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Short communication

# Importance of early precautionary actions in avoiding the spread of COVID-19: Saudi Arabia as an Example

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## ABSTRACT

Late in 2019, several cases of infection with a new strain of coronavirus were reported in China. This new strain was later officially named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the World Health Organization (WHO). This new virus (SARS-CoV2-) mainly affects the respiratory system and causes coronavirus disease 2019 (COVID-19). The first case of COVID-19 was reported to the WHO on December 31st, 2019, and the virus has spread dramatically in many countries worldwide. On March 11th, 2020, the WHO declared that COVID-19 had affected most of the world, and many deaths were linked to COVID-19. Unfortunately, there is no available treatment for COVID-19, and there is no available vaccine against SARS-CoV-2. Thus, preventive methods are the only way to limit the spread of the virus. Preventive actions have been taken by many countries, such as travel bans, closing borders and working from home. Saudi Arabia was one of the countries that took very early precautionary actions in the belief that these actions are the best way to fight the virus. Therefore, we present the actions that were taken by the Kingdom of Saudi Arabia to fight the new viral pandemic.

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## 1. Introduction

On December 31st, 2019, the first cases of coronavirus disease 2019 (COVID-19) were reported to the World Health Organization (WHO) (WHO, 2020a). COVID-19 is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and SARS-CoV-2 is now known infect and be transmitted among humans. Furthermore, the virus has a similar mechanism of causing disease as other coronaviruses and has the potential to cause multiorgan damage (i.e., lung, heart, liver, and kidney) and, in particular, to cause pneumonia (Yan et al., 2020). During the last 20 years, several epidemics have been associated with viruses, including SARS-CoV, H1N1 influenza and Middle East respiratory syndrome

coronavirus (MERS-CoV). All of these epidemics severely affected several countries (Casella et al., 2020).

The WHO believed that COVID-19 would be limited to China and would not affect many countries, taking into consideration the last MERS-CoV outbreak, which was limited to some countries and did not affect large numbers of people. However, with an increasing number of cases and affected countries, it is considered a very high-level epidemic (Casella et al., 2020). On March 11th, the WHO declared that COVID-19 was a pandemic since it had spread to most countries, and there were more than one hundred thousand patients affected by COVID-19 in more than 114 countries (WHO, 2020b). This new virus seems to be very contagious; the number of infected patients is dramatically increasing, and more countries are being affected by it. It seems to be more dangerous than previous viruses, and therefore, its economic and disease burdens are enormous (Casella et al., 2020).

All data show that even with good healthcare systems, COVID-19 places large burdens not only on healthcare but also on the country level systems. Countries such as Italy, Spain and the United States (US), which are known to have good healthcare systems, have a high number of cases as well as deaths (WHO, 2020b). Italy and Spain have the greatest numbers and percentages of deaths

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worldwide (WHO, 2020b). The most common complications of COVID-19 are pneumonia, acute respiratory distress syndrome, sepsis and septic shock. The percentage of deaths among these two countries ranges between 9 and 11%, which is considered a high fatality rate (WHO, 2020b). These challenges make dealing with COVID-19 difficult and could lead to enormous strain on the healthcare system.

The first option against COVID-19 is the prevention method to prevent the spread of the virus, taking into consideration that there is currently no available vaccine or treatment. SARS-CoV-2 is easily spread among humans, which might be one of the reasons for the rapid increase in the number of cases and the spread of the pandemic. The purpose of this review was to highlight the precautionary and preparedness actions by Saudi Arabia in the period between February 27th, 2020 until the date of this review.

## 2. Precautionary actions

The Kingdom of Saudi Arabia began taking precautionary actions before any cases occurred and before the WHO declared that COVID-19 was an epidemic. This was due to the belief that starting earlier would prevent a sharp increase in the number of cases in Saudi Arabia and prevent COVID-19 from becoming an epidemic within the country.

The Saudi Arabian actions can be categorized into two periods: (a) before the discovery of the first COVID-19 case and (b) after the discovery of the first case of COVID-19. Many precautionary actions were taken by the Saudi government. (1) The first action was to establish a committee to determine and implement the nec-

essary actions against COVID-19. This committee included 19 ministries and authorities. It was named the “COVID-19 follow-up committee” and is led by the Minister of Health (SPA, 2020a). (2) The second action was to suspend entry into Saudi Arabia for Umrah; people were no longer allowed to visit the holy mosque in Makkah or the holy mosque in Almadinah (Al-Tawfiq and Memish, 2020). (3) The third action involved ceasing to issue visas to individuals coming from countries that had already been affected by COVID-19 and in which an epidemic situation existed (SPA, 2020b). This action was taken as cases began to occur in neighboring countries, especially among the Gulf countries (especially Bahrain and Kuwait) for which a visa is not required to enter Saudi Arabia (SPA, 2020c), (4) The government barred citizens of the Gulf countries from entering the two holy cities (Makkah and Almadinah). Furthermore, due to the increase in the number of COVID-19 cases among Gulf countries and because most of these cases occurred due to travel to Iran, which was an epidemic area with thousands of cases (SPA, 2020d, 2020e), (5) the citizens of these countries were not allowed to enter Saudi Arabia with their national ID but only with their passport to ensure that they had not visited Iran in the previous 2 weeks (Figure 1).

In addition, (6) the government requested to declare any citizen who was in Iran during the previous 2 weeks (AJEL News, 2020). (7) The country stopped exporting all medical devices and products, including diagnostic agents or those used for protection, to ensure that these would be available in the event of COVID-19 cases (SPA, 2020f), and (8) twenty five hospitals all over Saudi Arabia were determined to address COVID-19 cases. Since the disease has no treatment, prevention is the best method of stopping the

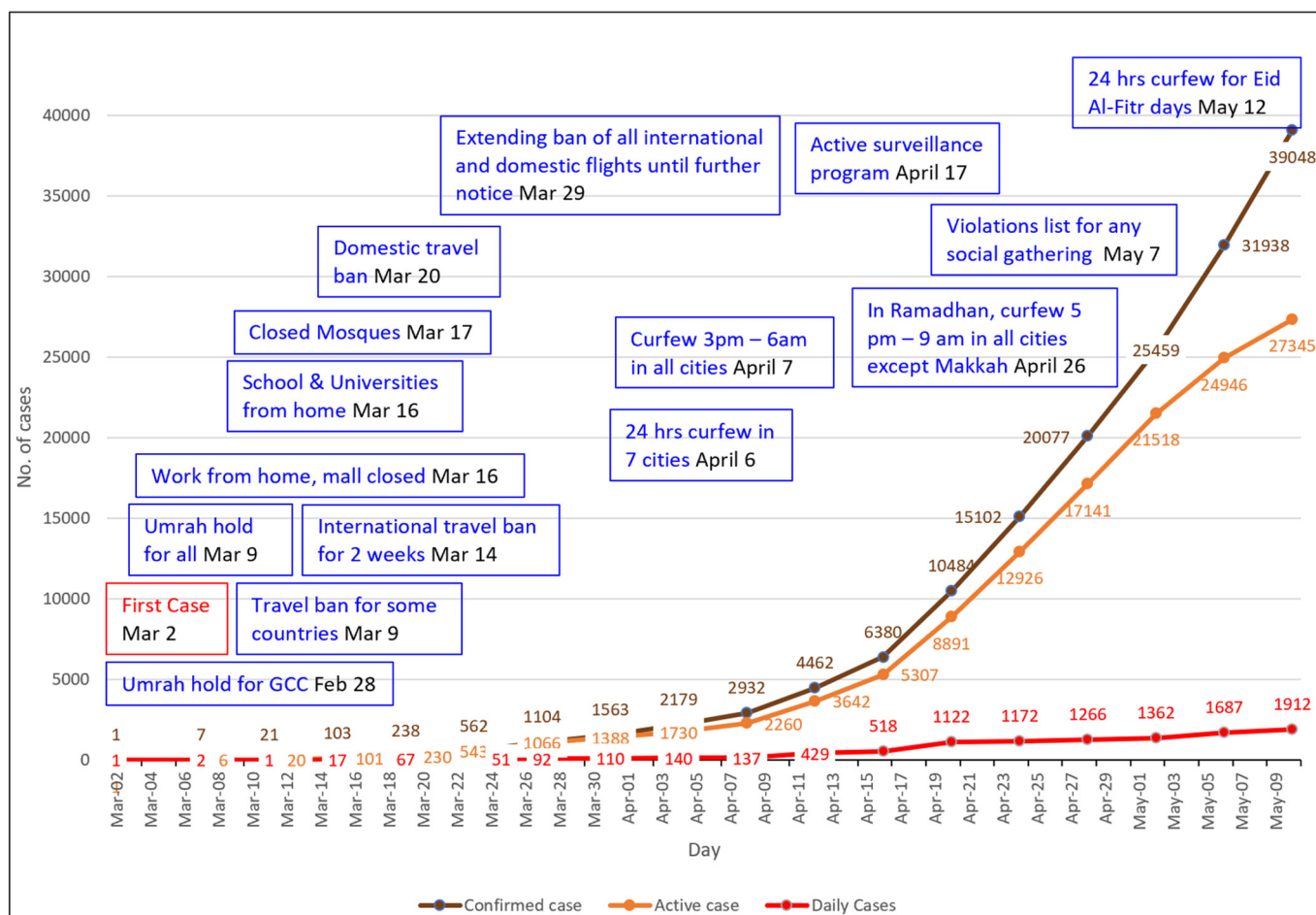


Fig. 1. Daily and cumulative number of confirmed and active COVID-19 cases in the period between March 2 and May 12, 2020, along with government actions.

spread of the virus (SPA, 2020g); therefore, (9) massive campaigns were conducted by the Ministry of Health (MoH) and other agencies to educate the public on ways to prevent the spread of the virus (SPA, 2020h). Furthermore, (10) the public and people who had recently arrived from areas or countries with a COVID-19 epidemic were guided by the MoH to contact a hotline information number, 937.

Nevertheless, despite all these actions and as expected by the committee, the first case occurred in Saudi Arabia on March 2nd, 2020, the individual was a citizen who had visited Iran through Bahrain. The patient did not follow the recommendations and orders of the government and did not declare that he had been in Iran. Many precautions and restrictions have been applied in Saudi Arabia (Al-Tawfiq and Memish, 2020; SPA, 2020c, 2020i).

More actions were taken by the government, and there was coordination among the Gulf countries. (11) Any Saudi citizen or citizen of one of the Gulf countries was required to declare where and why he/she had traveled (only a passport is allowed) to be tested for COVID-19. Furthermore, citizens of Gulf countries were required to stay in their country for a minimum of 2 weeks if they travelled to another country before being allowed to enter Saudi Arabia. Regarding the role of Saudi Arabia in the area (SPA, 2020d), (12) the Saudi government notified other Gulf countries that they could apply the same precautions toward Saudi citizens (SPA, 2020d).

Other ministries have also started to apply precautions. One of the main ministries is the Ministry of Education, which (13) developed a plan for universities and general education to limit the spread of the virus among students and employees (Al-Tawfiq and Memish, 2020). (14) The MoH issued warning to any hospital that did not take precautions against COVID-19. Most of the governmental and private sectors use a “fingerprints” for their employees as a method of checking in to work and checking out. Since SARS-CoV-2 is transmitted by air droplets, (15) the government ordered all sectors to stop using the fingerprint method during the COVID-19 epidemic (AL-THAQAFI, 2020). (16) The two holy mosques were disinfected to protect the people in Makkah and Almadinah who pray in these mosques. In addition, (17) the two holy mosques were closed from after Isha prayers (approximately 8 pm) until dawn (approximately 5 am) to limit the number of people (Arab News, 2020a).

The number of cases has increased, especially among those who visited Iran and did not declare their travel to the authorities. Therefore, precautions and restrictions have increased in an attempt to limit the spread of the virus. The first precaution during this time was (18) requesting again that any person who had visited Iran recently or during the previous 2 weeks to contact the health authorities to be tested for SARS-CoV-2 (SPA, 2020i). Moreover, (19) the two holy mosques were closed to visitors and to entry and prayer (SPA, 2020j). (20) People who came from Bahrain, Kuwait and the United Arab Emirates could only arrive by air and only from three cities: Riyadh, Jeddah and Dammam. (21) For people wishing to visit Saudi Arabia, a laboratory certificate was required that confirmed through a polymerase chain reaction (PCR) that the person did not have SARS CoV2 (SPA, 2020k). Some areas of Saudi Arabia have more cases, such as Alqatif city; therefore, (22) a city lockdown was performed, and all study and work in governmental and private sectors was stopped in Alqatif for two weeks starting on March 7th (SPA, 2020l). Globally, the number of cases of COVID-19 has increased dramatically, and many countries have developed a COVID-19 epidemic. Therefore, (23) arrivals from countries such as Italy, Egypt, Lebanon and 16 other countries had to quarantine themselves for 2 weeks (T, 2020).

The government of Saudi Arabia applied more rigorous restrictions because the number of cases was increasing rapidly worldwide and in Saudi Arabia. One of the most important actions was

to (24) suspend all in-person schools and universities in both governmental and private sectors across the country and utilize online teaching (SPA, 2020m). In addition, (25) all activities (e.g., religious events, scientific meetings or conferences, tourism events) were cancelled across the country (SPA, 2020n). Because travel is one method of transmitting the virus, on March 9th, (26) travel from and to 9 countries was stopped, including Oman, France, Germany, Turkey and Spain (SPA, 2020o). Furthermore, (27) all types of large gatherings, such as weddings and parties, were prohibited to avoid mass gatherings, which are a way of spreading the virus (Kumar, 2020).

On March 15th, (28) all international flights were suspended from and to Saudi Arabia (SPA, 2020p). (29) The MoH announced a list of 23 additional countries with quarantine restrictions; anyone arriving from those countries had to quarantine in their home and were provided with paid leave by their employer (paid by the government) (SPA, 2020q). The seaports are considered a type of transportation, and (30) all transportation through the sea or the gulf was stopped except for cargo (Report SG, 2020). Again, in an attempt to limit the spread of SARS-CoV-2, further rigorous restrictions have been implemented by the government, including (31) closing the malls and preventing gatherings in parks, leaving only supermarkets and pharmacies open. Additionally, (32) all restaurants and shops were prevented from providing dining-in services, and only takeaway orders were allowed to prevent large gatherings in these places (Khalid, 2020). In addition, (33) all governmental employees were instructed to work from home for 16 days except those working in the health and security sectors (SPA, 2020r).

One of the most difficult decisions was (34) preventing people from praying in the mosques for all five daily prayers, including the Friday prayer (Times TS, 2020). On March 17th, (35) the Custodian of the Two Holy Mosques, the King of the Kingdom of Saudi Arabia, King Salman Bin Abdulaziz called for an exceptional virtual meeting to be held with the G20 leaders to discuss the course of action against COVID-19 (France 24, 2020). Two days later, (36) the Custodian of the Two Holy Mosques, King Salman Bin Abdulaziz, delivered a message to his people and people living in Saudi Arabia discussing the situation and assuring them that the health of human beings and people living in Saudi Arabia was the first priority for him and for the government. The king's speech calmed all people in the country (SPA, 2020s). Additionally, (37) banks were asked to request that their employees work from home for 16 days and to specify some branches for emergency situation (National T, 2020). (38) All domestic flights were held for 14 days (SPA, 2020t). In the private sector, (39) workers who had a recent history of travel had a mandatory quarantine for 14 days (Arab News, 2020b).

Following the implementation of these restrictions, which had a good impact on limiting the number of new cases coming from outside, most of the new cases were due to the gathering of sick people and healthy people. Therefore, on March 23rd, (40) a curfew was applied between 7 pm and 6 am throughout the country for 3 weeks (SPA, 2020u). The first death due to COVID-19 occurred on March 24th in the city of Almadinah (MOH, 2020a). One day later, (41) three cities, namely, Riyadh, Makkah and Almadinah, were locked down, and no one left or entered these cities. Furthermore, (42) the curfew was changed to start at 3 pm. The second death due to COVID-19 was recorded in Makkah (MOH, 2020b).

On March 26th, the exceptional virtual meeting that King Salman called occurred among the leaders of the G20 to discuss how to address the COVID-19 pandemic (SPA, 2020v). The third death was recorded in Almadinah, and the number of cases was increasing in that city (MOH, 2020c). (43) Six neighborhoods in Almadinah were locked down to prevent the spread of the virus (SPA, 2020w).

On March 29th, (44) the international and domestic flights suspension was extended until further notice (Airlines, 2020). As the

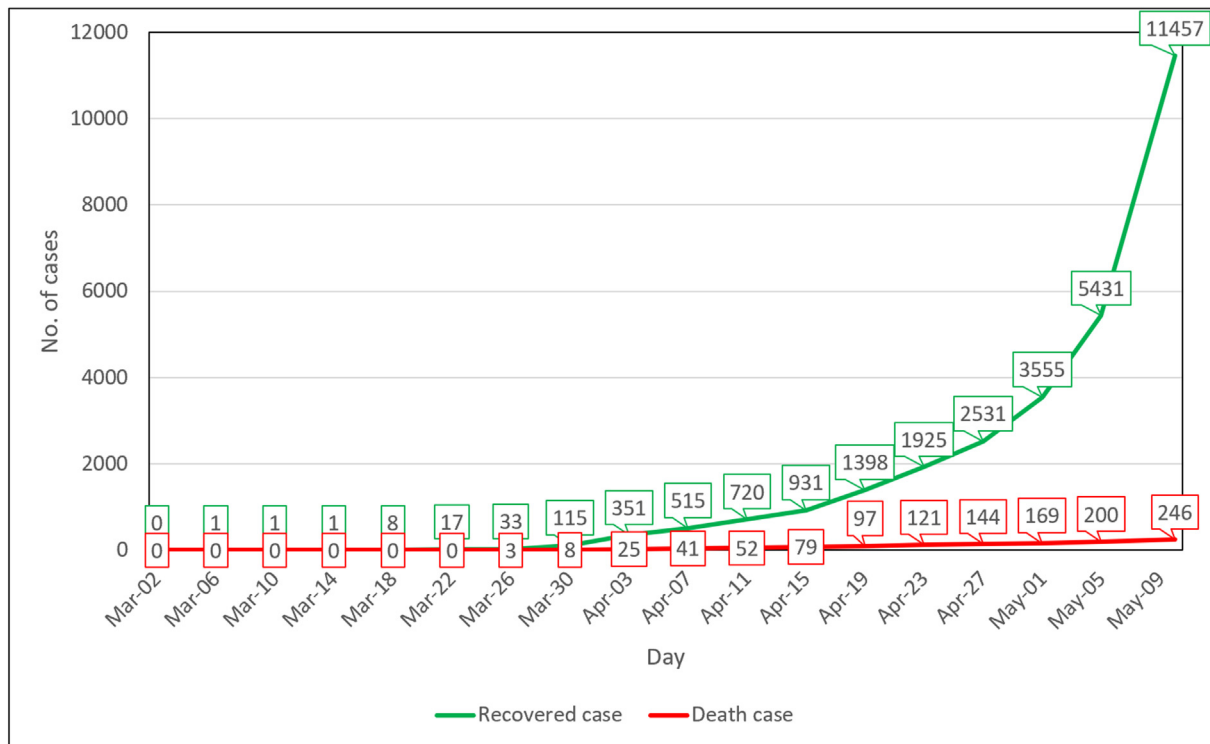


Fig. 2. Numbers of recovered COVID-19 cases and deaths in the period between March 2 and May 10, 2020.

government continued to facilitate this process for people living in Saudi Arabia, (45) King Salman ordered that all people living in Saudi Arabia would receive COVID-19 treatment free of charge and be paid by the government. Additionally, King Salman and his crown prince ordered funding to facilitate the people's needs and provide cover all expenses (MOH, 2020d). The number of COVID-19 cases had increased in Saudi, specifically in Makkah and Almadinah; therefore, (46) the two cities were locked down, and a 24-hour curfew was applied on April 2nd (SPA, 2020x). (47) Further restrictions were placed on 5 cities and 4 governorates (the cities of Riyadh, Dammam, Tabuk, Aldhahran, and Alhafof and the governorates of Jeddah, Taif, Qatif and Khobar) to start a 24-hour curfew, and (48) the curfew was changed to start at 3 pm instead of 7 pm in all regions in the country (SPA, 2020y).

### 3. Comment

The healthcare system in Saudi Arabia is a social health care system (i.e., all healthcare services are provided to citizens by the government and to non-citizens through their employers). This was one of the advantages of the Saudi health system with regard to fighting the COVID-19 pandemic. The MoH has also prepared plans to ensure that all medical products, including personal protective equipment, diagnostic agents, ventilators and medications, are available in sufficient quantities to address this crisis. All these restrictions and precautions played a major role in limiting the spread of SARS-CoV-2, and as of April 8th, 2020, there were 2932 active cases, 631 recovered cases and 41 deaths. The number of deaths was not very high compared to other countries, which might be due to good care in hospitals in Saudi Arabia. However, the number of COVID-19 cases has increased because of the active surveillance program that the Saudi MoH has started to test different areas in Saudi Arabia. As of May 11th, 2020, there were 27,345 active cases, 11,457 cured and 246 death (MOH, 2020e) (Figure 2). Nevertheless, the fatality rate is from the lowest worldwide. All

ministries and authorities in Saudi have taken responsibility for fighting the virus through a variety of actions. Initially, more than 120 billion Saudi riyal "SR" (US \$1 = 3.75 SR) was provided by the government to address harm from COVID-19 and to fight the virus (SPA, 2020z). Recently, the MoH received funds of 7 billion SR, and 8 billion SR was provided earlier from the government's (MOH, 2020f). On April 15th, King Salman has also ordered 47 billion SR for the MoH as additional fund to help them against COVID-19. He also ordered to fund 50 billion SR for private companies to reimburse them (News, 2020c). On April 26th, 2020, King Salman ordered the King Salman Humanitarian Aid and Relief Center to sign contracts with Chinas, USA, Switzerland and South Korea to combat the COVID-19 pandemic. These contracts have several purposes, the Chinese government will send 500 experts to help with the testing and utilize them as consultants. In addition, approximately 14.5 million SARS COV-2 tests will be performed, covering approximately 40% of the people living in Saudi Arabia making it the largest test capacity for SARS COV-2 worldwide. Also, establishing 6 regional laboratory all over the Kingdom to conduct 50,000 tests per day and mobile laboratory to conduct 10,000 tests per day (SPA, 2020aa). Although there are new cases of COVID-19 every day and these numbers fluctuate, the numbers are considered reasonable as a result of these precautions and restrictions, and we believe that without these actions, the numbers would be much higher. The number of cases depends on how well people follow the orders and guidance issued by the government because more than 95% of the cases within the country have been the results of transmission occurring at gatherings. As previously mentioned, there is an increasing number of COVID-19 cases, and the majority of these cases have been workers who live in the same building (i.e. no social distance). Therefore, it is believed that it is now the responsibility of the people living in Saudi Arabia to apply the concept of social distancing and to follow preventive methods such as hand washing to prevent the spread of the virus.

## CRedit authorship contribution statement

**Thamir M. Alshammari:** Conceptualization, Methodology, Writing - original draft, Supervision. **Ali F. Altebainawi:** Validation, Writing - review & editing. **Khalidah A. Alenzi:** Visualization, Writing - review & editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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