



## GEOGRAPHICAL ANALYSIS OF SPREADING COVID-19 (CORONAVIRUS) PANDEMICS : A GLOBAL SCENARIO

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### Abstract :-

At present 186 countries having a big problem about the spreading of COVID-19 pandemic. As on 1 April 2020, total reported positively infected by COVID-19 cases was 824563, total deaths recorded was 40673 and number of patients recovered from the disease was 174360 declared by WHO at globally. The new strain of coronavirus is called as Severe Acute Respiratory Syndrome coronavirus-2 (SARS-CoV-2). That virus causes coronavirus disease 19, favorably known as COVID-19. New COVID-19 (coronavirus) has spread rapidly in many parts of the world. According to the World Health Organization (WHO), declared COVID-19 as a pandemic. Objective of the present research to identify the geographical changes in epicenter of the disease COVID-19. From the origin of COVID-19 coronavirus in December 2019 from Wuhan city of China to till date this virus occupied whole geographical area of the world. For the present analysis is made on secondary data. Daily situation report of COVID-19 published by the WHO was use for the study. Maps and figures are used for the analysis. Concluding of the proposed research is to identifying the epicenter of COVID-19 and changes in their geographical location. Firstly, Wuhan city of China having epicenter of the pandemic disease. Due to the international travel from China to other parts of the world was the cause of spreading coronavirus (COVID-19). Second epicenter was Bergamo city of Italy. And recently change epicenter of COVID-19 is New York city of United States of America. At present 186 countries are affected by the spreading infection of COVID-19 which is originated from China. Recently domestic travel and local activities are the responsible for growing infection of COVID-19 in all countries of the world. According to WHO, only social distancing is one of the major solution of controlling or regulating or outbreak the spreading chain of COVID-19.

**Key Words :** COVID-19, Coronavirus, Epidemic, Pandemic, Confirmed cases, Deaths and Epicenter.

### Introduction :-

Now days, world has facing a big challenge or most crucial issue as spreading pandemic of COVID-19 (Coronavirus). Coronavirus COVID-19 pandemic is influence not only human beings but all activities of their on the globe. A global challenge has been arrived in the form of COVID-19.

*Epidemic* is a term that is often broadly used to describe any problem that has grown out of control. An *epidemic* is defined as "an outbreak of a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the population."

An epidemic is an event in which a disease is *actively* spreading. In contrast, the term *pandemic* relates to geographic spread and is used to describe a disease that affects a whole country or the entire world.

Coronavirus are a group of viruses that can be causing diseases in human being as well as animals. The severe acute respiratory syndrome (SARS) virus strain known as SARS-CoV is an example of coronavirus. The new strain of coronavirus is called as Severe Acute Respiratory Syndrome coronavirus-2 (SARS-CoV-2). That virus causes coronavirus disease 19, favorably known as COVID-19.

New COVID-19 (coronavirus) has spread rapidly in many parts of the world. According to the World Health Organization (WHO), declared COVID-19 as a pandemic. A pandemic disease that people are not immune the spread across large regions.

COVID-19 outbreak began in Wuhan, a major city in Hubei province of China. In the month of December of 2019, first case of COVID-19 reported in Wuhan city. COVID-19 spread from person to person directly through close communities. As on 1 April 2020, total reported positively infected by COVID-19 cases was 824563, total deaths recorded was 40673 and number of patients recovered from the disease was 174360 declared by WHO at globally. Now days, spreading infection of COVID-19 is very dangerous for human beings in all over the world. Total 196 countries are facing the big challenge of rapidly spreading the infection of such coronavirus (COVID-19). Various countries should be decided to lockdown their countries or part of their countries for prevention from spreading infection of \covid-19. Global economy and life cycle of the peoples are resume due to the infection of COVID-19.

Spreading of infection of COVID-19 from China to other countries in the world by person to person contact which is made by their migration or travel. COVID-19 spread across the world by human chain. Hence, present research study of spreading pandemic disease like COVID-19 (coronavirus) from the view of geographical perspective is useful for breaking the chain of such type of pandemic and epidemic diseases in future.

### **Objectives of the Research :**

Proposed research study having following objectives.

- 1) To study the global scenario of infection of COVID-19.
- 2) To identify the global level and cases of COVID -19( infected and deaths).
- 3) To analyze the way of spreading COVID-19 on global level.

### **Study Region :**

Whole world is the study region of the present research study. But major COVID-19 infected countries highlighting and their problems are focused in the present study.

### **Research Methodology:**

For the present research study secondary data was used for analysis of COVID-19 pandemics. Daily situation reports of COVID-19 are collect from the official website of World Health Organization(WHO), Research papers and articles of various scholars are collect from internet sources, media news reports are used for various countries analysis of COVID -19 infection and deaths related to concerned disease. Global maps for spreading of pandemic of Coronavirus are collected from various secondary sources especially from internet .

Collected data from various reports was tabulated in unique table format. Analyzed such data through graphs, charts and cartographic maps which is published by WHO.

### **Result and Discussion :**

COVID-19 is one of the strain of SARS-COV (Severe Acute Respiratory Syndrome). Now days, whole world facing a big challenge of rapidly spreading of COVID -19. Due to the infection of COVID-19 through person to person, various countries decided lockdown in their whole country or the partial lockdown in red alarming territories.

The epidemic began in mainland China, with a geographical focus in the city of Wuhan, Hubei. However, on Feb 26, 2020, the rate of increase in cases became greater in the rest of the world than inside China. Substantial outbreaks are occurring in Italy (69176 cases), the USA (51914 cases), and Iran (24811 cases), and geographical expansion of the epidemic continues.

COVID -19 firstly traced in Wuhan city of China on 31<sup>st</sup> December 2019. Firstly this case was detected by pneumonia (unknown etiology). Between 31<sup>st</sup> December 2019 to 3 January 2020, a total 44 cases detected with pneumonia . On 12 January 2020 , National Health Commission of China reported to WHO , that the outbreak associated with exposures in seafood market in Wuhan city . 7 January 2020 , Chinese authority identified a new type of Coronavirus. On January 2020, Republic of Korea reported the first case of novel Coronavirus.

Table 1 : Country Reported of Confirmed Cases of COVID-19			
Reporting Country	Date wise Reported Total Cases		
	20/01/2020	25/01/2020	30/01/2020
China	278	1297	7736
Thailand	2	4	14
Japan	1	3	11
Korea	1	2	4
Viet Nam	-	2	2
Republic of Singapore	-	3	10
Nepal	-	1	1
Australia	-	3	7
France	-	3	5
United States of America	-	2	5
Malaysia	-	-	7
Combodia	-	-	1
Philippines	-	-	1
Sri Lanka	-	-	1
India	-	-	1
UAE	-	-	4
Finland	-	-	1
Germany	-	-	4
Canada	-	-	3
<b>Total</b>	<b>282</b>	<b>1320</b>	<b>7818</b>

**Source :** WHO Daily Reports on COVID-19

As on 20 January 2020, total 278 cases confirmed of 2019-nCoV reported from Chinese authority. 2 cases reported in Thailand and 1 case each reported by Japan and Republic of Korea on 20 January 2020. Here, researcher computed interceptive daily situation reports of COVID-19 published by WHO. Report of the 20 January 2020, has revealed the statistics of growing cases of COVID-19 was in new six countries of various continents. At global cases reported was 1320 out of them China, Thailand, Japan, Korea, Viet Nam, Singapore, Nepal, France, USA and Australia having 1297, 4, 3, 2, 2, 3, 1, 3, 3 and 2 respectively. As on 30 January 2020, reported total 7818 cases of COVID-19 within total 19 countries around the world. Malaysia(7), Combodia, Philippines, Sri Lanka, India and Finland having 1 case each, UAE and Germany(4 each) and Canada(3) reported about confirmed cases of COVID-19.

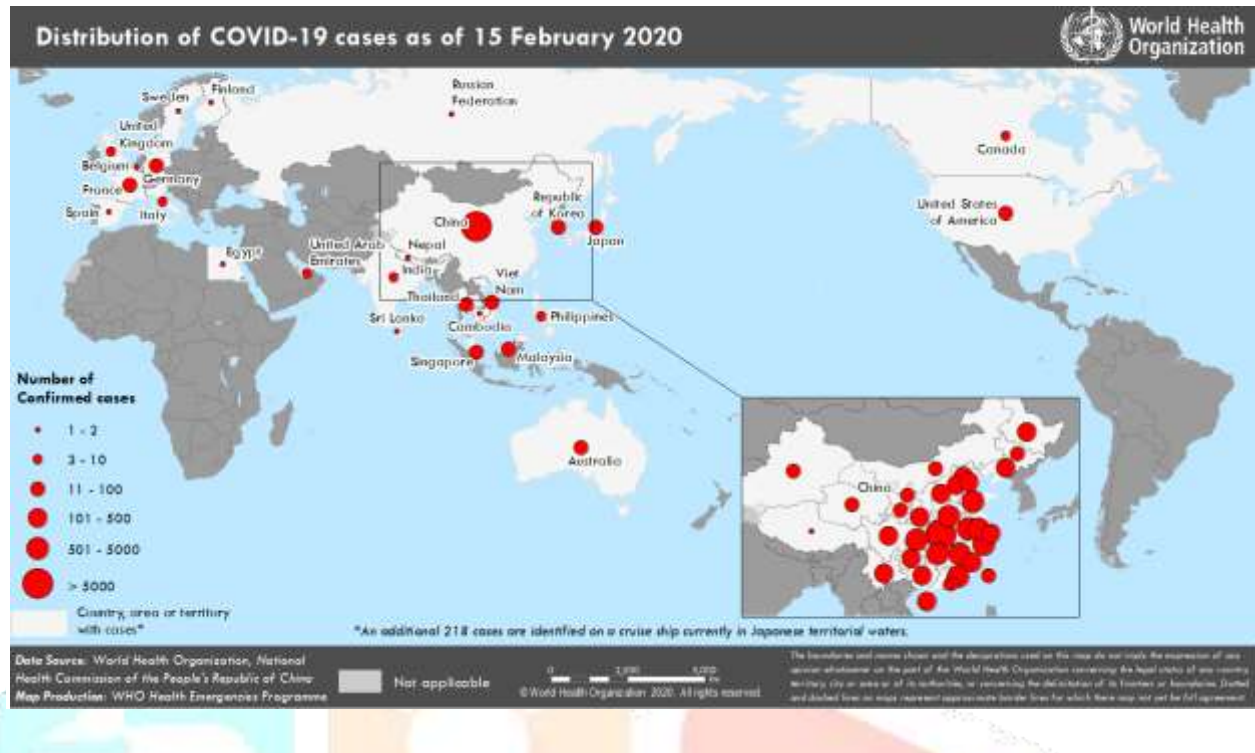
**Table 2. Countries, territories or areas outside China with reported laboratory-confirmed COVID-19 cases and deaths.****Data as of 15 February 2020**

WHO Region	Country/Territory/Area	Confirmed cases (new)	Total cases with travel history to China (new)	Total cases with possible or confirmed transmission outside of China (new)	Total cases with site of transmission under investigation (new)	Total deaths (new)
Western Pacific Region	Singapore	67 (9)	22 (0)	44 (8)	1 (1)	0 (0)
	Japan	41 (8)	25 (1)	16 (7)	0 (0)	1 (0)
	Korea	28 (0)	13 (0)	12 (0)	3 (0)	0 (0)
	Malaysia	21 (2)	16 (1)	4 (0)	1 (1)	0 (0)
	Viet Nam	16 (0)	8 (0)	8 (0)	0 (0)	0 (0)
	Australia	15 (0)	12 (0)	3 (0)	0 (0)	0 (0)
	Philippines	3 (0)	3 (0)	0 (0)	0 (0)	1 (0)
	Cambodia	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)
South-East Asia Region	Thailand	34 (1)	23 (0)	7 (1)	4 (0)	0 (0)
	India	3 (0)	3 (0)	0 (0)	0 (0)	0 (0)
	Nepal	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)
	Sri Lanka	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)
Region of the Americas	USA	15 (0)	13 (0)	2 (0)	0 (0)	0 (0)
	Canada	7 (0)	6 (0)	0 (0)	1 (0)	0 (0)
European Region	Germany	16 (0)	2 (0)	14 (0)	0 (0)	0 (0)
	France	11 (0)	5 (0)	6 (0)	0 (0)	0 (0)
	UK	9 (0)	2 (0)	7 (0)	0 (0)	0 (0)
	Italy	3 (0)	3 (0)	0 (0)	0 (0)	0 (0)
	Russian Federation	2 (0)	2 (0)	0 (0)	0 (0)	0 (0)
	Spain	2 (0)	0 (0)	2 (0)	0 (0)	0 (0)
	Belgium	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)
	Finland	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)
	Sweden	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)
Eastern Mediterranean Region	UAE	8 (0)	6 (0)	1 (0)	1 (0)	0 (0)
	Egypt	1 (1)	0 (0)	1 (1)	0 (0)	0 (0)
Other	International conveyance (Japan)	218 (0)	0 (0)	0 (0)	218 (0)	0 (0)
	<b>Total</b>	<b>526 (21)</b>	<b>170 (2)</b>	<b>127 (17)</b>	<b>229 (3)</b>	<b>2 (0)</b>
China	China	-	-	-	50054 (1506)	1524 (121)
	<b>Grand Total</b>	<b>526 (21)</b>	<b>170 (2)</b>	<b>127 (17)</b>	<b>50283 (1509)</b>	<b>1526 (121)</b>

Source : WHO Daily Reports on COVID-19

Figure 1. Countries, territories or areas with reported confirmed cases of COVID-19,

15 February 2020



Above Table 2 shows, the actual situation of spreading COVID-19 pandemic in various countries of the world. COVID-19 (Coronavirus) first case reported in Wuhan city of China. COVID-19 infection spread through person to person communities. After the confirmation of coronavirus transmitted to any person with The first transmission to humans was in Wuhan, China. Since then, the virus has mostly spread through person-to-person contact. When people with COVID-19 breathe out or cough, they expel tiny droplets that contain the virus. These droplets can enter the mouth or nose of someone without the virus, causing an infection to occur. The most common way that this illness spreads is through close contact with someone who has the infection. Close contact is within around 6 feet.

Droplets containing the virus can also land on nearby surfaces or objects. Other people can pick up the virus by touching these surfaces or objects. Infection is likely if the person then touches their nose, eyes, or mouth. It is important to note that COVID-19 is new, and research is still ongoing. There may also be other ways that the new coronavirus can spread.

It is reported that 31.3% of patients recent travelled to Wuhan and 72.3% of patients contacting with people from Wuhan among the patients of nonresidents of Wuhan. Transmission between healthcare workers occurred in 3.8% of COVID-19 patients, issued by the National Health Commission of China on 14 February 2020.

Approximately 30 countries trouble from COVID-19. All continents having infection of COVID-19. According to WHO daily situation report of COVID-19, total confirmed cases was 50283, out of them 1509 was newly added within past 24 hours in the world. Out of total cases of COVID-19 in different countries, 170 cases having travel history related to the China. It means clearly shows that the transmission of COVID-19 in other parts of the world having with travel of migration of the infected peoples and infection transmitted to others by their domestic movement. Regional variation was found in various continents or regions with positively infected cases of COVID-19. According to the WHO report of 15 February 2020, total deaths was 1526, out of them 121 deaths occurred in past 24 hours in the world. Only 2 deaths having in outside parts of the China.

<b>Table 3. Region wise Confirmed cases of COVID-19 acute respiratory disease reported by Various Countries, Data as 01 March 2020</b>		
<b>Country/Region</b>	<b>Confirmed Cases</b>	<b>Deaths</b>
China	79968	2873
Western Pacific Region	4147	24
European Region	1457	31
South-East Asia Region	47	0
Eastern Mediterranean Region	725	43
Region of the Americas	86	0
African Region	2	0
International conveyance	705	6
<b>Grand Total</b>	<b>87137</b>	<b>2977</b>
<b>Source : WHO Daily Reports on COVID-19</b>		

Above table and map reveals the global scenario of spreading COVID-19. The variation found in confirmed cases and number of deaths having regional variation on the earth. Migration from China to other countries in the world by human population with positive infection of COVID-19. Peoples having positive infection of COVID-19, spread the disease in general community through their local activity or movement or domestic travel. Symptoms of infection of pandemic is displaying or influence on human body after incubation period. Incubation period of COVID-19 is 5 to 15 days. Close community activity is one of the favorable factors for rapidly spreading the infection of coronavirus (COVID-19).

According to WHO daily situation report of COVID-19 on 1 March 2020, total 87137 persons having positive infection of COVID-19 in the different countries of the world with 2977 deaths. Almost various regions having rapid growth of spreading of COVID-19 except African region. South East Asian region having gradually spreading of coronavirus through domestic activities by the infected peoples. In Europe and Mediterranean region growth of spreading infection of COVID-19 having high rate.

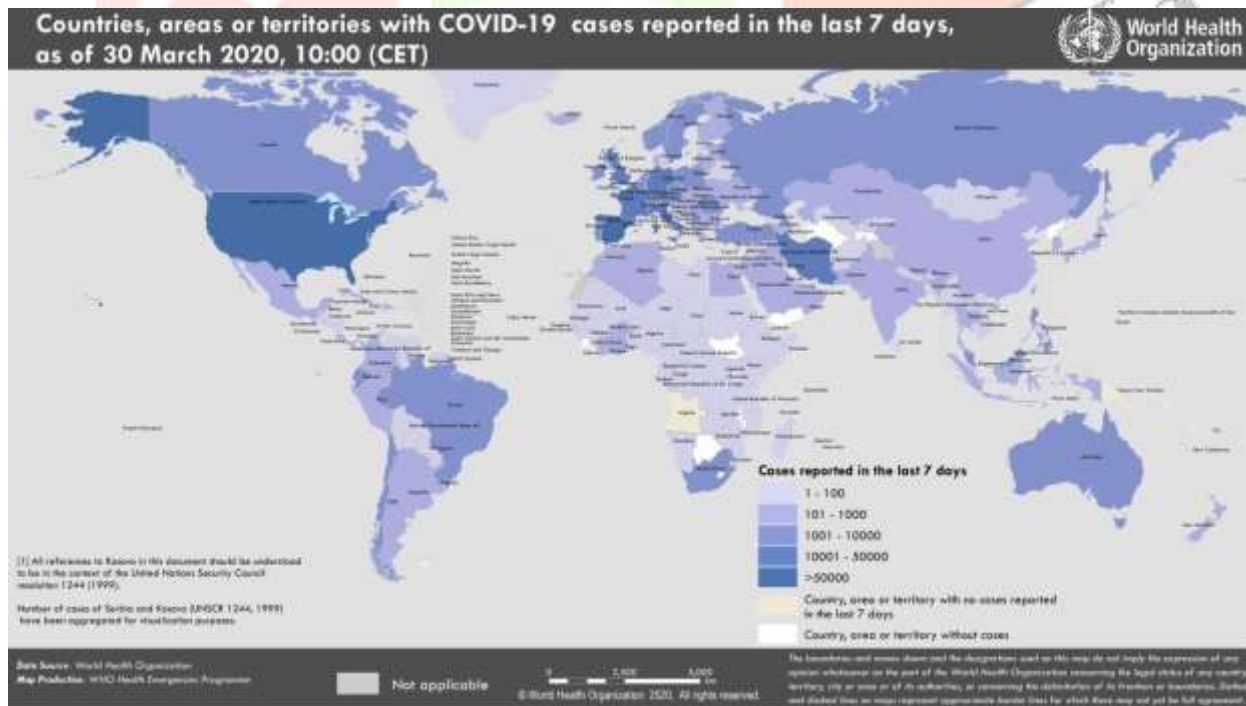
<b>Table 4. Region wise Confirmed cases of COVID-19 acute respiratory disease reported by Various Countries, Data as 15 March 2020</b>		
<b>Country/Region</b>	<b>Confirmed Cases</b>	<b>Deaths</b>
China	81048	3204
Western Pacific Region	10171	106
European Region	53877	1968
South-East Asia Region	404	8
Eastern Mediterranean Region	15523	735
Region of the Americas	2561	46
African Region	182	4
Others Region/Countries/Territories	9	0
International conveyance	697	7
<b>Total</b>	<b>164472</b>	<b>6078</b>
Substract New Cases	10955	343
<b>Grand Total</b>	<b>153517</b>	<b>5735</b>
<b>Source : WHO Daily Reports on COVID-19, Computed by Author</b>		

Table 4 shows the statistics of COVID-19 infected confirmed cases and number of deaths in the various parts of the world. Contribution of China having approximately 50 % share of total infected persons in the world. According to the WHO report of 15 March 2020, reveals the total confirmed cases was 153517 and 5735 was total number of deaths in the world due to transmission of coronavirus (infection of COVID-19). In past 24 hours having reported 10955 new confirmed cases of COVID-19 and newly added deaths in past 24 hours was 343.

Observation of confirmed cases of COVID-19 was differ in different regions of the world. Total 143 countries facing the problem of COVID-19 pandemic in the world. 9 new countries i.e. African Region (7), European Region (1) and Region of Americas (1) in have reported cases of COVID-19 in the past 24 hours. China control the transmission of COVID-19 in their dominant region of Hubei province of China. Lockdown applied to the whole territory by the government authority to regulating the epidemic. Inversely, European and eastern Mediterranean region having rapid high growth rate of infection of coronavirus. Sharing of the concerned region having more proportion to the total cases in the world and also having high mortality rate due to the spread of COVID-19. 45.20 % of total reporting confirmed cases and 47.13 % deaths occurred in European and Mediterranean region. Iran, Italy, Spain, France and Germany having high level risk of COVID-19. Unite States of America was started spreading of infection due to the domestic activities. India and Indonesia having second stage of spreading COVID-19.

Table 5. Region wise Confirmed cases of COVID-19 acute respiratory disease reported by Various Countries, Data as 30 March 2020		
Country/Region	Confirmed Cases	Deaths
China	82447	3310
Western Pacific Region	21220	338
European Region	392285	23959
South-East Asia Region	4084	158
Eastern Mediterranean Region	46329	2813
Region of the Americas	142081	2457
African Region	3197	60
Others Region/Countries/Territories	869	4
International conveyance	712	7
<b>Grand Total</b>	<b>693224</b>	<b>33106</b>
<b>Source : WHO Daily Reports on COVID-19, Computed by Author</b>		

Figure 4. Countries, territories or areas with reported confirmed cases of COVID-19, 30 March 2020

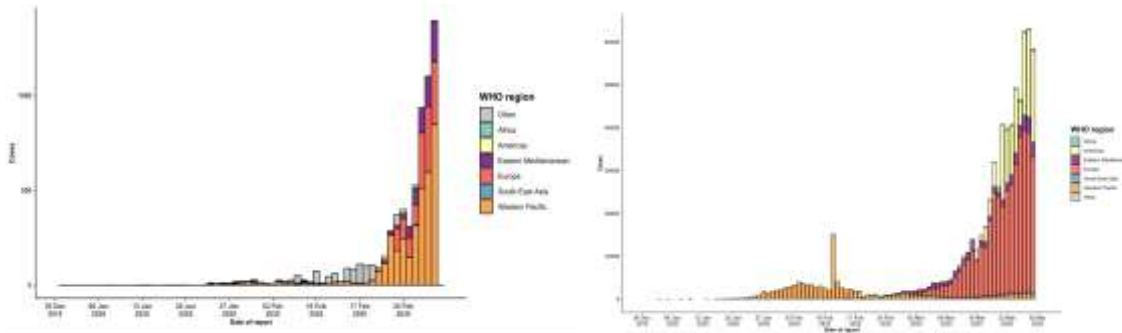


Various countries in the world having third and fourth stage of transmission of COVID-19 (coronavirus) clearly represents with the help of above map and tables. In European and Mediterranean region, Italy, Spain, Germany, France, The United Kingdom and all other countries having high risk level of spreading COVID-19. Spain having high mortality rate, approximately 11 % deaths are observed during the past 24 hours. Highest rate of growing confirmed cases of infection by COVID-19 and total number of deaths occurred Italy. In Italy, rapid transmission of COVID-19, due to the travel history from outside the Italy. Experts are pointing out the, rapid growth of

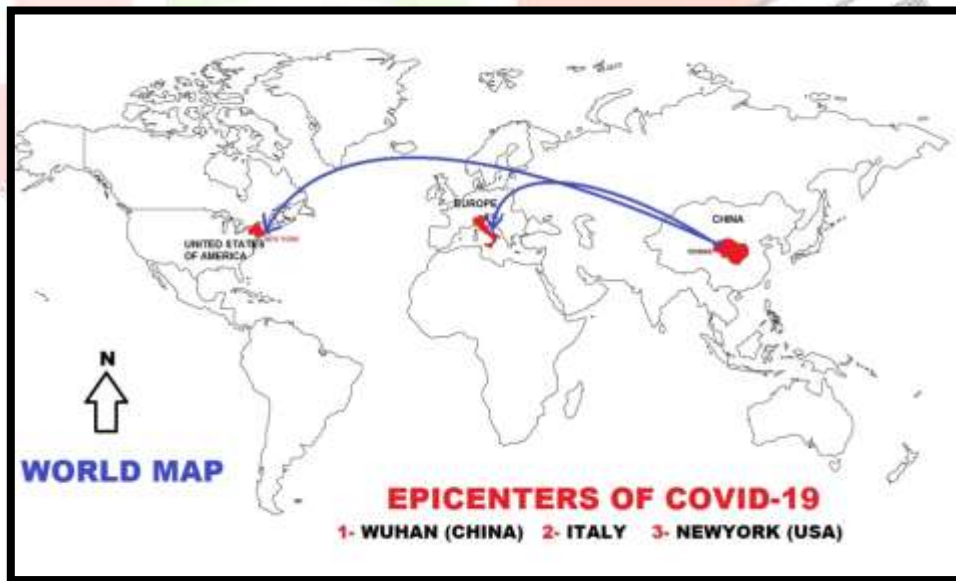
transmission in Italy, due to the organized football match in Bergamo city on 19 February. Bergamo was the new epicenter of COVID-19 (coronavirus) pandemic in the world. From across almost countries of the European region, approximately 40000 peoples are present in stadium for watch the concerned football match. Hence, one of the biggest reason of domestic transmission of COVID-19 in Italy and adjacent countries.

In South-East Asian region, Thailand, Indonesia and India having gradual rate of spreading of coronavirus. India is second populous country in the world. Indian government taking preventive action for better prevention about the regulating infection spreading of COVID-19, whole country had lockdown from the midnight of 26 March 2020. Iran transmitted in third stage of spreading coronavirus. United States of America was arising a new epicenter of the COVID-19. Rapid growth rate of spreading infection of coronavirus in USA during last two weeks. Between 20 to 25 March, added 500 % in confirmed cases and 400 % in total number of deaths due to the COVID-19. Between 25 to 30 March 2020, in USA occurred double growth in infected cases and triple growth in total number of deaths. USA having high risk level of rapidly spreading the infection of COVID-19 pandemic. African region having low rate of transmission of COVID-19.

Figure 5. Epidemic curve of confirmed COVID-19 cases (n=6567) reported outside of China, by date of report and WHO region with complete days of reporting through 29 February 2020 and 30 March 2020



Here is the comparison made with the help of graph which shows the confirmed cases of COVID-19 in around the world. How the changes in trends of spreading infection of coronavirus in various region of the world. First curve describe the situation as on 29 February and second curve displaying condition on 30 March 2020. Western Pacific, European and Eastern Mediterranean region having high rate of spreading COVID-19 in the last week of the month of February. Western Pacific region was the domain area of the origin of COVID-19. Wuhan city was the epicenter of COVID-19. On the beginning of March, European region having rapid growth rate of spreading of COVID-19.



Epicenter was transmit from Wuhan (China) to Italy. In ending of March, third new epicenter was origin in America. New York city of the United States of America was the new epicenter of COVID-19. American region having high risk level of spreading coronavirus.

At globally, almost all of the parts on the earth having infection of coronavirus (COVID-19) epidemic. Now days, a main and red alarming issue are facing all countries in the nature of COVID-19 pandemic. Various countries efforts for controlling disease and stop the human loss on the earth. WHO observed all activities and take necessary action day by day.



As on April 1<sup>st</sup>, 2020, Total confirmed cases of COVID-19 reported at global level was 8,24,563 and death was 40,673. The mortality rate was 4.93 %, that's clearly shows the high mortality was observed due to the pandemic of COVID-19. Recovery of the patients of COVID-19 was 21.14 % (1,74,360 cases) out of total patients in the whole world.

### Conclusion :-

Present research was made on the daily situation report of COVID-19, published by WHO. Data of confirmed cases of COVID-19 and number of deaths are the major tools for the analysis of geographical distribution of infection of coronavirus in various parts of the world. Actually, coronavirus (COVID-19) is natural or man made originated, that is the conflicted issue. Various scientist are working on such subject matter.

Concluding of the proposed research is to identifying the epicenter of COVID-19 and changes in their geographical location. Firstly, Wuhan city of China having epicenter of the pandemic disease. Due to the international travel from China to other parts of the world was the cause of spreading coronavirus (COVID-19). Second epicenter was Bergamo city of Italy. And recently change epicenter of COVID-19 is New York city of United States of America. At present 186 countries are affected by the spreading infection of COVID-19 which is originated from China. Recently domestic travel and local activities are the responsible for growing infection of COVID-19 in all countries of the world. According to WHO, only social distancing is one of the major solution of controlling or regulating or outbreak the spreading chain of COVID-19.

### Acknowledgement :

Researcher acknowledge to World Health Organization (WHO) for their continuously update on coronavirus. Daily situation report published by WHO was very useful for the present analysis. All relevant reports, news from various sources are useful for research. Researcher thanks to all sources those provide information on COVID-19.

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