

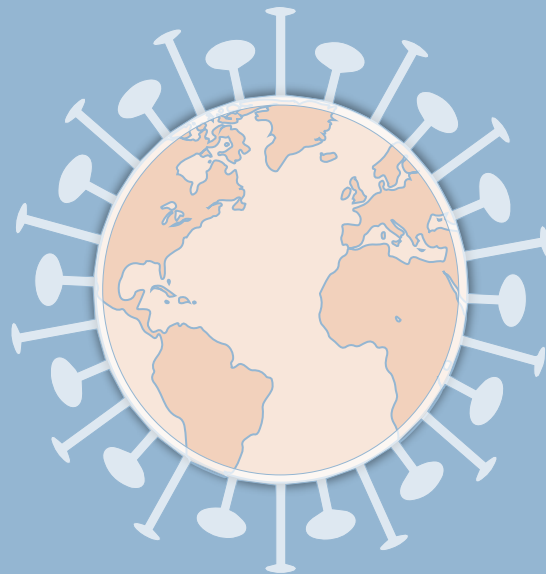
A study on the selected descriptive epidemiological aspects of Covid-19 in red zone districts of Rajasthan



Presented By-
Himadri Verma
MBA HM-23

DESCRIPTIVE EPIDEMIOLOGY

- The study of the occurrence and distribution of a disease.
- This study can be done when a very little information is known about a disease.
- This study can be further used as a pillar for the Analytical Epidemiology



INTRODUCTION

- Coronavirus, that is technically termed as SARS-CoV-2 is an infectious disease that was first identified in December 2019 in Wuhan, China and was declared pandemic by WHO on March 11, 2020.
- India reported its index case on 30th January 2020 in Kerala, who was a student returned from Wuhan and then the spread happens to all the states. To prevent the further spread, government has imposed a nationwide lockdown in four phases from 25th March till 31st May.
- According to a study, 'The COVID-19 pandemic may be controlled if the Government of India takes proactive steps to aggressively implement a lockdown in the country and extend it further.' (Sunita Tiwari et al., 2020)
- Rajasthan reported its index case on 2nd March in its capital, Jaipur. In some districts more number of cases were seen rising when compared to the other districts of the state.
- On 1st May, government has categorized the districts on the basis of red zone, orange zone and green zone till the 21st of May and made the different strategies for each zone. So this study is conducted to assess the selected descriptive epidemiological aspects of Covid-19 among the red zone districts of Rajasthan.





RESPONSE OF THE RAJASTHAN GOVERNMENT

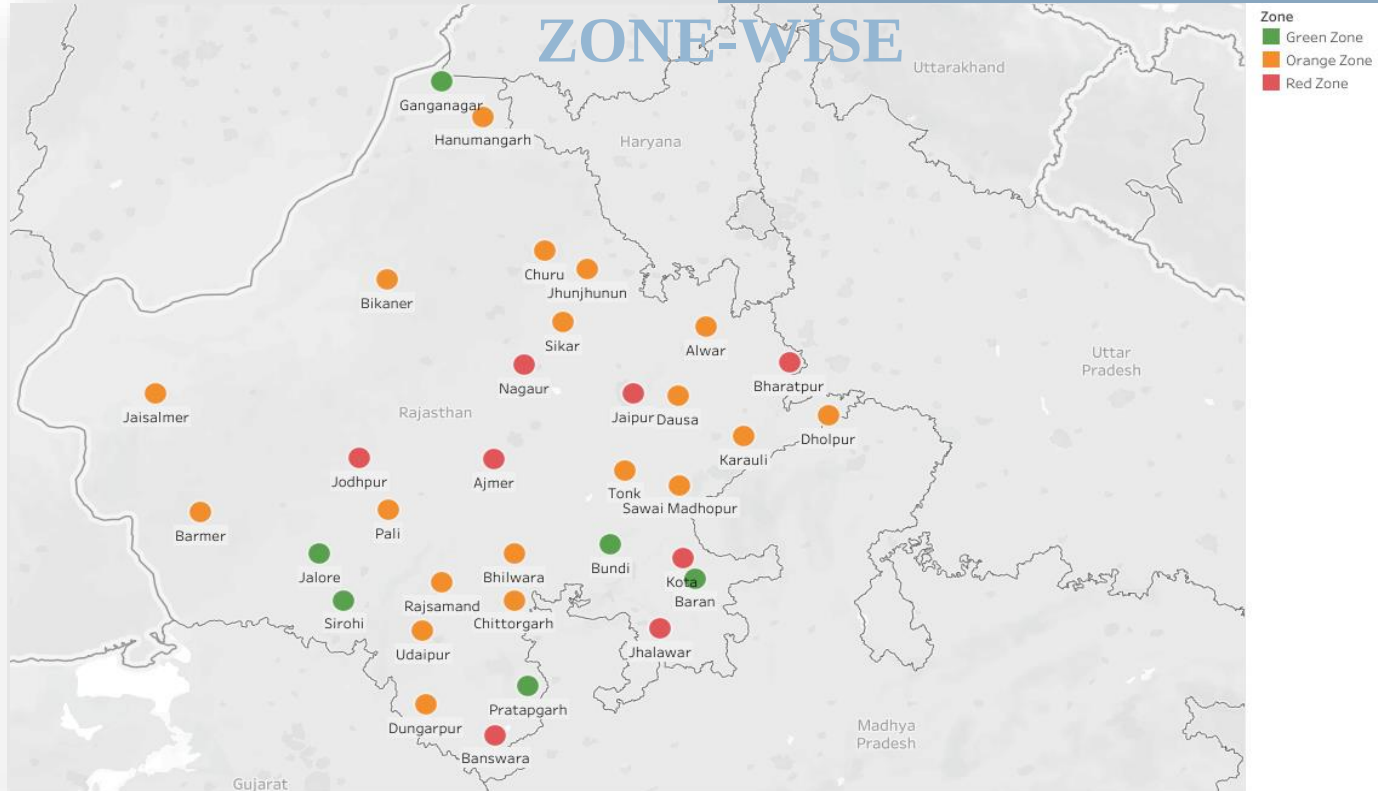
On 19th March, section 144 prohibiting the gathering of five or more was released in Rajasthan to contain the spread of the disease. The government has also monitored all passengers arriving in Jaipur on foreign flights and kept the ones showing symptoms in home quarantine for 14 days.

The state was the first to announce the complete closure of the road since 22nd March.

Relaxations have been recommended by the state government from April 21 onwards.

CLASSIFICATION OF STATE DISTRICTS

ZONE-WISE



RED ZONE

No Cases in Last
14 Days.

ORANGE ZONE

No Cases in Last
14 Days.

GREEN ZONE

NON PHARMACEUTICAL INTERVENTIONS FOR COVID-19

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Personal protective measures

- Hand hygiene
- Respiratory etiquette
- Face masks

Environmental NPI's

- Surface and object cleaning
- Other environmental measures (eg. using UV light, increasing ventilation and modifyng humidity)

Physical distancing measures

- Contact tracing
- Isolation of sick individuals and vulnerable groups
- Quarantine of exposed individuals for 14 days
- School measures and Closures
- Workplace measures (e.g. encouraging teleworking from home, staggering shifts, and loosening policies for sick leave and paid leave) and closures.
- Avoiding crowding (including closure of businesses and cancellation of events and mass gatherings)

Travel related measures

- Travel advisories
- Entry and exit screening
- Internal travel restrictions
- Border closures

SOURCE-A WHO Document "Calibrating long-term non-pharmaceutical interventions for COVID-19"

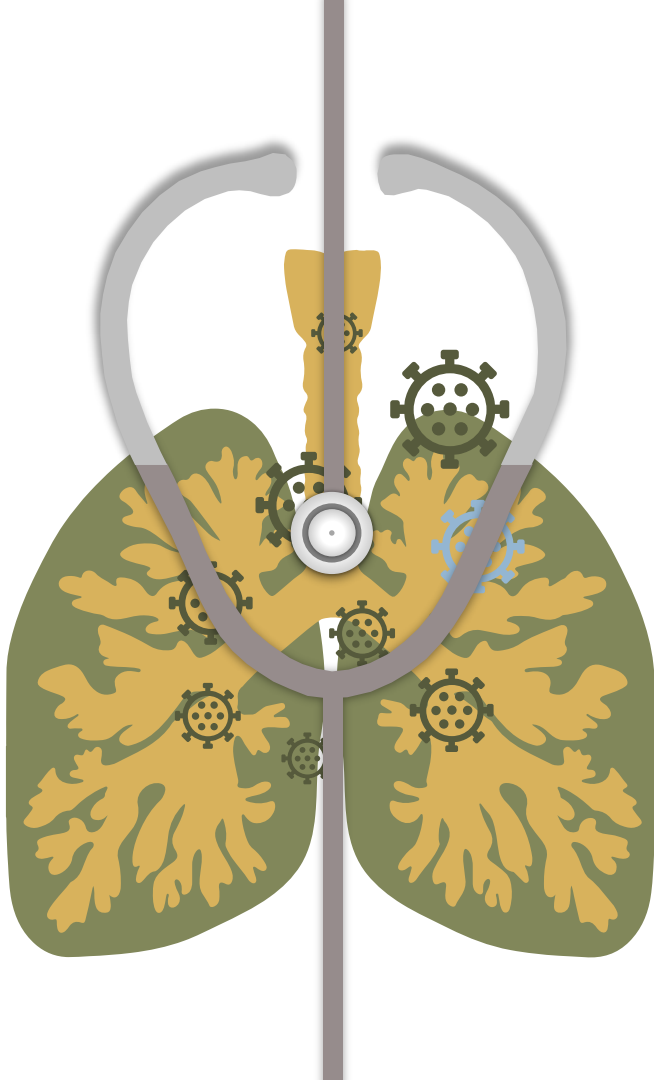
RATIONALE

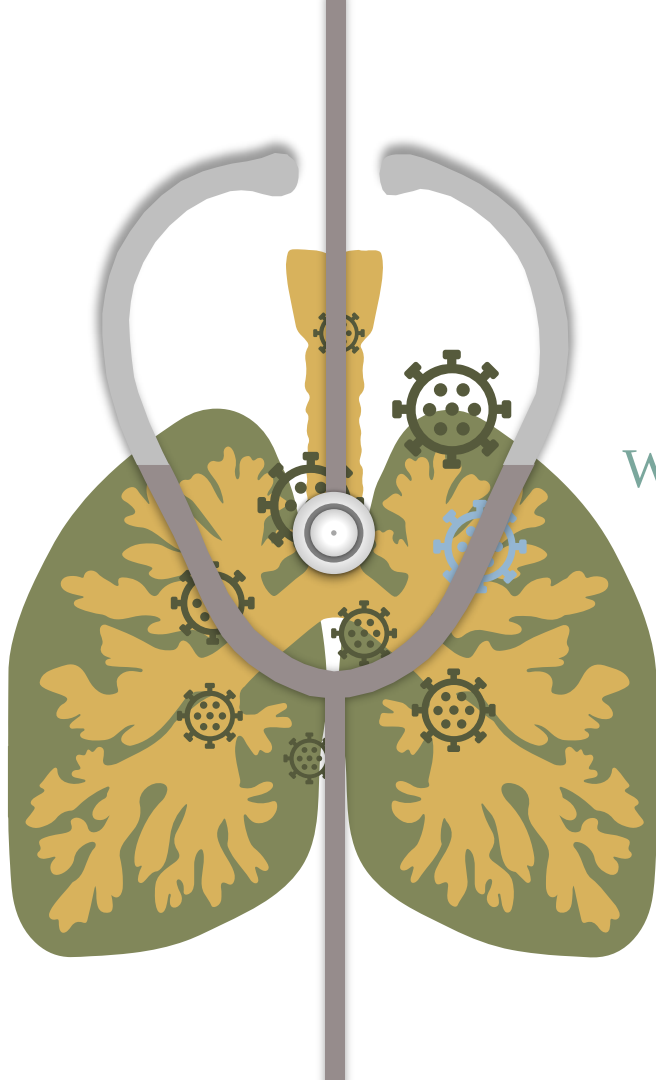
Out of the 33 districts of Rajasthan, 8 districts are categorized into red zone, 19 as orange zone and 6 as green zone. Most of the activities are made prohibited in these 8 red zone districts and they are the main focus of government. These districts are the main contributor for deciding the state statistics for Covid-19 and so efforts should be made to improve their epidemiological aspects first. So with the help of this study, descriptive epidemiological aspects of Covid-19 in red zone districts of Rajasthan can be studied by comparing the confirmed and death cases, new positive cases and new deaths, death to case ratios, case fatality rates and growth rates, tests conducted of Covid-19 among all the 8 districts of Rajasthan.



AIM

To describe selected descriptive epidemiological aspects of the 8 red zone districts of Rajasthan during their categorization.

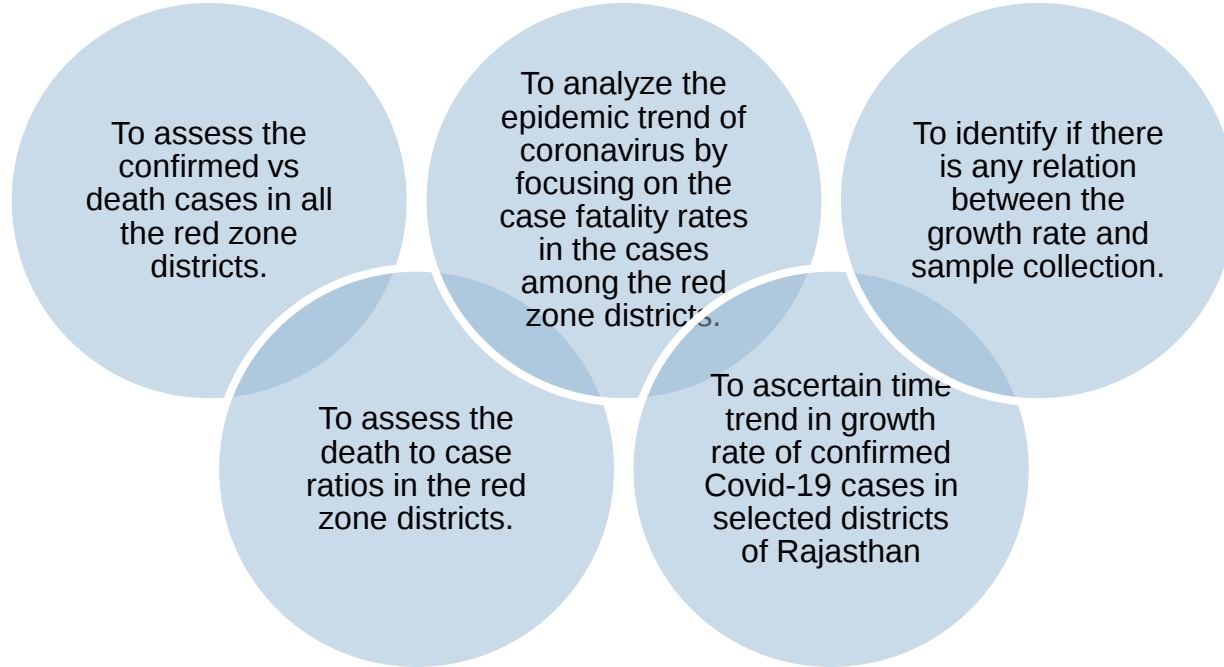




RESEARCH QUESTION

What are the selected descriptive epidemiological aspects of Covid-19 in the red zone districts of Rajasthan?

OBJECTIVES



METHODOLOGY

STUDY DESIGN

Study design used is **Analytical study**, as here the information from the **secondary data**, that is already available from the reliable sources were taken and then analyzed, to make a critical evaluation.

Inclusion criteria:

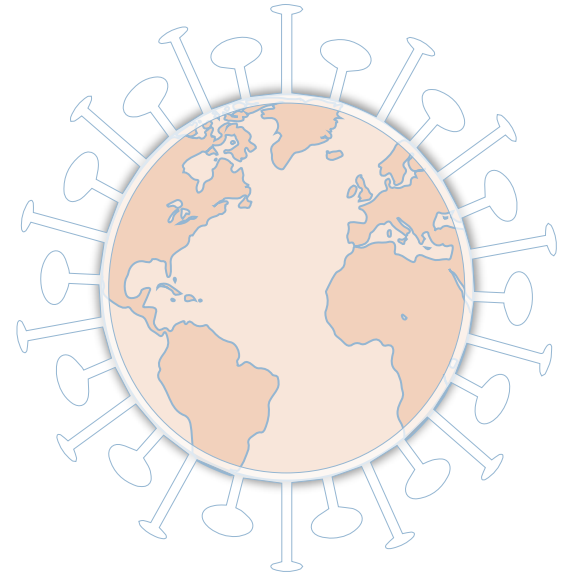
Population of red zone districts in Rajasthan.

Exclusion criteria:

Population of orange and green zone districts in Rajasthan.

STUDY DURATION

This study was carried from 11th March to 11th June that is a 3-month time duration, where the data was analyzed week-wise, from **3rd May to 25th May**.



METHODOLOGY

DATA ANALYSIS PLAN

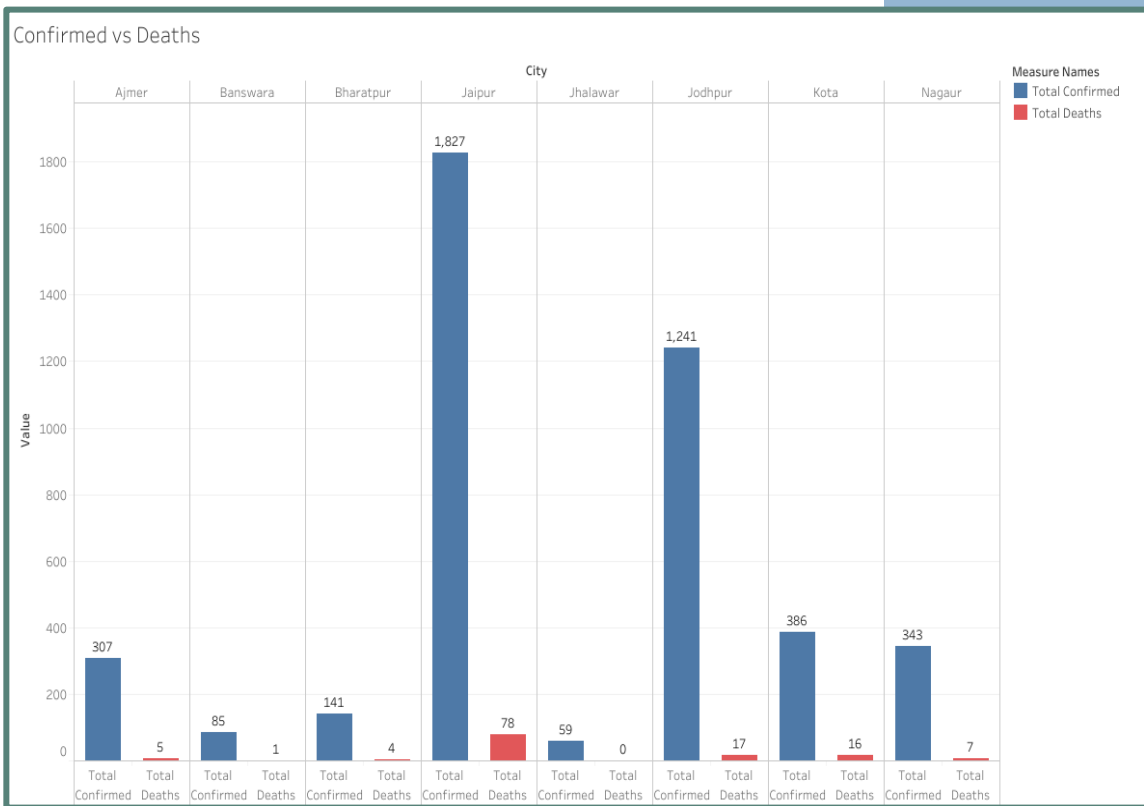
The study is conducted to assess the trend of Covid-19 in the red zone districts of Rajasthan after their categorization. So the data is collected for 3 weeks, from 3rd May to 25th May and analyzed from the MS Excel Software with all the visuals are made from Tableau Software. The data was analyzed as per the objectives of the study and collected on the daily basis



FINDINGS

- Total number of confirmed and death cases
- Emergence in the new positive cases
- Emergence in the new deaths
- Death to case ratios
- Case Fatality Rates
- Total number of Covid-19 tests conducted
- Increments in the sample collection
- Growth rate of the Covid-19 confirmed cases
- Growth rates and the sample collection
- Districts with high growth rate

Total number of confirmed and death cases



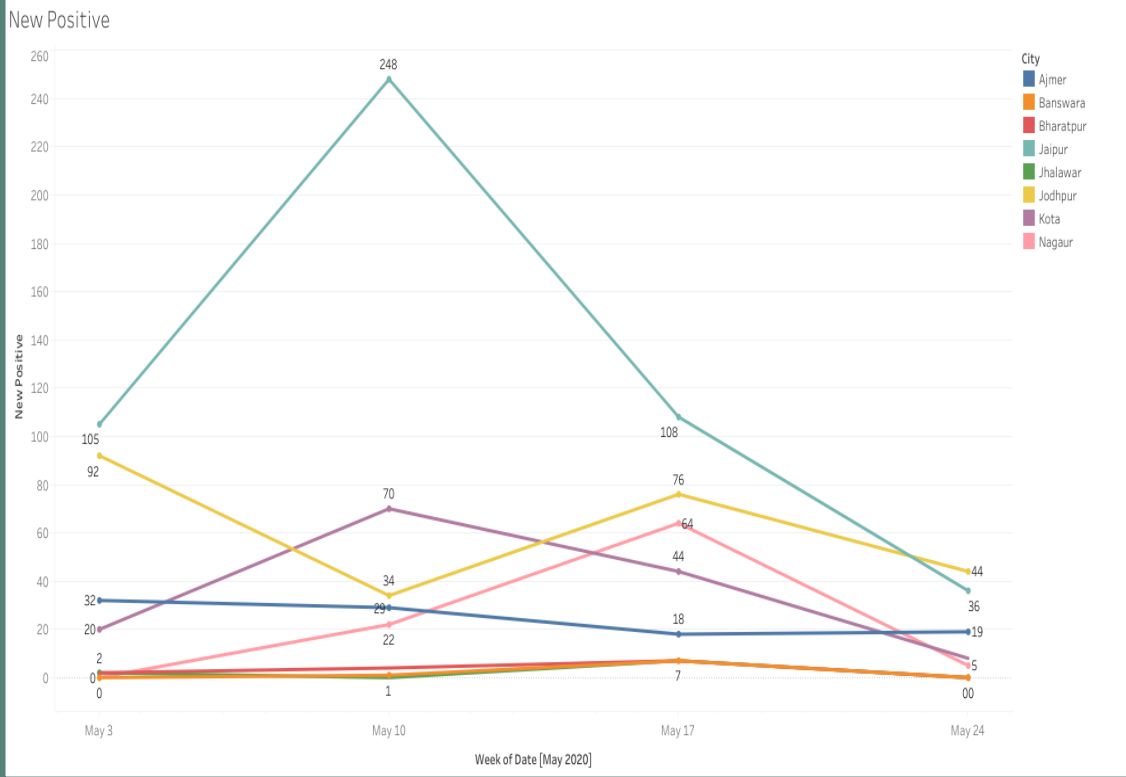
INTERPRETATION

- ✓ The graph depicts that Jaipur has the highest number of confirmed cases as well as deceased within the specified time frame wherein Jhalawar has the least.
- ✓ These cases are reported by 25th May from the start of the spread.

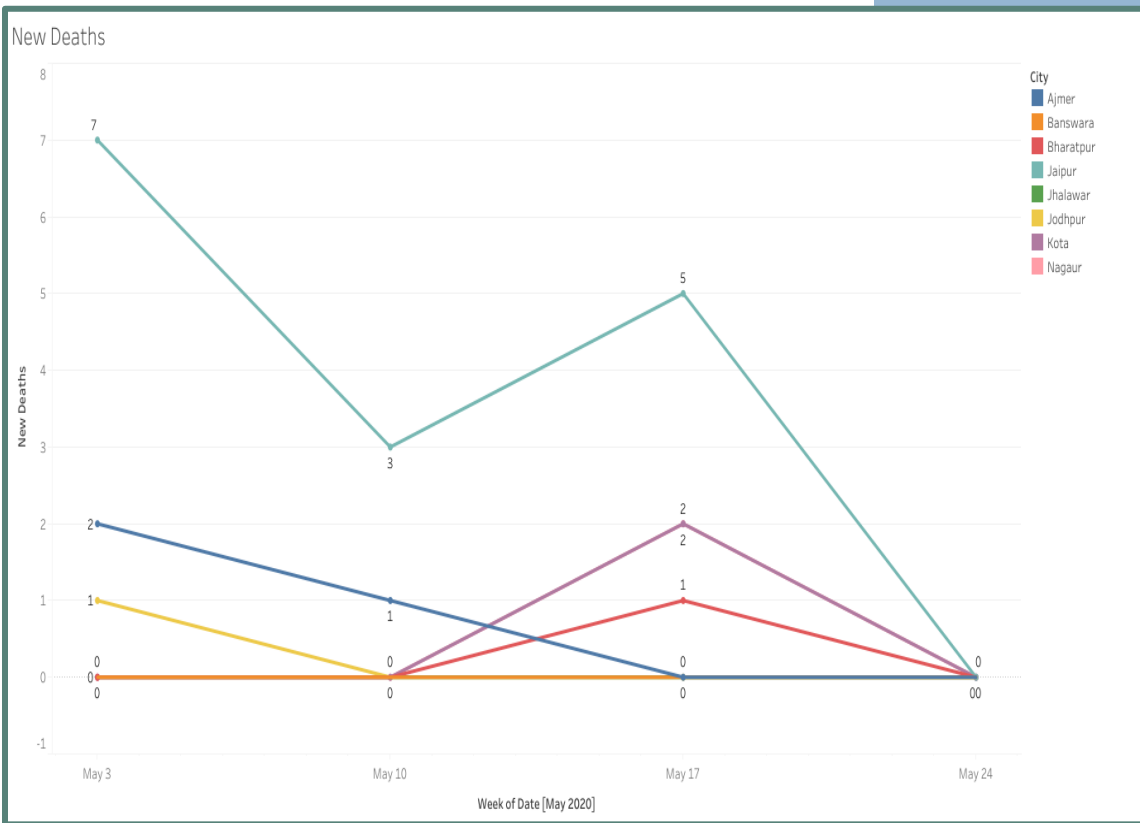
Emergence in the new positive cases

INTERPRETATION

- ✓ This graph depicts the new positive cases that have appeared within one-week time period for the three weeks.
- ✓ **Jaipur and Kota**, both the districts have shown a rise in the cases within the first week of categorization and then a drop in the number of new cases is seen afterwards.
- ✓ **Jodhpur** has shown a fall within the first week, then a rise in the second week and again a fall in the occurrence of new cases after the categorization.
- ✓ **Ajmer** has shown a continuous decrement till the second week and a stabilized situation till the third week.
- ✓ In **Nagaur**, the cases were continuously rising till the second week and shown a decrement in the third week.
- ✓ **Banswara, Bharatpur and Jhalawar** has shown the least occurrence of new cases.



Emergence in the new deaths



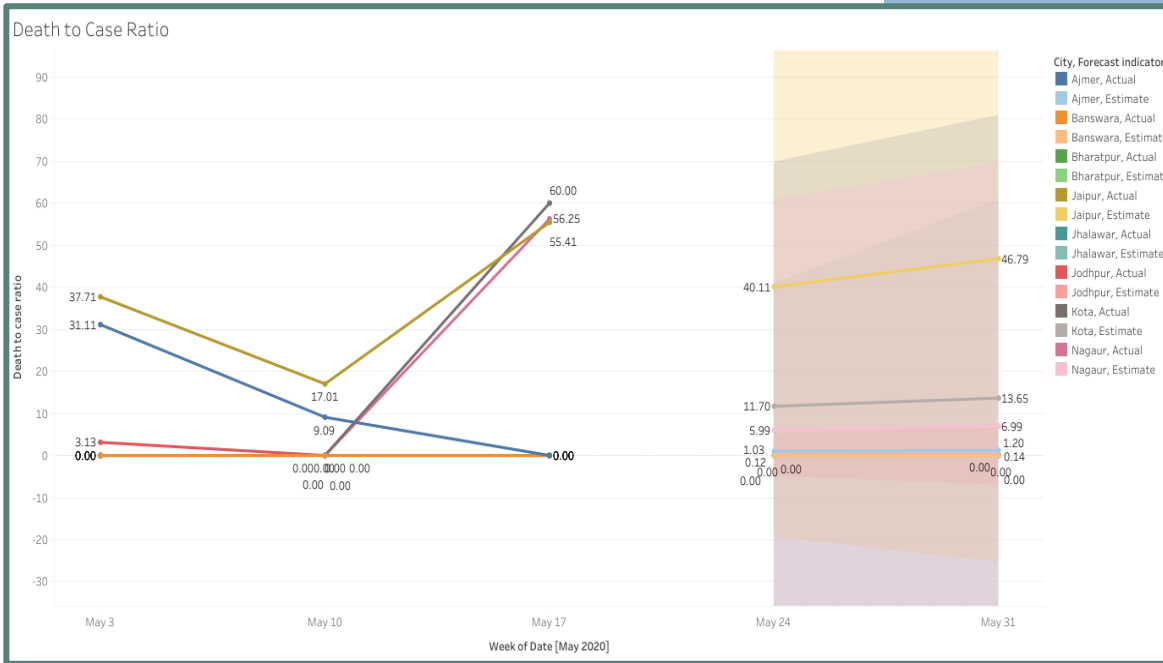
INTERPRETATION

- ✓ This graph shows that by 3rd May, **Jaipur** had 7 deceased, with **Ajmer** 2 and **Jodhpur** 1.
- ✓ Within the first week of categorization, the rate of new deaths occurrence decrease with 3 new deaths in Jaipur, 1 in Ajmer and 0 in Jodhpur.
- ✓ In **Jaipur, Kota and Bharatpur**, a rise in the new deaths is seen from the second week, that has fallen to 0 deaths in the third week.
- ✓ **Jodhpur**, with 1 death on 3rd May has not shown any new death in the next three weeks.
- ✓ **Banswara, Jhalawar and Nagaur** has not reported any deaths till 24th May.

Death to case ratios

INTERPRETATION

- ✓ This graph shows the death to case ratios for the three-week period and a forecast for the upcoming week.
- ✓ Here, **Jaipur**, **Ajmer** and **Jodhpur** has shown a decrement till first week. Ajmer was showing a continuous decrement afterwards, but **Jaipur** has shown an increment in the ratio with 56.25 from 17.01 on 17th May and a decrement to 40.11 on 24th May.
- ✓ Huge rise is seen within the second week in **Kota**, **Nagaur** with 60 and 55.41 and then a decrease to 11.70 and 5.99 respectively in the third week.
- ✓ With the help of the forecast indicator, it is shown that in the upcoming week, the highest rise in the death to case ratio can be seen in Jaipur.



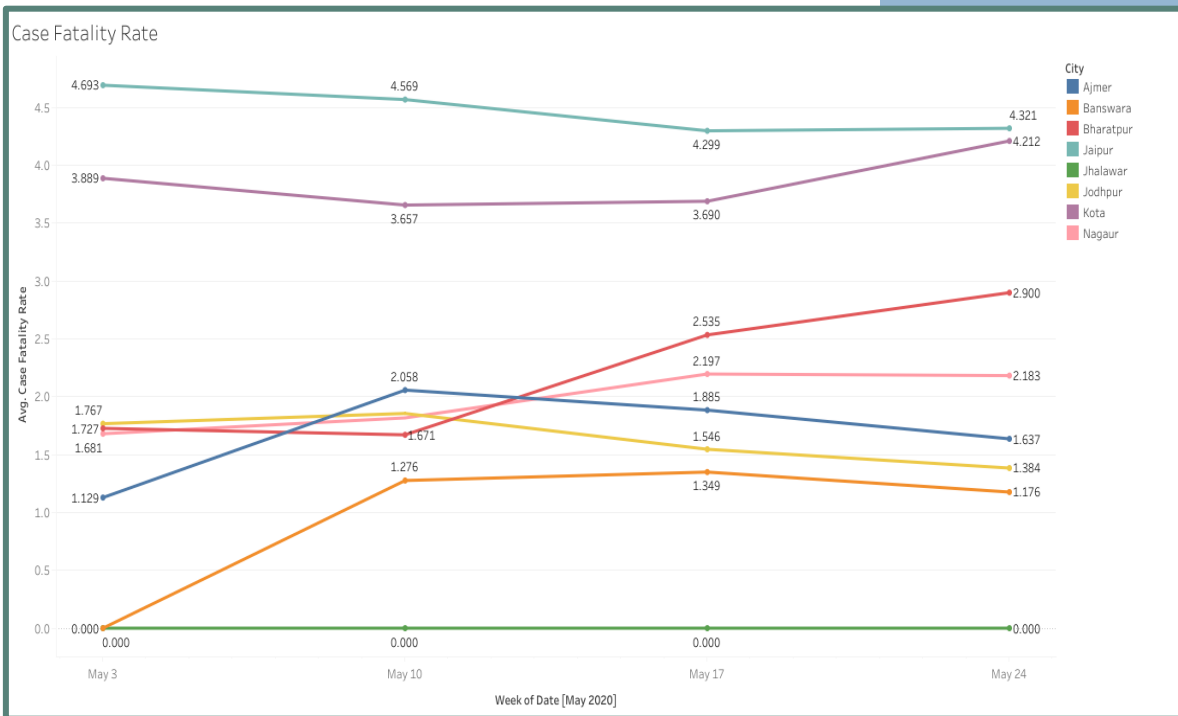
$$\text{Death to case ratio} = \frac{\text{New Deaths} \times 100}{\text{New Positive}}$$

Case Fatality Rates

INTERPRETATION

- ✓ The graph shows that **Jaipur and Kota** are the districts having Case Fatality rate higher when compared with other districts.
- ✓ Jaipur although has the highest case fatality rate but has shown decrement to 4.32 by 4.69 till the third week, wherein Kota has shown increment to 4.21 from 3.88.
- ✓ In **Bharatpur and Nagaur**, case fatality rate began to increase after the first week till the second week, with a slight decrease in Nagaur and increase in Bharatpur after third week.
- ✓ Case Fatality rate in **Ajmer and Jodhpur** was at peak by the end of first week and has shown a fall afterwards.
- ✓ **Banswara** has shown highest increment in case fatality rate among all the districts with a rise to 1.17 from 0 after the three weeks of categorization.
- ✓ **Jhalawar** has shown no change in the case fatality rate till the end of third week.

COVID-19



$$\text{Case Fatality rate} = \frac{\text{Total deaths}}{\text{Total confirmed}} \times 100$$

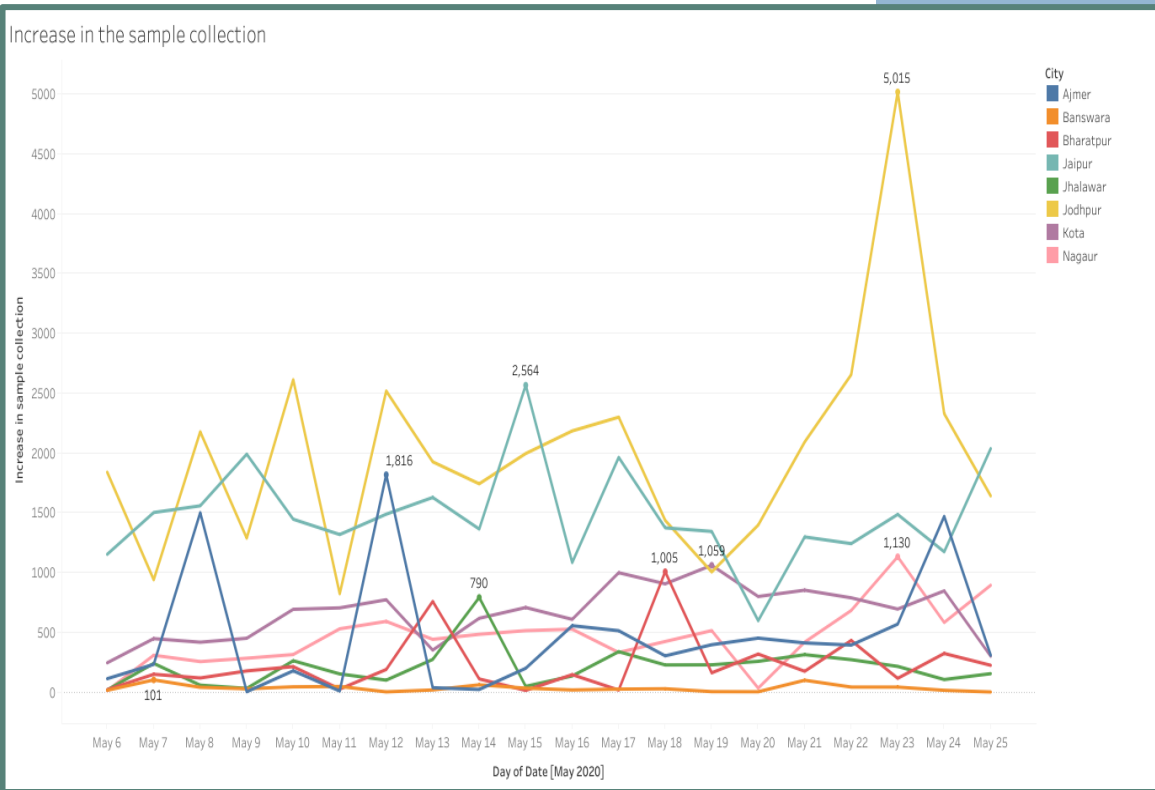
Total Number of Covid-19 Tests conducted



INTERPRETATION

- ✓ The tree map shows the total sample collected till 25th May.
- ✓ **Jodhpur** has tested highest number of samples as 63192, followed by **Jaipur** as 59182.
- ✓ By 25th May, Rajasthan has tested total 327836 samples out of which, a total of 187362 samples were tested in the red zone districts that implies 57.15% of the total.

Increments in the sample collection



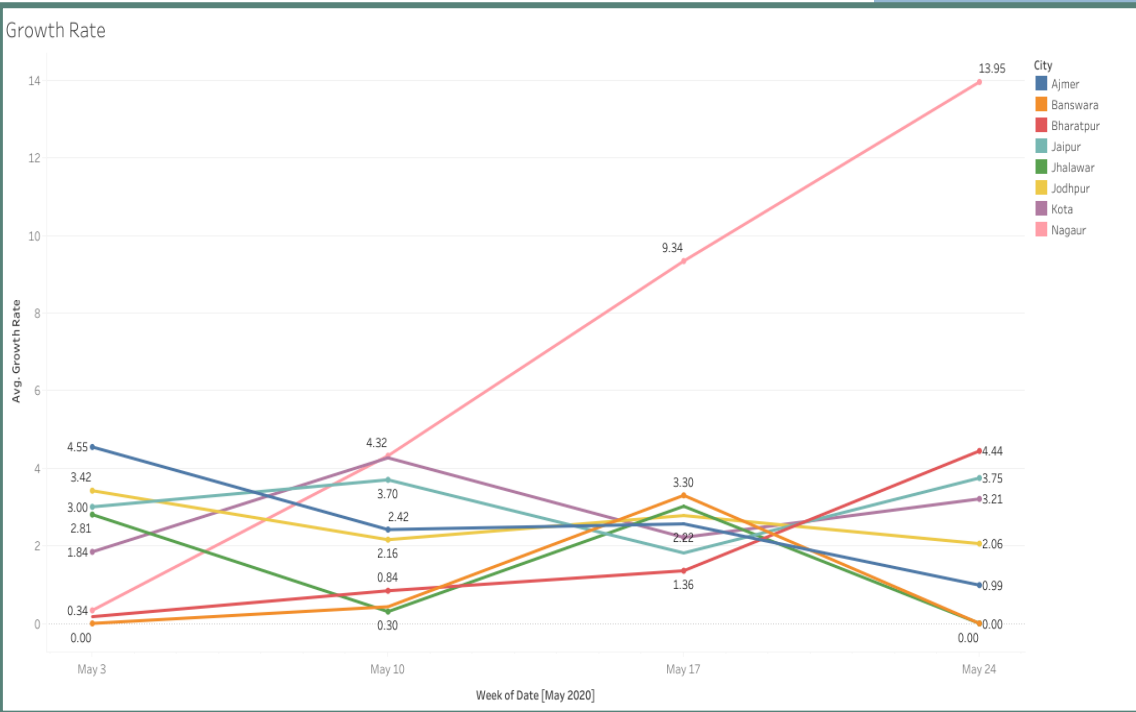
INTERPRETATION

- ✓ The map depicts that Jodhpur has collected highest number of samples among all the districts.
- ✓ This is a day wise graph that is showing highest sample collection or test done per district.

Growth rate of the Covid-19 confirmed cases

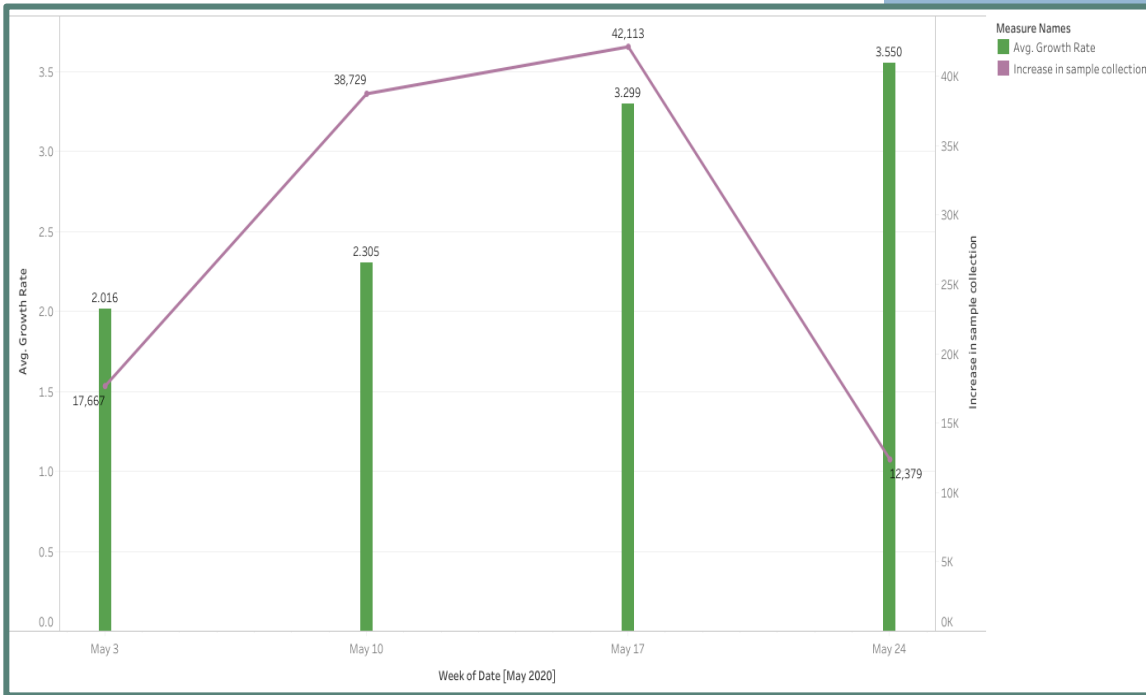
INTERPRETATION

- ✓ The graph shows growth rate with respect to confirmed cases in a week span.
- ✓ **Nagaur** has shown highest growth rate from 0.34 on 3rd May to 13.95 on 24th May with a rise of 13.61% followed by **Bharatpur** with the rise of 4.44% within 21 days.
- ✓ Although most number of confirmed cases are reported in **Jaipur**, but a little increase in growth rate is seen from the first week to the third week.
- ✓ **Ajmer, Jodhpur, and Jhalawar** has shown a decrease in the growth rate by 3.56%, 1.36% and 2.81% respectively from first week to third week.
- ✓ In **Banswara**, a continuous hike in the growth rate is seen till the second week that has fallen to 0 till the third week.
- ✓ In **Kota**, increase in the number of cases were at peak by the end of the first week.



$$\text{Growth rate (per day)} = \frac{\text{Total confirmed cases on that day} - \text{Total confirmed cases on previous day}}{\text{Total confirmed cases on previous day}} \times 100$$

Growth rates and the sample collection

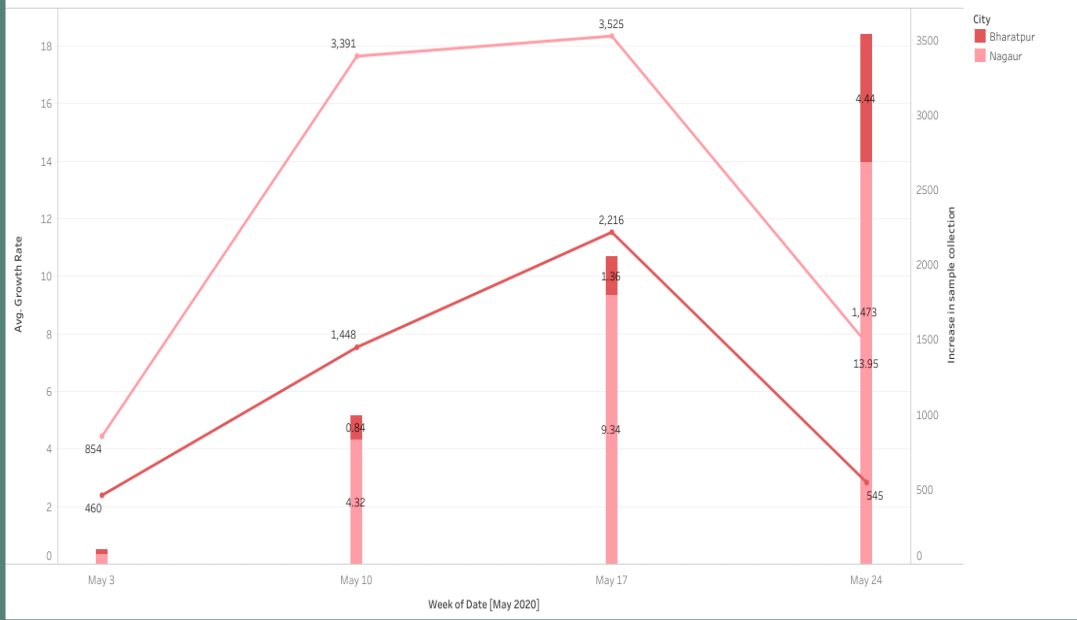


INTERPRETATION

- ✓ This bar line graph portrays the relation of the growth rate with respect to the difference in sample collection.
- ✓ It can be said that by the 3rd May, 17667 samples were collected. An increase in the sample collection to 38729, that is approx. 119% increment by the end of the first week, the growth rate is seen to be stabilized.
- ✓ By the end of second week, 42113 new samples were collected that is only 9% increment than the previous one and a growth rate hike to 0.994% is observed.
- ✓ By the end of third week, only 12379 new samples were collected that is 240% decrement in the sample collection and a hike in the growth rate is observed by 1.245% from the second week.

Districts with high growth rates

Districts with high growth rates



INTERPRETATION

- ✓ The graph of the growth rate shows that **Nagaur** and **Bharatpur** are the two districts that have shown the highest increase among all the districts.
- ✓ So this graph is showing the growth rates in the occurrence of new cases with respect to the increase in sample collection within the specified time period.
- ✓ In Bharatpur, 460 samples were taken by 3rd May. The highest increase in the sample collection is seen till the second week with 382% more than on the 3rd May. By the end of the third week only 545 new samples were collected that is a decrease of 75%. The growth rate is observed with the increase of 1.19% from the start of the first week till second week and a further increase to 3.08% by the end of third week.
- ✓ In Nagaur, the maximum samples were collected in the second week with a rise in the growth rate by 5.02%. Within the third week, a decrease of 139% in the sample collection is observed with an increase of 4.61% in the growth rate.

POINTS TO BE DISCUSSED

Among all the districts, **Jaipur** and then **Jodhpur** have shown a high rise in the number of confirmed cases and deaths. **Jhalawar** has the least number of confirmed cases with no deaths till 25th May.

The rate in the occurrence of new cases and new deaths have declined within the specified time period.

The Death to case ratio statistics are impacted in a negative sense by **Kota**, **Jaipur** and **Nagaur** with a huge rise seen in the ratio within the second week that may show a significant rise in the fourth week.

Jaipur and **Kota** are the districts with case fatality rates higher than the other districts, where in **Bharatpur**, **Nagaur** and **Banswara** are showing a high potential for the increase in their case fatality rates in future.

POINTS TO BE DISCUSSED

Jodhpur and then **Jaipur** has tested the most number of samples with **Jodhpur** collected the highest number of samples, on 23rd May among all the districts.

We can see many ups and downs in the line chart of the growth rate but two districts that are **Nagaur** and **Bharatpur**, have shown a high potential for the increase in growth rate in the future by showing a continuous increase from the first week to the third week with **Nagaur** the highest, 13.61.

When growth rates are compared with the increase in the sample collection, it is observed that to decrease the growth rate, we have to increase the number of sample collection.

CONCLUSIONS

Jaipur has shown the highest increase in the number of confirmed cases and deaths when compared to the other districts.

The two districts, **Nagaur** and **Bharatpur** has shown a great rise in the growth rate.

Jaipur, **Kota** and **Nagaur** have shown a potential in increasing their death to case ratios that should be taken under the consideration.

Growth rates show decrement, when more samples will be collected and tested

To increase the recovery rate, case fatality rates should be monitored for districts including **Jaipur** and **Kota**, having highest among the other districts and the potential districts including **Nagaur** and **Bharatpur** should be a main focus.



RECOMMENDATIONS

Training of the Trainer (TOT) sessions should be organized for building their capacities with respect to the contact tracing techniques.

Find, test, isolate and care for cases and quarantine contacts to control transmission.

Immunity Boosters should be given to the Covid-19 patients by prioritizing them on the basis of the severity levels.

People are not wearing the masks properly. Either the mask is only covering the mouth not the nose and if covering, then only the tip of the nose, hanging loosely, not washing the mask properly if can be reused, touching the nearby area of the face while wearing the mask. So IEC's should be designed covering all these points.

With the start of the Covid-19 outbreak in Rajasthan, Bhilwara emerged with highest number of cases for a short period of time and a sudden decrease is shown afterwards with a few number of new cases occurrence. So the strategies that were adopted there should be followed in all the districts.



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THANK YOU