

# Trends and Emerging Practices in Healthcare Project Management: The Role of Corona Crisis Management Room to Control COVID-19 Spread in Aseer Region, Saudi Arabia

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## Abstract

In response to the Covid-19 pandemic, the Emirate of Aseer Province, Saudi Arabia, has established the Corona Crisis Management Room (CCMR) to help support the health affairs and eliminate all the risks associated with the virus within the region. The study aimed at establishing the trends and emerging practices in healthcare project management with a concerted interest in determining the role played by the CCMR in controlling and stopping the spread of the virus in Aseer region. The study adopted the exploratory research approach which sought to investigate the research phenomenon. The CCMR formed the focus of the study. 17 participants working in the CCMR were selected using the purposive sampling technique. Data were collected using in-depth interviews where a clear and detailed description of the phenomenon under research was obtained. The collected data were subjected to thematic analysis and classified into three thematic areas. The findings of the study established that the CCMR had a critical role in coordinating government activities within Aseer region. New management practices were based on the experiences of the pandemic and ranged from

evidence-based decision making, use of modern technology, and collaboration of various entities. The pathological spectrum was key in risk assessment.

**Key words:** Covid-19; Corona virus; risk management; project management; crisis management; healthcare; qualitative research; Emirate of Aseer Province; Saudi Arabia

## Introduction

The ongoing spread of COVID-19 Virus presents major healthcare challenges worldwide. According to the World Health Organization (WHO), stopping the spread of the virus has become difficult, with countries using different measures to mitigate the viruses' impact. Saudi Arabia stands as the second-largest Arab country, with a population of approximately 34 million. The majority of the population are middle-aged (15-65 years), and those below 14 years and above 65 years make up 32.4% and 2.8%, respectively [1].

Provision of healthcare services in the Saudi Kingdom is free to the public under the supervision of the Ministry of Health (MoH). The private sector entails a network of for-profit hospitals across the region. With the growing need for healthcare services in Saudi Arabia, the Crown Prince launched the Kingdom's "2030 Vision" that considered fundamental structural changes in the healthcare sector. Likewise, during the pandemic, the Emirate of Aseer Region, Saudi Arabia, and on the generous initiative of His Royal Highness Prince Turki Bin Talal Bin Abdulaziz, the Prince of Aseer Region, has taken measures to establish the Corona Crisis Management Room (CCMR) to effectively support health affairs and eliminate all the health risks associated with the virus.

The MoH applies methodologies and practices of project management to help achieve the vision of the Kingdom. Project management as a body of knowledge, recognizes the importance of crisis/risk management. The pandemic has triggered governments at all levels to operate in a context of radical uncertainty. The impact of the virus, both local and international, is heterogeneous, with important implications for policy responses and crisis management. The COVID-19 crisis has immensely triggered several pre-existing trends in healthcare project management, especially in the aspects of digitalization, quality, risk management, and improvement programs. The spread of the virus has shaken the world, triggering a range of possible trajectories across the globe. It is the different trajectories that have prompted the different approach mechanisms to fight the virus [2].

According to Allain-Dupre et al. [2], there is strong evidence that implicates a detailed territorial approach to the COVID-19 crisis. Governments, and sub-governments are all at the forefront of crisis management and recovery from the virus, despite the asymmetric economic, health, and social impact. In addressing the impact to the health sector, various countries are adopting the differential approach, such as policies relating to the use of masks and execution of lockdowns. On the socio-economic front, governments are making available significant fiscal support to protect individuals and firms from the effect of COVID-19. Some countries have put in place large investment recovery packages that focus on public investment with a major focus on strengthening the health systems. Like many other countries, Saudi Arabia's response has been immense with the sole commissioning of the CCMR to

address the pandemic in the Kingdom. Therefore, the aim of this study was to establish the trends, and emerging practices in healthcare project management with a specific interest in determining the role played by the CCMR in stopping the spread of COVID-19 in Aseer Region, Saudi Arabia.

### Statement of the Problem

In 2020, the novel COVID-19 has negatively affected all countries, with more than 50 million people around the world being impacted. The COVID-19 has set up governments operating in a context of radical uncertainty raising health, economic, and social challenges. During the pandemic, the world has faced spontaneous containment measures and a series of lockdowns in various countries. Beyond the human and health tragedy caused by the virus, it is now evident that the pandemic has triggered a serious economic crisis since World War II [2]. Several economies are set not to recover their 2019 output levels at least until after 2022 [3]. A rebound of the crisis through 2021 is increasing uncertainty, calling for more containment measures to curb the spread of the virus. Recently, the WHO acknowledged the rise of a new variant that is more contagious [4].

The nature of the crisis seems unprecedented. Apart from the short-term reoccurring economic and health shocks, the long-term effects of COVID-19 on human capital, behavior, and productivity may turn out to be long-lasting. The pandemic has accelerated some pre-existing trends, especially in project management within the healthcare sector. The virus has taken the world by surprise, setting up waves of change accompanied by a range of unexpected trajectories in risk management [3].

Several governmental and non-governmental organizations are actively involved in the frontline of crisis management, and they are constantly being faced by the COVID-19 asymmetric economic, social, and health impact within and out the countries. The disparities in terms of infection of some populations are evident with the Western nations hit more than the African nations [4]. Large urban areas have been hit, but within them, the more deprived areas have been strongly affected. The health impact is now spreading toward the less populated regions, an example being the US, where the rural counties have experienced more deaths. Such disparities show that the risks vary depending on where one lives [2].

Taking that into account, the regional differences in disease impact call for a territorial approach to policy responses on the economic, health, fiscal, and health fronts coupled with strong inter-governmental cooperation and coordination.

Saudi Arabia has been quick in terms of implementing disease containment measures and working toward meeting the demands and needs of the community within the shortest time possible [5]. Despite the presence of the vaccines, not everyone has access to vaccination at this stage [4]. Therefore, it is evident that Saudi Arabia is being faced with a burden of how to prevent the spread of

the virus. To mitigate the risks involved with the spread, immediate measures, such as social distancing and city and state lockdowns continue to be the only solutions to containing the pandemic [6]. However, there is a need to try other management measures within the Kingdom.

As a result, the study sought to determine the role of the CCMR to control the spread of COVID-19 in Aseer Region, Saudi Arabia. Moreover, findings of this study are expected to establish whether the CCMR is efficient in preventing the spread of the virus and whether the regional-based approach to policy response is having an impact to curb the spread.

### Research Objectives

This study's main objective is to establish the trends and emerging practices in healthcare project management during COVID-19 pandemic through:

- determining the role of the CCMR in managing the spread of COVID-19 in Aseer Region,
- identifying the project management practices adopted in the management of COVID-19, and
- establishing the risk assessment approach adopted by the CCMR in fighting the virus.

### Research Scope

This study was conducted in Aseer Region, Saudi Arabia, with a special focus on the CCMR. The authors restricted themselves to the geographical scope of Aseer Region and within the confines of the CCMR.

### Literature Review

The Emergence of COVID-19: The Case of Saudi Arabia  
Coronaviruses (CoV) are important animal and human pathogens, which present an enormous public health and economic challenge. The viruses are known to cause gastrointestinal and respiratory infections [7]. Within the human body, Coronaviruses are known to affect the respiratory tract resulting in diseases that range from mild common cold to fatal pneumonia [8]. Four variants of human Coronaviruses are associated with the common cold, but a new variant of novel human Coronavirus was discovered in China between 2002-2003 and was associated with a severe respiratory disease referred to as Severe Acute Respiratory Syndrome-CoV (SARS-CoV) [9]. The SARS-CoV spread globally, causing a SARS epidemic affecting more than 8000 individuals with approximately 800 deaths [1]. Evidence suggests that there has been active research on the CoVs, but in 2012, a new zoonotic CoV identified as the Middle East Respiratory Syndrome-CoV (MERS-CoV) broke out in Saudi Arabia and spread to 27 nations resulting in approximately 2500 confirmed cases and 860 deaths with a majority in Saudi Arabia [10].

Recently, on January 7, 2020, a new variant of human Coronavirus, identified as Severe Acute Respiratory Syndrome-CoV-2 (SARS-CoV-2), was determined to be a causative agent of Coronavirus Disease 2019 (COVID-19) [11]. The virus was first reported in Wuhan, a Chinese city, and within weeks the virus quickly spread to different

Chinese cities and eventually outside of China, reaching almost all countries. The WHO declared a global pandemic because of the rapid and continuous spread of the SARS-CoV-2 by the end of January 2020. As on February 18, 2021, the virus has caused approximately 110 million cases, 61.9 million recoveries, and 2.43 million deaths, with several countries reporting high cases, including the USA, UK, Spain, Italy, China, Iran, France, Turkey, and Germany [1]. On March 2, 2020, the first case of COVID-19 was reported in Saudi Arabia, having been detected in a traveler coming back from Iran [1]. As of February 18, 2021, Saudi Arabia has reported 373,702 confirmed cases and 6,445 deaths, with June 2020 being the worst month of infection and deaths [12].

Since the start of the pandemic, the Kingdom has taken various measures ranging from restrictions, suspension of Umrah, closure of the two Holy Mosques in Makkah and Madinah and the shifting of learning to remote forms and virtual classrooms. The measures were followed by travel restrictions to affected countries and the execution of mandatory quarantine for individuals who had already arrived in the country. In addition to the domestic measures, Saudi Arabia has played a big role in the global efforts to control and fight the virus with a \$10 million pledge to the WHO [1].

## Crisis and Risk Management of COVID-19

The COVID-19 pandemic presents a complex global public health crisis resulting in not only clinical but also organizational and system-wide challenges to healthcare project management. Management and monitoring of the crisis require different research perspectives ranging from healthcare research, sociology, public health, epidemiology, management, and economics. According to Kringos et al. [13], the application of performance intelligence in addressing the COVID-19 crisis is critical since it demands the use of different research perspectives that support health systems' decision-makers to come up with policies that are based on well-informed choices aimed at enhancing the wholesome system. In line with the argument, the management of COVID-19 becomes an integral component of governing healthcare systems and does not make it a separate entity with its own rationale.

Since the start of the pandemic, Saudi Arabia has initiated and based its decisions on the risk assessment of the COVID-19 spread at both the local and international levels. According to the Saudi MoH report, the Kingdom largely relied on global statistics and the Saudi Center for Disease Prevention and Control's travel assessment tool to issue warnings against movements in and out of the Kingdom [2]. According to Algaissi et al. [1], the experience derived from the MERS-CoV in relation to risks that arise from having large crowds at Umrah and Hajj pilgrims helped shape the Kingdom's response to COVID-19. Risk management is an important component of project management practice, and the Kingdom's approach to risk assessment is testament enough to the role project management practice played in its measure.

Several risk assessment tools were under application by the Kingdom. According to the MoH [14], the “Jeddah Tool” for risk assessment helped to carry out a strategic assessment of the health risks associated with Hajj and Umrah during the pandemic. The findings of the tool indicated that the risk level was extremely high, and based on the result, Umrah was suspended. Another tool, “Salem COVID Tool” was applied in assessing the risks associated with mass gatherings. The two tools are scientific and developed with the supervision of the WHO making the results reliable. Therefore, the crisis and risks associated with COVID-19 can be well managed using scientific assessment tools that base results on factual data.

## Healthcare Project Management during the Pandemic

During the advent of COVID-19, almost all industries have been hit. The healthcare sector has suffered the most and continues to experience the strain. With the continuing pandemic, there exist opportunities for improvement, with healthcare project management playing a critical role. According to Moira [15], project managers are professionals who are used to working under pressure, be it financial, schedule-related, or quality control. Therefore, project management experts can easily help resolve crisis situations and lead the post-crisis reform agenda. Evidence suggests that the healthcare industry has been faced with challenges related to labor, scheduling, quality control, supply, and finance at the onset of the pandemic, thus requiring a well-organized project management office PMO [15]. The PMO’s responsibility lies in continuously monitoring the enterprise environmental factors that may affect projects and portfolios of organizations [16]. In coordination with other areas of management, the PMO assesses the threats and opportunities with the aim of developing a fallback plan.

## Materials and Methods

### Research Design

The authors adopted an exploratory approach to the study. According to Thomas and Lawal [17], exploratory research aims at investigating a research phenomenon that is not clearly defined. The study adopted a case study research design through conducting in-depth interviews. A case study design focuses on one organization as the source of information.

In this study, the CCMR in Aseer Region was used as the case study to understand its role in the larger Saudi Arabia. The application of the design is ideal in the current situation since it followed qualitative data collected through interviews. According to Hammarberg, Kirkman, and de Lacey [18], the qualitative methods are ideal in answering questions about a phenomenon and help in collecting factual data. The qualitative data were considered appropriate owing to its ability to reveal the emerging trends and practices in healthcare project management.

The qualitative design presents an inductive research that can be used to get the perspectives about the problem at hand and how it is being addressed. The collection of non-numerical data is only possible using qualitative research [19]. The design entailed the formulation of general research questions and the selection of specific targets within the CCMR, followed by a collection of data and data analysis to address the study objectives.

### Sampling Technique

For this research study, 17 individuals (34%) working at the CCMR in Aseer Region were selected out of 50 workers. Only individuals working in the Room were considered because of the focus of the study. The selection of study participants was through purposive sampling. According to Robinson [20], purposive sampling is the intentional selection of study participants based on the ability to elucidate a specific phenomenon, theme, or concept. In qualitative research, purposive sampling entails an iterative process of selecting the respondents instead of starting with a predetermined sampling frame from the larger study population. Therefore, the process involves the selection of the participants in line with the theme under study. The research applied purposive sampling out of convenience to help minimize movement during the pandemic and to align to the COVID-19 restriction measures put in place by the authorities.

### Data Collection Method

Data collection is a critical method during research. The study made use of in-depth interviews to collect data from the respondents. The major reason for conducting interviews was for the research to draw a clear and detailed description of the phenomenon under study. Interview questions were prepared, and the nominated respondents were taken through the direct interview or using a phone call interview. Respondents could respond in detail. The collected data were recorded and stored for analysis.

### Interview Questions

1. What is your role in the Crisis Management Room?
2. Has the COVID-19 pandemic impacted on crisis management practices? If yes, to what extent has your organization applied the practices?
3. What are some of the functions of the CCMR as per your understanding?
4. The CCMR aims at controlling the spread of COVID-19. What are some of the response strategies adopted to address this?
5. What are the current management practices in terms of project, program, and portfolio management that are applied during the pandemic?
6. Do you believe that crisis management is effective in controlling the spread of COVID-19 or reacting to its effects on the population?
7. Do you think that the CCMR has taken all the necessary measures to keep the public safe?
8. What are some of the risk assessment methods that are used in the Room to determine the effects and extent of the spread of the virus?
9. Has the pandemic changed the aspect of management

within the healthcare sector? If yes, what are some of the new insights?

**10.** From the experience of the pandemic and the anticipation of fundamental changes, has the management devised new practices to combat the spread of the pandemic?

**11.** On the global platform, how does the Room address the risk of global spread of the virus?

### Data Analysis Approach

The collected qualitative data were taken through thematic analysis. The NVivo software was used to find similarities in the collected data, which were unstructured and text-based. The interview transcripts were systematically arranged, and the data were coded and categorized [21].

## Results

The purpose of this qualitative case study was to explore and determine the trends and emerging practices in healthcare project management during the COVID-19 pandemic with a major focus on the CCMR in Aseer Region, Saudi Arabia, as the case study. Specifically, the study sought to determine the role of the CCMR in managing the spread of COVID-19 in Aseer Region and identify the project management practices adopted in the management of COVID-19 in the region. The study also established the risk assessment approach adopted by the CCMR in fighting the virus. To explore the topic, the authors targeted a total of 10 participants but managed to include 17 respondents (R1-R17), who were taken through the interview sessions to collect the relevant data to answer the study's objectives. To be considered for the study, the participants had to be working in the CCMR since its inception at the onset of the pandemic.

The unstructured interview data were subjected to thematic analysis. Three thematic areas were identified. The first thematic area was the role of the CCMR, and this was related to how the Room manages the spread of the virus within Aseer Region. The second thematic area was the project management practices adopted in managing COVID-19. The third thematic area was on risk assessment, where the risk assessment approaches adopted by the CCMR were analyzed based on the data collected.

### **Thematic Category 1: Role of the CCMR in Managing the Spread of COVID-19**

All the respondents in the study provided their views on this theme. The relative importance of this category was high in addressing the objectives of the study. The collected data showed strong evidence for the theme. The role of the CCMR strongly came out as one to control the virus and mitigate the effects of the pandemic. When asked to shed light on the functions of the CCMR, a variety of responses was attained, but the role of controlling the spread of the virus and mitigating the effects of the pandemic was strong. For example, Respondent 9 (R9) alluded that

*"...the most basic function of the CCMR, in my view, is to control the epidemic and mitigate the pandemic. This is done through a range of general functions of the Room and other specific tasks of specialized units. The general functions of the Room include ensuring follow-up and implementation of State directives regarding government decisions within the overall direction of the State in controlling the epidemic; close coordination between the various entities for the implementation of these directives; ... and the overall objective is to flatten the epidemiological curve and raise the capacity of the health sector."*

The arguments presented by R9 agreed with what R5, R7, R10, and R15 provided. It was evident across all the respondents that the major role of the CCMR was to control the epidemic and mitigate the pandemic. However, R2 provided different thoughts on the role played by CCMR. R2 divided the roles into what he termed as "field stages." The arguments were based on his role in data collection within the crisis management organization structure. He opined that

*"...I can divide roles by field stages to: phase 1 (preventive) which entails monitoring of non-proliferation hotspots, phase 2 (processing), which is the preparing of ICU rooms and increasing their capacity, phase 3 (treatment), which is the reception and treatment of cases at designated hospitals, phase 4 (preventive) which includes education and compliance with precautionary measures, and phase 5 (preventive) which entails vaccination of citizens and residents after the discovery of vaccines."*

The responses by R2 can be summarized into the preventive and treatment of COVID-19 role, which falls under the overall role of control and mitigation of the pandemic. There were notable similarities in R2 and R3 responses, but of notable interest, R3 opined that the CCMR had a role in "...vertical and horizontal coordination of all the healthcare stakeholders to make the mission against the Corona pandemic a success." The aspect of horizontal and vertical coordination agreed with the responses given by R5, who listed several functions that he believes define the role of the CCMR. R5 pointed out that

*"... the CCMR is responsible for collection and follow-up of government decisions, collection, and analysis of scientific information on the pandemic, dissemination of information and awareness-raising material to target groups, development of hypotheses for the worst-case scenarios and their respective implementation, monitoring of outlets and screening of passengers in accordance with the definition of suspected cases, ensuring approved standards are applied, and development of appropriate preventive measures together with their implementation follow ups."*

The similarities in responses acquired on the role of the CCMR suggested that the communication of the Room's scope was well understood by the respondents who are working at the organization. The CCMR in Aseer Region is mandated to "flatten the epidemiological curve and raise the absorptive energy of the health sector with the

*initiation of the Aseer Nashama Initiative program intended to reduce the effects of the pandemic in the region and its citizens (R7).*" However, the CCMR management works under the discretion of the Saudi Arabian Government, where it is mandated with supervising and implementing the Government's directives regarding the containment of the virus.

### **Thematic Category 2: Project Management Practices Adopted in Managing COVID-19**

Project management during the COVID-19 pandemic can be a challenge to many organizations. The number of activities that need to be coordinated and mobilized during this period can be overwhelming. Therefore, a combination of the best practices is needed to achieve results. According to [22], the COVID-19 pandemic has shown that the working environments are characterized by uncertainty, ambiguity, complexity, and volatility. Therefore, the application of project management strategies and practices is essential to ensure the success of the implementation and operation of various organizational activities. To answer the objectives of the study, the respondents were asked several questions, which targeted the project management strategies applied within the CCMR to control the spread of COVID-19.

### **Response Strategies**

The study participants were asked to respond to whether the COVID-19 pandemic has impacted on crisis management practices at the CCMR and how the organization is applying the practices in managing the spread of the virus. R1 alluded.

*"... Yes (the pandemic has impacted crisis management practices) and it has a clear impact on the working system in terms of restructuring the network of contact with those involved in dealing with the pandemic."*

R2 pointed out that the pandemic has influenced the *"... crisis management and working mechanisms"* of the organization. The sentiments of R1 and R2 were all like the other respondents who indicated that the pandemic had changed the way crisis management practices were executed.

With response to practices such as communication and risk management, R3 indicated that the pandemic has had a positive and tangible influence on crisis management practices. The Respondent said,

*"...the pandemic has certainly influenced some of the past practices in crisis management and has had a positive and tangible impact such as restructuring and improving the network of communication with stakeholders where they have been identified, and their requirements and impacts defined. Effective communication with stakeholders has been enhanced to address their needs and achieve the objectives of the Room. Risks have also been classified, analyzed, and prioritized with the necessary response plans developed if the risks occur. A number of precautionary and preventive measures have been modeled and coordinated to ensure safety, validity, and speed of the procedures."*

According to R3's response, it is evident that COVID-19 has changed the way communication management is carried out, significantly, and has influenced crisis management practices in a positive way.

In determining the various project management strategies under use by the CCMR to respond to COVID-19, the respondents were asked to point out some of the response strategies adopted. Several strategies were pointed out to indicate integration of various entities such as the management, security, oversight, and the public. R3, who is the commander of the Prevention Platform, responded as follows to the question:

*"...the pandemic response strategies under the administration of the Room are already entailed in the risk plan. They include escalation, avoid, mitigation, transfer of risks, exploitation of opportunities, digital transformation, increase in the number of ICU rooms, and development of regional laboratories where samples are sent to for testing during the crisis."*

The escalation strategy involves bottom-up communication in the event threats are difficult to solve within the limits of the CCMR. The avoid strategy involves the restriction of movements through traveling, while mitigation entails the response to various active cases and the risks they pose. Of interest, the Saudi Arabian Government, through the MoH, has heavily invested in digital transformation through the development of various applications that control crowds during religious gatherings.

In relation to the response strategies, R4 indicated that the strategies underuse includes the suppression strategy that makes use of non-therapeutic measures to control the virus based on seven key components, namely state-level control, health education, detection and isolation, community cleansing, health resources, physical distancing, and economic aspects. State-level control included the central coordination and control from the national prevention center with a clear participation and dissemination of information across the board regarding the pandemic. The health education campaign involved sensitization of the public on preventive measures. The detection and isolation components were made possible through the expansion of the medical examinations to be available to all and the treatment of active cases through isolation and medication. Surface contamination was controlled through community cleansing. The health resources were expanded to increase on the capacity of hospital beds and the provision of personal protection tools. Social distancing was also coordinated from the control room and through the use of digital applications. The economic component entailed providing material assistance to those affected by the pandemic and provision of assistance to professionals and healthcare workers. Other notable response strategies identified by R5 included implementation of Government resolutions on COVID-19, and monitoring of readiness in all Government and private establishments. The most common strategy among the majority of the respondents was the suppression strategy that relies on non-therapeutic measures.

In terms of projects and programs, R17 identifies the expansion of the healthcare facilities to increase capacity, establishment of field hospitals in Aseer Region, and equipping of vaccine centers in the region as some of the active undertakings. R15 identifies the "Aseer Nashama Initiative" as one of the programs started to target entrepreneurs in the region and cushion them against the adverse effects of the pandemic.

## Management Practices

Healthcare is one of the largest service industries in the world, and project management plays a vital role. Healthcare projects intend to improve access to healthcare, empower vulnerable groups during crises, and strengthen human resources [23]. The project management practices are conditions, characteristics, or variables that, if sustained and managed correctly, can result in significant success. In determining the various project management practices currently at play in the CCMR during the pandemic, the respondents were asked to respond to some questions during the interviews. The respondents had their say and shared the experiences on what they thought were the current management practices in terms of projects, programs, and portfolios management applied during the pandemic. R1 alluded that "...one of the most important practices is effective risk management at the highest level." In addition to that, R2 indicated that "monitoring of the epidemiological situation and periodic monitoring of all operational indicators" formed part of the management practices at play during the COVID-19 period. The responses by R2 agreed with R5 experiences, who said that "monitoring of standard implementations by regulators and the periodic evaluations" form part of the management practices exercised at the CCMR.

To establish the efficiency of the management practices at the CCMR, the respondents were tasked to respond to "Do you believe crisis management is effective in controlling the spread of COVID-19 or reacting to its effects on the population?" All the respondents were affirmative that crisis management has been very effective in curbing the spread of the virus. R5 responded by saying, "certainly, the Aseer Region has been proactive in implementing many of the initiatives that have come resulting in reduced cases and an increase in the absorptive capacity of the health facilities." R10 believes that the crisis management practices have been effective through the provision of guidance from the Room's leadership and the centralized decision-making approach adopted. The majority of the responses showed firm attainment of effectiveness and efficiency through crisis management of the COVID-19 pandemic in Aseer Region. Other responses received from some of the respondents are listed below.

*"It has certainly been very effective in controlling the spread of the epidemic because of policy follow up and coordination among stakeholders reflected in the curve of situations in the region (R16)."*

*"I believe that they are effective through the dissemination, application, and promotion of precautionary measures, whether recommendations or influential orders for the*

*application of divergence and control of the spread of the pandemic. However, there is still a lack of community awareness campaigns (R14)."*

*"Yes, crisis management is effective. Through the CCMR, facilitation and promotion of effective communication among different sectors (health, military, and services industry) have seen the suppression of the virus (R3)."*

*"It has been very effective in controlling the spread of the epidemic through careful implementation of guidance and close coordination between units and stakeholders (R17)."*

Based on the responses above it is evident that for implementation of new project guidelines within a given health situation, it is critical to have strategic and effective management practices. According to Njeri [23], project management practices are poised to have a positive impact on the success of a project. The inputs that are put into the process through the management practices are vital to ensure the delivery of the set objectives. In this case, the management of the CCMR is applying effective management practices in controlling the spread of the virus.

## New Management Practices

The experiences derived from the management of the COVID-19 pandemic have led to the introduction of new management practices. The Aseer Region is expected to experience the need for new management strategies regarding healthcare. The interviewees were asked to respond to whether the pandemic has changed the aspect of management within the healthcare sector. The majority of the responses were in the affirmative, indicating a shift to new management strategies based on the experience derived from the pandemic. Some of the responses have been listed.

*"...yes, the pandemic has changed the management approach not only in the health sector but also on the general level in terms of information-based decision making and not speculation or cognitive backgrounds (R2)."*

*"...yes, the epidemic has had a positive change in aspects of health management about administration and governance. Most of these changes are attention to risk assessment and better preparedness for health crises, decision making based on statistics and data collection, promotion of preventive aspects and public health, qualifying and training specialized cadre to face the crisis, making maximum use of modern technology for epidemiological investigation, and improved effectiveness of vertical and horizontal coordination (R4)."*

*"...yes, application of flexible working time and division of taskforce into groups, and adoption of remote working for staff who are most at risk (R13)."*

From the responses, it is evident that the pandemic has changed the management approach and way of working for a majority of people in the region. Every decision is made based on evidence with the aim of preventing further spread of the virus or having new infections.

New management practices have also been devised based on the experience of the pandemic and the anticipation of fundamental changes. The respondents identified some measures such as promotion of the concept of teamwork, use of modern technology, and remote working as the new practices across all the sectors. The Saudi Arabian Government has been active in ensuring digital transformation to support all the sectors of the economy to adapt to the new norms. Other notable new practices identified with the respondents included proactive professional media management of the crisis to combat rumors and raise awareness in the society, devising technical solutions to ensure optimal continuity of service such as having virtual clinics, and application of various hypotheses to measure performance and upgrade preparedness and response to any risks.

### **Thematic Category 3: The Risk Assessment Approach Adopted by the CCMR**

Governments and institutions are constantly being faced by an increasing number of crises. The crises may spread beyond national borders, thus triggering economic knock-on effects owing to the interconnected nature of the global economy [24]. The complexity of managing and controlling a pandemic entails the involvement of many actors that go beyond emergency services which demand effective risk assessment and coordination for a successful outcome. In relation to the risk assessment approaches adopted by the CCMR during this pandemic in Aseer Region, the interviewees were asked to respond to several questions regarding risk assessment methods and the contribution of the Room towards averting the risks caused by the global Virus.

In reference to the risk assessment methods used in the Crisis Management Room, the theory of a pathological spectrum was mentioned as the main strategy used to address the risks. The spectrum of pathological findings of the Coronavirus was key in addressing the risks of COVID-19. The pathological spectrum helps identify the COVID-19 pathophysiology, molecular pathology, diagnostics, and immunology with the aim of understanding the development of the disease and how it is spread [25]. In the CCMR, the spectrum has been key in the facilitation of scientific decision-making based on the facts of the pathogenesis of the disease. R14, in responding to the risk assessment methods question, pointed out that; *"...one of the most important methods used in the Room for risk assessment is the theory of pathological spectrum of the pandemic, with assumptions based on scientific studies to predict the numbers of potential cases by drawing epidemiological curves. This helps to determine the expected need and has helped make informed decisions on increasing the bed capacity in hospitals, intensive care units, and health quarries. The theory has also contributed to raising the capacity of the ICU beds from 470 to 920 in the region. A risk management team has also been established within the teams and units of the Room to assess potential risks and activate approved response plans."*

Risk assessment makes a critical contribution towards crisis management. In the region and across the world, individuals are in constant risk of contracting the virus. The risk assessment based on the established pathological spectrum goes a long way in informing the decisions of the (CCMR). In response to the global risks regarding international travel, the CCMR has made contributions that were notable to the interviewees. R16 argued that;

*"...the wise leadership of the Kingdom has implemented strict preventive and remedial protocols that have contributed to reducing the spread of the virus. Strict precautionary measures were applied to ensure that crowd flashpoints do not arise during the Hajj and Al Umra seasons as a global starting point. The Kingdom has applied strict measures to the Kingdom's border entry points, which have contributed to the control of the epidemic. It is from this application of the precautionary measures that Aseer Region has ensured all its terrestrial and airport entry points are monitored to prevent the entry of infected individuals."*

The CCMR in Aseer Region has been proactive in the implementation of the Government's measures to curb the emergence of new cases from outside the region. The control of movement has been effective in ensuring that the active cases are treated, and the chances of having new cases are reduced.

## Discussion

The efforts to build robust systems and project management structures are fundamental to avert the dangers caused by emergencies and crises that continue to ravage the world. The failure to detect the virus early enough to prompt preventive measures in many of the countries shows that building crisis management capacities deserves primary attention.

The CCMR in Aseer Region is a strategic measure that aims to address the Coronavirus pandemic as it continues to unfold. Its primary mandate is to control and avert the spread of the virus through providing a supervisory role to the Government directives in the region about containment measures and personal hygiene, for which the establishment of the CCMR in Aseer Region has spearheaded new developments in healthcare project management.

The CCMR management has focused on openness and transparency relating to its decision-making strategy and communication, where all decisions are based on scientific evidence and collected data. Moreover, management practice has also conformed to new measures informed by the experiences encountered in the management of the pandemic. The CCMR has opted for the adoption of modern technology in executing its duty. Other new management practices include effective horizontal and vertical coordination of health activities, strategic decision making, and teamwork.

Crisis management comprises phases, including preparedness before crisis, response to reduce damage, and feedback after the crisis. As a result, the CCMR is actively involved in sensitization of the society and creating awareness on the Coronavirus. The Room ensures that the community in Aseer implements the Government directives and has the knowledge to deal with any new cases and prevent the occurrence of other cases through personal hygiene and social distancing.

The involvement of the CCMR in risk assessment is evident, with a great deal of success. In response to the pandemic in the Aseer Region, the CCMR actively applies the response phase of crisis management. This involves detection of the virus, monitoring of the developments, selection of appropriate contingency plans (both medical and non-medical), coordination of responses, and application of standard procedures. For this activity to work, flexibility and application of adaptable capacities for responses are critical for achieving a more holistic and dynamic approach to risk assessment.

For future studies, it would be necessary to explore the levels of crisis preparedness both in planning scenarios and preparing for the unknown. The application of project management practices, especially risk assessment regarding risk knowledge among Government and private entities, needs to be determined to allow for early preparedness. It is recommended that a broader and shared view of risk, both at the local and national levels, through a multi-threat and multi-hazard approach be put in place to include new and emerging potential threats.

Moreover, risk assessment should be shared widely with appropriate limitations to emergency response stakeholders, such as health agencies, security and police, local emergency services, non-governmental organizations, volunteer organizations, critical infrastructure operators, media, and the public. A cooperative strategy should exist between different stakeholders and disciplines to allow a multi-sector response to future pandemics.

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