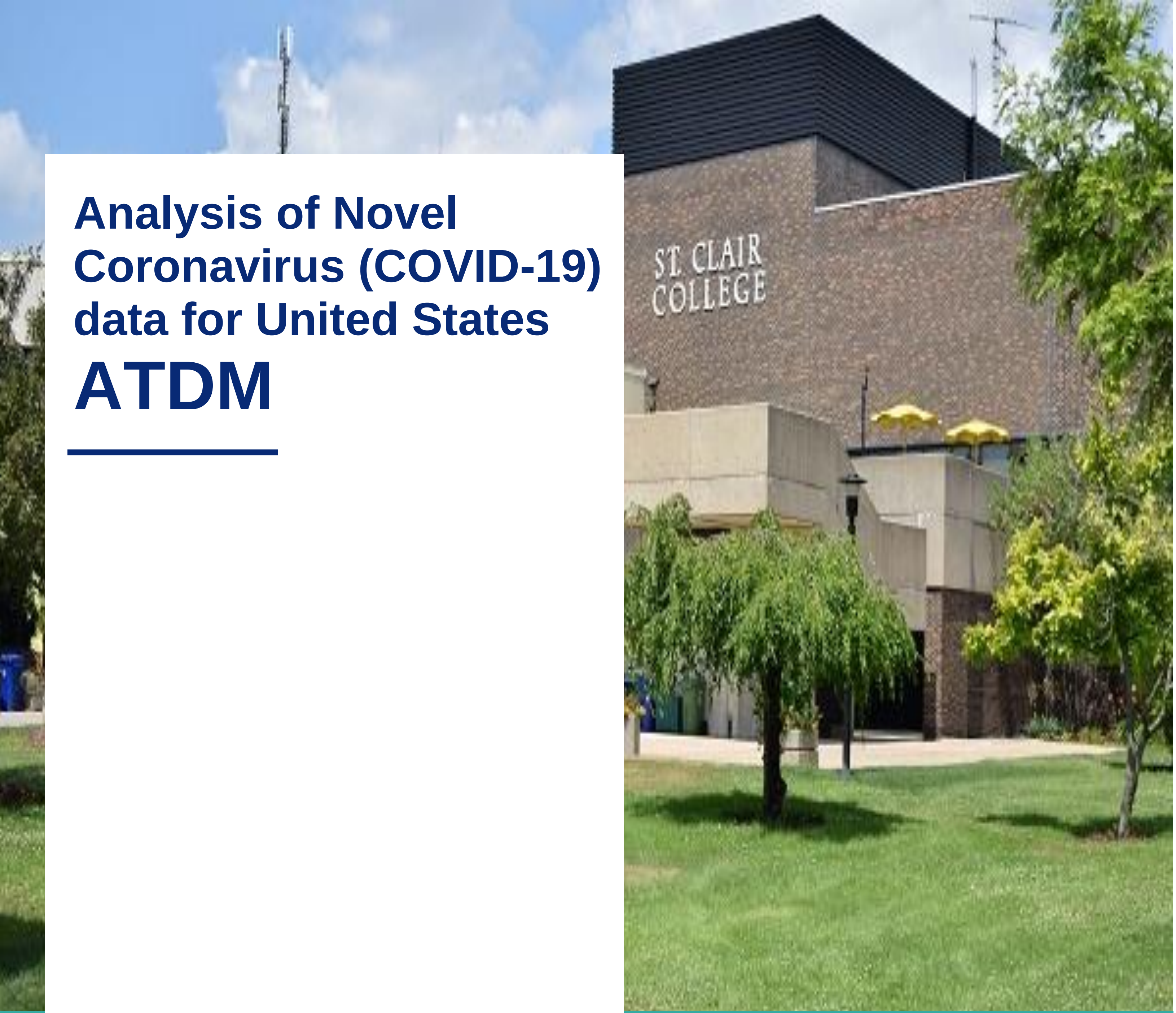
Analysis of Novel Coronavirus (COVID-19) data for United States

ATDM



JULY 19

St Clair College of Applied Arts and Technology

Authored by: Data Wizard- Group 01

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Project Guide

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Academic Integrity

We, Harsh Parmar, Nishil Patel, Raman Keshari, Shreyas Mahendra and Priyanka Harsukhbhai Ghetiya, hereby state that we have not communicated with or gained information in any way from any person or resource that would violate the College’s academic integrity policies, and that all work presented is our own. In addition, we also agree not to share our work in any way, before or after submission, that would violate the College’s academic integrity policies.

Analysis of Novel Coronavirus (COVID-19) data for United States

Start Date- 1st June 2021 End Date- 28th July 2021

Objectives- Analysis of the dataset using EDA and visualization

This project study aims to describe the health outcomes of people diagnosed with COVID-19 in the US, over time and in relation to the characteristics of the virus, by combining COVID-19 information from different states, hospital, general practice and death registry data.

Background

The novel coronavirus disease, named COVID-19 on 11 February 2020, is caused by SARS-CoV-2 virus. The outbreak was declared a Public Health Emergency of International Concern on 30 January 2020. While the number of confirmed cases worldwide and in the US is reported daily, detailed data on the outcomes of people who test positive for SARS-CoV-2, and predictors of outcomes, are still scarce.

Outcomes are likely to vary with context, including according to extensiveness of surveillance and testing, health systems functioning and population characteristics. Evidence to date has come primarily from various states of the US that are further along in the pandemic.

Goal

The aim of the project is to provide a list of priority areas for work and health research, that addresses evidence gaps and emerging evidence needs within the context of global pandemics generally and COVID19 specifically.

Requirements

The dataset is present on GitHub, which has been downloaded and loaded for our data analysis. Following are the technological requirement and tools used for this project.

Technological Requirements
Python 3.9
Anaconda- Jupyter Notebook
Tableau
Excel
GitHub
MS office

Project- Submission

DataSet- USA daily state reports for Novel Coronavirus (COVID-19)

Source- https://github.com/CSSEGISandData/COVID-19/tree/master/csse_covid_19_data

GitHub Link- https://github.com/ShreyasM6/ATDM-Project-Repo

Proposal

We will be working with the publicly available dataset from JHU CSSE's COVID-19 data repository. The data repository consists of different datasets related to covid-19.

What is the problem you are solving?

Data in this dataset is a collection of the covid-19 cases in the US, in which various locations are taken into consideration. The aim of the project is to provide data analysis of covid-19 pandemic, various cases have been studied like most affected areas due to this pandemic. Study of data from various states is combined to show the growth of cases and recovery. Through this project we are trying to achieve a sustainable solution and understanding of the behavioral trend of the crisis and, a step towards helping people to understand the spread and predict the raise in cases for the US.

The data analysis will provide a complete understanding of the critical information which will help address the business question that we are trying to answer. EDA and visualization are the most prominent way to perform analysis and obtain the required or desired details.

Who benefits from this project?

By the analysis of the dataset the results help any Government or national body to examine the current situation and establish clear protocols to help the stop of the virus. The measures collected in the dataset will provide an accurate statistic to take critical actions in order to contain the spread of the virus. The analysis of the tends in the dataset will be beneficial to have a better idea in the behavioral patterns of the cases and help to mitigate the spike. With the help of the results determined by the analysis, the local bodies can help to suppress any serious conditions that may arise, as the result would give us clear directions of what precautionary measures to be implemented. Hence by carrying out any kind of analytics to provide insights about the dataset will help a number of different sectors and avoid similar situation in future.

Analysis of the dataset using EDA and visualizing, will provide a way to convey information for any desired audience who has no prior knowledge about the dataset. The analysis using EDA and visualization can be taken advantage by the Government or national body to squeeze important details as much as possible.

Why is the project important?

The pandemic has already taken grip over life of people. Since the start of the pandemic, some countries are facing problem of ever-increasing cases. Through the data analysis of cases one can analyze how the US is doing in terms of controlling the pandemic. Analyzing data leads to adapt the prevention model that are doing great in terms of lowering the cases, Predictions can be made with the dataset available to the individual/country/organizations, thus helping to decide how far we are able to control the pandemic or up to what extent we should guide preventive measures.
Analysis is more important than ever during these unprecedented times. As a society, we've seen how important even basic line graphs, bar charts, and heat maps are to understanding the spread of the virus. We've heard a lot about various models in terms of predicting deaths associated with COVID-19. Many people want to see the data and understand the facts in this rapidly changing environment.

What are the business questions you are looking to answer or objectives you are looking to achieve from this project?

Business questions-

Which state was the most affected from covid-19?
Which state has the highest deaths from covid-19?
When did the COVID-19 cases had the highest peak?
When did the COVID-19 cases had the highest death rate?
When did the COVID-19 cases started to drop?
When did the death rate started to drop?
With the EDA and visualization performed, did you observe any pattern in the dataset?
Top five states confirmed and deaths statistics in the US?
Did you observe any unusual behavior of the dataset?
Why do you think EDA and visualization important?

Objectives-

With the help of the data we can estimate the cases and requirements that are essential for the treatment of patients effected by COVID 19. Improve on distribution and control the tools that are necessary in this critical times for example:- If a country is suffering from high amount of covid cases then the essentials are more required there and with the project we can understand how much tools are required for the stability of the situation.

The main objective is to describe the health outcomes of people diagnosed with COVID-19 in the US, over time and in relation to the characteristics of the virus, by combining COVID-19 information from different states, hospital, general practice and death registry data.

Describe the data at a high level, explain the data collection process, source of data, etc

The dataset represents the detailed characteristics of the 2019 Novel Coronavirus, which provides information about the US and provinces with the number of confirmed, deaths and recovered cases. This list includes a complete list of all sources ever used in the data set since January 2020. Some sources listed here (e.g. ECDC, US CDC, BNO News) are not currently relied upon as a source of data. The data is collected from multiple sources such as World Health Organization (WHO) and different US data sources at the state (Admin1) or county/city (Admin2) level.

The dataset which is used for analysis has categorical, continuous, and discrete data, the dataset has different data type like int, float, and object.

What insights does this data give and how can it be used in future?

The analyzed data provides information of different states in the United states which consists of the confirmed, death and recovered cases based on a timeframe and the location. This information can be used by the state government to analyze the current situation and help to suppress the severity. The dataset provides the insights of the day-to-day measures of increase and decrease of the cases, deaths, and recovery for the US. This kind of data is very useful in the current situation as it gives the government, the Ngo's, and other medical and social organization to analyze the covid affected areas for a better decision making.

This data is also future proof as it shows the pattern of transmission of the covid 19 and this kind of dataset can help the countries more resilient to any kind of pandemic in future.

What type of problems are solved with this approach?

With analytics, we are trying to acknowledge the general public about the pandemic and providing solutions to overcome this critical situation. In this project we are approaching with an open mindset and providing solution for general public rather than businesses.

Any problem related to COVID-19 or information can be fetched by the following preformed analysis, the insights gained by this can hugely incorporated in any real word model to address the needs of the situation in any given time period.

Can the performed analysis be implemented to any real word scenario?

Since the considered dataset is live data recorded for the US from 1st January 2020 to 13th July 2021, the performed analysis is a best fit for any real word scenario related to COVID-19. With the help of visuals provided below, decisions can be taken faster and act on the situation quicker than expected.

Descriptive Statistics and Exploratory Data Analysis (EDA)

Step 1: Confirm the data is correctly loaded

Before loading the dataset to a dataframe, we need to verify and make sure if the dataset has consistent column names across all the files.

Importing the dataset can be achieved with the pandas packages in python, following is the Code to import a single file to dataframe-

```
import pandas as pd
covid=pd.read_csv("https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master/csse_covid_19_data/csse_covid_19_daily_reports/01-01-2021.csv")
```

Step 2: Describe the data

Describe the data: The dataframe has 18 columns which gives information about the Province name and timeframe, the number of Confirmed cases, death toll and Recovered cases. It also provides statistical information which are derived columns (calculated columns) like Active cases, Incident_Rate and Case_Fatality_Ratio which will be helpful to perform more EDA on the dataset.

Summary statistics: Summary statistics can be performed in python using dataframe.describe() function. The describe function will provide the measures to describe the dataframe like- count, mean, std, min, max and much more.

Breakdown of variables (numeric, ordinal, categorical)

Variable Type	Column Names
Categorical	**Province_State, Country_Region, ISO3**
Numerical	**Lat, Long, Confirmed, Deaths, Recovered, Active, Incident_Rate, Total_Test_Results, People_Hospitalized,Case_Fatality_Ratio, UID, Testing_Rate, Hospitalization_Rate**
Date	**Last_Update**
Ordinal	**FIPS**

Step 3: Check the validity of data

Define schema: With the help of df.dtype function from the pandas package, we can determine the schema of the dataframe. Most of the variables are objects, float, or integer types.

Variable Type	Column Names
Object	Province_State, Country_Region, ISO3
Integer	Confirmed, Deaths, Recovered, Active, FIPS, Total_Test_Results, People_Hospitalized, UID
Float	Last_Update, Lat, Long, Incident_Rate, Case_Fatality_Ratio, Testing_Rate, Hospitalization_Rate
Date	Last_Update

Understand the data: The primary information from the dataset is the daily cases of COVID-19 from US. Which provides statistics about the number of confirmed, death and recovered based on the province and timeframe.

Step 4: Answer the following questions:

1. Does the data include missing, incomplete, or invalid records?
Yes, our dataset has missing and incomplete records. The missing and incomplete data is handled based on the requirement of the analysis to be performed. In our cases we are replacing the missing values with 0.

2. Does your data include outliers?
Yes, our dataset has outliers. Since the recorded data is live data, we can not eliminate the outliers as they also play an important role in providing the critical information.

3. Is the data segmented into groups?
Yes, the dataset is divided in groups based on the province, and timeframe. Grouped data will help us to provide information based on states with number of confirmed/death/recovered, and month/year.

4. Is the data imbalanced (a large number of the records represent a majority class and very few records represent the minority class)?
No, the dataset is not largely concentrated or representing a majority class. The data is equally divided for all the stated in the US.

5. Are some data elements highly correlated with each other?
Yes, the dataset has correlation with each other, as few columns are dependent and helps us to determine the trend of another column and also derive a calculated column.

6. How was the data collected?

The data is collected from multiple sources such as World Health Organization (WHO), European Centre for Disease Prevention and Control (ECDC) and different US data sources at the state or county/city level. The data was loaded using pandas library into a dataframe from github.

7. What are the inclusion criteria for your data?

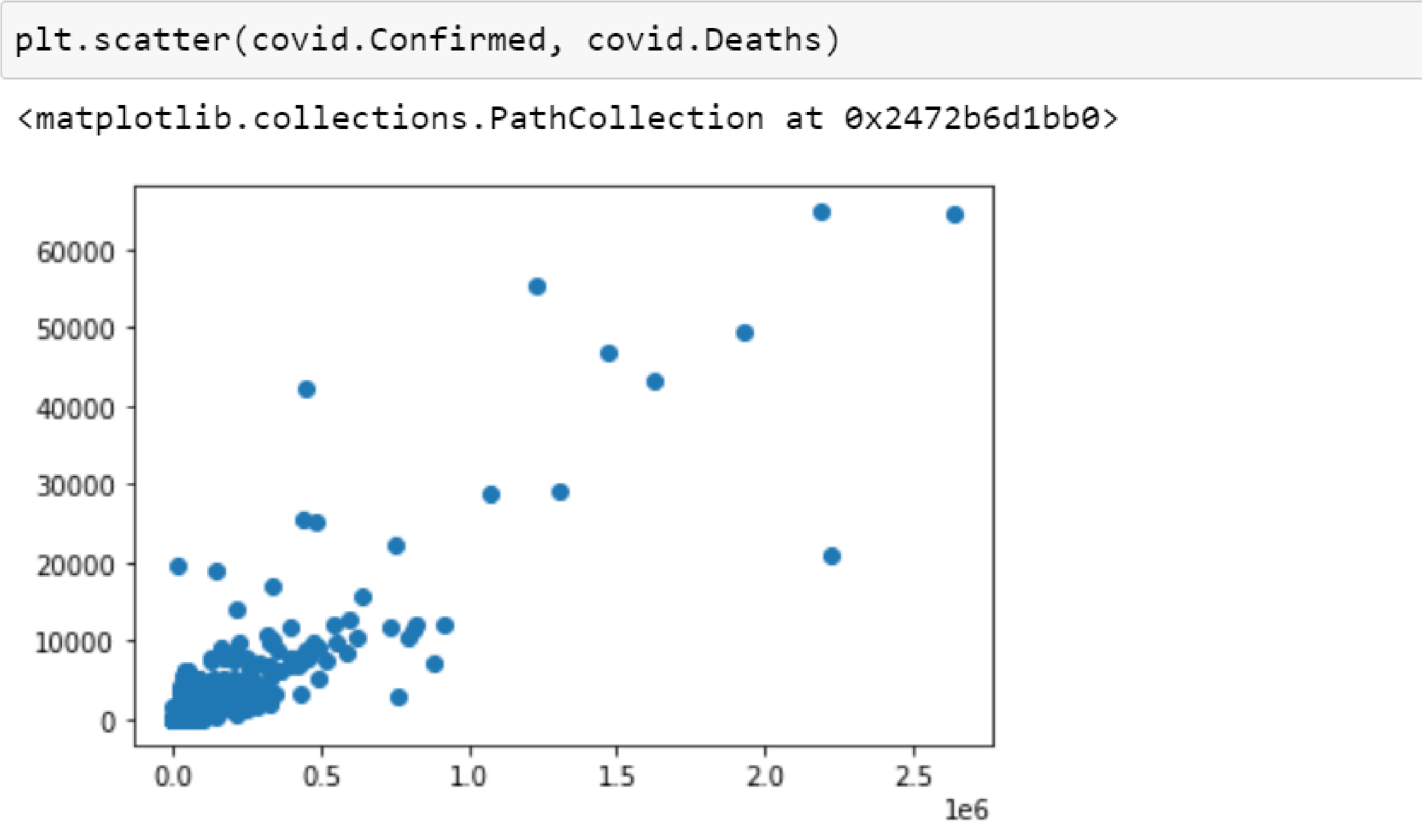
Inclusion criteria are defined on the key target feature which includes analysis on demographic, and geographic characteristics.

8. Can you generate preliminary visualizations for individual features?

Using the dataset we can induce visualization to check which province has the highest number of deaths or highest number of confirmed cases. By the visualization created we can have more data insights about the dataset.

Step 5: Use visualization to understand and explore, but not to explain

By using Matplotlib package we can produce visualization to understand the behavior of the dataset. The following plot is a scatter plot displaying the relation between the number of confirmed and deaths. As we can see the number of confirmed and deaths are directly proportional.



```
plt.scatter(covid.Confirmed, covid.Deaths)
```

```
<matplotlib.collections.PathCollection at 0x2472b6d1bb0>
```

Data Cleaning and Transformation

The COVID-19 data files considered for EDA is from 1st January 2020 to 13th July 2021, about 460 files close to 27 thousand rows and 20+ columns.

Transformation using Python-

1) Load all the required libraries for analysis-

   Python provides a wide range of libraries for analysis which must be imported prior performing our analysis. In our EDA process we are importing the following libraries.

   1)numpy package for arithmetic operation.
   2)pandas package for dataframe handling.
   3)OS package for interacting with the operating system.
   4)glob package for retrieve files/pathnames.
   5)date package to work with date and time.

2) Set the path from where the CSV files are picked-

   Using the glob package we can set the path where the COVID-19 data files are present to load them into a single dataframe. Also list all the files present in the directory using the OS package.

3) Create a dataframe-

   Using the pandas package, create an empty dataframe. The created empty dataframe will be used to load all the CSV files dynamically in a single run.

4) Load the files into a single DataFrame-

   Loading multiple CSV files into a dataframe is achieved in a single piece of code, which iterates between all the files and append the data to the dataframe. The for-loop operator helps us to iterate each file and load all the files to a temporary dataframe present in the directory. The append operator consolidates all the files loaded in the temporary dataframe to the newly created dataframe. To avoid ambiguity while performing EDA- we have created a new column which holds the filename for each row, which allows us an ability to trace back for verification and validity.

5) Retrieve the information of the loaded dataframe-

   After loading the data into the dataframe, we need to check the dimension of the dataframe and the data type of each columns, which helps us to understand the loaded data and perform any modifications if required. The .info operator retrieves all the information of a dataframe describing the categorical and continuous variables.

6) Find the sum of NaN values for each column-

   It is important to know the number of NaN values present in the dataframe for each column before performing EDA. As the result will determine the way to handle the NaN values. In general, any real time dataset will contain many NaN values which requires us to eliminate handle them in an efficient manner which would not effect the original dataset.

7) Replace the NaN values-

   As part of EDA, the key aspect is the way of handling the NaN values. Part of this solution is to drop the NaN values, however dropping the NaN values in our dataset will wipe out half of the data, resulting in losing valuable insights from the dataset. Although dropping NaN values might be a solution in some cases but replacing them with 0 is the best practice.

8) Data Transformation-

   Substring the filename column to retrieve only the date information and exclude the file type. This transformation will help to create new columns and perform analysis based on a timeframe. It is very important to have a column which represent the timeframe of the data, which will let us to represent the data in a specific period of time.

9) Creating new columns from the existing columns-

   Derive columns from already existing columns which provide information about the timestamp (Month, Year).

10) Rename the columns for readability-

    Renaming the columns will help us to understand the column information better.

11) Write the transformed data into a CSV file-

    To avoid performing transformation repeatedly, we are writing the transformed data from the dataframe to a CSV file.

All the mentioned above EDA and transformation is performed using python on Jupyter Notebook, the notebook has the required code along with headings and comments which has been uploaded on GitHub.

Data Analysis

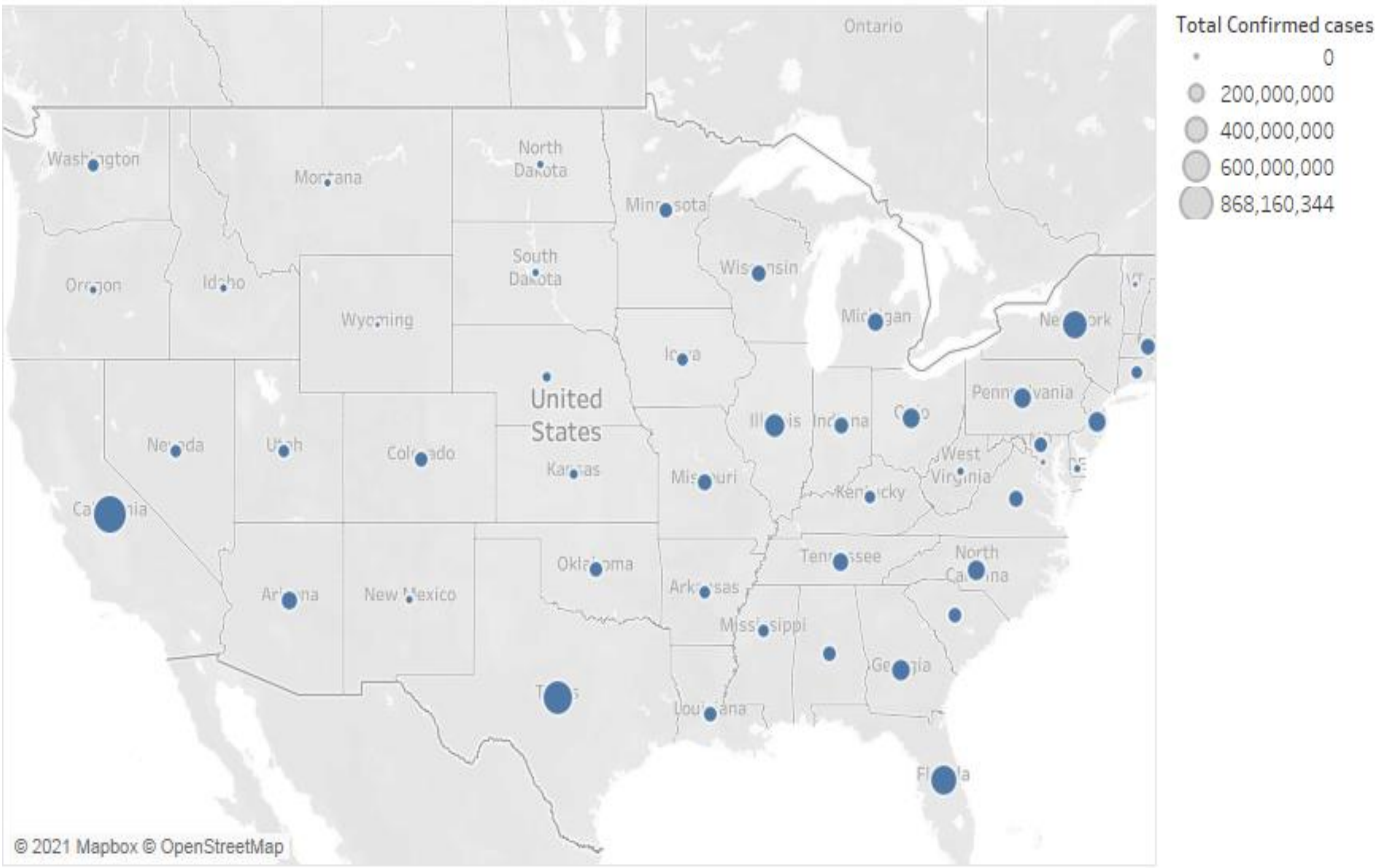
The COVID-19 dataset is visualized in Tableau after transformation, to identify the key patterns and to answer the business questions.

Key patterns and visualization-

Load the transformed data to Tableau for visualization

Confirmed cases in US

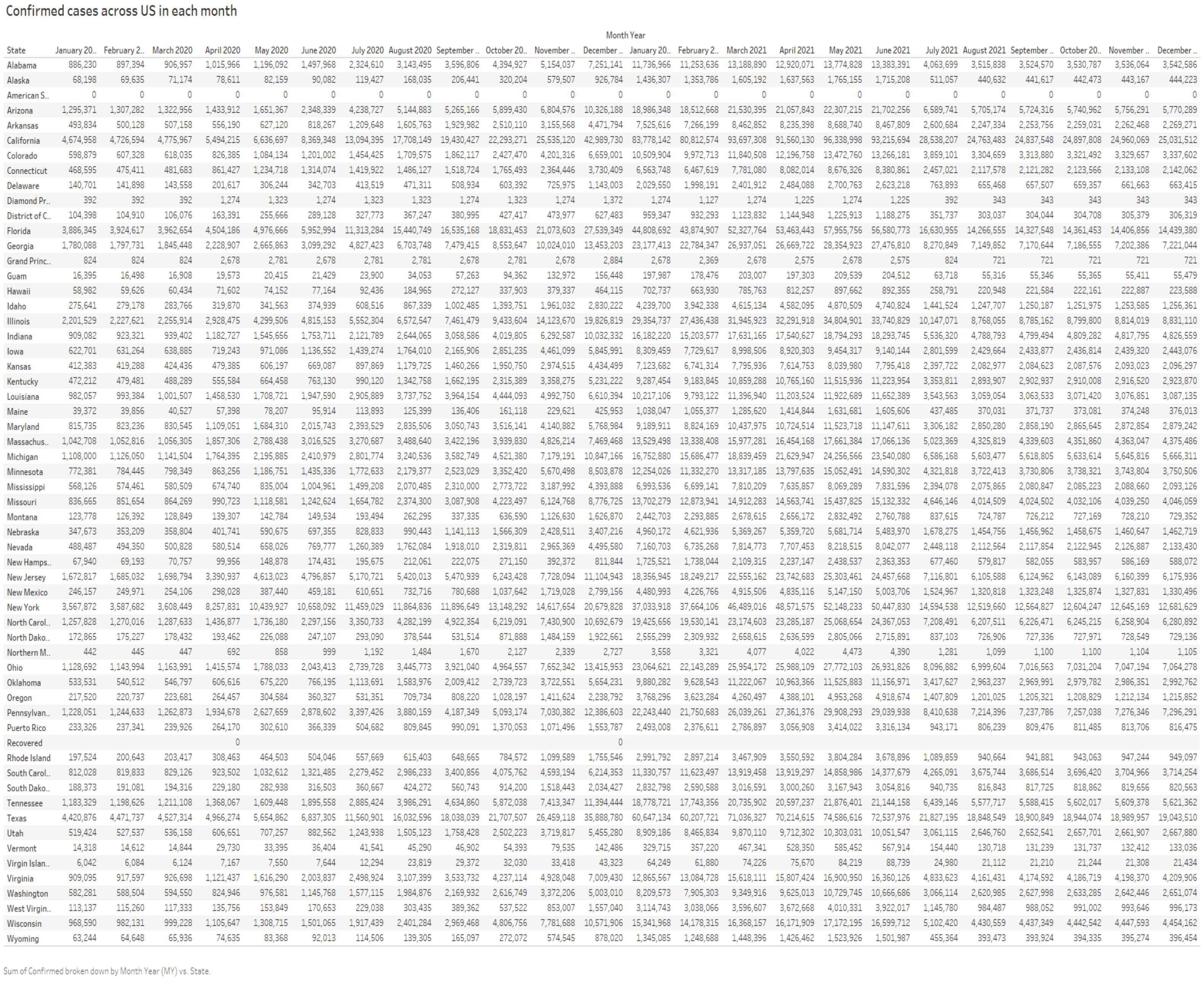
Display of Cases in different states of US



Map based on Longitude (generated) and Latitude (generated). Size shows sum of Confirmed. Details are shown for Country and State.

The above geographical distribution of the cases in US displays the spread of COVID-19 virus. The larger the size of the circle, larger is the intensity.

Statistical information about the confirmed cases in all the states of the US for each month starting from January 2020 to July 2021



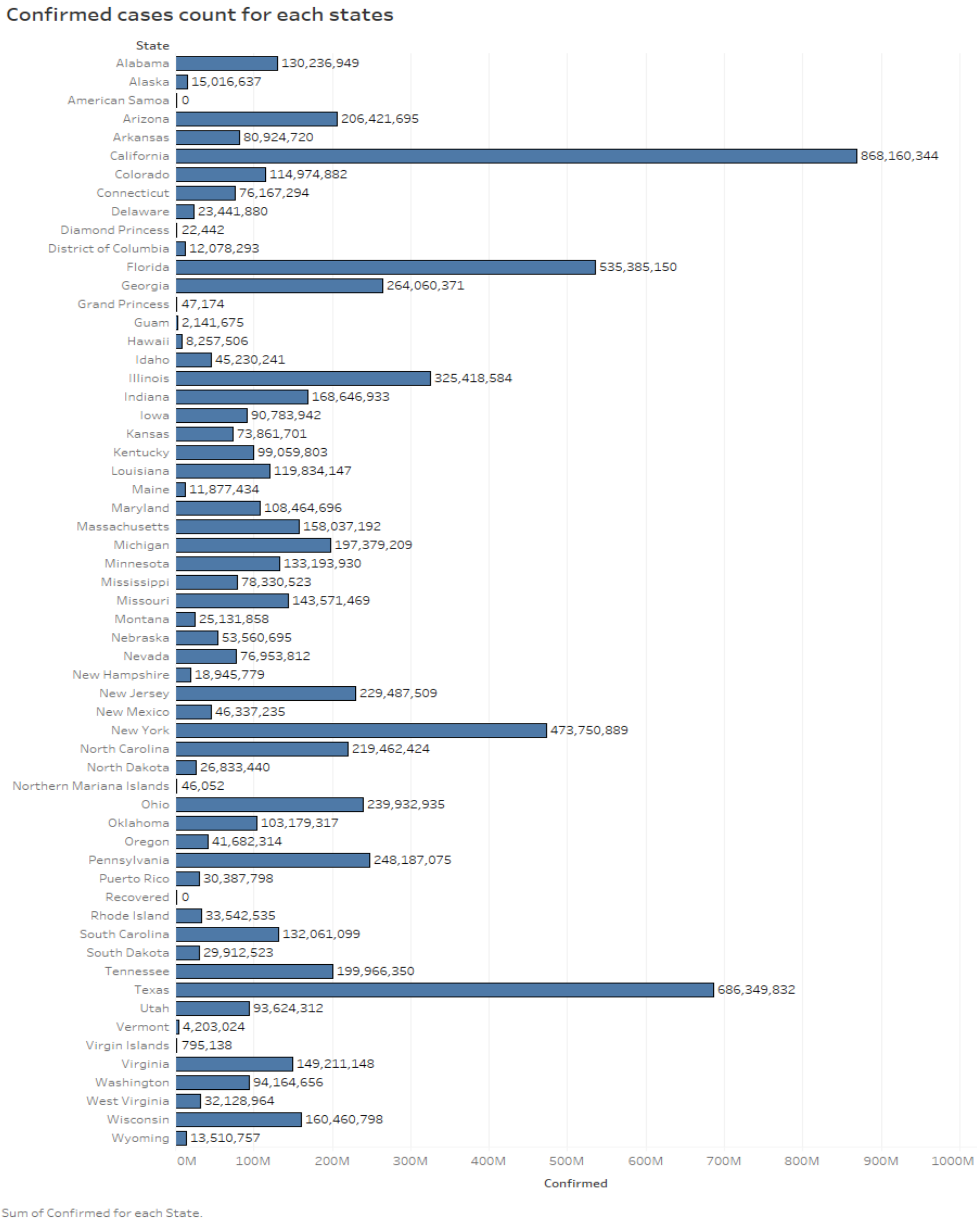
Confirmed cases across US in each month

	Month Year																							
State	January 20..	February 2..	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020	September ..	October 20..	November ..	December ..	January 20..	February 2..	March 2021	April 2021	May 2021	June 2021	July 2021	August 2021	September ..	October 20..	November ..	December ..
Alabama	886,230	897,394	906,957	1,015,966	1,196,092	1,497,968	2,324,610	3,143,495	3,596,806	4,394,927	5,154,037	7,251,141	11,736,966	11,253,636	13,188,890	12,920,071	13,774,828	13,383,391	4,063,699	3,515,838	3,524,570	3,530,787	3,536,064	3,542,586
Alaska	68,198	69,635	71,174	78,611	82,159	90,082	119,427	168,035	206,441	320,204	579,507	926,784	1,436,307	1,353,786	1,605,192	1,637,563	1,765,155	1,715,208	511,057	440,632	441,617	442,473	443,167	444,223
American S..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arizona	1,295,371	1,307,282	1,322,956	1,433,912	1,651,367	2,348,339	4,238,727	5,144,883	5,265,166	5,899,430	6,804,576	10,326,188	18,986,348	18,512,668	21,530,395	21,057,843	22,307,215	21,702,256	6,589,741	5,705,174	5,724,316	5,740,962	5,756,291	5,770,289
Arkansas	493,834	500,128	507,158	556,190	627,120	818,267	1,209,648	1,605,763	1,929,982	2,510,110	3,155,568	4,471,794	7,525,616	7,266,199	8,462,852	8,235,398	8,688,740	8,467,809	2,600,684	2,247,334	2,253,756	2,259,031	2,262,468	2,269,271
California	4,674,958	4,726,594	4,775,967	5,494,215	6,636,697	8,369,348	13,094,395	17,708,149	19,430,427	22,293,271	25,535,120	42,989,730	83,778,142	80,812,574	93,697,308	91,560,130	96,338,998	93,215,694	28,538,207	24,763,483	24,837,548	24,897,808	24,960,069	25,031,512
Colorado	598,879	607,328	618,035	826,385	1,084,134	1,201,002	1,454,425	1,709,575	1,862,117	2,427,470	4,201,316	6,659,001	10,509,904	9,972,713	11,840,508	12,196,758	13,472,760	13,266,181	3,859,101	3,304,659	3,313,880	3,321,492	3,329,657	3,337,602
Connecticut	468,595	475,411	481,683	861,427	1,234,718	1,314,074	1,419,922	1,486,127	1,518,724	1,765,493	2,364,446	3,730,409	6,563,748	6,467,619	7,781,080	8,082,014	8,676,326	8,380,861	2,457,021	2,117,578	2,121,282	2,123,566	2,133,108	2,142,062
Delaware	140,701	141,898	143,558	201,617	306,244	342,703	413,519	471,311	508,934	603,392	725,975	1,143,003	2,029,550	1,998,191	2,401,912	2,484,088	2,700,763	2,623,218	763,893	655,468	657,507	659,357	661,663	663,415
Diamond Pr..	392	392	392	1,274	1,323	1,274	1,323	1,323	1,274	1,323	1,274	1,372	1,274	1,127	1,274	1,225	1,274	1,225	392	343	343	343	343	343
District of C..	104,398	104,910	106,076	163,391	255,666	289,128	327,773	367,247	380,995	427,417	473,977	627,483	959,347	932,293	1,123,832	1,144,948	1,225,913	1,188,275	351,737	303,037	304,044	304,708	305,379	306,319
Florida	3,886,345	3,924,617	3,962,654	4,504,186	4,976,666	5,952,994	11,313,284	15,440,749	16,535,168	18,831,453	21,073,603	27,539,349	44,808,692	43,874,907	52,327,764	53,463,443	57,955,756	56,580,773	16,630,955	14,266,555	14,327,548	14,361,453	14,406,856	14,439,380
Georgia	1,780,088	1,797,731	1,845,448	2,228,907	2,665,863	3,099,292	4,827,423	6,703,748	7,479,415	8,553,647	10,024,010	13,453,203	23,177,413	22,784,347	26,937,051	26,669,722	28,354,923	27,476,810	8,270,849	7,149,852	7,170,644	7,186,555	7,202,386	7,221,044
Grand Princ..	824	824	824	2,678	2,781	2,678	2,781	2,781	2,678	2,781	2,678	2,884	2,678	2,369	2,678	2,575	2,678	2,575	824	721	721	721	721	721
Guam	16,395	16,498	16,908	19,573	20,415	21,429	23,900	34,053	57,263	94,362	132,972	156,448	197,987	178,476	203,007	197,303	209,539	204,512	63,718	55,316	55,346	55,365	55,411	55,479
Hawaii	58,982	59,626	60,434	71,602	74,152	77,164	92,436	184,965	272,127	337,903	379,337	464,115	702,737	663,930	785,763	812,257	897,662	892,355	258,791	220,948	221,584	222,161	222,887	223,588
Idaho	275,641	279,178	283,766	319,870	341,563	374,939	608,516	867,339	1,002,485	1,393,751	1,961,032	2,830,222	4,239,700	3,942,338	4,615,134	4,582,095	4,870,509	4,740,824	1,441,524	1,247,707	1,250,187	1,251,975	1,253,585	1,256,361
Illinois	2,201,529	2,227,621	2,255,914	2,928,475	4,299,506	4,815,153	5,552,304	6,572,547	7,461,479	9,433,604	14,123,670	19,826,819	29,354,737	27,436,438	31,945,923	32,291,918	34,804,901	33,740,829	10,147,071	8,768,055	8,785,162	8,799,800	8,814,019	8,831,110
Indiana	909,082	923,321	939,402	1,182,727	1,545,656	1,753,711	2,121,789	2,644,065	3,058,586	4,019,805	6,292,587	10,032,332	16,182,220	15,203,577	17,631,165	17,540,627	18,794,293	18,293,745	5,536,320	4,788,793	4,799,494	4,809,282	4,817,795	4,826,559
Iowa	622,701	631,264	638,885	719,243	971,086	1,136,552	1,439,274	1,764,010	2,165,906	2,851,235	4,461,099	5,845,991	8,309,459	7,729,617	8,998,506	8,920,303	9,454,317	9,140,144	2,801,599	2,429,664	2,433,877	2,436,814	2,439,320	2,443,076
Kansas	412,383	419,288	424,436	479,385	606,197	669,087	897,869	1,179,725	1,460,266	1,950,750	2,974,515	4,434,499	7,123,682	6,741,314	7,795,936	7,614,753	8,039,980	7,795,418	2,397,722	2,082,977	2,084,623	2,087,576	2,093,023	2,096,297
Kentucky	472,212	479,481	488,289	555,584	664,458	763,130	990,120	1,342,758	1,662,195	2,315,389	3,358,275	5,231,222	9,287,454	9,183,845	10,859,288	10,765,160	11,515,936	11,223,954	3,353,811	2,893,907	2,902,937	2,910,008	2,916,520	2,923,870
Louisiana	982,057	993,384	1,001,507	1,458,530	1,708,721	1,947,590	2,905,889	3,737,752	3,964,154	4,444,093	4,992,750	6,610,394	10,217,106	9,793,122	11,396,940	11,203,524	11,922,689	11,652,389	3,543,563	3,059,054	3,063,533	3,071,420	3,076,851	3,087,135
Maine	39,372	39,856	40,527	57,398	78,207	95,914	113,893	125,399	136,406	161,118	229,621	425,953	1,038,047	1,055,377	1,285,620	1,414,844	1,631,681	1,605,606	437,485	370,031	371,737	373,081	374,248	376,013
Maryland	815,735	823,236	830,545	1,109,051	1,684,310	2,015,743	2,393,529	2,835,506	3,050,743	3,516,141	4,140,882	5,768,984	9,189,911	8,824,169	10,437,975	10,724,514	11,523,718	11,147,611	3,306,182	2,850,280	2,858,190	2,865,645	2,872,854	2,879,242
Massachus..	1,042,708	1,052,816	1,056,305	1,857,306	2,788,438	3,016,525	3,270,687	3,488,640	3,422,196	3,939,830	4,826,214	7,469,468	13,529,498	13,338,408	15,977,281	16,454,168	17,661,384	17,066,136	5,023,369	4,325,819	4,339,603	4,351,860	4,363,047	4,375,486
Michigan	1,108,000	1,126,050	1,141,504	1,764,395	2,195,885	2,410,979	2,801,774	3,240,536	3,582,749	4,521,380	7,179,191	10,847,166	16,752,880	15,686,477	18,839,459	21,629,947	24,256,566	23,540,080	6,586,168	5,603,477	5,618,805	5,633,614	5,645,816	5,666,311
Minnesota	772,381	784,445	798,349	863,256	1,186,751	1,435,336	1,772,633	2,179,377	2,523,029	3,352,420	5,670,498	8,503,878	12,254,026	11,332,270	13,317,185	13,797,635	15,052,491	14,590,302	4,321,818	3,722,413	3,730,806	3,738,321	3,743,804	3,750,506
Mississippi	568,126	574,461	580,509	674,740	835,004	1,004,961	1,499,208	2,070,485	2,310,000	2,773,722	3,187,992	4,393,888	6,993,536	6,699,141	7,810,209	7,635,857	8,069,289	7,831,596	2,394,078	2,075,865	2,080,847	2,085,223	2,088,660	2,093,126
Missouri	836,665	851,654	864,269	990,723	1,118,581	1,242,624	1,654,782	2,374,300	3,087,908	4,223,497	6,124,768	8,776,725	13,702,279	12,873,941	14,912,283	14,563,741	15,437,825	15,132,332	4,646,146	4,014,509	4,024,502	4,032,106	4,039,250	4,046,059
Montana	123,778	126,392	128,849	139,307	142,784	149,534	193,494	262,295	337,335	636,590	1,126,630	1,626,870	2,442,703	2,293,885	2,678,615	2,656,172	2,832,492	2,760,788	837,615	724,787	726,212	727,169	728,210	729,352
Nebraska	347,673	353,209	358,804	401,741	590,675	697,355	828,833	990,443	1,141,113	1,566,309	2,428,511	3,407,216	4,960,172	4,621,936	5,369,267	5,359,720	5,681,714	5,483,970	1,678,275	1,454,756	1,456,962	1,458,675	1,460,647	1,462,719
Nevada	488,487	494,350	500,828	580,514	658,026	769,777	1,260,389	1,762,084	1,918,010	2,319,811	2,965,369	4,495,580	7,160,703	6,735,268	7,814,773	7,707,453	8,218,515	8,042,077	2,448,118	2,112,564	2,117,854	2,122,945	2,126,887	2,133,430
New Hamps..	67,940	69,193	70,757	99,956	148,878	174,431	195,675	212,061	222,075	271,150	392,372	811,844	1,725,521	1,738,044	2,109,315	2,237,147	2,438,537	2,363,353	677,460	579,817	582,055	583,957	586,169	588,072
New Jersey	1,672,817	1,685,032	1,698,794	3,390,937	4,613,023	4,796,857	5,170,721	5,420,013	5,470,939	6,243,428	7,728,094	11,104,943	18,356,945	18,249,217	22,555,162	23,742,683	25,303,461	24,457,668	7,116,801	6,105,588	6,124,962	6,143,089	6,160,399	6,175,936
New Mexico	246,157	249,971	254,106	298,028	387,440	459,181	610,651	732,716	780,688	1,037,642	1,719,028	2,799,156	4,480,993	4,226,766	4,915,506	4,835,116	5,147,150	5,003,706	1,524,967	1,320,818	1,323,248	1,325,874	1,327,831	1,330,496
New York	3,567,872	3,587,682	3,608,449	8,257,831	10,439,927	10,658,092	11,459,029	11,864,836	11,896,649	13,148,292	14,617,654	20,679,828	37,033,918	37,664,106	46,489,016	48,571,575	52,148,233	50,447,830	14,594,538	12,519,660	12,564,827	12,604,247	12,645,169	12,681,629
North Carol..	1,257,828	1,270,016	1,287,633	1,436,877	1,736,180	2,297,156	3,350,733	4,282,199	4,922,354	6,219,091	7,430,900	10,692,679	19,425,656	19,530,141	23,174,603	23,285,187	25,068,654	24,367,053	7,208,491	6,207,511	6,226,471	6,245,215	6,258,904	6,280,892
North Dako..	172,865	175,227	178,432	193,462	226,088	247,107	293,090	378,544	531,514	871,888	1,484,159	1,922,661	2,555,299	2,309,932	2,658,615	2,636,599	2,805,066	2,715,891	837,103	726,906	727,336	727,971	728,549	729,136
Northern M..	442	445	447	692	858	999	1,192	1,484	1,670	2,127	2,339	2,727	3,558	3,321	4,077	4,022	4,473	4,390	1,281	1,099	1,100	1,100	1,104	1,105
Ohio	1,128,692	1,143,994	1,163,991	1,415,574	1,788,033	2,043,413	2,739,728	3,445,773	3,921,040	4,964,557	7,652,342	13,415,953	23,064,621	22,143,289	25,954,172	25,988,109	27,772,103	26,931,826	8,096,882	6,999,604	7,016,563	7,031,204	7,047,194	7,064,278
Oklahoma	533,531	540,512	546,797	606,616	675,220	766,195	1,113,691	1,583,976	2,009,412	2,739,723	3,722,551	5,654,231	9,880,282	9,628,543	11,222,067	10,963,366	11,525,883	11,156,971	3,417,627	2,963,237	2,969,991	2,979,782	2,986,351	2,992,762
Oregon	217,520	220,737	223,681	264,457	304,584	360,327	531,351	709,734	808,220	1,028,197	1,411,624	2,238,792	3,768,296	3,623,284	4,260,497	4,388,101	4,953,268	4,918,674	1,407,809	1,201,025	1,205,321	1,208,829	1,212,134	1,215,852
Pennsylvan..	1,228,051	1,244,633	1,262,873	1,934,678	2,627,659	2,878,602	3,397,426	3,880,159	4,187,349	5,093,174	7,030,382	12,386,603	22,243,440	21,750,683	26,039,261	27,361,376	29,908,293	29,039,938	8,410,638	7,214,396	7,237,786	7,257,038	7,276,346	7,296,291
Puerto Rico	233,326	237,341	239,926	264,170	302,610	366,339	504,682	809,845	990,091	1,370,053	1,071,496	1,553,787	2,493,008	2,376,611	2,786,897	3,056,908	3,414,022	3,316,134	943,171	806,239	809,476	811,485	813,706	816,475
Recovered				0								0												
Rhode Island	197,524	200,643	203,417	308,463	464,503	504,046	557,669	615,403	648,665	784,572	1,099,589	1,755,546	2,991,792	2,897,214	3,467,909	3,550,592	3,804,284	3,678,896	1,089,859	940,664	941,881	943,063	947,244	949,097
South Carol..	812,028	819,833	829,126	923,502	1,032,612	1,321,485	2,279,452	2,986,233	3,400,856	4,075,762	4,593,194	6,214,353	11,330,757	11,623,497	13,919,458	13,919,297	14,858,986	14,377,679	4,265,091	3,675,744	3,686,514	3,696,420	3,704,966	3,714,254
South Dako..	188,373	191,081	194,316	229,180	282,938	316,503	360,667	424,272	560,743	914,200	1,518,443	2,034,427	2,832,798	2,590,588	3,016,591	3,000,260	3,167,943	3,054,816	940,735	816,843	817,725	818,862	819,656	820,563
Tennessee	1,183,329	1,198,626	1,211,108	1,368,067	1,609,448	1,895,558	2,885,424	3,986,291	4,634,860	5,872,038	7,413,347	11,394,444	18,778,721	17,743,356	20,735,902	20,597,237	21,876,401	21,144,158	6,439,146	5,577,717	5,588,415	5,602,017	5,609,378	5,621,362
Texas	4,420,876	4,471,737	4,527,314	4,966,274	5,654,862	6,837,305	11,560,901	16,032,596	18,038,039	21,707,507	26,459,118	35,888,780	60,647,134	60,207,721	71,036,327	70,214,615	74,586,616	72,537,976	21,827,195	18,848,549	18,900,849	18,944,074	18,989,957	19,043,510
Utah	519,424	527,537	536,158	606,651	707,257	882,562	1,243,938	1,505,123	1,758,428	2,502,223	3,719,817	5,455,280	8,909,186	8,465,834	9,870,110	9,712,302	10,303,031	10,051,547	3,061,115	2,646,760	2,652,541	2,657,701	2,661,907	2,667,880
Vermont	14,318	14,612	14,844	29,730	33,395	36,404	41,541	45,290	46,902	54,393	79,535	142,486	329,715	357,220	467,341	528,350	585,452	567,914	154,440	130,718	131,239	131,737	132,412	133,036
Virgin Islan..	6,042	6,084	6,124	7,167	7,550	7,644	12,294	23,819	29,372	32,030	33,418	43,323	64,249	61,880	74,226	75,670	84,219	88,739	24,980	21,112	21,210	21,244	21,308	21,434
Virginia	909,095	917,597	926,698	1,121,437	1,616,290	2,003,837	2,498,924	3,107,399	3,533,732	4,237,114	4,928,048	7,009,430	12,865,567	13,084,728	15,618,111	15,807,424	16,900,950	16,360,126	4,833,623	4,161,431	4,174,592	4,186,719	4,198,370	4,209,906
Washington	582,281	588,504	594,550	824,946	976,581	1,145,768	1,577,115	1,984,876	2,169,932	2,616,749	3,372,206	5,003,010	8,209,573	7,905,303	9,349,916	9,625,013	10,729,745	10,666,686	3,066,114	2,620,985	2,627,998	2,633,285	2,642,446	2,651,074
West Virgin..	113,137	115,260	117,333	135,756	153,849	170,653	229,038	303,435	389,362	537,522	853,007	1,557,040	3,114,743	3,038,066	3,596,607	3,672,668	4,010,331	3,922,017	1,145,780	984,487	988,052	991,002	993,646	996,173
Wisconsin	968,590	982,131	999,228	1,105,647	1,308,715	1,501,065	1,917,439	2,401,284	2,969,468	4,806,756	7,781,688	10,571,906	15,341,968	14,178,315	16,368,157	16,171,909	17,172,195	16,599,712	5,102,420	4,430,559	4,437,349	4,442,542	4,447,593	4,454,162
Wyoming	63,244	64,648	65,936	74,635	83,368	92,013	114,506	139,305	165,097	272,072	574,545	878,020	1,345,085	1,248,688	1,448,396	1,426,462	1,523,926	1,501,987	455,364	393,473	393,924	394,335	395,274	396,454

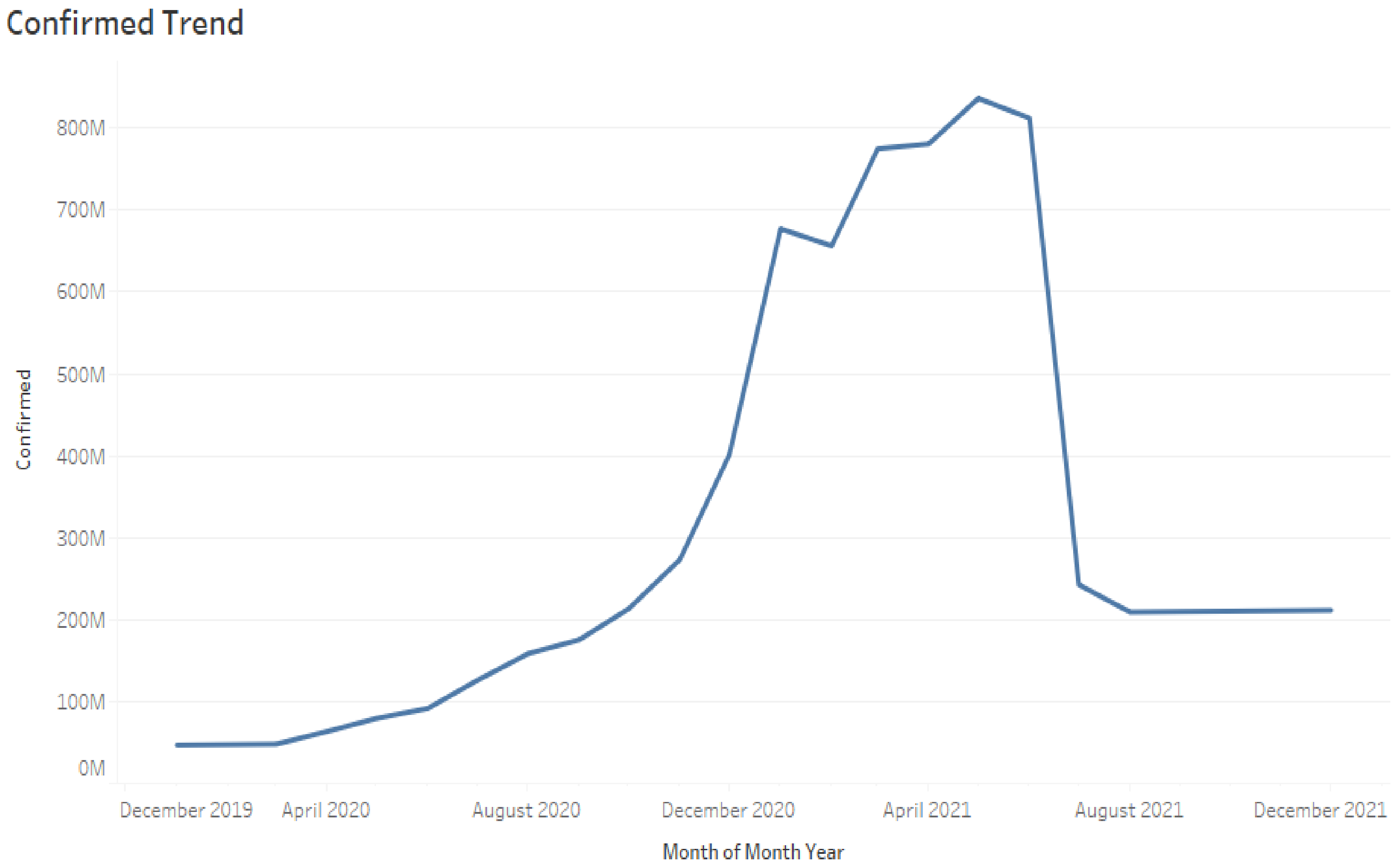
Sum of Confirmed broken down by Month Year (MY) vs. State.

While delivering the results found during statistics, the report has to be precise and concise, with the help of the above tabular representation of the data for the total confirmed cases for each state in a month, provides complete information in a single report. Anybody looking at this report can acquire knowledge about the number of cases confirmed in the US, in addition this report provides specific information with states and timeframe.

Bar Plot representation of the confirmed cases in US



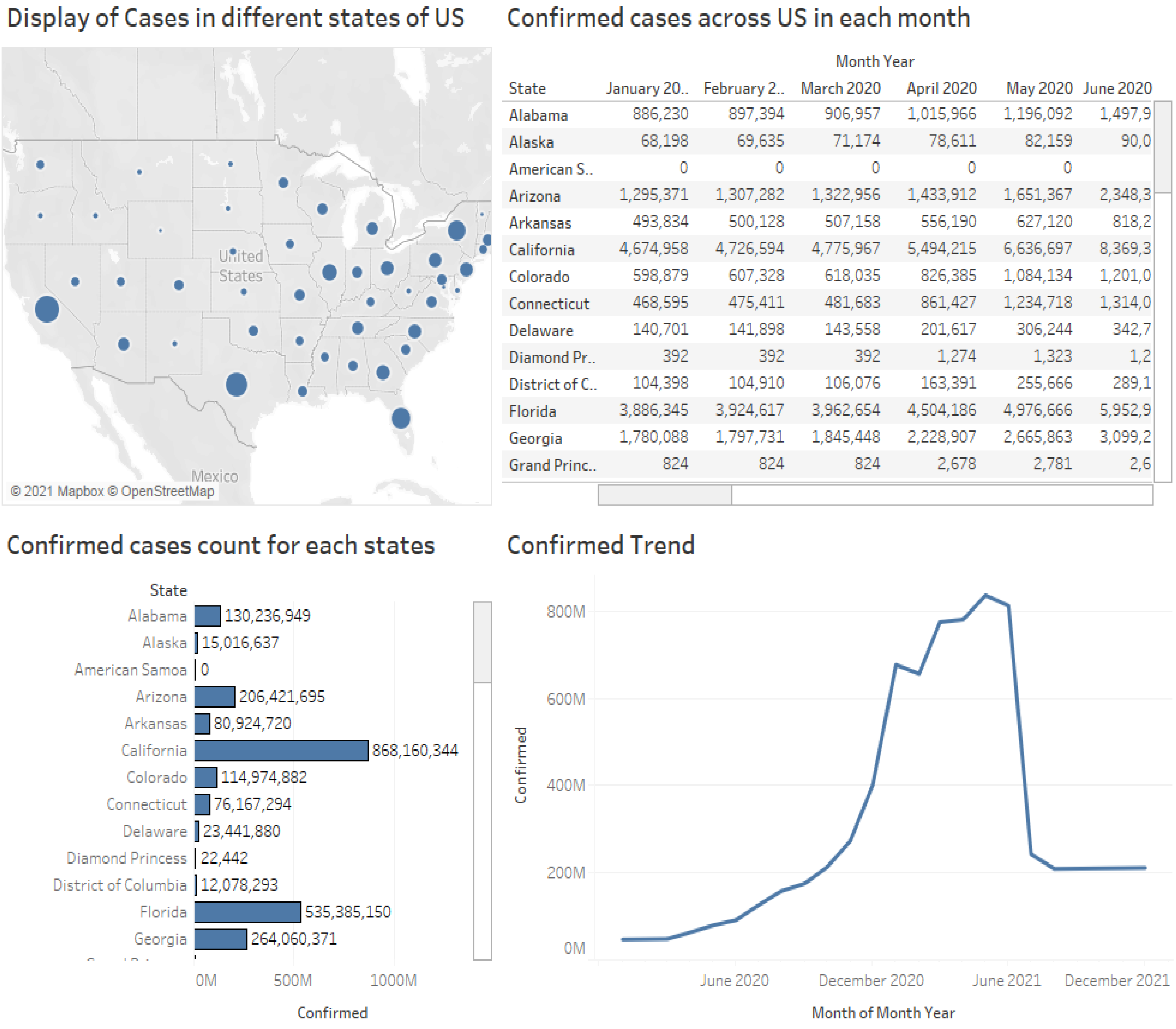
Line plot representing the trend of confirmed cases over the timeframe



The trend of sum of Confirmed for Month Year Month.

The above line graph displays the information of the rise and fall of the COVID-19 cases in US. Line graph helps us understand the key insights of the cases confirmed in the given timeframe, information like when was the spike and decrease in cases can be fetched without investigating the actual numbers.

Dashboard for Confirmed cases



Display of Cases in different states of US

Confirmed cases across US in each month

	Month Year					
State	January 20..	February 2..	March 2020	April 2020	May 2020	June 2020
Alabama	886,230	897,394	906,957	1,015,966	1,196,092	1,497,9
Alaska	68,198	69,635	71,174	78,611	82,159	90,0
American S..	0	0	0	0	0	
Arizona	1,295,371	1,307,282	1,322,956	1,433,912	1,651,367	2,348,3
Arkansas	493,834	500,128	507,158	556,190	627,120	818,2
California	4,674,958	4,726,594	4,775,967	5,494,215	6,636,697	8,369,3
Colorado	598,879	607,328	618,035	826,385	1,084,134	1,201,0
Connecticut	468,595	475,411	481,683	861,427	1,234,718	1,314,0
Delaware	140,701	141,898	143,558	201,617	306,244	342,7
Diamond Pr..	392	392	392	1,274	1,323	1,2
District of C..	104,398	104,910	106,076	163,391	255,666	289,1
Florida	3,886,345	3,924,617	3,962,654	4,504,186	4,976,666	5,952,9
Georgia	1,780,088	1,797,731	1,845,448	2,228,907	2,665,863	3,099,2
Grand Princ..	824	824	824	2,678	2,781	2,6

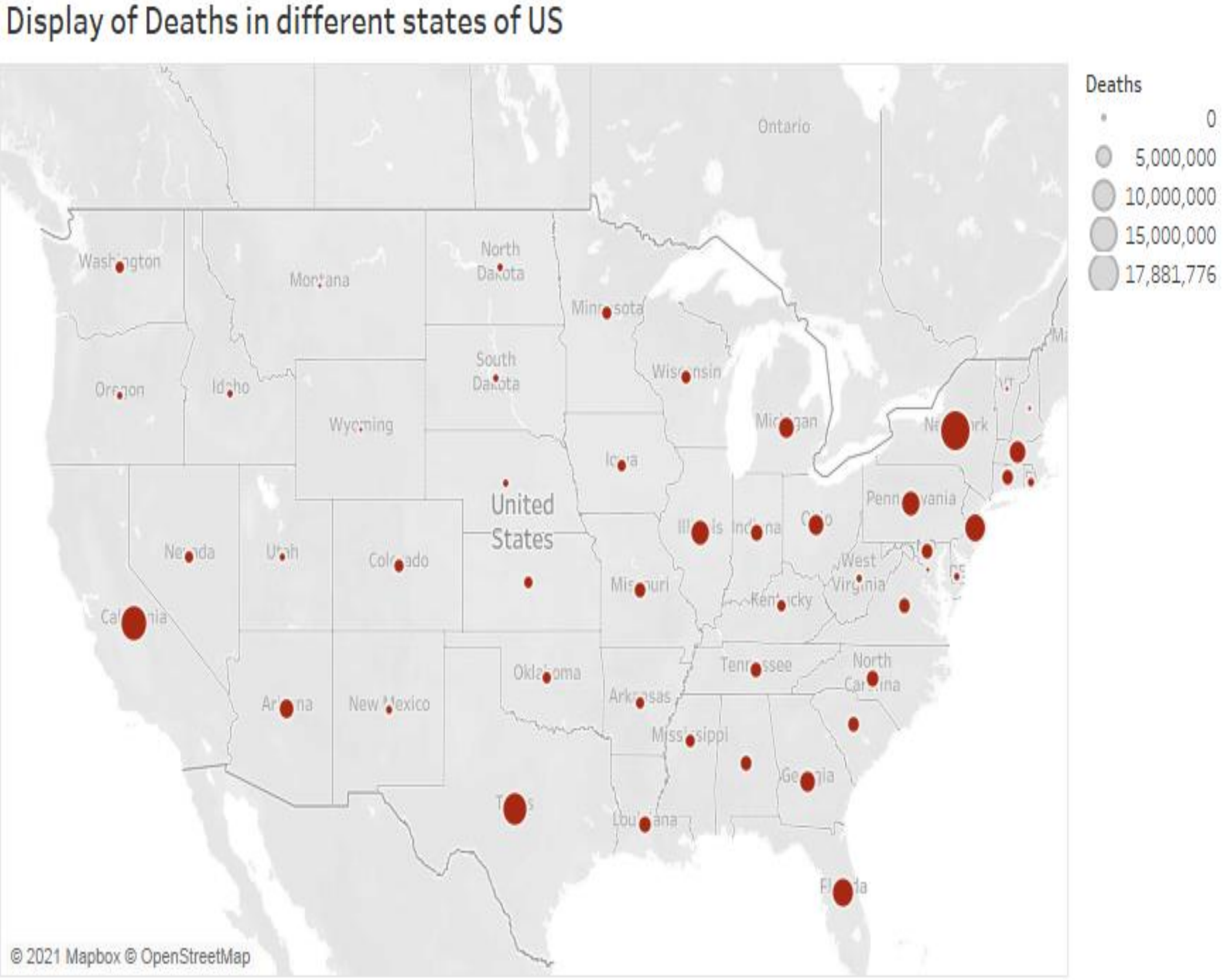
Confirmed cases count for each states

Confirmed Trend

Dashboard helps us to consolidate many reports into a single frame, providing multiple aspect of information at a time. Dashboards can provide us quick information hazel free, in the above dashboard we can fetch any can kind of information with respect to the confirmed cases for any state in the US.

Death cases in US

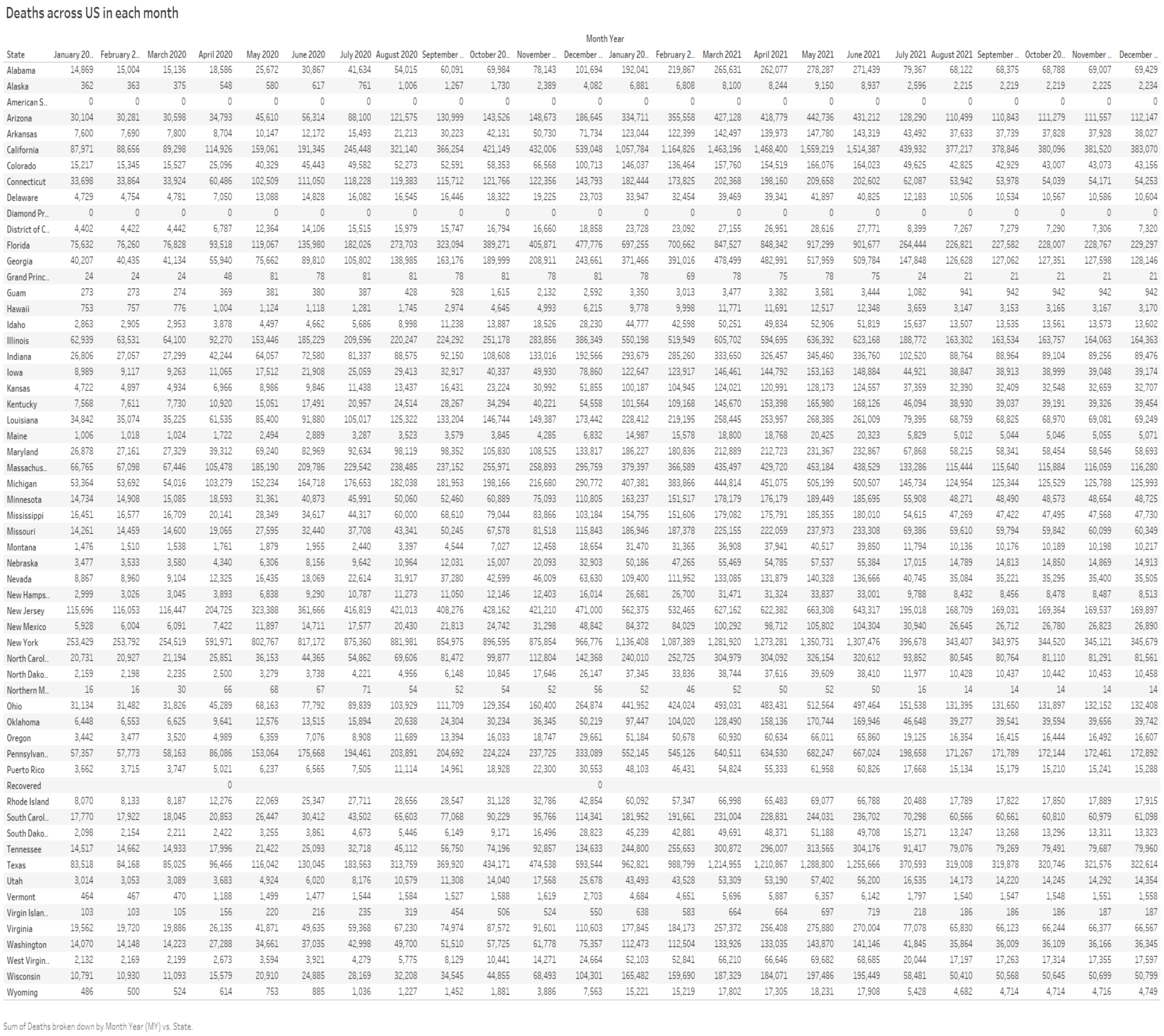
Display of Deaths in different states of US



Map based on Longitude (generated) and Latitude (generated). Size shows sum of Deaths. Details are shown for Country and State.

The above geographical distribution of deaths in US displays the severity of COVID-19 virus. The larger the size of the circle, larger is the intensity.

Statistical information about the death cases in all the states of the US for each month starting from January 2020 to July 2021



Deaths across US in each month

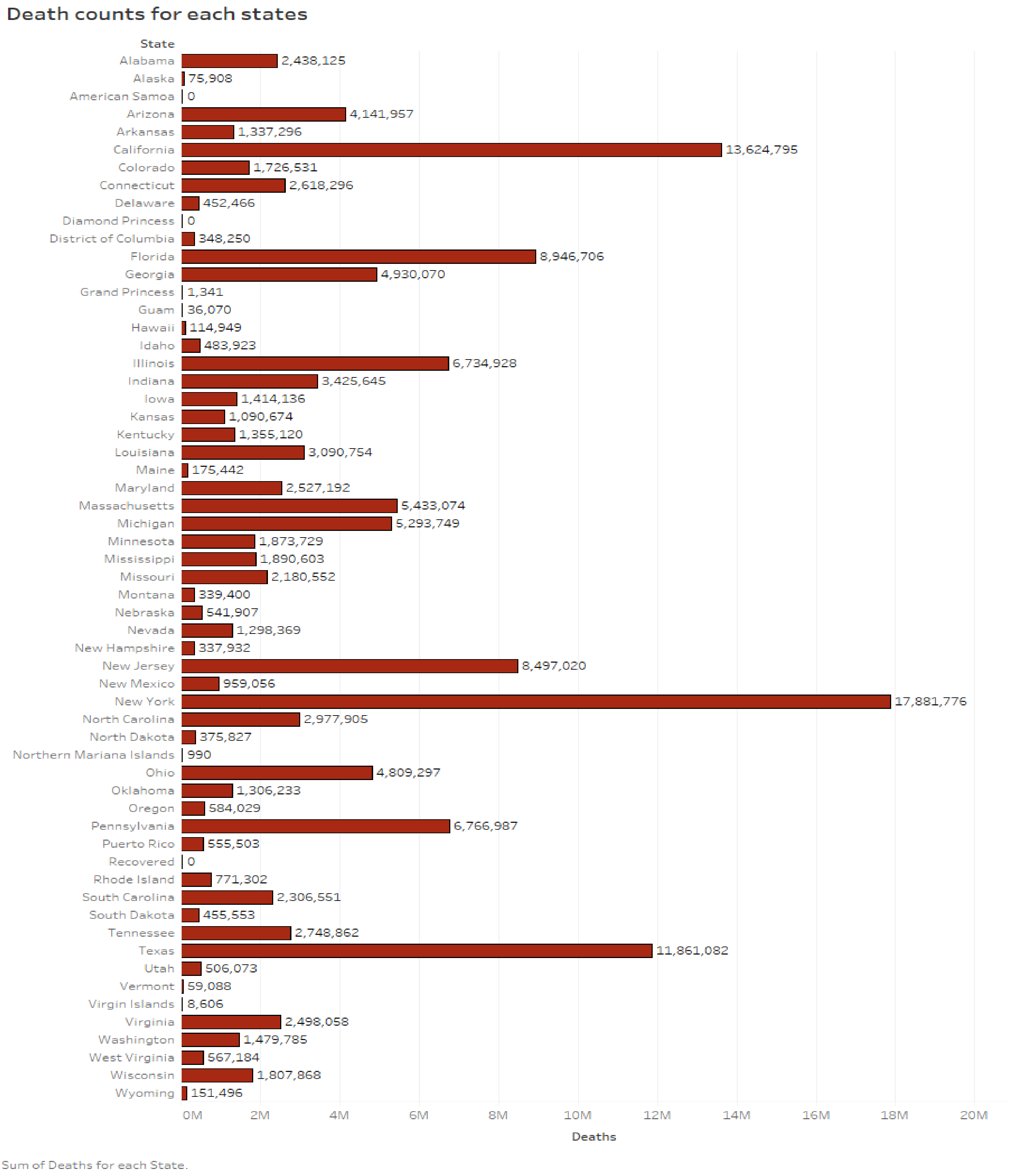
Month Year

State	January 20..	February 2..	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020	September ..	October 20..	November ..	December ..	January 20..	February 2..	March 2021	April 2021	May 2021	June 2021	July 2021	August 2021	September ..	October 20..	November ..	December ..
Alabama	14,869	15,004	15,136	18,586	25,672	30,867	41,634	54,015	60,091	69,984	78,143	101,694	192,041	219,867	265,631	262,077	278,287	271,439	79,367	68,122	68,375	68,788	69,007	69,429
Alaska	362	363	375	548	580	617	761	1,006	1,267	1,730	2,389	4,082	6,881	6,808	8,100	8,244	9,150	8,937	2,596	2,215	2,219	2,219	2,225	2,234
American S..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arizona	30,104	30,281	30,598	34,793	45,610	56,314	88,100	121,575	130,999	143,526	148,673	186,645	334,711	355,558	427,128	418,779	442,736	431,212	128,290	110,499	110,843	111,279	111,557	112,147
Arkansas	7,600	7,690	7,800	8,704	10,147	12,172	15,493	21,213	30,223	42,131	50,730	71,734	123,044	122,399	142,497	139,973	147,780	143,319	43,492	37,633	37,739	37,828	37,928	38,027
California	87,971	88,656	89,298	114,926	159,061	191,345	245,448	321,140	366,254	421,149	432,006	539,048	1,057,784	1,164,826	1,463,196	1,468,400	1,559,219	1,514,387	439,932	377,217	378,846	380,096	381,520	383,070
Colorado	15,217	15,345	15,527	25,096	40,329	45,443	49,582	52,273	52,591	58,353	66,568	100,713	146,037	136,464	157,760	154,519	166,076	164,023	49,625	42,825	42,929	43,007	43,073	43,156
Connecticut	33,698	33,864	33,924	60,486	102,509	111,050	118,228	119,383	115,712	121,766	122,356	143,793	182,444	173,825	202,368	198,160	209,658	202,602	62,087	53,942	53,978	54,039	54,171	54,253
Delaware	4,729	4,754	4,781	7,050	13,088	14,828	16,082	16,545	16,446	18,322	19,225	23,703	33,947	32,454	39,469	39,341	41,897	40,825	12,183	10,506	10,534	10,567	10,586	10,604
Diamond Pr..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
District of C..	4,402	4,422	4,442	6,787	12,364	14,106	15,515	15,979	15,747	16,794	16,660	18,858	23,728	23,092	27,155	26,951	28,616	27,771	8,399	7,267	7,279	7,290	7,306	7,320
Florida	75,632	76,260	76,828	93,518	119,067	135,980	182,026	273,703	323,094	389,271	405,871	477,776	697,255	700,662	847,527	848,342	917,299	901,677	264,444	226,821	227,582	228,007	228,767	229,297
Georgia	40,207	40,435	41,134	55,940	75,662	89,810	105,802	138,985	163,176	189,999	208,911	243,661	371,466	391,016	478,499	482,991	517,959	509,784	147,848	126,628	127,062	127,351	127,598	128,146
Grand Princ..	24	24	24	48	81	78	81	81	78	81	78	81	78	69	78	75	78	75	24	21	21	21	21	21
Guam	273	273	274	369	381	380	387	428	928	1,615	2,132	2,592	3,350	3,013	3,477	3,382	3,581	3,444	1,082	941	942	942	942	942
Hawaii	753	757	776	1,004	1,124	1,118	1,281	1,745	2,974	4,645	4,993	6,215	9,778	9,998	11,771	11,691	12,517	12,348	3,659	3,147	3,153	3,165	3,167	3,170
Idaho	2,863	2,905	2,953	3,878	4,497	4,662	5,686	8,998	11,238	13,887	18,526	28,230	44,777	42,598	50,251	49,834	52,906	51,819	15,637	13,507	13,535	13,561	13,573	13,602
Illinois	62,939	63,531	64,100	92,270	153,446	185,229	209,596	220,247	224,292	251,178	283,856	386,349	550,198	519,949	605,702	594,695	636,392	623,168	188,772	163,302	163,534	163,757	164,063	164,363
Indiana	26,806	27,057	27,299	42,244	64,057	72,580	81,337	88,575	92,150	108,608	133,016	192,566	293,679	285,260	333,650	326,457	345,460	336,760	102,520	88,764	88,964	89,104	89,256	89,476
Iowa	8,989	9,117	9,263	11,065	17,512	21,908	25,059	29,413	32,917	40,337	49,930	78,860	122,647	123,917	146,461	144,792	153,163	148,884	44,921	38,847	38,913	38,999	39,048	39,174
Kansas	4,722	4,897	4,934	6,966	8,986	9,846	11,438	13,437	16,431	23,224	30,992	51,855	100,187	104,945	124,021	120,991	128,173	124,557	37,359	32,390	32,409	32,548	32,659	32,707
Kentucky	7,568	7,611	7,730	10,920	15,051	17,491	20,957	24,514	28,267	34,294	40,221	54,558	101,564	109,168	145,670	153,398	165,980	168,126	46,094	38,930	39,037	39,191	39,326	39,454
Louisiana	34,842	35,074	35,225	61,535	85,400	91,880	105,017	125,322	133,204	146,744	149,387	173,442	228,412	219,195	258,445	253,957	268,385	261,009	79,395	68,759	68,825	68,970	69,081	69,249
Maine	1,006	1,018	1,024	1,722	2,494	2,889	3,287	3,523	3,579	3,845	4,285	6,832	14,987	15,578	18,800	18,768	20,425	20,323	5,829	5,012	5,044	5,046	5,055	5,071
Maryland	26,878	27,161	27,329	39,312	69,240	82,969	92,634	98,119	98,352	105,830	108,525	133,817	186,227	180,836	212,889	212,723	231,367	232,867	67,868	58,215	58,341	58,454	58,546	58,693
Massachus..	66,765	67,098	67,446	105,478	185,190	209,786	229,542	238,485	237,152	255,971	258,893	295,759	379,397	366,589	435,497	429,720	453,184	438,529	133,286	115,444	115,640	115,884	116,059	116,280
Michigan	53,364	53,692	54,016	103,279	152,234	164,718	176,653	182,038	181,953	198,166	216,680	290,772	407,381	383,866	444,814	451,075	505,199	500,507	145,734	124,954	125,344	125,529	125,788	125,993
Minnesota	14,734	14,908	15,085	18,593	31,361	40,873	45,991	50,060	52,460	60,889	75,093	110,805	163,237	151,517	178,179	176,179	189,449	185,695	55,908	48,271	48,490	48,573	48,654	48,725
Mississippi	16,451	16,577	16,709	20,141	28,349	34,617	44,317	60,000	68,610	79,044	83,866	103,184	154,795	151,606	179,082	175,791	185,355	180,010	54,615	47,269	47,422	47,495	47,568	47,730
Missouri	14,261	14,459	14,600	19,065	27,595	32,440	37,708	43,341	50,245	67,578	81,518	115,843	186,946	187,378	225,155	222,059	237,973	233,308	69,386	59,610	59,794	59,842	60,099	60,349
Montana	1,476	1,510	1,538	1,761	1,879	1,955	2,440	3,397	4,544	7,027	12,458	18,654	31,470	31,365	36,908	37,941	40,517	39,850	11,794	10,136	10,176	10,189	10,198	10,217
Nebraska	3,477	3,533	3,580	4,340	6,306	8,156	9,642	10,964	12,031	15,007	20,093	32,903	50,186	47,265	55,469	54,785	57,537	55,384	17,015	14,789	14,813	14,850	14,869	14,913
Nevada	8,867	8,960	9,104	12,325	16,435	18,069	22,614	31,917	37,280	42,599	46,009	63,630	109,400	111,952	133,085	131,879	140,328	136,666	40,745	35,084	35,221	35,295	35,400	35,505
New Hamps..	2,999	3,026	3,045	3,893	6,838	9,290	10,787	11,273	11,050	12,146	12,403	16,014	26,681	26,700	31,471	31,324	33,837	33,001	9,788	8,432	8,456	8,478	8,487	8,513
New Jersey	115,696	116,053	116,447	204,725	323,388	361,666	416,819	421,013	408,276	428,162	421,210	471,000	562,375	532,465	627,162	622,382	663,308	643,317	195,018	168,709	169,031	169,364	169,537	169,897
New Mexico	5,928	6,004	6,091	7,422	11,897	14,711	17,577	20,430	21,813	24,742	31,298	48,842	84,372	84,029	100,292	98,712	105,802	104,304	30,940	26,645	26,712	26,780	26,823	26,890
New York	253,429	253,792	254,519	591,971	802,767	817,172	875,360	881,981	854,975	896,595	875,854	966,776	1,136,408	1,087,389	1,281,920	1,273,281	1,350,731	1,307,476	396,678	343,407	343,975	344,520	345,121	345,679
North Carol..	20,731	20,927	21,194	25,851	36,153	44,365	54,862	69,606	81,472	99,877	112,804	142,368	240,010	252,725	304,979	304,092	326,154	320,612	93,852	80,545	80,764	81,110	81,291	81,561
North Dako..	2,159	2,198	2,235	2,500	3,279	3,738	4,221	4,956	6,148	10,845	17,646	26,147	37,345	33,836	38,744	37,616	39,609	38,410	11,977	10,428	10,437	10,442	10,453	10,458
Northern M..	16	16	30	66	68	67	71	54	52	54	52	56	52	46	52	50	52	50	16	14	14	14	14	14
Ohio	31,134	31,482	31,826	45,289	68,163	77,792	89,839	103,929	111,709	129,354	160,400	264,874	441,952	424,024	493,031	483,431	512,564	497,464	151,538	131,395	131,650	131,897	132,152	132,408
Oklahoma	6,448	6,553	6,625	9,641	12,576	13,515	15,894	20,638	24,304	30,234	36,345	50,219	97,447	104,020	128,490	158,136	170,744	169,946	46,648	39,277	39,541	39,594	39,656	39,742
Oregon	3,442	3,477	3,520	4,989	6,359	7,076	8,908	11,689	13,394	16,033	18,747	29,661	51,184	50,678	60,930	60,634	66,011	65,860	19,125	16,354	16,415	16,444	16,492	16,607
Pennsylvan..	57,357	57,773	58,163	86,086	153,064	175,668	194,461	203,891	204,692	224,224	237,725	333,089	552,145	545,126	640,511	634,530	682,247	667,024	198,658	171,267	171,789	172,144	172,461	172,892
Puerto Rico	3,662	3,715	3,747	5,021	6,237	6,565	7,505	11,114	14,961	18,928	22,300	30,553	48,103	46,431	54,824	55,333	61,958	60,826	17,668	15,134	15,179	15,210	15,241	15,288
Recovered				0								0												
Rhode Island	8,070	8,133	8,187	12,276	22,069	25,347	27,711	28,656	28,547	31,128	32,786	42,854	60,092	57,347	66,998	65,483	69,077	66,788	20,488	17,789	17,822	17,850	17,889	17,915
South Carol..	17,770	17,922	18,045	20,853	26,447	30,412	43,502	65,603	77,068	90,229	95,766	114,341	181,952	191,661	231,004	228,831	244,031	236,702	70,298	60,566	60,661	60,810	60,979	61,098
South Dako..	2,098	2,154	2,211	2,422	3,255	3,861	4,673	5,446	6,149	9,171	16,496	28,823	45,239	42,881	49,691	48,371	51,188	49,708	15,271	13,247	13,268	13,296	13,311	13,323
Tennessee	14,517	14,662	14,933	17,996	21,422	25,093	32,718	45,112	56,750	74,196	92,857	134,633	244,800	255,653	300,872	296,007	313,565	304,176	91,417	79,076	79,269	79,491	79,687	79,960
Texas	83,518	84,168	85,025	96,466	116,042	130,045	183,563	313,759	369,920	434,171	474,538	593,544	962,821	988,799	1,214,955	1,210,867	1,288,800	1,255,666	370,593	319,008	319,878	320,746	321,576	322,614
Utah	3,014	3,053	3,089	3,683	4,924	6,020	8,176	10,579	11,308	14,040	17,568	25,678	43,493	43,528	53,309	53,190	57,402	56,200	16,535	14,173	14,220	14,245	14,292	14,354
Vermont	464	467	470	1,188	1,499	1,477	1,544	1,584	1,527	1,588	1,619	2,703	4,684	4,651	5,696	5,887	6,357	6,142	1,797	1,540	1,547	1,548	1,551	1,558
Virgin Islan..	103	103	105	156	220	216	235	319	454	506	524	550	638	583	664	664	697	719	218	186	186	186	187	187
Virginia	19,562	19,720	19,886	26,135	41,871	49,635	59,368	67,230	74,974	87,572	91,601	110,603	177,845	184,173	257,372	256,408	275,880	270,004	77,078	65,830	66,123	66,244	66,377	66,567
Washington	14,070	14,148	14,223	27,288	34,661	37,035	42,998	49,700	51,510	57,725	61,778	75,357	112,473	112,504	133,926	133,035	143,870	141,146	41,845	35,864	36,009	36,109	36,166	36,345
West Virgin..	2,132	2,169	2,199	2,673	3,594	3,921	4,279	5,775	8,129	10,441	14,271	24,664	52,103	52,841	66,210	66,646	69,682	68,685	20,044	17,197	17,263	17,314	17,355	17,597
Wisconsin	10,791	10,930	11,093	15,579	20,910	24,885	28,169	32,208	34,545	44,855	68,493	104,301	165,482	159,690	187,329	184,071	197,486	195,449	58,481	50,410	50,568	50,645	50,699	50,799
Wyoming	486	500	524	614	753	885	1,036	1,227	1,452	1,881	3,886	7,563	15,221	15,219	17,802	17,305	18,231	17,908	5,428	4,682	4,714	4,714	4,716	4,749

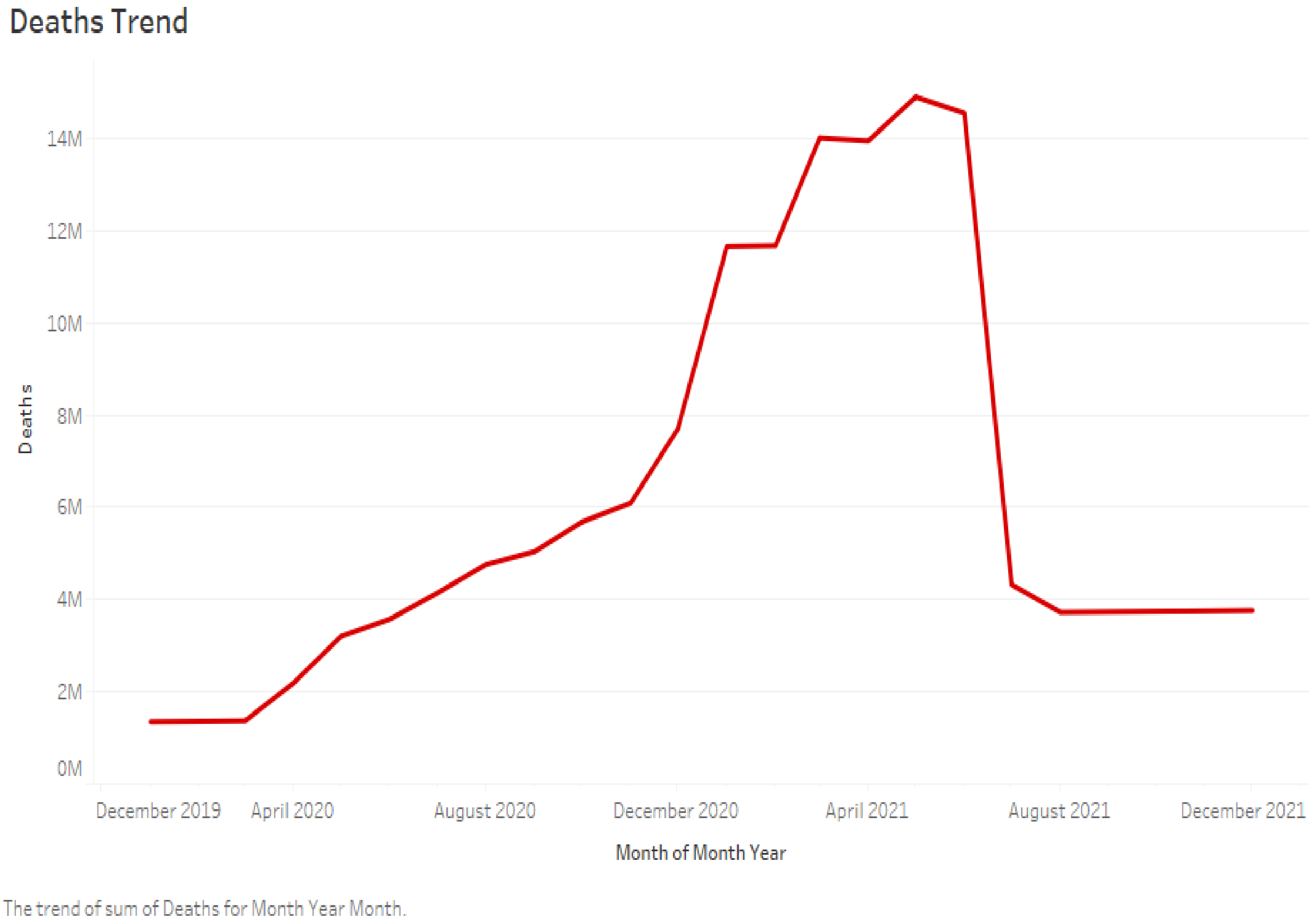
Sum of Deaths broken down by Month Year (MY) vs. State.

The above tabular representation of the data for the total death cases for each state in a month, provides complete information in a single report. Having a look at this report can acquire knowledge about the number of deaths confirmed in the US, in addition this report provides specific information with states and timeframe.

Bar Plot representation of the death cases in US

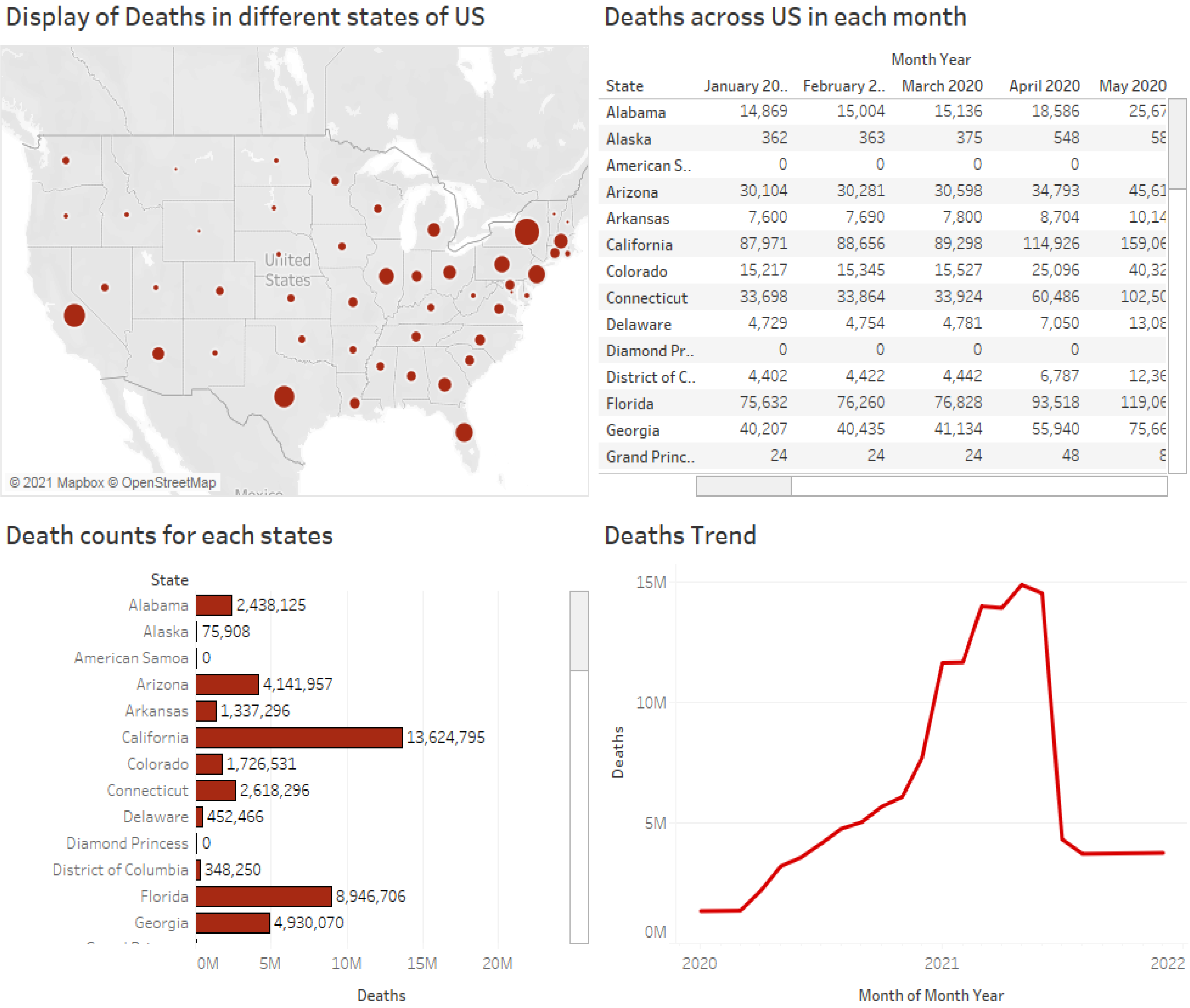


Line plot representing the trend of death cases over the timeframe



The above line graph displays the information of the rise and fall of the COVID-19 deaths in US.

Dashboard for Death cases



Display of Deaths in different states of US

Deaths across US in each month

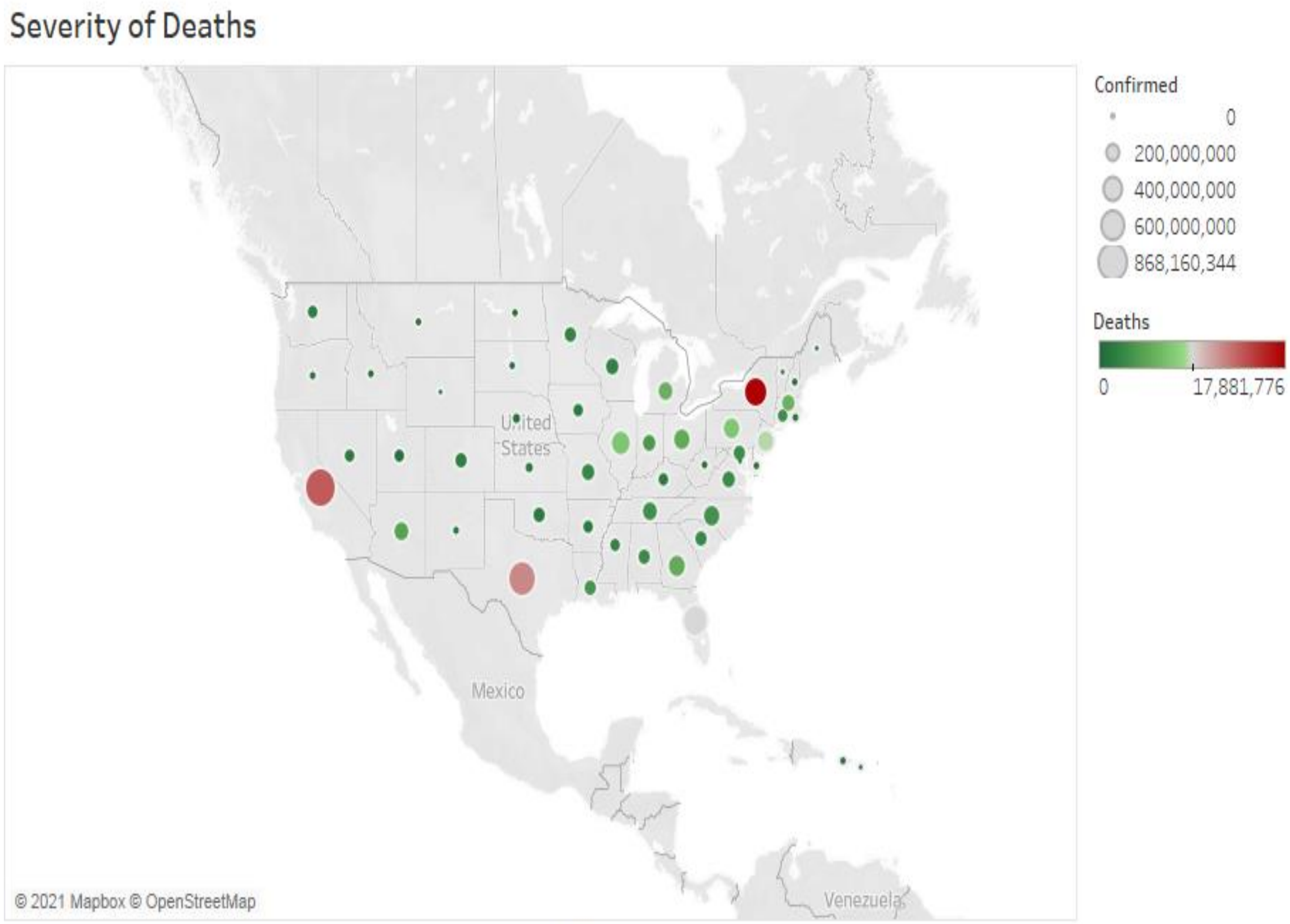
	Month Year				
State	January 20..	February 2..	March 2020	April 2020	May 2020
Alabama	14,869	15,004	15,136	18,586	25,67
Alaska	362	363	375	548	58
American S..	0	0	0	0	
Arizona	30,104	30,281	30,598	34,793	45,61
Arkansas	7,600	7,690	7,800	8,704	10,14
California	87,971	88,656	89,298	114,926	159,06
Colorado	15,217	15,345	15,527	25,096	40,32
Connecticut	33,698	33,864	33,924	60,486	102,50
Delaware	4,729	4,754	4,781	7,050	13,08
Diamond Pr..	0	0	0	0	
District of C..	4,402	4,422	4,442	6,787	12,36
Florida	75,632	76,260	76,828	93,518	119,06
Georgia	40,207	40,435	41,134	55,940	75,66
Grand Princ..	24	24	24	48	8

Death counts for each states

Deaths Trend

The above dashboard providing wide range of information for the death cases in the US.

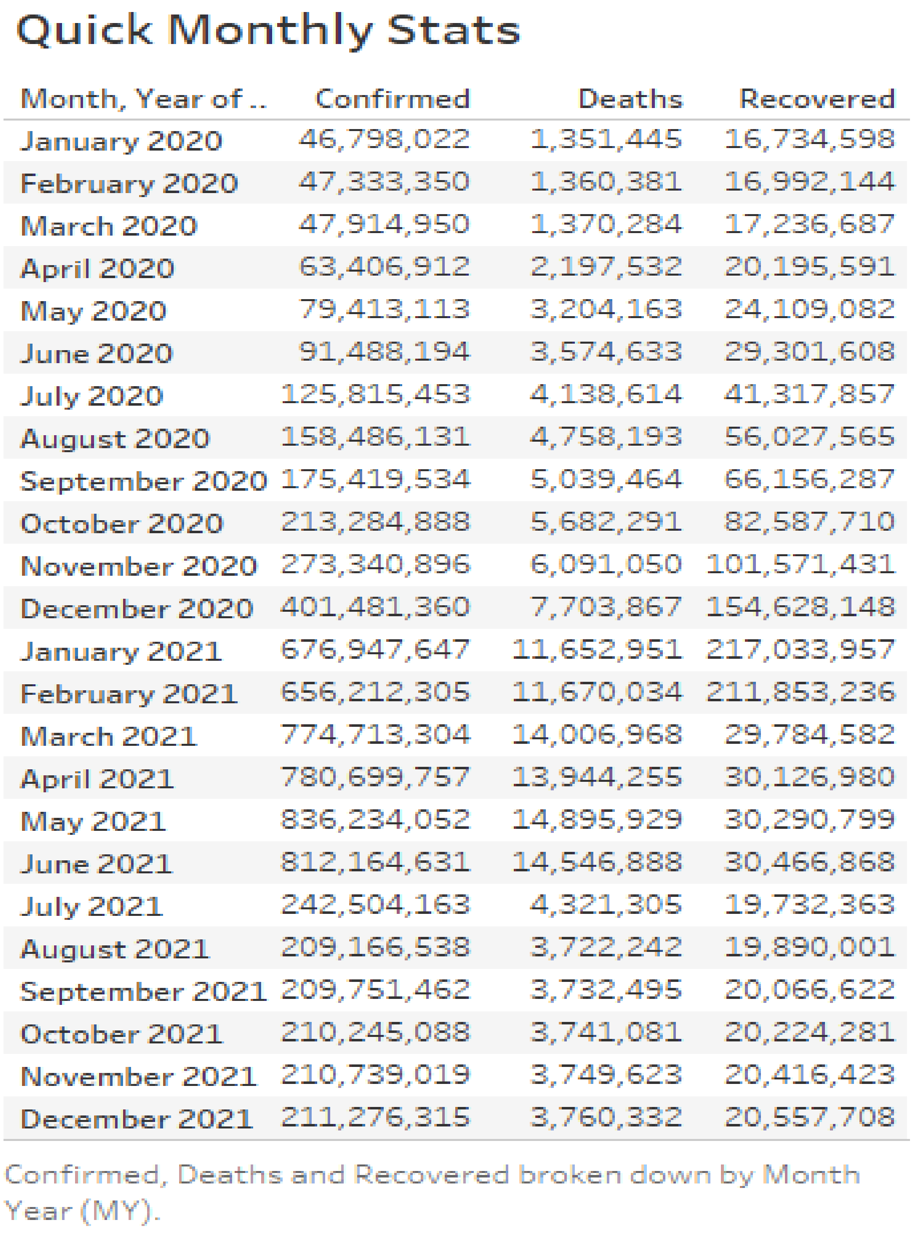
Severity of Deaths in the US



Map based on Longitude (generated) and Latitude (generated). Color shows sum of Deaths. Size shows sum of Confirmed. Details are shown for Country and State.

The above geographical distribution of the deaths in US displays the severity of COVID-19 virus. The darker and larger the size of the circle, larger is the intensity.

Quick statistics of COVID-19 dataset



Quick Monthly Stats

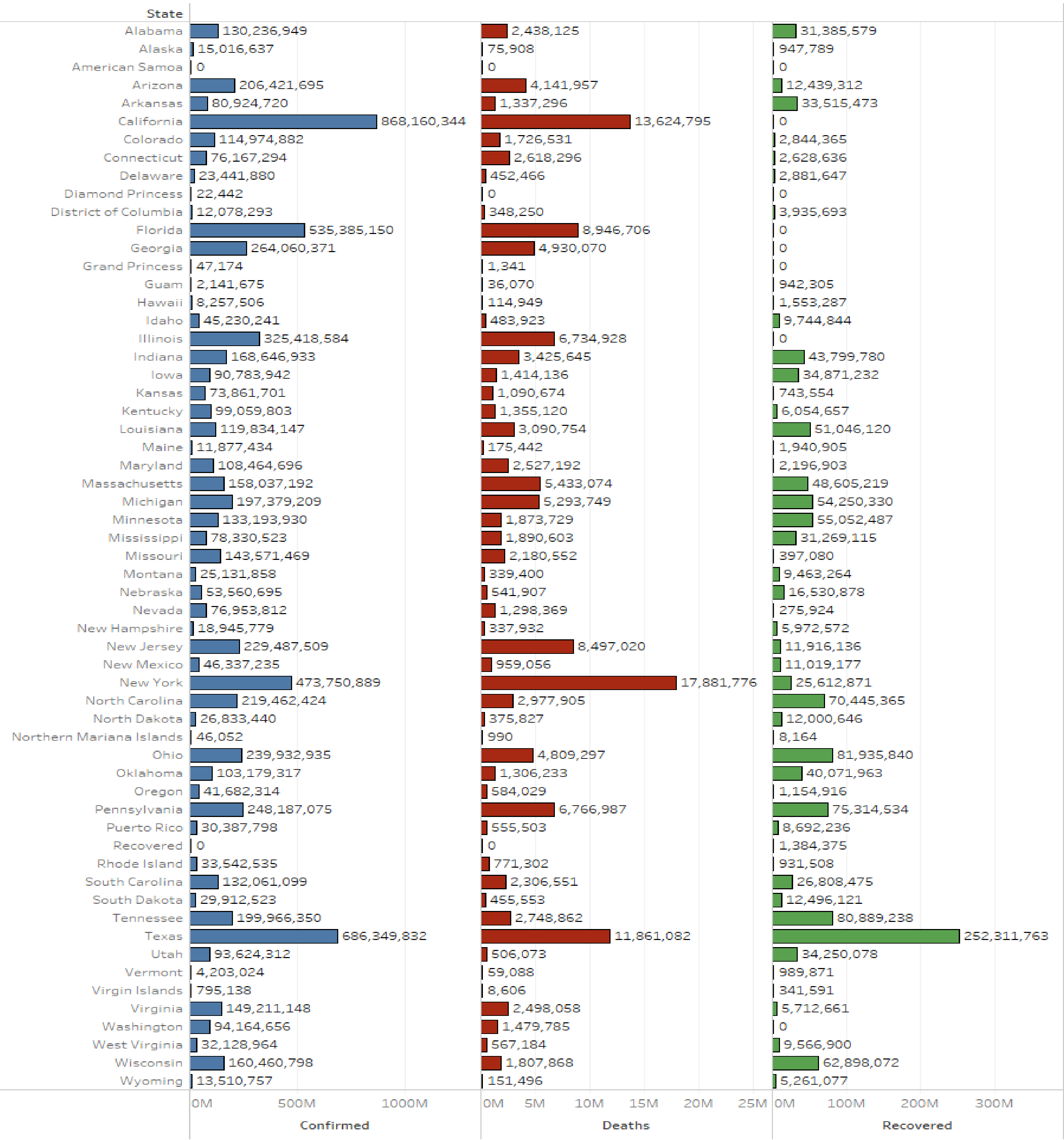
Month, Year of ..	Confirmed	Deaths	Recovered
January 2020	46,798,022	1,351,445	16,734,598
February 2020	47,333,350	1,360,381	16,992,144
March 2020	47,914,950	1,370,284	17,236,687
April 2020	63,406,912	2,197,532	20,195,591
May 2020	79,413,113	3,204,163	24,109,082
June 2020	91,488,194	3,574,633	29,301,608
July 2020	125,815,453	4,138,614	41,317,857
August 2020	158,486,131	4,758,193	56,027,565
September 2020	175,419,534	5,039,464	66,156,287
October 2020	213,284,888	5,682,291	82,587,710
November 2020	273,340,896	6,091,050	101,571,431
December 2020	401,481,360	7,703,867	154,628,148
January 2021	676,947,647	11,652,951	217,033,957
February 2021	656,212,305	11,670,034	211,853,236
March 2021	774,713,304	14,006,968	29,784,582
April 2021	780,699,757	13,944,255	30,126,980
May 2021	836,234,052	14,895,929	30,290,799
June 2021	812,164,631	14,546,888	30,466,868
July 2021	242,504,163	4,321,305	19,732,363
August 2021	209,166,538	3,722,242	19,890,001
September 2021	209,751,462	3,732,495	20,066,622
October 2021	210,245,088	3,741,081	20,224,281
November 2021	210,739,019	3,749,623	20,416,423
December 2021	211,276,315	3,760,332	20,557,708

Confirmed, Deaths and Recovered broken down by Month Year (MY).

The above table displays the information of confirmed, deaths and recovered cases for each month in the US.

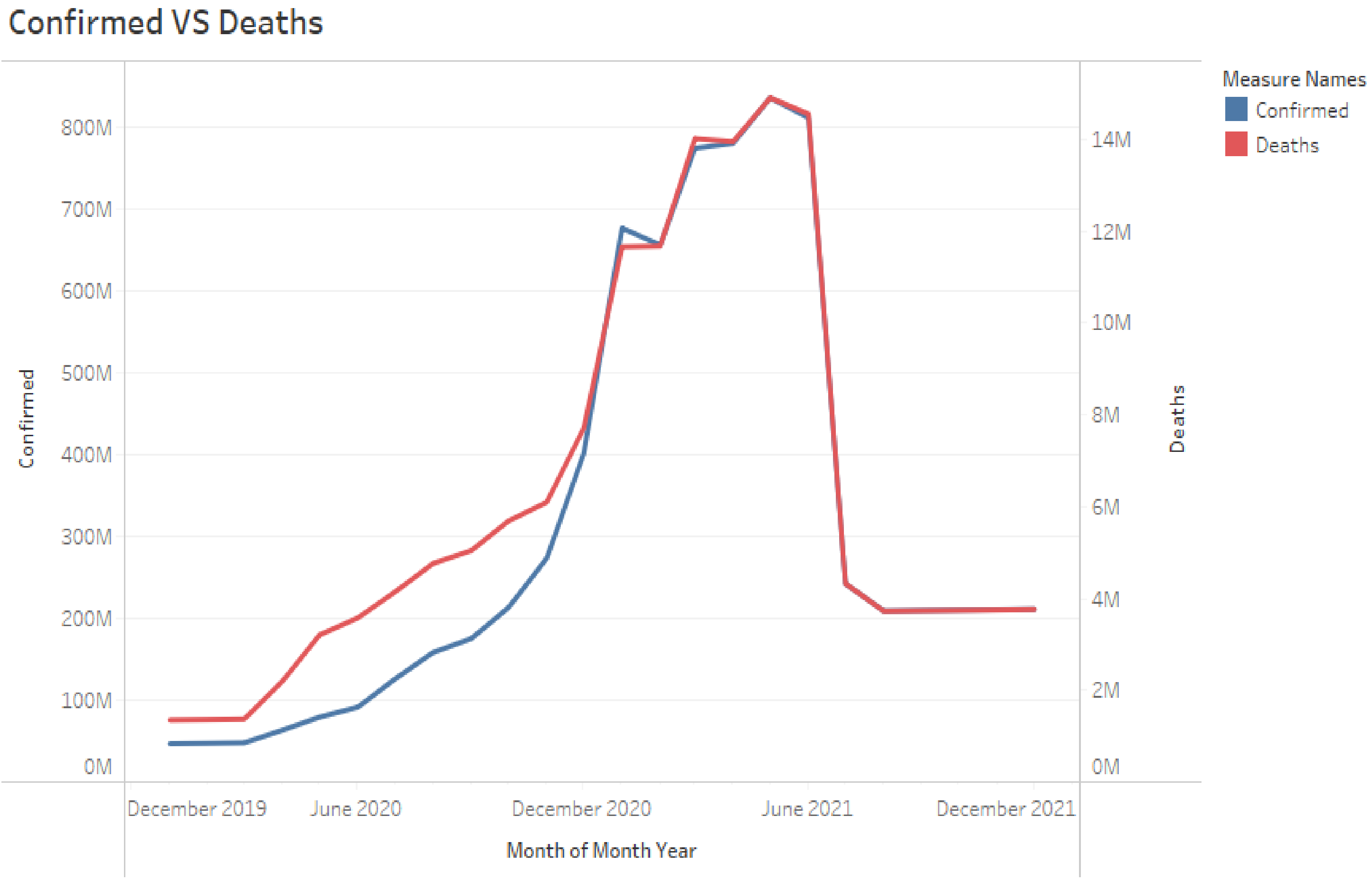
Bar plot for Confirmed, Death and Recovered cases

Confirmed, Deaths and Recovered



Sum of Confirmed, sum of Deaths and sum of Recovered for each State.

Confirmed VS Deaths trend

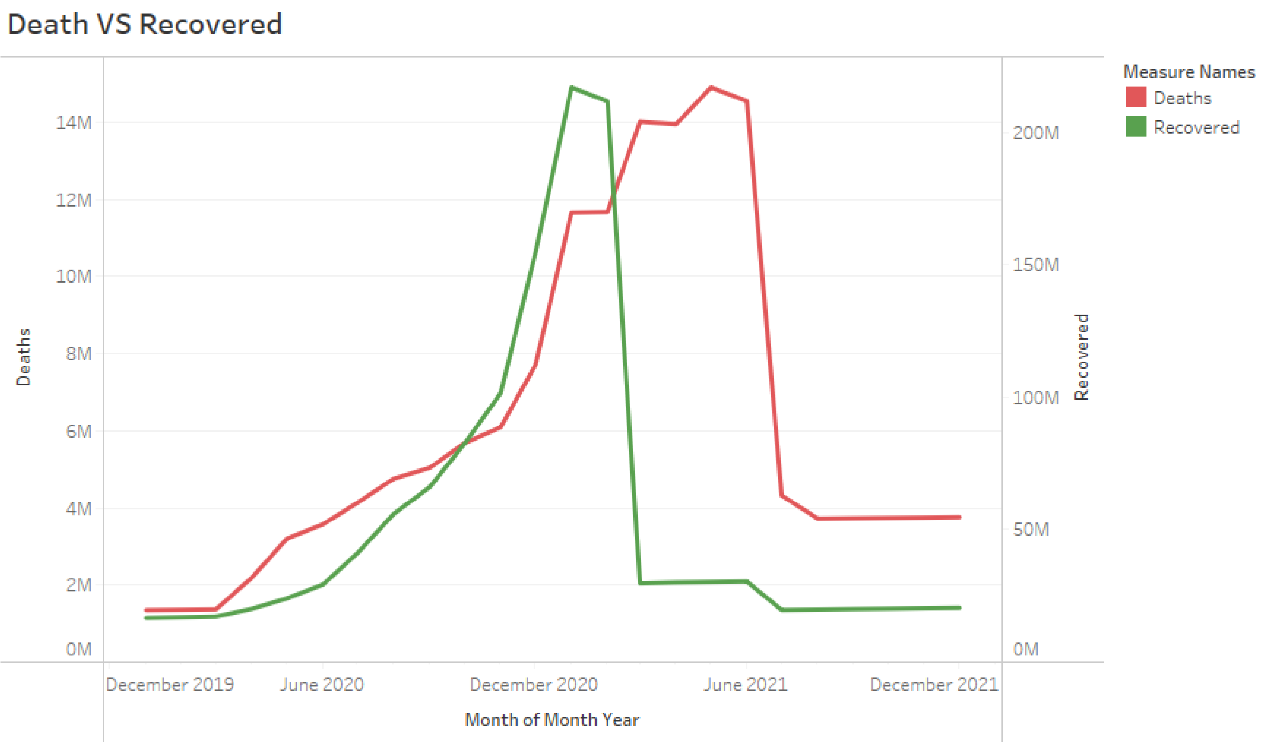


The trends of Confirmed and Deaths for Month Year Month. Color shows details about Confirmed and Deaths.

The above line graph displays the relation between the confirmed and death cases. We can see that as the confirmed cases increased the death cases also increase.

NOTE- The Y axis intervals are different for confirmed and deaths, confirmed cases intervals are displayed on the left, and deaths on the right.

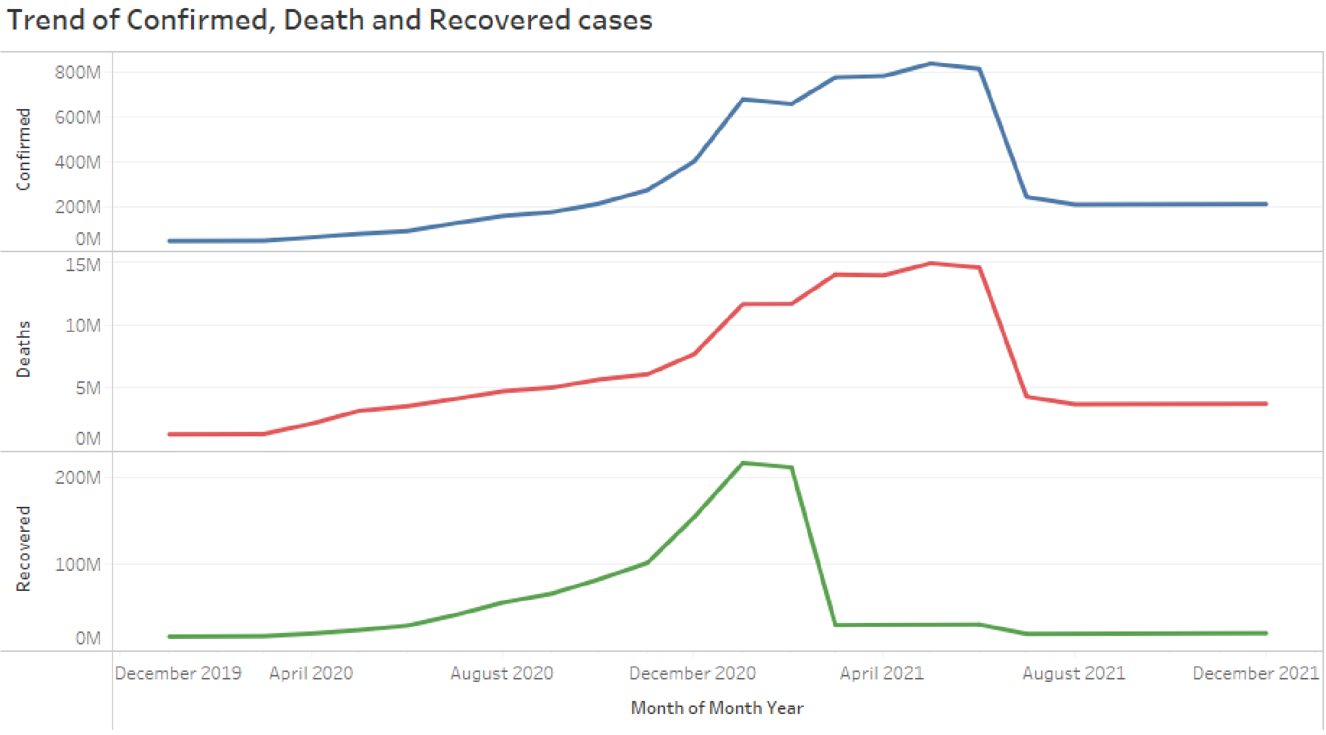
Death VS Recovered



The trends of Deaths and Recovered for Month Year Month. Color shows details about Deaths and Recovered.

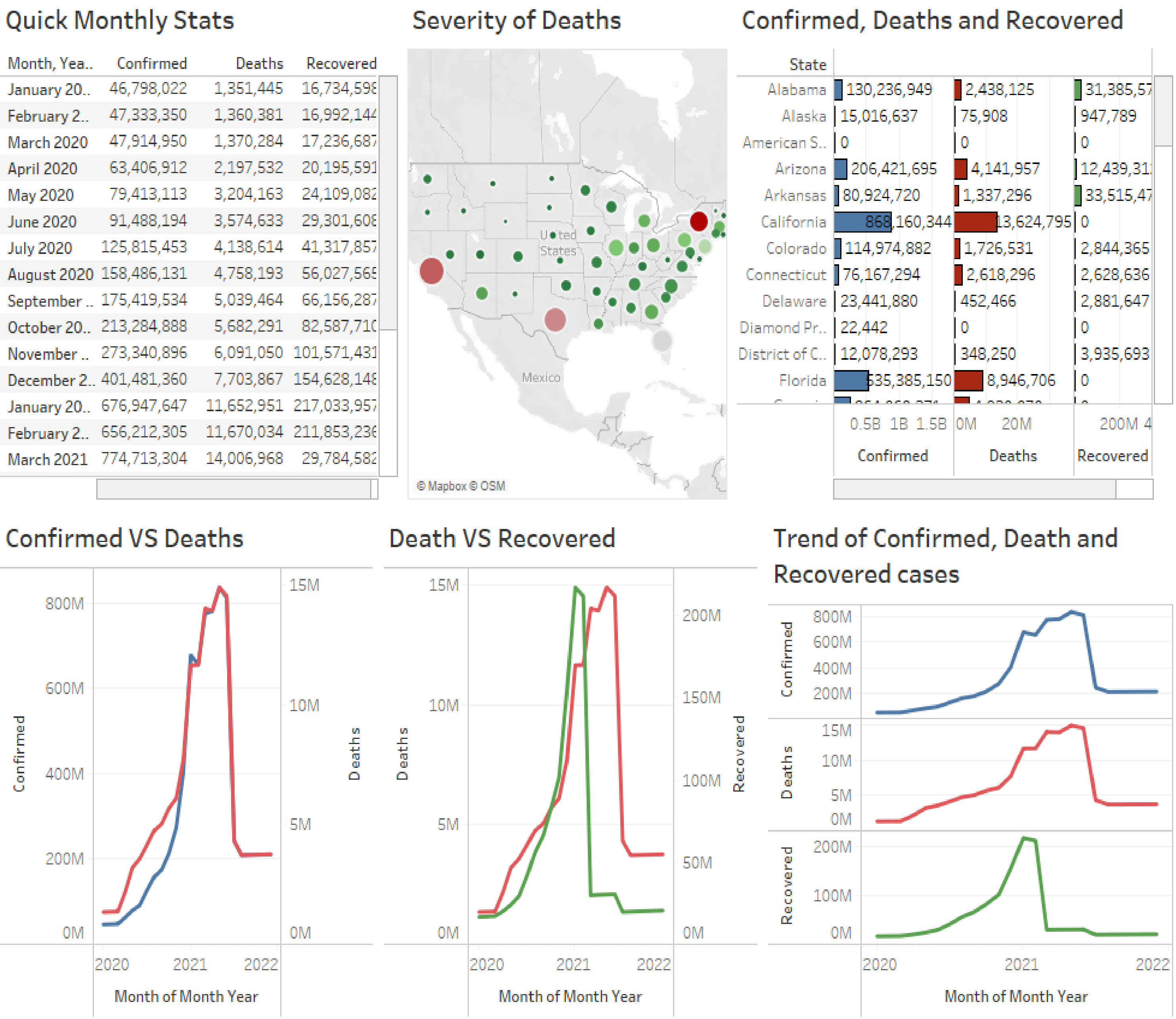
NOTE- The Y axis intervals are not the same for both the measures.

Trends of different measures



The trends of sum of Confirmed, sum of Deaths and sum of Recovered for Month Year Month.

Overall insights of the COVID-19 dataset



Quick Monthly Stats

Month, Yea..	Confirmed	Deaths	Recovered
January 20..	46,798,022	1,351,445	16,734,598
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June 2020	91,488,194	3,574,633	29,301,608
July 2020	125,815,453	4,138,614	41,317,857
August 2020	158,486,131	4,758,193	56,027,565
September ..	175,419,534	5,039,464	66,156,287
October 20..	213,284,888	5,682,291	82,587,710
November ..	273,340,896	6,091,050	101,571,431
December 2..	401,481,360	7,703,867	154,628,148
January 20..	676,947,647	11,652,951	217,033,957
February 2..	656,212,305	11,670,034	211,853,236
March 2021	774,713,304	14,006,968	29,784,582

Severity of Deaths

Confirmed, Deaths and Recovered

State	Confirmed	Deaths	Recovered
Alabama	130,236,949	2,438,125	31,385,57
Alaska	15,016,637	75,908	947,789
American S..	0	0	0
Arizona	206,421,695	4,141,957	12,439,31
Arkansas	80,924,720	1,337,296	33,515,47
California	868,160,344	13,624,795	0
Colorado	114,974,882	1,726,531	2,844,365
Connecticut	76,167,294	2,618,296	2,628,636
Delaware	23,441,880	452,466	2,881,647
Diamond Pr..	22,442	0	0
District of C..	12,078,293	348,250	3,935,693
Florida	535,385,150	8,946,706	0

Confirmed VS Deaths

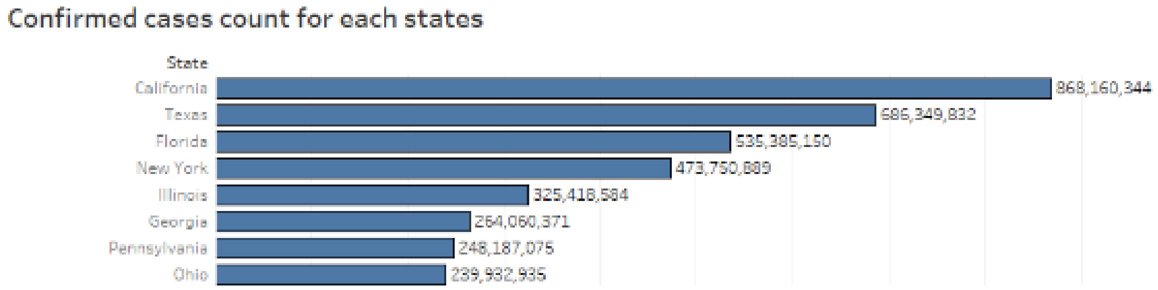
Death VS Recovered

Trend of Confirmed, Death and Recovered cases

The above dashboard provides the overall insights and the behavior of the dataset.

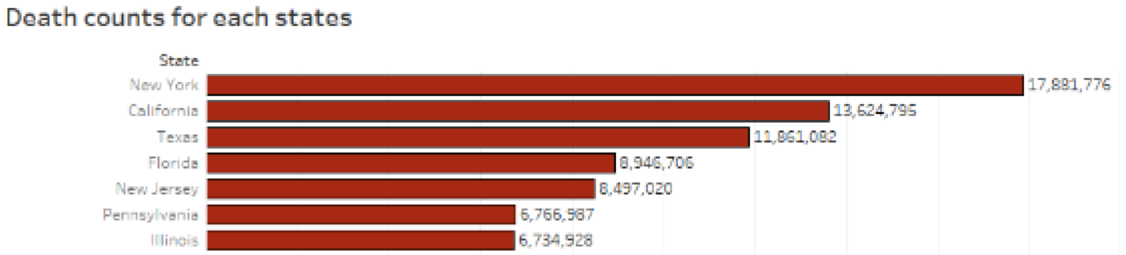
Business Questions

Which state was the most affected from covid-19?


Confirmed cases count for each states

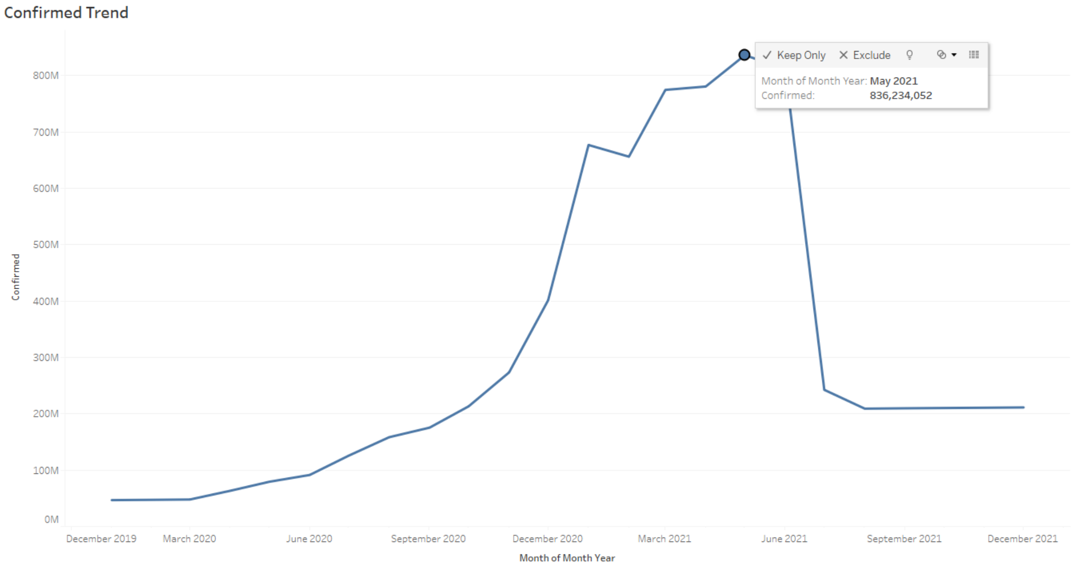
As displayed in the above visual, California state is the most affected from COVID-19

Which state has the highest deaths from covid-19?


Death counts for each states

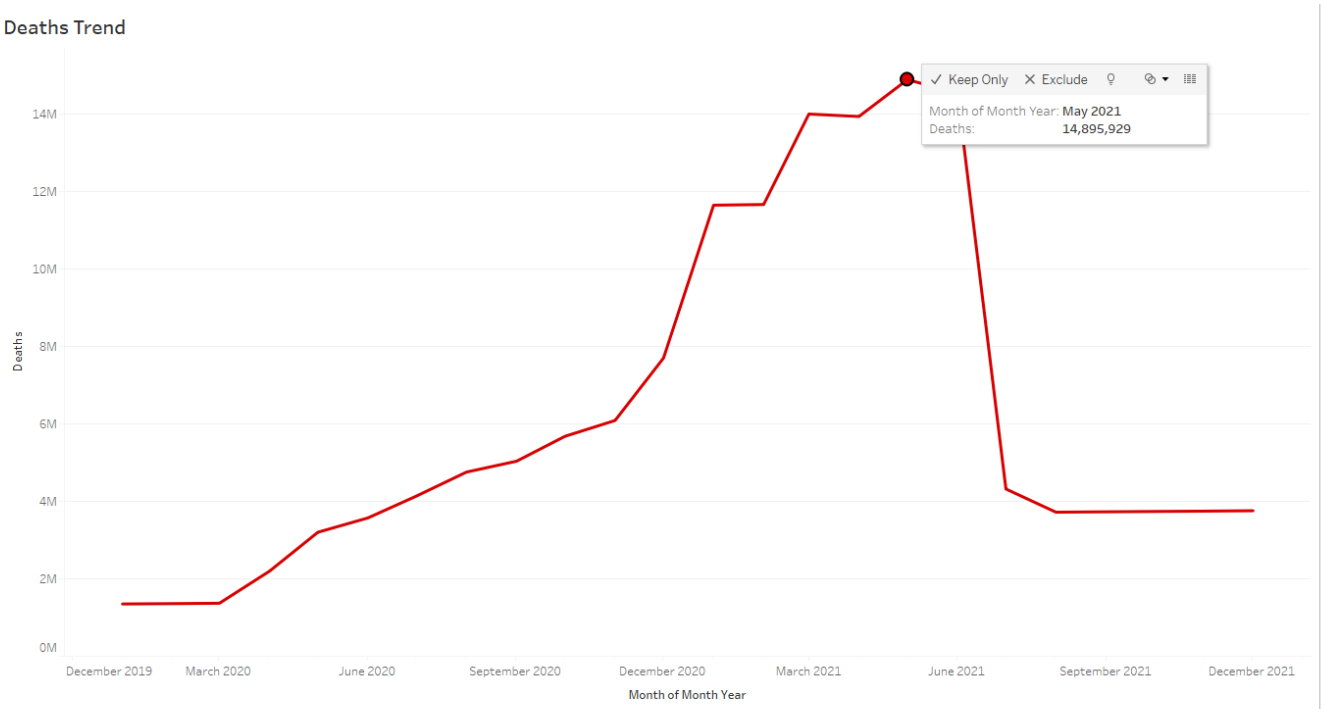
As indicated in the above visual, New York is the state with most deaths.

When did the COVID-19 cases had the highest peak?


Confirmed Trend

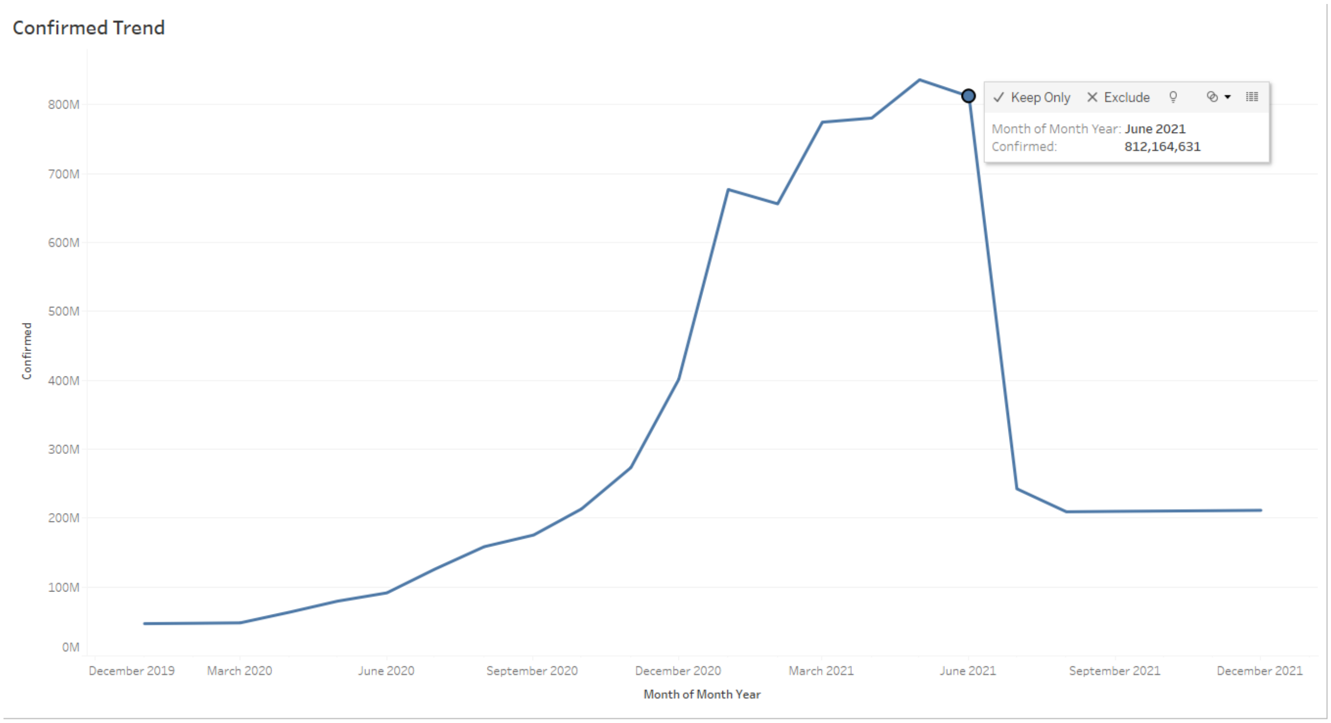
May 2021 was the month which had the highest peak of COVID-19 cases, with 836,234,052 cases.

When did the COVID-19 cases had the highest death rate?



May 2021 was the month with highest death cases of COVID-19, with deaths of 14,895,929.

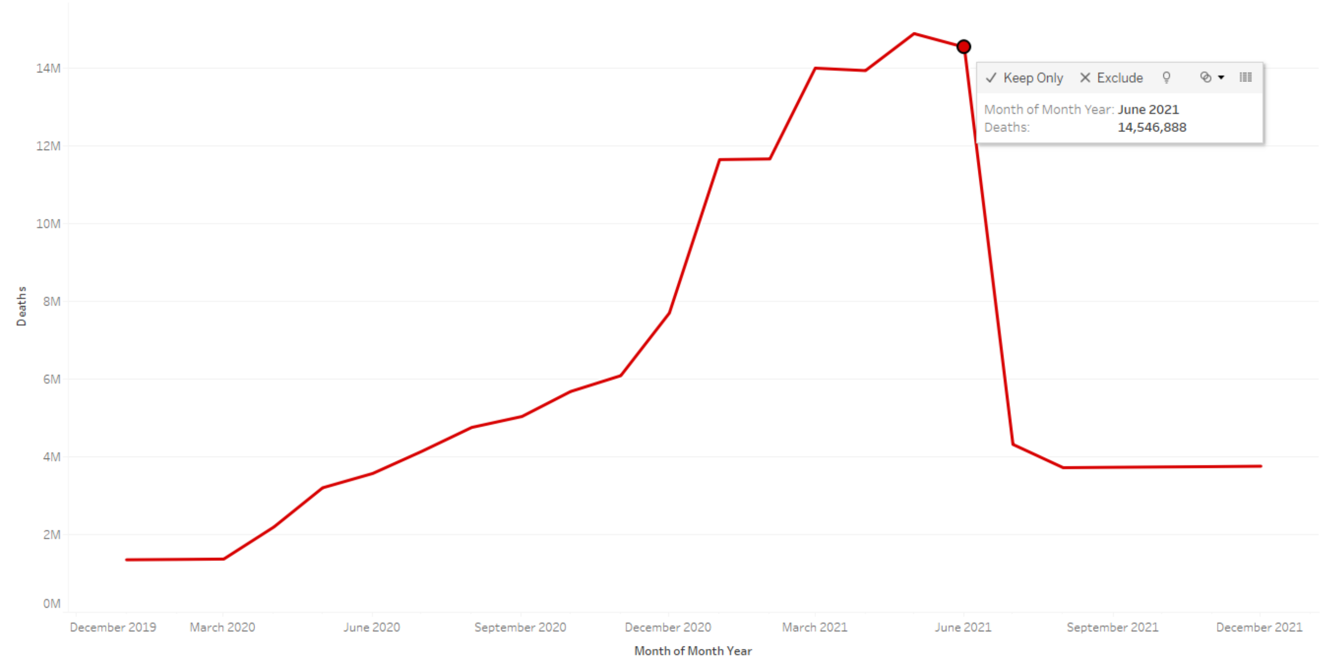
When did the COVID-19 cases started to drop?



During the month June 2021, there is a huge drop of COVID-19 cases.

When did the death rate started to drop?

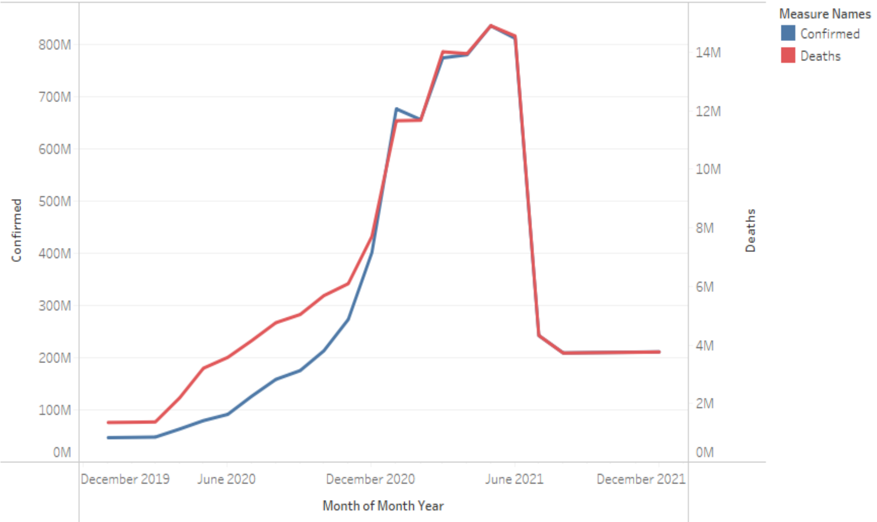
Deaths Trend



During the month of June 2021, the death rate dropped drastically.

With the EDA and visualization performed, did you observe any pattern in the dataset?

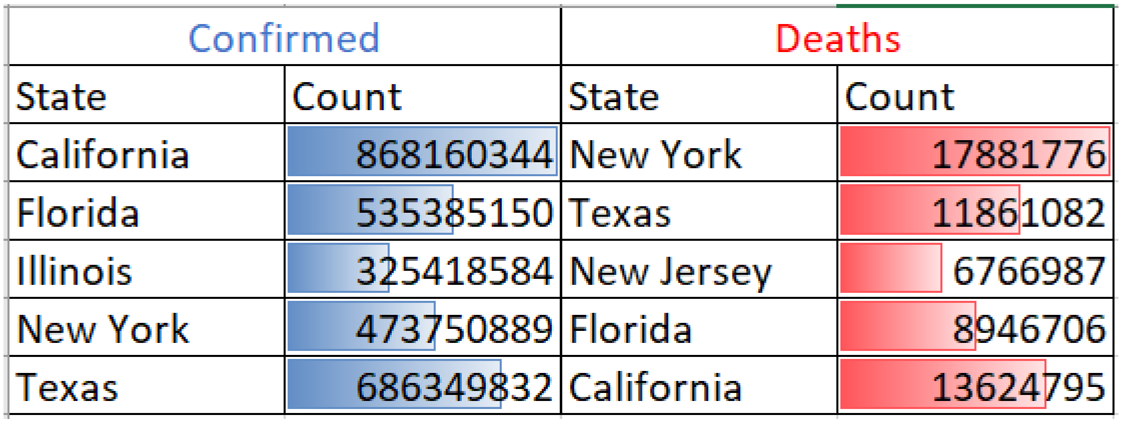
Confirmed VS Deaths



The trends of Confirmed and Deaths for Month Year Month. Color shows details about Confirmed and Deaths.

In the above trend, we can see there is a direct relationship between the confirmed and deaths column, as the number of confirmed cases increased, the death counts also increased.

Top five states confirmed and deaths statistics in the US?



Confirmed		Deaths	
State	Count	State	Count
California	868160344	New York	17881776
Florida	535385150	Texas	11861082
Illinois	325418584	New Jersey	6766987
New York	473750889	Florida	8946706
Texas	686349832	California	13624795

Did you observe any unusual behavior of the dataset?

Yes, there are unusual behaviors, During the month of June 2021 the number of confirmed and death cases dropped thoroughly. The drop was caused by the massive vaccination drives conducted by the national governments to the general public to tackle the virus.

The number of confirmed and death cases had a linear raise until October 2020, however there is an immediate uplift of the cases until April 2021. This was due to, the US government had enforced strict lockdown all over the country until September 2020, after the relaxation of the rules the virus spread was escalated.

Why do you think EDA and visualization is important?

After performing all the above analysis using EDA and visualization, both helps us to provide accurate insights about the data before making any assumptions. EDA and visualization provide us a better understanding of the variables and the relationships between them, it helps to understand the data better to measure its impact on the business and communicates the insight visually to internal and external audiences. By performing EDA and visualization on our dataset provides precise information and helped us to answer all our business question effortlessly. EDA and visualization are two important aspect of data analytics when trying to get insights on a dataset.

All the mentioned above screenshots and visualization is performed on Tableau the required code/file (.twb) has been uploaded on GitHub.

Thank you,
Data Wizard Team