

# Qatar's Response to COVID-19 Pandemic-A Reflection on the Initial 100 Days

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## Abstract

**Background:** After COVID-19 was declared as a Public Health Emergency of International Concern by WHO governments of the world, including Arab states of Gulf Cooperation Council, took stringent measures to limit the spread of the COVID-19. Qatar's preparations for responding to the potential pandemic began soon after the Wuhan event became public. In this article we reflected upon the response of the State of Qatar against the COVID-19 pandemic during the initial 100 days from 1<sup>st</sup> January, 2020 to 9<sup>th</sup> April, 2020. Qatar's efforts have always been directed to halt its local transmission, contain the spread, and mitigate the impact of outbreak. Qatar reported its first case of COVID-19 on the 29<sup>th</sup> of February 2020. Qatar rolled out the most ambitious and aggressive disease containment effort in history. The state's aggressive action manifested in early testing of thousands of its people and tracking and isolation of infected individuals, even using smartphone and GPS technology, were critically important.

**Conclusion:** Qatar's response to the pandemic within its borders, barring a few lapses, has been commendable. Qatar is now pursuing an equally vigorous regimen to contain future waves of infections.

**Keywords:** Pandemic response • Reflection • Containment measures • Surveillance • Emergency preparedness

## Perspective

**Background:** On the 31<sup>st</sup> of December, 2019, China reported to the World Health Organization (WHO) about the outbreak of a cluster of pneumonia cases of unknown etiology under investigation in Wuhan City, Hubei Province of China. This was then confirmed to be Coronavirus infectious disease 2019 (COVID-19) caused by the novel corona virus SARS CoV-2. Since the beginning of 2020, more cases of COVID-19 have been confirmed, not only in other cities and provinces of China, but also in several other countries amongst passengers who travelled from China. COVID-19 subsequently spread globally across multiple countries in Asia, Europe, North America and Australia, with the exception of Antarctica, before the end of January, 2020 [1-3]. It was declared as a Public Health Emergency of International Concern (PHEIC) by the WHO on 30<sup>th</sup> January, 2020 and then as a pandemic on 11<sup>th</sup> March, 2020 [4].

After being declared as a PHEIC by WHO, governments of the world, including Arab states of Gulf Cooperation Council (GCC), took stringent measures in order to limit the spread of the virus [5]. Safety measures like testing of travelers, quarantine on returning from countries where the disease is widespread, not permitting the return from certain affected countries, or even closing borders have been adopted by several countries to limit the spread of the virus [6,7]. COVID-19 was first reported in the Middle East in the United Arab Emirates (UAE) on 29<sup>th</sup> of January 2020 [8]. Qatar reported its first case of COVID-19 on the 29<sup>th</sup> of February 2020 [9,10].

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**Qatar's response to COVID-19 pandemic:** Qatar's preparations for responding to the potential pandemic began soon after the Wuhan event became public. In this article we reflected upon Qatar's efforts to halt the local transmission and contain the new virus during the initial 100 days, from 1<sup>st</sup> January 2020 to 9<sup>th</sup> April 2020. A national operation task force was formed at the Ministry of Public Health (MOPH) to combat the pandemic. Surveillance and emergency preparedness measures were initiated immediately. On the 28<sup>th</sup> of January, 2020 interim guidelines for early case detection and management of Novel Corona Virus was published and training programs were organized for capacity building. The existing staff handling Health Promotion and Communicable Disease Control (HP-CDC) Hotline (both English and Arabic) were oriented to tackle the queries related to COVID-19 and had regular departmental meetings to resolve issues identified. As the frequency and number of calls increased, the number of staff handling the hotline were increased. Subsequently, a National COVID-19 call center was set up and new staff with public health background were recruited and trained to handle this toll-free number.

**Portal of entry-based surveillance-** Since Qatar is a peninsula and due to the political scenario since June 5<sup>th</sup>, 2017, at that point in time, the only entry via land was blocked. And the plausible ports of entry into Qatar were via its two international airports and its few seaports.

Immediately after the WHO informed the world about the COVID-19 outbreak, on 31<sup>st</sup> December 2019, Qatar began checking all incoming airline passengers from Wuhan with proactive testing and appropriate quarantine. From the 24<sup>th</sup> of January 2020, screening using infrared thermal image scanners and screening for flu like symptoms was initiated at the International Airport for passengers and flight crew flying in from China. Passenger announcements were made on board airplanes, to raise awareness about the risk of COVID-19 infection and were promoted to watch out for influenza like symptoms for up to 14 days after their travel from the COVID-19 affected countries. The suspected cases were sent to Communicable Disease Center (CDC) hospital for further follow up. By mid-February, the screening was extended to all inbound passengers and flight crews from any country. Towards the end of February, screening was initiated at seaports also.

First COVID-19 case- Qatar had begun to bring back its residents who were willing to return from other countries by February. On the 28<sup>th</sup> February, 2020, a 36-year-old Qatari male, who had flown in a chartered repatriation flight from Sheraz in Iran on the previous day, became febrile and was transferred from the quarantine guest facility to CDC hospital. He was confirmed to be COVID-19 positive on the 29<sup>th</sup> February, 2020 and was declared as the first COVID-19 case in Qatar. On the 1<sup>st</sup> March, 2020, two more from amongst the passengers on the same flight which returned from Iran were confirmed to be positive for COVID-19. To curtail the spread, investigation of positive cases and contact tracing along with robust surveillance, especially at portal of entry, were strengthened.

Guest facilities for quarantine- Guest facilities were set up from the 1<sup>st</sup> February, 2020 to quarantine the flight crew as well as passengers coming from China. From 23<sup>rd</sup> February, anybody with travel history to Iran or South Korea, in the preceding 14 days were sent for quarantine. By early March, the list of high-risk countries was expanded to include Japan, Italy, Macao, Thailand, Hong Kong, Singapore and Malaysia [11]. Later residents returning from any COVID-19 affected countries were asked to undergo 14 days quarantine.

Home isolation was an option given to citizens who returned to Qatar after the nation reported a spike in COVID-19 cases when the daily cases hit 100 per day in April 2020 (provided they had facility for proper home isolation i.e., bedroom with attached bathroom). They would be requested to self-quarantine for 14 days from their return date into the country [12]. Those under home isolation were followed up regularly via phone calls by the 'Home Isolation Team' and on completion of the isolation period, without any flu like symptoms, they were issued clearance letters from MOPH.

COVID-19 testing- Since it was then believed that individuals may not show any symptoms during the first 14 days of being contaminated and yet already be infectious, the Qatar National Pandemic Preparedness Committee also identified the need to put a system in place rapidly to invite travellers for swab testing retrospectively. Decision to adopt a drive-through testing approach was taken on the 1<sup>st</sup> March, 2020, to screen people who had recently returned from a SARS-CoV-2 infected country. It was decided to contact anyone who had returned to Qatar between 16<sup>th</sup>-23<sup>rd</sup> February, 2020 from specific affected countries so they could be given a free COVID-19 testing appointment [11]. They were also asked to extend this testing invitation to anyone they had been in close contact with over a prolonged period of time, such as other members of their household.

All guests who were quarantined in the guest facilities were tested for COVID-19 using Reverse Transcriptase - Polymerase Chain Reaction (RT-PCR) test, free of cost. If tested positive or on developing symptoms, they were transferred to the CDC hospital for further assessments.

A negative RT-PCR test result was not needed at that point for people travelling into Qatar. Later, in August 2020 people travelling into Qatar, from some specific countries had to present a negative COVID-19 medical test result and gradually it was made a mandate that all passengers coming to Qatar had to present a negative test result to enter the country.

Restriction on travel- Direct flights to and from China were suspended from the 4<sup>th</sup> February, 2020 till the 26<sup>th</sup> July, 2020. Flights to and from Iran were temporarily suspended from 26<sup>th</sup> February, 2020. Two days before COVID-19 was declared a pandemic, on the 9<sup>th</sup> March, 2020 a travel ban was placed on 15 countries (Bangladesh, China, Egypt, India, Iran, Iraq, Italy, Lebanon, Nepal, Pakistan, the Philippines, South Korea, Sri Lanka, Syria and Thailand) and on 14<sup>th</sup> March, 2020 the travel ban expanded to include three more countries, namely Germany, Spain and France. All inbound flights to Doha were suspended from March 16<sup>th</sup>, 2020, till the end of May 2020, with exception of the transit flights and cargo [13].

**Emergence of community cases:** The first documented community transmission case of SARS-CoV-2, a 24-year-old Bangladeshi male, with no recent travel history, was picked up passively when the person came seeking healthcare on March 7<sup>th</sup>, 2020. The source was suspected to be his roommate who had come from Bangladesh on 14<sup>th</sup> February, 2020, which at that point of time was not considered a high-risk country. In addition, there was also

the possibility of presence of potential asymptomatic carriers of SARS-CoV-2 both at his accommodation and workplace, who had returned from countries not considered high risk then, with which he would have had close contact. The first community case was followed by notification of two more cases of COVID-19 later the same day. Both cases were non-Qataris, single male workers, both identified on seeking health care, having no recent travel history but with history of contact with a roommate who had fever.

Response to the initial community cases- MOPH dispatched teams to investigate the reported positive cases admitted in the CDC hospital, their accommodation as well as the workplaces. Their close contacts, both at work and residence were identified, tested and transferred to a quarantine facility. Environmental samples were taken from their accommodations (rooms, common areas, staircase rails, bathrooms and kitchens) and were closed for decontamination. The viral particles were detected in the environmental samples. The workplaces of the cases were also closed, and decontamination was done. The National Operations Task Force met with Ministry of Interior and the Hamad Medical Corporation Ambulance services and discussed regarding the flow of information and transfer of positive cases and close contacts identified to health care/quarantine facilities.

Within a week's time from the date the first community case was identified, a cluster of about 238 COVID-19 infections among expatriate craft and manual workers (CMW) living in high-density housing accommodations was identified by active surveillance. This hotspot area was immediately locked down. These crowded camps on the outskirts of Doha, could have acted as a fertile ground for COVID-19 transmission. Qatar's largest labour camp for the migrant workers, a huge zone within the "Industrial Area" had gone into total lockdown, cutting it off from the rest of the country. The government ensured they got free accommodation, food and basic wages. Free treatment was provided in case they fell ill. Soon strict lockdown measures were imposed in Qatar, for a three-month period, when the positive cases began to rise. The lockdown measures were lifted under a four-phase plan starting on June 15<sup>th</sup>, 2020 [14,15].

Aggressive surveillance and testing and contact tracing- Following the WHO guidelines, Qatar adopted a "testing, tracing, and isolation" approach, as the backbone of its national response [16,17] implementing a country-wide active case investigation, contact tracing and testing using the RT-PCR test. Ad-hoc testing campaigns in workplaces and in residential areas were initiated by the MOPH shortly after the identification of the first cluster in March 2020 and accelerated in subsequent weeks. The newly detected cases were quarantined and provided with free medical care; all contacts of infected cases were identified, tested and isolated. The new cases of infection were mostly expatriate single male workers, people in contact with infected cases and travelers who had returned recently to the State of Qatar from countries affected by COVID-19. MOPH emphasized on the decontamination of the residence and workplaces of the positive cases. If the positive case had visited any health facility in the preceding 14 days, the respective authorities were informed to take necessary actions.

Other non-pharmaceutical interventions- The measures were not limited to, closing of borders, restrictions of travel by sea or air, and lockdowns of specific areas. Two days before COVID-19 was declared a pandemic, on the 9<sup>th</sup> March, Qatar announced closure of all schools and universities and transformation into online education until further notice [18-20]. As of March 11<sup>th</sup>, 2020, when WHO declared COVID-19 as a pandemic, Qatar had reported 160 cases.

Taking sincere precautionary measures to limit the spread of Coronavirus, from 12<sup>th</sup> March, 2020, the Doha metro train services, metro link services and public transit bus service were suspended on the weekends to start with, and later suspended completely [20]. The services were partially resumed with limited capacity on September 1<sup>st</sup>, 2020. Even the road transport except for those carrying essential items was hit during the partial lockdown from mid-March 2020.

Because of the potential presence of asymptomatic carriers of SARS CoV-2 in the community, the need to impose physical distancing, wearing of face masks and the cancellation of public events, including sports and

religious gatherings, was important. To safeguard the health and wellbeing of the public, new set of precautionary measures were announced on the 13<sup>th</sup> March, 2020. The public was urged to observe safety measures such as frequent hand washing and restrictive social and physical distancing. The MOPH urged all agencies and individuals to follow preventive measures and adhere to the requirements of home isolation to ensure their safety and that of their community, and not to go out unless absolutely necessary [21]. Actions were instituted against those who violated restrictions set to curb the spread of the coronavirus. Starting in mid-May, face masks became mandatory in public places [21]. On 20<sup>th</sup> March, 2020, Ministry of Municipality and Environment closed all parks and public beaches to curb the spread of COVID-19 [22]. Three days later, the Ministry of Commerce and Industry decided to temporarily close all restaurants, cafes, food outlets and food trucks in selected locations. The measures also extended to closure of mosques, cinemas, theatres, children's play areas, gyms and wedding venues, including those in hotels. These measures have had palpable negative economic impact, by reducing trade and disruption of production amongst many others. However, the preparations for the 2022 FIFA World Cup continued on schedule [23-25].

**Digital tracing technology:** The approach of hotspot hunting to conduct pre-emptive testing in a focused geographical area cutting off hot spot areas, using smartphone and Global Positioning System (GPS) technology, was very crucial. Like many countries like South Korea, Singapore, China, Australia and Egypt, the state of Qatar too introduced a mandatory mobile public health application, as the official contact tracing application, owned and operated by the Ministry of Public Health. Etheraz, which is Arabic for 'precaution', was introduced as an additional precautionary measure to prevent the spread of the virus by identifying transmission chains and allowing contact tracing. It was later made compulsory in November, 2020 for people aged 18 and above. It provides alerts or notifications when members of the public are exposed to a suspected, infected, or confirmed COVID-19 case through prompt, accurate, digital contact tracing. It also helps to identify locations with high infection rates in order for the relevant authorities to provide prompt action to prevent further spread and higher risk exposure to members of the public. It also provides a visual QR code showing infection and/or vaccine status (when available) to other individuals for safe interaction with the wider community.

**Capacity building:** The HP-CDC section in MOPH which played a significant role in this fight against COVID-19, had to face unprecedented changes after the pandemic struck the State. The HP-CDC reconfigured to meet the response requirement by amalgamating pre-COVID-19 resources to form Case investigation and Contact tracing units. Business as usual was suspended temporarily, to fight the pandemic. To tackle the increasing numbers that had to be investigated and contacts traced for testing, staff from Primary Health Care Corporation (PHCC) and Hamad Medical Corporation (HMC) were re-deployed and joined the MOPH team and some people with medical background who were unemployed were temporarily recruited. The Ministry of Public Health also engaged the private health sector very early on in the pandemic to enhance surveillance and testing. The track and trace capacity was enhanced by expanding the team 12-fold during the course of the pandemic, supporting the early detection of cases in the community and limiting the spread of the virus by isolating positive cases very early in the course of their infection.

Over the past few years, Qatar had invested on building its healthcare infrastructure and capacity by establishing new hospitals and primary care health centers, and this helped Qatar to respond to the COVID-19 pandemic rapidly and efficiently, ensuring that healthcare care was provided free of charge to anybody in need. HMC forecasted to run out of beds and challenges related to shortage of supplies and immediate actions were taken to resolve them. Over the next few weeks, five of its hospitals were converted into COVID-19 facilities and, temporary field hospitals were set up. Health-care workers (ICU medical and nursing staff in addition to clinical support services and allied health professionals) were redeployed to staff the newly opened or repurposed COVID-19 facilities to be able to provide high-quality care and additional manpower were hired. Ventilators, oxygen, medicines, and personal protective equipment were procured at rampant speed. Isolation facilities were rapidly built to isolate all positive and suspected cases from the rest of

society to slow down the epidemic and flatten the wave and also safeguarded our hospital system from being overwhelmed. Access to Personal Protective Equipment, alongside strict infection control guidelines and measures for health-care facilities, staff, patients, and visitors, plus maintaining consistently high clinical staffing levels throughout the pandemic helped in containing infection rates among health-care workers in both public and private sectors.

Of the original public health-care capacity, 92% remained available for non-COVID-19 clinical operations in order to provide routine care to the rest of the community. Most of the routine services provided by PHCC and HMC had been transformed to telephonic consultations unless needed otherwise, in order to reduce risk of acquiring infection from the health facilities. Telehealth and telemedicine services for chronic care, pediatric care, mental health, older people and home delivery of medications, were rapidly expanded, which ensured that physical visits occurred only when absolutely necessary. A hotline for psychological aid was also initiated in April, 2020 [23]. However, cancellation/postponement of the dental/ ophthalmology outpatient services, led to people not getting the care they needed in a timely manner. Postponement of elective surgeries for a very long period especially, created secondary casualties.

**Scaling up of Laboratory services:** Qatar was one of the first countries in the region to introduce the RT-PCR test for SARS-CoV-2. HMC's virology team validated and introduced RT-PCR assays for SARS-CoV-2 in January 2020 and was providing this test for 4 weeks before the first case was confirmed on February 28, 2020. During the initial days the aggressive and intensive testing happening across the country tested the capacity of the central laboratory and faced challenges in ensuring logistics and supplies. But ever since, the capacity of the laboratory has been escalated to such an extent that we have been able to maintain our high testing rates. Qatar acted swiftly to enhance its laboratory capacity to ensure that it could deliver up to 20,000 RT-PCR tests per day, ensuring a daily testing rate of over 2/1000 people/day which is among the highest in the world. In addition to the central COVID-19 laboratory, two new COVID-19 laboratories and four rapid PCR facilities were started in the main hospital sites to support critical and urgent care. Our laboratory facilities validated and supported the introduction of rapid IgG/IgM serology testing and rapid antigen testing.

Access to testing for COVID-19 was readily available to the public and provided for free if they have signs or symptoms of the virus or if they had been in close contact with a confirmed case. On April 8<sup>th</sup> 2020, PHCC designated two health centers for screening, testing COVID-19 patients. Later these were expanded to four centers and then more centers, as well as three dedicated, drive-through facilities, to accommodate the large numbers being tested for COVID-19. Increasing the testing capacity along with the effective contributed significantly to identify the positive cases. This can also be attributed to the surveillance system in place and the effective contact tracing. However, testing at PHCC has been subject to several changes during the outbreak, due to technical and supply chain factors. The policy on testing services has changed multiple times from the start till date. Despite changes in the Ct value threshold, test positivity rate remained high. The Ministry of Public Health also engaged the private health sector very early on in the pandemic to enhance early detection of cases. As on the 9<sup>th</sup> of April 2020, a total of 43,144 people had been tested for COVID-19 in Qatar.

## Discussion

COVID-19 infections in Qatar started in two distinct clusters, a larger cluster among expatriate craft and manual workers and a smaller one among Qatari nationals returning from abroad during the epidemic; but then became more widespread in the population through community transmission. As on the 9<sup>th</sup> April, 2020, 166 new cases of COVID-19 were confirmed in Qatar, adding up to a total of 2601 COVID-19 cases and 6 deaths. Two weeks later, Qatar reached the 10,000 mark of coronavirus cases on April 26<sup>th</sup>, 2020 [8,10]. Qatar rolled out the most ambitious and aggressive disease containment effort in its history, and although experiencing 70158 cases and 54 deaths as of June 8<sup>th</sup>, 2020 marking 100 days after the first case [24]. The deaths in Qatar were

remarkably low relative to the reported cases. This may be greatly due to the robust health care system in the country and partly due to the high proportion of residents being young and healthy. Qatar has a unique population profile, which is highly dynamic and predominantly expatriate workforce, majority being young (between 20-50 years) and males, with only 2% being >60 years of age (Figures 1-3) [25-27].

As per the article by Dr Hanaan, between 28<sup>th</sup> February and 18<sup>th</sup> April 2020, 5685 cases of COVID-19 and 7 deaths were identified, with the median age of 34 (IQR 28-43) years, 88.9% males and 8.7% being Qatari nationals. Infections were mostly asymptomatic or with minimal symptoms and associated with very low mortality. Severe/critical illness was associated with presence of hypertension or diabetes but not with increasing age.

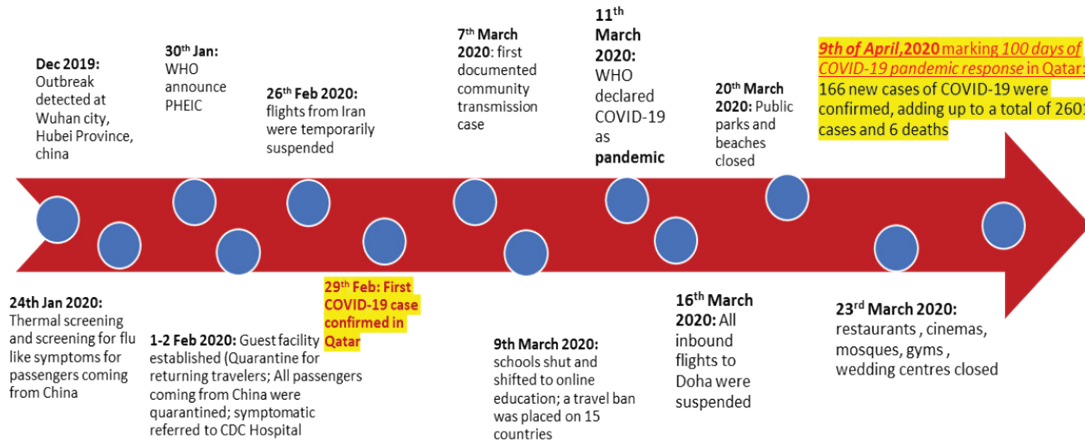


Figure 1. Timeline depiction of the initial 100 days of COVID-19 pandemic response in Qatar.

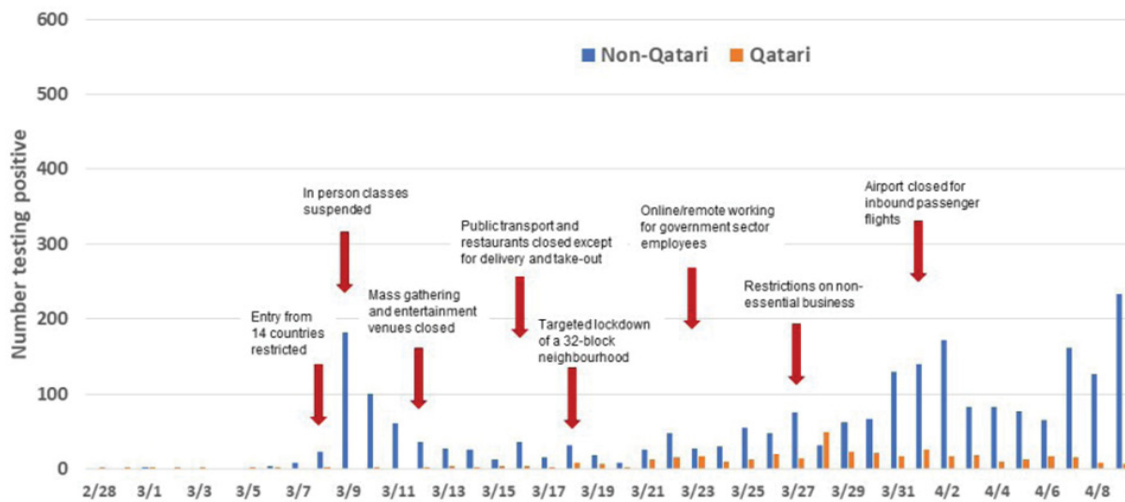


Figure 2. Epidemiological curve of COVID-19 cases with depiction of interventions during the initial 100 days of COVID-19 pandemic response in Qatar.

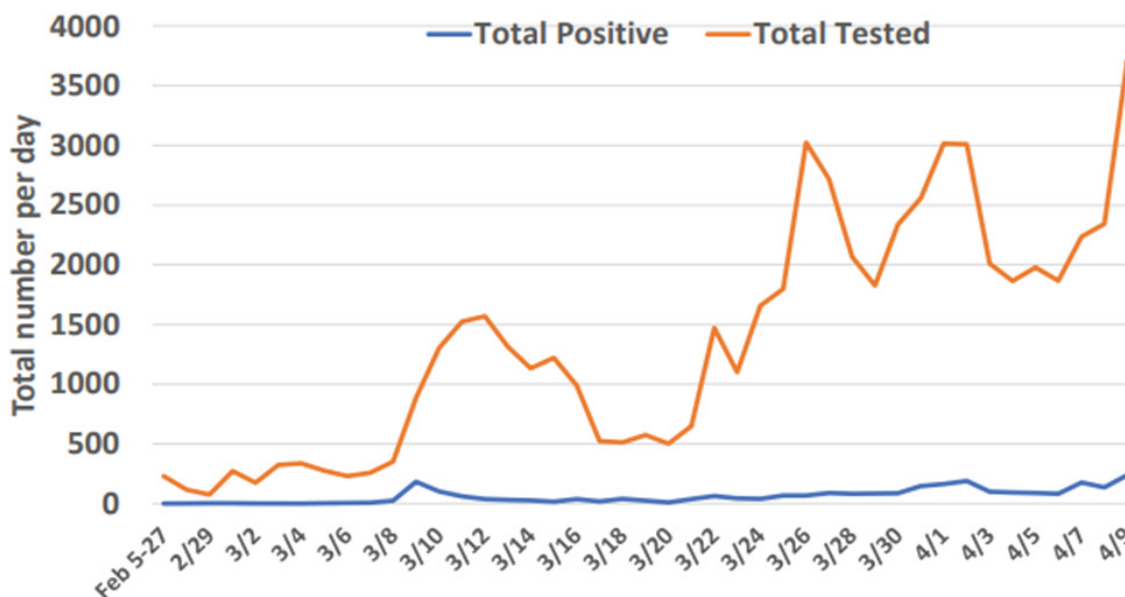


Figure 3. Timeline depiction of number of tests done and the number who tested positive during the initial 100 days of COVID-19 pandemic response in Qatar.

Although Qatar had an established Severe Acute Respiratory Illness/Influenza like Illness (SARI/ILI) surveillance there was an unfortunate delay in recognizing the early cases in early 2020 as a new SARS-like outbreak, leading to a rapid spread of COVID-19 in the country. The surveillance was temporarily dampened to the extent that the community transmission could not be picked up early. Initially the focus was more on hospital-based surveillance, Severe Acute Respiratory Illness (SARI) and Intensive Care Unit utilization. The case definition was based on symptoms overlooking the fact that asymptomatic cases can transmit. Asymptomatic cases were missed on thermal scanning at the ports of entry into Qatar, hence failed to identify them and missed the beginning of the cases in the community. Thus, the disease had already started spreading in the community while the attention was focused on the ports of entry. In the study by Abu-Raddad LJ, et al. [15] it is said that using mathematical modeling, the cluster size suggested the infection may have been circulating for at least 4 weeks prior to cluster identification [28]. Moreover, in the initial days the focus was only on travelers from China and did not include those from other countries till high case rates were reported by them. The failure to restrict travel at an early stage in the outbreak may have been one of the contributing factors.

With the understanding of the disease evolving as the pandemic spread, the reaction time between the emergence of knowledge and response to it in action in the public health arena faced challenges though minimal. There were issues due to frequent changes in the testing policy, treatment protocols and containment strategy as the pandemic progressed. There was delayed response to the need for development of evidence-based guidelines, protocols and standard operating procedures. The quarantine / isolation was not followed completely and there was no strict physical distancing.

**Success determinants:** The Government worked to contain the virus, initially via a national approach that promoted universal temperature monitoring and physical distancing. Another strategy that underpinned this containment effort was through semi-government/private sector engagement in surveillance and testing later in the pandemic which played a great role in expanding the reach and thus maintaining the high testing rates. The state's aggressive action manifested in early testing of thousands of its people and tracking and isolation of infected individuals were critically important. Strong political leadership, multisectoral involvement and access to innovative technologies helped in curbing the outbreak, though we faced lack of coordination initially.

## Conclusion

The way forward Qatar's response to the pandemic within its borders, barring a few lapses, has been commendable. Dealing with an emergency; the size of the COVID-19 pandemic has significantly strengthened the public health sector as well as the primary and tertiary healthcare systems. This pandemic indeed tested the health care sector as well as public health and like many other countries around the world, Qatar too has learnt some important lessons from this pandemic. It also indirectly tested the preparedness and response capacity of the country for holding a major event in the country. The public health system and health care sector must build its capacity further by focusing on the lessons learnt and bridge the gaps identified during this pandemic response, thereby become better prepared in case of a similar outbreak in the future as well as for the FIFA world cup 2022.

In spite of having robust rapid-response teams and infectious disease reporting system, committed staff, much more equipped and more competent in dealing with pandemics and major outbreaks than ever before; the system needs to be well prepared for a possible surge as well as ensure a sustainable system for future. Qatar is now pursuing an equally vigorous regimen to contain any future surges and outbreaks.

The disease surveillance system must be strengthened especially promoting proactive surveillance rather than reactive. There is a need to build the capacity of the public health sector especially develop trained field teams. Another important area of focus should be risk assessment in the community. Focusing on risk communication, raising awareness and behavioral change communication will help in strengthening control activities such as home

isolation, quarantine, and physical distancing. There is a need for laws, legal framework and regulations to support control activities such as home isolation. Above all, by promote public health research new public health interventions based on the evidence can be developed and implemented.

## References

1. Cereda, Danilo, Mattia Manica, Marcello Tirani and Francesca Rovida, et al. "The early phase of the COVID-19 outbreak in Lombardy, Italy." *Epidemics* 37 (2021):100528.
2. Ng, Yixiang, Zongbin Li, Yi Xian Chua and Wei Liang Chaw, et al. "Evaluation of the effectiveness of surveillance and containment measures for the first 100 patients with COVID-19 in Singapore-January 2-February 29, 2020." *Morb Mortal Wkly Rep* 69 (2020):307-311.
3. Gudbjartsson, Daniel F, Agnar Helgason, Hakon Jonsson and Olafur T Magnusson et al. "Spread of SARS-CoV-2 in the Icelandic population." *N Engl J Med* 382(2020):2302-2315.
4. World Health Organization. "WHO Director General's opening remarks at the media briefing on COVID-19." Geneva, Switzerland (2020).
5. GCC Statistical Center. "Coronavirus Pandemic Counts map (COVID-19) for the cooperation council for the Arab countries of the Gulf region (GCC)."
6. WHO. "Updated WHO recommendations for international traffic in relation to COVID-19 outbreak." 29 February 2020 COVID-19 Travel Advice: World Health Organization (2020).
7. Phelan, Alexandra L, Rebecca Katz and Lawrence O Gostin. "The novel coronavirus originating in Wuhan, China: challenges for global health governance." *Jama* 323(2020):709-710.
8. "Coronavirus: First case confirmed in UAE". *Gulf News* (2020).
9. <http://www.moph.gov.qa/english/mediacenter/news/pages/newsdetails.aspx?itemld=83>
10. Ministry of Public Health. "Information tailored for you, Coronavirus Disease." (2020).
11. "Qatar bans entry of passengers from 15 countries, including India and Pakistan." *Gulf News* (2020).
12. Alinier, Guillaume, Brendon Morris, Junaid Abu and Loua Al Shaikh. "Implementation of a drivethrough testing clinic in Qatar for residents having recently returned from a country with a COVID-19 travel warning." *Qatar Med J* 3(2020):42.
13. "All inbound flights to Doha suspended for 14 days." *Gulf Times* (2020).
14. Qatar OFW. "Qatar issues temporary transport suspension due to covid 19." (2020)
15. Abu-Raddad, Laith J, Hiam Chemaitelly, Houssein H Ayoub and Zaina Al Kanaani, et al. "Characterizing the Qatar advanced-phase SARS-CoV-2 epidemic." *Medrxiv BMJ* 11(2021):1-15.
16. Lacina, Linda. "WHO coronavirus briefing: Isolation, testing and tracing comprise the 'backbone' of response." *World Economic Forum* (2020).
17. "New mental health services launched on 16000 helpline." *Gulf Times*.
18. Government Communications Office. "Statement on the suspension of public and private schools and universities for all students until further notice as a precautionary measure to contain the spread of coronavirus." (2020).
19. "MOPH announces masks to be compulsory from mid-May." *Gulf Times* (2020).
20. "Ministry of municipality and environment." *Ministry news* (2021).
21. "Temporary closure of eateries starts at select locations". (2020).
22. Abu Shark, Ahmed. "Potential impact of COVID-19 on Qatar's economy." *KPMG, Qatar* (2020).
23. Tarazi, Alexandra, Alberto Azpeitia. "Providing telehealth in Qatar." (2020).
24. "New COVID cases on Qatar and three more deaths reported." *Peninsula Qatar* (2020).
25. Al Kuwari, Hanan M, Hanan F Abdul Rahim, Laith J Abu-Raddad and Abdul-Badi Abou-Samra, et al. "Epidemiological investigation of the first 5685 cases of SARS-CoV-2 infection in Qatar, 28 February-18 April 2020." *BMJ Open* 10(2020):e040428.

26. Reuters. "Coronavirus hits migrant workers in Qatar." (2020).
27. Planning and statistics authority-state of Qatar. The simplified census of population, housing and establishments (2019).
28. "The public transport services suspended." Peninsula Qatar (2020).

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