Flattening the Curve

COVID-19 ANALYSIS

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Presentation Outline

Introduction

The COVID-19 pandemic has profoundly impacted the world, affecting nearly every aspect of daily life. One of the key ways to understand and respond to the pandemic is through data analysis.

About The Data: The data is in nested JSON format which consist of State name, District name, population, confirmed cases, recovered, tested, deceased,vaccinated1and vaccinated2.

Data Files: Date-wise Covid Data & State-wise Covid Data

First Step: Understand the JSON file and then convert the data into CSV file in a more readable form

Aim of Project

- Understand the patterns and trends of the virus spread, including identifying high-risk areas and populations.
- Evaluate the effectiveness of different policy interventions and strategies to slow the spread of the virus.
- Provide valuable insights to public health officials and policymakers to inform their decision-making and guide the response to the pandemic.
- Identifying the factors that are associated with the severe cases and deaths from COVID-19.

THE BEGINNING

- The novel virus was first identified in an outbreak in the Chinese city of Wuhan in December 2019.
- The first case of COVID-19 in India which was reported on January 30, 2020, was in the district of Thrissur , Kerala .

AS OF 31 OCT ' 2021

- **Total Number of Cases**

  34M

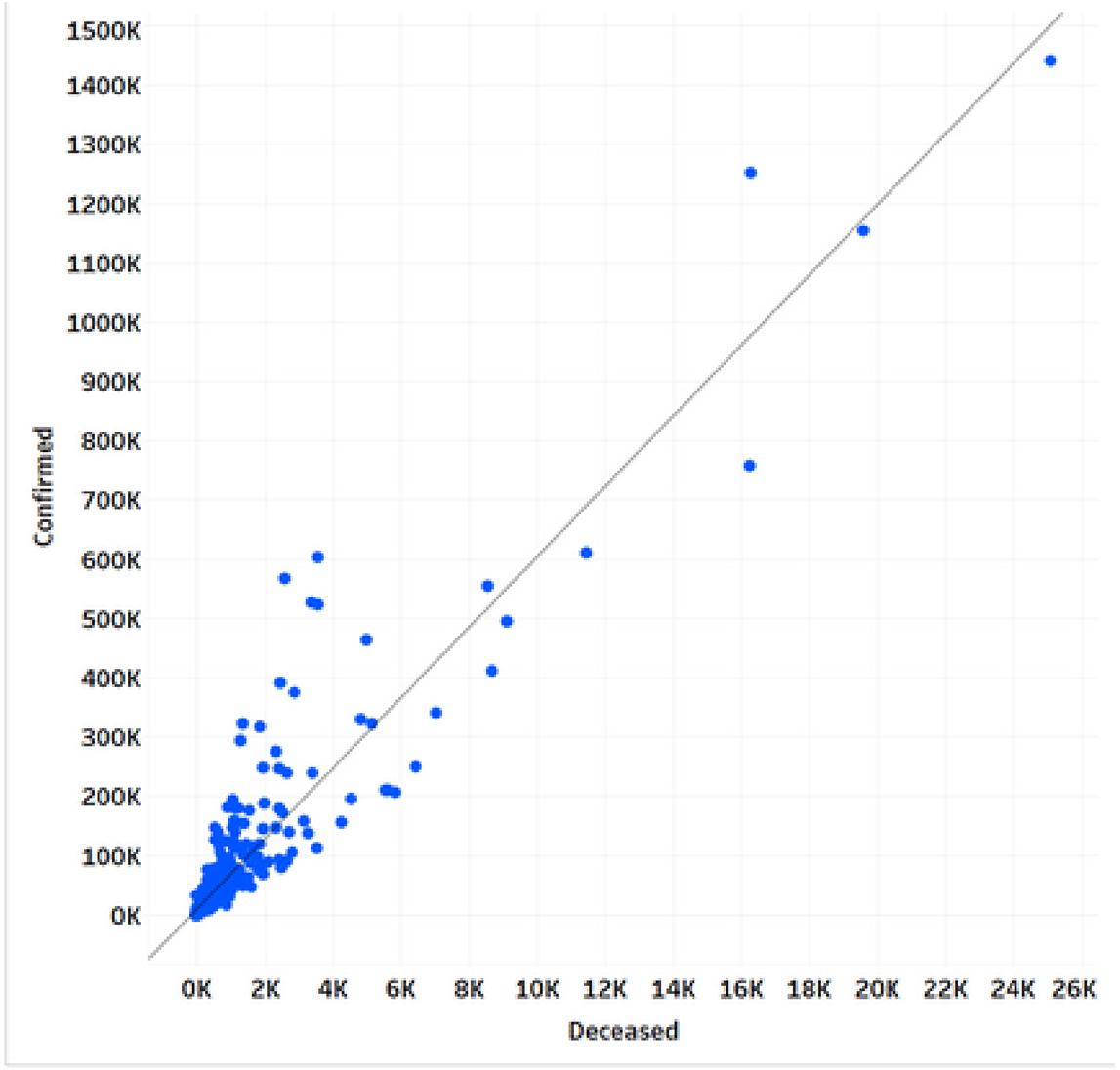
- **Total Number of Deceased**

  451K

- **Total Number of Active Cases**

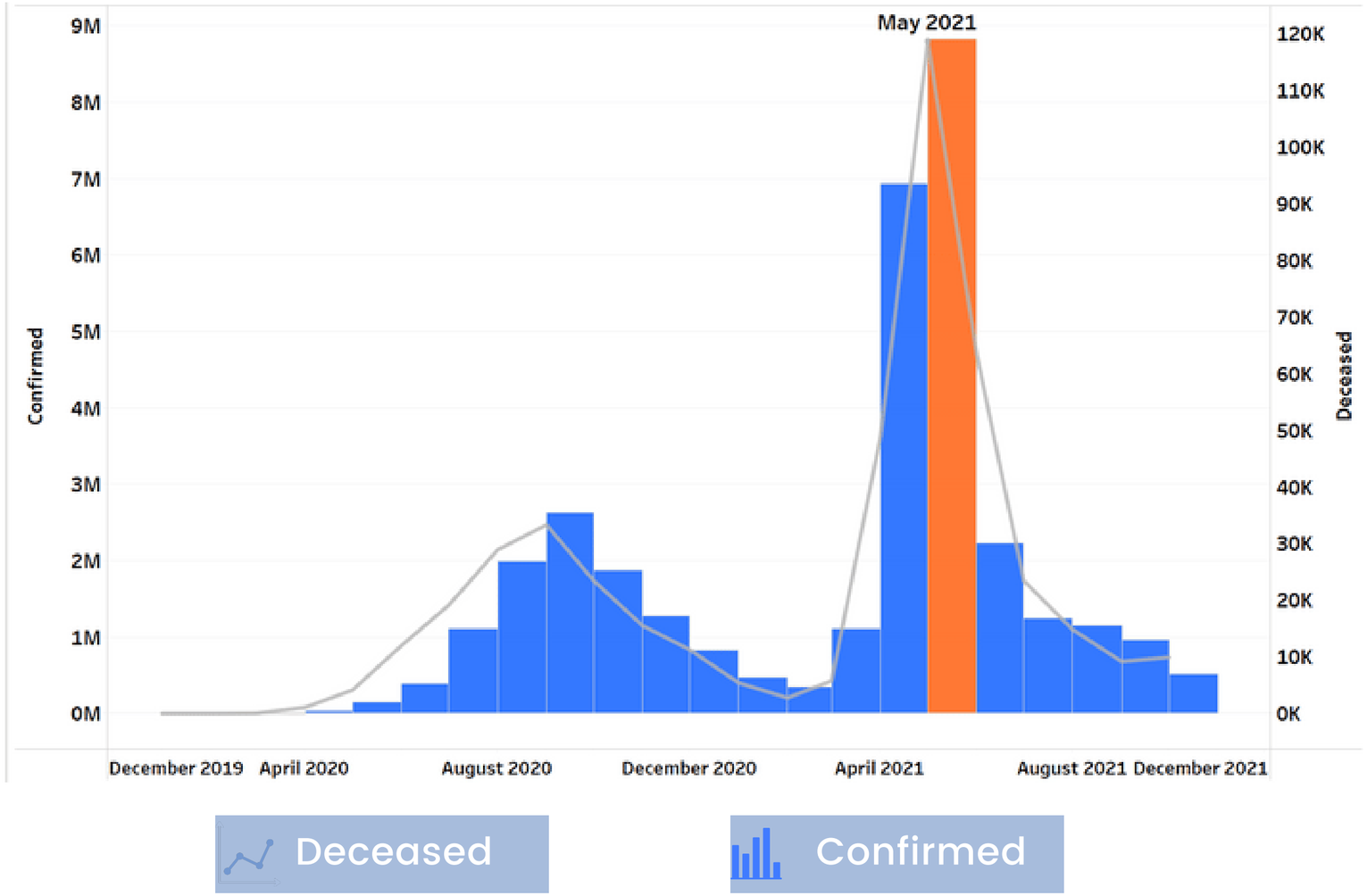
  451K

Relation b/w Confirmed And Deceased



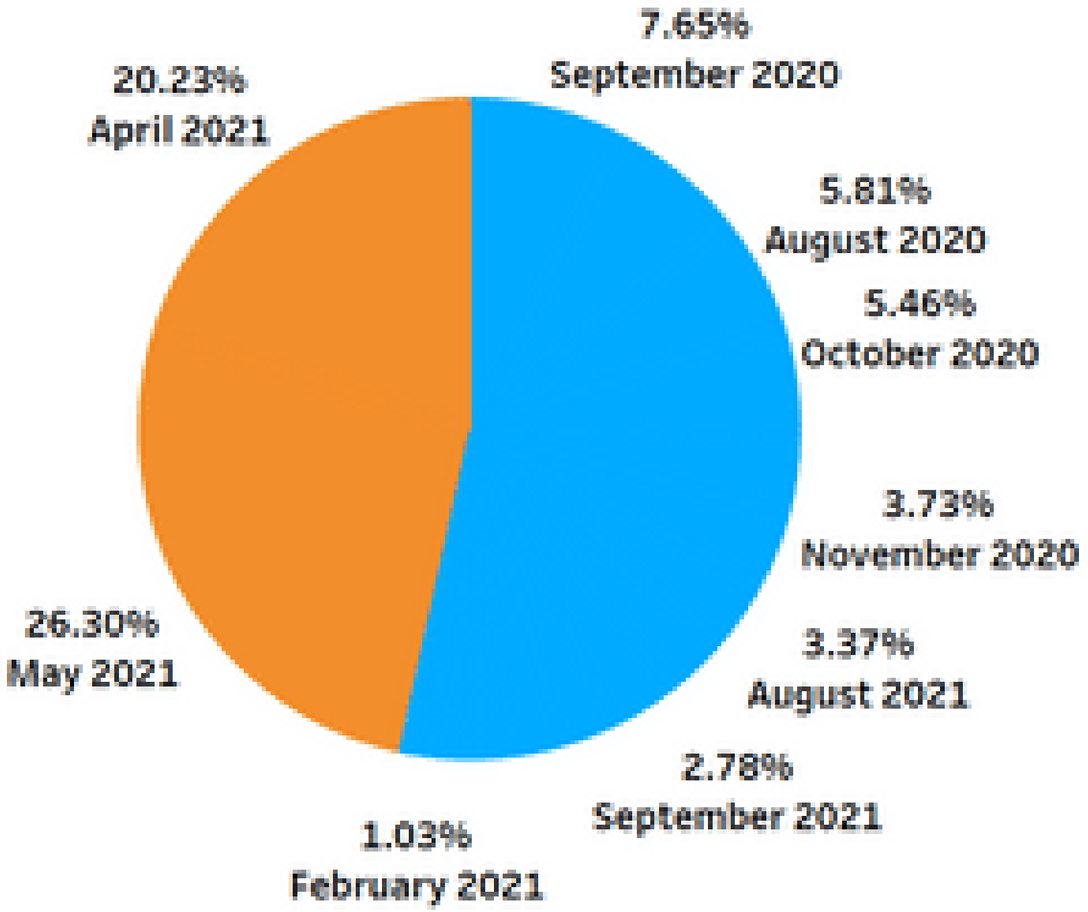
- We can clearly see the direct co-relation between confirmed cases and deceased.
- This means that as the no. of confirmed cases will increase, the no. of deceased will also increase.

Monthly Trend

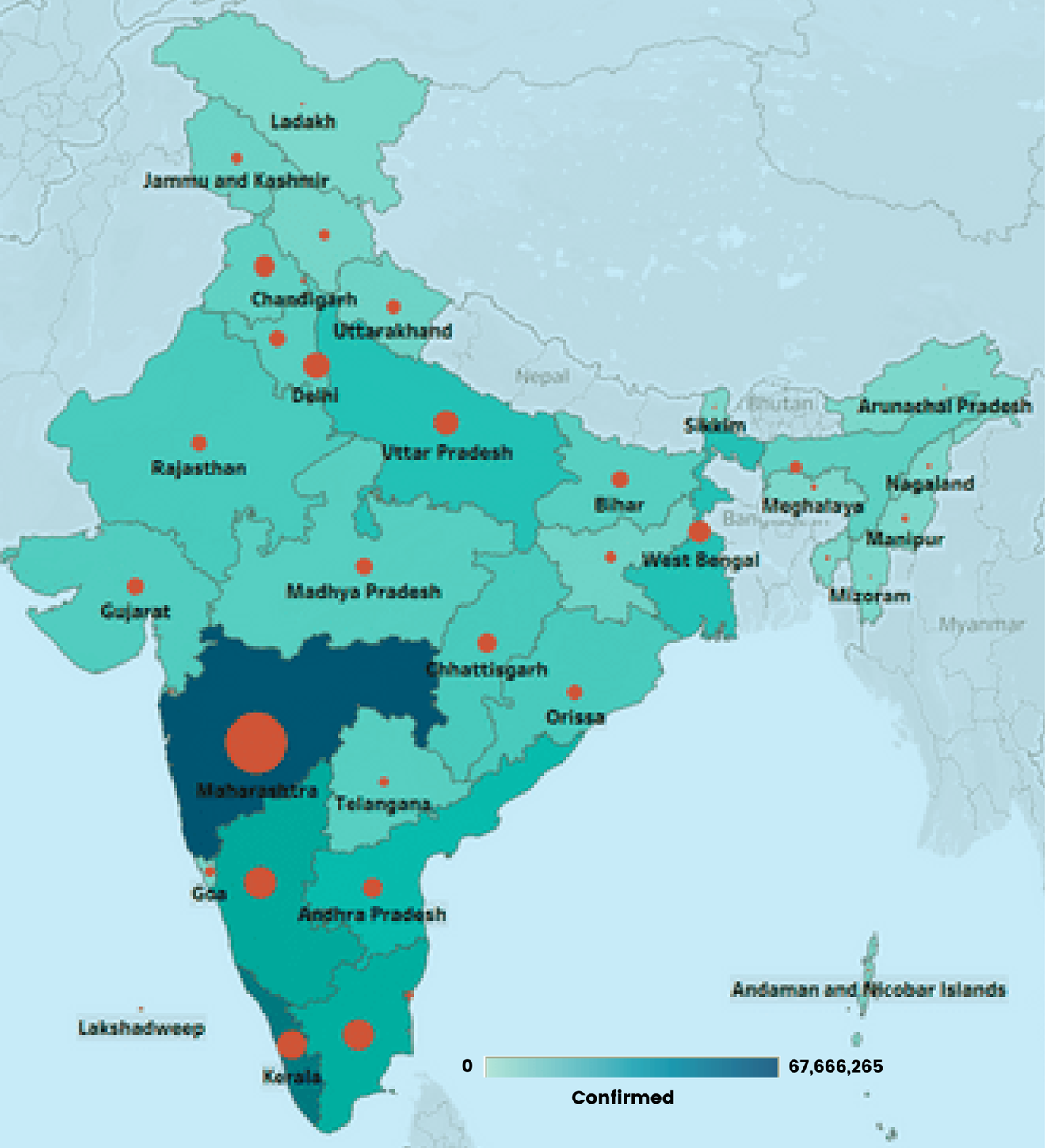


- The bar graph shows the total monthly confirmed cases and line graph shows the trend in monthly deaths during first and second covid wave.
- We can clearly see that both confirmed and deceased was maximum in the month of May 2021.
- It is also clear from the graph that as the no. of confirmed are increasing, the number of deceased is also increasing respectively.

Most Severe Months



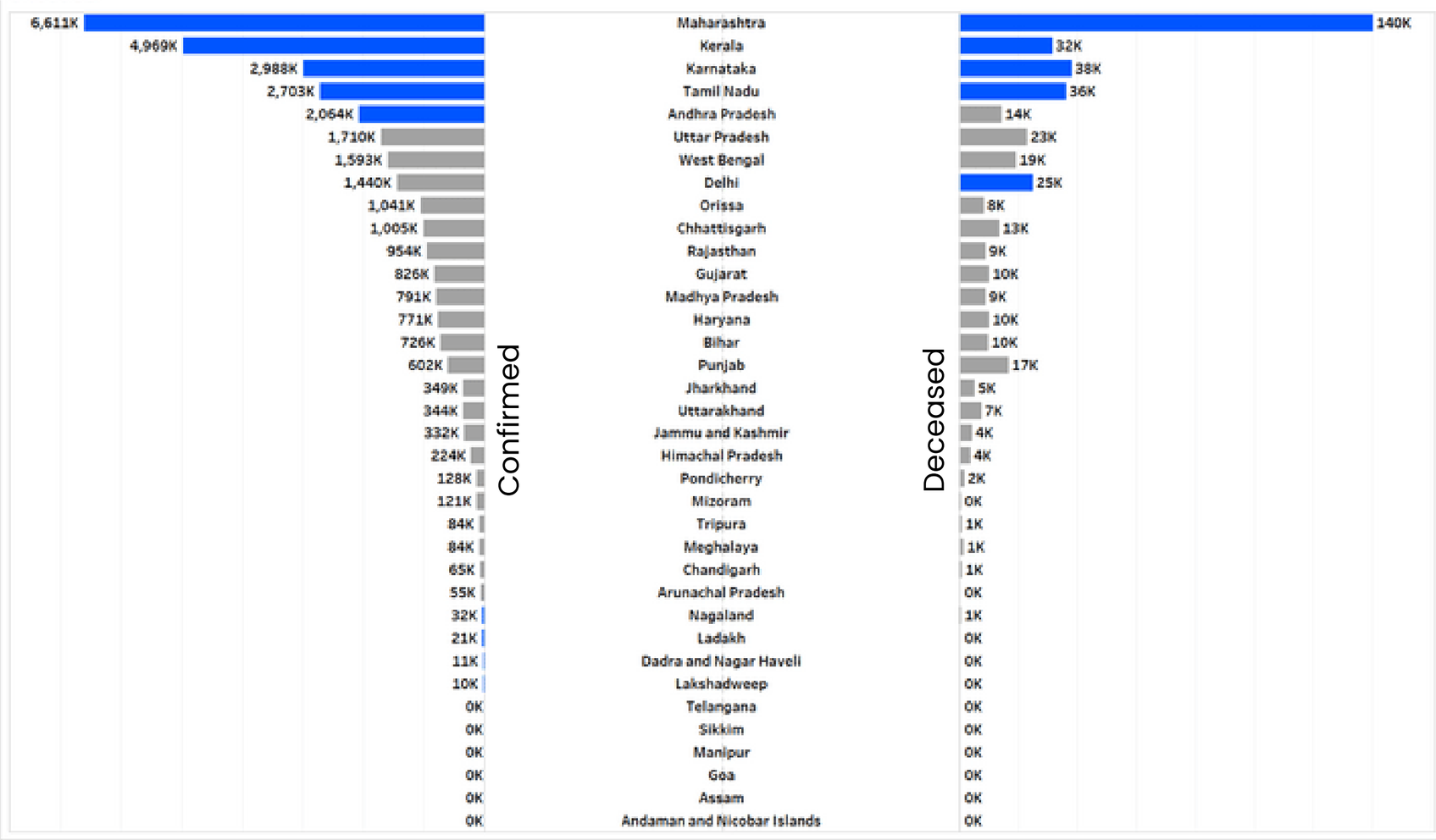
- About half of the total cases were only recorded in two months (April 2021 and May 2021).
- 16M cases in total were recorded in these two months that is around 47% of total cases.



Confirmed and Deceased Map Chart

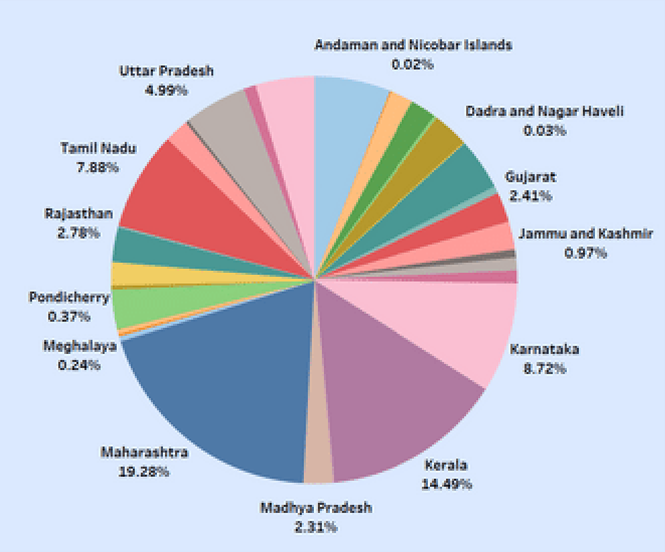
- The intensity of blue color shows the no. of confirmed cases in states and the size of circle shows the no. of deceased in the states.
- We can clearly see that Maharashtra has most number of cases as well as deceased also.
- South states are more affected as compared to the east states.

Most Suffering States/UT's

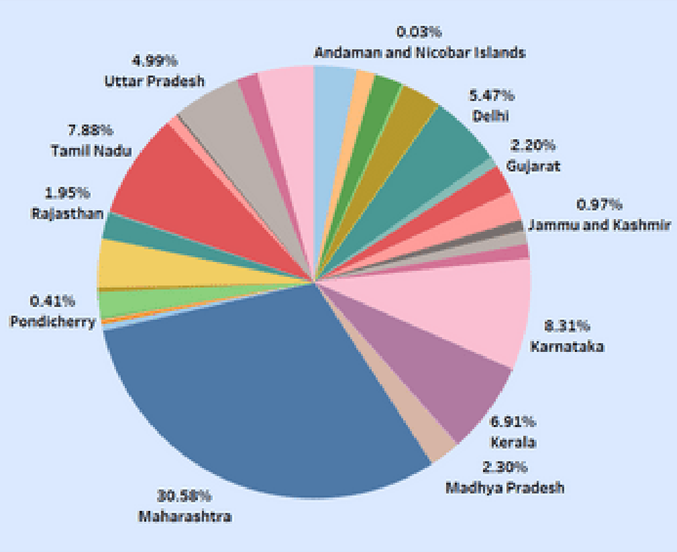


- This butterfly bar graph shows the top 5 most affected states or UT in terms of confirmed and deceased cases.
- We can see that out of 5 states 4 are common on both sides.

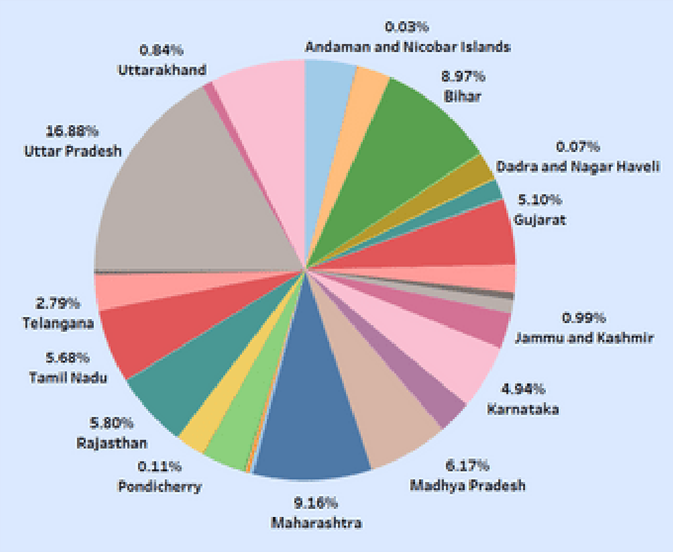
POPULATION V/S PERFORMANCE



Confirmed

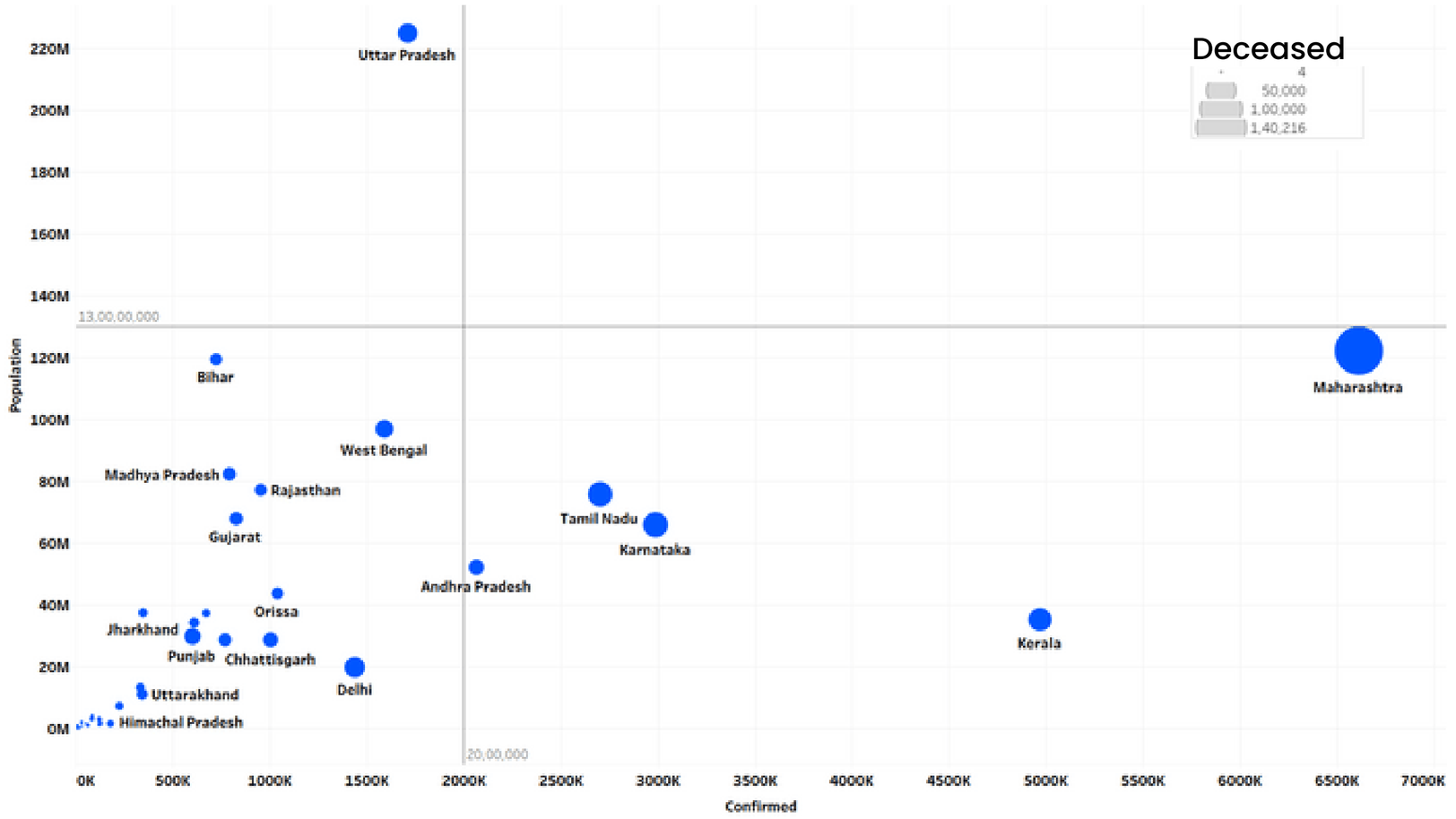


Deceased



Population

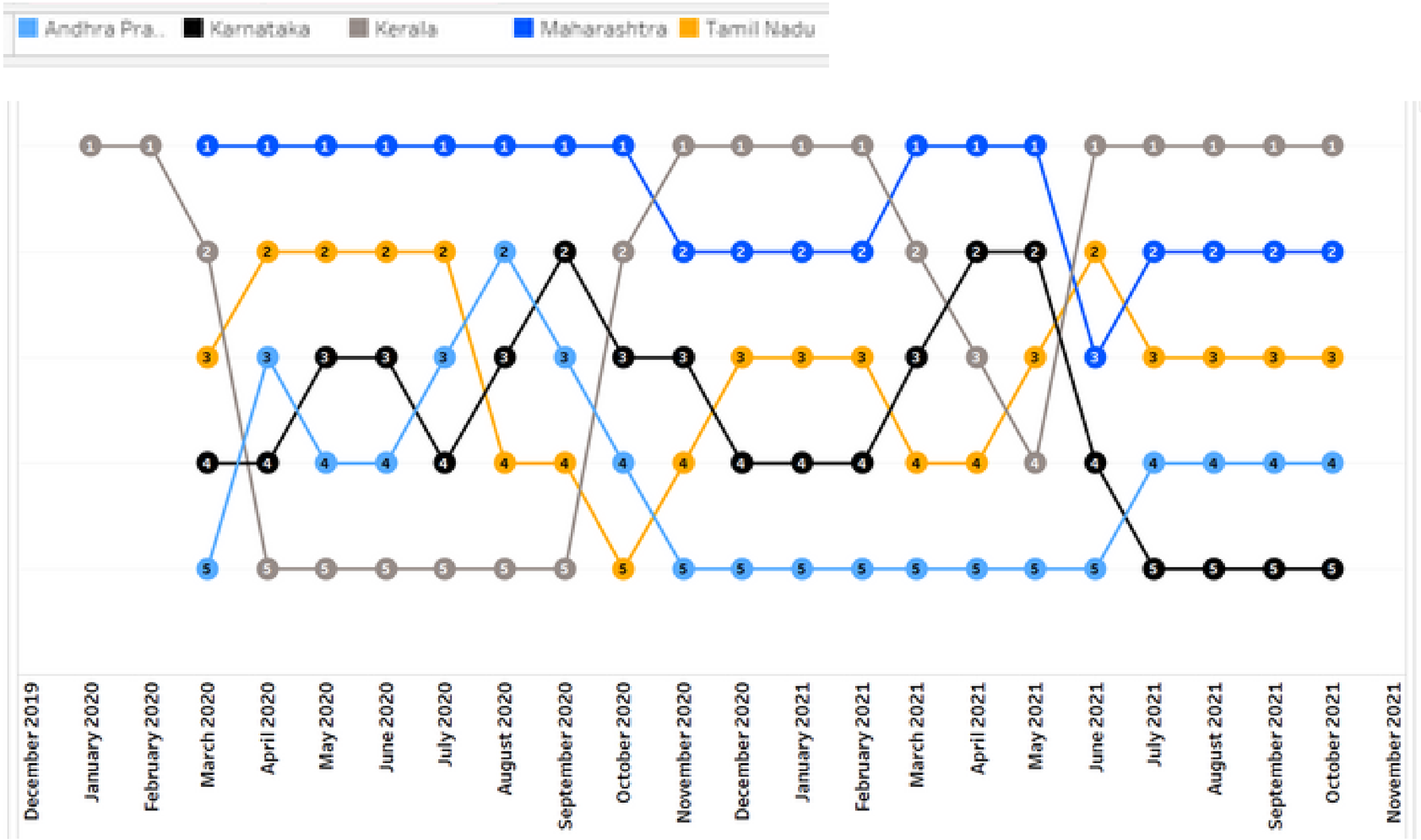
Performance Matrix



- This scatter plot shows the performance of states based on their population by putting them in a different quadrants.

- We can see Uttar Pradesh outperformed Maharashtra and several other states despite of having such a huge population.

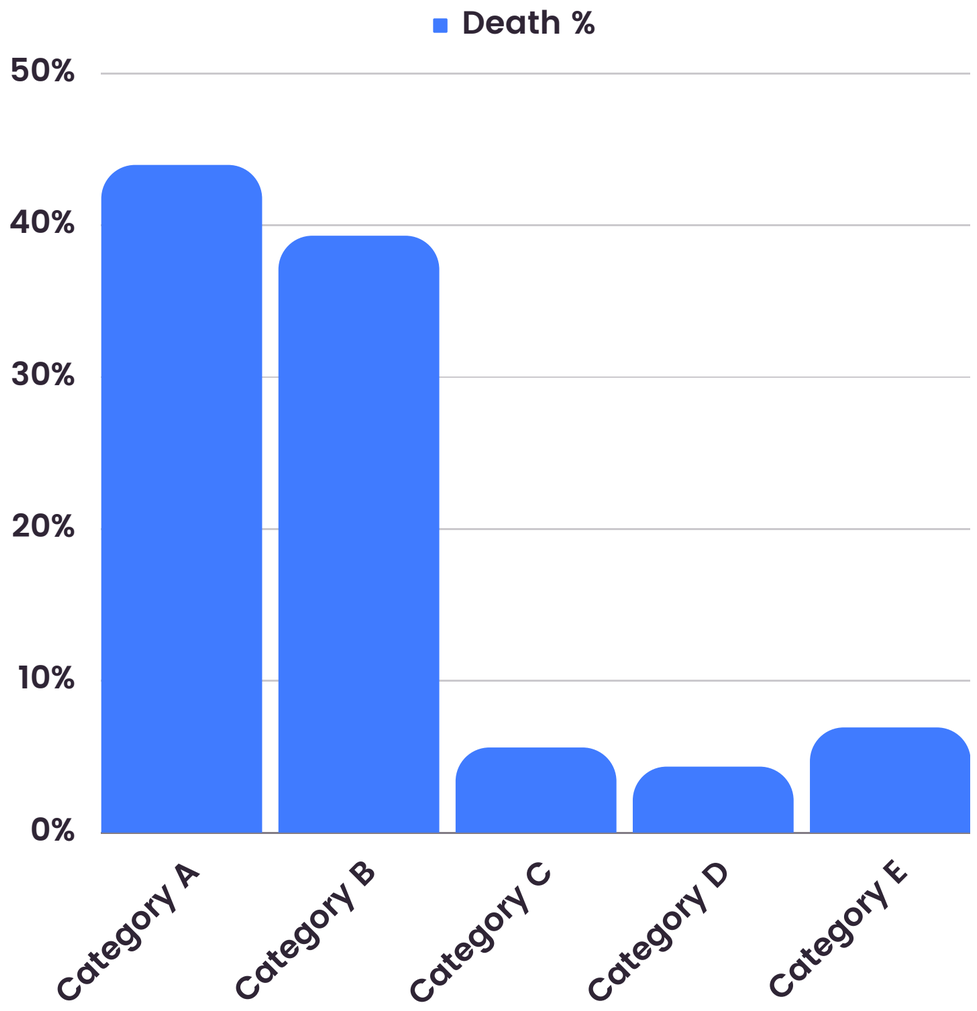
State's Ranking



- We can clearly observe one thing that the list of top 5 states on the basis of confirmed cases remained un-change during whole pandemic from the start to the last.

- This also tells us that more cases lead to higher number of confirmed cases.

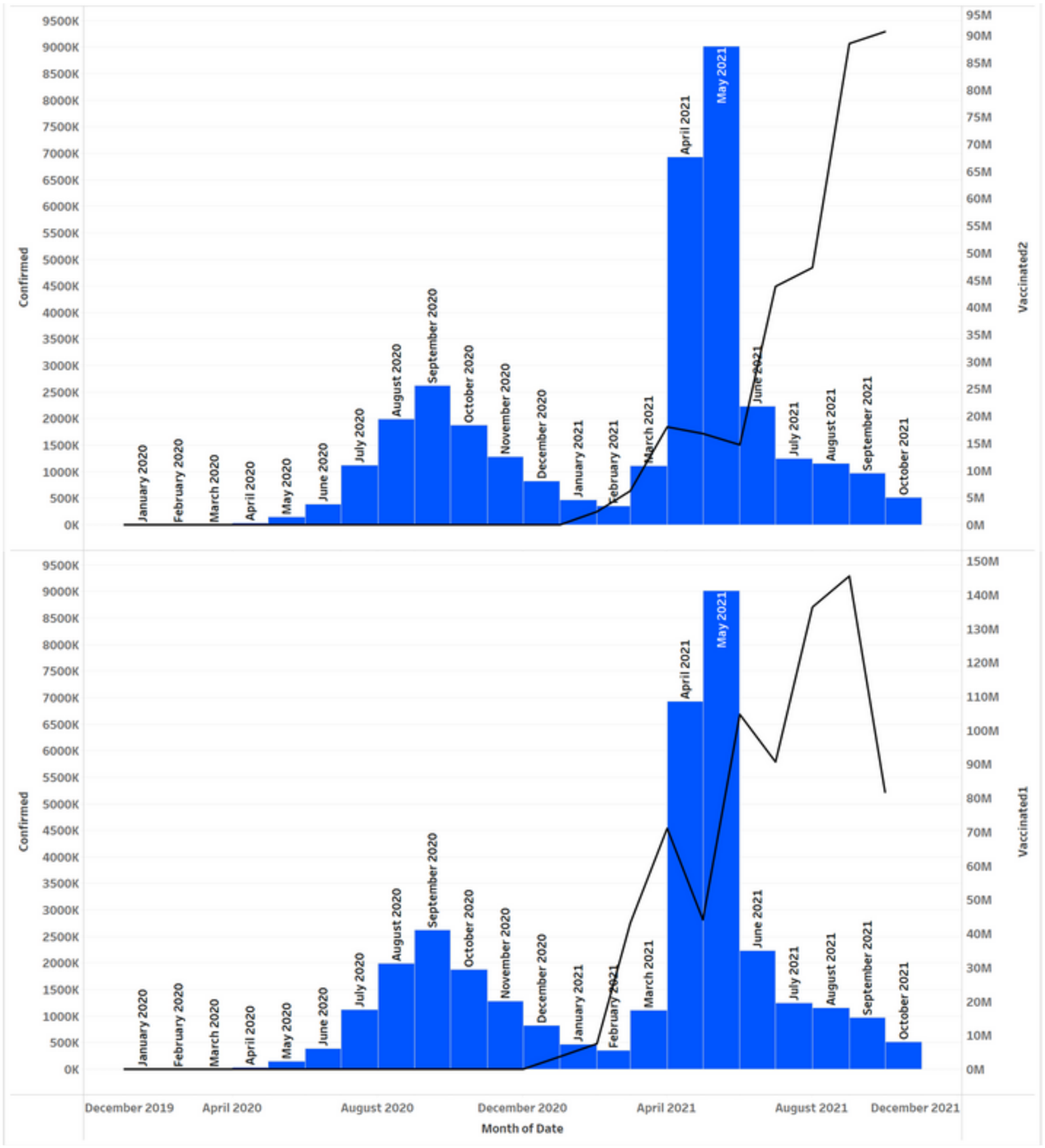
Testing Ratio



Testing Ratio(TR) = (Number of Tests Done) /(Population)

- Category A: 0.05 ≤ TR ≤ 0.10
- Category B: 0.10 < TR ≤ 0.30
- Category C: 0.30 < TR ≤ 0.50
- Category D: 0.50 < TR ≤ 0.75
- Category E: 0.75 < TR ≤ 1.00

Confirmed and Vaccination Comparison

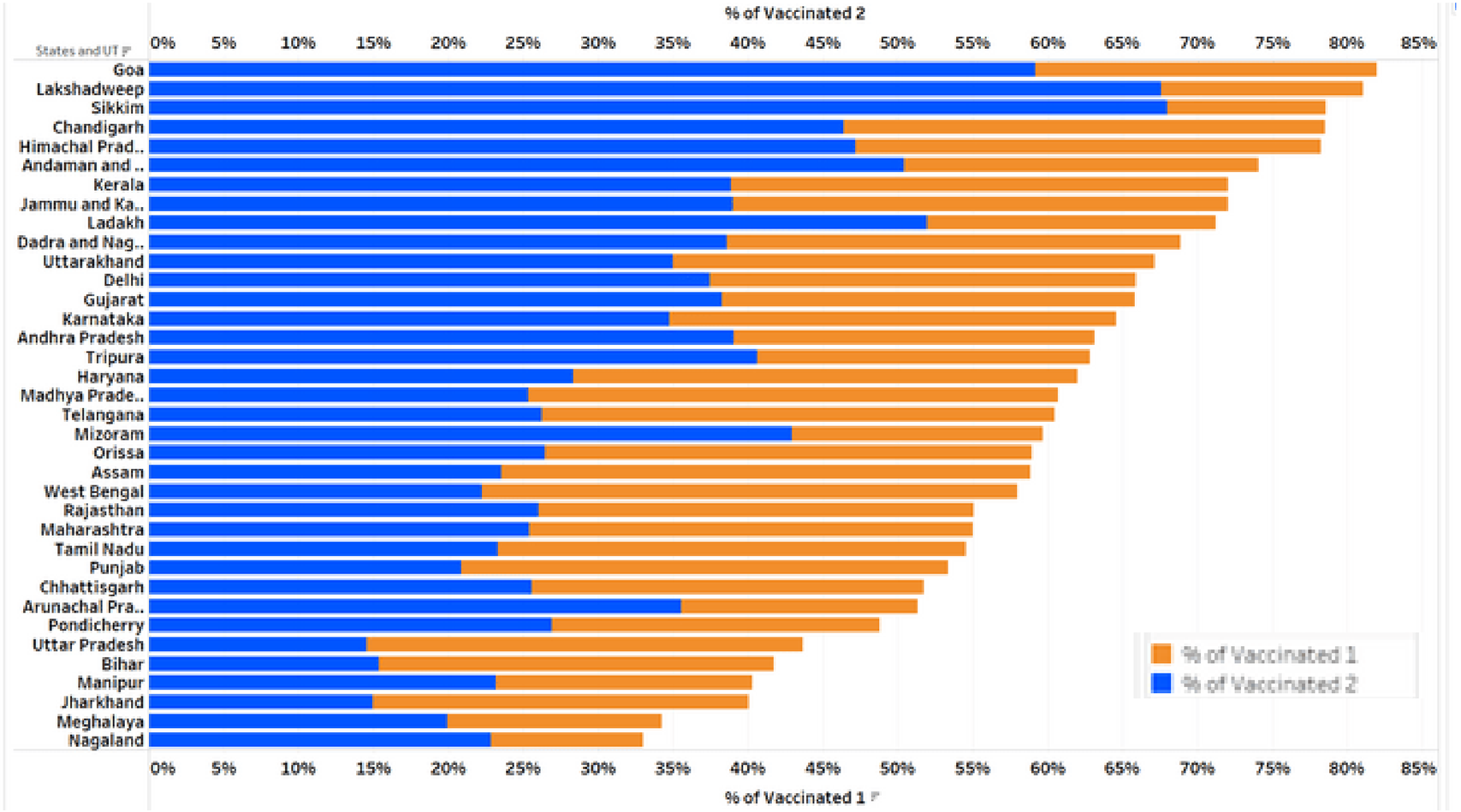


- April and May suffered a decrease in vaccination but after that, it picked up the pace and increased exponentially.

- That exponential increase also led to a sudden decrease and after that, a continuous decrease in the confirmed cases is observed.

- This also tells us the importance of vaccination in such pandemics.

Vaccination Drive



- Goa, Lakshadweep and Sikkim have highest percentage of population vaccinated with both doses of vaccine.

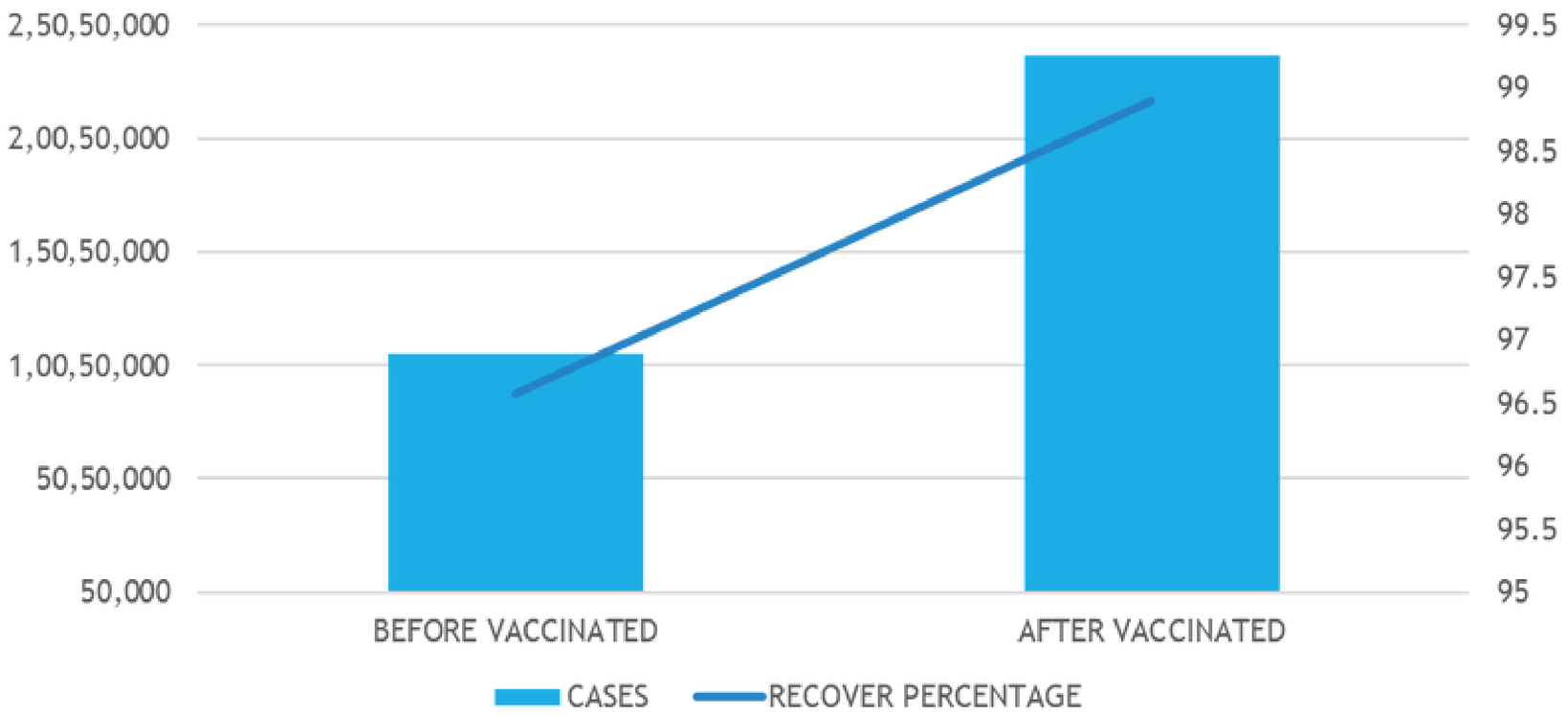
FIRST WAVE V/S SECOND WAVE

	Confirmed	Deceased	Death Rate
First Wave	1,11,12,057	1,57,194	1.41%
Second Wave	2,31,89,169	3,01,384	1.30%

- We know that second wave hit us hard enough and that too is clear from data also. Both confirmed cases and deceased were double as compared to the first wave.

- But what is interesting is despite of all this, the death rate got decreased.

Recovery Rate Comparison



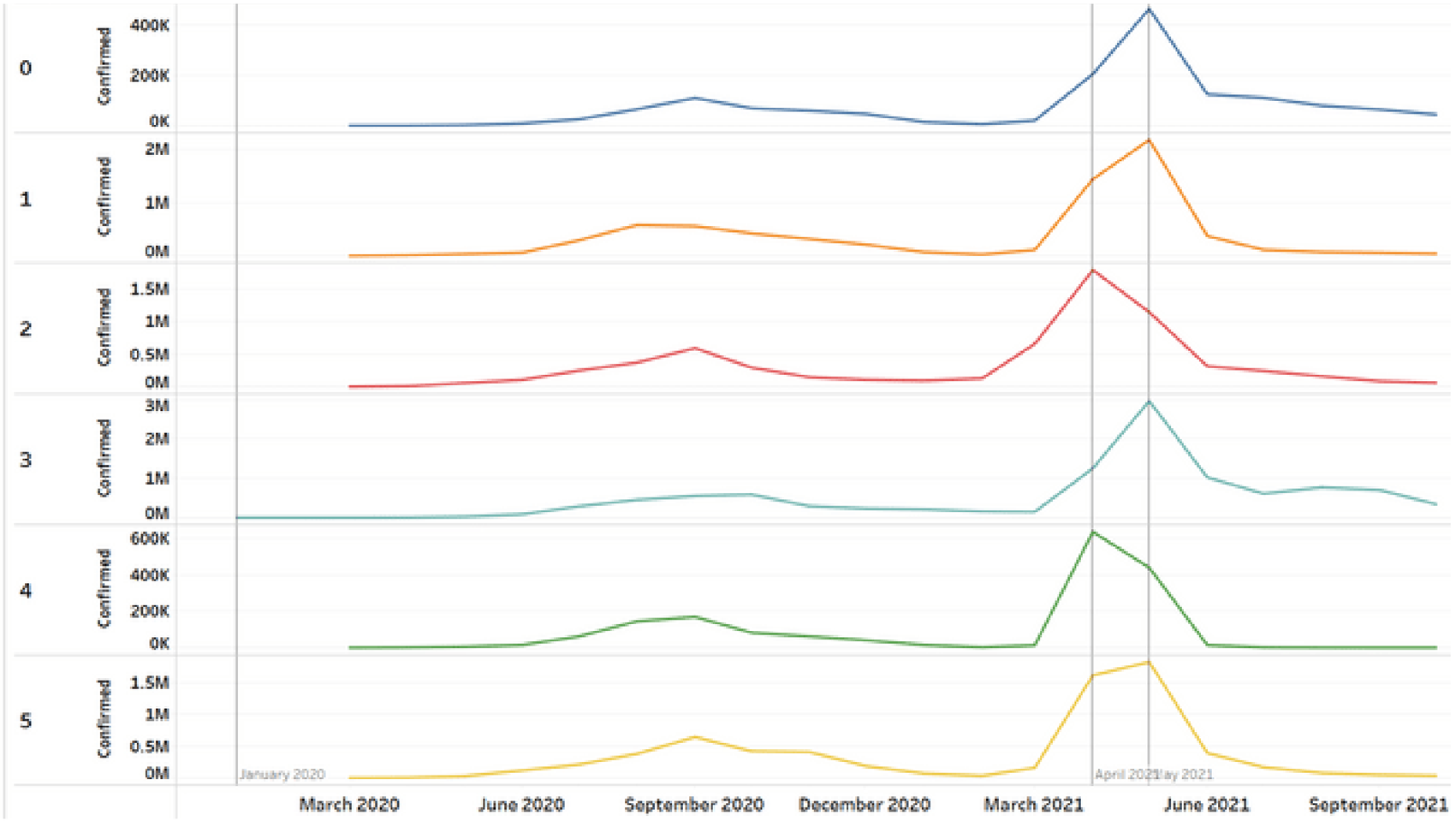
- In this chart we can clearly see the improvement in recovery as compared to before vaccination was introduced.
- So, this chart clearly explains the reason behind the decrease in the death rate in the previous chart.

States/UT's Clustering

Category_0	Category_1	Category_2	Category_3	Category_4	Category_5
Andaman and Nicobar Islands	Andhra Pradesh	Maharashtra	Karnataka	Uttar Pradesh	Assam
Arunachal Pradesh	Bihar		Kerala		Chhattisgarh
Chandigarh	Gujarat		Tamil Nadu		Delhi
Dadra and Nagar Haveli	Madhya Pradesh				Haryana
Goa	Rajasthan				Jharkhand
Himachal Pradesh	West Bengal				Jammu and Kashmir
Ladakh					Orissa
Lakshadweep					Punjab
Meghalaya					Telangana
Manipur					
Mizoram					
Nagaland					
Pondicherry					
Sikkim					
Tripura					
Uttarakhand					

- These are the lists of states/UTs on the basis of their data which are divided into 5 different clusters by a ML model.
- Mostly UT's or East states are there in category 0.

Categories Trend Pattern



- Out of these 5 categories category-2 and 4 are responsible for the outbreak in cases in the month of April while other 3 categories are responsible for the outbreak in May month.

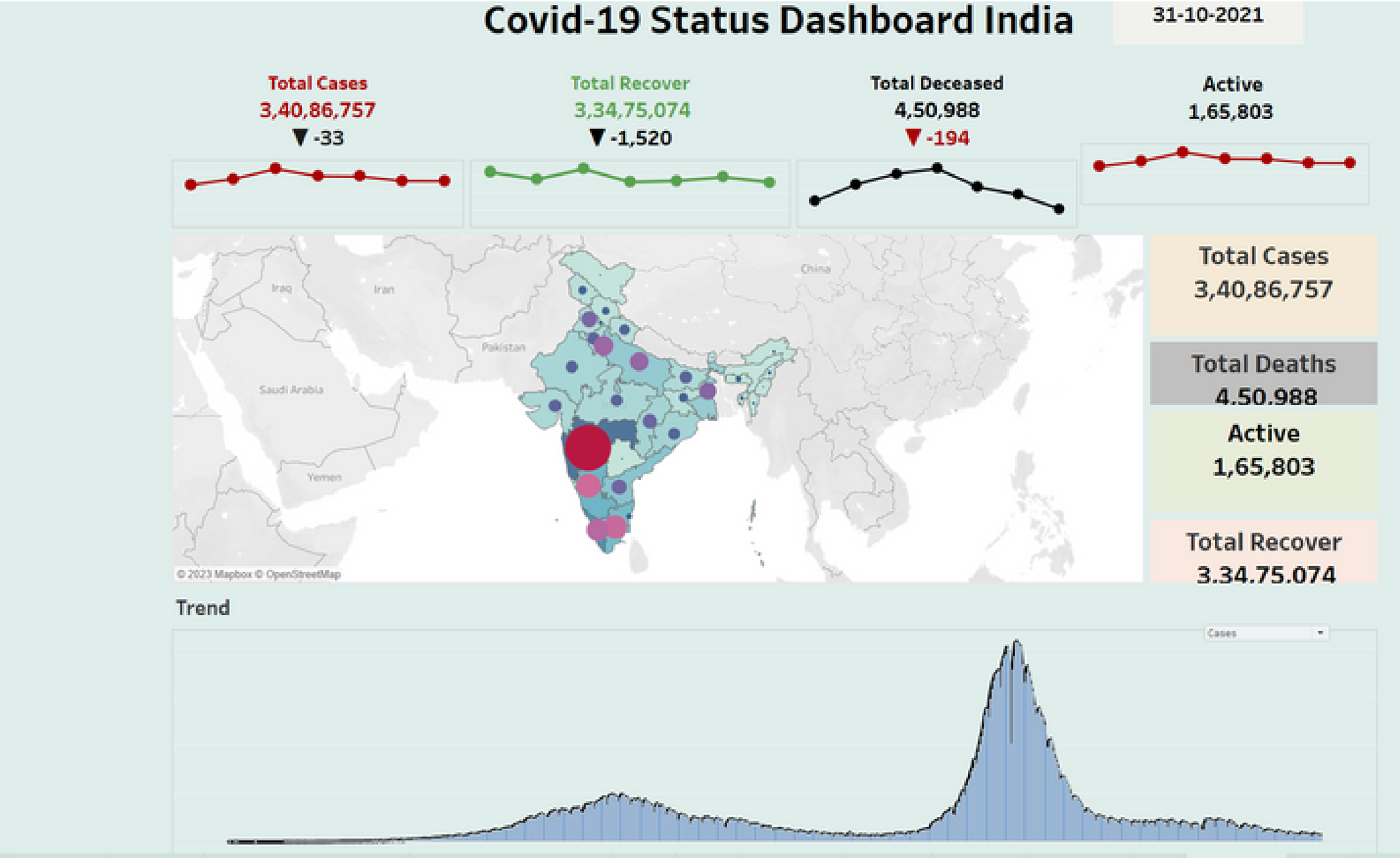
IMPORTANT MEASURES

- More and more testing should be our first priority whenever this kind of unknown pandemic erupts.
- Places with high population density should have strict rules to avoid further spread.
- Government should not remove lockdowns until any cure or vaccine is not found because vaccine is a very vital part of such pandemics.
- Once vaccination is available then the vaccination rate should not decrease or stop until each and every person is vaccinated.

CONCLUSION

- States or UT's with high population density were mostly affected more.
- States or UT's with less migration or isolated from big cities or states were less affected.
- Testing and vaccination played vital role in controlling the spread of the disease.
- Uttar Pradesh being most populated state performed great in comparison to other states because they focused more on testing till the vaccine was not introduced.

DASHBOARD



[Dashboard Link]

For dynamic dashboard and other charts go through the link of the dashboard above.

Thank you.