

Coronavirus Disease-19 Comparison of Mortality Rates in USA, Europe, United Kingdom, and Turkey: A Cross-sectional Study

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ABSTRACT

Introduction: Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) appeared in Wuhan, China, in December 2019. The SARS-CoV-2 infection in human was named as 2019 coronavirus disease (COVID-19). Although we have completed the 1st year of the pandemic, the number of cases and deaths is increasing every day. It is also interesting that the number of COVID-19 cases and mortality rates differ from country to country. In this study, as of December 17, 2020, date of US, European Union countries, United Kingdom, and comparing COVID-19 mortality rate seen in Turkey and aimed to discuss the differences. **Methods:** Our study is a cross-sectional study. In this study, we evaluated the coronavirus statistics dated of December 17, 2020, taken from the Worldometer digital database. Then, the data were analyzed separately and comparatively. **Results:** When we look at the distribution of COVID-19 cases by country, the rate in the first eight countries with the highest number of cases in the world is respectively; USA 23.3% (17.3 million), India 13.3% (9.9 million), Brazil 9.4% (7 million), Russia 3.6% (2.7 million), France 3%, 2 (2.4 million), Turkey 2.6% (1.9 million), United Kingdom 2.5% (1.9 million), and Italy 2.5% (1.8 million). When the COVID-19 data and mortality in USA, European Union countries, United Kingdom, and Turkey are examined; the first three countries with the lowest mortality rate in Denmark (0.8%), Estonia (0.8%), and Turkey (0.9%) were observed. The first three countries with the highest mortality rate were Italy (3.5%), United Kingdom (3.4%), and Bulgaria (3.3%). **Conclusion:** When the COVID-19 mortality rate in USA, European Union countries, United Kingdom, and Turkey was compared, it was found that the highest mortality was in Italy. We thought that the difference in mortality between countries may be due to the elderly population, free access to the hospital, health expenditure of the country, health services, health insurance, and genetic infrastructure in humans. However, further studies are needed to obtain clear data on this subject.

Key words: Coronavirus disease-19, mortality, USA, Europe, United Kingdom, Turkey

INTRODUCTION

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) appeared in Wuhan, China, in December 2019. The SARS-CoV-2 infection in human was named as 2019 coronavirus disease (COVID-19). Although we have completed the 1st year of the pandemic, the number of cases and deaths is increasing every day. It has now infected more than 74 million people worldwide, becoming an epidemic responsible for more than 1.6 million deaths until of December

17, 2020. The COVID-19 pandemic has now turned into a global crisis. Many countries transparently share day-to-day data and take various measures to contain the increase in the number of cases.^[1-3]

The number of deaths related to COVID-19 continues to increase day by day. So much so that COVID-19 deaths in the USA exceeded the number of US military deaths caused by all conflicts since the Second World War. Despite thousands of studies for COVID-19, no definitive cure has yet been found.

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COVID-19 vaccines started to be applied in the USA and other countries as of December 2020. Hopefully vaccines can prevent the pandemic, or this death toll will be just the very sad looking tip of the much larger iceberg that COVID-19 has and continues to cause. Apart from death, morbidity associated with COVID-19 is likely to have long-term effects on patients' health.^[4-6]

It is also interesting that the number of COVID-19 cases and mortality rates differ from country to country. Many hypotheses have been put forward that may be effective in the virulence of COVID-19, which has a high virulence in different climatic conditions, different geographies, different gene pools and different ethnic groups, and despite the studies conducted on this subject, no concrete result has been achieved. In addition to this rapid and almost unstoppable spreading situation, observing different mortality rates in countries has brought some polemics and conspiracy theories. Although the rumors are not widely accepted in scientific circles, as the virus may be artificially produced in a laboratory environment and an out of control biological weapon, they are on the agenda of the society. Further research is needed on this subject. The main elements of combating the epidemic are reducing social mobility and ensuring isolation, applying screening methods, quarantining diagnosed patients and contacts, and providing appropriate treatment. For all these elements to be done completely, the health system in the country must be good. The contribution of the health system and the rate of benefiting from health facilities to the public are one of the most important factors in observing different mortality rates in countries.^[2,7-10]

In this study, as of December 17, 2020, date of US, European Union countries, United Kingdom, and comparing COVID-19 mortality rate seen in Turkey and aimed to discuss the differences.

METHODS

Our study is a cross-sectional study. In this study, we evaluated the coronavirus statistics dated of December 17, 2020, taken from the Worldometer digital database.^[11] The evaluated data are total cases, total deaths, total recovered, active cases, serious or critical cases, total number of COVID-19 cases and deaths per million population, total number of tests performed, total number of COVID-19 tests performed per million population, and country populations. Descriptive data table was created by transferring the data to MS Excel program. Then, the data were analyzed separately and comparatively. In our study, there is no ethical violation since public data and related literature are analyzed.

RESULTS

When we look at the distribution of COVID-19 cases by country, the rate in the first eight countries with the

highest number of cases in the world is respectively; USA 23.3% (17.3 million), India 13.3% (9.9 million), Brazil 9.4% (7 million), Russia 3.6% (2.7 million), France 3%, 2 (2.4 million), Turkey 2.6% (1.9 million), United Kingdom 2.5% (1.9 million), and Italy 2.5% (1.8 million) [Figure 1].

When we look at the results of COVID-19 cases all over the world, it was observed that the death rates were high on February 2, 2020, and then the death rates decreased and recovery rates increased until March 15, 2020. It was determined that the mortality rates increased from March 15 to April 12 and subsequently decreased [Figure 2].

When the COVID-19 data and mortality in USA, European Union countries, United Kingdom, and Turkey are examined; the first three countries with the lowest mortality rate in Denmark (0.8%), Estonia (0.8%), and Turkey (0.9%) were observed. The first three countries with the highest mortality rate were Italy (3.5%), United Kingdom (3.4%), and Bulgaria (3.3%). Other data are shown in Table 1.

When the number of cases per million population was examined, it was observed that the top five countries were Luxemborg, Czechia, Belgium, USA, and Slovenia. When the number of deaths per million population was examined, it was observed that the top five countries were Belgium, Italy, Slovenia, Spain, and UK. The USA was ranked 6th highest [Table 1].

DISCUSSION

In our study, when we look at the number of cases by country all over the world, it is observed that the highest number of cases is in the USA. However, it is surprising that the number of cases is so low, the country with the highest population in the world is China and the epidemic was first observed in China. Further studies are needed to clarify this issue.

In our study, when we examine the death and recovery rates of COVID-19, which was first detected in China in December 2019; it was observed that the death rates were high on February 2, 2020, and then decreased and increased again from March 15 to April 12. It has been determined that the death rates have decreased since April 12. Changes in mortality rates may be due to the number of tests, the number of patients diagnosed with asymptomatic, and the number of elderly population.

The fact that death rates differ from country to country has drawn our attention. There may be different situations that may be effective in the virulence of COVID-19, which has a high virulence in different climatic conditions, different geographies, different gene pools and different ethnic groups, and studies on this subject continue.^[7,8]

Table 1: COVID-19 data and mortality for USA, European Union countries, United Kingdom, and Turkey

Country	Mortality of COVID-19 (percent)	Total cases	Total deaths	Total recovered	Active cases	Serious or critical cases	Cases per million	Deaths per million	Total tests	Tests per million	Population
Denmark	0.8	119,779	975	83,801	35,003	68	20,646	168	8,867,957	1,528,532	5,801,617
Estonia	0.8	19,271	160	12,117	6,994	24	14,523	121	559,105	421,347	1,326,948
Turkey	0.9	1,928,165	17,121	1,691,113	219,931	5,960	22,750	202	21,695,592	255,979	84,755,454
Lithuania	0.9	99,869	907	43,379	55,583	184	36,927	335	1,448,398	535,546	2,704,526
Slovakia	0.9	139,088	1,309	101,584	36,195	310	25,47	240	1,246,580	228,275	5,460,866
Luxembourg	1.0	42,845	421	33,920	8,504	48	67,940	668	1,545,073	2,450,055	630,628
Latvia	1.4	27,495	382	18,153	8,960	41	14,653	204	750,834	400,132	1,876,466
Austria	1.4	330,343	4,764	291,042	34,537	548	36,583	528	3,474,856	384,809	9,030,075
Finland	1.5	31,870	472	7, Ağu	8,898	34	5,748	85	2,251,705	406,100	5,544,699
Croatia	1.6	183,045	2,870	157,773	22,402	294	44,716	701	908,215	221,868	4,093,495
Malta	1.6	11,415	180	9,516	1,719	18	25,821	407	472,902	1,069,706	442,086
Portugal	1.6	358,296	5,815	283,719	68,762	486	35,186	571	5,104,372	501,268	10,182,917
Czechia	1.7	594,148	9,882	516,786	67,480	585	55,434	922	3,405,458	317,728	10,718,163
Netherlands	1.7	177	3	166	8	N/A	6,721	114	3,966	150,598	26,335
Germany	1.7	1,407,487	24,441	1,025,000	358,046	4,836	16,774	291	31,974,158	381,064	83,907,628
USA	1.8	17,392,618	314,577	10,170,735	6,907,306	28,325	52,404	948	226,675,901	682,971	331,896,850
Poland	2.1	1,159,901	23,914	892,650	243,337	1,732	30,663	632	6,768,498	178,931	37,827,409
Slovenia	2.2	100,401	2,190	77,453	20,758	210	48,291	1,053	606,328	291,634	2,079,070
Sweden	2.2	348,585	7,802	N/A	N/A	270	34,417	770	3,718,476	367,138	10,128,268
Romania	2.4	571,749	13,862	469,499	88,388	1,267	29,813	723	4,505,916	234,952	19,177,993
France	2.5	2,409,062	59,361	180,311	2,169,390	2,850	36,869	908	29,368,410	449,469	65,340,247
Hungary	2.6	288,567	7,381	83,940	197,246	574	29,906	765	2,406,171	249,371	9,648,975
Spain	2.7	1,782,566	48,596	N/A	N/A	1,964	38,119	1,039	24,918,644	532,869	46,763,157
Ireland	2.8	77,197	2,140	23,364	51,693	27	15,554	431	2,122,513	427,66	4,963,084
Belgium	3.0	615,058	18,278	42,199	554,581	571	52,963	1,574	6,437,162	554,312	11,612,888
Greece	3.0	127,557	3,870	9,989	113,698	552	12,266	372	3,005,479	289,005	10,399,402
Bulgaria	3.3	186,246	6,196	90,510	89,540	570	26,898	895	1,083,606	156,498	6,924,097
UK	3.4	1,913,277	65,520	N/A	N/A	1,326	28,116	963	48,810,250	717,266	68,050,379
Italy	3.5	1,888,144	66,537	1,175,901	645,706	2,926	31,25	1,101	24,683,230	408,523	60,420,630

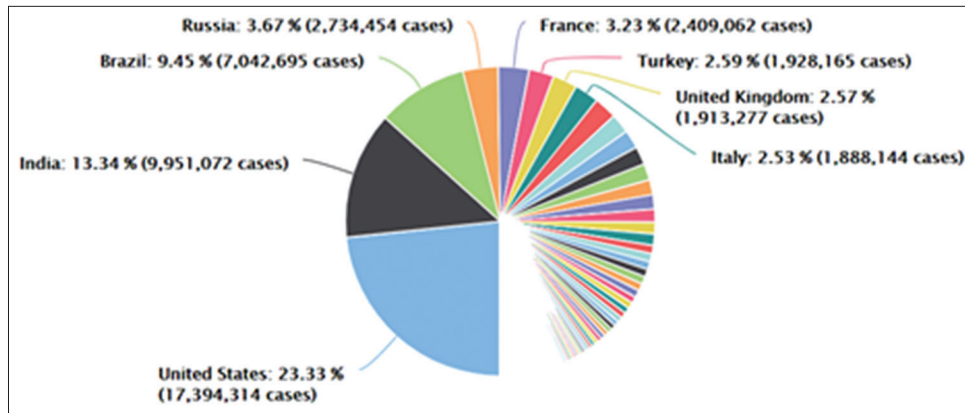


Figure 1: Distribution of coronavirus disease-19 cases by country^[11]

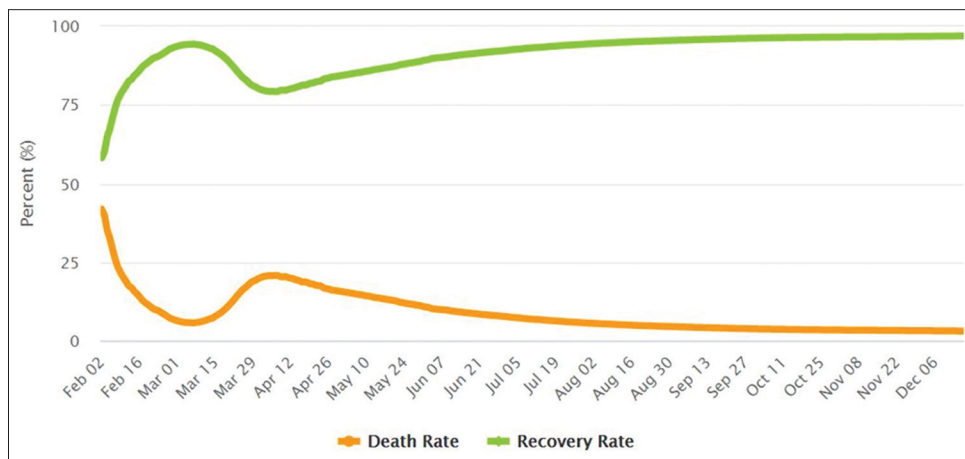


Figure 2: Outcome of total coronavirus disease-19 cases (recovery and death rate)^[11]

One of the issues that have come to the fore in the public is that the disease progresses more seriously in countries with a high elderly population. We analyzed the proportion of elderly population (65 years and over) in the countries included in our research. Elderly population ratio is the highest in Italy and was found to be the lowest in Turkey. There is literature information stating that COVID-19 is more mortal in elderly patients.^[12-14]

In our study, the top three countries with the lowest mortality rate in Denmark (0.8%), Estonia (0.8%), and Turkey (0.9%) were observed. The first three countries with the highest mortality rate were Italy (3.5%), United Kingdom (3.4%), and Bulgaria (3.3%). It was observed that the death rate was high in Italy, where elderly population was high. At the same time, it was observed that the death rate was low in Turkey, where the elderly population was low.

We think that the differences in COVID-19 mortality rates between countries may be influenced by the factors of the country's health expenditure, health services, health insurance, and free access to the hospital. In Turkey, state-sponsored health insurance covers all people. When Turkey

on free access to hospitals factor taken into consideration, this factor can be thought to reduce COVID-19 mortality. Further studies are needed on this subject.

CONCLUSION

When the COVID-19 mortality rate in USA, European Union countries, United Kingdom, and Turkey was compared, it was found that the highest mortality was in Italy. We thought that the difference in mortality between countries may be due to the elderly population, free access to the hospital, health expenditure of the country, health services, health insurance, and genetic infrastructure in humans. However, further studies are needed to obtain clear data on this subject.

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