Original Article

Corona Virus Outbreak in Iran: A Comparison with China, Italy and South Korea in One Month after Infection

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ARTICLE INFO   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 was to investigate the incidence pattern of Confirmed COVID-19 Cases in Iran, and comparison between countries with high infected person such as China, Italy and South Korea.

Method: In this cross sectional study 126789 infected cases with COVID 19 related countries with highest infection, China, Italy, Iran and South Korea in 30 day timespan was extracted from the cumulative frequency chart at https://www.worldmeters. Info/coronavirus/. The incidence rate pattern was presented.

Results: The findings show the frequency pattern of the infected person's frequency within 30 days since the first case has observed in Iran are similar. Although incidence rate coronavirus is similar to other countries in during 14 days, but after the 14th day, there is a noticeable difference between the obtained pattern of confirmed cases in Iran and other countries. There is a spectacular difference in the number of patients in Iran and South Korea after the seventh day and between Iran and Italy after the fourteenth day.

Conclusion: The Covid-19 quickly spread across the world and caused varying challenges. Thus the prevention strategies aimed at reducing transmission in the community are a necessity.

Introduction

Nowadays concern is growing about Coronaviruses (CoVs), because it is rapidly spreading throughout the world (1). According to the World Health Organization (WHO), the coronavirus outbreak has become a serious issue of the entire world (2). This virus of bat origin (3) has infected more than 200 countries and more than 21 million people so far (4).The virus has affected all industries, especially healthcare industry and has imposed higher costs for everyone (5, 6). Coronaviruses (CoVs) or coronavirus disease 2019 (Covid-19) the members of the family Coronaviridae are enveloped viruses with a positive sense, single-stranded RNA genome (7) that replicates in the cytoplasm (8). Coronavirus particles contain four main structural proteins. These are the spike (S), membrane (M), envelope (E), and nucleocapsid (N) proteins (9). Initial

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symptoms of the disease can include a respiratory infection, mild fever, cough (dry), sore throat, nasal congestion, malaise, headache, muscle pain, or diarrhea is present (10,11). The Computed Tomography (CT) findings have been recommended for clinical diagnosis of COVID-19 (12, 13). At present, real-time reverse-transcription–polymerase-chain-reaction (RT-PCR) assay for COVID-19 has been used (14). The coronaviruses mainly can be transmitted by close contact with Human or respiratory droplets (15). Although some effort has been made in vaccines, such as Oxford vaccine or etc., but there is no specific treatment or vaccine against COVID-19 infection in humans (16). China was the first country to experience the recent outbreak of the coronavirus, Became a diffusion intermediate within a few months for many countries. Iran linked to passengers traveling from other countries. Hence the virus arrived in Iran for the last three to four weeks and is now widely spread throughout Iran. Therefore, Iran is now the epicenter of the coronavirus in the Middle East. On the other hand Sanctions and also medical needs make it highly complicated to control of viruses and transmission inhibition .Although, health workers are dedicated to taking care of patients, due to lack of medical resource, unawareness the future outbreak rate for politicians and health care providers is very worrying issue. The major concerns already in Iran about the unavoidable spread of viruses were reinforced. Also, there was clear indication were not being met. This is likely because the outbreak went undetected. In some ways, the ability to provide outbreak rate prediction is helpful. The key strategy for managing the COVID-19 pandemic is trying to limit the spread of cases. This provides more time for a treatment to be developed also helps resource management (17). The

epidemiological modelling and situation analysis are valuable tools to identify the trends of disease incidence, mortality, risk factors and impressions of interventions (18). But at present most predictions assumed an identical pattern of incidence in Iran and China. Therefore the main purpose of this study was to investigate the incidence pattern of Confirmed COVID-19 Cases in Iran, and comparisons between countries with high infected person such as China, Italy and South Korea after one month.

Method

In this cross sectional study, according to report on July 21, 2020 in world meters info page (https://www.worldmeters. Info/coronavirus/) more than 14881625 infected cases with CVID-19 have been identified worldwide. The epidemics in China, Italy, Iran and South Korea have been the highest in the first month, respectively. In this study, the total number of cases per day was extracted based on the cumulative frequency chart and stored in Excel 2016 worksheets (126789 cases). Also the study period considered the number of infected people from day 1 (when the outbreak was first reported) to day 30 for each country. The number of Chinese patients recorded from January 22 to February 20, number of Italian cases from February 15 to March 15, number of South Korean from Feb.15 to Mar 15 and the number of infected Iranian from Feb19 to Mar 19 imported to study. The incidence rate pattern was presented.

Result

Frequency for coronavirus outbreak in China, Italy, South Korea and Iran during first 30 days of 2020 outbreaks can be seen in Table 1:

Table 1. Frequency for coronavirus outbreak in China, Italy, South Korea and Iran during first 30 days of 2020 outbreaks

Day	#China	#Italy	#South_Korea	#CIK	#Iran
1	571	3	28	602	2
2	259	0	1	260	3
3	457	0	1	458	13
4	688	0	1	689	11
5	769	0	27	796	14
6	1771	1	53	1825	18
7	1459	17	98	1574	34
8	1737	58	227	2022	44
9	1981	78	166	2225	106
10	2099	72	231	2402	143
11	2589	94	144	2827	205
12	2825	147	284	3256	385
13	3235	185	505	3925	523
14	3884	234	571	4689	835
15	3694	239	813	4746	586
16	3143	573	586	4302	591
17	3385	335	599	4319	1234
18	2652	466	851	3969	1076
19	2973	587	435	3995	743
20	2467	769	663	3899	595
21	2015	778	309	3102	881
22	14108	1247	448	15803	958
23	5090	1492	272	6854	1075
24	2641	1797	165	4603	1289
25	2008	977	35	3020	1365
26	2048	2313	242	4603	1209
27	1888	2653	114	4655	1053
28	1749	2548	110	4407	1178
29	391	3499	107	3997	1192
30	889	3593	76	4558	1046

"CIK: Chine, Italy and Korea"

Frequency distribution of corona virus cases in Iran, Italy, South Korea and China during the first month is shown in the Figure1.
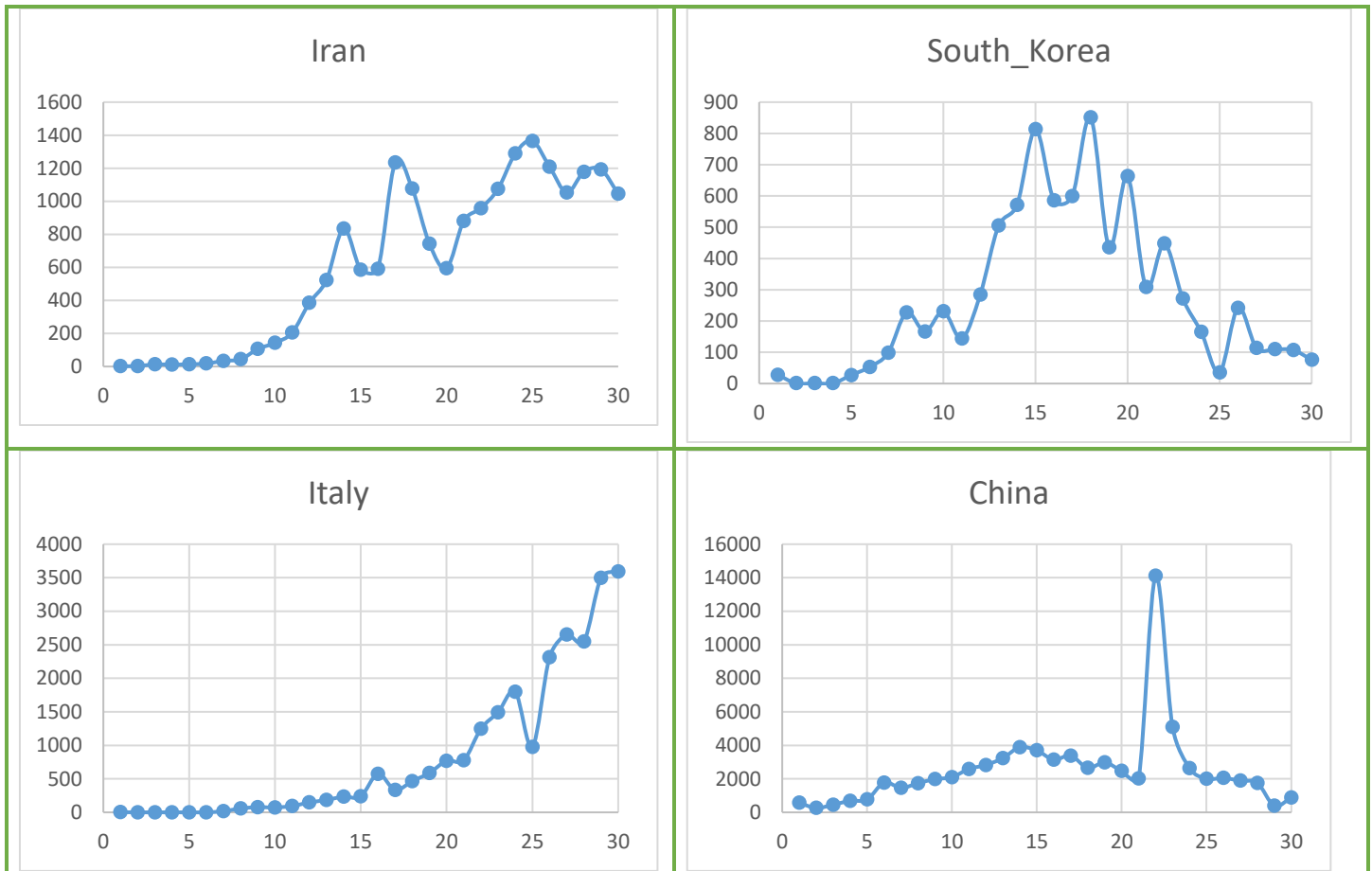
Figure 1. Frequency distribution of corona virus cases in Iran, Italy, South_Korea and China during first month

At the first glance it is evident that the number of confirmed cases in Iran shows a rising trend until the end of March. Meanwhile, after March 12, the number of patients identified per day was almost constant, which could be related to the interventions and the end of the Iranian holiday, but after the end of the official holiday, there is increased dramatically in infected cases. The number of confirmed patients on days 1 to 7 in the Italy has been almost constant, while in Iran this rate is accompanied by an overall increasing trend with changes on different days. From 7 to 30 days in Italy, this trend has been dramatically increased, but in Iran, there have been changes during this period. The number of

confirmed patients on days 1 to 5 in the China has been almost constant, there have been changes until day 21, this trend has been considerably increasing on day 21 and that have steadily trend on day 30. While in Iran this rate is accompanied by an increasing trend after day 26 and there is no similarity to that. The number of confirmed patients on days 1 to 5 in the South_Korea has been almost constant, there have been changes until day 19, this trend has been drastically increasing on day 19 and that have almost descended trend on day 30. Although incidence rate coronavirus is similar to other countries in during 14 days, but after the 14th day, there is a noticeable difference between the obtained pattern of confirmed cases in

Iran and other countries. These Figures show differences between the pattern of the number of confirmed patients between Iran and South Korea after day 7 and between Iran and Italy after day 12.

Discussion and Conclusion

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 China, Italy and South Korea during the first one months. Findings show incidence rate coronavirus is similar to other countries in during 14 days, but after the 14th day, there is a noticeable difference between the obtained pattern of confirmed cases in Iran and other countries. It seems appropriate intervention is not used. Also there were great difference about the pattern of the number of confirmed patients between Iran and South Korea after day 7 and between Iran and Italy after day 12. These research findings can be useful to think about prevalence factors or intervention. There are many countries that don't have well-developed health care systems, Knowledge of the prevalence rate in these countries is very useful. All about the community should be focused to degrade the transmission of viruses and their impacts. The spread of the infection suddenly leads to decline in health care delivery and decrease quality care, mismanagement and inadequate medical resources for patients. Because of lack of previous experience with the coronavirus, Health care providers are having problems. Knowing the incidence rates and

used interventions in other countries can also be applied to reduce the spread and can be helpful approached. In different studies, using the prevalence rate in different countries such as Korea, Italy and Iran, they were able to predict the rate of infection in the coming months (17-20). In some studies, the prevalence rate has been used to compare countries with high incidence (21). Pattern incidence provides more time for discovering vaccine and apply appropriate interventions.

Conflicts of interest:

All authors have no conflicts of interest to disclose.

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