Low Reported COVID-19 Cases in South Asian Countries: A Luck of Nature or A Ticking Time Bomb

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Abstract

Objective Purpose of the current study was to find the trend in progression of COVID-19 among South Asian countries as compared to more developed western countries. Method COVID-19 data of South Asian countries was taken for this observational study. Data was taken up to 21 st April since the outbreak of the virus. There were 4 out of 7 countries which passed through the inclusion criteria and included for analysis. Results Increase in average weekly reported cases after 5 th week since first case reported was exponential. Correlation between reported cases and tests performed was found strong and significant (r=0.90, p-value=0.037). However, on average 315.25 tests per million population was performed which was at least 12 times lower than the tests performed in the countries having large number of COVID-19 cases. Conclusion At present, number of reported cases from South Asia was found extrememly lower than western countries. However, it could be due to a smaller number of tests performed. Hence, increase in strength of performing diagnostic tests is highly recommended. Strict measures are required to be taken to make the people of these countries to follow the instructions of social distancing and comply with preventive measures.

Introduction

Any outbreak of an infectious disease or a natural disaster on a large scale, which spreads over a large geographical area leading to morbidity and mortality, is known as a pandemic. Evidence suggests that the likelihood of pandemics has increased over the past century because of an increase in global travel, urbanization, and greater exploitation of the natural environment [1]. Consequences of pandemics are multidimensional, have an impact on global health, socioeconomic conditions, and political implications [2]. The recent outbreak of coronavirus disease (COVID-19) was reported in the Huanan Seafood Market in Wuhan, China. China is therefore considered as the epicenter of the disease. However, in the current scenario, some European countries and the United States (US) have become new epicenters of the disease. Individually, these countries have more than twice the number of reported cases when compared to China. Meanwhile, their death toll is at least five times greater than in China [3]. During the second week of March, the COVID-19 outbreak was declared a pandemic by the World Health Organization (WHO) [4].

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that causes COVID-19, belongs to the same family of corona viruses that includes the Middle East respiratory syndrome virus (MERS-CoV) [5]. Signs and symptoms of COVID-19 include respiratory symptoms, fever, cough, and shortness of breath. These breathing difficulties can worsen over time, and the disease can lead to complications such as: pneumonia, severe acute respiratory syndrome, kidney failure, and even death. People with low immunity and underlying systemic diseases are more prone to SARS-CoV-2 infection [6]. This is why the highest death rates are reported in the elderly population among those who were infected by COVID-19 [7].

Various precautionary methods have been adapted by countries to control and stop the spread of COVID-19. A few such measures include hygiene maintenance, public awareness, partial lockdown, complete

lockdown, and even the imposition of curfews [8]. Currently, social distancing is the only recognized way to prevent the spread of the virus. Hence, countries are making decisions based on their circumstances and the experiences of other countries. Based on data extracted from the WHO database, the progression of the disease and deaths in various regions and countries differ [9]. Statistics show a high number of reported COVID-19 cases and deaths in some European countries and in the US as well. The first confirmed case of COVID-19 was reported on 15th of February 2020 in some South Asian countries like India and Sri Lanka while in Pakistan and Bangladesh first confirmed case was reported on 26th February and 8th March respectively. The trend in average weekly increases in reported cases remained untested. Therefore, the objective of the current study was to find the trend in the progression of COVID-19 among South Asian countries compared to more developed Western countries.

Materials And Method

This observational study was conducted between April 20 and April 22, 2020. The study included COVID-19 data available from worldometer® [10]. Data was extracted from the date of the first COVID-19 case reported up until April 21, 2020. Data was extracted for all South Asian countries that were affected by the current outbreak. Only countries with at least 100 reported cases by April 21, 2020 were included in the study. Hence, a total of four out of the seven countries were included in the study: India, Pakistan, Sri Lanka, and Bangladesh.

The variables taken from the data source were: (1) total reported cases, (2) total deaths, (3) total recovered, (4) number of cases with outcome, (5) number of serious/critical cases, (6) total cases per one million population, (7) total tests performed, and (8) total tests performed per one million population. Furthermore, a few more variables were calculated using the extracted data and variables. The total outcome was calculated by adding the total number of deaths and the total number of recoveries. Percentage of deaths was calculated by using the equation [total deaths / (total deaths reported + total recovered) x 100%], the percentage of recovered cases was calculated as [total recovered/ (total deaths reported + total recovered) x 100%], the percentage of critical cases as “number of critical cases/active cases × 100%”, and the ratio of the number of cases tested by dividing the total number of cases by the total number of tests performed. The weekly number of cases reported after the first case reported until April 21, 2020 was also extracted from the data

source. For the descriptive comparison of the present study's findings of countries with a high number of COVID-19 cases, some of the statistics are summarized in Table 1 [10].

Table 1: Data for COVID-19 extracted from worldometer® [10].

Countries	No. of reported cases	No. of deaths reported	No. of recovered cases	No. of tests performed per million	Population (per km^2)
US	792,938	42,518	72,389	12,167	36
Spain	204,178	21,282	82,514	19,896	94
Italy	181,228	24,114	48,877	23,122	206
France	155,383	20,265	37,409	7,103	119
UK	124,743	16,509	N/A	7,386	75
China	82,758	4,632	77,123		153
Turkey	90,980	2,140	13,430	7,991	110
Iran	83,505	5,209	59,273	4,203	52

The statistical package for social sciences (SPSS v. 23) was used for the analysis. Descriptive statistics included the calculation of averages and standard deviations as well as line graphs to present the number of weekly reported cases in each country. In inferential statistics, a simple linear regression was used between total cases (dependent variable) and total tests performed (independent variable). The Wilcoxon signed-ranks test was used to analyze the weekly increase in COVID-19 cases.

Results

The total number of reported COVID-19 cases in South Asian countries by April 21, 2020 were 31,565 of which 5,526 (17.5%) recovered. The number of reported deaths was 901. Among South Asian countries, India had the highest number of positive COVID-19 cases (18,658; 59.1%), followed by Pakistan (9,216; 29.2%), Bangladesh (3,382; 10.7%), and Sri Lanka (309; 1%) (Table 2). The percentage of reported deaths was highest in Bangladesh (55.84%), followed by India (15.32%), Sri Lanka (6.54%), and Pakistan (8.5%).

Figure 1 shows the exponential growth in the number of reported cases among the South Asian countries after the fourth to fifth week since the start of the disease. A sharp increase was observed in reported cases in India from the sixth week onwards. In Pakistan, the number of reported cases was also found to increase at the start of the fourth week. However, the spread of the virus was not as rapid in Bangladesh and Sri Lanka, as was found in the Indian and Pakistani populations. A comparison of the average number of reported cases in each week with the previous week revealed that the average increase in cases was not statistically significant except between 5th and 6th week (z-value -2.02, p-value 0.043). Figure 2 presented descriptive comparison of the average number of confirmed cases between two consecutive weeks.

On average, 315.25 tests per million population were performed in the countries included in the current study. A correlation between the total reported cases and the total number of tests performed was found. The data revealed a very strong, direct, and statistically significant correlation (r=0.90, p=0.037). The Bangladeshi population had the highest percentage of tested positive cases in relation to the total number of tests performed (12.71%), followed by Pakistan (8.24%), Sri Lanka (4.78%), and India (4.65%).

The regression model between the number of tests performed (independent variable) and total number of cases reported (dependent variable) demonstrated a very strong R-square value 0.925 with significance of the model (p =0.025). The predicted values of constant and slope for the model were 1442.4 and 0.045, respectively. Hence, the regression equation can be written as

No. of cases reported = 1442.4 + 0.045 (No. of tests performed)

Table 2: Country-wise extracted and computed variables after inclusion criteria for South Asian countries

Countries	Cases	Deaths	Recovered	OUTCOME	Death (%)	Recovered (%)	No. of tests performed per million pop.
India	18,658	592	3,273	3,865	15.32	84.68	291
Pakistan	9,216	192	2,066	2,258	8.50	91.50	506
Sri Lanka	309	7	100	107	6.54	93.46	302
Bangladesh	3,382	110	87	197	55.84	44.16	162

Discussions

Current data suggest that recent pandemics' origins are associated with a zoonotic mode of transmission from animals to humans [11]. Animal to human transmission was presumed to be the main route of transmission for SARS-CoV-2, since the first reported case of COVID-19 was linked with direct exposure to the Huanan Seafood Market in Wuhan, China. Nevertheless, the subsequent cases that were reported did not follow this mechanism [12]. Therefore, it was concluded that SARS-CoV-2 could also be transmitted through aerosol, human to human (symptomatic/asymptomatic), and surface to human contact [13].

As of April 21, 2020, there had been over 2.5 million reported cases of COVID-19 in 210 countries across six continents. At the beginning of this pandemic, China (82,758) was affected the most by the disease; however, later the US (792,938), Spain (204,178), Italy (181,228), France (155,383), Turkey (90,980), and Iran (83,505) had the most COVID-19 cases worldwide. The number of reported cases has since started to increase in South Asian countries (India, Pakistan, Sri Lanka, and Bangladesh). The initial cases reported in South Asian countries were thought to be caused by travelers returning from other COVID-19 affected countries. Although, by the date (21st April, 2020), the total number of reported cases in South Asian countries is not as high as it was in the US, Italy, Spain, France, and Iran (Table 1). However, the weekly growth in the number of reported cases (up to the eighth week) in South Asian countries is quite similar to the increase in the number of reported cases in the US, France, and the United Kingdom (UK).

Based on the preparedness index formulated by Greenhill and Oppenheim, which defines the ability of a country to curtail any pandemic [14], the spread risk of this pandemic is higher in South Asian developing countries than in developed countries [15]. A few of the factors that contribute to a higher spread risk of the pandemic include population density, susceptibility to infection, patterns of movement driven by travel, trade, and migration, the speed and effectiveness of public health surveillance and response measures, and the socioeconomic status of the country [15]. Three out of four countries included in the current study fall under the top ten most populated countries in the world [16-18]. Furthermore, the per km^2 population in Bangladesh, India, and Pakistan is more than any country listed in Table 1. In addition, a large number of people in these countries live in slums [16-18], which makes it difficult to maintain social distancing and to adopt preventive measures. Furthermore, poor education and extreme poverty

are other factors that make it more difficult to follow social distancing instructions, or early disease identification of symptoms of COVID-19. A report from Pakistan showed an increasing number of cases where people died due to COVID-19 before reaching a hospital [19].

To date, there has been a total of 2,505,858 reported cases of COVID-19 worldwide, with a lower number of reported cases (31,608) and reported deaths (901) in South Asian countries compared to other regions of the world. There have been many hypotheses related to this lower reported COVID-19 cases and deaths. Some of the theories included stronger immunity, warmer weather, childhood BCG vaccinations, and exposure to anti-malaria medications. From the data collected from the worldometer® website, the authors believe that the lower number of reported cases in the South Asian countries could be due to the lower number of diagnostic tests performed for COVID-19 virus compared to countries that have reported a higher number of COVID-19 cases. India (18,658) and Pakistan (9,216) have the most COVID-19 cases in South Asian countries, with 291 and 506 tests performed per million population, respectively. The number of tests (per million) performed in India and Pakistan is significantly lower than in the US (12,167), Spain (19,896), Italy (23,122), France (7,103), and the UK (7,386). Even countries in Asia with the highest number of COVID-19 cases, Turkey (7,991) and Iran (4,203), have a higher number of tests performed per million population. In South Asia, on average, 315.25 tests per million population were performed; this is at least 12 times lower than the number of tests performed in the epicenters of COVID-19.

Accountability for preparedness in these countries is diffuse, and many countries that are at the greatest risk have the most limited capacity to manage and mitigate pandemic risk. In addition, these countries need to perform the virus diagnostic tests in greater numbers to get an accurate picture of the pandemic. Based on the data, one could suggest that the low number of reported cases but with high percentage increases for South Asian countries could be a ticking time bomb waiting to explode, and this region could be the next highlighted region of this current pandemic.

Conclusion

Although the current number of reported cases and reported deaths from South Asia suggested that the spread of COVID-19 is not as high as it was in many other countries. However, a comparison of statistics and population characteristics does not portray a good picture for the future. Therefore, the following conclusions can be drawn:

1. One side of the picture is a lower number of reported cases and deaths, but the other side of the picture suggests a large number of cases that are prevailing in the society that are unidentified and undiagnosed. Hence, identifying the spread of the disease by increasing the number of diagnostic tests is highly recommended.
2. Governments in these countries are required to take strict measures such as partial or complete lockdowns in order to maintain proper social distancing, since a high population density coupled with low education levels and low disease awareness could lead to a new disease epicenter.

Declarations

Ethics approval and consent to participate

Not Applicable

Consent for publication

Not Applicable

Availability of data and materials

1. The main dataset analyzed during the current study is available on Worldometer coronavirus. [Accessed 2020 Apr 21].

Available at https://www.worldometers.info/coronavirus/

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

Khan SQ: Conceptualization, Methodology Literature review, data analysis, article writing, overall supervision

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Farooqi FA: Data analysis, Validation, Article writing and Formatting

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Figures

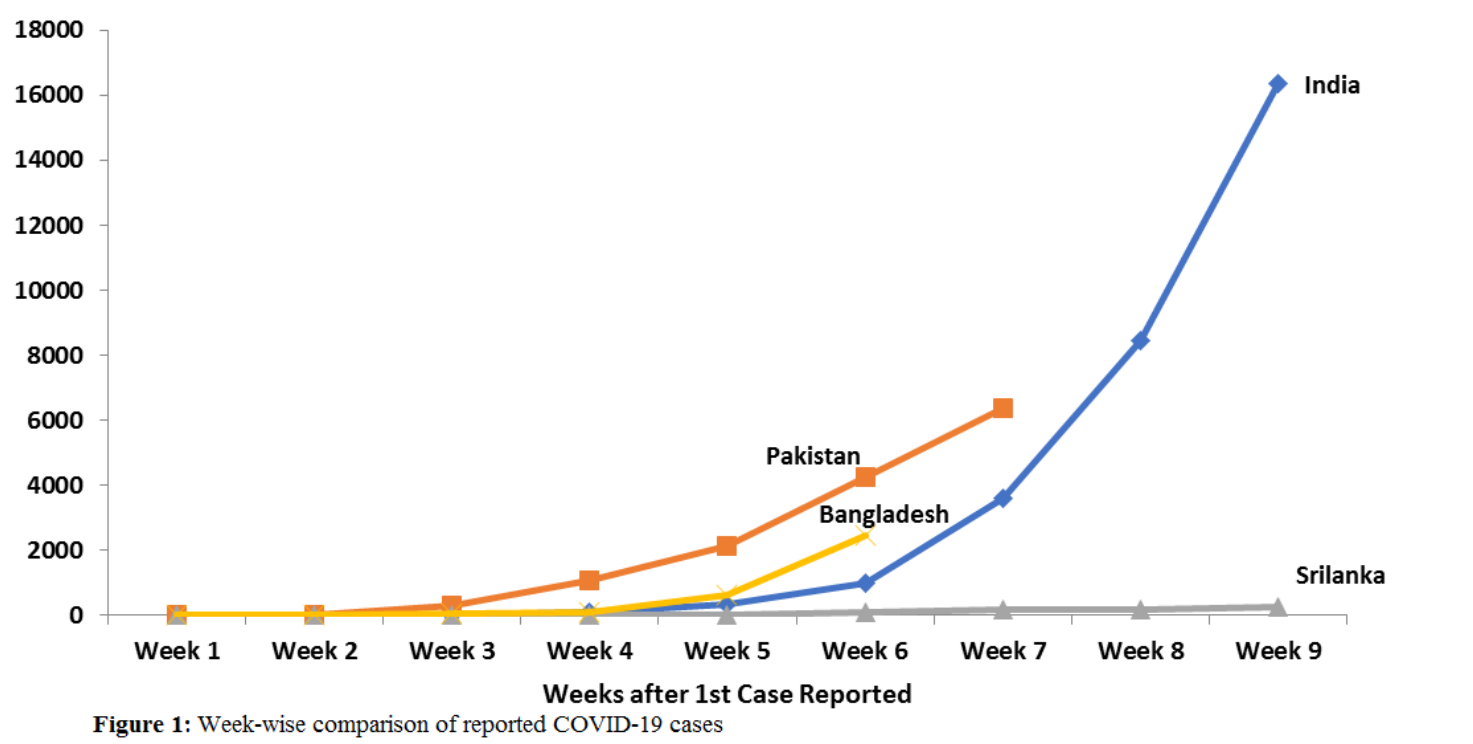

Figure 1

Week-wise comparison of reported COVID-19 cases

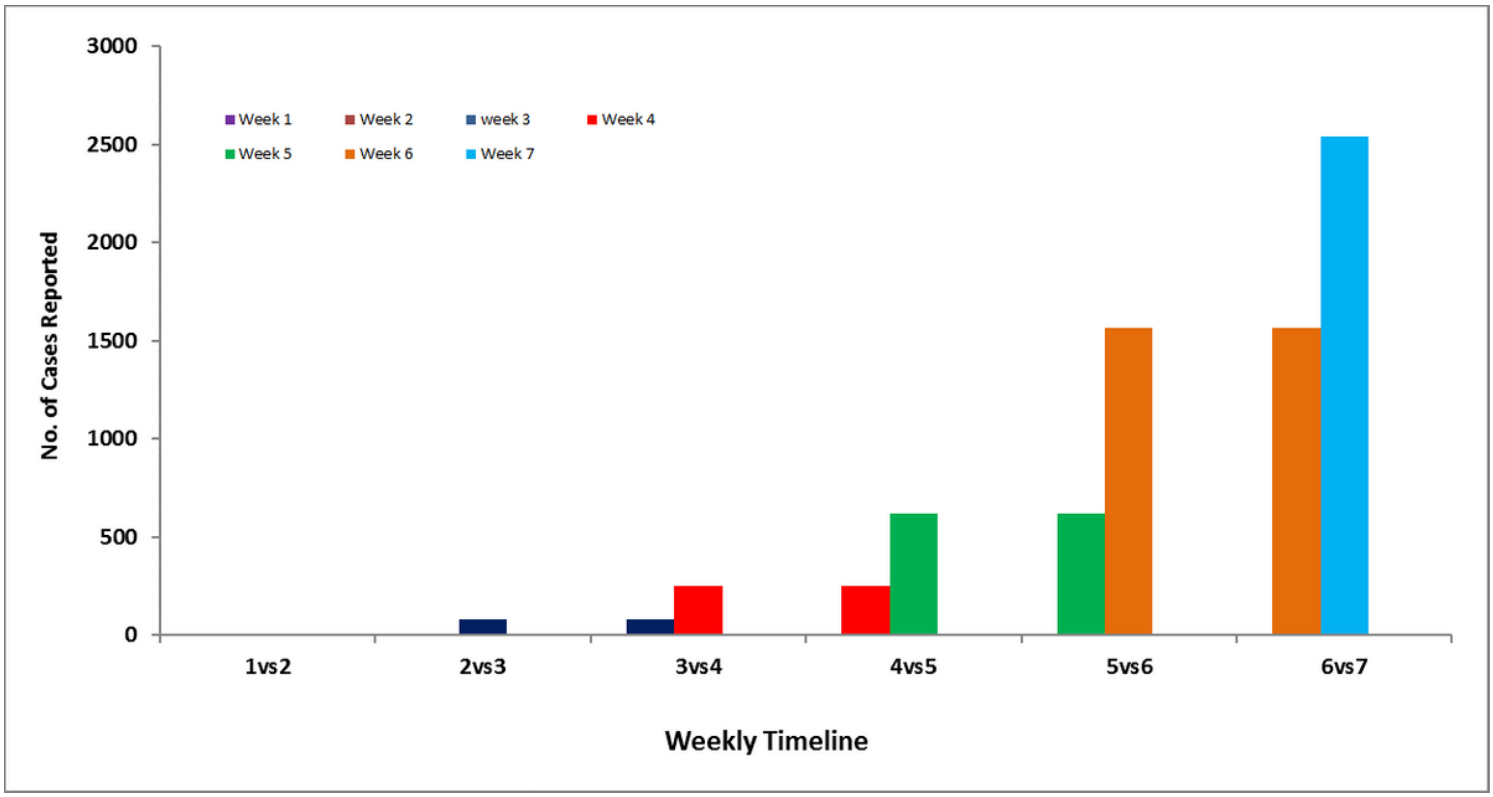

Figure 2

Week wise comparison of reported cases for South Asian countries