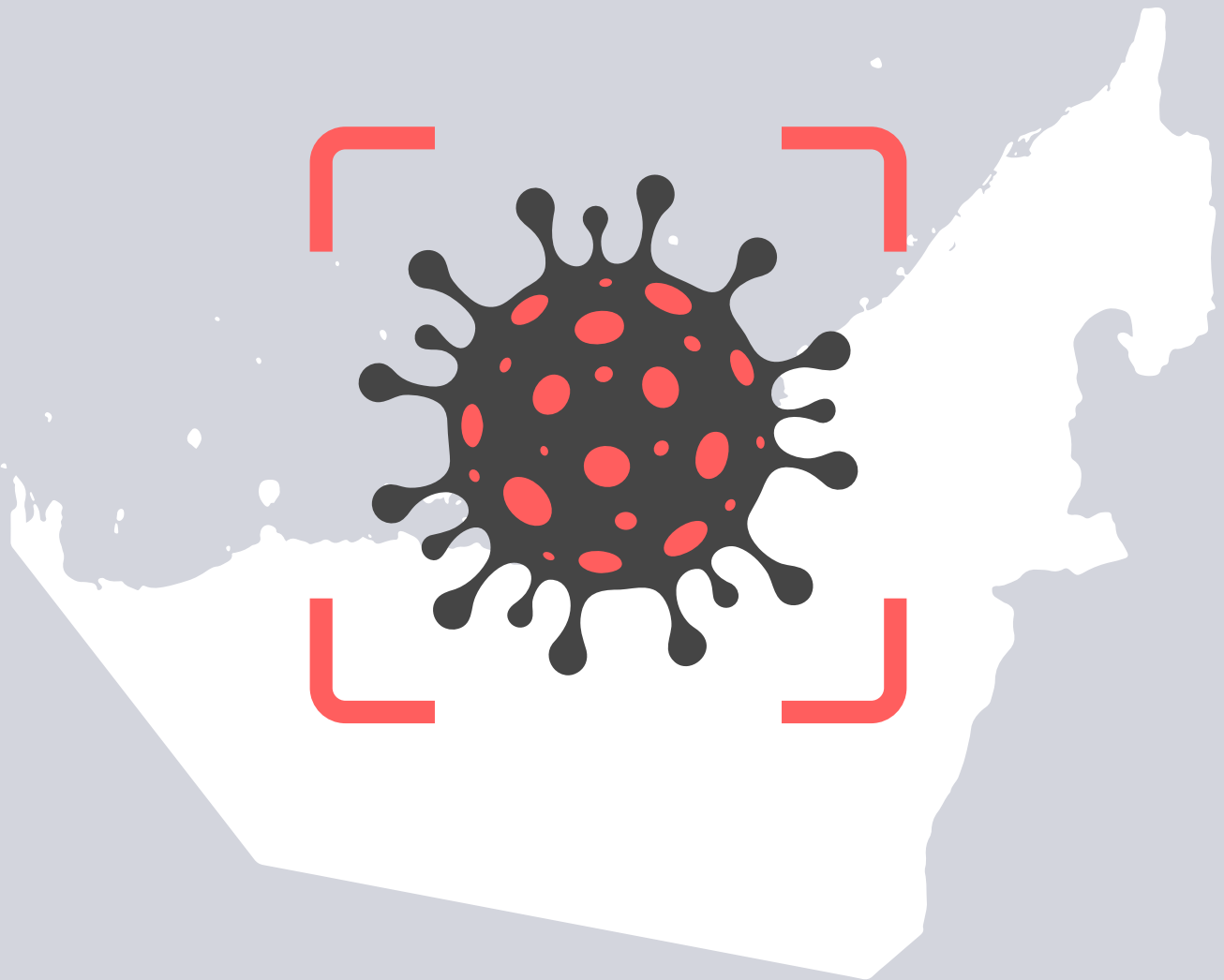


White Paper

The Resilience of the Healthcare Sector in the Region

Lessons from COVID-19



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GLOSSARY

Abbreviation	Details
AED	United Arab Emirates Dirham
API	Advanced Pharmaceutical Ingredients
CBUAE	Central Bank of United Arab Emirates
CDC	Centres for Disease Control and Prevention
COVID-19	Coronavirus Diseases-19
CNBG	China National Biotec Group
DOH	Department of Health
DPI	Diffraction Phase Interferometry
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
ICU	Intensive Care Unit
IP	Inpatient
IRBD	International Bank for Reconstruction and Development
KPO	Knowledge Process Outsourcing
LamPORE	Loop-mediated isothermal amplification
MOE	Ministry of Education
MOH	Ministry of Health
MOHAP	Ministry of Health and Prevention
MRNA	Messenger Ribonucleic Acid
NCEMA	National Emergency Crisis and Disaster Management Authority
PCR	Polymerase Chain Reaction
PPE	Personal Protective Equipment
PPP	Public-Private Partnership
R&D	Research and Development
RT-LAMP	Reverse-Transcription Loop-Mediated Isothermal Amplification
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SME	Small and Medium Enterprises
UAE	United Arab Emirates
UK	United Kingdom
US	United States
WHO	World Health Organisation

LIST OF WHO REGIONS

Regions

Key countries

African Region (AFR)

Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Ivory Coast, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Eswatini, Togo, Uganda, Tanzania, Zambia, Zimbabwe

Region of the Americas (AMR)

Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, United States, Uruguay, Venezuela

South-East Asian Region (SEAR)

Bangladesh, Bhutan, North Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, Timor-Leste

European Region (EUR)

Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Malta, Moldova, Monaco, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, United Kingdom, Uzbekistan

Eastern Mediterranean Region (EMR)

Afghanistan, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen

Western Pacific Region (WPR)

Australia, Brunei, Cambodia, China, Cook Islands, Fiji, Japan, Kiribati, Laos, Malaysia, Marshall Islands, Micronesia, Mongolia, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, South Korea, Taiwan, Tonga, Tuvalu, Vanuatu, Vietnam

The above-mentioned WHO regions have been considered for the purpose of this report. In addition to this, selected countries of the Middle East have been considered for a comparative analysis, including countries of the GCC (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) along with Egypt and Morocco.

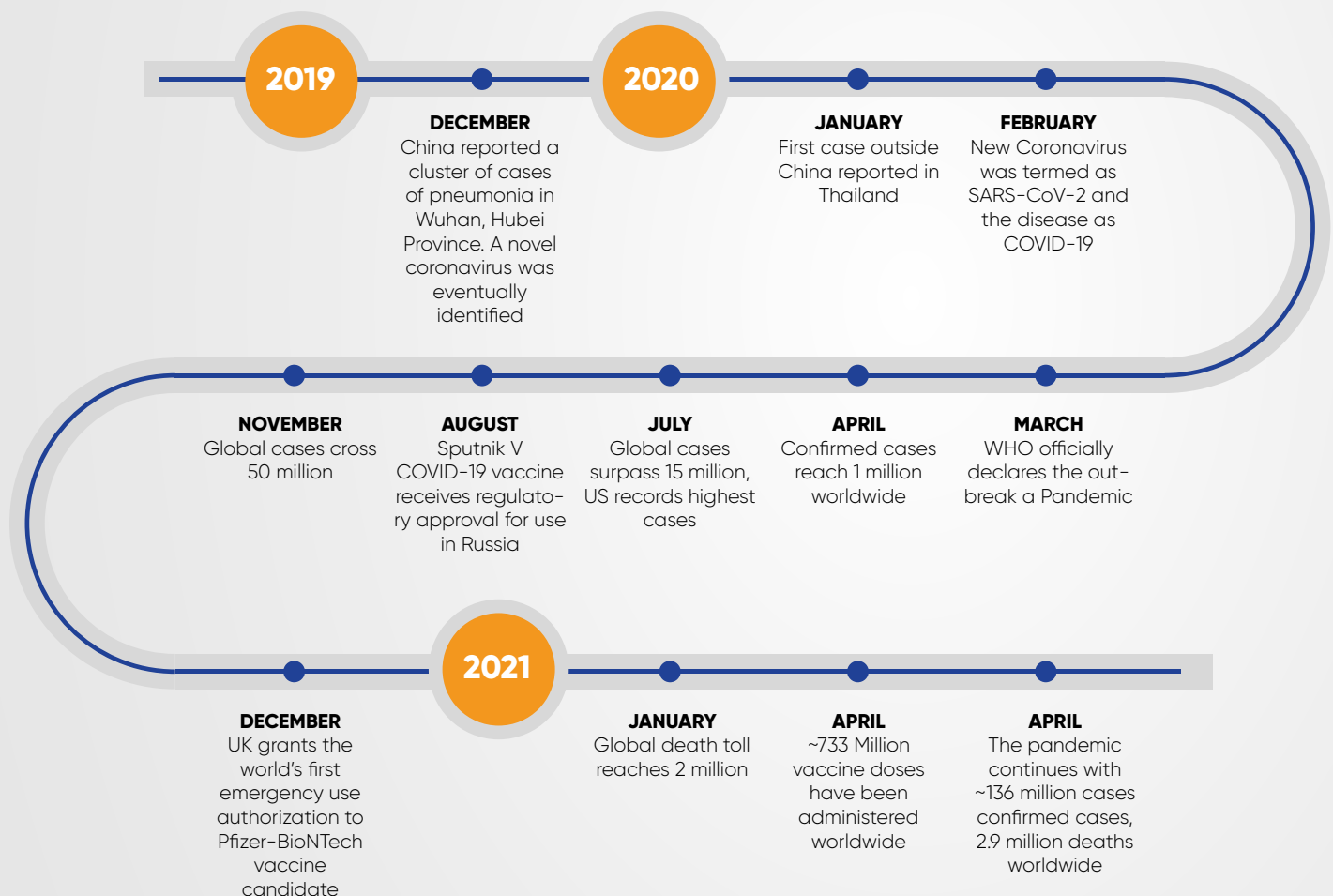
The timeline defined for the report is from the start of the outbreak (around December 2019) till end of March 2021.

Section 1: Global and Regional Footprint of COVID-19

COVID-19 is defined as illness caused by a novel coronavirus, now called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2¹; formerly called 2019-nCoV), which was first identified in Wuhan City, Hubei Province, China. The COVID-19 outbreak started as an endemic² and was declared a pandemic³ by WHO on March 11th, 2020. It is still classified as a pandemic because infections continue to increase worldwide, and many people are still susceptible. Since the initial outbreak, COVID-19 has spread to nearly all the countries around the world. It has created a global health crisis and has been an unprecedented challenge on a global scale upending life, derailing the global economy and being responsible for millions of infections and deaths globally.

1.1 Timeline of the Pandemic

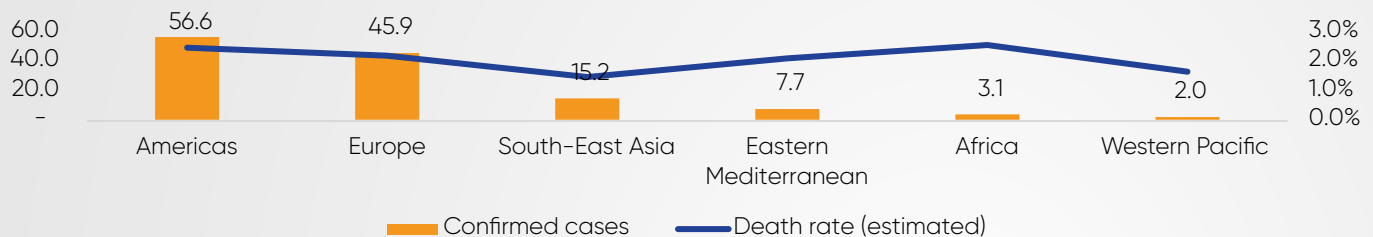
Exhibit 1: Timeline of the evolution of COVID-19 pandemic



1.2 Global Disease Incidence

The outbreak has spread to nearly every country and infected more than 130 million people worldwide with around 2.9 million deaths (as of March end, 2021), making it one of the worst pandemics in the history of mankind. The African region followed by the Americas has had the highest estimated death rate. The death toll continues to rise; however, official figures may not fully reflect the true number in many countries. Also, the virus has been constantly mutating and giving rise to new strains. With many countries delivering widespread vaccine rollouts, experts estimate that the severity of infections and death rate could decrease in the near future.

Exhibit 2: Confirmed cases (million) and estimated death rate⁴ by WHO regions



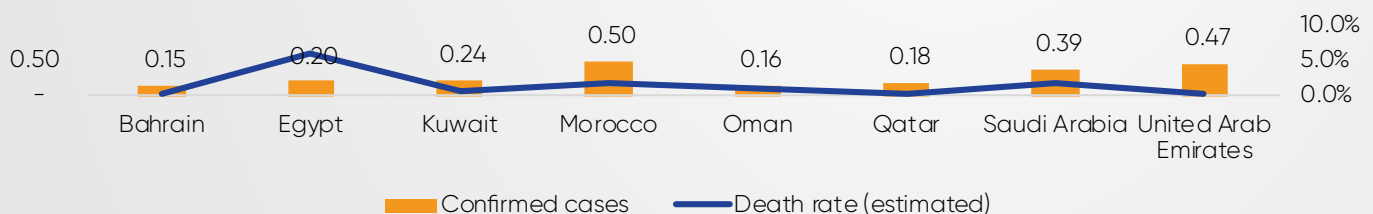
Note: The number of cases and estimated death rate mentioned are as of end March 2021

Source: WHO Coronavirus (COVID-19) Dashboard, JLL Healthcare Analysis

1.3 Regional Disease Incidence: Selected countries in the Middle Eastern Region⁵

Around 2.3 million COVID-19 cases have been confirmed in selected countries as of the end of March 2021, with Morocco accounting for around 0.50 million cases, followed by the UAE (0.47 million) and Saudi Arabia (0.39 million). There have been more than 12,000 deaths in these regions; Egypt faced the highest death rate (5.9% of the total confirmed COVID-19 cases) owing to the country's large population and limited medical infrastructure as compared to GCC countries. UAE and Qatar have been highly successful so far in keeping the death rate under control.

Exhibit 3: Confirmed cases (million) and estimated death rate in selected countries



Note: The number of cases and estimated death rate mentioned are as of End March 2021

Source: WHO Coronavirus (COVID-19) Dashboard, JLL Healthcare Analysis

⁴Death rate has been calculated as number of deaths till Q1 2021 divided by total reported infections till 2021. These deaths are attributed only to COVID-19. Many cases of secondary deaths may not have been attributed to COVID-19

⁵Selected countries for detailed analysis in the Middle Eastern region include GCC countries (Bahrain, Kuwait, Oman, Saudi Arabia, Qatar, UAE), Egypt and Morocco



Sinopharm CNBG has started manufacturing the UAE's Hayat-Vax at Gulf Pharmaceutical Industries' facility in Ras al-Khaimah

Key countries in the Middle Eastern region have been on the road to recovery from COVID-19 with nations advancing vaccine administrations. A joint venture of the local G42 and China's Sinopharm CNBG has started manufacturing the UAE's Hayat-Vax at Gulf Pharmaceutical Industries' (Julphar) facility in Ras al-Khaimah, with a plan to establish a production site in Abu Dhabi this year. In Egypt, the MOH is in process to start vaccine manufacturing and distribution to Egypt and African countries. Also, Egypt is planning to conduct clinical trials of 17 Chinese vaccines in their third phase⁶. In addition, Algeria is aiming to start manufacturing the Sputnik V vaccine in partnership with Moscow to supply African countries⁷. Vaccine deliveries and the localisation of production will increase as governments look to reduce and control infections.

⁶"Egypt to sign deals to manufacture Chinese vaccines", March 2021, Arab News

⁷"Algeria to start Russia's Sputnik V vaccine production in September", April 2021, Reuters

Section 2: Measures Taken to Control the Pandemic

Various control measures were undertaken worldwide to prevent the spread of COVID-19 locally and nationally. These measures are divided into three main categories, as explained below.



2.1 Containment and closure

Regulations across the globe include closures of educational facilities, businesses, recreational venues, work suspensions and remote working⁸, limiting the number of gatherings and visitors in confined settings, restrictions on movement of goods and flight suspensions etc.

GCC countries have taken unprecedented measures with border closures, travel restrictions, lockdowns, and curfews etc. to mitigate the outbreak along with imposing fines and sanctions for violations⁹. Also, imposed restrictions have constantly evolved while the pandemic spread has been and is carefully monitored. For e.g., Dubai allowed 50% of staff to return to offices in May 2020, after new infection rates began to decline¹⁰. When infections again spiked, authorities stepped in to add more curbs. Restrictions have also evolved based on seasons, such as separate prayer rules for Ramadan.

2.2 Response of Health systems

a) Public information campaign

CDC published a COVID-19 self-check tool to help in making decisions on PCR testing and medical care¹¹. In addition, public health guidelines have been published to ensure physical or social distancing, personal hygiene measures and avoiding crowded / poorly ventilated spaces¹².

In the UAE, the MoHaP and local health authorities, after obtaining approvals of NCEMA, were responsible for publishing awareness information, infection numbers and death rates.

⁸"Enforcement of law to contain the spread of COVID-19", March 2021, NCEMA

⁹"Community, Work, and School Information for Where You Live, Work, Learn, and Play", February 2021, CDC

¹⁰"Coronavirus: Dubai to allow 50% of staff to return to offices", May 2020, National News

¹¹"Coronavirus Self-Checker", February 2021, CDC

¹²"Coronavirus disease (COVID-19) advice for the public", April 2021, WHO

b) Testing policy

Key tests used to detect COVID-19 include the most common nasal PCR, laser DPI, LamPORE and antibody blood test. Across the globe, testing is being done for symptomatic patients or those meeting specific criteria; for e.g., health personnel, admitted patients, exposed persons and international travellers. Some countries have open public testing for asymptomatic people such as drive through testing.

UAE hospitals and healthcare centres are serving as testing facilities. To ensure comprehensive identification, numerous screening centres have been opened across the country. By March 2021, the UAE had conducted around 39 million tests¹³. Recently, DoH Abu Dhabi approved three tests for emergency use that offer faster results. These are new antigen (results in 20 minutes), RT-LAMP (results in 60 minutes) and Saliva specimen test (Reserved for children or where a nasal swab is not possible). The UAE has also been slashing PCR test prices (AED 65 as of March 2021¹⁴) to encourage testing.

c) Contact tracing

Contact persons of positive cases are notified and supported throughout the isolation and quarantine period. Contact tracing has been one of WHO's key strategies to combat and prevent infectious diseases for decades. Some countries used network-based location tracking instead of apps, for e.g., Israel authorised its secret service (Shin Bet) for network-based tracking. In South Korea, information from mobile device tracking, card transactions etc. were combined to track potentially infected individuals.

A nationwide campaign launched by UAE's MoHaP, has been urging the community to join the COVID-19 contact tracing app, Alhosn, to control the spread of COVID-19¹⁵. Alhosn was created by Artificial intelligence which uses a decentralised model for contact tracing that ensures a person's health and privacy. Now, it is also being used to trace vaccinated population for keeping records and availing of various exemptions, specifically by vaccinated people.

d) Emergency investment in healthcare

Many countries have been investing in their healthcare sectors to boost emergency responses of the health system as well as increased spending on digitalisation, healthcare research and development (R&D) and innovation¹⁶. In addition, they have a growing interest in integrating tele-health with public-private partnership (PPP) models and government healthcare systems.

Over the last year, the UAE has opened several field hospitals in record time, including general beds for moderate cases and ICUs for severe cases¹⁷; for e.g.

- 3,000-bed Dubai World Trade Centre (DWTC) facility with 800 beds set aside for intensive-care patients (opened in April 2020)
- Abu Dhabi field hospitals set up in Emirates Humanitarian City in Mohammed bin Zayed city which spanned over 29,000 square metres and had a capacity to serve 1,200 patients (opened in May 2020)

¹³National emergency crisis and disasters management authority UAE

¹⁴UAE Covid PCR test price slashed to lowest ever", March 2021, Khaleej Times

¹⁵UAE public urged to join COVID-19 contact tracing app Alhosn to protect themselves, communities", May 2020, MoHAP

¹⁶Private investment in UAE healthcare to rise by 9.5% annually: KPMG report", September 2020, Gulf Business

¹⁷The list of field hospitals and beds is not conclusive as there have been many changes in location and capacity of these hospitals over the last year

- Field hospitals opened in the Northern Emirates at the Sharjah Expo Centre, Sheikh Khalifa Hall in Umm Al Quwain, Ras Al Khaimah Exhibition Centre and Fujairah Exhibition Centre, raising the capacity to more than 5,000 beds

e) Investment in COVID-19 vaccines

Many countries have been allocating large sums of money and resources to produce COVID-19 vaccines including the United States, India, China, the UK, Germany, and South Korea. COVAX (COVID-19 Vaccines Global Access, a global initiative aimed at equitable access to COVID-19 vaccines) also has been working on developing adaptable resources across countries to support the introduction of COVID-19 vaccines, disseminating guidance, training, tools, and advocacy materials¹⁸.

Traditionally, it takes around 10–15 years to develop a vaccine¹⁹. However, due to the exigent and emergency situation, the entire pharmaceutical industry responded and in less than 12 months post the beginning of the COVID-19 pandemic, several research teams had developed vaccines²⁰. Several COVID-19 vaccines against the virus have now been approved for use, either by individual countries or groups of countries, such as the European Union and WHO. The details are given below.

Name	Vaccine type	Primary developers	Country of origin	Authorisation/Approval
Comirnaty (BNT162b2)	mRNA-based vaccine	Pfizer, BioNTech; Fosun Pharma	Multinational	Australia, Bahrain, Canada, the Caribbean, European Union, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Switzerland, Tunisia, Turkey, UAE, UK, US, WHO
Moderna COVID-19 Vaccine (mRNA-1273)	mRNA-based vaccine	Moderna, BARDA, NIAID	US	Canada, European Union, Qatar, Singapore, Switzerland, UK, US
COVID-19 Vaccine AstraZeneca (AZD1222); also known as Vaxzevria and Covishield	Adenovirus vaccine	BARDA, OWS	UK	India, Indonesia, Iran, Iraq, Morocco, Philippines, UK, Vietnam, WHO
Sputnik V	Recombinant adenovirus vaccine (rAd26 and rAd5)	Gamaleya Research Institute, Acellera Contract Drug Research and Development	Russia	India, Iran, Iraq, Jordan, Laos, Lebanon, Morocco, Pakistan, Syria, Palestine, United Arab Emirates
COVID-19 Vaccine Janssen (JNJ-78436735; Ad26.COV2.S)	Non-replicating viral vector	Janssen Vaccines (Johnson & Johnson)	The Netherlands, US	Canada, European Union, South Korea, Switzerland, Thailand, Tunisia, US, WHO
CoronaVac	Inactivated vaccine	Sinovac (formalin with alum adjuvant)	China	Brazil, China, Philippines, Thailand, Tunisia, and Turkey
Covaxin	Inactivated vaccine	Bharat Biotech, ICMR	India	India, Iran, Mexico, Nepal, Paraguay, and Zimbabwe

Source: Regulatory Affairs Professionals Society

¹⁸"COVAX Working for global equitable access to COVID-19 vaccines", April 2021, WHO

¹⁹"Vaccine Q&A: How Long Does It Take to Make Vaccines?" Dec 2020, New York State University

²⁰Our World in Data: COVID vaccination data

UAE companies were conducting Chinese COVID-19 vaccine trials in partnership with Sino-pharm's China National Biotec Group (CNBG) and Abu Dhabi-based artificial intelligence and cloud computing company Group 42²¹. Currently, approved COVID-19 vaccines in the UAE are SARS-CoV-2 Vaccine Inactivated Vaccine (Sinopharm), mRNA (Pfizer/BioNTech), Sputnik V and the latest by Oxford-AstraZeneca. The UAE is offering these vaccines to its citizens and residents free of charge and on an optional basis after ensuring that the person has no conditions or symptoms that make it inadvisable. As of April 2021, the country has administered approximately 9 million vaccine doses²².

2.3 Economic response

a) General support

Some governments have been covering salaries, giving cash payments/universal basic income, freezing financial obligations to needy people who lost their jobs along with providing payments to firms. The UAE has offered residents delayed payments on household debts etc. Also, UAE banks have agreed to provide financial relief to small-to-medium enterprises (SMEs) and large organisations with temporary exemption from principal payments and interest on existing loans²³.

b) Fiscal measures

Some regions have been adopting economic stimulus policies including tax cuts to support their economies. In the UAE, measures undertaken are as follows²⁴:

- The Government of Abu Dhabi announced reduction / suspension of government fees and penalties, and rebates on commercial lease payments in tourism and hospitality sectors
- In July 2020, Dubai announced an AED 1.5 billion (\$0.4 billion) package, which includes cancelling certain fines, tax reimbursements etc.
- In October 2020, Dubai announced an AED 500 million (\$136.14 million) stimulus package
- In January 2021, an additional stimulus of AED 315 million was announced
- Other Emirates employed similar measures; for e.g., Sharjah announced packages amounting to AED 993 million (\$0.27 billion)

c) Providing international support

Developing countries are dependent on international support to suppress infection spread, counter misinformation, control mortality and morbidity rates, and ensure equitable access to COVID-19 tools and supplies. WHO has spent more than USD 225 million on providing essential commodities to support vulnerable communities, refugees, and displaced populations²⁵. Other key donor organisations include the World Bank, European Union and the International Bank for Reconstruction and Development (IBRD) etc.

²¹Statista, WHO the COVAX facility, National emergency crisis and disasters management authority, the economics times, emirates news agency

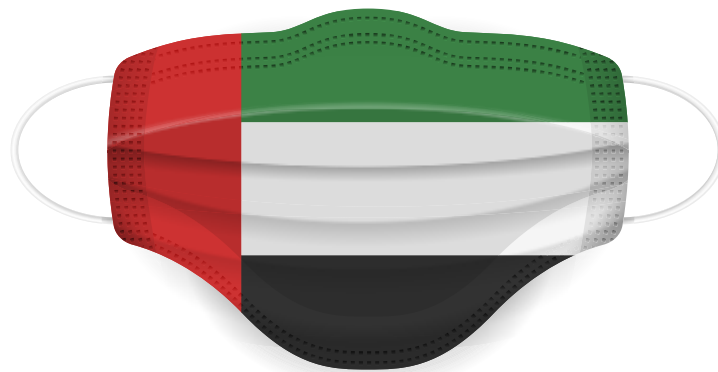
²²UAE CORONAVIRUS (COVID-19) UPDATES, April 2021, NCEMA

²³Our world in data, Central Bank of the UAE, "Policy responses to COVID-19", April 2021, International monetary fund

²⁴"Policy responses to COVID-19", April 2021, International monetary fund

²⁵"COVID-19 Solidarity Response Fund", April 2021, WHO

Section 3: Impact and response to the COVID-19 pandemic by various stakeholders – UAE



The COVID-19 pandemic has impacted healthcare and economies in high, middle, and low-income countries. This crisis has reinforced the view that the majority of healthcare systems across the world need to be better prepared to respond to such a large-scale emergency. To tackle this pandemic, a global mobilisation of resources was needed, whereas currently available resources were not enough even for developed countries. The pandemic has brought negative growth to the global economy, and while healthcare has not been entirely immune, it is expected to show more resilience in relation to most industries, with accelerated growth in several subsectors such as long-term care, post-acute care and telehealth etc.

Some GCC countries have been successful in managing the spread of COVID-19 due to their quick responses. Major impact on key stakeholders has been described below:

3.1 Payors

Impact of the pandemic:

The spread of COVID-19 continues to have a significant immediate and long-term impact on the insurance industry as mentioned below:

- According to a Dubai Health Authority (DHA) and Ministry of Health and Prevention (MoHaP) circular, all DHA-licensed health facilities needed to consider suspected or confirmed COVID-19 cases as emergency cases and to be treated either by insurance companies or through Government sponsorship²⁶. Therefore, insurance companies needed to go the extra mile to provide coverage to all patients.
- UAE airlines are also offering coverage against COVID-19 to passengers. Emirates became the first airline in the world to offer free COVID insurance cover. Etihad followed suit, offering COVID-19 insurance as part of its Etihad Wellness programme²⁷.

Lessons for the future:

Predictions by insurance companies or payors indicate changes in employer sponsored insurance schemes and coverage. Payors should also look at extending insurance coverage to include psychiatric care, which might be on the rise due to COVID-19.

²⁶"Coronavirus cases in UAE to be treated free of cost, insurance not necessary", Feb 2020, Khaleej Times

²⁷"Dubai-based VFS Global adds COVID-19 coverage to international travel insurance", Oct 2020, Gulf Business

3.2 Providers

Impact of the pandemic:

During the pandemic, healthcare facilities provided unprecedented service to those in need even though payment mechanisms were not clear. Key responses by healthcare providers are as follows:

- Focus on reducing operational costs and improving liquidity
 - Key healthcare facilities reduced operational costs by having a temporary salary reduction and decreased workforce to survive.
 - New strategies are being implemented to improve operational and financial efficiency.
 - Some facilities moved to Propco-Opco structure; opting for sale and lease models to improve liquidity.
- Focus on operational efficiency
 - Hospitals also worked to ensure safety of staff by following approved protocols for testing, contact tracing and procuring necessary personal protective equipment (PPE).
- Increase and flexibility in available resources to cater to the pandemic surges
 - Hospitals increased capacity of hospital beds by working closely with health authorities, including field hospital beds (temporary infrastructure).
 - Availability of diagnostic facilities increased at several hospitals within a short period of time to deal with the surge in patients (testing facilities, drive through testing, different types of tests for COVID-19 etc.).
 - In many facilities, elective procedures were temporarily suspended to leave enough resources available for COVID-19 patients.
 - Several hospitals increased the hiring and training of medical workforces to deal with emergency management services.
 - Hospitals also focused on providing care to patients outside the hospital setting through increased homecare services as well as tele-consultation services.

Lessons for the future:

- Hospitals will focus on developing capability to have flexible infrastructure (IP beds being converted to ICU beds, portable/modular hospitals etc.) along with comprehensive infectious disease departments and improved an ratio of ICU beds
- Key hospitals will also develop protocols to be able to access temporary or contractual medical staff, especially nurses and paramedics. Moreover, investment in training of the healthcare workforce for better adaptability will also increase
- Hospitals will also continue with operational efficiencies gained during the pandemic. Implementation of lean management systems and Knowledge Process Outsourcing (KPO) across the healthcare sector is expected to increase to maximise cost efficiencies for providers, helping them offset immediate revenue challenges and be prepared for any future cash and liquidity issues
- Technology has been a major pillar of support for all stakeholders. Higher technology focus to ensure seamless patient support including telehealth services is also expected to continue
- The pandemic has also created a need for a relook at hospital design and architecture. Cre-

²⁶"Coronavirus cases in UAE to be treated free of cost, insurance not necessary", Feb 2020, Khaleej Times

²⁷"Dubai-based VFS Global adds COVID-19 coverage to international travel insurance", Oct 2020, Gulf Business

ation of separate wings where communicable disease patients can be quarantined will also become a focus area for future hospitals

- Psychiatric care for patients and providers with support for self-isolation requirements and screening for symptoms of anxiety, depression, and post-traumatic stress disorders is expected to increase
 - Resource allocation strategies may also change soon with a focus on preventive services such as regular check-ups and monitoring, immunisation, and screening services etc.
 - Hospitals will also implement new care models; for e.g., improved homecare, LTC, and Rehab capabilities
-

3.3 Medical devices, equipment & consumable companies

Impact of the pandemic:

The medical supply chain is one of the most critical components of the healthcare ecosystem. The COVID-19 lockdowns and movement restrictions that happened locally, nationally, and internationally have significantly affected medical consumables production, processing, distribution, and supply. The importance of the medical consumables sector was also evident with dire shortages of gloves, masks, PPE kits etc. Moreover, there has been a huge increase in demand of self-monitoring devices like temperature monitoring, portable oximeters, nebulisers etc.

In the UAE, the Dubai Future Foundation has developed the M061 ventilator in eight weeks in response to the need for crucial medical supplies due to the COVID-19 pandemic. In addition, scientists and researchers at Khalifa University are aiming to develop emergency ventilators to help meet the increased demand.

Lessons for the future:

Countries have realised the importance of local manufacturing capabilities for medical devices, equipment, and consumables. Therefore, investment in these capabilities will be the way forward along with increased use of technology and investment in research activities to support innovation.

3.4 Pharmaceutical companies

Impact of the pandemic:

A strong part of the supply side disruption is that of pharmaceuticals, advanced pharmaceutical ingredients (APIs) and essential drugs. Pharmaceutical companies struggling to get vital raw ingredients for common antibiotics and vitamins industries that were shut down. Although some of the pharmaceutical factories have restarted working, the market might face some shortages of certain drugs. Availability of critical drugs, medical gases etc. was in short supply across the globe. Countries with local manufacturing capabilities thrived in this situation. Moreover, pharmaceutical companies were able to innovate and produce both traditional as well as new technology vaccines in record time. This has reinstated the importance of R&D activities.

Lessons for the future:

- Ensuring better supply chains of essential medicines and vaccines
- Increased domestic manufacturing capabilities and technical partnerships
- High investment in R&D activities

3.5 Government

Impact of the pandemic:

The Government supported all aspects to help patients and decrease the spread of infection by redefining public policies across all domains including healthcare, businesses, travel, entertainment etc. In accordance with the WHO, the UAE has been abiding by public health policies and guidelines and is aiming to strengthen the health system to have the best defence against any future outbreak.

Lessons for the future:

The Government needs to prepare for future pandemics with a focus on the following:

- Improve healthcare infrastructure including protocols to create field hospitals during times of need
 - Further refining guidelines for disaster management and relief, by incorporating learnings from the pandemic
 - Revamp governance and policy to define shared goals and improve decision making
 - Investment in quality medical education, clinical trials, and research to be at the forefront of the latest treatments being developed globally
 - Increased partnership with the private sector
 - Increased capability in R&D activities and local manufacturing of medical equipment and pharmaceuticals
-

3.6 Patients

Impact of the pandemic:

The inability or fear of high-risk patients to consult a doctor is disrupting chronic disease management and delaying some critical care procedures even after accounting for telehealth services. Further, closures and lockdowns in addition to economic decline significantly impacted the mental and physical health of the population due to sedentary and unhealthy lifestyles. Also, the current pandemic has had a drastic effect on people's mental health with issues like loss of jobs, salary cuts, working from home without social contact etc. These have caused several mental health issues in the global population, that need to be addressed in time. Governments throughout the world, including in the GCC, have already launched initiatives to deal with the mental health dimension of COVID-19.

Lessons for the future:

Patients need to be better prepared for the challenging times the pandemic has brought. Some of the key measures are listed below:

- Maintain preventive measures such as personal hygiene, social distancing, work from home (wherever applicable) etc.
- Undergo regular preventive health check-ups to detect any underlying diseases
- Improve immunity by adopting healthy lifestyles
- Invest in health insurance to protect themselves and loved ones in times of need
- Address any underlying and developing mental health issues
- Increase use of technology to prevent exposure, for e.g., use tele-consultations wherever possible

3.7 Technology

Impact of the pandemic:

Technology had a role as an enabler across all stakeholders. The pandemic has catalysed GCC's healthcare service providers to ramp up investments in digitisation and telehealth, in an effort to drive future growth and improve operational efficiencies post COVID-19 such as increasing remote working and virtual interactions, increasing spending on data security, accelerating the use of online purchasing services, advancing technologies in operations etc. The UAE healthcare industry was able to scale up these technologies due to its vast technological infrastructure and investments in artificial intelligence in recent times. The use of phone and video consultations was widespread in the region during the pandemic.

Lessons for the future:

Healthcare operators in the UAE shall invest further in digital technology and data solutions after witnessing their value during the COVID-19 pandemic.

While the COVID-19 pandemic has placed unparalleled demands on the UAE healthcare system, the industry demonstrated its resilience by upping services and bringing new products to the market quickly including medical consumables, pharmaceuticals, and vaccines. But with the continuing pandemic, healthcare players in the region can prepare for a better response to disaster management with increased use of technology across key stakeholders.

Section 4: Lessons for the future



2020 and 2021 will be remembered as the years of COVID-19. The pandemic has massively disrupted and exposed the shortcomings of healthcare systems around the world in both public and private sectors. It has also exposed the limited research and development (R&D) activities. But at the same time, it has also served as a catalyst for unprecedented innovation and scientific collaboration and pushed authorities to make significant changes and have a better preparedness for the future. Prevention and preparedness are an imperative for the future health sector. Lessons learned during these difficult times will pave way for a new post-COVID-19 world.