Policy Review: Dubai Health Authority's COVID-19 Rapid Response

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Abstract
Dubai Health Authority (DHA) is the entity regulating the healthcare sector in the Emirate of Dubai, ensuring high quality and safe healthcare services delivery to the population. The World Health Organization (WHO) declared COVID-19 a pandemic on the 11th of March 2020, indicating to the world that further infection spread is very likely, and alerting countries that they should be ready for possible widespread community transmission. The first case of COVID-19 in the United Arab Emirates was confirmed on 29th of January 2020; since then, the number of cases has continued to grow exponentially. As of 8th of July 2020 (end of the day), 53,045 cases of coronavirus have been confirmed with a death toll of 327 cases. The UAE has conducted over 3,720,000 COVID-19 tests among UAE citizens and residents over the past four months, in line with the government's plans to strengthen virus screening to contain the spread of COVID-19. There were vital UAE policies, laws, regulations, and decrees that have been announced for immediate implementation to limit the spread of COVID- 19, to prevent panic and to ensure the overall food, nutrition, and well-being are provided. The UAE is amongst the World's Top 10 for COVID-19 Treatment Efficiency and in the World's Top 20 for the implementation of COVID-19 Safety measures. The UAE's mission is to work towards resuming life after COVID-19 and enter into the recovery phases. This policy research paper will discuss the Dubai Health Authority's rapid response initiatives towards combating the control and spread of COVID-19 and future policy implications and recommendations. The underlying factors and policy options will be discussed in terms of governance, finance, and delivery.

Keywords: Health Policy, DHA, COVID-19, Rapid Response; Policy Review, Dubai, UAE

Introduction
On 31st December 2019, a cluster of respiratory illnesses caused by a new coronavirus was first identified in Wuhan city, China. Early on in the outbreak, many of the patients reportedly had some link to a large wet market, suggesting the likelihood that the virus was of an animal origin. The source of Coronavirus 2019 (COVID-19) has not yet been identified. The virus has shown to be highly contagious, spreading to different countries across the globe. On March 11, 2020, the World Health Organization declared COVID-19 a pandemic. Countries were advised to take stringent measures to contain the disease and prevent the spread. Advanced countries with leading healthcare indicators have struggled to contain the spread and accommodate the high number of infected patients requiring critical care [1]. Therefore, the question rises to what would the rest of the countries face? How would they direct the resources and efforts to contain the spread of the infection? Exploring the demographics and the healthcare indicators of the United Arab Emirates and Dubai in detail, we realize that with the available bed capacity and specialized workforce, the city will be facing a huge challenge to contain. Looking at several historical events where Dubai has proved to the world it's resilience and

innovative ways of tackling challenges and creating opportunities out of them. The policymakers and decision-makers quickly realized that this city has not lost to any of those bets. In this policy research paper, we explore the country's economic status, healthcare status and list the policies and decisions set in place by the leadership and government authorities to contain the spread of the disease while providing essential services to the residents and maintaining safety and security.

The Health Policy Issue
Coronaviruses are a large family of viruses that are common in many different species of animals, including humans. There are four main sub-groupings of coronaviruses, known as alpha, beta, gamma, and delta. Human coronaviruses were first identified in the mid-1960s [2]. Globally, people are commonly infected with human coronaviruses 229E, NL63, OC43, and HKU1. These illnesses usually only last for a short period. Symptoms may include runny nose, headache, cough, sore throat, fever and a general feeling of being unwell. Sometimes coronaviruses that infect animals can evolve into a new human coronavirus and infect humans. Three recent examples of this are MERS-CoV, SARS-CoV and COVID-19 [3].

Recent reports from WHO confirmed that COVID-19, a new strain of corona viruses, was first identified in a cluster of

pneumonia cases in Wuhan City, Hubei Province of China [4, 5]. Most cases have shown mild respiratory symptoms and fever. Currently, there is no known treatment or vaccine available for this disease. Symptomatic treatment and intensive supportive care is the foremost approach to manage the infection in humans. People with cardiopulmonary disease, immune-deficient, infants, and older adults are prone to such infections. A state of Public Health Emergency of International concern was declared by WHO in January 2020. After the increased spread and the strong impact of the virus on various countries later in March, COVID19 was classified as a Pandemic.

Dubai is one of the seven Emirates that constitute the United Arab Emirates (UAE). It'S 3.4 Million population comprises 34% of the country's population. Dubai is considered an admired tourist destination with a total of 15 million tourists over the year of 2018 from across the globe, which contributes to a high revenue in the hotel and hospitality sector [6]. Compared to other Arabian Gulf countries, the city of Dubai in thee UAE has held the most diverse economy with a GDP of 3.9 in 2018 and a growth rate of 1.9% [7]. Post-Arab Spring, Dubai, and the UAE at large are seen as a safe and stable home for investors and entrepreneurs.

Dubai has profoundly invested in its airport and airline company, Emirates. Given the city's ideal position on the map, being 8hrs away from almost all destinations, the airport acts as a hub for many transits connecting flights ranking the 3rd busiest airport worldwide in 2018 and catered to over 90 million passengers [8]. The aviation sector in the UAE contributed approximately 15% of the country's GDP in 2018.

The healthcare system in Dubai is primarily regulated by the UAE Ministry of Health and Prevention (MOHAP) on a federal level, where the ministry issues the laws and bylaws, and by Dubai Health Authority (DHA) on a local level. The healthcare sector is inclusive of government and private entities that are aligned to the overall healthcare strategy set and strive to provide quality services that are appropriate, accessible, and affordable for the Dubai community.
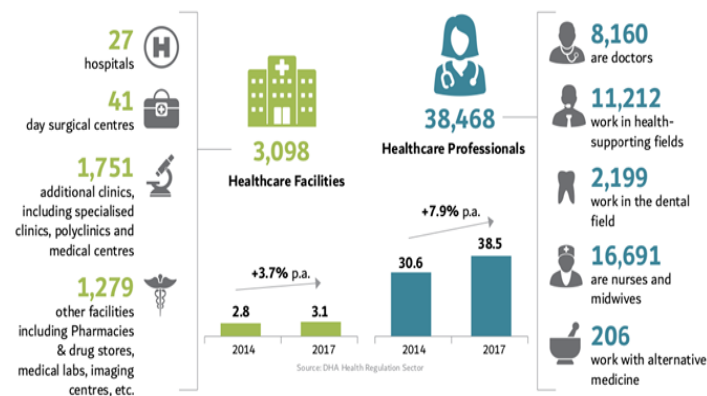

Figure 1- Licensed healthcare facilities and professionals, regulated by DHA, as of April 2018 (DHA, 2019)

DHA has three main roles, first is the regulation of the healthcare sector on mainland Dubai and its free zones (except Dubai Healthcare city and MOHAP facilities), second is the delivery of preventive health services, and third is the operation of several healthcare institutions; 4 hospitals, 7 specialized care centers and 13 primary healthcare centers [10].

POPULATION	3,080,165
PHYSICIANS / 1000 POPULATION	2.9
DENTISTS / 1000 POPULATION	0.7
NURSES/ 1000 POPULATION	5.6
NO.OF DAILY VISITS / 1000 POPULATION	14.28
NO.OF VISITS / POPULATION	3.53
ANNUAL DISCHARGES / 1000 POPULATION	115.36
NO.OF BEDS / 1000 POPULATION	1.5
PHYSICIANS/ BED	0.5
NURSES/ BED	0.27

Figure 2- HEALTH SERVICES PERFORMANCE INDICATORS IN DUBAI FOR THE YEAR 2018

The published Health Investment Guide by DHA in 2019 shows that Dubai Holds 27 private Hospitals with a bed capacity of 1.5 beds per 1000 population (shown in figures 1 & 2) and 29 physicians per 1000 population. Compared to other advanced countries, this capacity is considered low. Which was one of the motivators for DHA to release the Dubai Investment Guide in 2019 to encourage investors, increase the bed capacity in Dubai, and fill the gaps in the continuum of care?

Dubai Healthcare City (DHCC) is a free zone for healthcare services in Dubai. It is regulated by its authority and hosts more than five hospitals with more than 300 specialties with secondary and tertiary care facilities, including oncology, pediatric, orthopedics, kidney transplantation, and mental health [11].

Dubai's health status has been closely studied and discussed in its 2017 Dubai Annual Health Statistics Report from which this section has drawn key measures. Life expectancy in Dubai in 2017 was 80 years for the total population, 79 years for males, and 81 years for females. The figure below shows that lifestyle diseases and its effects, such as heart disease and cancer, are the leading causes of death in Dubai. Early screening and prevention strategies, highlighted by the 15 Strategic Programs from the Dubai Health Strategy 2016 – 2021 report, are now at the top of the health agenda for the Health Authority to improve the quality of life and reduce deaths of the Dubai population.
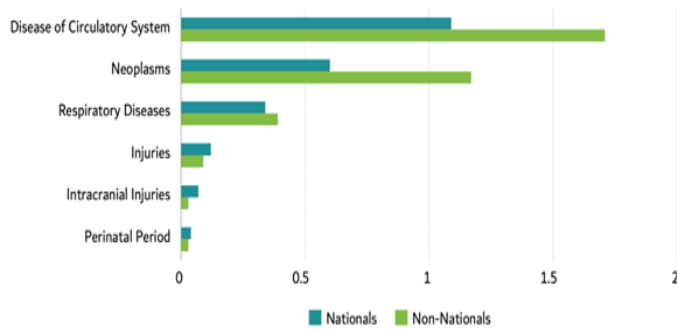
Figure 3. Major causes of death in Dubai Population (DHA,2018)

Like the rest of the world, the Middle Eastern region's population has experienced a shift from infectious diseases and childhood illnesses to non-communicable conditions. This notion paired with the increasing life expectancy, suggests that the population of UAE is now living for longer with their disabilities, which can cause pain, limit mobility, and impair the senses.

The Burden of Disease study conducted in 2017 by the Institute for Health Metrics and Evaluation (IHME) reported that ischemic heart disease is the primary cause of death, followed by road traffic accidents and stroke. At the same time, drug use disorders were the primary cause of death and disability (DALYs) followed by road traffic accidents and ischemic heart disease.

In 2014, Dubai rolled out a mandatory health insurance law in three main phases so that by end-2017, every employee and dependent residing in Dubai was medically insured. As a result, almost 100% of Dubai's population is covered by health insurance. While healthcare expenses reached around AED 17.5 billion in 2017, the share of private insurance has skyrocketed to approximately 60% [12].

Dubai as a tourist destination, and a hub for transits has a high likelihood of the COVID19 virus entering into the population and causing wide community spread, the UAE Government of Dubai and DHA has been meeting since the beginning of January 2020 discussing preventive measures and strengthening early warning systems and response measures to ensure disease containment.

The first cases in Dubai were diagnosed in late January 2020, a Chinese family of 4 have traveled to the city from Wuhan-China seven days before the onset of their symptoms. The cases were traced early, and the public health team reacted swiftly towards contact tracing and containment of the spread. From there on, the numbers started to increase slowly, and more strict decisions started trailing.

The UAE established the National Emergency and Crisis Management Authority (NCEMA) in 2007, and it operates under the Supreme Council for National security. It carries the role of regulating and coordinating all efforts of emergency, crisis, and disaster management as well as the development of a national plan for responding to emergencies [13]. In the situation of the pandemic, all governmental authorities were getting guidance and support as well as reporting directly to NCEMA.

The international landscape shows that the impact of the pandemic on several advanced countries has been steady and resulted in containment difficulties and high mortality. So far, the virus has infected over 4 million of the world's population, with the United States of America leading with the highest number of cases, followed by Italy, Spain, and the United Kingdom. Figure 4a below shows the number of cases per million people per country, and the UAE reflects 1,591.24 cases per million [14].
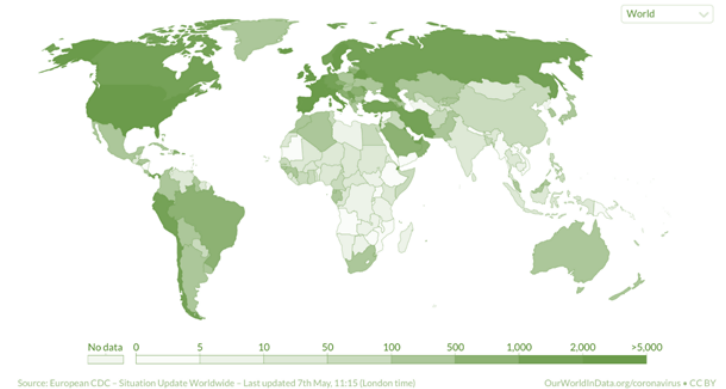

Figure 4a. Total confirmed COVID19 cases per million people, May 2020.
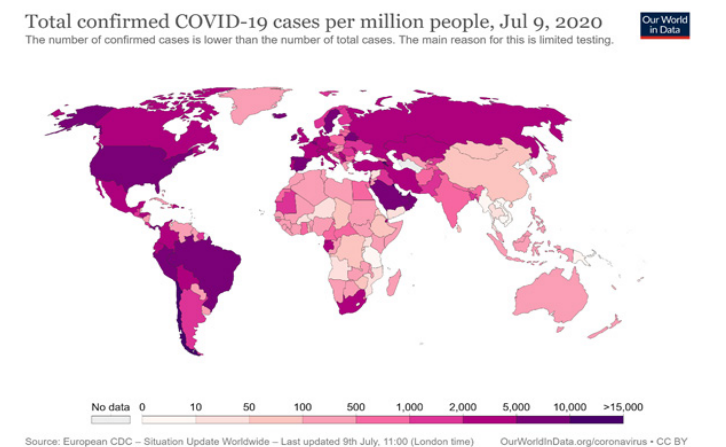

Figure 4b. Total confirmed COVID19 cases per million people, July 2020.

Two months later, there was a 3.4 times number of cases, Figure 4b below shows the number of cases per million people per country, and the UAE reflects 5,363.28 cases per million [15]. The UAE has a total number of cases of 53,045, with a mortality rate of 0.006% and a recovery rate of 80% as of July 8th, 2020. The trajectory of the infection rate curve has been going upwards since January 2020 despite the government measures to contain the spread [16, 17]. Figure 5 below shows the UAE Active COVID19 cases since February 2020.
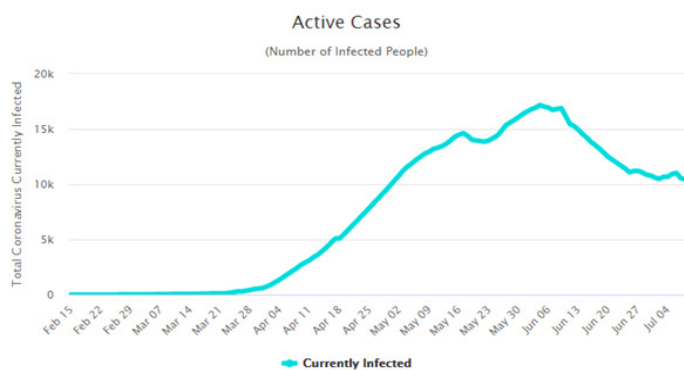
Figure 5. Active COVID19 cases in the UAE

Size of the Health Policy Issue

Comparing healthcare indicators in Dubai to other developed countries such as the US, UK, and Germany, shows that the ratio of doctors, nurses, and beds per 1,000 population is low. The shortage is prevalent across all GCC countries; Dubai's beds per population ratio 1.9 surpasses the average ratio across the GCC 1.7. Dubai's ratio for physicians 2.7 is significantly higher than the average ratio of physicians across the GCC 1.75, ranking 2nd across the region while being in line with the majority of the healthcare markets in developed nations.

With the international anticipation that COVID19 will impact 70% of a country's population, the above bed capacity shows that Dubai will suffer a massive shortage in beds, and the healthcare workers will have a significant load on them and most likely will suffer burnout within a short period of time. The demand associated with the pandemic is massive; it is predicted that 12% of the population will require critical care. The current availability of ICU beds won't be able to handle this demand. DHA has to come with measures to ensure the demand is met, and its population is catered with the needed health services to ensure its vision is achieved.

Underlying factors

Reviewing the impact of the pandemic globally and the severity of the impact in countries that had better healthcare indicators than the UAE, we can establish that the underlying factors that will impose as a threat to the problem are:
* Low bed capacity
* Low ratio of physicians
* High number of laborers in camps
* High number of individuals in shared accommodations
* Low number of isolation ICU Beds
* Low number of Isolation Beds

These underlying factors will be discussed in terms of governance, finance, and delivery.

Governance

The UAE government has done all the necessary when it comes to containing the potential threat of a community spread. Its efforts are widely recognized across the globe as a model of efficiency in tackling the COVID-19 pandemic. Based on a Government Response Stringency Index the UAE has scored 90.7 with 100 being the strictest, the index measures nine response indicators including school closures, workplace closures, and travel bans.

Primarily, Dubai has established a Command and Control Center for COVID-19 under the patronage of His Highness Sheikh Hamdan Bin Mohammed Bin Rashid AlMaktoum. The center works in 7 main streams; containment, testing, treatment, data science, supply chain, finance, and communication. The streams report to the lead of the center and to the NCEMA [18]. The main role of the center is to develop the strategic plans in collaboration with respective authorities to combat the pandemic.

Financing

To contain this crisis and reduce its impact on the community, the UAE government allocated a flexible stimulus budget amounting to AED 256bn [19]. The budget was directed towards different initiatives, mainly:
* Containment and treatment of COVID 19.
* Strengthening the growth of the economy and the business sector.
* Supporting the remote education of the younger population.

The Federal Law no. (14) of 2014 concerning the control of communicable diseases, and the Cabinet Decision no. (33) of 2016 promulgating the bylaw of the control of communicable diseases both state during pandemics the treatment is offered to the confirmed case, contacts and the suspected cases, the treatment is provided free of charge and the government bore the cost. Dubai has developed a set of codes to be used for billing those cases through the eClaims platform. In this situation, the government has utilized the insurance and third-party administration companies in the review of the cases from the medical and financial aspects as well as in the development of rules to approve and reject the services administered. By this the government established an assurance from a billing and finance perspective.

Delivery

DHA took vital actions early on in the sector that supported the healthcare system in the containment of the spread, directing the efforts of the professionals towards the management of the disease and increasing the capacity of the beds. Those measures where:

1. Publishing the Clinical Guidelines for Management of COVID19 in Health Facilities.
2. Directing all facilities to handle all cases suspected to be COVID19 as emergency cases and informing the Public Health Department immediately about them.
3. Mandating the coverage of COVID19 testing and treatment at any facility by the insurance on all policies.
4. Restricting surgical procedures to urgent and emergency cases to support the shortage of blood supply in the blood bank.
5. Opening the secondment of healthcare professionals between health facilities to fill any shortage in staffing.
6. Restricting testing to approved clinical labs that fulfill the WHO testing criteria to ensure reporting and containment.
7. Expansion of bed capacity by transforming hotels into isolation and quarantine facilities, ensuring that they meet set criteria to fulfil patient care and health quality.
8. Establishing fever clinics, by turning three different Primary Health Care Centers scattered across Dubai into clinics that catered to suspected COVID19 patients.

9. Waiving off the expiration of healthcare workers and facilities till the end of 2020.
10. Developing a COVID19 online platform that tracks suspected and confirmed cases (HASANA).
11. Increasing lab testing capacity.
12. Dedication of all media platforms towards public awareness about COVID19.
13. Heightened the inspection efforts towards COVID19 related compliance.
14. Cooperation with the C3.
15. Implementation of the C3 decisions.

Other Dubai and UAE governmental initiatives and efforts included:
1. Early closure of the schools and educational institutes.
2. Closure of different public facilities, like gyms and parks.
3. Physical distancing.
4. Travel ban.
5. Remote work enforcement.
6. Disinfection program.
7. Enforcement of personal protective equipment; face mask and gloves wearing in public.

Methodology
Policy Element 1: Testing
The UAE has put policies in place that ensure testing is open to the population. Compared to the rest of the world in COVID19 Testing Policies, it has held a position at the top ranks with its extensive testing policy, testing asymptomatic individuals of the population. Abu Dhabi has 7 testing drive through locations established across the emirate. While the northern emirates each has one drive-through centers [20].

There are drive through testing location where allocated in 7 main areas in Dubai, providing access to testing to the population of those areas. Home Testing was also established for people of determination (people with disabilities) and senior citizens through equipped vehicles and trained staff. Increasing the capacity of testing not only ensured early screening and containment but as well supported the retesting and discharge of the recovered patients, freeing existing beds in hospitals and institutions for new cases.

Category of finding	Testing
Benefits	Early detection and containment of the disease
Potential harms	Commercialization, misuse and abuse
Cost	Capped at 370aed per test
Uncertainty	Due to limited resources and the situation across the globe, the UAE has to explore the production of testing swabs and reagents to ensure constant supply is maintained.

Policy Element 2: Tracing
The Public Health Department held the role of the case investigation and contact tracing. All positive cases were reported to the department through the online platform HASANA, and the team initiated the necessary actions. Enhancing the contact tracing ensures early containment of the disease and identification of clusters. With the exponential increase in confirmed and suspected cases, the team was quickly expanded by pooling in the healthcare workers from departments that didn't have patients flow, dentists and dental residents; a system of training and onboarding was established to ensure continuous support was maintained. Dubai has initially stated with one center for contact tracing, but due to the demographics of the population and the high number of labor workers, a new tracing center has been established for this category of the population.

Category of finding	Contact Tracing
Benefits	Containment of the spread and early detection of clusters
Potential harms	Spread of infection among staff, delay in contact tracing, patient confidentiality issues
Cost	Cost of location and manpower by volunteers
Uncertainty	Should be staffed by employees assigned officially to the task, signing confidentiality disclaimers. Investment in virtual training and working remotely should be considered.

Policy Element 3: Isolating
Due to the low bed capacity, Dubai has turned to one of its vital sectors; Tourism. By turning its hotels into Institutional isolation and quarantine facilities, it ticked the box quite quickly. The hotels had an infrastructure that supported the system, with minor changes and bringing in a medical team to run the medical operations Dubai has expanded rapidly its bed capacity to over 4,000 COVID19 beds [21].

Expansion of isolation wards and isolation ICUs has also taken place in DHA's two leading hospitals; Rashid and Dubai Hospital [22]. Dubai has built two field hospitals with 3,000-bed capacity ready to accommodate mild to moderate patients. The facilities are equipped with necessary medical devices and manpowered by trained healthcare workers to ensure quality healthcare is delivered.

Category of finding	Isolation
Benefits	Containment of infection spread and treatment
Potential harms	Misuse, inequity

Cost	Capped at a specific cost per diem based on the severity of the case
Uncertainty	Hospitals might bill for more severe cases while the case is mild to moderate. Avoid accepting severe cases due to complexity of care.

Communication with the public

One of the six criteria published by WHO that support a country in the fight against COVID19 is "Communities are fully educated, engaged and empowered to adjust to the new norms". Specialized teams started focusing on this aspect, dedication of all social media platforms of DHA to educate and empower the community. Special FAQ page was dedicated on the official website as well as training the call center staff and updating them continuously with the latest guidelines to align the response given to the public to the operations of the sector.

Leaders across the globe have been engaging in press conferences and publicly speaking to their nations to enhance the populations engagement, urging them to take precautionary measures and explaining scenarios where loved ones will be lost. While mainly fear was the tool used to engage populations abroad, the UAE leaders where using trust. His Highness Sheikh Mohamed Bin Zayed was holding a weekly "Majlis"; a local term used to describe a casual gathering; where he sat in his home office on a sofa in a very relaxed environment with one or more of his grandchildren around him, hosting virtually members of the first responding teams. His Highness used terms that reflected his concern and care about the individuals and their families, focusing on how they are coping with this situation. As well, his population directed advice was always focusing on fighting the pandemic as one power, instilling trust and faith in the individuals that each one will do his/her part. The term used in the media was "we are committed", this hashtag was trending across social media platforms as locals and residents of the UAE showed how they are committed to the instructions given to them by the leaders without any needed enforcement.

Future Policy Recommendations

The WHO has recently published six categories of measures governments need to have in place before easing off "lockdown" measures [23]. The categories are:

1. Control of virus transmission to a level of sporadic cases and clusters of cases, all from known contacts; at a minimum, new cases would be reduced to a level that the health system can manage based on health care capacity.
2. Sufficient public health workforce and health system capacities establishment to enable a shift from detection and treatment of mainly serious cases to detection and isolation of all cases.
3. Outbreak risks in high-vulnerability settings are minimized, which requires all major drivers or amplifiers of COVID-19 transmission to have been identified, with appropriate measures in place to maximize physical distancing and reduce the risk of new outbreaks.
4. Establishment of preventive measures in workplaces.

5. Manage the risk of importing and exporting cases from high transmission risks communities.
6. Communities are fully engaged and understand that the importance of transition away from large-scale movement restrictions and public health and social measures is necessary as prevention measures and that all people have critical roles in preventing spread of the infection.

At this point, the planning and execution of a cautious and responsive 'exit strategy' is appropriate. Still, there remains a need for an even stronger capacity to test, retest, identify, quarantine, and to trace and isolate contacts [23, 24]. To suppress transmission, public health and social measures should continue at both the individual and the community levels. Individuals will need to maintain movement restriction measures at their discretion, wearing masks in public places and keeping a 2-meter distance, and international travel restrictions will continue to be implemented [24]. The Pandemic status is not yet clear, and experts cannot establish forecasts, the possibility of a second surge of COVID19 once restrictions are lifted is likely. It was advised that the government consider lifting restrictions when the above six recommendations listed by WHO are met until effective pharmaceutical interventions (medication and vaccine) are made widely available. The UAE will need to continue alternating between loosening and reinstating measures throughout this pandemic and be prepared for managing future health risks.

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