

Outbreak of coronavirus in Iran compared to countries with the highest incidence

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ABSTRACT

Introduction: The coronavirus outbreak has become a serious issue of the entire world. In some ways, the ability to provide outbreak rate prediction is helpful. Therefore the main purpose of this study is to investigate the incidence pattern of Confirmed COVID-19 Cases in Iran, and comparison between countries with high infected person such as USA, Brazil and others.

Material and Methods: A total of 7801401 infected cases with COVID 19 related countries with highest infection, USA, Brazil, India, Russia, Peru, Chile, Mexico, Spain, UK, South Africa, Iran and Pakistan in 17 weeks timespan was extracted from the Daily New Cases chart at <https://www.worldometers.info/coronavirus/>. Also, the incidence rate pattern was presented. The frequency distribution charts used to compare countries.

Results: In Iran, from the interval of first week to the end of fifth week after observing the 100th case of infection, the trend of identifying patients was upward, and after that, it showed a decreasing tendency until the end of the 10th week. However, it seems that from the 10th to the 12th week, the trend has been increasing and after that it has been almost constant. In countries such as South Africa, India, and Brazil, however, this trend has roughly always been ascending during this period, and in other countries it has been fluctuated.

Conclusion: The Covid-19 has become pandemic disease. Finding similar incidence rate with other countries aimed for applying appropriate intervention is helpful.

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INTRODUCTION

According to the World Health Organization (WHO), the coronavirus outbreak has become a serious issue of the entire world [1]. This virus has infected more than 200 countries and 15,000,000 people and killed 600,000 people so far [2]. The virus has infected all industries, especially healthcare industry and has imposed higher costs for everyone [3, 4]. Coronavirus is increasing in various countries regardless of race, climate and other factors [5]. Since there is currently no cure for the virus, the only solution is to use appropriate prevention strategies. The unpredicted prevalence rate is another problem in reducing transmission [6]. There are many countries that don't have well-developed health care systems, knowledge of the prevalence rate in these countries is very useful. The only information available about the prevalence rate is the use of the prevalence rate in countries with high rates of infection, such as China, which have been infected earlier. By comparing the

prevalence rate with high rate countries and finding similarities, their interventions can be used to reduce the outbreak. This provides more time for a treatment to be developed also helps resource management [7, 8]. Therefore the main purpose of this study was to investigate the incidence pattern of confirmed COVID-19 cases in Iran, and compare with countries with high infected person such as USA and Brazil for finding similarity incidence rate.

MATERIAL AND METHODS

According to the report on July 20, 2020 in world meters info page (<https://www.worldometers.info/coronavirus/>) more than 15 million infected cases with COVID-19 have been identified worldwide. The epidemics in USA, Brazil, India, Russia, Peru, Chile, Mexico, Spain, UK, South Africa, Iran and Pakistan have been the highest, respectively. In this study, the total number of cases per day and per country were extracted based on the Daily New Cases

chart and stored in Excel 2016 worksheets (7801401 cases). Also the study period considered 17 weeks since the hundred infected cases has observed for each country. In this study, day 1 indicate 100 or more COVID-19 infected case had been identified in that country. For Iran Feb 26, USA and Spain, Mar 2, UK, Mar 5, Brazil Mar 13, India Mar 14, Chile and Pakistan Mar 16, Russia Mar 17, South Africa Mar 18 and Mexico Mar 19 was considered as first day. The number of USA patients recorded from Mar 2 to June 29, number of Brazil cases from Mar 13 to Jul 11, number of India from March 14 to Jul 12, number of Russia from Mar 17 to Jul 15, number of Peru from Mar 17 to Jul 15, number of Chile from Mar 16 to Jul 14, number of Mexico from Mar 19 to Jul 17, number of infected Spain from Mar 2 to June 29, number of infected UK from Mar 5 to Jul 2, number of infected South Africa from Mar 18 to Jul 16, number of infected Iran from Feb 26 to June 23 and number of infected Pakistan from Mar 16 to Jul 14 imported to study. The main purpose is to discover incidence rate patterns in the countries with high infection rates. To achieve this, draw a frequency distribution

chart and compare with target countries

RESULTS

Analytical information about the study is observed in Table 1 and Fig 1.

In all countries, in the 1st five weeks after observing the 100th case of the disease, an upward trend is seen in the number of patients. Probably either no intervention has taken place or the effect of the intervention is not seen. In the 1st ten weeks after the 1st case of the disease, the number of patients in the United States, Russia, the United Kingdom, and Iran decreased such that in the 7th week in the United States, in the 9th week in Russia, in the 8th week in the UK, and in the 6th week in Iran the trend decreased compared to previous weeks. While in countries such as Brazil, India, Peru, Chile, Mexico, and South Africa the number of patients was constantly increasing during this period.

Table 1: Frequency for coronavirus outbreak during 17 weeks since the hundred cases has observed.

week	USA	Brazil	India	Russia	Peru	Chile	Mexico	Spain	UK	South Africa	Iran	Pakistan
1	441	489	149	324	278	558	287	554	311	438	2197	592
2	2918	2015	555	341	534	1630	740	6757	1840	644	5120	722
3	29335	4627	2072	4006	1496	2367	1407	18826	5656	369	7169	1440
4	101201	8951	4012	10831	6830	2807	2218	44974	16094	570	7450	1464
5	176523	10894	5906	26019	6022	3000	3654	43687	24403	959	17588	2852
6	193263	15810	8082	34384	10862	3305	6208	30156	30165	1361	14996	4436
7	176146	32385	10974	51710	16182	6847	8626	28575	27464	2222	10291	6169
8	189850	43584	19996	65974	17633	9624	10690	26419	20837	6658	8413	9393
9	178636	57026	22976	58435	22874	16054	14160	17700	26892	5126	6588	9210
10	156475	92698	34146	53486	24496	26968	17966	16362	22910	6261	6313	12476
11	145666	107922	42068	52536	40288	30067	19303	9576	17266	9875	9117	13147
12	138842	147532	54357	52917	24812	33931	88808	4664	13455	15466	11878	26483
13	133454	159643	62981	51957	29256	41486	25679	4029	9706	20913	12562	35559
14	288950	153457	74186	46822	20291	32349	68383	1912	8388	25696	15971	32139
15	136691	194579	97719	41451	21555	25019	29242	2211	7220	39413	15231	21867
16	172986	221299	120312	33402	17505	19533	36238	2163	6286	56522	14501	21962
17	246263	215762	148699	39300	20623	16484	36483	2266	5232	73627	14919	17054

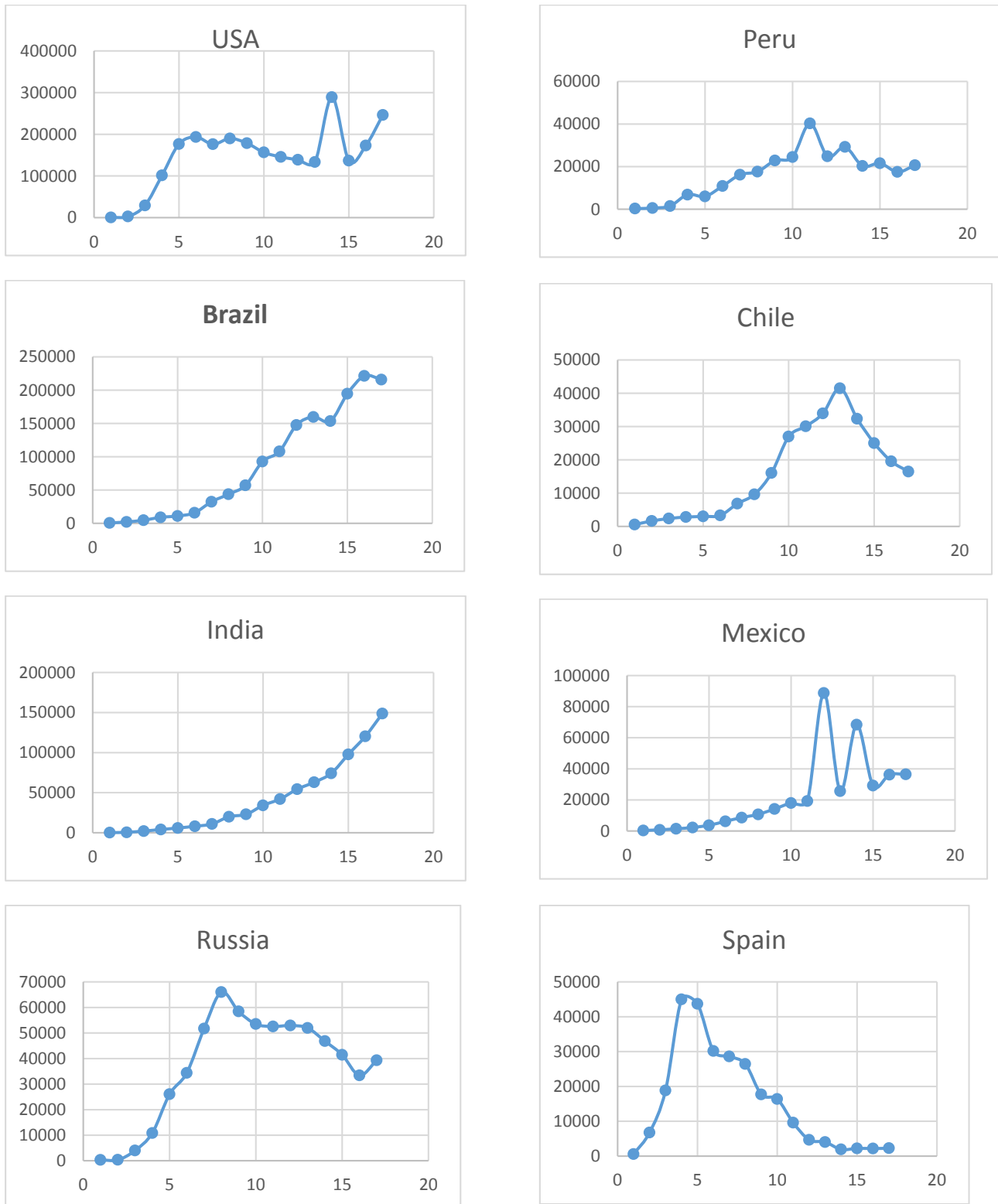


Fig 1: Frequency for coronavirus outbreak in USA, Brazil, India, Russia, Peru, Chile, Mexico and Spain during 17 weeks since the hundred cases has observed

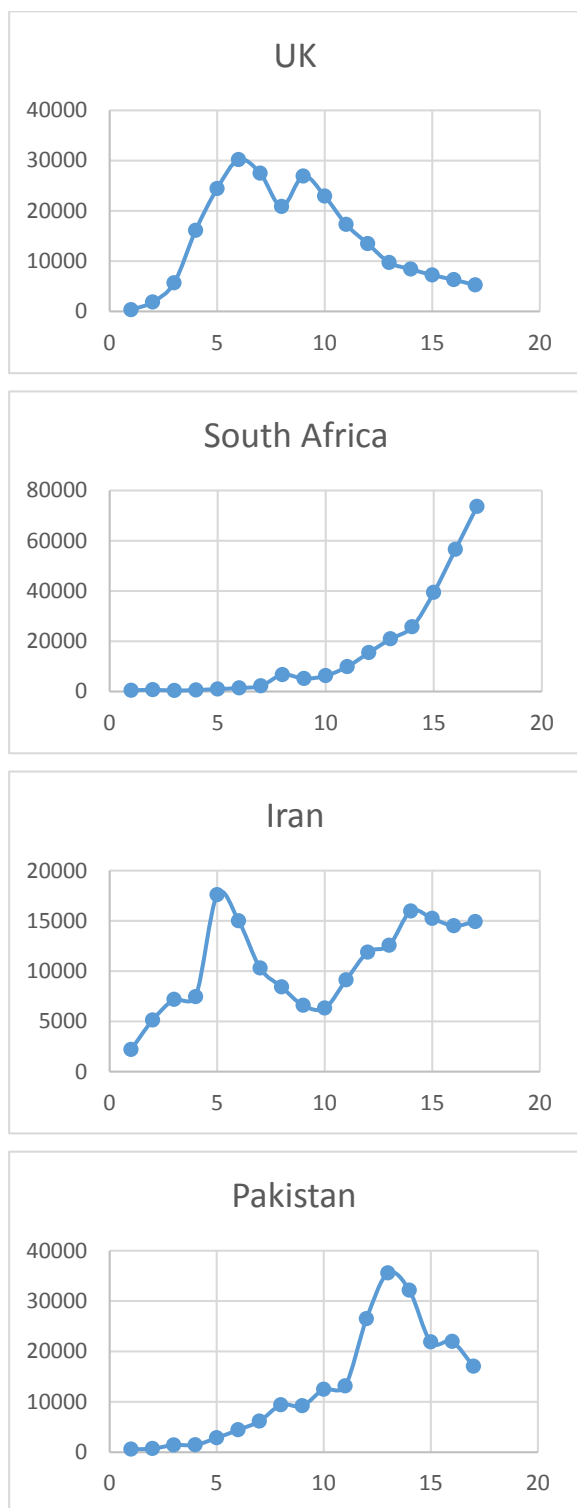


Fig 1 (Continue): Frequency for coronavirus outbreak in UK, South Africa, Iran and Pakistan during 17 weeks since the hundred cases has observed.

Between the 10th and 15th weeks after observing the 100th person with Covid-19, there was an approximately declining trend in India, Russia, Spain,

and the United Kingdom, a nearly upward trend was observed in Brazil, South Africa, and Iran, and in other countries the tendency was oscillating.

DISCUSSION

The Coronaviruses (CoVs) have substantially caused a great concern in the century and rapidly spread throughout the world. The outbreak of coronavirus has resulted in applying useful approach for prevention. Therefore the main purpose of this study was to investigate the incidence pattern of confirmed COVID-19 Cases in Iran, and comparison between countries with high infected person such as USA, Brazil, India, Russia, Peru and others. Findings show in Iran, from week one to the end of week five the trend of identifying patients was increasing, and after that, it showed a decreasing trend until the end of the 10th week. However, it seems that from the 10th to the 12th week, the trend has been increasing and after that it has been almost constant. In countries such as South Africa, India, and Brazil, however, this trend has roughly always been upward during this period, and in other countries it has been fluctuated. Countries with a declining incidence of Covid-19 appear to have used beneficial interventions and methods that were effective in reducing the spread of the disease.

CONCLUSION

It is recommended that other countries, being informed of those interventions, use appropriate strategies to prevent further spread of the disease. Countries can be prepared to face an unpredictable disaster, knowing the incidence rate. Also, the prevention and prediction strategies such as information about the same incidence rate of other countries aimed at applying appropriate intervention is a necessity.

AUTHOR'S CONTRIBUTION

The authors agree on this final form of the manuscript, and attested that all authors contributed in the final draft of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this study.

FINANCIAL DISCLOSURE

No financial interests related to the material of this manuscript have been declared.

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