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COVID 19: A Comparative Study of Asian, European, American continent

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ABSTRACT:
Novel Coronavirus disease – COVID-19 spreads all over the world. Now, at present COVID-19 is spread person to person. Main Transmission source is crowded area and hospitals. Aim of present study is evaluate comparative study of SARS-CoV-2 infected countries in Asia, Europe, and American continent. Present study is based on confirmed case, number of deaths, death rate per 1000 confirmed case and China as model for present study. Study model suggested that death rate per 1000 COVID-19 confirmed case may be ranges from 40 to is 100. In Asian countries like India, Pakistan, Bangladesh where population is high and medical facility is less as compared to Europe so it can be more serious in future. Therefore, lockdown can be play crucial role in COVID-19. This lockdown in countries provide more time to search alternative solution for control of COVID-19 disease and upcoming 3-4 weeks are more critical.

Keywords: COVID-19, SARS-CoV-2, SARS coronavirus

INTRODUCTION

COVID-19 crisis was the outbreak of an ongoing viral pneumonia in the city of Wuhan, China in 2019. Now, COVID-19 spreads in 198 countries and territories around the world have been reported 472,529 confirmed cases and a death toll of 21305 deaths till 26/03/2020. Coronaviruses (CoVs) are named for the crown-like spikes on their surface. These CoVs have enveloped positive-sense RNA viruses and they are characterized into four groups namely alpha, beta, gamma and delta coronaviruses [1, 2]. Seven coronaviruses that can infect people are: 229E (alpha coronavirus), NL63 (alpha coronavirus), OC43 (beta coronavirus), HKU1 (beta coronavirus), MERS-CoV (the beta coronavirus that causes Middle East Respiratory Syndrome, or MERS), SARS-CoV (the beta coronavirus that causes severe acute respiratory syndrome, or SARS) and SARS-CoV-2/ Novel Coronavirus / COVID-19 [3].

Coronavirus (CoV) is well known zoonosis disease but can be reverse zoonosis or animal-to-animal [4-7]. Coronavirus derived from *Paguma larvata* [8], Civet [5], *Paradoxurus hermaphrodites* [9], *Aselliscus stoliczkanus* [10], *Rhinolophus sinicus* [8], Camel [6]. A novel coronavirus (SCoV) is the etiological agent of severe acute respiratory syndrome (SARS).

Recently, it is assume that coronaviruses (CoVs) are originate from bats [11]. More than 66 viruses have been isolated from or detected in bat tissues and these viruses can cause various diseases to humans and other animals [12]. Bats are responsible for transmission of major viruses such as SARS-CoV [8]; Rabies [13]; Ebola [14], SARS-CoV-2 [15].

According to CDC, at present COVID-19 can spread by person-to-person, through respiratory droplets produced when an infected person coughs or sneezes, touching a surface or object that has the virus on it [16]. Further, majority of cases showed close contact in crowed places. Recently, the rapid spread of COVID-19 in South Korean cases more than 55% of the cases associated with the church cluster in Daegu [17]. Previous studies confirmed that nosocomial transmission of SARS was facilitated by the used of various nebulizers, suction, intubation, bronchoscopy, or cardiopulmonary resuscitation on SARS patients [18, 19]. Although viral RNA remained detectable in respiratory secretions and stool and urine specimens for >30 days in some patients,

virus could not be cultured after week 3 of illness [20]. Aim of present study is evaluate comparative study of SARS-CoV-2 infected countries in Asia, Europe, and America.

MATERIAL AND METHODS

Collection of data: COVID-19 confirmed cases and number of deaths are collected from [21]. Seven day data are selected for present study.

Parameters used in study: Three parameters such as COVID-19 confirmed cases, number of deaths, deaths rate per 1000 confirmed cases are used in present study.

Model study: Comparison of above said data in seven days is used for analysis the progress of disease. In comparative study, Asian, European and American continental countries data are compared with China. Where, China is used as control.

Table 1: Confirmed case, deaths and death rate due to COVID-19 in Asian countries

S.No.	COUNTRY	Confirmed case			Deaths			Death rate per 1000		
		A*	B*	C*	A*	B*	C*	A*	B*	C*
1	China	80,967	81,285	0.39	3,248	3,287	1.2	40.12	40.44	0.8
2	Iran	19,644	29,406	49.69	1,433	2,234	55.9	72.95	75.97	4.14
3	South Korea	8,652	9,241	6.81	94	131	39.36	10.86	14.18	30.48
4	Israel	705	2,495	253.9	0	6	NA	0	2.4	NA
5	Turkey	359	2,433	577.72	4	59	1375	11.14	24.25	117.64
6	Malaysia	1,030	2,031	97.18	3	23	666.67	2.91	11.32	288.81
7	Japan (+Diamond Princess)	1,675	2,019	20.54	40	55	37.5	23.88	27.24	14.07
8	Pakistan	478	1,123	134.94	3	8	166.67	6.28	7.12	13.51
9	Thailand	322	1,045	224.53	1	4	300	3.11	3.83	23.25
10	Saudi Arabia	274	900	228.47	0	2	NA	0	2.22	NA
11	Indonesia	369	893	142.01	32	78	143.75	86.72	87.35	0.72
12	Philippines	230	707	207.39	18	45	150	78.26	63.65	-18.67
13	India	223	695	211.66	5	14	180	22.42	20.14	-10.16
	Average	114,928	134,273	16.83	4,881	5,946	21.82	42.47	44.28	4.27

A*= 20/03/2020, B*= 26/03/2020, C*= more variation (%), NA= not applicable

Table 2: Confirmed case, deaths and death rate due to COVID in European countries

S.No.	Country	Confirmed case			Deaths			Death rate per 1000		
		A*	B*	C*	A*	B*	C*	A*	B*	C*
1	Italy	41,035	74,386	81.275	3,405	7,503	120.352	82.98	100.87	21.56
2	Spain	20,412	56,188	175.27	1,041	4,089	292.795	51.00	72.77	42.69
3	Germany	18,588	39,502	112.51	52	206	296.154	2.80	5.21	86.41
4	France	10,995	25,233	129.5	372	1,331	257.796	33.83	52.75	55.91
5	Switzerland	4,906	11,478	133.96	51	169	231.373	10.40	14.72	41.64
6	United Kingdom	3,269	9,529	191.5	184	465	152.717	56.29	48.8	-13.3
7	Netherlands	2,994	6,412	114.16	106	356	235.849	35.4	55.52	56.82
8	Belgium	2,257	6,235	176.25	37	220	494.595	16.39	35.28	115.24
9	Austria	2,491	6,001	140.91	6	42	600	2.41	7.00	190.57
10	Portugal	1,020	3,544	247.45	6	60	900	5.88	16.93	187.81
11	Norway	1,900	3,217	69.316	7	14	100	3.68	4.35	18.12
12	Sweden	1,639	2,554	55.827	16	64	300	9.76	25.06	156.70

13	Denmark	1,255	1,851	47.49	9	34	277.778	7.17	18.37	156.14
14	Czech Republic (Czechia)	774	1,775	129.33	0	6	NA	0	3.38	NA
	Average	113,535	247,905	118.35	5,292	14,559	175.113	46.61	58.73	26

A*= 20/03/2020, B*= 26/03/2020, C*= percentage more variation ((B*-A*)/A*) x100), NA = not applicable

Table 3a: Confirmed case, deaths and death rate due to COVID in North American's countries

S.No.	Country	Confirmed case			Deaths			Death rate per 1000		
		A*	B*	C*	A*	B*	C*	A*	B*	C*
1	United States	16,067	68,594	326.92	219	1,036	373.059	13.63	15.1	10.81
2	Canada	924	3,409	268.94	12	36	200	12.99	10.56	-18.69
3	Panama	137	558	307.3	1	8	700	7.3	14.34	96.42
4	Mexico	164	475	189.63	1	6	500	6.1	12.63	107.16
5	Dominican Republic	72	392	444.44	2	10	400	27.78	25.51	-8.16
6	Costa Rica	89	201	125.84	2	2	0	22.47	9.95	-55.72
7	Guadeloupe	45	73	62.222	0	1	NA	0	13.7	NA
	Average	17,498	73,702	321.2	237	1099	363.713	13.54	14.91	10.09

A*= 20/03/2020, B*= 26/03/2020, C*= percentage more variation ((B*-A*)/A*) x100), NA = not applicable

Table 3b: Confirmed case, deaths and death rate due to COVID in South American's countries

S.No.	Country	Confirmed case			Deaths			Death rate per 1000		
		A*	B*	C*	A*	B*	C*	A*	B*	C*
1	Brazil	651	2,563	293.7	7	60	757.14	10.75	23.41	117.71
2	Ecuador	367	1,211	229.97	5	29	480.00	13.62	23.95	75.77
3	Chile	434	1,142	163.13	0	3	300.00	0.00	2.63	2.63
4	Argentina	128	502	292.19	3	8	166.67	23.44	15.94	-32.01
5	Peru	234	480	105.13	3	9	200.00	12.82	18.75	46.25
6	Colombia	145	470	224.14	0	4	400	0.00	8.51	851.00
	Average	1959	6368	225.06	18	113	527.78	9.19	17.74	93.12

A*= 20/03/2020, B*= 26/03/2020, C*= percentage more variation ((B*-A*)/A*) x100), NA = not applicable

Table 4: Comparison of Confirmed case, deaths and death rate due to COVID-19 in Asian, European, North & South American countries

S.No.	Countries	Confirmed case			Deaths			Death rate per 1000		
		A*	B*	C*	A*	B*	C*	A*	B*	C*
1	Asian	114,928	134,273	16.83	4,881	5,946	21.82	42.47	44.28	4.27
2	European	113,535	247,905	118.35	5,292	14,559	175.113	46.61	58.73	26.00
3	North American	17,498	73,702	321.2	237	1099	363.713	13.54	14.91	10.09

4	South American	1959	6368	225.06	18	113	527.78	9.19	17.74	93.12
5	China	80,967	81,285	0.39	3,248	3,287	1.20	40.12	40.44	0.80

A*= 20/03/2020, B*= 26/03/2020, C*= percentage more variation ((B*-A*)/A*) x100), China as control

RESULTS AND DISCUSSION

After seven days, all data confirmed that COVID-19 incidence in China is constant but in Iran, confirmed cases are increased by 49.69 % and death rate per 1000 confirmed case is 75.97 on 26/03/2020. In Asian country, Turkey COVID-19 confirmed case enhanced by 577.72% and death rate climbed 117.64% within seven days. COVID-19 Death rate per 1000 confirmed case in Indonesia is 87.35 which is not a good sign. Confirmed cases in Pakistan and India are gradually increased. India is second largest population based country and confirmed case increased 211.66% but death rate is reduced 10.16% as compared to previous week data (Table 1).

In European countries like Italy, Spain, France, United Kingdom and Netherlands are major COVID-19 infected countries. In Italy confirmed case and death rate per 1000 confirmed case are increased by 81.27 and 21.56 % respective within seven days. Death rate in Italy is 100.87 which are highest in world. Spain is second highest among COVID-19 affected among European country. In Spain confirmed case increased by 175.27% and death rate per 1000 confirmed case is 72.77 which are quite high. In United Kingdom, COVID-19 confirmed case are 191.5 % and death rate is 48.80 (Table 2). In United States confirmed cases, death cases is increased by more than 326% and death rate per 1000 confirmed case is 15.10 (Table 3a). Among north American country Brazil confirmed case and death rate is increased by 293 and 757% respectively within week but death rate per 1000 confirmed case is 23.41 (Table 3b).

Ratio of confirmed cases, death cases and death rate per 1000 confirmed cased are highest in north American countries and lowest in Asia as compared but Asian countries showed lowest number to china as control (Table 4). Further, in China total death rate is near 40 and condition is now in control but death rate in Italy is 100.87 where condition is worst. If we are ignoring immune system of patient, medical facility and other parameter than death rate per 1000 confirmed cases may be varies from 40 to 100. If disease use same pattern in worldwide than upcoming condition in Europe, United States will be worst due to high numbers of confirmed cases.

Conclusion In present scenario, when numbers of cases are increase continuously then lockdown can be play major role. The lockdown in country provides more time to control the COVID-19. In Asian countries like India, Pakistan, Bangladesh where population is high and medical facility is less as compared to Europe. The numbers of cases in Asian countries are low due to lockdown condition and starting of incidence of COVID-19 is late in Asia. Therefore author assume that condition may be change more quickly in upcoming days and alternative solution of lock down should be search.

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