

World's Five Most Affected Countries by COVID-19: A Comparative Study

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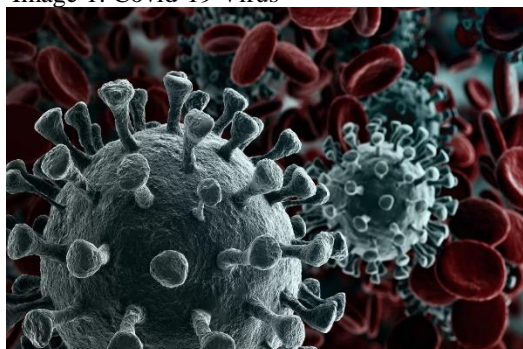
Abstract— The objective of this study is to make a comparison between five (5) most affected countries (USA, Brazil, U.K., Italy and India) of the world by Covid-19. The study is based on the secondary data. For conducting this study published data in online portal www.worldometers.info has been used. 4 months i.e. August 2020 to November 2020 has been chosen to carry out this study. For data analysis and interpretation Microsoft excel software (version 2019) has been used. Basic arithmetic technique and ratio analysis has been used in this study for data interpretation purpose. For measuring cyclical fluctuations in Covid-19 cases and its corresponding death cases, visual representation has been incorporated as bar diagram. Relevant images have been sourced from authentic sources and used in this study for satisfying the research objective. Finally the study has revealed that during the period of August 2020 to November 2020 Brazil is the most affected country and United States of America is the least affected country based on the mortality rate among the five countries taken as sample for this study.

Keywords— Covid 19, Cyclical fluctuations, Mortality.

I. INTRODUCTION

COVID-19 is the infectious disease caused by the most recently discovered corona virus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. COVID-19 is now a pandemic affecting many countries globally. CoVs are positive-RNA viruses with a crown like appearance under an electron microscope (coronam) is the spike glycoproteins on the envelope. The new corona virus is a respiratory virus which spreads primarily through droplets generated when an infected person coughs or sneezes or through droplets of saliva or discharge from the nose (Nucleonix, 2020; Desai,R., 2020).

Image 1: Covid-19 Virus

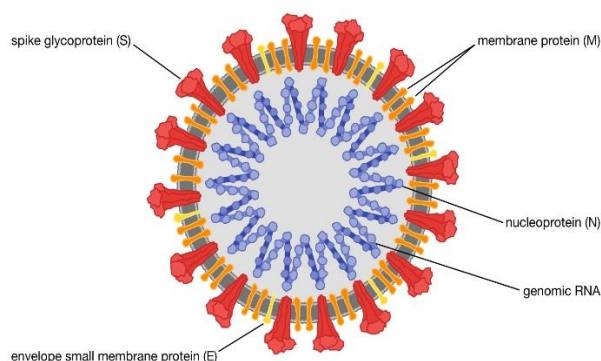


[Image Source: Encyclopaedia Inc]

Corona virus, have enveloped virions (virus particle) that measure approximately 120nm(1nm=10⁻⁹ metre) in

diameter. Club-shaped glycoprotein spikes in the envelope give the viruses a crownlike, or coronal, appearance. The nucleocapsid, made up of a protein shell known as a capsid and containing the viral nucleic acids, is helical or tubular. The Corona virus genome consists of a single strand of positive-sense RNA (Ribonucleic Acid) (Britannica, 2020).

Image 2: Severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2)

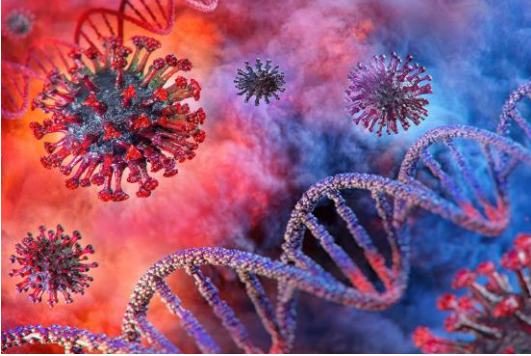


[Image Source: Encyclopaedia Inc]

Coronaviruses are a large family of viruses which may cause illness in animals or humans. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such

as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease COVID-19 (Cohuna District Hospital, 2020).

Image 3: Middle East Respiratory Syndrome (MERS)



[Image Source: Encyclopaedia Inc]

1.1 Origin of the disease

The coronavirus disease 19 (COVID-19) is a highly transmittable and pathogenic viral infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which emerged in Wuhan, China and spread around the world. Genomic analysis revealed that SARS-CoV-2 is phylogenetically related to severe acute respiratory syndrome-like (SARS-like) bat viruses, therefore bats could be the possible primary reservoir (Shereen, M., Khan, S, & Kazmi, A. *et al.*, 2020).

Image 4: Wuhan City



[Image Source: Encyclopaedia Inc]

1.2 Symptoms of Covid-19

The most common symptoms of COVID-19 are fever, dry cough, and tiredness. Other symptoms that are less common and may affect some patients include aches and pains, nasal congestion, headache, conjunctivitis, sore throat, diarrhoea, loss of taste or smell or a rash on skin or discoloration of fingers or toes. These symptoms are usually mild and begin gradually. Some people become infected but only have very mild symptoms. Most people (about 80%) recover from the disease without needing hospital treatment. Around 1 out of every 5 people who gets COVID-19 becomes seriously ill and develops difficulty breathing. Older people, and those with underlying medical problems like high blood pressure,

heart and lung problems, diabetes, or cancer, are at higher risk of developing serious illness (Agencia TIC TIMOR I.P., 2020). However, anyone can catch COVID-19 and become seriously ill. People of all ages who experience fever and/or cough associated with difficulty breathing/shortness of breath, chest pain/pressure, or loss of speech or movement should seek medical attention immediately. If possible, it is recommended to call the health care provider or facility first, so the patient can be directed to the right clinic. The most common symptoms of COVID-19 are fever, dry cough, and tiredness. Other symptoms that are less common and may affect some patients include aches and pains, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, loss of taste or smell or a rash on skin or discoloration of fingers or toes. These symptoms are usually mild and begin gradually. Some people become infected but only have very mild symptoms (Ministry of Health, Federal Republic of Somalia, 2020).

Image 5: Symptoms of Coronavirus



[Image Source: cdc.gov/coronavirus]

Most people (about 80%) recover from the disease without needing hospital treatment. Around 1 out of every 5 people who gets COVID-19 becomes seriously ill and develops difficulty breathing. Older people, and those with underlying medical problems like high blood pressure, heart and lung problems, diabetes, or cancer, are at higher risk of developing serious illness. However, anyone can catch COVID-19 and become seriously ill. People of all ages who experience fever and/or cough associated with difficulty breathing/shortness of breath, chest pain/pressure, or loss of speech or movement should seek medical attention immediately. If possible, it is recommended to call the health care provider or facility first, so the patient can be directed to the right clinic (India Today, 2020).

1.3 How does Covid-19 spread?

According to the guideline as prescribed by the World Health Organization (<https://www.who.int>) people can catch COVID-19 from others who have the virus.

- The disease spreads primarily from person to person through small droplets from the nose or mouth, which are expelled when a person with COVID-19 coughs, sneezes, or speaks.
- These droplets are relatively heavy, do not travel far and quickly sink to the ground. People can catch COVID-19 if they breathe in these droplets from a person infected with the virus.
- These droplets can land on objects and surfaces around the person such as tables, doorknobs and handrails.
- People can become infected-by touching these objects or surfaces, then touching their eyes, nose or mouth.

1.4 Precautionary measures & protection from Covid-19?

- Cleaning hands frequently and thoroughly.
- Avoid touching eyes, mouth and nose.
- Covering cough with the bend of elbow or tissue. If a tissue is used, discard it immediately and wash hands.
- Maintain a distance of at least 1 metre from others.

Image 6: Wearing Mask



[Image Source: Encyclopaedia Inc]

II. LITERATURE REVIEW AND RESEARCH GAP

To satisfy the objective of this study the endeavour has taken to review the existing literatures. The study conducted by Praghlapati, A. (2020) has revealed that students tend to focus their discussions on topics very close to their neighbourhood, such as school closing and local news. The author also emphasized that although the positive percentage (%) of COVID-19 Tweets was very low for both demographics, college students proved to be significantly more negative. The COVID-19 pandemic is associated with highly significant levels of psychological distress that, in many cases, would meet the threshold for clinical relevance. Mitigating the hazardous effects of COVID-19 on mental health is an international public health priority (Xiong, J. et.al, 2020). The study conducted by Tee, M. L. et. al. (2020) has revealed that during the early phase of the pandemic in the Philippines, one-fourth of respondents reported moderate-to-severe anxiety and one-sixth reported moderate-to-severe depression and psychological impact. The factors identified can be used to devise effective psychological support strategies. The research work carried out by Cao, W. et. al. (2020) indicated that economic effects, and effects on daily life, as well as delays in academic activities, were positively associated with anxiety symptoms ($P < .001$). However, social support was negatively correlated with the level of anxiety ($P < .001$). It is suggested that the mental health of college students should be monitored during epidemics.

The existing literatures suggest that there are limited studies conducted in the area of country wise comparison based on the Covid-19 impact on the most affected countries for the period of August 2020 to November 2020. To plug-in the analytical gap a serious attempt has been taken in this study by conceptualizing the objective as follows for this research work.

III. OBJECTIVE OF THE STUDY:

The objective of this study is to make a comparison between five (5) most affected countries (USA, Brazil, U.K., Italy and India) of the world by Covid-19 for the period of August 2020 to November 2020.

IV. MATERIALS AND METHODS

Secondary data has been used for carrying out this research work. Published data in online portal www.worldometers.info has been extracted for this study. Four (4) months i.e. August 2020 to November 2020 has been chosen to carry out this study. For data analysis and interpretation purpose, Microsoft excel software (version 2019) has been used. Basic arithmetic technique and ratio analysis has been also used in this study for data interpretation purpose. For visual representation bar diagram has been used

V. RESULTS AND DISCUSSION

Globally, as of 4:32pm CET, 30 December 2020, there have been 80,773,033 confirmed cases of COVID-19, including 1,783,619 deaths, reported to World Health Organization

(WHO). In the following a detailed discussion has been made with respect to the most 5 affected countries (USA, Brazil, U.K., Italy and India) by Covid-19. The comparison has also been shown among these 5 countries with the help of the graphs of the no. of infected people and deaths in the 5 countries. Microsoft Excel (MS Excel 2019) software has been used in this study for data analysis & interpretation purpose.

Table 1: Total Covid-19 Case & Death of USA: Period August 2020 to November 2020

United States of America (USA)	Aug-20	Sep-20	Oct-20	Nov-20		Last Date of Previous Month or Opening Date of Current Month	Last Date of the Current Month	Difference between the two dates
TOTAL CASE	1525150	1222278	1948418	4505137	Aug-20	4767288	6292438	1525150
TOTAL DEATH	32182	23969	23410	38802	Sep-20	6292438	7514716	1222278
					Oct-20	7514716	9463134	1948418
					Nov-20	9463134	13968271	4505137
						Last Date of Previous Month or Opening Date of Current Month	Last Date of the Current Month	Difference between the two dates
					Aug-20	155937	188119	32182
					Sep-20	188119	212088	23969
					Oct-20	212088	235498	23410
					Nov-20	235498	274300	38802

[SOURCE: AUTHOR'S OWN COMPUTATION]

TABLE 2: TOTAL COVID-19 CASE & DEATH OF BRAZIL: PERIOD AUGUST 2020 TO NOVEMBER 2020

Brazil	Aug-20	Sep-20	Oct-20	Nov-20		Last Date of Previous Month or Opening Date of Current Month	Last Date of the Current Month	Difference between the two dates
TOTAL CASE	1235603	911685	722019	800673	Aug-20	2666298	3901901	1235603
TOTAL DEATH	28947	22447	15940	13263	Sep-20	3901901	4813586	911685
					Oct-20	4813586	5535605	722019
					Nov-20	5535605	6336278	800673
						Last Date of Previous Month or Opening Date of Current Month	Last Date of the Current Month	Difference between the two dates
					Aug-20	92568	121515	28947
					Sep-20	121515	143962	22447
					Oct-20	143962	159902	15940
					Nov-20	159902	173165	13263

[SOURCE: AUTHOR'S OWN COMPUTATION]

TABLE 3: TOTAL COVID-19 CASE & DEATH OF UK: PERIOD AUGUST 2020 TO NOVEMBER 2020

Brazil	Aug-20	Sep-20	Oct-20	Nov-20		Last Date of Previous Month or Opening Date of Current Month	Last Date of the Current Month	Difference between the two dates
TOTAL CASE	1235603	911685	722019	800673	Aug-20	2666298	3901901	1235603
TOTAL DEATH	28947	22447	15940	13263	Sep-20	3901901	4813586	911685
					Oct-20	4813586	5535605	722019
					Nov-20	5535605	6336278	800673
						Last Date of Previous Month or Opening Date of Current Month	Last Date of the Current Month	Difference between the two dates
					Aug-20	92568	121515	28947
					Sep-20	121515	143962	22447
					Oct-20	143962	159902	15940
					Nov-20	159902	173165	13263

[SOURCE: AUTHOR'S OWN COMPUTATION]

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TABLE 4: TOTAL COVID-19 CASE & DEATH OF ITALY: PERIOD AUGUST 2020 TO NOVEMBER 2020

Italy	Aug-20	Sep-20	Oct-20	Nov-20		Last Date of Previous Month or Opening Date of Current Month	Last Date of the Current Month	Difference between the two dates
TOTAL CASE	21680	45644	364567	922002	Aug-20	247537	269217	21680
TOTAL DEATH	188	411	2724	16958	Sep-20	269217	314861	45644
					Oct-20	314861	679428	364567
					Nov-20	679428	1601430	922002
						Last Date of Previous Month or Opening Date of Current Month	Last Date of the Current Month	Difference between the two dates
					Aug-20	35295	35483	188
					Sep-20	35483	35894	411
					Oct-20	35894	38618	2724
					Nov-20	38618	55576	16958

[SOURCE: AUTHOR'S OWN COMPUTATION]

TABLE 5: TOTAL COVID-19 CASE & DEATH OF INDIA: PERIOD AUGUST 2020 TO NOVEMBER 2020

India	Aug-20	Sep-20	Oct-20	Nov-20		Last Date of Previous Month or Opening Date of Current Month	Last Date of the Current Month	Difference between the two dates
TOTAL CASE	1990885	2622328	1825899	1327088	Aug-20	1697054	3687939	1990885
TOTAL DEATH	28884	33273	23441	15510	Sep-20	3687939	6310267	2622328
					Oct-20	6310267	8136166	1825899
					Nov-20	8136166	9463254	1327088
						Last Date of Previous Month or Opening Date of Current Month	Last Date of the Current Month	Difference between the two dates
					Aug-20	36551	65435	28884
					Sep-20	65435	98708	33273
					Oct-20	98708	122149	23441
					Nov-20	122149	137659	15510

[Source: Author's Own Computation]

Table 6: Country-wise Total Covid-19 Cases Vs Total Death

Period: August 2020 to November 2020

Country	Total Covid-19 Cases	Total Death	Death Percentage (%) on Total Cases
USA	9200983	118363	1.29
Brazil	3669980	80597	2.20
United Kingdom	1326475	17259	1.30
Italy	1353893	20281	1.50
India	7766200	101108	1.30

[Source: Author's Own Computation]

From Table 1 to Table 5 we can visualize the country-wise (U.S.A, Brazil, United Kingdom, Italy, and India) total Covid-19 cases and total death due to Covid-19 for the period of August-2020 to November 2020. Table 6 represents the country-wise total covid-19 cases vs. total death for the period of August 2020 to November 2020. From the above Table-6 we can find out that U.S.A, Brazil, United Kingdom, Italy, and India has total number of Covid-19 cases are 9200983, 3669980, 1326475, 1353893, and India respectively. Total death reported due to Covid-19 for U.S.A, Brazil, United Kingdom, Italy, and India are: 118363, 80597, 17259, 20281 and 101108 respectively for the period of August 2020 to November 2020. As far as percentage (%) is concerned U.S.A, Brazil, United

Kingdom, Italy, and India reported 1.29%, 2.20%, 1.30%, 1.50% and 1.30% death on total Covid-19 cases respectively.

Following two formulas has been used in this study for calculation purpose.

I. Month-wise Covid-19 Case & Death due to Covid-19:

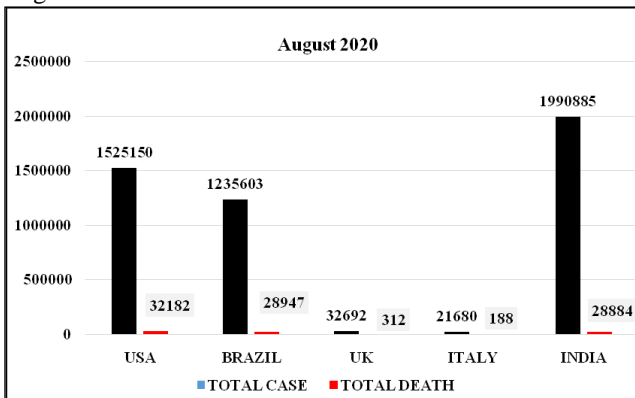
(Last Date of Previous Month or Opening Date of Current Month - Last Date of the Current Month) = Covid-19 Case & Death due to Covid-19 for current month

II. Country wise Death Percentage (%)

Total Death for the Period of August 2020 to November 2020 / Total Covid-19 Cases for the Period of August 2020 to November

In the following month-wise and country-wise Covid-19 cases & deaths are discussed through graphical representation.

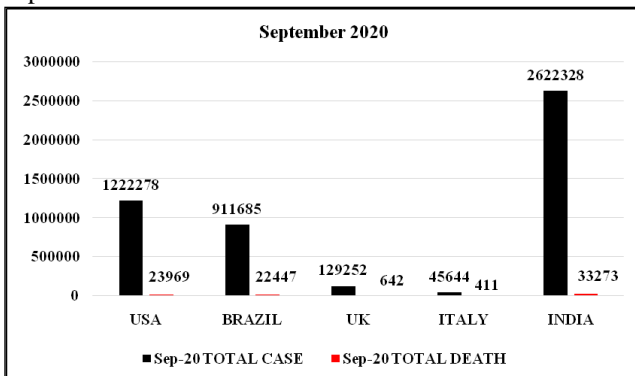
Figure 1: Country-wise Covid-19 Case & Death: Month August 2020



[Source: Author's Own Calculation]

From Figure 1 we can visualize that during August 2020 most number of Covid-19 cases were reported for India (1,990,885) where as in case of death USA had reported the highest number of deaths (32,182).

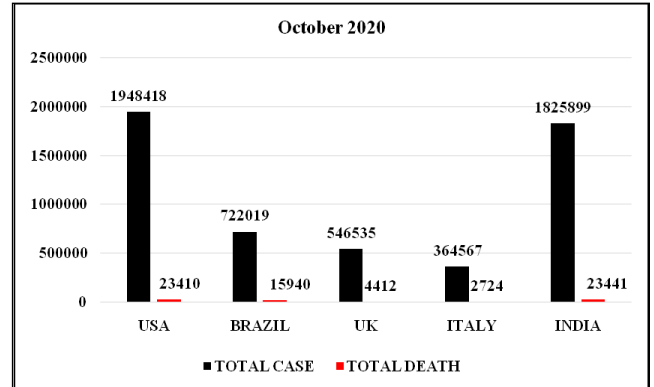
Figure 2: Country-wise Covid-19 Case & Death: Month September 2020



[Source: Author's Own Calculation]

From Figure 2 we can visualize that during September 2020 month most number of Covid-19 cases were reported for India (2,622,328); in case of death also India had reported the highest number of deaths (33,273).

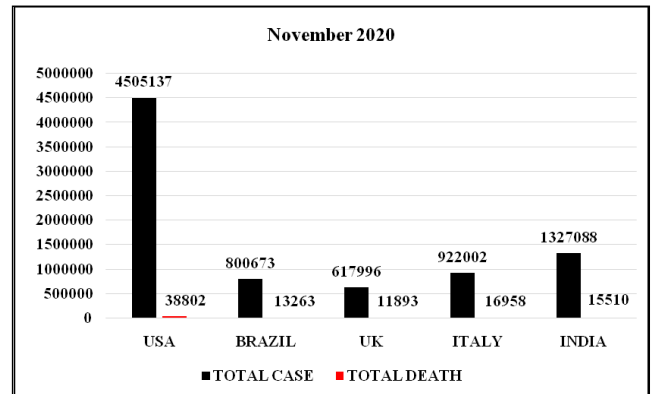
Figure 3: Country-wise Covid-19 Case & Death: Month October 2020



[Source: Author's Own Calculation]

From Figure 3 we can visualize that during October 2020 month most number of Covid-19 cases were reported for USA (1,948,418); in case of death India had reported the highest number of deaths (23,441).

Figure 4: Country-wise Covid-19 Case & Death: Month November 2020



[Source: Author's Own Calculation]

From Figure 4 we can visualize that during November 2020 month most number of Covid-19 cases were reported for USA (4,505,137); in case of death also USA had reported the highest number of deaths (23,441).

VI. CONCLUSION

Finally the study has revealed that during the period of August 2020 to November 2020 Brazil is the most affected country and United States of America is the least affected country based on the mortality rate. The country-wise rank is presented below.

Table 7: Rank of World's Most Affected Country Period: August 2020 to November 2020

Country	Total Covid-19 Cases	Total Death	Death Percentage (%) on Total Cases	Most Effected Country Rank
USA	9200983	118363	1.29	IV
Brazil	3669980	80597	2.20	I
United Kingdom	1326475	17259	1.30	III
Italy	1353893	20281	1.50	II
India	7766200	101108	1.30	III

[Source: Author's Own Calculation]

From the above table we can visualize that during the period of August 2020 to November 2020 Brazil has reported most mortality rate i.e. 2.20% on the total Covid-19 cases and on the contrary USA has reported least mortality rate i.e. 1.29%

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