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SUCCESS STORY OF CONTROLLING COVID-19 IN EAST ASIA: LESSONS FOR SOUTH ASIA

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ABSTRACT

The novel coronavirus is an issue of life and death**.** The main purpose of the study is to know the East Asian success story of controlling Covid-19 and identify which strategies could be a lesson for South Asia and to examine the influence of good governance on controlling COVID-19. Total daily cases of COVID-19 are collected from March 10 to June 15 for East Asian and March 4 to June 15 for South Asian countries. ARIMA forecasting, ADF test, stability test, and diagnostic tests are applied. The minimum value of AIC and BIC shows the appropriate model is ARIMA (0, 1, 1) for both regions. In the East and South Asian model, the coefficients of the constant term are -0.759451 and 198.0155, and coefficients of MA (1) are -0.715686 and -0.339701 respectively for both regions. It's significant at a 1% significance level and support our hypotheses that the total daily cases of COVID-19 decreasing into East Asia but increasing into South Asia and prove that the South Asia region has faced a lot of difficulties to tackle COVID-19 as most of the countries have not enough government capacity, weak institutions, limited resources, narrow government reaches to the vulnerable people and corruption compare to East Asian region and no actual strategies are yet noticeable from the governments of South Asia as a result transmission increases day by day.

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That is why; we think that South Asian countries could take lessons from East Asian countries as these countries are more successful to control COVID-19.

Keywords: COVID-19, Transmission, Good Governance, Institutional Quality, ARIMA

1. INTRODUCTION

COVID-19, the highly contagious disease is currently spreading across the world has emerged from Wuhan (Hubei, China) in December 2019. Economic conditions are collapsing day by day; overloaded health services indicate that most of the countries health sectors were in shade specifically South Asia; political leaders are in dilemma and facing challenges to finding solutions to how they will overcome this situation.

South Asia is also known as the southern region of the Asian continent which geographically covers the Indian subcontinent and its close surroundings. South Asia hosts are approximately 23 percent of the world's population and contribute over and above 15 percent of worldwide economic growth. This region is not only undergoing a high rate of poverty and inequality but also has infrastructure and connectivity limitations. Moreover, most of the countries of this region have not enough capacity to handle the pandemic due to less investment in the health and education sector. For these reasons, some experts think it will be quite tough for South Asia to manage the COVID-19 pandemic.

On the contrary, although one of the East Asian countries named China was the epidemic center of coronavirus East Asian nations like China, Japan, South Korea, Vietnam, and Taiwan have done better to fight against the pandemic rather than any other region. Whereas the pandemic situation is deteriorating and numbers of infected people are increasing in most of the regions in the world, East Asian country's number of infected people is decreasing. East Asia's strategy and activities have a great impact on the battle against the novel coronavirus. These regional countries' prevention and control processes of the disease could be a lesson for the South Asian countries.

Table 1: Comparative Analysis of COVID-19 Situation of South Asia

South Asian Country	*Coronavirus Cases Total*	*Deaths*	*Recovered*
India	10,495,816	151,564	10,129,111
Pakistan	508,824	10,772	464,95
Bangladesh	524,020	7,819	468,681
Afghanistan	53,690	2,308	44,608
Nepal	265,698	1,932	259,358
Sri Lanka	49,537	244	42,621
Bhutan	831	1	730
Maldives	14,218	49	13,402

Source: Worldometers (2021)

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Table 2: Comparative Analysis of COVID-19 Situation of East Asia

East Asian Country	*Coronavirus Cases Total*	*Deaths*	*Recovered*
China	87,706	4,634	82,288
Japan	292,212	4,094	225,396
South Korea	70,212	1,185	54,636
Hong Kong	9,344	160	8,524
Mongolia	1,469	*2*	909
Taiwan	838	*7*	730
Macao	*46*	*0*	*46*

Source: Worldometers (2021)

Table 1and 2 show comparative analysis of COVID in South and East Asian countries, among the two regional countries, India has recorded the highest number of infected cases10,495,816, and death 151,564, though its population is less than China. Bangladesh detected the second-highest number of infected cases 524,020 in the two regions. It is a horrible matter for South Asia that the number of new cases is increasing trend in this region whereas in East Asia it is a decreasing trend.

This situation gives us an empirical puzzle why are East Asian countries more successful than South Asian countries to manage the COVID-19 pandemic? What are the major initiatives that have been taken by East Asian states in combating COVID-19? Is there any influence of good governance issues to control the pandemic? Which strategies are required to take South Asian countries to manage the impact of COVID-19?

The answer might be that the East Asian countries became successful because of their governments' timely response and have taken various initiatives to over whelmed the pandemic. As Kent Calder who is the Professor at the Johns Hopkins School of Advanced International Studies said, "we can identify some distinctive features in the responses of successful East Asian countries. The most striking is the use of digital tools. The successful countries have utilized such tools to coordinate test results, to undertake contact tracing, and to implement digital quarantines" (HUB, 2020).

Whereas East Asian states emphasized "3Ts" ("testing, tracing, treatment"), South Asian countries have suffered scarcity of testing kits, less reporting practices due to low literacy rates, and poor capacity in health care like infrastructure(Agrawal, 2020).In South, Asia healthcare is such a field where misgovernance has weakened the progress of human capital. The government regulated the health sector tightly, without providing adequate infrastructure facilities. In this region, Sri Lanka invested 4 percent and India spends only 1.28 percent in the

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health sector of its gross domestic product (GDP). India has 7 hospital beds per 10,000 persons, Bangladesh has 8 and Pakistan has 6 beds, whereas China has 42 (Wagner & Scholz, 2020).

The South Asian all countries have a shortage of medical equipment as well as personal protective equipment (PPE) for health professionals. Otherwise, modern medical equipment is mostly put in urban areas, while a rural area is ominously worsening. Infection figures will be increased more if these countries had the capacity for testing. All countries of South Asia have gotten enough time to be prepared but they failed to utilize this time. Most of the countries including India have belatedly decided to lock down their borders both within the countries as well as external.

Although countries declared "lockdown" or "general holiday", failed to implement it properly. For instance, during the general holiday period, Bangladesh garments factories have opened closed again reopened. In the time of lockdown, there was a lack of coordination between different ministries, departments, and groups. It is observed that governments were indecisive about what role they should play in this time.

Overall, weak institutional capacity and effectiveness, lack of long-term planning, failure to control corruption, lack of general people participation, and information dissemination, failed to create public awareness, which ultimately leads the failure of ensuring good governance regarding control of COVID-19 in the South Asia region. The COVID-19 has proved an unambiguous reality that most of the East Asian countries invested in human capital, particularly the education and health sector, thus, doing well than others.

Certainly, comparison requires generalities, though it is a challenging task to compare between the South and East regions as some East Asian countries are developed than South Asian countries. Most of the administrators of the South Asian countries compare the COVID-19 situation with North America and Europe to highlight their success regarding pandemic management. We think that these comparisons would be not fair.

The COVID-19 managing strategy of the South Asian region could be better evaluated through a comparison with its neighbor region East Asia. As regional countries, economic structure, population density, culture, geographical characteristics, the climate is mostly similar. Considering these perspectives, we made a comparative analysis of the government of South Asian and East Asian Country's responses to the COVID-19 pandemic.

2. OBJECTIVES OF THE STUDY

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Under the above complications, the main objective of this study is to know the East Asian success story of Covid-19 and identify which strategies could be a lesson for South Asia. Specific objectives are the following:

i. To know the present situation of Covid-19 in South Asia and East Asia region.

ii. To identify and compare the current scenario of the health sector in both regions.

iii. To examine the influence of good governance on controlling the covid-19 pandemic

3. COMPARATIVE ANALYSIS OF COVID-19 IN THE CASE OF EAST AND SOUTH ASIAN COUNTRIES

Though COVID-19 detected first in East Asian countries these countries have tackled it very well in comparison to South Asian countries. However, in the following Table 2 shows the comparative analysis of GDP growth(% annual), mortality rate, infant(per 1000 live births), and literacy rate, an adult total of East and South Asian countries. From Tables 3 and 4, we notice that among the south Asian countries GDP growth is higher in Bangladesh where its growth is 7.86 percent in 2018. India, Pakistan, Afghanistan, Nepal, Bhutan, and the Maldives have 6.81, 5.83, 1.03, 6.66, 3.21, 3.03, and 6.89 percent respectively.

Table 3: GDP Growth, Literacy Rate & Mortality Rate in South Asian Countries (2018)

South Asian Country	*GDP Growth*	*Literacy Rate*	*Mortality Rate (Infant)*
India	*6.81*	*74.37*	*29.9*
Pakistan	*5.83*	*86.30*	*57.2*
Bangladesh	*7.86*	*73.91*	*25.1*
Afghanistan	*1.03*	*43.02*	*47.9*
Nepal	*6.66*	*67.91*	*26.7*
Sri Lanka	*3.21*	*91.71*	*6.4*
Bhutan	*3.03*	*67*	*24.8*
Maldives	*6.89*	*97.7*	*7.4*

Source: World Bank (2018)

From East Asian countries, we see GDP growth is 6.57, 0.79, 2.69, 3, 7.22, and 2.99 percent for China, Japan, South Korea, Hong Kong, Mongolia, and Taiwan respectively. In South Asian countries literacy rate is comparatively high in Sri Lanka and Maldives but East Asian countries are possessed with a high literacy rate. The table also reveals that the mortality rate is high in South Asian countries rather than East Asian countries; where the highest mortality rate is 57.2 in Pakistan and the lowest in 1.32 in Hong Kong.

Table 4: GDP Growth, Literacy Rate&Mortality Rate in East Asian Countries (2018)

East Asian Country	*GDP Growth*	*Literacy Rate (Adult)*	*Mortality Rate (Infant)*
China	*6.57*	*96.84*	*7.4*
Japan	*0.79*		*1.8*
South Korea	*2.69*	*97.9*	*2.7*
Hong Kong	*3.00*	*99*	*1.32*

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Mongolia	*7.22*	*98.42*	*14*
Taiwan	*2.99*	*98.5*	*3.71*

Source: World Bank (2018)

Asia has total 21,645,710 covid-19 cases, 350,911 deaths and 20,103,433 recovered (Worldometer, 13 January, 2021). There is a clear difference between East and South Asian countries regarding COVID-19 total cases; total death and total recovered which already has shown in the first table. Compare to South Asia, East Asia is in a better point where cases total is highest in Japan and other country has lower total cases and also lower total deaths.

3.1. Performance of East Asian countries

COVID-19 cases tremendously increase worldwide and actually, it's a threat for Asian countries as many of its countries are populous. But East Asian countries do a better fight with this invisible enmity. Performance of East Asian countries in combating COVID 19 are explaing below.

3.1.1. The Situation of China

China, the origin of COVID-19 initially was vulnerable for the infection of the coronavirus. But eventually, it can control the spread of this virus. Till June 7, 2020; the total corona cases are 83040, where total deaths are 4634 and total recovered patients are 78341.FromFigure 2 shows daily new cases and daily death of corona patients, where both the cases and death significantly decrease in China. After 16 May there is no reported death of corona patients in China.

Screening, testing, and monitoring become the core key to reduce virus transmission and health sector provide timely treatment. Ensuring test kits play a vital role in reducing this epidemic in China. The test result was provided only four to six hours instead of sis days. Dynamic management system, epidemiological investigation (1800 epidemiological group), hospitals classification based on the conditions of patients, more than 80% Severe cases were under consultancy, traditional Chinese herbal medicine, mobilizing of resources, more than 42000 health workers and 340 medical aid teams, rapid supply of medical accessories, daily supply of test kit were nearly 350000 begins on march technological support by National Health Commission central government ensures daily necessity, wartime command pandemic system play a vital role to combat the spreading of coronavirus.

Strong governance, strict regulation, strong community vigilance, use of big data and digital technologies help a lot to combat COVID-19 in China (Hua & Shaw,2020). Lin *et al*.

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(2020) exposed that the Chinese government mitigates the crisis by setting up special hospitals and providing restrictions on travel. Chen *et al*. (2020) showed social distancing and a range of accompanying epidemic control measures prevent new infections. Zhang *et al*. (2020) found that social distancing can significantly limit the COVID-19 China and can reduce the virus up to 98.9%.

3.1.2. The Situation of Taiwan

The prevention measures for COVID-19 of Taiwan can be instructions for other countries (Wang *et al*., 2020). Taiwan becomes a role model for pandemic management with a few numbers for corona cases where different nations struggle to keep down the attack of covid-19. Conclusive action of government makes a quick result to reduce COVID-19 in Taiwan.

Although Taiwan is near to china but has the least number of corona cases where the total corona cases up to 7 June are only 443 from where 430 patients are recovered and reported deaths are only 7, displaying in the figure below. Taiwan had three pillars which are real-time surveillance, border control, and quarantine, and building the capacity of the laboratory (Cheng *et al*.,2020) which help a lot to curve the virus.Big data with its immigration and customs database helps a lot of Taiwan in the case of COVID-19. QR code scanning, governmental compassion by providing food, health checks, and encouragement and plays an active role in resource allocation (Wang *et al*., 2020).

3.1.3. The Situation of South Korea

South Korea effectively traced people who may have the possible contact with the patient of COVID-19; through smartphone and use credit cards the government can easily trace who are COVID-19 positive. Through these steps, South Korea potentially traced infected persons. Quarantine patients were also checked to know either they are at home or not by using GPS data and also exercise transparency in information relating to COVID-19 (Ahn, 2020). Rapid diagnostic tests for covid-19 were ensured in Korea (Duddu, 2020). Without facing any lockdown South Korea curve, the spread of covid-19; where the people are self-disciplined, staying at home, wearing masks all the time(Duc,2020), and social distancing must be particularly emphasized (Cho,2020).

3.2. Performance of South Asian countries

In the control of COVID-19, the performance of South Asian countries is worsening day by day. The first coronavirus case was detected in Bangladesh on 8 March (IECDR, 2020)

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where the first death due to the coronavirus was on March 18. Covid-19 forced the country to adopt several measures such as lockdowns, home quarantine, social distancing, and flight bans, etc. for curving the transmission (Khan & Hossain, 2020).

Being a highly populated country is not possible to maintain social distancing though there is lockdown everywhere. Overpopulation, poverty, poor infrastructure in the healthcare system cannot restrict the transmission of covid-19. Bangladesh has only 0.8 hospital beds for every 1,000 people (WB, 2015) and has a total of 141,903 hospital beds ("The Daily Dhaka Tribune", March 21, 2020).

Khan and Howlader (2020) reveal that current testing levels in Bangladesh are not adequate where experts believe that testing played a major role in controlling the COVID-19. The health professionals are threatened by the spreading behavior of COVID-19; due to the risk of infection for both general people and health professionals (Khan *et al*., 2020) as there are limited resources, and expanding healthcare capacity remains a challenge in Bangladesh. The Institute of Epidemiology, Disease Control and Research (IEDCR) claimed that it tests every person who entered the country from abroad but there has doubt about the testing facilities (Sujan & Hasan, 2020).

India is the second-most populous country in the world. In India, the first case of COVID-19 was detected on 30 January 2020 and it rises alarmingly in India. There has been a more inward influx of infected persons from foreign countries during the first half of March (Roy, 2020). Considering the population and socio-economic conditions of the country, a single uniform policy may not work to stop the community spread (Bhola *et al*., 2020). The rise in population is a challenge for the Covid-19.

Gupta *et al.* (2020) reported that the growth rate of infected cases has been controlled through lockdown, but some uncontrolled mass level events increase the infected cases. The majority of the population leads a life without proper support and idea of hygiene which is also a challenge for the fight against coronavirus.

COVID-19 case was detected on 26 February 2020 by the Pakistan Federal Health Minister confirmed. Compared with China and Iran, it has a lower standard of health care and facilities (Saqlain *et al*., 2020). Like Afghanistan, Pakistan also faced the same problem resulting in huge returnees came from Iran (Mohammad & Khan, 2020). Due to limited resources, Pakistan cannot guard against such a pandemic. Saqlain *et al.* (2020) explain lacked

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any diagnostic facilities, only a few specific quarantine centers, lack of standard screening, and protective equipment.

Afghanistan is a country with $5 per capita allocations to health for each citizen and only three doctors for every 10,000 patients. The COVID-19 situation in Afghanistan has high transmission rates because of owing its border with Iran, where a severe outbreak of COVID-19 occurs (The International Organization for Migration)

3.2.1. South Asia: A Region of Institutional Incapacity

In the initial stage, the government of Bangladesh responded slowly to the pandemic. After identifying the first case of the COVID-19, in the first three weeks, the IEDCR was the only diagnostic center of Bangladesh, and the daily testing rate was approximately 100 per day on an average, after five weeks test reached 11,223 (Anwar, Nasrullah & Hosen, 2020). The government delayed decentralizing the COVID-19 test due to a lack of testing kits, personal protective equipment (PPE) for the doctor, nurses, and other staff.

As a result of the combined lack of PPE and diagnostic testing capacity, fear, and anxiety geared up among the population, and even to the healthcare professionals, so refused to provide any service (Anwar et al., 2020). Dr. Zafaullah Chowdhury, founder of Gonoshasthaya Kendra think that Bangladesh is facing big challenges due to a weak health ministry. He added, “There is a serious crisis of ICU beds prepared for patients and necessary training and supply of PPE to physicians and health care associates"(Sakib, 2020).

India also has a lack of trained doctors, whereas it needs a minimum of 400,000 doctors to meet its demand, but hardly has 90,000 physicians. Bangladesh's government has futile to the COVID-19 test properly and to isolate and treat confirmed patients that demonstrated its inadequate public health infrastructure. It has only 127,000 hospital beds, of which 91,000 is state-run.

Moreover, it has merely 737 incentives care units' beds, out of the 432 in the public health system. The Indian government has been delayed in response to providing emergency preventative care to its people such as vaccination, access to safe drinking water, well sanitation arrangement, and nutritional care for children (Pande, 2020). In India, some patients including part of the government prefer to go to private hospitals because the government hospital has not enough logistic support, other South Asian countries are no exception (Pande, 2020).

COVID-19 patients may need admission to Intensive Care Units (ICU) and could require ventilation support. India has between 70,000-95000 ICU beds and 48,000 ventilators

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for 1.3 billion people. Among them, most of the ICUs beds and ventilators are situated in seven states of India such as Uttar Pradesh, Karnataka, Maharashtra, Tamil Nadu, West Bengal, Telangana, and Kerala respectively 14.8%, 13.8%, 12.2%, 8.1%, 5.9%, 5.2% and 5.2% (Kapoor et.al, 2020).

The patients' accommodation is the major challenge in South Asia during a pandemic. Already most of the countries of this region are started using government buildings, stadiums, educational institutions as COVID-19 isolation centers. Those places usually have not enough facilities for patients, thus the infectious might be worsening. In the case of Pakistan, Doctors asked for more PPE from the government but failed, it has only 2,200 ventilators (Fliegaufand Ayres, 2020).

Pakistan spends only 2% of its GDP in the health sector, that means allocated per citizen only US$40.Saqlain*et al.* (2020) explains, Pakistan suffered a lack of diagnostic facilities, standard screening, and protective equipment; it has only a few specific quarantine centers. In Nepal, there are 48 ICUs and 331 ICU beds in which 161 beds have ventilation facilities (Acharya, 2013). On the contrary, in Sri Lanka, there are only 99 ICUs, 2.42 beds on an average per 100,000 people.Moreover, one common problem in South Asian countries is unequal access to healthcare.

3.2.2. Governance Problem in the South Asian Countries

According to Joshua Castellino who is the Executive Director of the Minority Rights Group International (MRG), "While the virus has the potency to kill, poor governance choices can weaponize this potency" (Khaliq, 2020). All South Asian countries fight against COVID-19 through the central arrangement. The central government did not take any steps to decentralize its power and do not give financial autonomy to manage the pandemic.

The government of India has neglected the demanding requirements for an extensive transfer of ‘central funds to near-bankrupt state governments’ which will be covered most of the expenditure on health care, social safety net, and agriculture **(**Bardhan**,** 2020)**.** In its place, the decision-making process of the government is over-centralized whereas poor participation by local bodies and communities brought about puzzling and contradictory administrative rules.

Moreover, the central government of this region does not provide transparent information to their people regarding testing kit availability, shortage of PPE and ICU, even death rate. Lack of transparent information, people could be misguided about the health system.

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If the central government empower local authorities and involve civil society as well as all stakeholders in the decision-making process, it would help them to select vulnerable people, build up awareness among the communities regarding the COVID-19 pandemic.

Bangladesh is another example of centralization of power, corruption, and patronization of ruling party activists which leads to malfunctioning governance in the country. Bangladesh's government efforts almost have gone in vain due to the corruption of some politically influential and local government representatives.Bangladesh did not impose any strict protocol initially, as millions of people were out on the streets, especially in Dhaka city (Anwar *et al*., 2020).

Moreover, the Bangladesh government has imposed lockdown and decision of social distancing without much preparation to meet the basic needs of the poor people. In Bangladesh most of the garment factories are situated in Dhaka, Gazipur, and Narayangonj, these places are also recognized as a hotspot of the Coronavirus. When the government declared general holidays all over the country, most of the people including garments workers had gone to their village home with the risk of COVID-19 and violate government instructions. After that suddenly garments industries decided to start production again, despite the general holiday continuing.

Then Garments workers again came back their job place on foot, ferry, auto-rickshaw, or through crowded vehicles. Health experts think that the decision of reopening garments factories would be put at risk workers' life. Even though the government getting confirmed the COVID-19 case in the country, some governments of South Asia do not take necessary protective steps in the airport who were returned home. For instance, many people back in their respective countries such as Bangladesh and Pakistan from the Middle East, these governments do not arrange tested or institutional quarantined for 14 days (Fliegauf & Ayres, 2020).

For people who came from Italy, the Bangladesh government had planned to keep them to 'epicenter'- a quarantine site. But lack of proper arrangement those people were not agreed to stay there and the government was allowed to keep them self-isolation at home for 14 days (Anwar *et al*., 2020). As of March 28, 2020, more than 650,000 people entered Bangladesh through its international airports, seaports, and land borders, among them merely 28,483 people were in quarantine and 47 was in isolation (Sakib, 2020).

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Meanwhile, the election commission of Bangladesh arranged three constituencies election where voters had to go to the polling centers in-person to provide their votes. Health Minister of Bangladesh, ZahidMaleque said that various departments and agencies were deciding to combat the coronavirus pandemic without notifying him or his ministry although he is the chief of the national committee of COVID-19.

As he said, "There is a national committee on COVID-19, I am the chief of the committee as the health minister, but I am not aware of decisions taken by various authorities in this regard" (New Age, April 07, 2020). He added, he or his "department was not informed of the reopening and closure of the garment factories, the meetings with mosque authorities and locking down of roads in places" (New Age, April 07, 2020). Usually, such activities substantiated a failure of law enforcement agencies which ultimately leads to misgovernance.

Even, many low-income people became jobless due to the ongoing lockdown, the Bangladesh government has launched allocating daily commodities and cash to overcome the problems of those people. But some corrupt public representatives, OMS dealers, and political leaders have stolen succor which was allocated for the poor and the vulnerable people (Dhaka Tribune, June 12, 2020).

As Dr. Ifekharuzzaman who is the Executive Director, Transparency International Bangladesh mentioned, "No words are enough to condemn that many of those involved in the abuse of power, misappropriation and other forms of immorality and illegality are public representatives and OMS dealers who are also often politically linked." (The Daily Star, 2020). That is why ensuring food security and earning income has become more burning issues than the spread of coronavirus to poor people that push them to go outside.

Some legislators of India have claimed deceptively that cow urine and its muck could fight the coronavirus which could be considered as a 'part of an ongoing trend to promote Hindu nationalist pseudoscience' (Agrawal, 2020). The government of the South Asian region was late in taking protective initiatives on the pandemic. India's communally motivating activities and a portion of print and virtual media blaming Muslims for propagating the virus (Khan, 2020).

Though it was an unproven claim by some media and legislators as most of the infection suspected people of India have not been tested (Khan, 2020). Moreover, one interesting matter is that similar gatherings were also noticeable by Hindu religious people in the temple throughout India. For example, till the 16th of March, the Tirupati temple was open where

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approximately 30,000 to 40,000 visitors gather in a day for praying, and KashiVisnath Temple was also open till 20 March (Mohammad, 2020). Overall, it is clear that the government did not take the early initiative to stop such activities rather it gives a communal color of the corona pandemic.

Yet the Pakistan government has no clear statement on coronavirus and an organized policy to notify, instruct, and protect the masses has not been coming out. The government issued its first public message in the Urdu language that translation is like "fight instead of fearing coronavirus." Such a message provided the huge ground for the general public to face frivolously to the damning virus.

In February, several people were returning to Pakistan after visiting the Shiite pilgrims via Iran, some were quarantined, and many of them were free without an appropriate health check. In March, Punjab provincial government permitted the Tablighis for a congregation in Lahore city. More than 100,000 people gathered there from across Pakistan, along with followers from about 40 countries.

Later, it was evidenced that people who returned from Shiite pilgrims and the Tablighis became the key agents of spreading the coronavirus in various cities (Khattak, 2020). Whereas Health experts always asking for strict lockdown, the government voice was in confusion. During the time of lock down, the Pakistan government permitted communal prayers of Muslims in Ramadan, activities of exporting industries, and some commercial institutions are also resumed (Fliegauf & Ayres, 2020).

On 5th June 2020, Prime Minister Khan said on television to his so-called 'Corona Relief Tiger Force volunteers' that "it is important to ensure people follow the SOPs (standard operating procedures, referring to precautionary measures) because we can't go back to lockdown; this country cannot afford it" (Khattak, 2020).

The weak public healthcare system, poverty, instability, contacts, and returning travelers from Iran might result in the substantial transmission of COVID-19 in Afghanistan (Mousavi *et al*., 2020). In this year, 198,000 returnees recorded to return to Afghanistan from Iran (The International Organization for Migration) where 15,000 people a day were crossing the border (Baby & Pandey, 2020). As of 26 February, the border crossing with Iran was re-opened after closing on 23 February makes a prone zone for COVID-19 spread (World Health Organization).

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Some experts consider that South Asia is adopting the approach to 'developed so-called herd immunity', without mentioning it openly (Hasan, 2020). It means millions of people will require to be infected through the virus to turn into immune, and the virus will ultimately weaken away. But it is a hard process as many people will die.

4. Methods of the Study

4.1.1. Data and Sample

We conduct this research with the data from March 10 to June 15 for total daily cases of COVID-19 in four selecting East Asian countries (China, Taiwan, Hong Kong, and South Korea) and March 4 to June 15 for total daily cases of COVID-19 in four selecting South Asian countries (India, Pakistan, Bangladesh, and Afghanistan), where the secondary data is collected from world meter till 15 June, 2020.

4.1.2. Model Specification

To know the future COVID-19 cases we apply the ARIMA forecasting model for our study. The Autoregressive Integrated Moving Average Model (ARIMA) is a model based on time series data that follows a normal distribution. AR, MA, and ARMA are various sub-classification of this model.

To construct the ARIMA model the time series observations must be stationary and data have to be integrated. The principle of parsimony implies that the model with the smallest number of parameters shows the accurate model. Box Jenkins methodology is used for the optimal model building process in ARIMA, which has made ARIMA popular (Ghosh, 2017).

The general equation of the ARIMA model for COVID -19 cases is equation 1,

$$TDC\_19_t = \beta_0 + \beta_1 TDC\_19_{t-1} + \ldots\ldots + \beta_P TDC\_19_{t-p} + + \beta_2 \mu_{t-1} + \ldots\ldots + \beta_q \mu_{t-q} \quad (1)$$

Here TDC_19 refers to the total daily cases of COVID-19 in East and South Asian countries and μ refer to the error term.

4.1.3. Hypotheses Statement

The case of COVID-19 in East Asian countries drastically curved due to the proper implication of good governance. The government control system significantly works in this case through lockdown, ban traveling, the prohibition of public gathering, etc. Providing real information and removing rumors increases transparency to reduce COVID-19 in the East Asian region, clear rules and responsibilities help a lot to curb COVID-19 (Shaw, 2020).

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Mobilizing resources, rapid response, strong administrative power of the Chinese government reduces the COVID-19 cases in China (Qian *et al*., 2020). The effectiveness of the Chinese government's steps is also praiseworthy to fall the patient of coronavirus (Al Takari, 2020). Besides Taiwan is a model for public health governance with a lower case of coronavirus and death (Financial Times, 2020). The government of Taiwanese quick and transparent response with limited resources helps to reduce coronavirus outbreak (Chen & Chang, 2020). The hypothesis of this statement is below:

- ***H_1: There is a Decreasing Trend of New Infected Cases of COVID-19 in East Asia***

COVID-19 cases increasing day by day in South Asian countries. Lack of governance may be responsible to increase this epidemic in South Asian countries. Though lockdown was enforced, there were open several businesses and services show the ineffectiveness of government in Bangladesh (Ahmed, 2020). Due to insufficient medical resource allocation COVID-19 increase in India (Al Jazeera, 2020). Lack of testing kits and government regulations worsens the situation of COVID-19 in Pakistan (Mohammad and Khan, 2020). Afghanistan's government also fails to control the border area and detection of COVID-19. The hypothesis of this statement is below:

- ***H_2: There is an Increasing Trend of New Infected Cases of COVID-19 in South Asia***

5. EMPIRICAL RESULTS AND DISCUSSION

5.1. ARIMA Forecasting Model for Total Daily Cases in East and South Asian Countries

5.1.1. Stationary of the Variables for Both Regions

For time-series data forecasting, data must be stationary. In *Appendix Figure 1* and *Appendix Figure 3*, for total daily cases of COVID-19 are not stationary as the mean and variance are not consistent. To convert the data from non-stationary to stationary the study has been used the first difference of the data and found the graph in *Appendix Figure 2* and *4* shows stationarity of the data as the mean and variance is consistent in the graph respectively.

Augmented Dickey-Fuller (ADF) test are shown in table 5 (a) and 5(b) where *t* statistics are significant at 1% level that means at *I (1)* our data is stationary for total daily cases of COVID-19 in selecting four countries of East Asia and South Asian countries respectively.

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Table 5 (a): Augmented Dickey-Fuller Unit Root Test for East Asian Selected Countries

Variable	*Level*	*1st difference*	*Decision*
	t-statistics	*t-statistics*	
TDC_19	*-1.285045*	*-8.082022****	*I(1)*

*** indicates 1% level of significance

Table 5(b): Augmented Dickey-Fuller Unit Root Test for South Asian Countries

Variable	***Level***	***1st difference***	***Decision***
	t-statistics	*t-statistics*	
TDC_19	*2.070246*	*-12.74416****	*I(1)*

*** indicates 1% level of significance

5.1.2. Model Identification for both East and South Asia

Appendix Table 1 shows the correlogram of the data at the first difference. Where autocorrelation function provides the value of *q* and partial autocorrelation function provides the value of *p* for our ARIMA forecasting model. The correlogram with ACF and PACF function at first difference shows 36 lags. From the correlogram, we select the various model and the results are summarized in Table 6(a). As the data is stationary at the first difference, we ensure that our model is ARIMA. Based on the value of AIC and BIC our selected ARIMA model is (0, 1, 1) as it has the lowest value of AIC and BIC (Ghosh, 2017).

Table 6 (a): ARIMA Model Identification for East Asian Countries

MODEL	*AR*	*MA*	*AIC*	*BIC*
ARIMA(0,1,1)	*0*	*1*	*10.348986*	*10.428117*
ARIMA(0,1,2)	*0*	*2*	*10.365124*	*10.470633*
ARIMA(1,1,1)	*1*	*1*	*10.365435*	*10.470944*
ARIMA(1,1,2)	*1*	*2*	*10.376702*	*10.508588*

Appendix Table 3 shows the correlogram of the data at the first difference. From the correlogram, we select the various model and the results are summarized in Table 6(b). Based on the principle of parsimony we select the following model. Based on the value of AIC and BIC our selected ARIMA model is (0, 1, 1) as it has the lowest value of AIC and BIC (Ghosh, 2017).

Table 6(b): ARIMA Model Identification for South Asian Countries

MODEL	*AR*	*MA*	*AIC*	*BIC*
ARIMA(011)	*0*	*1*	*16.293765*	*16.370045*
ARIMA(214	*2*	*4*	*16.297740*	*16.501154*
ARIMA(210)	*2*	*0*	*16.302630*	*16.404337*
ARIMA(213	*2*	*3*	*16.302842*	*16.302842*

5.1.3. Diagnostics Test of the Two Models

For statistically accepting the model we apply an autocorrelation test for residuals. For testing the autocorrelation of residuals, we apply the Q-statistic of Box Ljung (1978) for 36 lags and found the value probability is more than 0.05 ensures that there is no autocorrelation

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in both models presenting in the *Appendix Table 2 (East Asia)* and *Appendix Table 4(South Asia)*.

5.1.4. Final Model for East and South Asian Countries

Table 7 (a) and 7(b) illustrates the coefficient of the final model for East and South Asian countries respectively. In the East and South Asian model, the coefficient of the constant term is -0.759451 and 198.0155 respectively.

Table 7 (a): ARIMA (0, 1, 1) Model for East Asia

Variable	***Coefficient***	***Std. Error***	***t-Statistic***	***Prob.***
Constant	*-0.759451*	*1.733199*	*-0.438179*	*0.6623*
MA(1)	*-0.715686*	*0.077177*	*-9.273295*	*0.0000*
SIGMASQ	*1897.975*	*182.9626*	*10.37357*	*0.0000*
R-squared =0.356182 *Probability (F-statistic)= 0.000000* *Durbin-Watson stat=1.846539*				

Table 7(b): ARIMA (0, 1, 1) Model for South Asian Countries

Variable	***Coefficient***	***Std. Error***	***t-Statistic***	***Prob.***
Constant	*198.0155*	*60.41429*	*3.277627*	*0.0014*
MA(1)	*-0.339701*	*0.095744*	*-3.548014*	*0.0006*
SIGMASQ	*770378.3*	*67274.11*	*11.45133*	*0.0000*
R-squared =0.090914 *Probability (F-statistic)= 0.008516* *Durbin-Watson stat=1.894805*				

The coefficients of MA (1) are -0.715686 and -0.339701 respectively for both regions. It is statistically significant at a 1% significance level. SIGMASQ indicates the volatility of the model and it is also significant. The value of R square is 0.36 and 0.09 and the Durbin Watson value is 1.85 and 1.90 for both models respectively.

5.1.5. Forecasting for both Regions

As we identify the perfect model and also apply the diagnostic test of the residuals now we can proceed with forecasting the model. Figure 1(a) and 1(b) shows the forecasting result of the COVID-19 daily cases from June 16, 2020 to June 30, 2021 for both regions. In Figure 1(a) the blue line shows the forecasting line which is decreasing for our forecasting days indicating that the daily cases of COVID-19 in East Asian countries will decrease day by day.

In Figure 1(b) the blue line shows the forecasting line which is increasing for our forecasting days indicating that the daily cases of Covid-19 in South Asian countries will increase day by day. MA (1) is significant both for East and South Asian countries and supports the hypotheses.

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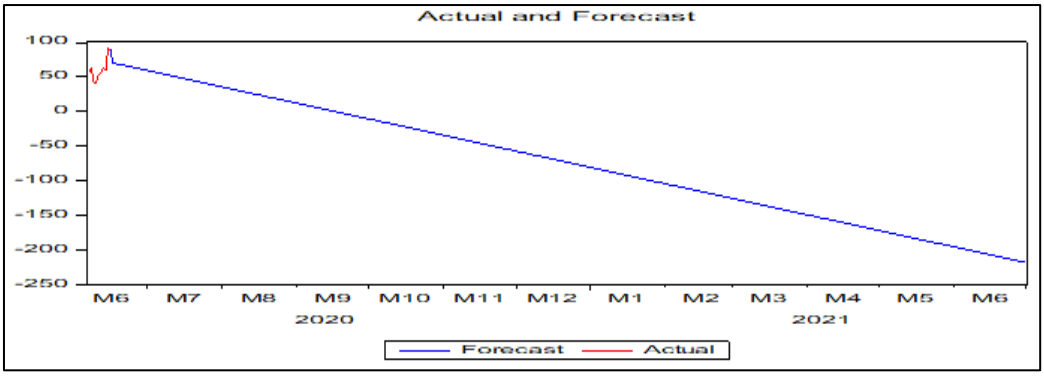

Figure 1a: Actual and Forecasting Graph for East Asian Countries

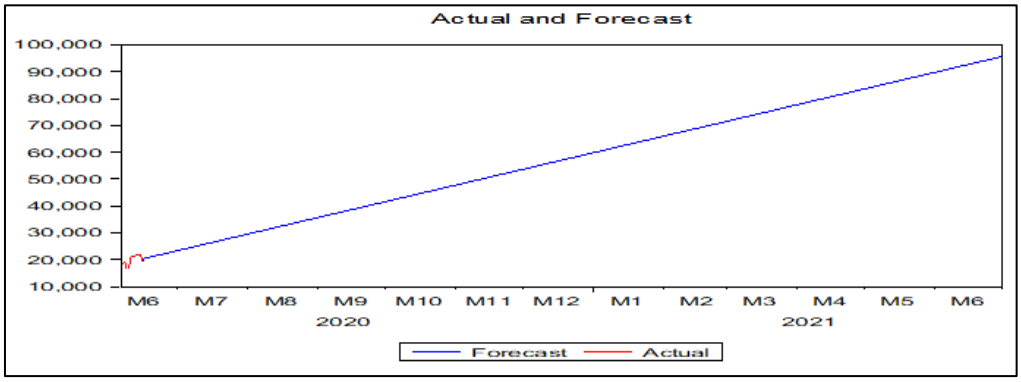

Figure 1b: Actual and Forecasting Graph

5.2. Comparison of forecasting Graph for East and South Asian Countries

To compare the forecasting result we summarize the result of ARIMA forecasting in Figure 2 below for the time being of June 16, 2020 to June 30, 2021, where the upper portion shows the forecasting cases of COVID-19 in East Asian countries and the lower portion shows the cases of COVID-19 in South Asian countries. Comparing these two graphs we can admit that South Asian countries have a higher possibility to increase the COVID-19 compare to East Asian countries. We can conclude that the practice of good governance helps to reduce coronavirus cases in East Asia and a lack of good governance boost the coronavirus cases in South Asia.

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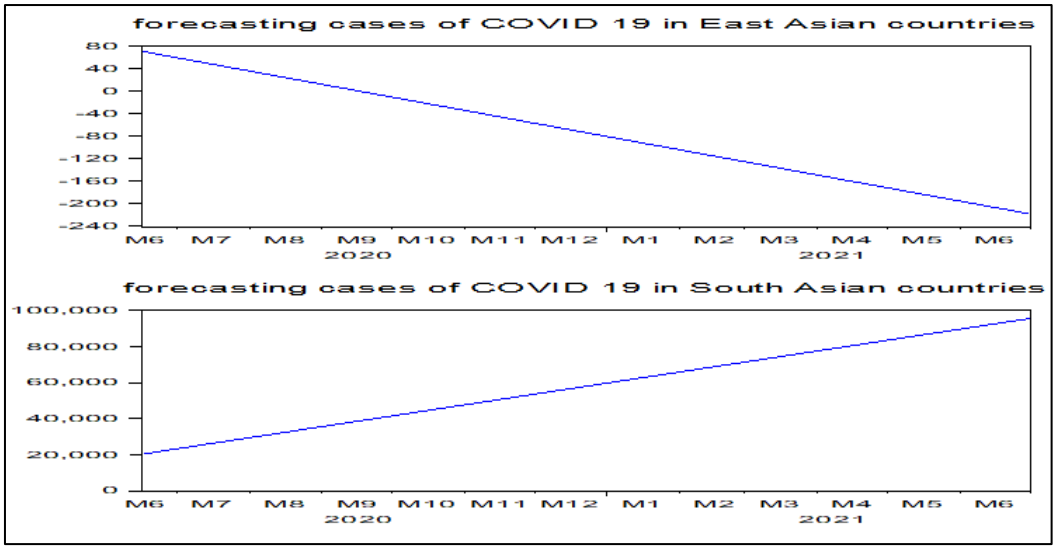

Figure 2: Comparison of Forecasting Graph for East and South Asian Countries

6. CONCLUDING REMARKS AND POLICY RECOMMENDATIONS

ARIMA forecasting procedure is applied in this study to observe the COVID-19 cases in both regions of Asia. Data is extracted from Worldometer daily reported cases of COVID-19 for March 10 to June 15 for four selecting East Asian countries and March 4 to June 15 for four selecting South Asian countries. Our forecasted variable is the total daily cases of COVID-19. Based on the minimum value of AIC and BIC our selected appropriate model is ARIMA (0,1,1) for East and South Asia.

In the East and South Asian model, the coefficient of the constant term is -0.759451 and 198.0155 respectively. The coefficients of MA (1) are -0.715686 and -0.339701 respectively for both regions. It is statistically significant at a 1% significance level. SIGMASQ indicates the volatility of the model and it is also significant. The value of R square is 0.36 and 0.09 and the Durbin Watson value is 1.85 and 1.90 for both models respectively.

The forecasting graph for both two regions significantly supports our hypotheses and shows that the total daily cases of COVID-19 decreasing into East Asia but increasing into South Asia.

The South Asia region has faced a lot of difficulties to tackle COVID-19 as most of the countries have not enough government capacity, weak institutions, limited resources, narrow government reach to the vulnerable people and corruption of the political leaders. Moreover, the government of the South Asian countries found themselves in a dilemma of whether to "save lives or livelihoods". No actual strategies are yet noticeable from the governments of South Asia for tracing, testing, and containment of the coronavirus aggressively. Moreover,

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due to the lack of coordination between different authorities the transmission increases day by day. That is why we think that South Asian countries could take lessons from East Asian Countries as these countries are more successful to control COVID-19.

Based on the findings, we offer some recommendations for South Asian countries in following from the East Asia experience to tackle pandemic.

Increasing health expenditure will be a blessing for any country to tackle any outbreak because it saves and protects the doctor, nurses, and other health workers. Lockdowns, social distancing, and quarantine should be maintained accurately in south Asian countries as it is an important way to combat the cases of COVID-19. The number of testing should be increased as soon as possible because more testing help to detect new infections and save others from being infected. Many people are in vulnerable situations due to their health, social and economic circumstances.

In various informal sectors, the life of day workers is at stake. So it's urgent to ensure their basic needs to relieve them from insecurity and mental pressure and also have to ensure that they are at home. Transparent information should be ensured at any cost by the government because the exchange of rumors may create the worst situation rather than combating COVID-19 and also should ensure accessibility of public health information.

Administrative procedures should be simplified to improve the situation.

As Coronavirus spreading around the world, regional cooperation can be helpful to respond to the pandemic by research and knowledge.

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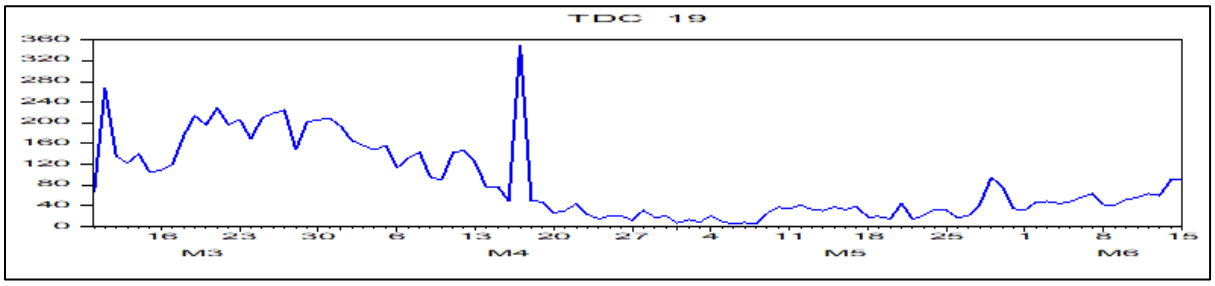
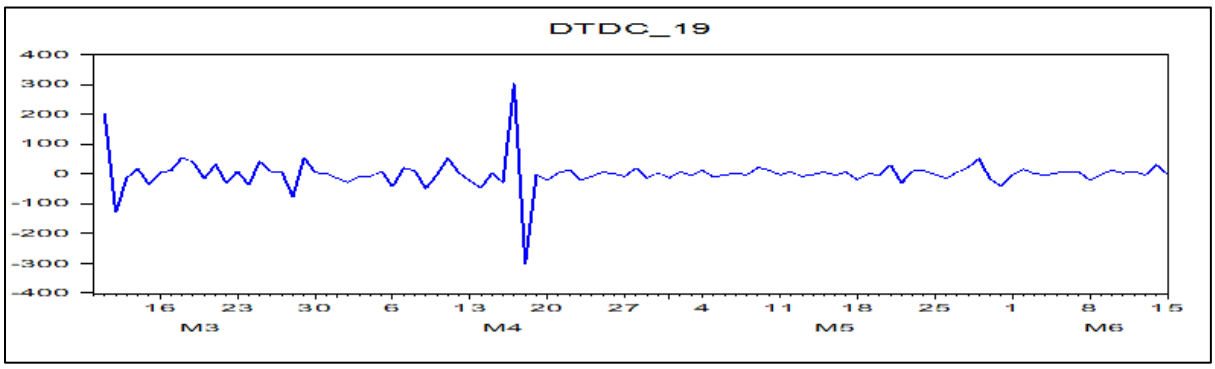
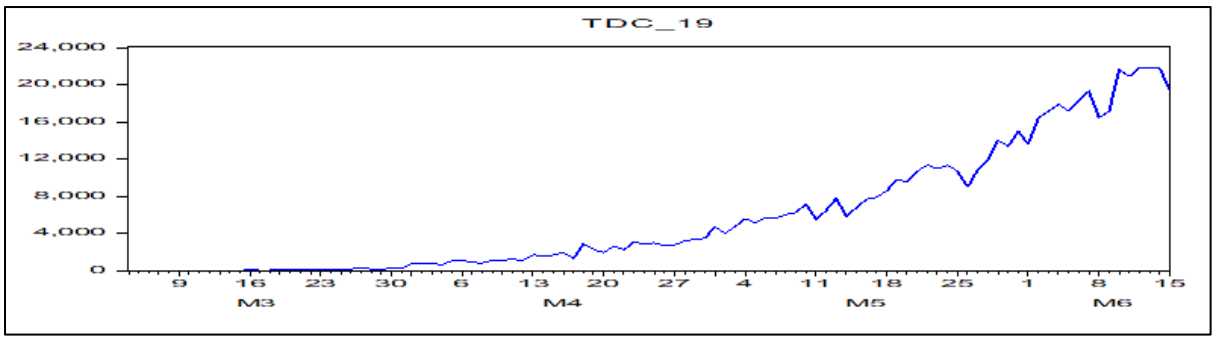
APPENDICES



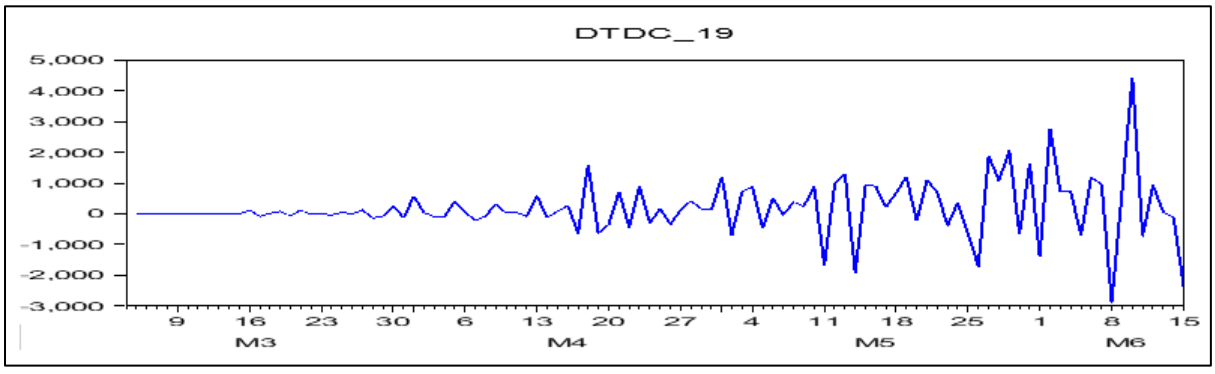
Appendix Figure 1: Total daily cases of COVID-19 in East Asian countries



Appendix Figure 2: Total daily cases of COVID-19 in East Asian countries (At first difference)



Appendix Figure 3: Total Daily Infected Cases of COVID-19 in South Asian countries



Appendix Figure 4: Total Daily Infected Cases of COVID-19 in South Asian countries (At first difference)

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Appendix Table 1: Correlogram for the Data of East Asian Countries

Autocorrelation	*Partial Correlation*		*AC*	*PAC*	*Q-Stat*	*Prob*
***|. |	***|. |	*1*	*-0.460*	*-0.460*	*21.179*	*0.000*
.|. |	**|. |	*2*	*0.023*	*-0.240*	*21.231*	*0.000*
*|. |	**|. |	*3*	*-0.085*	*-0.246*	*21.971*	*0.000*
.|. |	*|. |	*4*	*0.030*	*-0.184*	*22.063*	*0.000*
.|. |	.|. |	*5*	*0.051*	*-0.065*	*22.330*	*0.000*
.|. |	.|. |	*6*	*0.020*	*0.016*	*22.372*	*0.001*
.|. |	.|. |	*7*	*-0.051*	*-0.017*	*22.646*	*0.002*
.|. |	.|. |	*8*	*0.005*	*-0.010*	*22.649*	*0.004*
.|. |	.|* |	*9*	*0.053*	*0.075*	*22.958*	*0.006*
.|. |	.|* |	*10*	*-0.004*	*0.084*	*22.959*	*0.011*
.|. |	.|. |	*11*	*-0.056*	*-0.004*	*23.308*	*0.016*
.|* |	.|* |	*12*	*0.074*	*0.084*	*23.931*	*0.021*
.|. |	.|* |	*13*	*-0.012*	*0.096*	*23.947*	*0.032*
.|. |	.|. |	*14*	*-0.028*	*0.020*	*24.040*	*0.045*
.|. |	.|. |	*15*	*-0.011*	*-0.019*	*24.055*	*0.064*
.|. |	.|. |	*16*	*0.019*	*0.002*	*24.097*	*0.087*
.|. |	.|. |	*17*	*0.008*	*-0.003*	*24.104*	*0.117*
.|. |	.|. |	*18*	*0.017*	*0.004*	*24.140*	*0.150*
.|. |	.|* |	*19*	*0.041*	*0.095*	*24.344*	*0.183*
*|. |	.|. |	*20*	*-0.128*	*-0.056*	*26.377*	*0.154*
.|* |	.|. |	*21*	*0.075*	*-0.029*	*27.094*	*0.168*
.|. |	.|. |	*22*	*-0.019*	*-0.034*	*27.140*	*0.206*
.|. |	.|. |	*23*	*0.060*	*0.041*	*27.603*	*0.231*
*|. |	*|. |	*24*	*-0.102*	*-0.082*	*28.972*	*0.221*
.|* |	.|. |	*25*	*0.099*	*0.031*	*30.287*	*0.214*
*|. |	.|. |	*26*	*-0.109*	*-0.064*	*31.891*	*0.197*
.|. |	.|. |	*27*	*0.059*	*-0.057*	*32.372*	*0.219*
.|. |	.|. |	*28*	*-0.015*	*-0.054*	*32.401*	*0.258*
.|. |	.|. |	*29*	*0.015*	*-0.014*	*32.431*	*0.301*
.|. |	.|. |	*30*	*0.021*	*0.040*	*32.496*	*0.345*
.|. |	.|. |	*31*	*-0.044*	*-0.025*	*32.782*	*0.380*
.|. |	.|. |	*32*	*0.026*	*0.037*	*32.885*	*0.424*
*|. |	*|. |	*33*	*-0.087*	*-0.083*	*34.030*	*0.418*
.|* |	.|. |	*34*	*0.102*	*0.001*	*35.605*	*0.393*
*|. |	*|. |	*35*	*-0.070*	*-0.073*	*36.365*	*0.405*
*|. |	**|. |	*36*	*-0.141*	*-0.304*	*39.517*	*0.316*

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Appendix Table2: Autocorrelation Test of Residuals of East Asian Countries

Autocorrelation	*Partial Correlation*		*AC*	*PAC*	*Q-Stat*	*Prob*
.|. |	.|. |	*1*	*0.002*	*0.002*	*0.0005*	
.|. |	.|. |	*2*	*-0.008*	*-0.008*	*0.0074*	*0.932*
*|. |	*|. |	*3*	*-0.067*	*-0.067*	*0.4684*	*0.791*
.|. |	.|. |	*4*	*0.050*	*0.050*	*0.7226*	*0.868*
.|* |	.|* |	*5*	*0.098*	*0.098*	*1.7305*	*0.785*
.|. |	.|. |	*6*	*0.050*	*0.046*	*1.9929*	*0.850*
.|. |	.|. |	*7*	*-0.024*	*-0.017*	*2.0554*	*0.915*
.|. |	.|. |	*8*	*0.031*	*0.042*	*2.1590*	*0.951*
.|* |	.|* |	*9*	*0.084*	*0.083*	*2.9344*	*0.938*
.|. |	.|. |	*10*	*0.034*	*0.018*	*3.0604*	*0.962*
.|. |	.|. |	*11*	*0.002*	*-0.000*	*3.0608*	*0.980*
.|* |	.|* |	*12*	*0.086*	*0.098*	*3.8908*	*0.973*
.|. |	.|. |	*13*	*0.015*	*0.008*	*3.9160*	*0.985*
.|. |	.|. |	*14*	*-0.033*	*-0.057*	*4.0443*	*0.991*
.|. |	.|. |	*15*	*-0.007*	*-0.006*	*4.0500*	*0.995*
.|. |	.|. |	*16*	*0.049*	*0.044*	*4.3303*	*0.996*
.|. |	.|. |	*17*	*0.053*	*0.025*	*4.6707*	*0.997*
.|. |	.|. |	*18*	*0.031*	*0.013*	*4.7856*	*0.998*
.|. |	.|. |	*19*	*-0.001*	*0.014*	*4.7859*	*0.999*
*|. |	*|. |	*20*	*-0.116*	*-0.119*	*6.4624*	*0.997*
.|. |	.|. |	*21*	*0.035*	*0.006*	*6.6158*	*0.998*
.|. |	.|. |	*22*	*0.017*	*0.001*	*6.6519*	*0.999*
.|. |	.|. |	*23*	*0.033*	*0.019*	*6.7939*	*0.999*
*|. |	*|. |	*24*	*-0.078*	*-0.080*	*7.5961*	*0.999*
.|. |	.|. |	*25*	*0.025*	*0.036*	*7.6804*	*0.999*
*|. |	*|. |	*26*	*-0.092*	*-0.090*	*8.8322*	*0.999*
.|. |	.|. |	*27*	*0.011*	*-0.018*	*8.8498*	*0.999*
.|. |	.|. |	*28*	*-0.004*	*-0.003*	*8.8522*	*1.000*
.|. |	.|. |	*29*	*0.008*	*0.020*	*8.8617*	*1.000*
.|. |	.|. |	*30*	*-0.028*	*-0.022*	*8.9743*	*1.000*
*|. |	*|. |	*31*	*-0.106*	*-0.106*	*10.600*	*1.000*
*|. |	.|. |	*32*	*-0.083*	*-0.055*	*11.619*	*0.999*
*|. |	*|. |	*33*	*-0.127*	*-0.144*	*14.039*	*0.998*
.|. |	.|. |	*34*	*-0.009*	*-0.041*	*14.051*	*0.998*
*|. |	*|. |	*35*	*-0.127*	*-0.136*	*16.567*	*0.995*
*|. |	*|. |	*36*	*-0.115*	*-0.096*	*18.664*	*0.989*

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Appendix Table 3: Correlogram for the data of South Asian Countries

Autocorrelation	*Partial Correlation*		*AC*	*PAC*	*Q-Stat*	*Prob*
**|. |	**|. |	*1*	*-0.256*	*-0.256*	*6.9725*	*0.008*
*|. |	*|. |	*2*	*-0.083*	*-0.159*	*7.7129*	*0.021*
.|* |	.|. |	*3*	*0.098*	*0.036*	*8.7580*	*0.033*
.|. |	.|. |	*4*	*0.041*	*0.073*	*8.9403*	*0.063*
**|. |	*|. |	*5*	*-0.215*	*-0.184*	*14.046*	*0.015*
.|* |	.|. |	*6*	*0.110*	*0.006*	*15.383*	*0.017*
.|* |	.|* |	*7*	*0.101*	*0.100*	*16.523*	*0.021*
.|. |	.|* |	*8*	*-0.016*	*0.087*	*16.550*	*0.035*
.|. |	.|. |	*9*	*0.023*	*0.074*	*16.610*	*0.055*
.|. |	.|. |	*10*	*0.060*	*0.039*	*17.027*	*0.074*
*|. |	*|. |	*11*	*-0.125*	*-0.093*	*18.878*	*0.063*
.|* |	.|* |	*12*	*0.175*	*0.179*	*22.501*	*0.032*
.|. |	.|. |	*13*	*-0.038*	*0.037*	*22.678*	*0.046*
.|* |	.|* |	*14*	*0.137*	*0.204*	*24.963*	*0.035*
.|. |	.|. |	*15*	*-0.064*	*0.003*	*25.473*	*0.044*
.|. |	.|. |	*16*	*0.051*	*0.006*	*25.797*	*0.057*
*|. |	*|. |	*17*	*-0.113*	*-0.079*	*27.393*	*0.053*
.|. |	*|. |	*18*	*-0.007*	*-0.070*	*27.399*	*0.072*
.|. |	.|. |	*19*	*-0.010*	*-0.037*	*27.412*	*0.095*
.|. |	.|. |	*20*	*0.038*	*-0.012*	*27.599*	*0.119*
.|. |	.|. |	*21*	*0.060*	*0.043*	*28.076*	*0.138*
.|. |	.|. |	*22*	*0.052*	*0.036*	*28.443*	*0.161*
.|. |	.|. |	*23*	*-0.065*	*-0.033*	*29.021*	*0.180*
.|. |	*|. |	*24*	*-0.017*	*-0.080*	*29.061*	*0.218*
.|* |	.|** |	*25*	*0.160*	*0.217*	*32.593*	*0.142*
*|. |	.|. |	*26*	*-0.091*	*-0.028*	*33.745*	*0.142*
*|. |	*|. |	*27*	*-0.125*	*-0.111*	*35.958*	*0.116*
.|* |	.|. |	*28*	*0.150*	*-0.039*	*39.223*	*0.077*
.|. |	.|. |	*29*	*-0.038*	*-0.016*	*39.435*	*0.094*
.|. |	.|* |	*30*	*-0.037*	*0.087*	*39.633*	*0.112*
.|. |	.|. |	*31*	*0.010*	*0.020*	*39.649*	*0.137*
.|. |	.|. |	*32*	*0.030*	*-0.052*	*39.783*	*0.162*
.|. |	.|. |	*33*	*-0.028*	*-0.011*	*39.902*	*0.190*
.|. |	.|. |	*34*	*0.041*	*0.008*	*40.168*	*0.216*
.|. |	.|. |	*35*	*-0.011*	*-0.024*	*40.186*	*0.251*
.|. |	.|. |	*36*	*-0.017*	*0.026*	*40.233*	*0.288*

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Appendix Table 4: Autocorrelation Test of Residuals for South Asian Countries

Autocorrelation	*Partial Correlation*		*AC*	*PAC*	*Q-Stat*	*Prob*
.|. |	.|. |	*1*	*0.007*	*0.007*	*0.0057*	
.|. |	.|. |	*2*	*-0.058*	*-0.058*	*0.3620*	*0.547*
.|* |	.|* |	*3*	*0.084*	*0.085*	*1.1271*	*0.569*
.|. |	.|. |	*4*	*0.021*	*0.016*	*1.1757*	*0.759*
*|. |	*|. |	*5*	*-0.171*	*-0.163*	*4.3987*	*0.355*
.|* |	.|* |	*6*	*0.146*	*0.151*	*6.7897*	*0.237*
.|* |	.|* |	*7*	*0.155*	*0.135*	*9.4816*	*0.148*
.|. |	.|. |	*8*	*0.017*	*0.053*	*9.5151*	*0.218*
.|. |	.|. |	*9*	*0.057*	*0.057*	*9.8830*	*0.273*
.|. |	.|. |	*10*	*0.069*	*0.018*	*10.442*	*0.316*
.|. |	.|. |	*11*	*-0.056*	*-0.016*	*10.809*	*0.373*
.|* |	.|** |	*12*	*0.185*	*0.225*	*14.857*	*0.189*
.|* |	.|. |	*13*	*0.078*	*0.039*	*15.597*	*0.210*
.|* |	.|** |	*14*	*0.180*	*0.213*	*19.549*	*0.107*
.|. |	.|. |	*15*	*-0.018*	*-0.053*	*19.587*	*0.144*
.|. |	.|. |	*16*	*0.024*	*-0.007*	*19.659*	*0.185*
*|. |	*|. |	*17*	*-0.118*	*-0.099*	*21.407*	*0.163*
.|. |	.|. |	*18*	*-0.017*	*-0.051*	*21.446*	*0.207*
.|. |	.|. |	*19*	*0.020*	*-0.003*	*21.500*	*0.255*
.|* |	.|. |	*20*	*0.086*	*0.015*	*22.475*	*0.261*
.|* |	.|. |	*21*	*0.083*	*0.020*	*23.383*	*0.270*
.|. |	.|. |	*22*	*0.055*	*-0.007*	*23.785*	*0.304*
.|. |	.|. |	*23*	*-0.044*	*-0.057*	*24.043*	*0.345*
.|. |	.|. |	*24*	*0.008*	*-0.012*	*24.051*	*0.401*
.|* |	.|* |	*25*	*0.144*	*0.194*	*26.914*	*0.308*
*|. |	*|. |	*26*	*-0.070*	*-0.159*	*27.601*	*0.327*
*|. |	*|. |	*27*	*-0.111*	*-0.116*	*29.349*	*0.295*
.|* |	.|. |	*28*	*0.124*	*0.007*	*31.560*	*0.249*
.|. |	.|. |	*29*	*-0.004*	*0.045*	*31.563*	*0.293*
.|. |	.|* |	*30*	*-0.031*	*0.095*	*31.708*	*0.333*
.|. |	.|. |	*31*	*0.019*	*-0.019*	*31.761*	*0.379*
.|. |	.|. |	*32*	*0.036*	*-0.057*	*31.954*	*0.419*
.|. |	.|. |	*33*	*-0.024*	*0.020*	*32.045*	*0.465*
.|. |	.|. |	*34*	*0.046*	*0.004*	*32.375*	*0.498*
.|. |	.|. |	*35*	*0.004*	*-0.014*	*32.377*	*0.547*
.|. |	.|. |	*36*	*-0.026*	*0.012*	*32.487*	*0.590*