

*Review Article*

## **COVID-19 Pandemic in South Asia: Challenges and Mitigation**

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### **ABSTRACT**

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has already reached almost every corner of the earth. We are currently left with very limited options to battle the pandemic with containment and to provide supporting care. This review article summarizes the current situation and the future prospect of the pandemic in one of the most populated regions on the globe, South Asia. Although COVID-19 cases have been steadily increasing in many countries, the overall response in this region is polarizing but highly criticized. India is now hosting the world's second most infected cases while Maldives and Bhutan have almost kept it under control. Most of these countries have very underwhelming healthcare facilities, and the number of RT-PCR based coronavirus tests is very insignificant so far with respect to the extent of the population. There are various challenges ahead with agriculture and export-based economy, hygiene problem and imminent dengue outbreaks in some region. With the recent clearance of Pfizer-BioNTech and Moderna vaccines, challenges remain for the South Asian countries to ensure vaccines for all their citizens and develop proper storage and transportation facilities.

The countries have to opt for some extremely proactive measures to not only save its people but secure the economic longevity for the post-pandemic period.

### **Abbreviations**

Coronavirus Disease 2019 (COVID-19); Severe Acute Respiratory Syndrome Coronavirus (SARS CoV-2); Middle East Respiratory Syndrome Coronavirus (MERS-CoV); Real-Time Polymerase Chain Reaction (RT-PCR); World Health Organization (WHO), South Asian Association for Regional Cooperation (SAARC); Institute of Epidemiology, Disease Control and Research (IEDCR); United Nations (UN); Global Alliance for Vaccines and Immunization (GAVI); National Disaster Management Authority (NDMA); Health Protection Agency (HPA); Real-Time Quantitative Polymerase Chain Reaction (RT-qPCR); Center for Disease, Dynamics, Economics and Policy (CDDEP); Intensive Care Unit (ICU); South Asia Food and Nutrition Security Initiative (SAFANSI).

### **Keywords**

COVID-19 pandemic, lockdown, South Asian countries, healthcare facilities, internet connectivity.

## SUMMARY

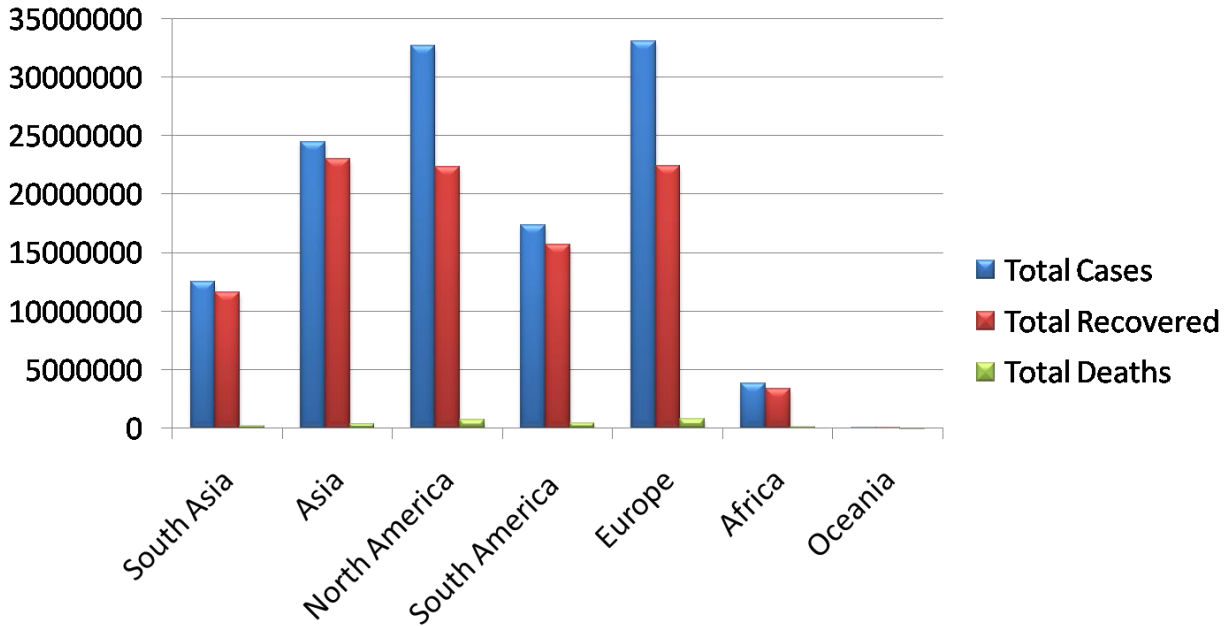
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### 1. Introduction

Struggle to dispose of COVID-19, the ongoing global pandemic caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), is becoming harder with time for people from all sectors of life<sup>1,2</sup>. The outbreak originating from Wuhan City of Hubei Province in China has now hit across the whole globe and has caught hold of almost every nation in the world today. SARS-CoV-2 is only the third coronavirus that has spread so much severity in the form of a pandemic, emerging after the previous two strains- SARS-CoV and MERS CoV<sup>3</sup>, and only the seventh to affect human<sup>4</sup>. According to sources, 22,155,898 active cases and 2,477,839 deaths around the world are recorded as of 22<sup>nd</sup> February, 2021 at 04:04 GMT<sup>5</sup>. United States is ahead of other countries in terms of both total cases and total deaths followed by India and Brazil. After China had almost exceptionally tackled the pandemic, Asian countries were expected to have lesser infection as well as death rate. South Asian countries like Afghanistan, Bangladesh, Bhutan,

Maldives, Nepal, Pakistan and Sri Lanka are still displaying a relatively lower count of infection and deaths but India is experiencing the worst condition after USA. The overall lower rate of infection in other South Asian countries is assumed to be contributed by insignificant investment in diagnosis of COVID-19 because of limited resources available in countries of that region. Hence, the real extent to which the virus has affected their people is undiscovered<sup>6</sup>. Apparently, all of the countries of South Asia have been able to contain the virus in a rather reluctant manner. The only possible measures they are administering include complete or partial lockdown by trending the practice of social distancing, remote business management, maintaining self-isolation, home and institutional quarantine and promoting health care and cleanliness to prevent disease transmission as much as possible. Such an unprecedented occurrence has put a sudden halt on overall economic and political systems of the whole world; not only of a certain locality<sup>7</sup>. From an economic perspective, South Asian countries have always been lagging behind even the rest of Asia. While India somehow managed to strengthen its position on the world map with a diplomatic dominance, it is still thriving with its economy like the other seven countries to serve and satisfy its people's fundamental needs. According to World Bank, the low income people of South Asia will be prone to most misery as the local growth is expected to drop up to 3.1 percent which would be very disastrous from a regional standpoint<sup>8</sup>. This prediction indicates that the South Asian people below poverty line are to be victimized the most if the pandemic continues to outburst like this within the region and that even if the outbreak is abated, it will be very difficult to recover from the already collapsed economic system<sup>9</sup>.

This study simply focuses on the overall influence that COVID-19 is bringing upon South Asia alone through discussing different aspects of all the countries and their infrastructural conditions. Delving into the current measures taken by each individual country to control the viral outbreak, the study summarizes the effects inflicted upon the country and its people and also the flaws that should've been avoided. Finally, a fitting suggestion is made to apply some reformed social and political techniques in an attempt to ensure a better chance to fight off the pandemic and save lives which should be the most prioritized goal as of now.



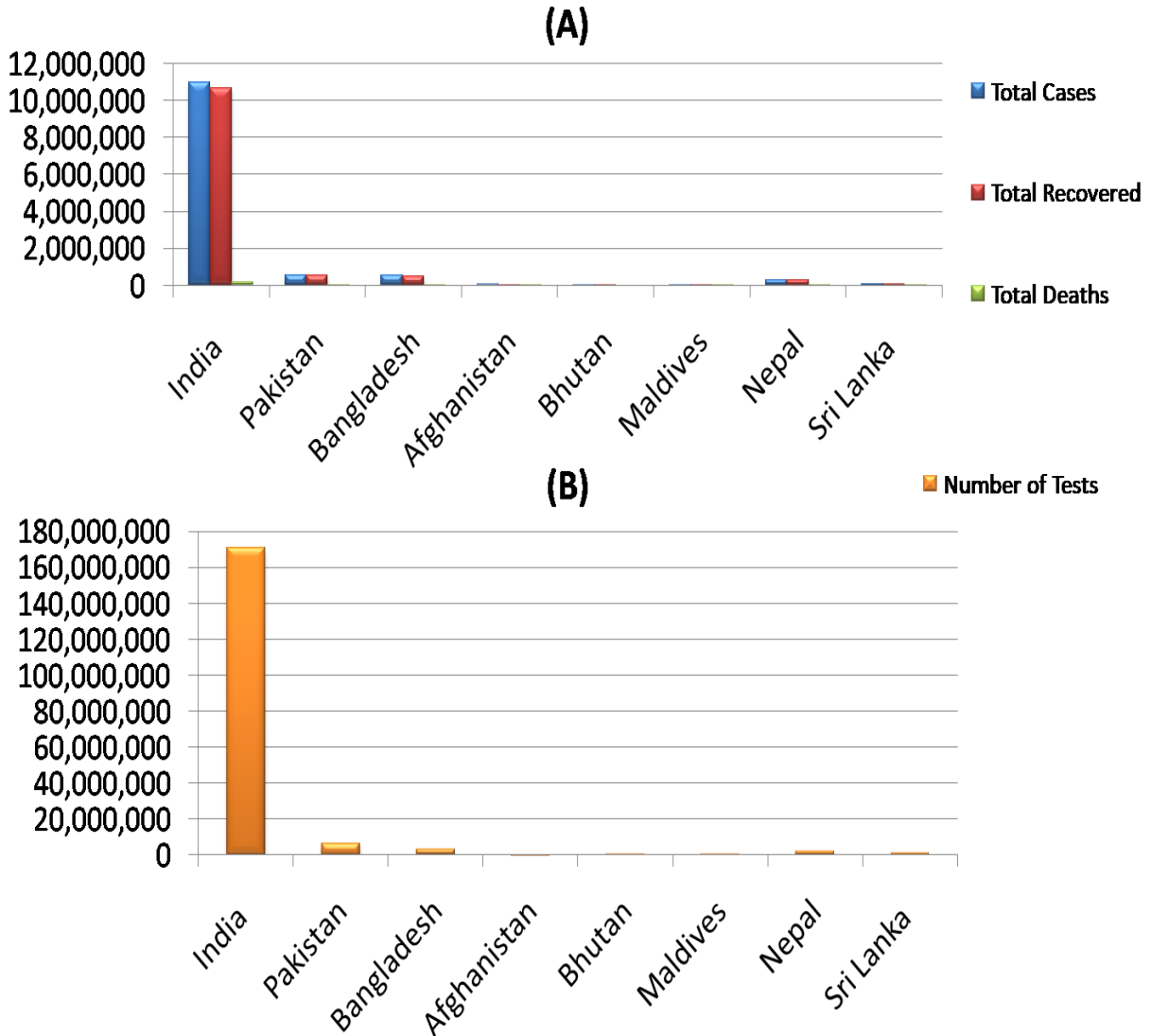
**Figure 1. Scenario of COVID-19 cases across all the continents of the world with respect to South Asia.** All the data were retrieved from [www.worldometer.com/coronavirus](http://www.worldometer.com/coronavirus) as of 14.57 pm (GMT) on February 21, 2021

## 2. COVID-19 Pandemic in the Globe and South Asia

Among all the continents of the world, Europe has suffered the most from the pandemic of COVID-19 with currently over 33 million cases and the highest number of deaths- over 790,000. Italy, Spain, Russia, United Kingdom and France have been the most victimized European countries so far (Figure 1). North America comes next with over 32 million cases and over 737,000 deaths, most of which are concentrated on United States of America alone<sup>5</sup>. But a consistent rebound is also being displayed by the medical authorities there. South America is also in a more controlling mode than these two continents, though Brazil is losing the control with over 10 million cases and nearly 247,000 deaths. As the virus originated from China, Asian countries have also had a fair share of lethal cases and deaths. Currently, over 24 million cases are reported in Asia with about 23 million recoveries already. But among all the Asian territories, South Asia has had relatively lower count of cases except the country India which is observing the 3rd highest number of deaths after USA and Brazil (Figure 1).

Even this concurrent comparatively lesser engagement with the virus has caused a major shift

in economic and social affairs of the involving countries of this underdeveloped region. India being the biggest country of the region with the largest population as well has been going through the most events of infection by SARS-CoV-2. At present, the country contains over 11 million total cases and nearly 155,000 deaths (Figure 2A). The other countries are lagging quite behind India in terms of both cases and deaths. Pakistan is the 2nd most infected country among them with over 570,000 cases and 12,617 deaths. Bangladesh follows Pakistan with over 540,000 cases and 8,349 deaths. Nepal is undergoing an upsurge of infection with over 270,000 cases and just over 2000 reported deaths. With over 55,000 cases, Afghanistan is also observing an increase in infection rate every day. The other three countries- Sri Lanka, Maldives and Bhutan are rather experiencing a lesser number of infections relatively with Bhutan being the country with the least account of deaths (only 1 death) in the region<sup>10</sup>. As for the recovered entries, India leads with about 10.9 million cases followed by Pakistan with over 535,000 and Bangladesh with over 491,000 cases. Maldives and Bhutan have an impressive number of recovered cases against infected cases. 16,196 cases have been recovered against 13,691 detected cases in Maldives whereas



**Figure 2. Current situation of the South Asia countries afflicted with COVID-19**

**A)** Comparison of COVID-19 cases and deaths among all the South Asian countries. All the data were retrieved from [www.worldometer.com/coronavirus](http://www.worldometer.com/coronavirus) as of 15.09 pm (GMT) on February 21, 2021.

**B)** Comparison of the total number of clinical tests among South Asian countries.

in Bhutan, 857 cases recovered against 8,666 detected cases only. Sri Lanka has total 74,299 recovered cases against ~80,000 detected cases<sup>5</sup>.

The diagnostic approach of COVID-19 was primarily based on the symptoms of the patients and their epidemiological and clinical background<sup>11</sup>. The only effective measure globally taken so far is identifying the COVID-19 patients by RT-PCR based test, their isolation and testing of their contacts. However, South Asian countries are way behind to implement this technique properly with inadequate testing<sup>12</sup>. As for number of tests done per

country, India has an impressive over 170 million tests to their name although being considered insufficient with respect to rising cases. Pakistan has pulled off over 6.6 million tests in total. Bangladesh is also under criticism for only about 3.2 million tests after nine months of constantly being exposed to the spread of viral infection. Afghanistan having one of the most underprivileged health facilities in the world has been struggling with conducting tests as currently they have carried out nearly only 198,000 tests. Sri Lanka, Maldives and Nepal have conducted about 1.2 million, 311,000 and 1.9

million tests respectively whereas Bhutan has performed 274,360 tests with 866 reported cases (Figure 2B). Although the mRNA-based Pfizer/BioNTech vaccine has recently reached the region for selective trials, drug and vaccine repurposing pipeline has been found quite underdeveloped in the South Asian countries excepting India and Pakistan<sup>13</sup>.

### 3. Response in South Asia

To confirm maximum protection for the people within, South Asian Association for Regional Cooperation (SAARC) has commenced a collective approach to eliminate the disease altogether by setting aside the political differences<sup>14</sup>. But imposing such a universal security protocol could not be implemented across all the countries due to lack of modern technologies and entire dependency on internal production systems. As a result, implementing a complete lockdown hasn't been possible for any one of the countries and preventive measures have differed for each individual country<sup>15</sup>.

#### 3.1 India

Although in India, the first case of COVID-19 was reported in January, the outbreak began to spread in mid-March followed by an immediate declaration of a public curfew on March 22, 2020<sup>16</sup>. A lockdown in districts and cities was implemented to assess the situation properly and follow it up having reported heavy exposure to SARS CoV-2. Finally, on 24th March, the biggest lockdown in the world was announced for 21 days, until April 15<sup>17</sup>. This timely lockdown was associated with travel ban and suspension of tourist's visa to limit incoming foreign passengers who had been held responsible for the onset of the outbreak<sup>18</sup>. This all-out command of response in national level eventually surged down to the different states of India in slightly different ways. Kerala having tasted the outbreak of Nipah virus, a bat-borne henipavirus emerging in the southeast Asia mainly<sup>19</sup>, in 2018 showed ready preparation against the emerging outbreak of today by practice of social distancing, public communication monitoring and mobile awareness campaigns<sup>20</sup>. Maharashtra and Odisha also developed enough precaution for that matter by decreasing physical contact and carrying the tendency of lockdown whenever an infected case was presented. These prior experiences with Nipah

virus and Ebola virus outbreak (2014) have helped the Indian government set up a great defense going into the challenge<sup>21</sup>. But this rather hasty decision to bring all the business institutions and industries to an indefinite closure has unfortunately trapped all the 1.3 billion people of India<sup>22,23</sup>. However, government's prompt action, urgent policy making and investment in vaccine and drug research and development received acclamation. India launched 2,281 testing laboratories so far across the country by both government and private organizations<sup>24</sup>. Two vaccines, Covishield and Covaxin, are in the pipeline for emergency authorization, and India projected to begin vaccination in January, 2021<sup>25</sup>.

#### 3.2 Pakistan

Among all the countries around the world, Pakistan demonstrated a very timely and compatible response to COVID-19 while it was still in the buds. The country was well prepared to handle the situation while other South Asian countries were still struggling to manage cases<sup>26</sup>. An emergency lockdown was declared after the first case in the country was detected on February 26 in 2020<sup>27,28</sup>. The lockdown expired on May 9, 2020 though some business activities and even exporting companies are still operating following safety guidelines. The government isolated suspected cases with suitable screening scopes available. Pakistan has settled 141 testing labs across the country. But despite such a rigorous combination of measures taken, the country is still dealing with the second most deaths in South Asia due to some of the drawbacks of their decisions. The testing labs are still insufficient and there might be some infected cases going untreated and falling to death after transmission has already occurred<sup>29</sup>. Still, the country is in comfort zone owing to some timely initiatives taken by the government<sup>30</sup>. On 23<sup>rd</sup> of April 2020, Pakistan launched its Strategic Preparedness and Response Plan to raise fund from donors around the world to battle COVID-19. They strengthened surveillance in the airport and increased their testing capacity quickly. The Ministry of Health launched WECARE program to protect frontline health workers. The drug regulatory authority of Pakistan has approved phase-III clinical trial of a COVID-19 vaccine Ad5-nCoV developed by CanSinoBio and Beijing Institute of Biotechnology, China<sup>31,32</sup>. Pakistan has also engaged in the UN's COVAX program to secure millions of doses by the end of 2021.

### 3.3 Bangladesh

After the first confirmed case of COVID-19 on March, 7 2020 even though carrying the virus for quite a longer period according to specialists, Bangladesh may have gone through the most controversial series of events in terms of their taking actions on the matter<sup>33</sup>. The government of the country attempted to bypass the infection rate by promoting self-cleanliness, avoiding physical contact and ordaining health regulations only. On 15th March, Bangladesh banned all international flights, especially the European ones except for United Kingdom for a certain period of time<sup>33,34</sup>. A 14-day self-isolation was forced mandatorily upon those who returned from different COVID-19 affected countries around the world. To maintain the quarantine state properly, the country then appointed the army in capital Dhaka on 19th March and eventually in multiple major districts like Chattogram, Cumilla and Sylhet later on. A lockdown for 10 days was imposed nationwide effective from March 26 causing shut down of all organizations, educational institutions and a ban was imposed on travels except the absolute necessary ones. The period of lockdown was extended multiple times later on to be in force until May 30. The up and rising COVID-19 cases in the country is alleged to be contributed by both the government and the people. Over 600 thousand people were transported from different countries from January 21 to mid-March and despite bans on air travel, several flights landed on the country with thousands of more in a ten days span<sup>35</sup>. Additionally, flights from Italy brought on travelers with probably the most possible cases of infection. Instead of maintaining self-quarantine, they were reported to participate in public affairs<sup>36</sup>. The government was blamed for lack of supervision in this case although the leaders constantly denied such an allegation. In spite of regular promotion of avoiding mass gathering by the government, the country witnessed a specialized prayer session in Laxmipur involving thousands of people in March and a funeral session of a respected Islamic scholar in Brahmanbaria with around 100 thousand people in April to which the authorities claimed to have no control over<sup>33</sup>. Voting for three constituencies was promoted as well at that critical time that involved mass people gathering in centers to vote which may have been one of the solid reasons for the spread. Initially, there had been only

the Institute of Epidemiology, Disease Control and Research (IEDCR) for testing COVID-19 which had been a terrible inconvenience to the whole country. Gradually, number of testing labs was increased to 118 in different cities but they are still acute in terms of people being affected each day<sup>37</sup>. Bangladesh Medical Research Council approved Sinovac Biotech to begin a third-phase trial of a potential COVID-19 vaccine. Bangladesh also expects to get 60 million of vaccine doses from COVAX facility in addition to 30 million doses from Oxford-Astrazeneca vaccine by June, 2021.

### 3.4 Afghanistan

The first case of COVID-19 in Afghanistan was confirmed on 24th February, a day after the country blocked its border with Iran because of a suspect around the area<sup>38</sup>. However, in March, restrictions were put on most of the international flights to prevent any type of crisis. By the end of March, a stricter restriction was enforced on public gatherings and other sensitive issues that might lead to community transmission<sup>39</sup>. Several provinces were locked down as well to fight off the infection which included the bigger and busier ones like Kabul and Kandahar. As far as the lower counts of deaths and cases are concerned, their lack of facilities of testing the cases is assumed to be more accountable than their success in a whole. Although testing facilities did increase later on, they are still not sufficient enough considering the population of the country<sup>40</sup>. A lot of criticism has bestowed upon the reigning government for this. Moreover, the Taliban are admittedly retreating themselves from the humanitarian ceasefire proposal put forward by the Afghan government and United Nations (UN). Afghan President Ashraf Ghani has been showing a considerable compromise with U.S-Taliban peace treaty as he has slowed down the processing of prisoner's release. As a result, the Taliban is attacking on the government risking the current COVID-19 situation to go uncontrolled<sup>41</sup>. Economic growth is predicted to decline sharply with majority of the country's population falling below poverty line. A second wave of COVID-19 has recently been predicted to hit Afghanistan soon enough. Ministry of Health of the country has reassured that they expect to receive their first vaccine shipment within the next seven months<sup>42</sup>.

### 3.5 Sri Lanka

Sri Lanka has somehow kept the read low so far with the same tactics the other South Asian countries are following, though cases are starting to pile up as of now. The ruling Gotabaya Rajapaksa party has rather administered a stricter set of laws to battle COVID-19 than any other country of South Asia. The country called for a curfew to keep people at home and within a time span between March 20 and May 15, over 40000 people were arrested due to not abiding by the curfew<sup>43,44</sup>. Also, a travel ban was in place till April 30 to stop foreigners from getting in the land<sup>45,46</sup>. From 25th April, the lockdown was reinforced to last through May 4th and has been extended again. As a part of the lockdown, all the schools and offices have been shut down. But some of the places remain opened to this day which stood for one of the most reasonable factors for the country being affected now<sup>47-49</sup>. The government tried to loosen up the lockdown in Colombo, the capital of the nation as well but faced severe consequence because of this as 250 sailors near the city were tested positive with COVID-19<sup>50-52</sup>. The lockdown was put back on for the sake of the people. Second hit of COVID-19 hit hard in Sri Lanka till October 4 with increasing number of cases. Sri Lanka also joined the Global Alliance for Vaccines and Immunization (GAVI) to get COVID vaccine from COVAX platform<sup>53</sup>.

### 3.6 Maldives

Being a country formed by multiple islands, it was obvious that Maldives would not be as afflicted as any other country with easier access. To tourists, Maldives has always been a favorite place and that may have caused the country to fall a victim to the pandemic. Because, first two confirmed cases of Maldives were addressed from a resort named Kuredo Resort and Spa on 7th March where an Italian tourist stayed over immediately prior to those reports came on. The resort was locked down along with some others from different islands like Batalaa and Kuramathi following the unexpected event by 11th of March. On 12th March, a public health emergency was called upon and on 17th of April a month-long lockdown was instituted by the Maldives government. All the international flights were suspended indefinitely. Travelling was banned between islands as well as a compulsory safety measure<sup>54</sup>. However, the first original case of Maldives was diagnosed on 27th of April who was

also a traveler from United Kingdom as surprisingly all the earlier cases were of other nationalities; mostly the Bangladeshi migrants who occupy quarter of the country's population<sup>55</sup>. The World Bank approved of a high budget project named "Maldives COVID-19 Emergency Response and Health Systems Preparedness Project" on April 2 to prevent and respond to the outbreak<sup>56,57</sup>. The government has set up an example by establishing a massive quarantine facility in the resort island of Villivaru in Kafu Atoll. Known as "the world's first coronavirus resort", this facility was reported to have over 2200 beds for patients by the Minister of Tourism Ali Waheed back in late March<sup>58</sup>. The quarantined patients would be privileged with free health care as well as an elegant stay in the resort<sup>59</sup>. The government of Maldives designated the National Disaster Management Authority (NDMA) and Health Protection Agency (HPA) to coordinate a nationwide multi-sectoral effort. Though the country has constricted the records of cases and deaths so far, it remains to be seen whether they can retain the flat numbers for the days to come. Maldives also joined COVAX platform to ensure vaccine dosages for its citizens<sup>60</sup>.

### 3.7 Nepal

Apparently, the first case of whole South Asia was confirmed in Nepal on 24th January as a student of the country returned from the hub of nCoV-2, Wuhan City of China<sup>61</sup>. However, it took 2 months to report the second case of COVID-19 in the country showing the ability of the country to consciously avert the pandemic spread. Though they still have maintained a stiffer condition compared to other regional peers, such a strict prohibition has impacted on the general mass people of the country to a large extent. All the international flights were suspended until May 15, even for their own citizens outside of the country<sup>62,63</sup>. Their border with India and China were closed temporarily<sup>64</sup>. A nationwide lockdown was implemented effective on March 24 until May 7. As a part of lockdown, all the schools and institutions have been closed and all kinds of academic examinations have been postponed. Nepalese government has also called for an unconventional ban on regular movement of the mass using transport or even by foot. This decision has so far pushed the unemployed people of the country in an uncomfortable situation. Tourism is one of the most important sources of Nepalese

income and as the pandemic grows, it is now the most affected sector in the whole country due to the lack of tourists, most of which used to be from China<sup>65</sup>. Multiple public construction projects remain unfinished because of the Chinese workers not making back into the country which accounts for an infrastructural effect. Nepal had “Visit Nepal Year 2020”- a multinational festival to celebrate the nation’s cultural heritage and natural bounty, planned for this year but due to the outbreak, a huge opportunity to earn from the biggest tourists’ congregation was lost<sup>64,66</sup>. While the country is still dealing with lesser cases than most of the countries of South Asia, it is now in an expectation of measles outbreak as well. Real-time RT-PCR (RT-qPCR) tests have been performed in 40 laboratories across the country so far<sup>67</sup>. The government projects to get 20 percent of the total required vaccine from the World Health Organization under the COVAX program and also to continue discussion with other countries for potential vaccines<sup>68</sup>.

### 3.8 Bhutan

Bhutan has been the country with the least affiliation with the pandemic infection among the South Asian countries; pertaining to being the second least populous country of the region as well. The Himalayan province was introduced with the virus on 6th March by an adult American male tourist travelling across India<sup>69,70</sup>. The authority immediately quarantined the rest along with the suspect and temporarily suspended foreign tourists. On 22nd March, the king of the country, Jigme Khesar Namgyel Wangchuck officially announced for sealing off all the land borders and on 24th instant, international borders of India were sealed off as well<sup>72</sup>. Bhutan has beaten all the fellow regional countries in terms of testing proportionately with its population which has been appreciated as a great achievement. The country has limited the daily affairs by turning off offices and by ordering stores be closed after 7 in the evening. The unemployed families are privileged with a scope to apply for relief storage from the royal fund<sup>73</sup>. All the schools and colleges have been closed as well but an online platform has been established to resume the academic curriculum<sup>74,75</sup>. Prime Minister Lotay Tshering is rather bordering on a loose restriction for his country compared to other countries with tougher regulations<sup>76</sup>. On 27<sup>th</sup> April, the UN development program granted over 300,000 dollars to the Bhutan

government to emphasize on the upgrading of the country’s healthsystem<sup>77</sup>. Despite having the minimum effect of the pandemic so far, economic growth of Bhutan is estimated to be hindered significantly and so a large impact is going to be distributed among the vulnerable. The country enforced a second nationwide lockdown effective from December 23, 2020 to curb the infection rate from the second wave of COVID-19<sup>78</sup>. Bhutan is also a member party of global COVAX platform to access COVID vaccine to battle the pandemic.

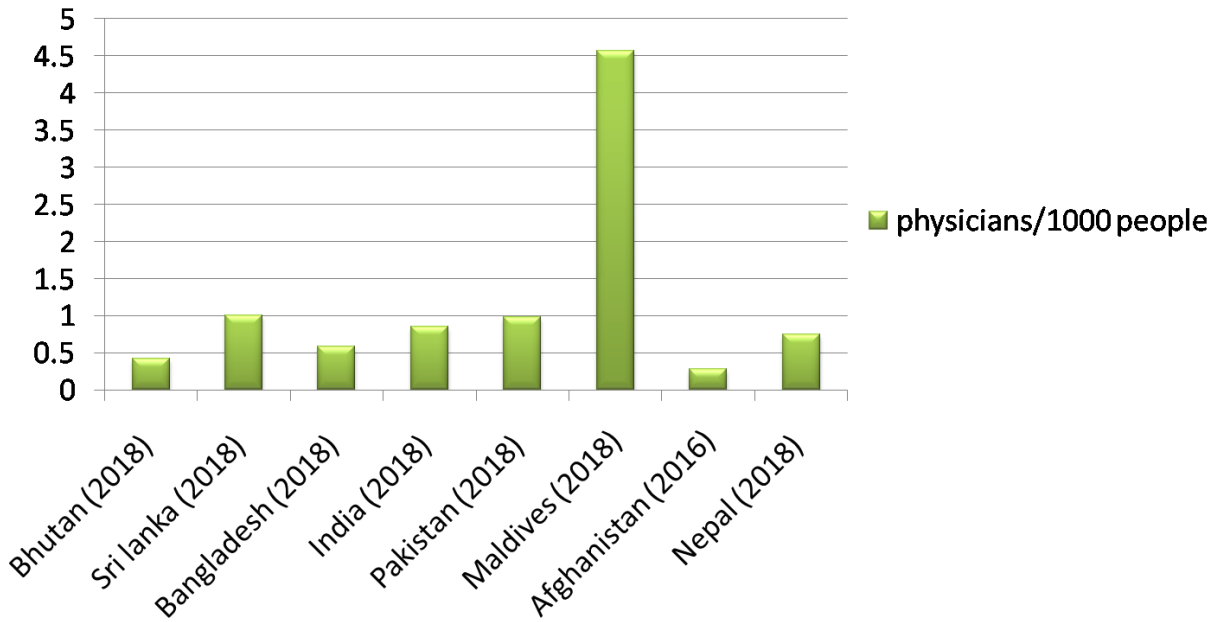
## 4. Healthcare Facilities

To battle such a dangerous pandemic, a country must possess enough medical facilities to accommodate patients and suspects with a sufficient number of highly qualified physicians and nurses. Highlighting an underdeveloped region like South Asia in terms of these situations may sum up the potential abilities of the countries within the region to fight off the outbreak.

### 4.1 Doctors/Physicians

World Health Organization (WHO) has set a standard ratio of 1:1000 and 23:10,000 of doctors and patients in a country. A study of World Bank showed that Pakistan had almost achieved the landmark among the South Asian countries with 0.9753:1000 ratio in 2015. In 2016, Maldives scored more than 1 in 1000 while Afghanistan was the most fragile in terms of those numbers. In 2017, Sri Lanka went almost close to the goal with a score of 0.958. But with the novel coronavirus continuing to spread across the region, only the current situation of doctors and physicians matters to predict whether a country may respond successfully or not. In India, 9.27 lakhs of doctors are reported to be active as of now which is still an insufficient number to battle the outbreak with<sup>79</sup>. Pakistan is encountering COVID-19 with only 0.2 million of doctors in hand as the country is getting populous constantly<sup>80</sup>. Bangladesh has about 86,800 MBBS doctors signed up though only 20,000 of them are assigned to government bodies<sup>81</sup>. The doctor-patient ratio in the country is about 5.26:10,000- only the second lowest of South Asia as of July, 2019 which is way below the WHO threshold<sup>82</sup>. It is to be noted that Afghanistan being a war-inflicted country, still struggles to this day with inadequate health professionals<sup>83</sup>. Nepal is one of the developing





**Figure 3. Distribution of physicians (per 1000 people) among south Asian countries (source: WHO)**

countries in the world and being consistent with others, it also has a rather underwhelming record of below one doctor for 1000 patients. The champion of 2016, Maldives managed to trump all other regional peers in 2019 as well with a stuttering 22.3:10,000 ratio of doctor-patients. Sri Lanka has an impressive and somewhat a perfect setting of doctor-patient ratio as well (1:671) (Figure 3).

#### 4.2 Hospital Beds

As for the hospital beds and other specialized arrangements, India seems to be leading with 1.9 million hospital beds, 95 thousand ICU beds and 48 thousand ventilators according to CDDEP researchers<sup>84</sup>. Most of the facilities are concentrated on 7 of the 37 states and it can be concluded that public health care systems are still inadequate proportionately with the country's population. Private infrastructures are coming forward as well in regular intervals to combat the crisis. Pakistan had shown a brilliant response during onset of the pandemic but as the country is experiencing an exponential growth of cases currently, only about 26,000 beds as estimated over all the four provinces will not suffice at all; especially when in Punjab, there are only 24 hospitals available and in Sindh, only 487 ambulances are to be run<sup>85</sup>. Bangladesh has been reported to offer only 8.7 general beds against

every 10,000 patients which is an insignificant count of facilities with respect to around 170 million of people living in the country. As far as the ICU beds are concerned, the private health care units have been more involved in providing (737) for COVID-19 patients than the public health infrastructures have contributed (469)<sup>86</sup>. Afghanistan with only 2,300 beds so far having a ratio of 5 beds per 10,000 people, has planned by the Public health Ministry to create 100,000 more beds with at least a thousand of them having ICU facilities to face the upsurge of the viral infection in the country<sup>87</sup>. Sri Lanka is also reported to have a very weak preparation for rising infection in coming days as the country has only above 2 ICU beds for every 100,000 people<sup>88</sup>. Though Maldives is undergoing a slow pandemic growth, it remains to be seen if the country's over 2000 beds in different suspended island resorts will be enough for COVID-19 cases with time<sup>89</sup>. The government of Nepal focused on Kathmandu Valley to add 115 more ICU beds and 1000 isolation beds there for the common people and ordered local governments to set up 120 ICU beds for each province. Bhutan having the least infection rate so far in the whole region has been well equipped with beds and testing labs. The Monggar district of the country hosts an isolation hospital and about 30 quarantine facilities for suspected cases<sup>90</sup>.

## 5. Commodity Factors

South Asian countries are normally prone to multiple severe diseases such as heart failure, diabetes and hypertension because of their geographic position, as well as food habits of the residing people<sup>91-93</sup>. In fact, the underlying diseases like these increase chances for a person to be seriously affected and even to die of COVID-19 compared to those having no such affiliation at all<sup>94, 95</sup>, because most of the South Asian people have a genetic resistance to insulin which ultimately leads to diabetes<sup>96</sup>. On the other hand, high cholesterol intake from traditional Asian foods blocks the arterial pathways resulting in cardiovascular diseases. Hypertension is also one of the side effects of insulin resistance<sup>97</sup>. Towhid *et al.* (2020) accumulated a wide range of pathogenic possibilities of cardiovascular complications in patients already affected by COVID-19<sup>98</sup>. Naturally, these medical conditions account for a badly compromised immunity system in the South Asians anyway. When subjected to SARS CoV-2, such a weakened system is bound to fail sooner than a fitter self. As studies have revealed that probability of mortality due to COVID-19 is significantly high for those having related conditions prior to infection, it is obvious that the risk factor is automatically involved for regional natives. Therefore, South Asian people with underlying health problems need extra precaution handling the situation<sup>99</sup>.

## 6. Food Security

South Asia Food and Nutrition Security Initiative (SAFANSI) is a regional organization devoted to serve the South Asian people, especially children and women in terms of health care and micro and macro nutrition management<sup>100</sup>. During COVID-19, South Asians are struggling with different health issues as an extended challenge<sup>101</sup>. Although the countries of the region are rich in producing decent crops and cereals internally and even hold the capability to export them in other Asian and non-Asian countries, at the current moment, strict lockdown implementation has limited their production way below usual threshold. Moreover, trading restriction has hindered import of other food products as well. All these changes have raised the market price of daily food products beyond range of the low-income people of this underdeveloped

region. During this pandemic, ensuring proper and nutritious diet for the vulnerable group of people at the rural side is now looking fancy. For instance, despite good yield, Pakistan is still failing to provide for the underprivileged people. Bangladesh is dealing with high price range of the essential food items in markets. While SAFANSI is working to report the problems to impose responsibilities on corresponding authorities of the region, common people should also cooperate in maintaining domestic production with safety measures and producing diets with the best food combinations<sup>102</sup>.

## 7. Challenges in Education and Connectivity

Disruption in regular communication is one of the biggest damages caused upon by COVID-19; not only in South Asia but for the whole world<sup>103</sup>. But being a region already afflicted with so many problems, communication management has been posed as a major challenge to the people within. Lockdown and quarantine enforcement brought out an unusual suspension on public transportation. Such a sudden stoppage caused the people a lot of harassment such as creating a huge gap between home and workplace. Schools and all the educational institutions had to be closed down as well which led to an academic interruption. To make it up, arrangement of online classes is being made in some of the countries. But almost all the countries of South Asia lack suitable systems to confirm internet connectivity and stability for all the citizens; especially people of rural areas and ethnic territories<sup>104</sup>. As a result, such a proposition of online education is also being criticized largely.

## 8. Suggestion for Mitigation

As the world is progressing at a formidable speed today, COVID-19 has appeared as a curse. To keep this fatal pandemic at a safer distance, applying lockdown has been the most popular step taken in most of the countries<sup>105</sup>. The whole point of lockdown is to focus on saving lives of people rather than keeping the economic cycle going on at a greater expense of costing lives<sup>106,107</sup>. However, in countries like the South Asian ones where majority of people spend lives in total hardship, maintaining a lockdown is tough and somehow self-destructive as well in terms of economic salvation. Hence, most of the countries opted to find an intermediary step

between a complete lockdown and a rough movement that may cause infection. Several more preventive measures are suggested below to grapple with the crisis.

### 8.1 Development of Mass Awareness Program

Different communication media like online social media, print media, radio, TV, cell phone-based SMS, flag messages etc. can play a vital role in fighting COVID-19 through mass awareness<sup>108,109</sup>. Awareness campaigns help dispel misinformation about the coronavirus while promoting precautionary measures like frequent hand washing and wearing masks. Limited access to information and a weak health system make it difficult for the country to control the rapid spread of the virus. People can be encouraged to wash hands frequently, use antiseptics to clean household items, wear masks in public places, avoid meeting people with colds and coughs, observe physical distance, avoid crowded places, and stay home as much as possible. The public awareness campaigns are one of several measures undertaken by the countries that are fighting COVID-19 well. Most people living in remote areas have no access to the internet or other information sources to survive the COVID-19 pandemic. Broadcasting of awareness on community radio stations can reach populations far from mass broadcasting channels.

### 8.2 Increasing Healthcare Facilities

Strict quarantine ruling has to be constituted to restrict the suspects and infected cases from wandering in the open<sup>110</sup>. For that to work, more and more isolation beds and spaces are needed. Apart from the hospital and other health care facilities, some temporary quarantine centers may be established like Maldives did in suspended island resorts. For the developing countries with cities and towns, schools and local residential hotels may be turned into quarantine spaces. With the help of armed forces and volunteers and by the funding of both government and non-government organizations, such facilities will not consume much time to be set up out of limited resources. Testing facilities ought to be increased in each of the countries to be able to record correct information so that efficient treatment policies may be adopted. All the molecular biology, biochemistry, genetic engineering and medical labs in universities and medical colleges can be used as testing centers very easily and students and teachers

of life science and medical faculties should volunteer to contribute as man power which is much needed to transform such an unfortunate situation into a safer condition for common people. Above all, a sound awareness campaign has to be promoted by national media and central and local government bodies to inform marginal people of health issues regarding COVID-19 and usage of several hygiene products like hand sanitizers and soaps to get rid of the outbreak<sup>110,111</sup>.

### 8.3 Coping with Mental Stress

A catastrophe so uncalled for, accompanies fear and anxiety in almost all the people, especially those having no basic knowledge of viral infection and how to deal with such a situation<sup>112,113</sup>. Additionally, bad rumors and false news as a part of publicity stunt regarding the virus instill stress into people's mind and account for public harassment. To relieve people of such an unnecessary mental pressure, media personalities and political leaders have to be very careful in conveying information nationally. It has to be made sure that only the factually, rationally and scientifically plausible bits and news are broadcast. Religious leaders of different regions should also come forward to encourage the public to remain calm and steady during the pandemic.

### 8.4 Fund Generation

Being a region with far less privileges than Europe and America, it is understandable as to why keeping a lockdown might not be a feasible idea economically for the South Asian countries. Still, it is only obvious that stalling the non-developmental work processes for the time being will pile up resources for the governments of these countries to spend for the people suffering. World Bank is currently collaborating on multiple projects with South Asian countries to accelerate their health care systems<sup>114</sup>. Thus, wiring more donations from other global organizations and managing exchange of relief funds among the countries themselves may yield a collective success for South Asia in a whole. Private entities can be encouraged to donate their incentives which can be used for tax rebate.

## 9. Conclusion

COVID-19 pandemic has drastically changed the cultural, political and socio-economic demographics of the world and has impacted different countries in

## KEY POINTS

- ◆ *South Asian countries already being so overpopulated and poverty-stricken, are experiencing a direct effect from the COVID-19 pandemic in the form of increasing infection rate and an indirect impact as the side effects of preventive measures taken in form of possible economic recession.*
- ◆ *Insufficiency of healthcare facilities against the bolting number of cases seems to be the reason behind the region's incapability to strike off the virus.*
- ◆ *Respective governments affiliated with important regional and global bodies are already attempting to power through some necessary resources to ensure food and health security and continuation of education and communication in the affected countries of the region.*
- ◆ *We suggest a more vigorous connection to be built between both mental and physical health of the natives of South Asia by mainly promoting mass awareness while aiding the governments in facilitating the essentials for healthcare, food, educational and economic improvement.*

different ways. Geographical conditions and population characteristics of South Asian countries have put them on a common platform and thus have asked for similar strategies undertaken to combat the pandemic. This review highlighted different aspects of COVID-19 in these countries including their current status, strategies and implementations so far, their upcoming challenges and suggestions for mitigation. People in these countries were found to become infected with the virus from the persons returning from various countries- mainly China, Italy and Iran. Performances and responses varied from country to country within the region, resulting in different outcomes for each one. India is now the host of most infected cases in the world after USA. The country hosting more than 1.3 billion people has experienced a series of lockdown to curtail the spread of the virus falling prey to economic recession. Such measures and social distancing were already challenging for the densely populated countries like Bangladesh, Pakistan and Afghanistan to implement and hence, the increase in infection. Speculation remains whether comparatively a smaller number of infections in those countries is due to their preventive achievements or inadequate testing. However, the number of deaths and confirmed cases deviated from the predicted models as social distancing and proper isolation could not be maintained in those countries. Maldives and Sri Lanka with better medical facilities have been able to hold the situation in control with their aptly taken

measures. Nepal although being able to prevent the spread better than other countries, the country's economy is predicted to be severely affected due to the pandemic's impact on tourism, remittance and trade. Bhutan did exceptionally well so far by checking the infection and death rate receiving much accolade from the world, which was possible through proper planning, prompt action including contact tracing, testing and isolating the suspects and infected cases. On the eve of the coronavirus second wave, it remains to be seen how the South Asian countries tackle the situation with prior experiences. Nonetheless, the key to address the situation will be contact tracing, quarantining the suspects and infected cases, social distancing following proper health guidelines prescribed by WHO. The countries need to strengthen their existing healthcare facilities, protect their frontline healthcare professionals and invest more on research. The countries should further increase their regional cooperation through SAARC platform to ensure safety and security of their people and fight better against the pandemic. Recently, Pfizer-BioNTech obtained clearance from FDA and people are being vaccinated in UK and USA. Other regulatory authorities from various countries are approving the vaccine and some other vaccines are also in the pipeline. South Asian countries are also expected to receive dosages through global COVAX platform of which they are signatory parties. Vaccine developed by India is on the pipeline to get approval which the neighboring

countries might find useful with less transportation cost and more specificity against the available viral strain retaining in this region. However, challenges remain about the proper distribution and management of the vaccines as some countries are lacking proper storage and transportation facilities. Countries should focus on developing the systems for proper vaccination program, capacity building and ensuring vaccine dosages from international forum through collaboration.

### Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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