population are considered fully vaccinated.
- Florida's low COVID-19 vaccination rates was significantly associated with voting preferences in the 2020 presidential election.

Overall, the trends align with our expectations:

A higher prevalence of vaccinated individuals leads to a reduced number of deaths in the population across all states.

Conclusions



- Examined trends in COVID-19 cases, deaths, and vaccinations from 2020-2023
- Explored trends in comorbidities and mortality in the COVID-19 pandemic

Higher vaccination rates ultimately contribute to a decline in death count!


Thank You!