

## FROM COAST TO COAST: EXPLORING THE VARIATIONS IN COVID CASES ACROSS AMERICAN STATES

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### Abstract

The goal of this research is to check the Average of COVID-19 cases in different states of USA (United States of America) and to check the variation of COVID-19 cases in different USA states. To check the variation or average of COVID-19 reported cases and deaths in different states of USA, we took data from the world o meter and compare the covid-19 cases from March to May in USA states. Descriptive Analysis is used to conduct this research. The purpose of the study is to observe the total number of cases in our state. Death ratio in the state with the total number of active cases in the state. the purpose is the identification of the first case, when it deducted with the first death of the person due to COVID-19. There is total of 9.2 milion population in the the state of New Jersey. In which for the month of March, total of 18,696 people were effected from COVID-19. So a total of 0.002% ( 18696/9200000) were effected from the COVID-19. The total of (267/9200000) = 0.0000290% of the total population death occur. In the March 2020, COVID-19 also attacked on the other states of US. *e.g.* In the state of New york, there were total of 83,712 cases were reported and 1941 number of deaths occur in the state of New york. In Illinois, 4<sup>th</sup> case were confirmed in March 2, 2020. In the end of March 2020, there were total of 5994 cases were reported. The number of deaths were 99 in that state. Its means that among the total population of 13.1 million, total of 0.00045% population were effected from this disease. While 0.0000076% population died with this pandemic. Similarly the total of confirmed cases with the deaths were observed. For the other states, total number of confirmed cases with the number of deaths were observed as in California, there were total of 8155 cases were reported in the end of March. There were 171 deaths occur. Similarly in the state of Massachusettes, there were 6,620 cases were appear in the end of March 2020. The total number of deaths were 89 untill the end of March 2020. The comparisons with the other states were observed with the state of New jersey and the conclusion is made as that in some states, the cases were more than the New Jersey and in some states, the cases were less than the New Jersey. Similarly for the number of deaths, same thing happens. Over all in the US, the number of cases for the COVID-19 increased exponentially. The ratio for the number of death also increased from this pandemic.

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**Keyword:** Virus, Corona, Threat, Disease

### Introduction

The world did not forget the year 2020 just because of a virus known as corona virus disease 2019 or abbreviated as COVID-19 [1]. This virus shutdown everything even the entire world almost [2]. This virus attacks around 4.3 million folks around the globe and still increase cases exponentially

[3]. This virus arose from Wuhan, China. There are lots of negative effects of this virus. All the business shutdown just because of Corona and it seems that 2020 is wasted due to COVID-19 [4]. The economy of the world is badly destroyed just because of Corona. This virus shows that we need to focus more on our scientists and provide them all the facilities to conduct research on different major topics [5]. This virus aware people about some of the major fields like virology, microbiology, and biotechnology and now people said that the biotechnology is the future of the world. With lots of negative effects of COVID-19, there are also some positive affects like on environment, climate, and some major fields like biotechnology [6]. We can see that ozone layer start filling faster than ever in 2020 and can see the heavy decline in different types of pollution like air pollution, noise pollution etc. The most affected countries due to COVID-19 includes USA (United States of America), Italy, Spain, Germany, and china. In this research we compare the cases of corona from different states of USA [7].

### Objective

- To check the Average of COVID-19 cases in different states of USA
- To check the variation of COVID-19 cases in different states of USA

### METHODOLOGY

#### Data Collection

To check the variation or average of COVID-19 reported cases and deaths in different states of USA, we took data from the world o meter and compare the covid-19 cases from March to May in USA states.

#### Statistical Analysis

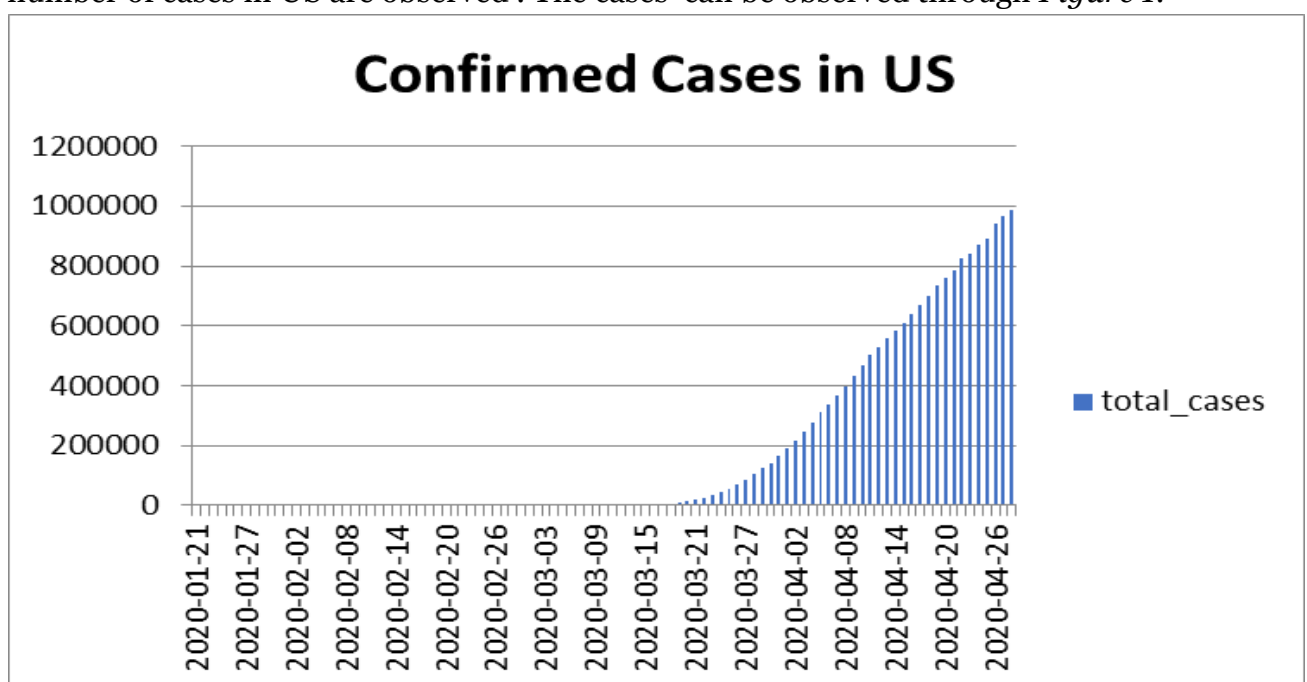
Descriptive Analysis is used to conduct this research

### RESULT AND DISCUSSION

The outcome of this research is listed in the following section:

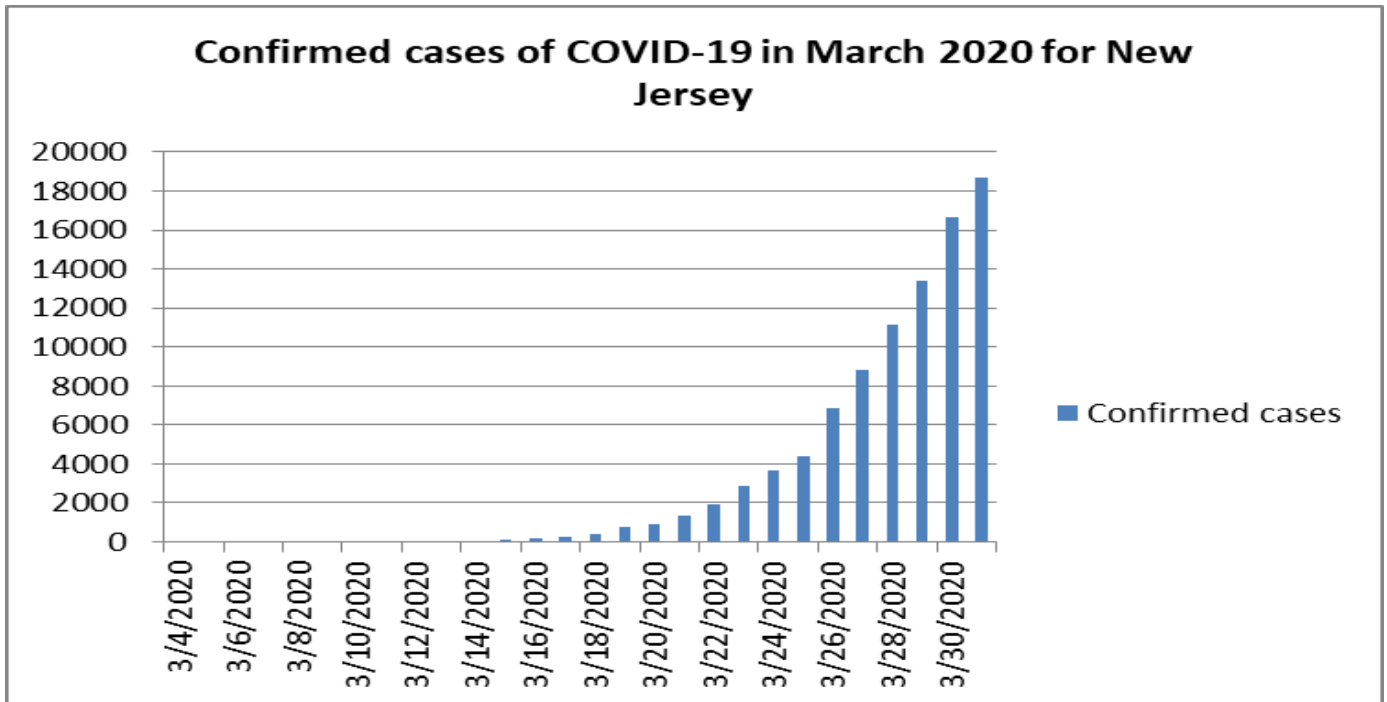
#### Descriptive Statistics and Diagrams

a)The number of cases in US are observed . The cases can be observed through *Figure 1*.



**Figure 1:** confirmed cases in US from January 2020 to April 2020

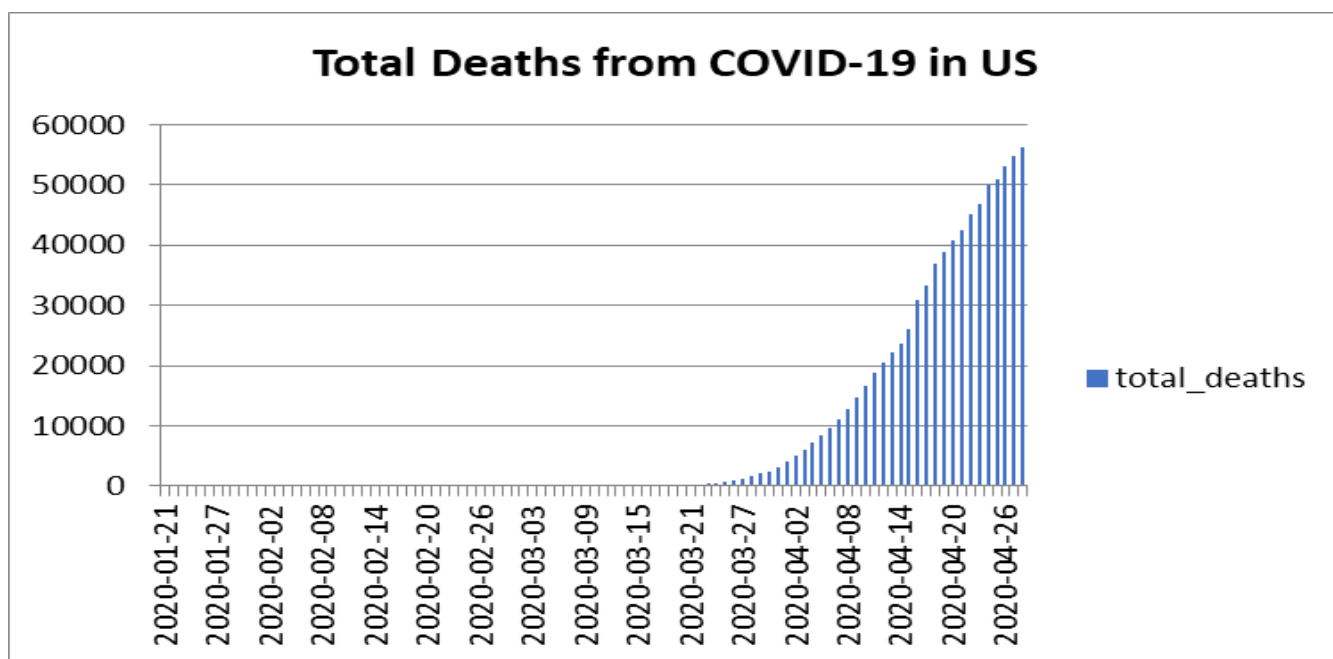
From *Figure 1*, the confirmed cases of COVID-19 are observed. From the *Figure 1*, it is clearly observed that from January 2020 until April 2020, total confirmed cases in US are increased. The confirmed cases for the month of March is observed for the state New Jersey. The total cases are observed in *Figure 2*.



**Figure 2:** confirmed cases in New Jersey for March 2020

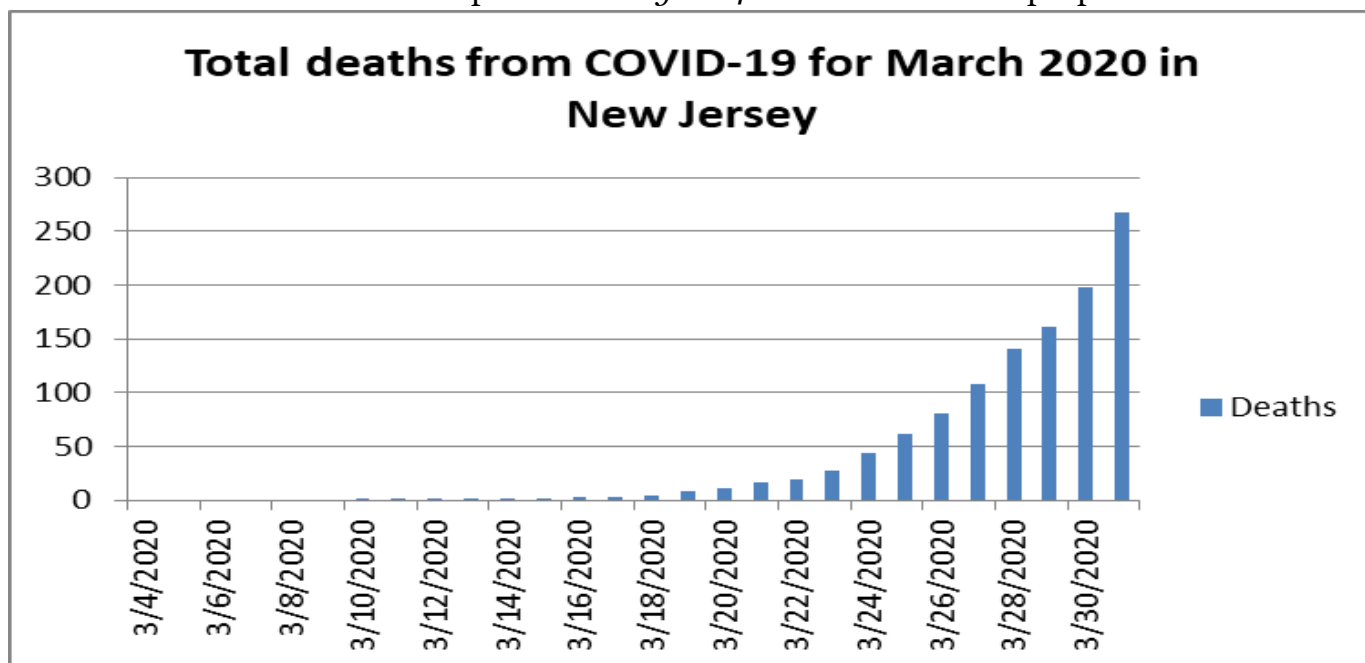
From *Figure 2*, it is observed that the total number of effected cases are increased exponentially in the New Jersey for the month of March 2020. From 4<sup>th</sup> March, there was one case while until 31<sup>st</sup> March, there were 18696 cases were reported from the pandemic of COVID-19.

**b)** Similarly, for the number of deaths, the cases were observed in the US from January 2020 to April 2020. The *Figure 3* is obtained for the purpose of observing number of deaths in US.



*Figure 3:* Total deaths in US from January 2020 to April 2020

*Figure 3* state the total deaths in US from the start of January untill the end of April. It can be clearly observed that the ratio of death is increased in the US from COVID-19. There are now 56245 number of deaths untill the end of April. Specifically in our state, total number of deaths are observed only in the month of March from this pendemic. *Figure 4* is obtained for this purpose.



*Figure 4:* Total deaths in New Jersey for March 2020

From *Figure 4*, the total death ratio can be observed. The deaths are rapidly increasing in the month of March 2020. The discriptive statistics is observed for the all four cases. The mean and standard deviations are observed to see the variation in the cases and the deaths.

The details are observed in **Table 1**.

	mean	S.D
Cases in US	177466.5	294211.7
Deaths in US	8111.354	15597.69
Cases in New Jersey for March	3304.321	5432.102
Deaths in New Jersey in March	52.86364	75.64975

c) from the *Figure 1-Figure 4*, it is observed that how much faster the cases are increased for the pandemic and for deaths in US and in our state. From **Table 1**, the variation can be observed for each situation. The variation in the overall US is more than the variation in our state. It means that the overall variation in deaths and cases are more as compared to just our state. On the average, also the mean is greater for US as compared to our state only.

d) the advantages of presenting the data in charts is that only by seeing just one time, the pattern can be observed that whether there is an increase or decrease in that situation. On the other hand, disadvantage is that the whole exact figure cannot be observed or we cannot observe that what happened exactly in the middle of that period.

3) a) For the probability count, the number of cases and the deaths are observed only in the month of March 2020. The exact digits can be observed in **Table 2**

**Table 2.** Number of cases and deaths in March 2020 for some states of US

States	Number of cases	Number of deaths
New Jersey	18696	267
Illinois	5994	99
California	8155	171
Massachusetts	6620	89
Texas	3266	41
Florida	6741	85
<b>Total</b>	<b>49472</b>	<b>752</b>

On the basis of **Table 2**, it is observed that the number of cases in our state is more than other states in March. The probability of the number of cases is increasing in our state as compared to the other states. Similarly, the number of deaths are increasing in our state as compared to the other states. The frequency of March shows that the cases are increasing day by day. Also the number of deaths are increasing on daily basis in March.

4. The descriptive statistics for the New Jersey in the month of March 2020 is found. The number of confirmed cases with the total number of deaths were observed. The summary statistics for that can be defined in Table 3.

**Table 3: Summary Statistics of New Jersey in March 2020**

Descriptive	Total Cases	Total Deaths
Mean	3304.321	52.86364
Standard Error	1026.571	16.12858
Median	347	13.5
Mode	4	1
Standard Deviation	5432.102	75.64975
Sample Variance	29507729	5722.885
Kurtosis	2.194049	1.979609
Skewness	1.788444	1.639772

Range	18695	266
Minimum	1	1
Maximum	18696	267

For the rest of the state that has been used in comparison, discriptive analysis is carried out from **Table 4 -Table 7.**

**Table 4: Summary Statistics of Illinois in March 2020**

Descriptive	Total Cases	Total Deaths
Mean	1250.392857	29.71428571
Median	436.5	17.5
Mode	1049	#N/A
Standard Deviation	1714.965507	30.32497973
Minimum	4	1
Maximum	5994	99

**Table 5: Summary Statistics of Massachusetts in March 2020**

Descriptive	Total Cases	Total Deaths
Mean	1192.931	28.33333333
Median	218	20
Mode	2	#N/A
Standard Deviation	1912.309	26.91850777
Minimum	2	1
Maximum	6620	89

**Table 6: Summary Statistics of Texas in March 2020**

Descriptive	Total Cases	Total Deaths
Mean	654.3077	15.53333
Median	95	11
Mode	5	5
Standard Deviation	1004.135	13.78854
Minimum	5	1
Maximum	3266	41

**Table 7: Summary Statistics of Flourida in March 2020**

Descriptive	Total Cases	Total Deaths
Mean	1233.552	20.58333
Median	216	10
Mode	2	2
Standard Deviation	1898.746	24.45745
Minimum	2	2
Maximum	6741	85

**a)** From Table 3-7, the descriptive analysis shows that the highest mean number of cases are observed for New Jersey. While the lowest mean number of cases are observed for Texas. The highest

mean number of death is observed for New Jersey and the lowest mean number of death was observed for Texas.

**b)** standard deviation tell us that how much variation is observed on the average. The more standard deviation means the more variation on daily number of cases. The less standard deviation mean that the less variation in number of cases or the number of deaths. *e.g.* The highest standard deviation was observed for New Jersey for the number of cases observed. The lowest standard deviation was observed for Texas. The highest standard deviation was observed for New Jersey and the lowest is observed for Texas in case of number of deaths.

### **Conclusion**

The purpose of the study is to observe the total number of cases in our state. Death ratio in the state with the total number of active cases in the state. the purpose is the identification of the first case, when it deducted with the first death of the person due to COVID-19. There is total of 9.2 million population in the the state of New Jersey. In which for the month of March, total of 18,696 people were effected from COVID-19. So a total of 0.002% ( 18696/9200000) were effected from the COVID-19. The total of  $(267/9200000) = 0.0000290\%$  of the total population death occur. In the March 2020, COVID-19 also attacked on the other states of US. *e.g.* In the state of New York, there were total of 83,712 cases were reported and 1941 number of deaths occur in the state of New York. In Illinois, 4<sup>th</sup> case were confirmed in March 2, 2020. In the end of March 2020, there were total of 5994 cases were reported. The number of deaths were 99 in that state. Its means that among the total population of 13.1 million, total of 0.00045% population were effected from this disease. While 0.0000076% population died with this pandemic. Similarly the total of confirmed cases with the deaths were observed. For the other states, total number of confirmed cases with the number of deaths were observed as in California, there were total of 8155 cases were reported in the end of March. There were 171 deaths occur. Similarly in the state of Massachusettes, there were 6,620 cases were appear in the end of March 2020. The total number of deaths were 89 untill the end of March 2020. The comparisons with the other states were observed with the state of New Jersey and the conclusion is made as that in some states, the cases were more than the New Jersey and in some states, the cases were less than the New Jersey. Similarly for the number of deaths, same thing happens. Over all in the US, the number of cases for the COVID-19 increased exponentially. The ratio for the number of death also increased from this pandemic.

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