Data Visualization [using Tableau]

PROJECT PRESENTATION

U.S.A COVID - 19
Case Study (2020-2023)

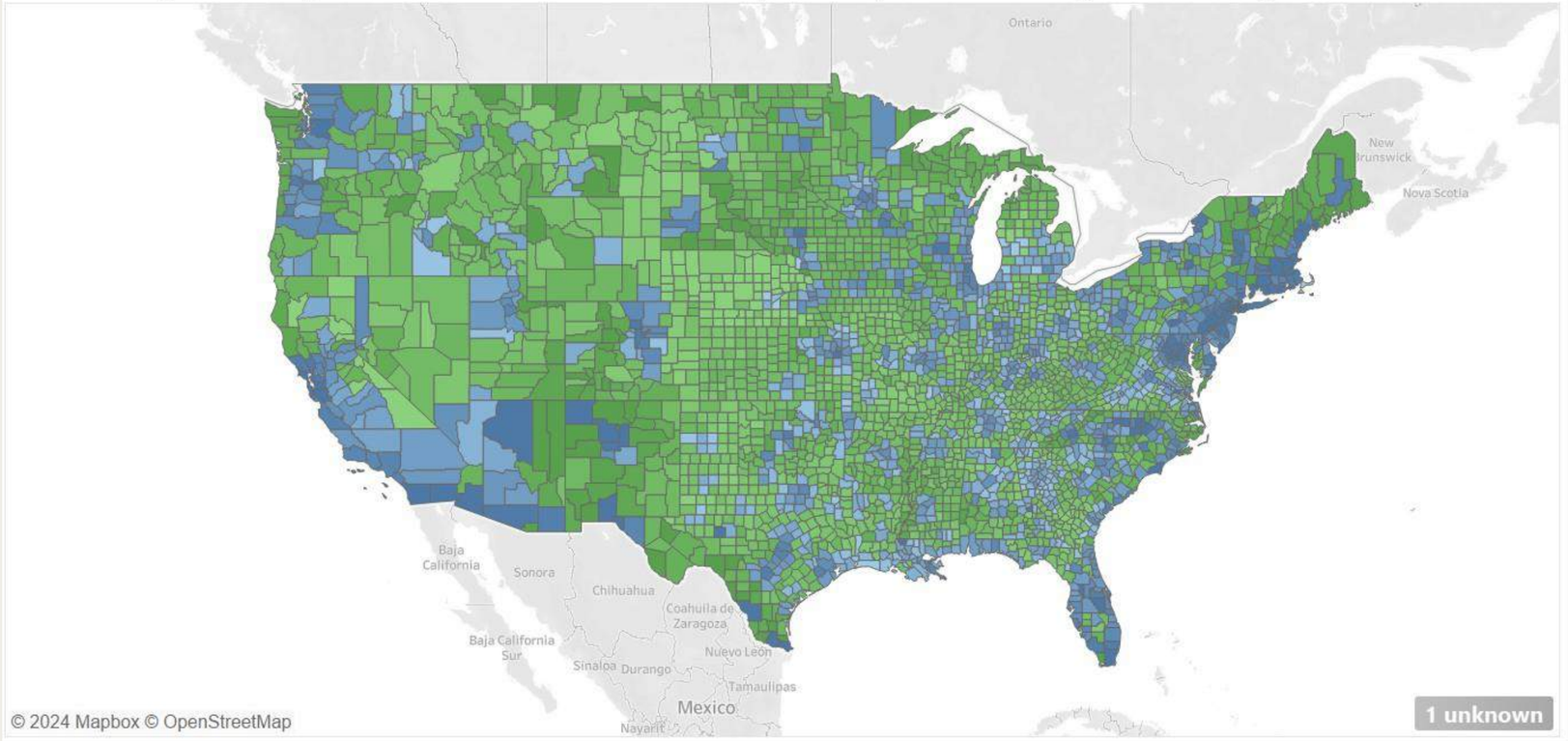
HYPOTHESIS 1

- Between January 2021 and May 2023 in the United States, there's likely to be a notable difference in vaccination rates between urban and rural counties, with urban areas experiencing approximately 30% higher vaccination rates than rural ones.

Insights-

- People in rural counties may be more likely to be misinformed about the safety and efficacy of vaccines.
- People in rural counties may be more likely to be distrustful of authority figures, including healthcare professionals.

Percentage Of People With at least One Dose by Metro/Non-Metro (2020-2023)

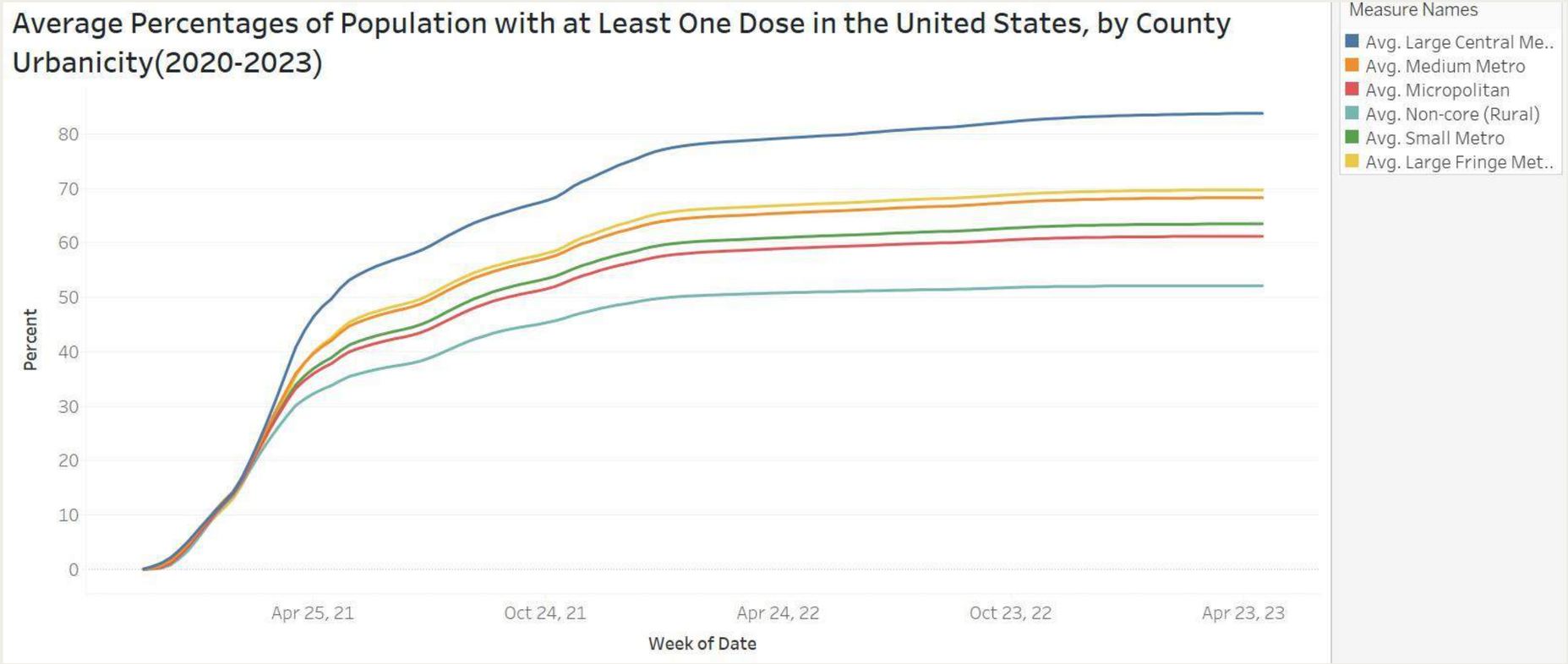


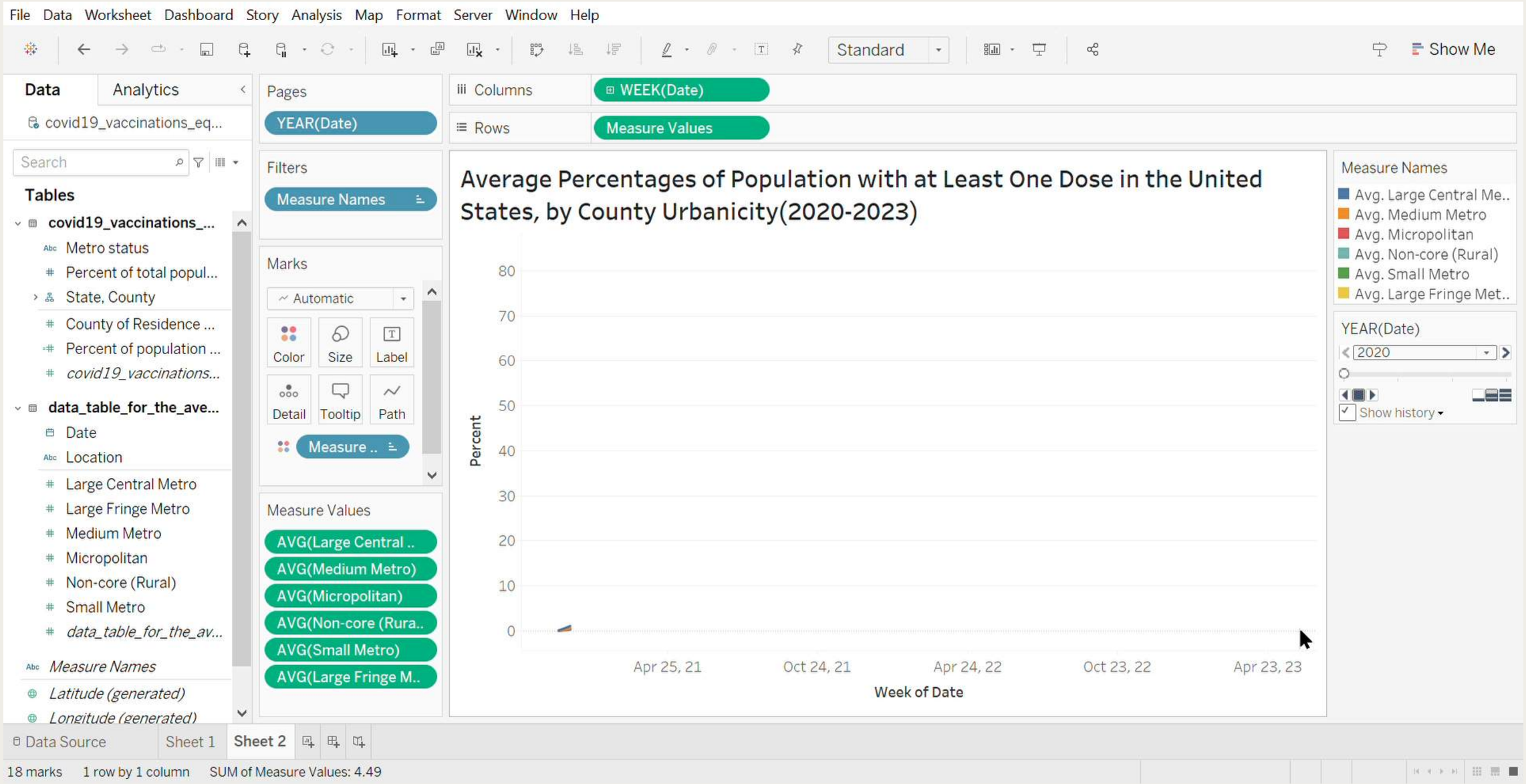
State

(All)

Metro status

- [x] (All)
- [x] Metro
- [x] N/A
- [x] Non-metro


Average Percentages of Population with at Least One Dose in the United States, by County Urbanicity(2020-2023)
Percent
80
70
60
50
40
30
20
10
0
Apr 25, 21
Oct 24, 21
Apr 24, 22
Oct 23, 22
Apr 23, 23
Week of Date
Measure Names
Avg. Large Central Me..
Avg. Medium Metro
Avg. Micropolitan
Avg. Non-core (Rural)
Avg. Small Metro
Avg. Large Fringe Met..


File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Standard
Show Me
Data
Analytics
covid19_vaccinations_eq...
Search
Tables
covid19_vaccinations_...
Metro status
Percent of total popul...
State, County
County of Residence ...
Percent of population ...
covid19_vaccinations...
data_table_for_the_ave...
Date
Location
Large Central Metro
Large Fringe Metro
Medium Metro
Micropolitan
Non-core (Rural)
Small Metro
data_table_for_the_av...
Measure Names
Latitude (generated)
Longitude (generated)
Pages
YEAR(Date)
Filters
Measure Names
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Path
Measure ..
Measure Values
AVG(Large Central ..
AVG(Medium Metro)
AVG(Micropolitan)
AVG(Non-core (Rura..
AVG(Small Metro)
AVG(Large Fringe M..
Columns
WEEK(Date)
Rows
Measure Values
Average Percentages of Population with at Least One Dose in the United States, by County Urbanicity(2020-2023)
Percent
80
70
60
50
40
30
20
10
0
Apr 25, 21
Oct 24, 21
Apr 24, 22
Oct 23, 22
Apr 23, 23
Week of Date
Measure Names
Avg. Large Central Me..
Avg. Medium Metro
Avg. Micropolitan
Avg. Non-core (Rural)
Avg. Small Metro
Avg. Large Fringe Met..
YEAR(Date)
2020
Show history
Data Source
Sheet 1
Sheet 2
18 marks
1 row by 1 column
SUM of Measure Values: 4.49

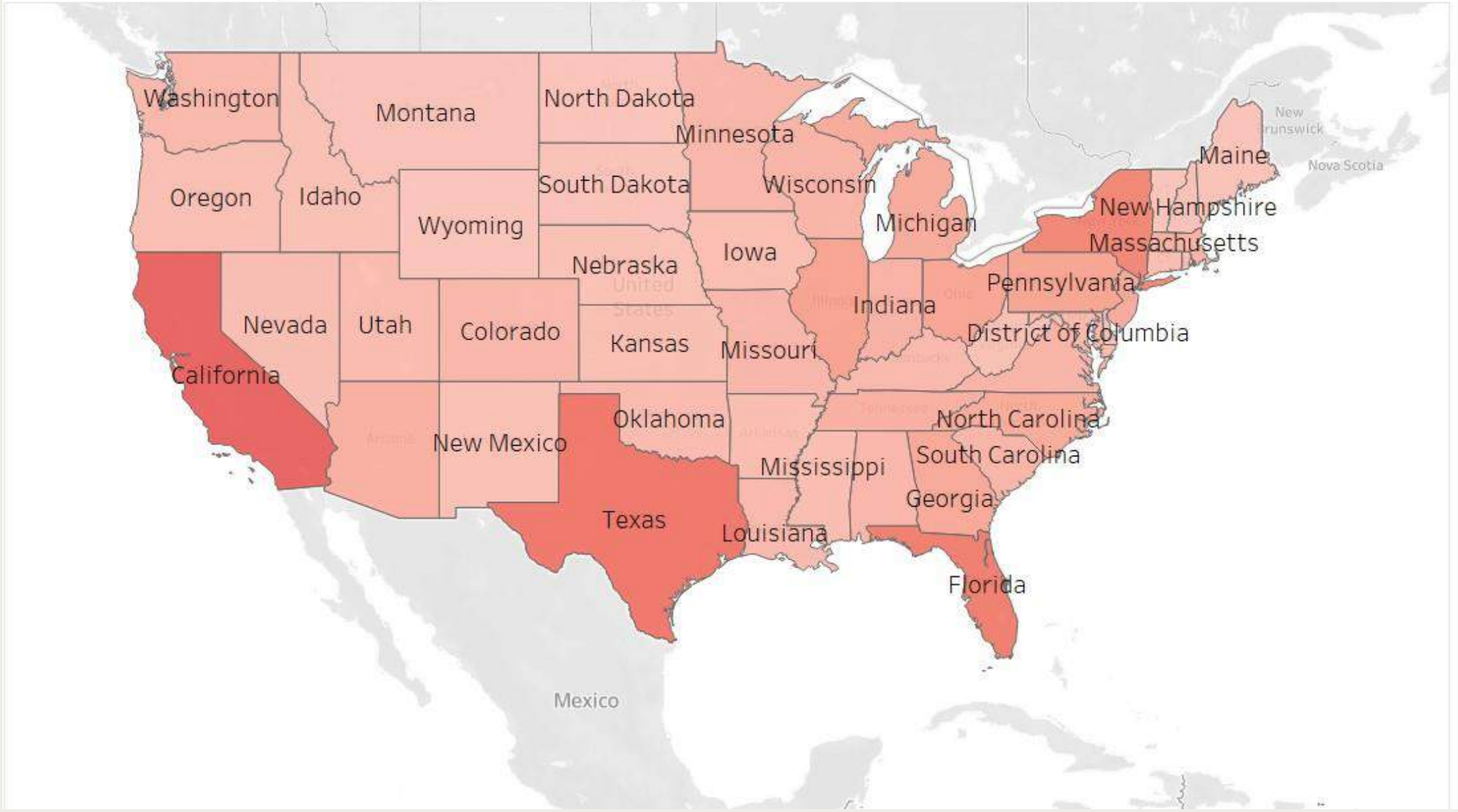
HYPOTHESIS 2

- In California, the 50% increase in COVID-19 cases in December 2020 was caused by the introduction of the Delta variant due to 30% of the population being unvaccinated.

Insights

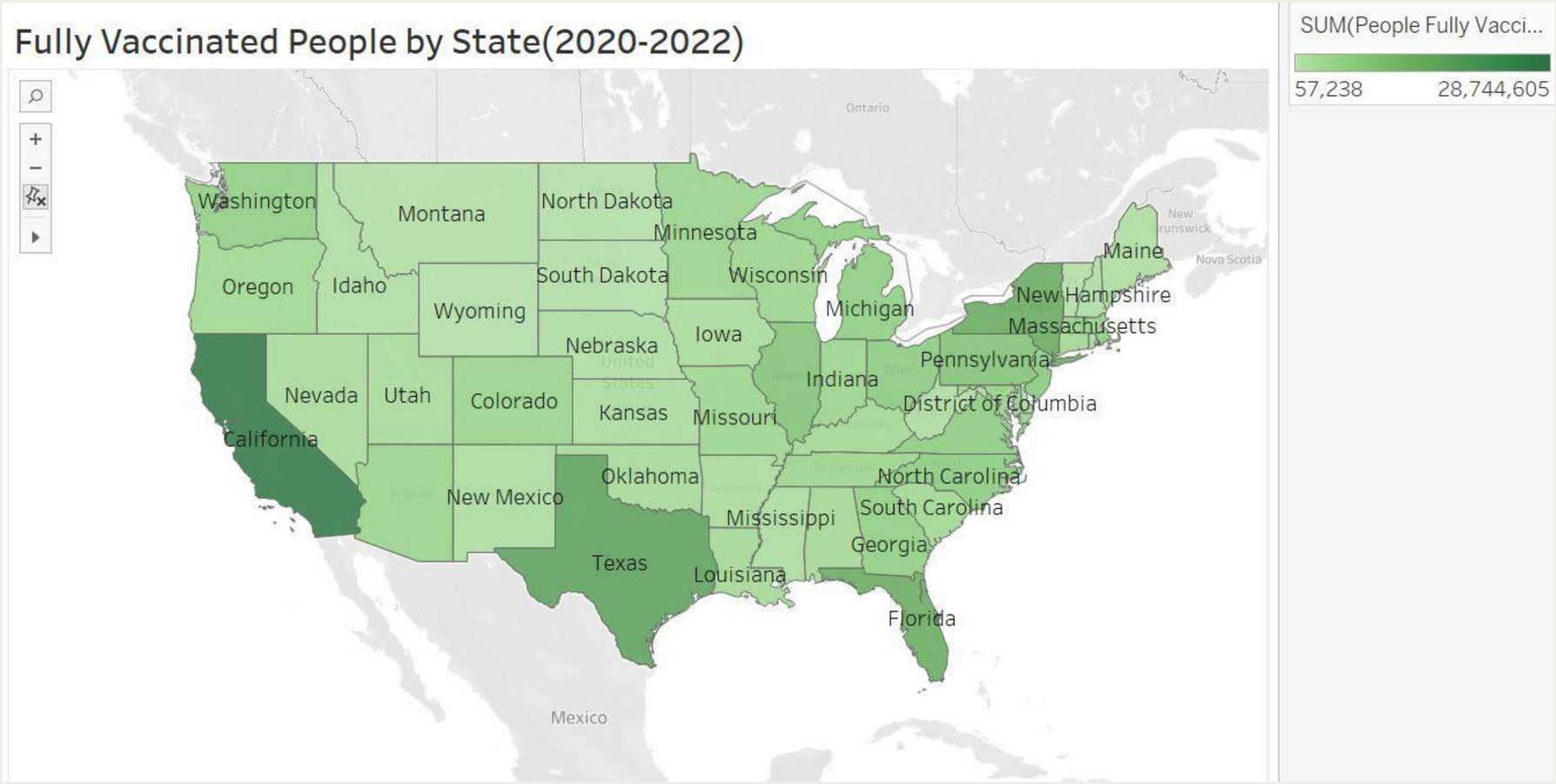
- The United States dashboard highlights a correlation between state vaccination rates and COVID-19 cases. California stands out with high case counts despite having one of the highest vaccination levels. A line graph depicts increasing cases alongside vaccine distribution and variant emergence. It underscores that while vaccines are beneficial, additional precautions are necessary, particularly with the rise of potentially more transmissible variants. This emphasizes the importance of a multifaceted approach to controlling the pandemic.

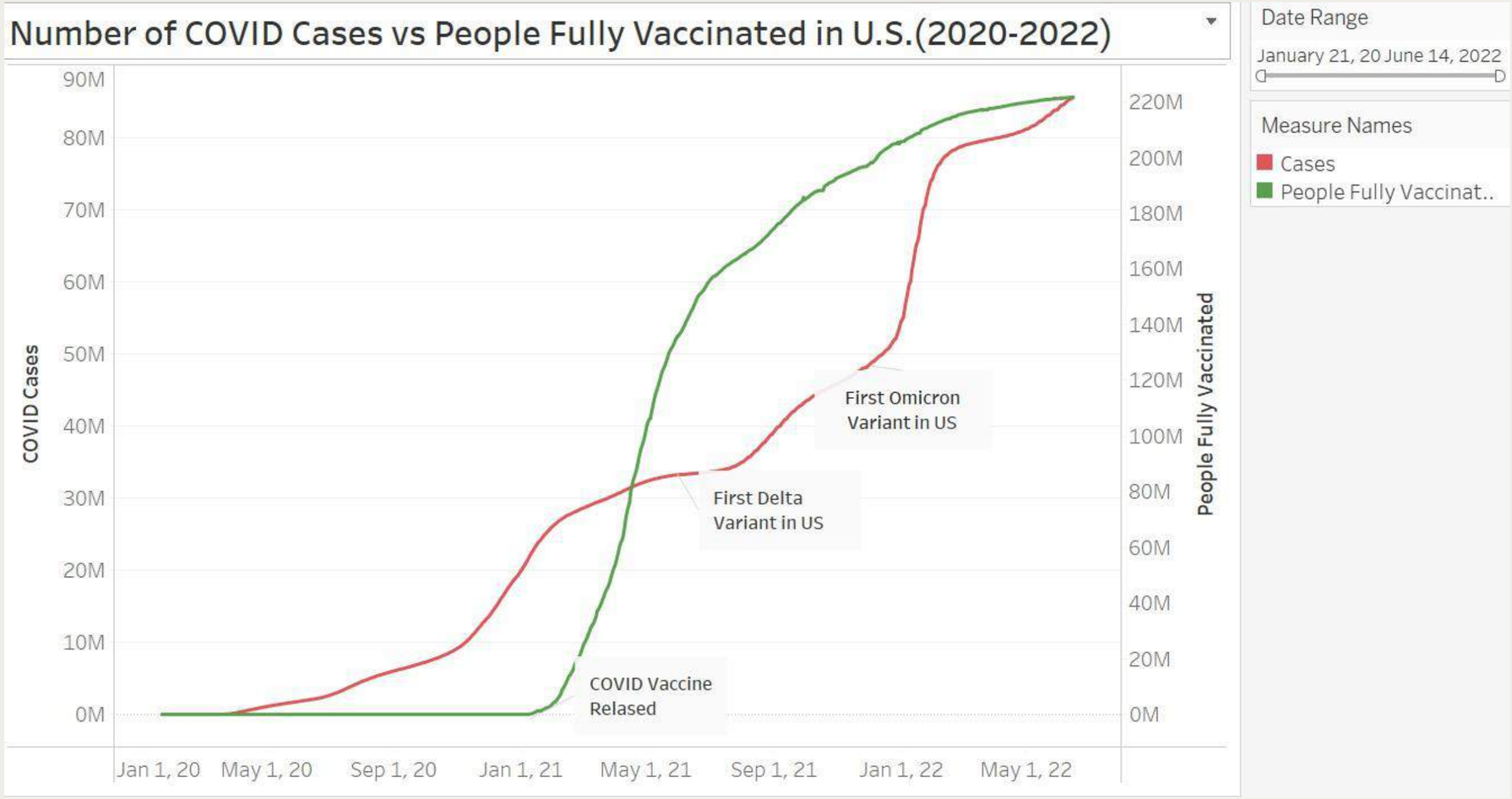
COVID Cases By State(2020-2022)

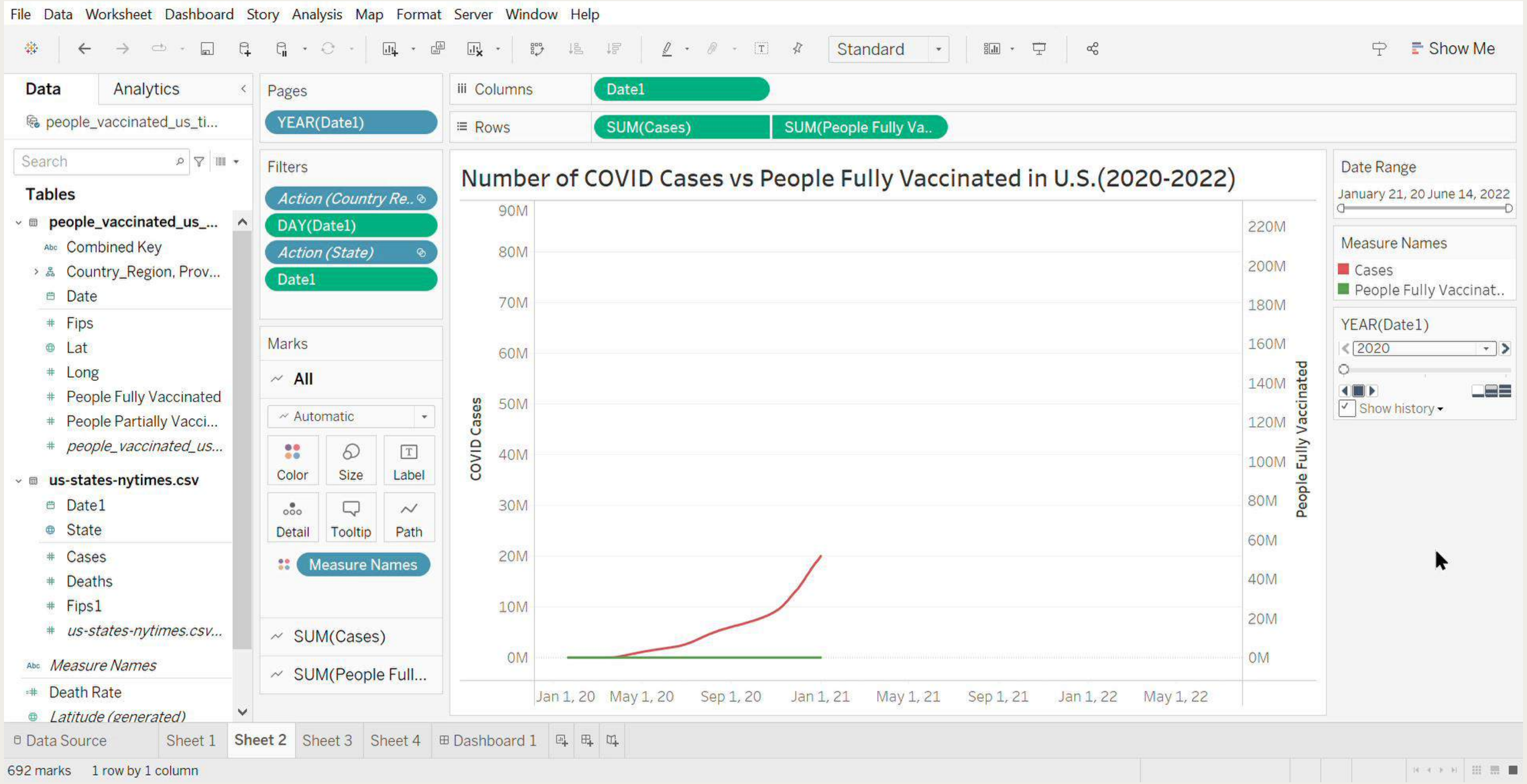


SUM(Cases)

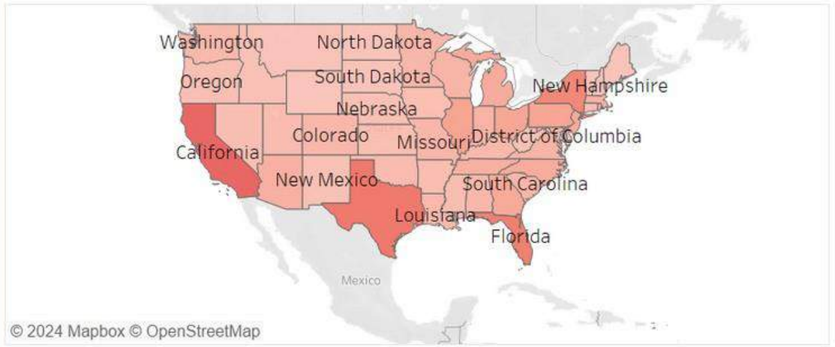
20,472 9,850,089


Fully Vaccinated People by State(2020-2022)
SUM(People Fully Vacci...
57,238
28,744,605
Ontario
New Brunswick
Nova Scotia
Washington
Montana
North Dakota
Minnesota
Maine
Oregon
Idaho
South Dakota
Wisconsin
New Hampshire
Wyoming
Michigan
Massachusetts
Nebraska
Iowa
Pennsylvania
Nevada
Utah
Colorado
Kansas
Missouri
Indiana
District of Columbia
California
Oklahoma
North Carolina
New Mexico
South Carolina
Mississippi
Georgia
Texas
Louisiana
Florida
Mexico

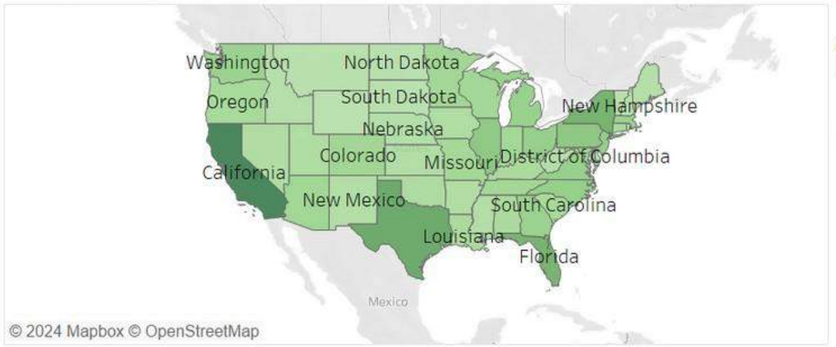

Number of COVID Cases vs People Fully Vaccinated in U.S.(2020-2022)
COVID Cases
90M
80M
70M
60M
50M
40M
30M
20M
10M
0M
People Fully Vaccinated
220M
200M
180M
160M
140M
120M
100M
80M
60M
40M
20M
0M
Jan 1, 20
May 1, 20
Sep 1, 20
Jan 1, 21
May 1, 21
Sep 1, 21
Jan 1, 22
May 1, 22
First Omicron Variant in US
First Delta Variant in US
COVID Vaccine Relased
Date Range
January 21, 20 June 14, 2022
Measure Names
Cases
People Fully Vaccinat..


File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Standard
Show Me
Data
Analytics
people_vaccinated_us_ti...
Search
Tables
people_vaccinated_us_...
Combined Key
Country_Region, Prov...
Date
Fips
Lat
Long
People Fully Vaccinated
People Partially Vacci...
people_vaccinated_us...
us-states-nytimes.csv
Date1
State
Cases
Deaths
Fips1
us-states-nytimes.csv...
Measure Names
Death Rate
Latitude (generated)
Pages
YEAR(Date1)
Filters
Action (Country Re..
DAY(Date1)
Action (State)
Date1
Marks
All
Automatic
Color
Size
Label
Detail
Tooltip
Path
Measure Names
SUM(Cases)
SUM(People Full...
Columns
Date1
Rows
SUM(Cases)
SUM(People Fully Va..
Number of COVID Cases vs People Fully Vaccinated in U.S.(2020-2022)
COVID Cases
People Fully Vaccinated
90M
80M
70M
60M
50M
40M
30M
20M
10M
0M
220M
200M
180M
160M
140M
120M
100M
80M
60M
40M
20M
0M
Jan 1, 20
May 1, 20
Sep 1, 20
Jan 1, 21
May 1, 21
Sep 1, 21
Jan 1, 22
May 1, 22
Date Range
January 21, 20 June 14, 2022
Measure Names
Cases
People Fully Vaccinat..
YEAR(Date1)
2020
Show history
Data Source
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Dashboard 1
692 marks
1 row by 1 column

COVID Cases By State(2020-2022)



Fully Vaccinated People by State(2020-2022)

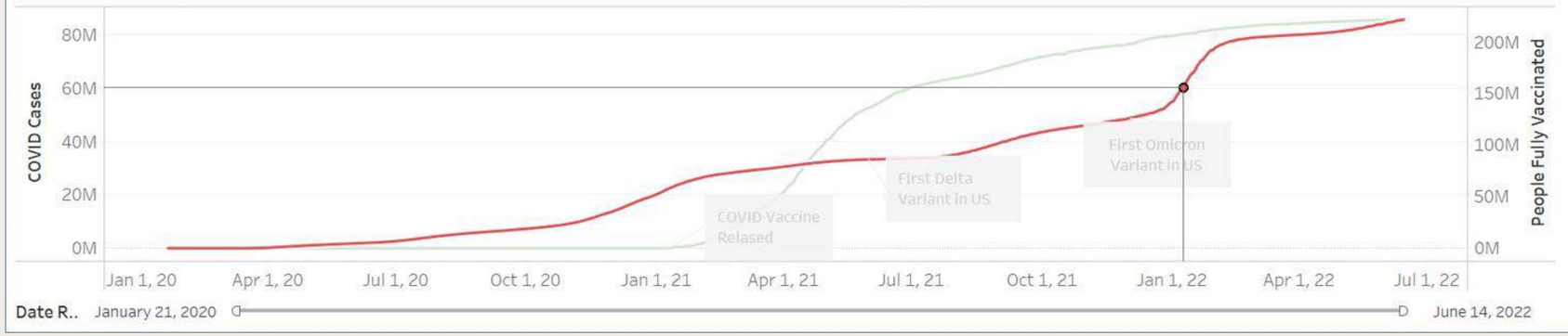


Cases
20,472 9,850,089

People Fully Vaccinated
57,238 28,744,605

Death Rate

Number of COVID Cases vs People Fully Vaccinated in U.S.(2020-2022)

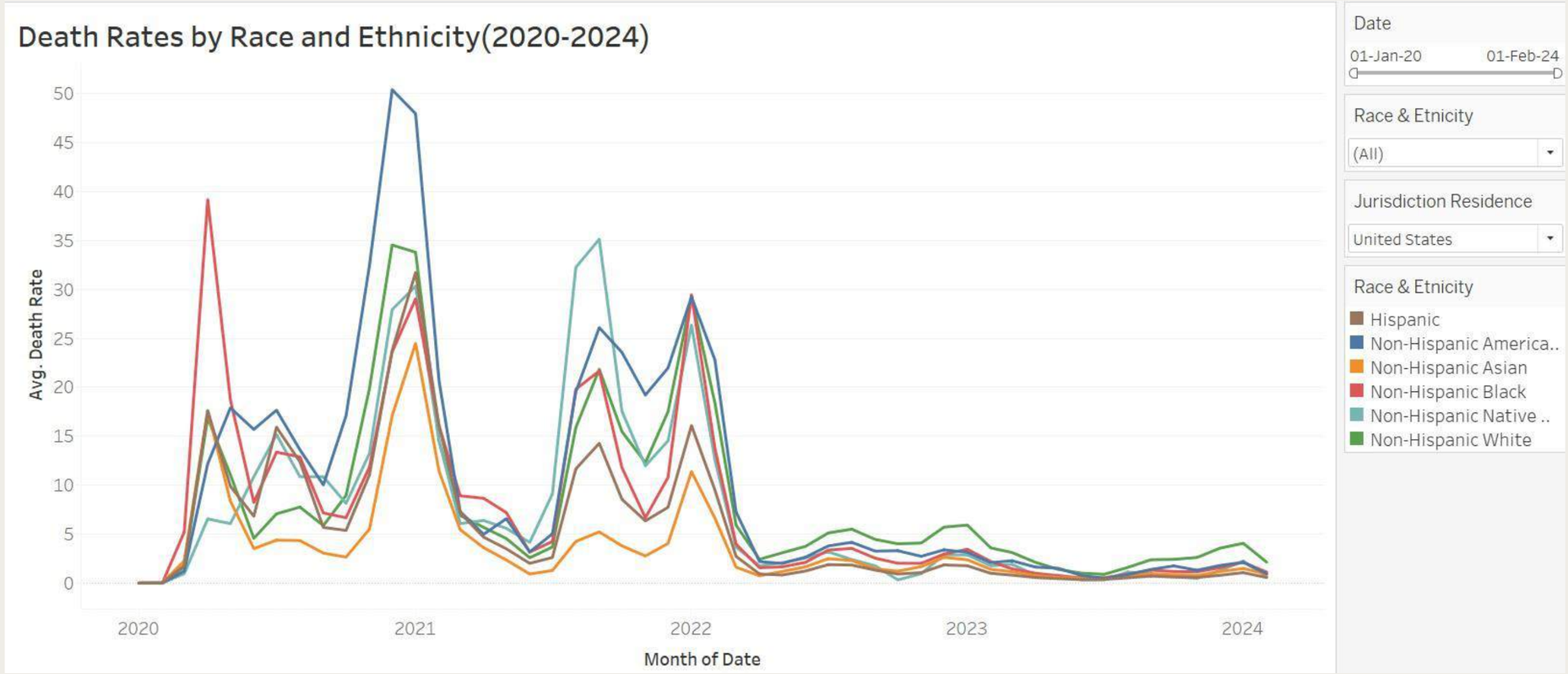


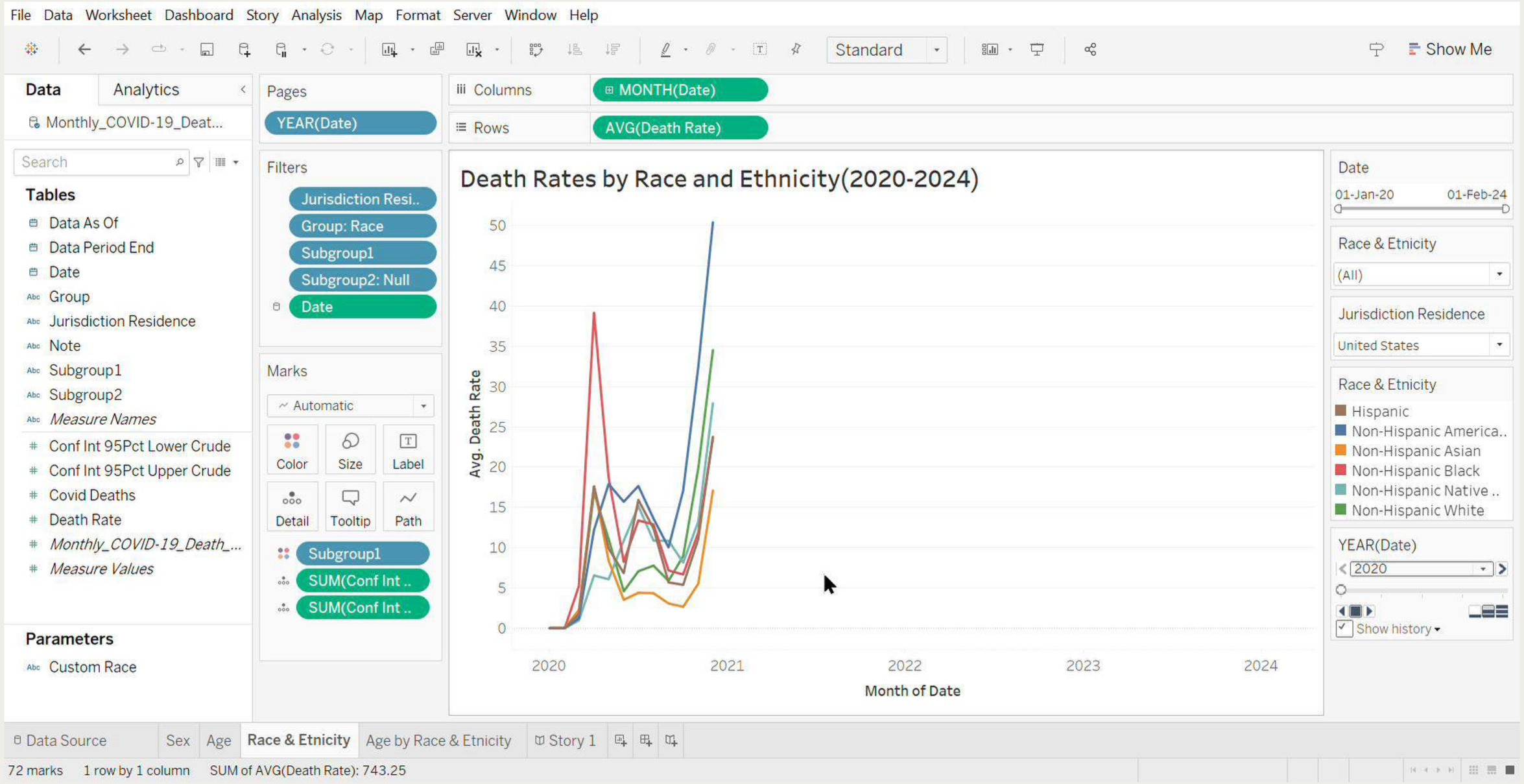
HYPOTHESIS 3

- Between 2020 and 2023 in the United States, there appears to be a significant difference in death rates among different ethnic groups. Non-Hispanic American Indians and African Americans have a higher death rate, approximately 20% more than Asian Americans and Hispanics.

Insights

- The graph depicts COVID-19 death rates per 100,000 people by age and ethnicity from January 2020 to February 2024. Peaks suggest waves of high mortality.
- Mortality rates may vary across different races due to a number of factors, such as lack of healthcare resources, barriers to accessing healthcare, Social and structural challenges and history of low vaccination rates.


Death Rates by Race and Ethnicity(2020-2024)
Avg. Death Rate
50
45
40
35
30
25
20
15
10
5
0
2020
2021
2022
2023
2024
Month of Date
Date
01-Jan-20
01-Feb-24
Race & Etnicity
(All)
Jurisdiction Residence
United States
Race & Etnicity
Hispanic
Non-Hispanic America..
Non-Hispanic Asian
Non-Hispanic Black
Non-Hispanic Native ..
Non-Hispanic White

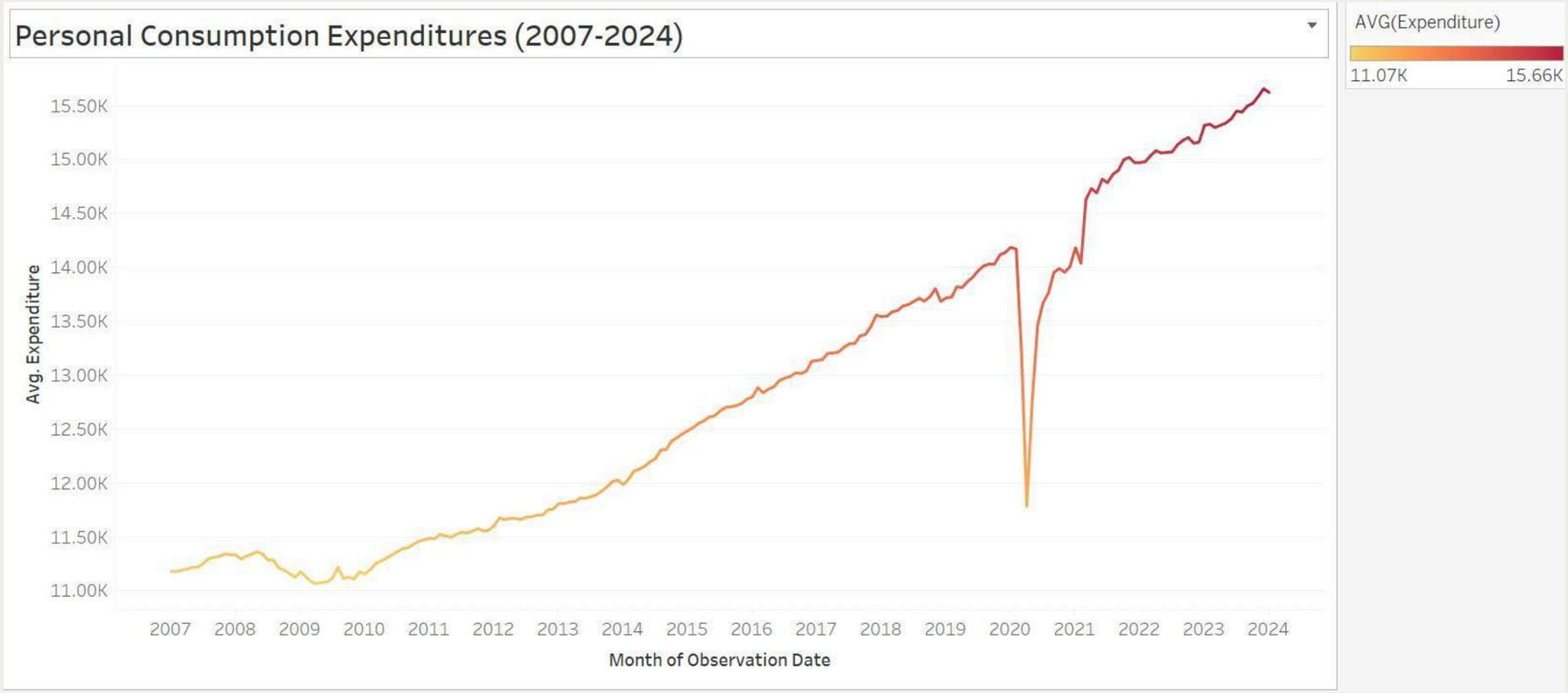

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Standard
Show Me
Data
Analytics
Monthly_COVID-19_Deat...
Search
Tables
Data As Of
Data Period End
Date
Group
Jurisdiction Residence
Note
Subgroup1
Subgroup2
Measure Names
Conf Int 95Pct Lower Crude
Conf Int 95Pct Upper Crude
Covid Deaths
Death Rate
Monthly_COVID-19_Death_...
Measure Values
Parameters
Custom Race
Pages
YEAR(Date)
Filters
Jurisdiction Resi..
Group: Race
Subgroup1
Subgroup2: Null
Date
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Path
Subgroup1
SUM(Conf Int ..
SUM(Conf Int ..
Columns
MONTH(Date)
Rows
AVG(Death Rate)
Death Rates by Race and Ethnicity(2020-2024)
Avg. Death Rate
50
45
40
35
30
25
20
15
10
5
0
2020
2021
2022
2023
2024
Month of Date
Date
01-Jan-20
01-Feb-24
Race & Etnicity
(All)
Jurisdiction Residence
United States
Race & Etnicity
Hispanic
Non-Hispanic America..
Non-Hispanic Asian
Non-Hispanic Black
Non-Hispanic Native ..
Non-Hispanic White
YEAR(Date)
2020
Show history
Data Source
Sex
Age
Race & Etnicity
Age by Race & Etnicity
Story 1
72 marks
1 row by 1 column
SUM of AVG(Death Rate): 743.25

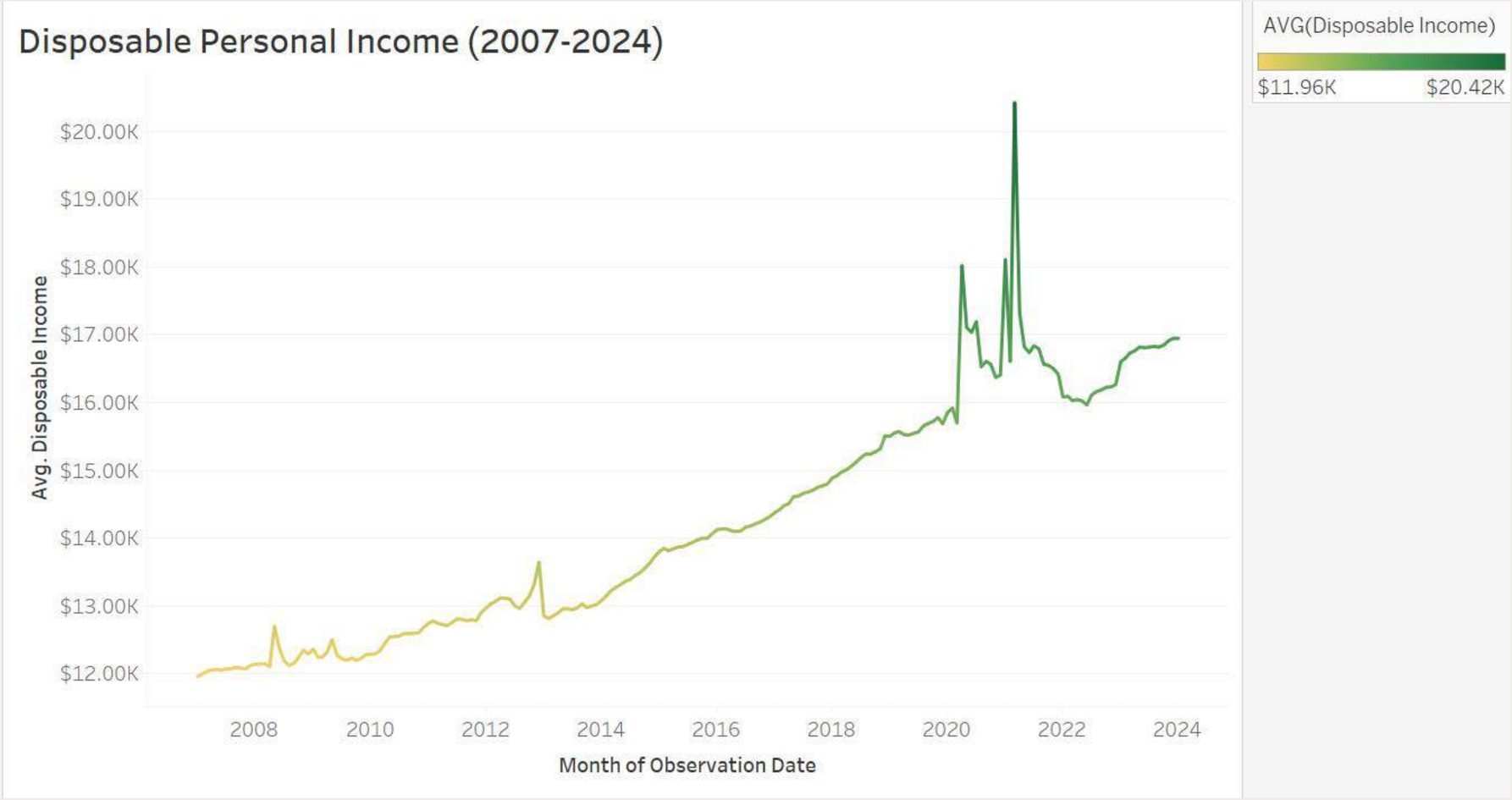
HYPOTHESIS 4

- The American household savings from their disposable income reduced by 30% during the years 2019-2022 in the pandemic due to unemployment.

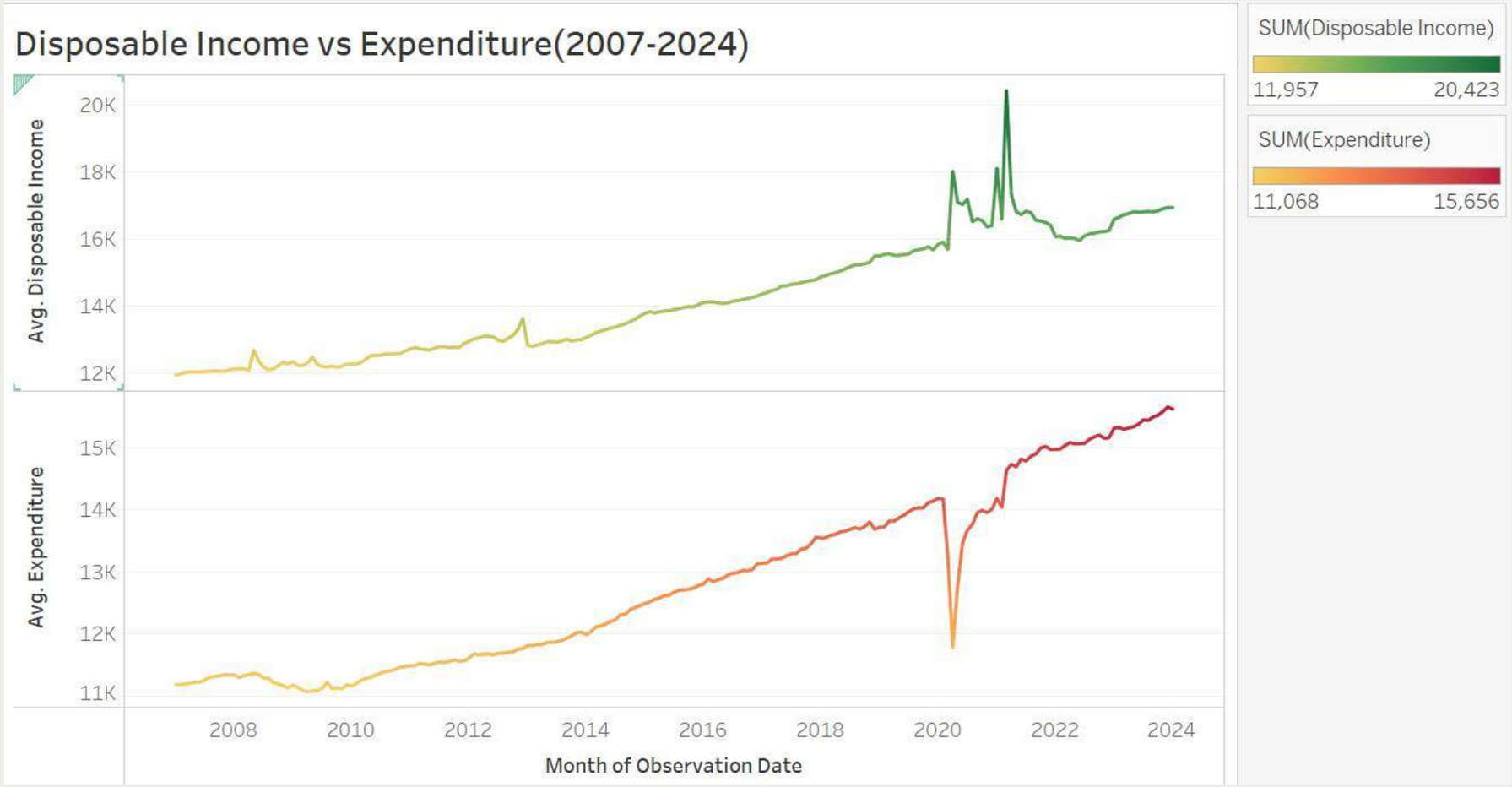
Insights

- The graphic displays personal expenditures from 2007 to 2024. A notable decline occurred in 2020 due to the pandemic-induced lockdown worldwide. Post-lockdown, expenditures resumed an upward trend, as indicated by the data.
- The second graphic illustrates disposable income trends from 2007 to 2024. Overall, income saw steady growth until February 2020, when pandemic-related fluctuations began. Despite instability, income reached its peak in March 2021.
- The final visualization from 2007 to 2024 reveals minimal changes in income and expenditure until the pandemic hit. Both increased steadily during this period. However, from 2020 onwards, erratic fluctuations occurred, stabilizing somewhat in 2023 and persisting to the present.


Personal Consumption Expenditures (2007-2024)
AVG(Expenditure)
11.07K
15.66K
15.50K
15.00K
14.50K
14.00K
13.50K
13.00K
12.50K
12.00K
11.50K
11.00K
Avg. Expenditure
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Month of Observation Date


Disposable Personal Income (2007-2024)
AVG(Disposable Income)
$11.96K
$20.42K
$20.00K
$19.00K
$18.00K
$17.00K
$16.00K
$15.00K
$14.00K
$13.00K
$12.00K
Avg. Disposable Income
2008
2010
2012
2014
2016
2018
2020
2022
2024
Month of Observation Date

Disposable Income vs Expenditure(2007-2024)



File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Standard | Show Me

Data | Analytics

FRED Graph (PCEC96)

Search

Tables

- Observation Date
- *Measure Names*
- Disposable Income
- Expenditure
- *FRED Graph (Count)*
- *Measure Values*

Pages: YEAR(Observation D..

Filters

Marks: All

Line

Color | Size | Label | Detail | Tooltip | Path

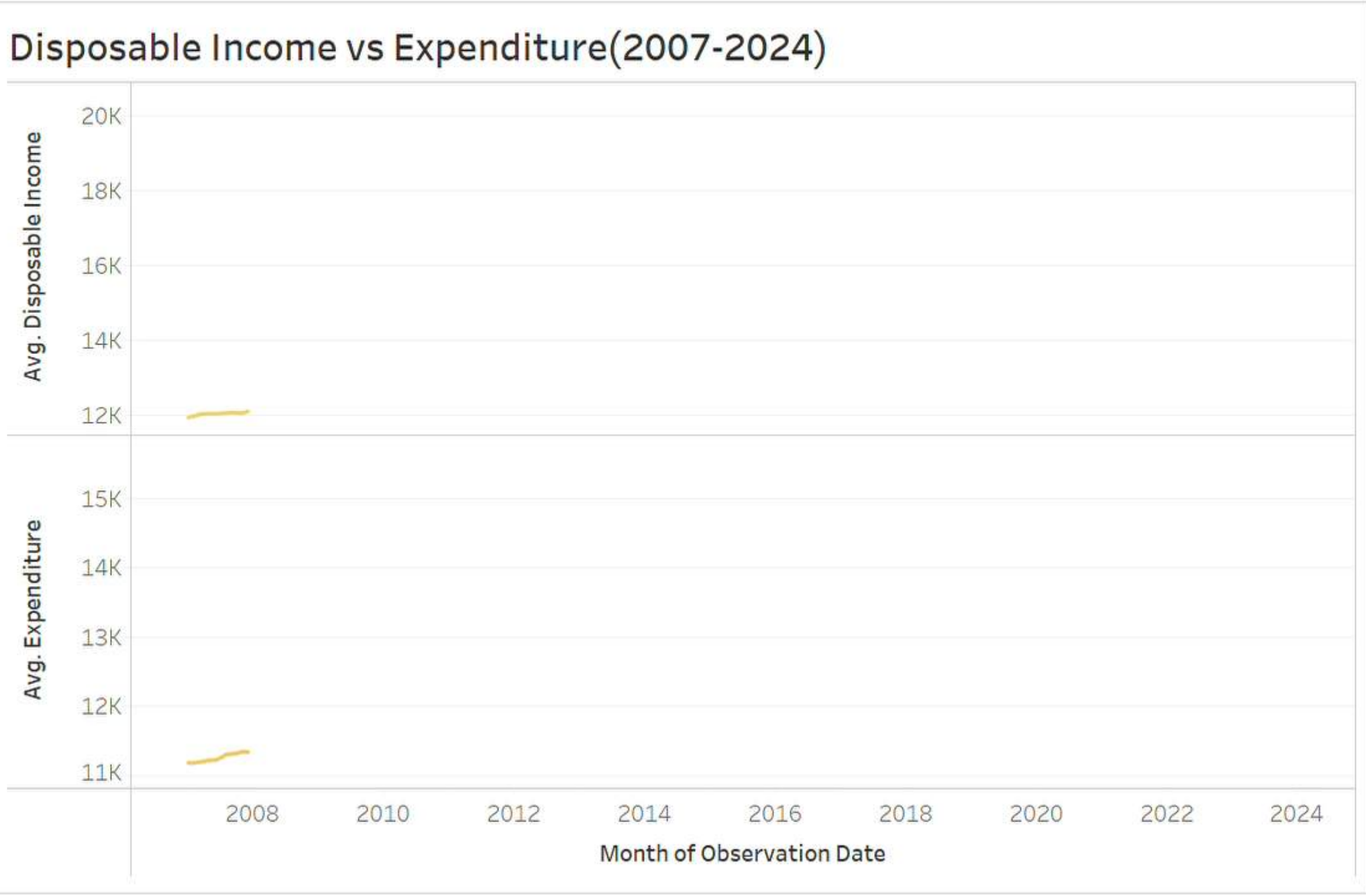
Multiple fields

AVG(Disposable ...

AVG(Expenditure)

Columns: MONTH(Observati..

Rows: AVG(Disposable Inco.. | AVG(Expenditure)



SUM(Disposable Income)
11,957 20,423

SUM(Expenditure)
11,068 15,656

YEAR(Observation Date)
2007
Show history

Data Source | Sheet 1 | Sheet 2 | **Sheet 3** | Sheet 3 (2) | Dashboard 1

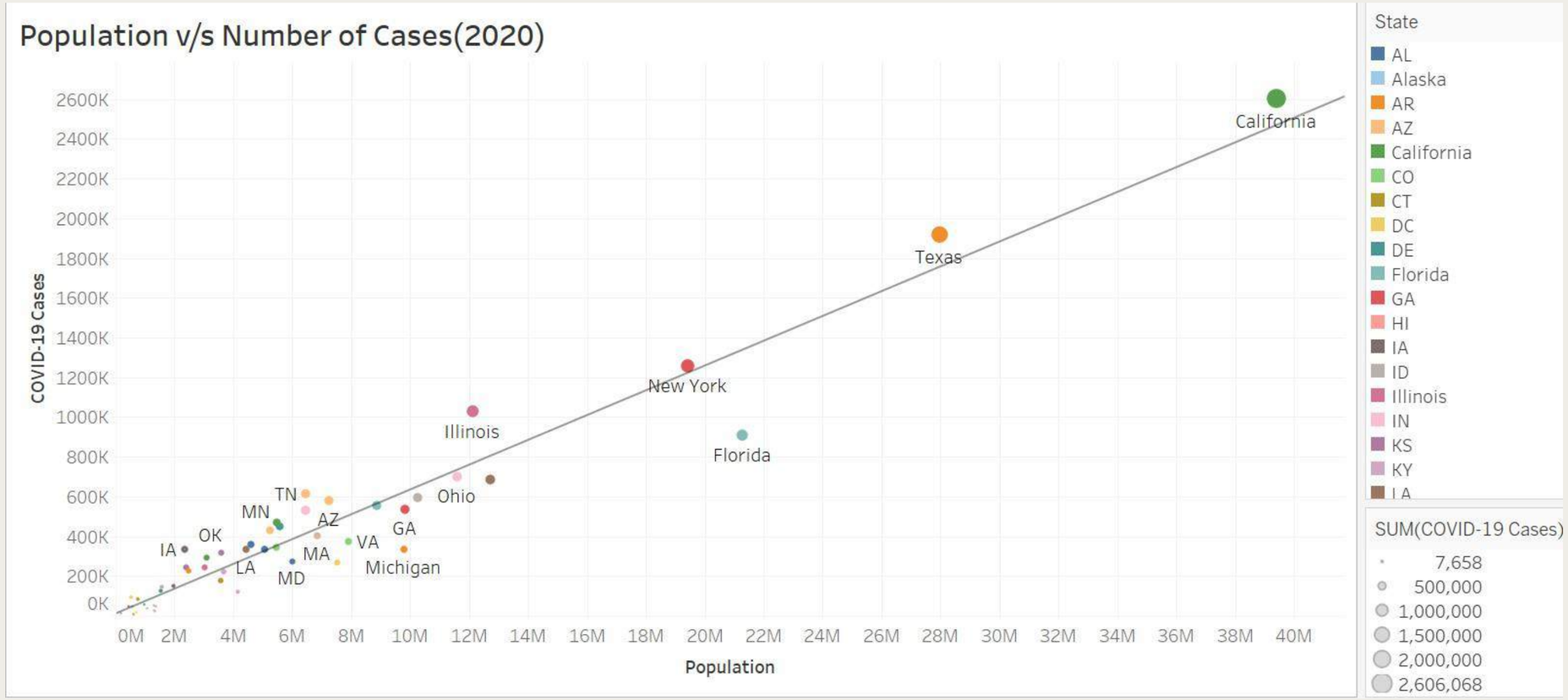
24 marks 2 rows by 1 column SUM of AVG(Disposable Income): 144,652

HYPOTHESIS 5

- In united states between the years of 2019-2022, the number of COVID-19 cases in a state is positively correlated with the state's population. As the population increases, the number of COVID-19 cases also increases.

Insights

- The visualization that compares the number of COVID-19 cases with state populations in the U.S. for the year 2020. The scatter plot reveals a direct correlation where states with bigger populations tend to report more COVID-19 cases. For instance, states such as California, Texas, and New York stand out with both high populations and case counts. The trend line on the graph supports the correlation. A potential hypothesis from this data could be that densely populated states have a higher rate of virus spread due to increased social interaction, which could result in a greater number of infections.


Population v/s Number of Cases(2020)
COVID-19 Cases
2600K
2400K
2200K
2000K
1800K
1600K
1400K
1200K
1000K
800K
600K
400K
200K
0K
0M
2M
4M
6M
8M
10M
12M
14M
16M
18M
20M
22M
24M
26M
28M
30M
32M
34M
36M
38M
40M
Population
California
Texas
New York
Florida
Illinois
Ohio
Michigan
GA
VA
AZ
TN
MN
MA
MD
LA
OK
IA
State
AL
Alaska
AR
AZ
California
CO
CT
DC
DE
Florida
GA
HI
IA
ID
Illinois
IN
KS
KY
LA
SUM(COVID-19 Cases)
7,658
500,000
1,000,000
1,500,000
2,000,000
2,606,068

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Entire View | Show Me

Data | Analytics

LR_Summary (LR_Summ...

Search

Tables

- State
- *Measure Names*
- COVID-19 Cases
- Population
- *Latitude (generated)*
- *Longitude (generated)*
- *LR_Summary (Count)*
- *Measure Values*

Pages: SUM(Population)

Filters

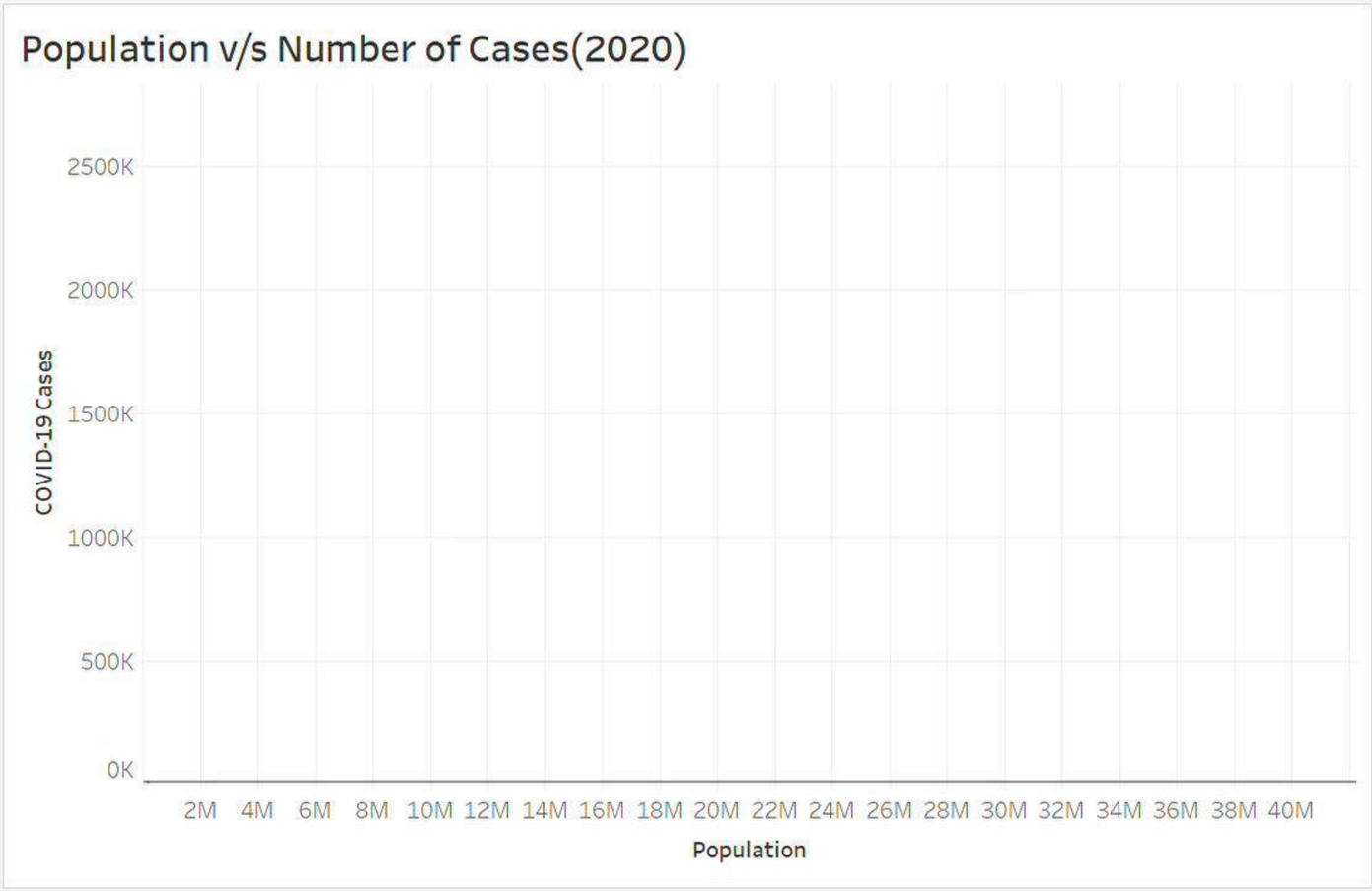
Marks: Circle

Color | Size | Label | Detail | Tooltip

State
SUM(COVID-19..
State

Columns: SUM(Population)

Rows: SUM(COVID-19 Case..



State
AL
Alaska
AR
AZ
California
CO
CT
DC
DE
Florida
GA
HI
IA

SUM(COVID-19 Cases)
7,658
500,000
1,000,000
1,500,000
2,000,000
2,606,068

SUM(Population)
178,124
Show history

Data Source | Sheet 1

1 mark | 1 row by 1 column | SUM(Population): 178,124

References

- https://covid.cdc.gov/covid-data-tracker/ #datatracker-home
- https://data.who.int/dashboards/covid19/cases?n=c
- https://data.who.int/dashboards/covid19/cases?n=c
- https://coronavirus.jhu.edu/us-map
- https://covid.cdc.gov/covid-data-tracker/ #vaccine-delivery-coverage