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**RESEARCH ARTICLES**

# Comparison of actions taken by Pakistan, United Arab Emirates and Vietnam for prevention and control of COVID-19

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**Abstract**

**Background:** Coronavirus disease (COVID-19) is an infectious disease caused by the newly discovered zoonotic virus SARS-CoV-2. This disease presents the worst public health crisis the world has faced since the Spanish flu pandemic in 1918. It is the biggest global public health challenge of our lifetimes. COVID-19 situation in each country and sometimes even within countries is different and evolving. The objective of this study was to determine the impact of actions taken by the governments and individual behaviour on the coronavirus epidemic in a country.

**Methods:** Three countries were selected. COVID-19 daily news reported cases and deaths in Pakistan, Vietnam and UAE data between 21 January to 30 April 2020, was extracted from COVID-19 dashboard. Articles, TV channels and newspapers were searched. These three countries were visited during 12 to 21 March 2020 and public's behaviour was observed.

**Results:** In Vietnam, during the first stage of outbreak, the main strategy was to impose international travel restrictions to prevent imported cases from COVID-19 highly effected countries, and to delay the spread and reduce the magnitude of prevailing epidemic. Furthermore, combination of preventive measures and national level readiness to respond to coronavirus disease aided to contain the further spread of virus. Government of Vietnam took swift preventive measures as compared to Pakistan and UAE, to limit imported COVID-19 cases and to contain the local transmission of the coronavirus. Delayed in decision making regarding travel restrictions and imposing lockdown by Pakistan and UAE may have resulted in rapid spread of the disease.

**Conclusion:** In developing countries, the decision regarding travel and complete lockdown is challenging due to prevalent socio-economic circumstances and maintenance of supply of food and essential goods. The response of an individual to advice issued by the government on preventive measures and Government communication strategies to inform the public to respond positively against this disease are important factors.

**Key words:** COVID-19; Actions, Individual's Behaviour; Pakistan; United Arab Emirates; Vietnam

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**Introduction**

Coronavirus disease (COVID-19) is caused by a novel coronavirus, first reported in Wuhan city China, in December 2019. The WHO announced the official name of the coronavirus as coronavirus disease (COVID-19) on 11 February 2020, the current reference name for this virus is severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (1,2). According to the World Health Organization modes of transmission are contact, droplet and aerosol (3,4). Until now, no vaccine or treatment is available for COVID-19 (5). World Health Organization recommended public health education regarding personal hygiene i.e. hand hygiene, cough etiquette, social distancing and avoiding large gatherings (6). On 11 March 2020, WHO declared COVID-19 as pandemic (3). Total confirmed cases of

COVID-19 until May 1, 2020 were 3177207, and the total death toll reached 224172 in the world (7).

Health systems around the world are struggling to cope with COVID-19. International and domestic travellers from the affected areas are the potential source of disease transmission (8,9). Careful planning and clear guidance are helpful for the prevention and control of this epidemic in a country. During an epidemic it is advised to avoid large gatherings in order to prevent person to person transmission (6). China might have lost billions of dollars by stopping all businesses but in the end, this proved to be a correct action and wise decision. Measures implemented in Wuhan, were very different than those implemented in other places such as Chengdu and Shanghai (3). This is very important lesson for the authorities that responses must be tailored carefully according to the local context. What has worked in China, South Korea,

and Singapore, may not be directly transferable to the European countries. And in turn, measures in the European Region may not be appropriate in other developing countries. Aim of this study was to determine the impact of actions taken by the governments and individual behaviour on the coronavirus epidemic in a country.

## Methods

In this study, we closely monitored daily updates on COVID-19 Dashboard by the Centre for Systems Science and Engineering (CSSE) at Johns Hopkins University (<https://coronavirus.jhu.edu/map.html>) and China Global Television Network (CGTN) between 21 January to 30 April 2020 to extract the daily reported cases and deaths in Pakistan, Vietnam and UAE (10,11). Articles and newspapers were searched using the terms “COVID-19”, “response” “measurers”, “Pakistan”, “Vietnam” and “United Arab Emirates”. Relevant information was extracted from the selected studies and newspapers. These three countries were visited during 12 to 21 March 2020 and public’s behaviour was observed.

To know the future behaviour of the pandemic in the three countries we referred an article published by Singapore University of Technology and Design (<http://www.sutd.edu.sg>). In this article pandemic life cycle was estimated. The regressed SIR model was appropriate for the estimation of full pandemic life cycle and plotting the life cycle curve. The first part of the curve was fitted with the data to date and the rest of the part of the curve was forecasted. The forecasts in the article present these three surrogate estimates of end (12).

## Results

### Pakistan

Pakistan is located between two main COVID-19 affected countries i.e. China and Iran. On 26 February 2020, the first two cases of COVID-19 were reported in Islamabad and Karachi respectively (13). Both patients had travelled from Iran. After importation of cases from Iran, close monitoring and active screening of passengers travelling from Iran started at Taftan border (14). The total number of positive COVID-19 test were reached at 16,817, with 6340 (38%) cases in Punjab Province, 6053 (36%) in Sindh, 2627 (16%) in Khyber Pakhtunkhwa, 1049 (6%) in Balochistan, 339 (2%) in Gilgit-Baltistan, 343 (2%) in Islamabad, and 66 (0.4%) in Azad Jammu & Kashmir up till 30th April 2020 (15).

A congregation of an Islamic organization took place at Raiwind Markaz, Lahore on 13th March 2020 and resulted as super-spreader event with more than 539 confirmed cases across the country (16). On 13th March, the health department Sindh identified a patient as positive, this case was the first domestic transmission as patient had travelled from Islamabad (17). The first death due to COVID-19 was reported in Sindh on 20 March 2020 (18).

It was observed that many people were unaware and did not take this epidemic seriously. Several rumours regarding COVID-19 prevention and treatment were being spread, leading to anxiety and panic among the public.

### Actions taken by the government of Pakistan

National Institute of Health (NIH), Pakistan has played a pivotal role in the control of COVID-19. It has taken many steps including activation of Emergency Operation Centre (EOC) on 22nd January, 2020, and issued advisories, national guidelines and Standard Operating Procedures (SOPs) regarding COVID-19 detection, transmission and prevention, conducted trainings on surveillance, rapid response teams, effective case management, Infection Prevention and Control (IPC), sample collection & transportation and strengthened the coordination mechanisms with other stakeholders. NIH has also provided support to all provinces for establishing disease surveillance and response units (PDSRUs) (19,20). During the early days of this epidemic, Pakistan lacked diagnostic facilities, and samples of suspected cases were sent to foreign laboratories. Currently, Pakistan has developed indigenous PCR testing capacity and has COVID-19 test centers in all provinces. On 24th January, screening of passengers was started at all international airports (21). On 23rd February, Pakistan closed Taftan border to travellers from Iran until 7th March 2020 (22,23).

On 12th March, the government announced that the remaining Pakistan super league (PSL) matches would be held behind closed doors (24). On 13th March, the government announced several critical measures, including setting up of a National Coordination Committee to deal with this epidemic on a federal level, and by engaging the National Disaster Management Authority (NDMA) to implement the response, cancelling Pakistan day (23rd March) parade, closing the country’s border with Iran and Afghanistan and shutting all educational institutes (25). On 14th March, the government imposed a temporary ban on marriage halls, shrines and festivals, and closed all land borders on 16th March (26,27). On 21st March, all flights were suspended for two weeks and screening of domestic travellers was started at airports (28). On 22nd March, the government decided to close down markets, shopping malls, parks, and public places, urged people to stay home, maintain social distancing and avoid unnecessary travel (29).

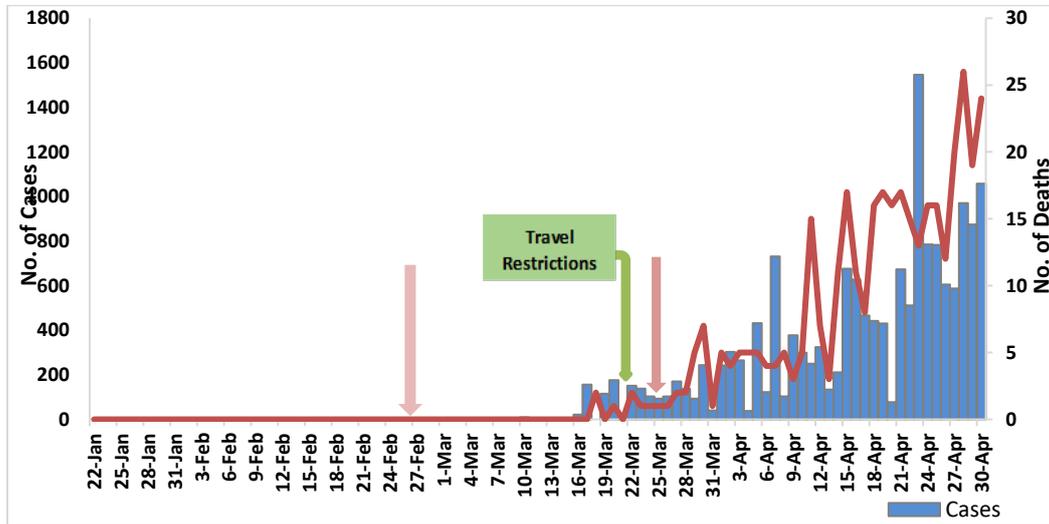
Lockdown was imposed on 24th March until 7th April and deployment of troops was executed nationwide and military’s medical resources were provided to curtail ongoing outbreak (30). On 25th March, several restrictions were imposed, including closing of the outpatient departments of hospitals, ban on gathering in public and private places and complete prohibition on intra-city, inter-district, and inter-province public transport (31). On 27th March, the NIH initiated district level training of isolation, high-

dependency unit, and quarantine staff across the country (20).

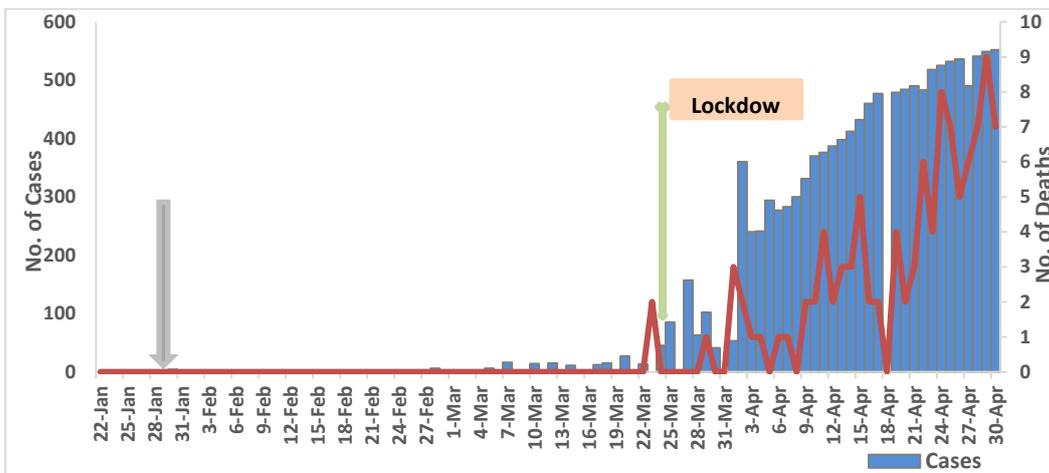
Pakistan imposed travel restrictions after having 515 (3%) of the total reported cases of COVID-19 and

the government decided a lockdown in the country when the number of positive cases of COVID-19 raised to 903 (5.4 %) out of the total cases reported till 30th April 2020

**Figure 1:** Trend of COVID-19 cases and deaths in Pakistan till 30<sup>th</sup> April 2020.



**Figure 2:** Trend of COVID-19 cases and deaths in United Arab Emirates (UAE) till 30th April 2020 Vietnam.



### United Arab Emirates

The first confirmed case of COVID-19 in the United Arab Emirates (UAE) was reported on 29th January 2020, who travelled from Wuhan city, China (32). It was the first country in the Middle East to report a confirmed case (33). First two deaths were reported on 20th March. Till 30th April, total cases and deaths were 12516 and 105 respectively (11). During our visit it was observed that many people were unaware and did not take this epidemic seriously.

### Actions taken by the government of UAE

On 23rd January 2020, the UAE government started screening of passengers arriving from China at Dubai International airport and Abu Dhabi International airport (34). On 24th January, the UAE

Ministry of Foreign Affairs and international Cooperation, imposed travel ban, calling all UAE citizens not to travel to Iran and Thailand (35).

On 2nd March, the UAE government announced closure of all schools and universities (36). On 12th March, all churches in UAE had announced temporary closure (37). On 21st March, the government closed down public places, beaches, tourist spots and parks, and urged people to stay at home (38). On March 16, prayers at mosques and other places of worships in the UAE were suspended (39). On 22nd March, Emirates announced suspension of all passenger flights, but continued to operate cargo flights for essential goods (40). On 23rd March, all the malls were shutdown (41). On 24th March, Telecommunication Regulatory Authority (TRA) unblocked Skype and Google

Hangouts amid Coronavirus outbreak (42). On 25th March, the government announced “National Disinfection Programme” for complete sterilization of all public utilities, metro service and public transport during the weekend (43).

On 26th March, the country-imposed night curfew and UAE cabinet approved a fine AED 50, 000 on the violation of measures to contain coronavirus (44). On 28th March, the country extended disinfection and curfews until 5th April and a testing site opened in Abu Dhabi (45). On 29th March, the Dubai Tram and

Dubai Metro were suspended (46). On 1st April, Emirates Sky Cargo suspended operations at Al Maktoum International airport (47). On 3rd April, the government launched a mobile based “StayHome” app for those in mandatory quarantine (48). On 14th April, inter-city bus services were suspended in Sharjah (49). The UAE government decided to lockdown the country and imposed travel restrictions after having 283 (2%) of the total reported cases of COVID-19 till 30th April 2020.

**Table 1:** List of actions taken for COVID-19 prevention and control by Pakistan, UAE & Vietnam.

Actions	Pakistan	UAE	Vietnam	Reference
Travel restrictions	✓	✓	✓	(28,34,56)
Health declaration form	✓	✓	✓	(21,34,64)
Screening passengers at airport	✓	✓	✓	(21,34,64)
Widespread testing	✗	✓	✓	(64,65)
Contact tracing	✓	✓	✓	(20,19,36,64)
Closure of educational institutes	✓	✓	✓	(25,58,65)
Camera and radar surveillance	✗	✓	✗	(65)
Deployment of troops	✓	✗	✓	(30,59)
Lockdown	✓	✓	✓	(30,44,63)
Closure of markets, restaurants, and tourist attractions	✓	✓	✓	(29,38,61)
Social gathering and event ban	✓	✓	✓	(27,38,61)
Social distancing encouraged	✓	✓	✓	(29,39,61)
Religious event ban	✓	✓	✓	(26,27,39,61)
Use of sanitizers and face mask	✓	✓	✓	(31,44,64)
Any fine	✗	✓	✓	(44,64)
Training of Health frontline workers	✓	✓	✓	(20,64,65)
Mobile based App	✓	✓	✓	(48,60,66)
Public awareness campaigns	✓	✓	✓	(54,60,65,66)
Helpline/hotline	✓	✓	✓	(54,55,65,66)

### Vietnam

On 23rd January 2020, Vietnam confirmed the first two COVID-19 cases, a Chinese man travelled from Wuhan, China to Hanoi (50). As of 30th April 2020, 271 confirmed cases were reported with no deaths (11). The domestic transmission started on 1st February and prime minister had declared COVID-19 a public health emergency in Vietnam (51). Central Institute of Hygiene and Epidemiology announced on 7th February, successfully cultured and isolated COVID-19 virus in the laboratory. This is one of the few countries able to isolate this virus (52). It was observed during our visit that people were aware and well prepared to respond to this epidemic. People were practicing all preventive measures.

### Actions taken by the government of Vietnam

On 22nd January 2020, Vietnam closed its border with China (53). On 23rd January, strict measures were taken including aviation permits revoked, visa restriction and Ministry of health issued two hotline numbers for information on coronavirus for citizens (54,55). On 24th January, the Emergency Epidemic

Prevention Centre was activated (56). On the same day, the Civil Aviation Administration of Vietnam ordered the cancellation of all flights from and to Wuhan, China and started screening of travellers at international airports (57). On 14th February, the government announced shutting down nationwide schools due to COVID-19 (58). On 22nd February, the Vietnam People’s Armed Forces took part in patrolling and controlling measures to combat possible outbreak (59).

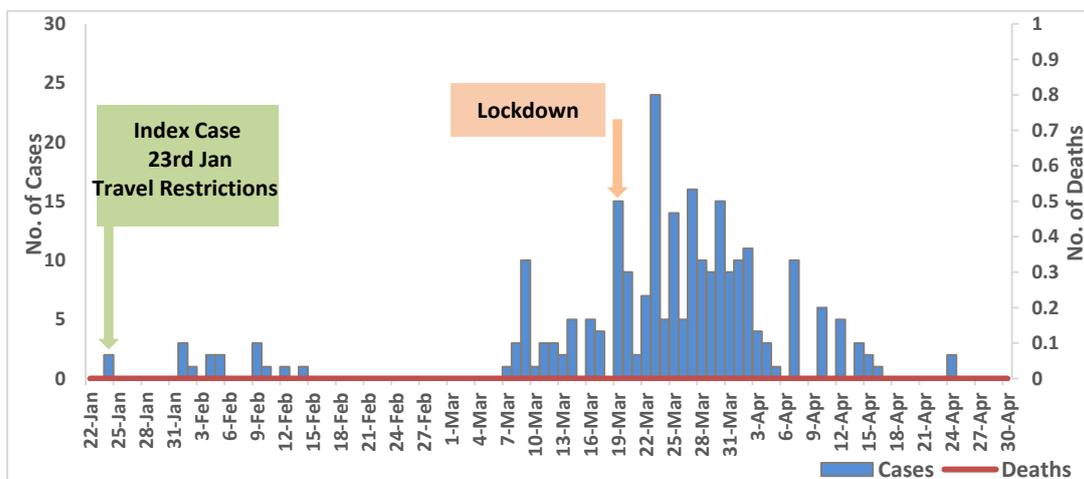
On 10th March, the government launched an app called NCOVI for the public to get information and identify cluster as early as possible (60). On 27th March, strict measures were taken, including suspensions of meetings, religious services, gatherings and shutdown of tourist sites, massage parlours, restaurants, and cinemas (61). On 31st March, the government ordered nationwide isolation of 15 days from 1st April to 15th April (62). Lockdown was imposed on 1st April (63). Vietnam imposed travel restrictions after diagnosis of the first two cases of COVID-19 and the government decided a lockdown in the country when the number of positive cases of

COVID-19 were raised to 68 (25%) out of the total cases reported till 30th April 2020.

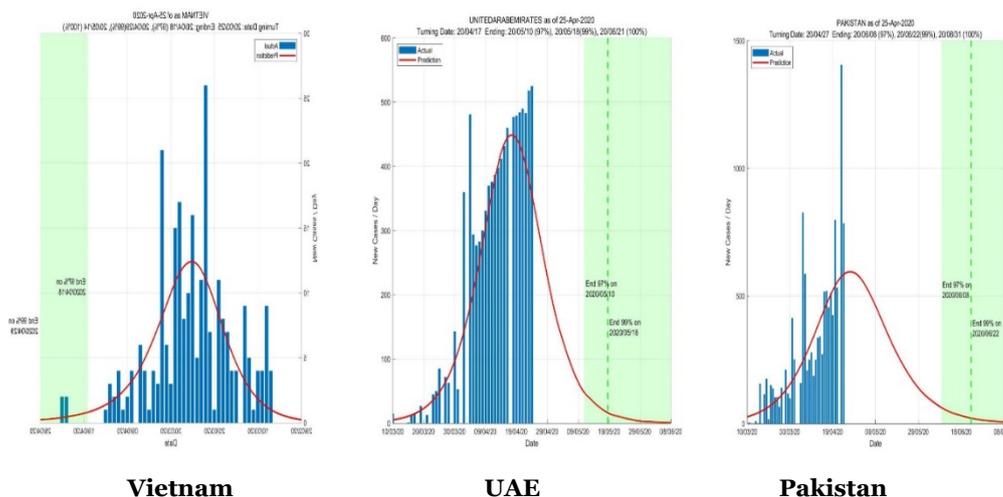
On April 18, Singapore university of Technology and Design launched a webpage (<https://ddi.sutd.edu.sg/when-will-covid-19-end/>) to share prediction of future developments and end dates of Coronavirus epidemic in different countries. For each country, a simple figure was provided to show estimated pandemic life cycle and ending phase along with the real data or history to date, which consecutively describes the inflection point and ending phase. According to the model estimation based on data as of 25th April 2020, the pandemic in Vietnam has previously gone over its inflection point

and is expected to reach its ending phase. According to the SIR model the pandemic in Vietnam is in its ending phase in the last part of April and will possibly end on 15th May 2020, UAE has also already experienced the peak in the number of cases and will be in the ending phase from 11th to 19th May 2020 and the pandemic will probably end on 22nd June 2020 in UAE. According to the model Pakistan has experienced the bend in the cure on 27th April 2020 and 97% of the COVID-19 in the country is expected to end in the mid of June 2020 and the forecast is that the pandemic will end on 1st September 2020 in Pakistan (12).

**Figure 3:** Trend of COVID-19 cases and deaths reported in Vietnam till 30<sup>th</sup> April 2020.



**Figure 4:** Model-Based Data-Driven Estimation of COVID-19 Life Cycle, Turning and Ending Dates in Vietnam, UAE and Pakistan based on data as of 25 April 2020 (12).



## Discussion

Vietnam took swift preventive measures as compared to Pakistan and UAE, to limit the imported COVID-19 cases and to prevent local spread of the coronavirus. However, decision regarding travel

restrictions and lockdown is very difficult for developing countries like Pakistan, due to financial reasons and to maintain the supply chain of food and essential goods. It was observed during our visit that people were aware and well prepared to respond to

this epidemic. People were practicing all preventive measures while in Pakistan and UAE it was observed that many people were unaware and did not take this epidemic seriously in UAE and Pakistan. Vietnam was the first nation besides China to confirm a case of SARS in 2003 and it was the first country which contained the outbreak successfully. The public's experience with SARS, swine, and avian influenza, have helped to contour COVID-19, and likely influenced people's readiness to respond (66). Individual behaviour is crucial to control the spread of virus. Early self-isolation, social distancing, washing hands, wearing masks, and seeking medical advice remotely unless severe symptoms emerge are important measures.

There are three main control measures that aim to stop the disease spread. The first is to impose travel restrictions on people from areas with high number of cases; the second is to apply quarantine rules to prevent spread of infection from a COVID-19 confirmed or suspected case; and the third is shutdowns/lockdown and social distancing to prevent further transmission by reducing human to human contact (67). The Prophet Mohammad, peace be upon him (PBUH), said: If you hear that there is a plague in a land, do not enter it; and if it (plague) visits a land while you are therein, do not go out of it (68).

Australia, Taiwan, Hong Kong, and Singapore imposed strict travel restrictions early in the pandemic. Italy, Spain, United State America, United Kingdom, and Iran were relatively slow to respond to the epidemic and experienced an explosion of cases which overwhelmed the health system (69, 70, 71). China's first phase of response to COVID-19 focused on short-term measures i.e. school closures, travel bans and workplace shutdowns to stop the coronavirus spread from Hubei to the other parts of the country. The most controversial measure was the lockdown of Wuhan and other nearby cities, which had placed at least 50 million people under mandatory quarantine. According to the reports, lockdown effectively prevented the further exportation of infected individuals to other regions. In other provinces of mainland China, people voluntarily quarantined and were monitored by appointed leaders in neighbourhoods (3). However, it is unclear whether developing countries can implement the strict measures for a long period as China eventually adopted.

Many countries (Taiwan, Singapore, Hong Kong, China, and Vietnam) that have had the greatest success in containing the SARS in 2002-03. The SARS epidemic experience may have led to the better preparedness and readiness of people to comply with restrictions on movement and daily life to prevent the spread of the disease in the country (69). These countries have been managed well to date, due to early action taken by the government and through social distancing measures taken by individuals (72). COVID-19 prediction modelling can help policy

makers to make timely and right decisions, by indicating level of transmission and duration of strict interventions required to mitigate the epidemic in a country (12).

## Conclusion

The spread of COVID-19 is a major challenge for governments all over the world. Currently, there is no effective vaccines to prevent COVID-19. For this reason, strict public health measures have been implemented in a number of countries to reduce disease transmission both locally and globally. Vietnam took swift preventive measures and successfully contained the spread of virus. Delay in decision making regarding travel restrictions and other public health measures implementation by the Pakistan and UAE government resulted in rapid spread of disease. In fighting COVID-19, everyone has the responsibility, and it is more important to mobilize all of the society and get involved in the process. The teachings of the Prophet Muhammad (PBUH), regarding personal hygiene, cleanliness and infectious diseases are implemented in modern times by public health organizations as WHO and CDC. Countries must learn from each other to develop the widest possible range of prevention and control measures and uniform guidelines to fight the virus in different contexts.

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