

Health Care Administrators' Data and Information Needs for Decision Making during the COVID-19 Pandemic

Ayman Makhdour Kalib Al-Jadaani¹, Fahd Abdulaziz Ali Al-Saedi¹, Saleh Mohammed Saleh Shami¹, Yasser Abdullah Mayoud Al-Jaid², Nabil Ibrahim Hamad Al-Othman³, Ibrahim Saeed Saad Al-Saedi⁴, Youssef Dakhil Dakhil Al Saadi⁵, Falah Saeed Falah Al Da'armi⁶, Nada Rashid Khalaf Al Balawi⁷, Mohammed Saad Mohammed Almotawa⁸, Muneeh Allah Matar Al-Mutairi⁹, Abdullah Mohammed Almutlaq¹⁰, Abdulaziz Thani Khalifa Al Shammari¹¹, Zahraa Musa Al Qafas¹², Zainab Ahmed Al Bakhit¹²

1 Health Services and Hospitals Management, Erada Complex and Mental Health - Erada Services (formerly Al-Amal Hospital), Makkah Al-Mukarramah, KSA

2 Health Services and Hospitals Management, King Fahd General Hospital in Jeddah, KSA

3 Health Services Management, Imam Abdulrahman Al-Faisal Hospital, Riyadh, KSA

4 Health Services and Hospitals Management, Madinah Health Cluster, Madinah Al-Munawwarah, KSA

5 Health Services and Hospitals Management, First Cluster, East Jeddah Hospital, Makkah-Jeddah, KSA

6 Health Services Hospitals Management, Maternity and Children Hospital in Bisha - Asir, KSA

7 Health Information Technician, King Fahd Specialist Hospital-Assistant for Centers Affairs, Tabuk Health Cluster, Tabuk, KSA

8 Health Administration, Riyadh Health Centers Scope, Third Riyadh Health Cluster, KSA

9 Hospital Management, Al-Ruwaidah Health Center, Al-Madinah Al-Munawwarah, KSA

10 Health Informatics, Supply Management at the Ministry of Health Branch in Riyadh Region, KSA

11 Health Administration Specialist, Maternity and Children's Hospital, Eastern Region Hafar Al Batin, KSA

12 Health Administration Technician, Maternity and Children's Hospital, Eastern Region Hafar Al Batin, KSA

Abstract

The COVID-19 pandemic has significantly transformed the landscape of health care administration, presenting unique challenges that have tested the resilience and adaptability of health care administrators. This article explores the critical data and information needs of health care administrators during the pandemic, emphasizing the role of data in guiding decision-making processes. As stewards of health care organizations, administrators faced unprecedented demands for timely and accurate information to manage patient care, resource allocation, and operational efficiency. The reliance on both internal data—such as patient admissions, staffing levels, and resource availability—and external data from public health agencies and research institutions became paramount in navigating the evolving crisis. The pandemic highlighted the multifaceted nature of data needs, which evolved from immediate operational concerns to long-term planning and recovery strategies. Administrators encountered significant challenges, including issues related to data quality, integration, and the rapid pace of change. The lack of standardized metrics and inconsistent reporting practices complicated effective decision-making, underscoring the necessity for robust data management systems. Furthermore, effective communication emerged as a critical component in ensuring that relevant data was shared promptly among stakeholders, fostering collaboration and alignment within health care organizations. The lessons learned during this crisis emphasize the importance of investing in data infrastructure, standardizing reporting protocols, and enhancing data literacy among health care administrators. By prioritizing these areas, health care organizations can improve their capacity for data-driven decision-making, ultimately leading to better

patient outcomes and more resilient health care systems. This article provides insights into the evolving data landscape for health care administrators during the COVID-19 pandemic and offers recommendations for future practices that can enhance the effectiveness of health care administration in the face of ongoing and future public health challenges.

Introduction

The COVID-19 pandemic has profoundly impacted health care systems worldwide, presenting unprecedented challenges that have tested the resilience and adaptability of health care administrators. As the stewards of health care organizations, administrators are responsible for making critical decisions that affect patient care, resource allocation, and overall operational efficiency. The pandemic has underscored the importance of data and information in guiding these decisions, revealing both the strengths and weaknesses of existing data management practices. This article explores the multifaceted data and information needs of health care administrators during the COVID-19 pandemic, examining how these needs evolved in response to the crisis and the implications for future health care administration.

The pandemic has not only highlighted the immediate data needs of health care administrators but has also illuminated the long-term implications of data management practices. The rapid spread of the virus necessitated swift decision-making, often based on incomplete or evolving data. Administrators were faced with the challenge of balancing the urgency of the situation with the need for accurate information. This duality of urgency and accuracy became a defining characteristic of health care administration during the pandemic, shaping the strategies employed by administrators to navigate the crisis.

As the pandemic unfolded, the landscape of health care administration transformed dramatically. The traditional roles of administrators expanded to encompass crisis management, strategic planning, and the implementation of emergency protocols. The ability to make informed decisions in such a rapidly changing environment became heavily reliant on access to accurate and timely data. This article aims to provide a comprehensive understanding of the data and information needs of health care administrators during the COVID-19 pandemic, exploring the complexities of data utilization and the lessons learned that can inform future practices in health care administration.

The Role of Health Care Administrators

Health care administrators play a pivotal role in the functioning of health care organizations. They are tasked with overseeing operations, managing finances, ensuring compliance with regulations, and facilitating communication among various stakeholders. In the context of a public health crisis like COVID-19, their responsibilities expand to include crisis management, strategic planning, and the implementation of emergency protocols. The ability to make informed decisions in such a rapidly changing environment is heavily reliant on access to accurate and timely data.

The role of health care administrators is multifaceted, encompassing a wide range of responsibilities that require a diverse skill set. Administrators must navigate the complexities of health care delivery, balancing the needs of patients, staff, and the organization as a whole. This requires not only a deep understanding of clinical operations but also a keen awareness of the broader health care landscape, including regulatory requirements, financial constraints, and community health needs.

During the pandemic, the role of health care administrators became even more critical as they were called upon to lead their organizations through uncharted territory. They had to make decisions that would impact not only the immediate response to the crisis but also the long-term sustainability of their organizations. This necessitated a shift in focus from traditional operational metrics to a more dynamic approach that prioritized adaptability and resilience.

In addition to their operational responsibilities, health care administrators also serve as key communicators within their organizations. They must ensure that information flows effectively between clinical staff, leadership, and external stakeholders. This requires strong interpersonal skills and the ability to convey complex information in a clear and concise manner. The pandemic highlighted the importance of effective communication in fostering collaboration and alignment among diverse teams, ultimately contributing to better patient outcomes.

Data as a Decision-Making Tool

Data serves as a critical tool for health care administrators, enabling them to assess situations, identify trends, and make evidence-based decisions. During the COVID-19 pandemic, administrators relied on a variety of data sources, including internal metrics such as patient admissions, staffing levels, and resource availability, as well as external data from public health agencies, research institutions, and other health care organizations. The integration of these data sources allowed administrators to develop a comprehensive understanding of the evolving situation and to respond effectively.

The reliance on data during the pandemic was not merely a matter of preference; it was a necessity. The rapidly changing nature of the virus and its impact on health care systems required administrators to make decisions based on the best available evidence. This often meant synthesizing information from multiple sources, including real-time data on infection rates, hospital capacity, and treatment protocols. The ability to analyze and interpret this data became a critical competency for health care administrators, as it directly influenced their decision-making processes.

Moreover, the pandemic underscored the importance of data transparency and accessibility. Administrators needed to ensure that relevant data was readily available to all stakeholders, including clinical staff, board members, and external partners. This required the implementation of data-sharing protocols and the development of user-friendly dashboards that could present complex information in an easily digestible format. By fostering a culture of data-driven decision-making, health care organizations could enhance their responsiveness to the challenges posed by the pandemic.

The integration of data analytics into decision-making processes also allowed administrators to identify patterns and trends that may not have been immediately apparent. For example, analyzing patient demographics and comorbidities could reveal insights into which populations were most at risk for severe outcomes from COVID-19. This information could then inform targeted interventions, such as outreach programs for high-risk groups or adjustments to resource allocation. By leveraging data analytics, health care administrators could not only respond to immediate challenges but also anticipate future needs and develop proactive strategies.

Internal Data Needs

The internal data needs of health care administrators during the pandemic were multifaceted. Administrators required real-time information on patient volumes, bed

occupancy rates, and the availability of critical resources such as personal protective equipment (PPE) and ventilators. This information was essential for making immediate operational decisions, such as reallocating staff, adjusting patient care protocols, and managing supply chains. The ability to track and analyze internal data allowed administrators to identify trends and anticipate future needs, enabling them to respond proactively to the challenges posed by the pandemic.

In addition to operational data, administrators also needed information related to workforce management. The pandemic placed immense strain on health care workers, leading to increased rates of burnout and turnover. Administrators required data on staff availability, morale, and well-being to implement strategies that would support their workforce during this challenging time. This included monitoring staff health, providing mental health resources, and ensuring adequate staffing levels to meet patient needs.

Furthermore, the need for internal data extended to financial management. Administrators had to closely monitor revenue streams, expenses, and funding sources to ensure the financial viability of their organizations during a time of unprecedented uncertainty. The ability to analyze financial data in conjunction with operational metrics allowed administrators to make informed decisions about budget allocations, staffing levels, and resource investments.

External Data Needs

External data sources played a crucial role in informing health care administrators' decision-making during the pandemic. Public health data, including infection rates, hospitalization trends, and vaccination statistics, provided administrators with insights into the broader epidemiological landscape. This information was vital for understanding the impact of COVID-19 on their communities and for making informed decisions about resource allocation and patient care strategies.

The need for accurate and timely external data became particularly evident as the pandemic progressed. Administrators faced challenges related to the quality and reliability of data from various sources. Inconsistent reporting practices, delays in data dissemination, and variations in data definitions created obstacles to effective decision-making. Administrators often found themselves navigating a complex web of information, requiring them to critically evaluate the sources and validity of the data they were using.

Moreover, the pandemic highlighted the importance of collaboration among health care organizations and public health agencies. Sharing data across systems and jurisdictions became essential for developing a comprehensive understanding of the pandemic's trajectory. Administrators had to establish partnerships with external stakeholders to facilitate data sharing and enhance the collective response to the crisis. This collaborative approach not only improved data access but also fostered a sense of shared responsibility among health care organizations.

Evolving Information Needs

As the pandemic unfolded, the information needs of health care administrators evolved. Initially focused on immediate operational concerns, administrators began to prioritize long-term planning and recovery strategies. This shift necessitated a broader understanding of data analytics and modeling, as administrators sought to forecast patient volumes, assess the impact of interventions, and plan for future surges in cases.

The importance of data-driven decision-making became increasingly apparent as administrators grappled with the uncertainty of the pandemic. The ability to analyze trends

and make predictions based on data allowed administrators to develop more effective strategies for managing resources and ensuring patient safety. This shift towards a more analytical approach to decision-making highlighted the need for enhanced data literacy among health care administrators, as well as the importance of investing in data analytics capabilities within health care organizations.

Additionally, the evolving nature of the pandemic required administrators to remain agile and adaptable. As new variants of the virus emerged and vaccination efforts progressed, the information needs of administrators continued to shift. This dynamic environment necessitated continuous monitoring of data trends and adjusting operational plans accordingly. Administrators had to be prepared to pivot their strategies in response to changing circumstances, underscoring the importance of flexibility in data management practices.

Challenges in Data Utilization

Despite the critical role of data in decision-making, health care administrators faced significant challenges in utilizing data effectively during the pandemic. One of the primary challenges was the issue of data quality. Inconsistent data reporting practices and variations in data definitions created confusion and hindered the ability of administrators to make informed decisions. The lack of standardized metrics made it difficult to compare data across different organizations and regions, complicating efforts to assess the overall impact of the pandemic.

Another challenge was the integration of data from multiple sources. Health care administrators often relied on a patchwork of data systems, which made it difficult to consolidate information and gain a comprehensive view of the situation. The lack of interoperability between different health information systems created barriers to data sharing and collaboration, limiting the ability of administrators to leverage collective insights. This fragmentation of data not only hampered decision-making but also increased the risk of miscommunication and errors in reporting.

Moreover, the rapid pace of change during the pandemic meant that data needs were constantly shifting. Administrators had to remain agile, adapting their strategies as new information emerged regarding the virus, treatment protocols, and vaccination efforts. This required continuous monitoring of data trends and adjusting operational plans accordingly. The dynamic nature of the pandemic underscored the necessity for health care organizations to develop flexible data management systems that could accommodate evolving information needs.

Additionally, the overwhelming volume of data generated during the pandemic posed its own set of challenges. Administrators were inundated with information from various sources, making it difficult to discern which data was most relevant to their decision-making processes. The sheer amount of data could lead to analysis paralysis, where the abundance of information hindered timely decision-making. To combat this, administrators needed to develop strategies for prioritizing data that aligned with their immediate operational goals and long-term planning objectives.

The Importance of Communication

Effective communication emerged as a critical component of data utilization during the pandemic. Health care administrators needed to ensure that relevant data was communicated clearly and promptly to all stakeholders, including clinical staff, board members, and external partners. The ability to translate complex data into actionable

insights was essential for fostering a shared understanding of the situation and aligning efforts across the organization.

Furthermore, transparent communication about data limitations and uncertainties was vital for maintaining trust among stakeholders. Administrators had to navigate the challenges of conveying the evolving nature of the pandemic while providing reassurance that decisions were being made based on the best available evidence. This necessitated a commitment to ongoing dialogue and collaboration, both within health care organizations and with external partners.

The role of communication extended beyond internal stakeholders; it also encompassed the broader community. Health care administrators had to engage with the public, providing clear and accurate information about the pandemic, vaccination efforts, and health resources. This required the development of communication strategies that were not only informative but also empathetic, addressing the concerns and fears of the community. By fostering open lines of communication, administrators could build trust and encourage public compliance with health guidelines.

Lessons Learned and Future Implications

The experiences of health care administrators during the COVID-19 pandemic have yielded valuable lessons that can inform future practices in health care administration. One of the key takeaways is the importance of investing in data infrastructure and analytics capabilities. Health care organizations must prioritize the development of robust data systems that facilitate real-time data sharing and integration. This investment will enhance the ability of administrators to access and utilize data effectively, ultimately improving decision-making processes.

Additionally, the pandemic highlighted the need for standardized data reporting protocols across health systems. Establishing common metrics and definitions will improve the quality and consistency of data, enabling better comparisons and assessments of health care outcomes. Standardization will also facilitate collaboration among health care organizations, allowing for a more coordinated response to future public health emergencies.

Training and education for health care administrators on data analytics and information management will be essential for empowering them to leverage data more effectively in their decision-making processes. By enhancing data literacy and analytical skills, administrators will be better equipped to navigate complex data landscapes and make informed decisions that positively impact patient care.

Moreover, the pandemic has underscored the importance of fostering a culture of data-driven decision-making within health care organizations. This involves not only providing access to data but also encouraging staff at all levels to engage with data in their daily work. By promoting data literacy across the organization, health care administrators can create an environment where data is viewed as a valuable asset that informs practice and drives improvement.

Conclusion

The COVID-19 pandemic has underscored the critical role of data and information in health care administration. As administrators faced unprecedented challenges, their ability to access, interpret, and utilize data became paramount for effective decision-making. The lessons learned during this crisis will inform the development of more resilient health care systems that are better equipped to respond to future public health emergencies. By

prioritizing data infrastructure, standardization, and education, health care administrators can enhance their capacity to make informed decisions that ultimately improve patient care and health outcomes. The ongoing evolution of data needs and the importance of effective communication will continue to shape the landscape of health care administration in the years to come.

References:

1. Wickramasekera et al. "Can electronic assessment tools improve the process of shared decision-making? A systematic review" *Health information management journal* (2020) doi:10.1177/1833358320954385
2. Ohannessian et al. "Global Telemedicine Implementation and Integration Within Health Systems to Fight the COVID-19 Pandemic: A Call to Action" *Jmir public health and surveillance* (2020) doi:10.2196/18810
3. "The Future of Healthcare Data Intelligence: Ethical Insights and Evolutionary Pathway" *Journal of medicine and healthcare* (2022) doi:10.47363/jmh/2022(4)252
4. Efverman and Axelsson "Observing the Implementation of Shared Decision-making in Routine Radiotherapy Cancer Nursing" *Cancer nursing* (2020) doi:10.1097/ncc.0000000000000830
5. Peyroteo et al. "Remote Monitoring Systems for Patients With Chronic Diseases in Primary Health Care: Systematic Review" *Jmir mhealth and uhealth* (2021) doi:10.2196/28285
6. Ejaz et al. "Knowledge and Data-Driven Framework for Designing a Computerized Physician Order Entry System" *Ieee access* (2022) doi:10.1109/access.2022.3167517
7. Aoun et al. "Why and how the work of Motor Neurone Disease Associations matters before and during bereavement: a consumer perspective" *Palliative care and social practice* (2021) doi:10.1177/26323524211009537
8. Aramrat et al. "Advancing multimorbidity management in primary care: a narrative review" *Primary health care research & development* (2022) doi:10.1017/s1463423622000238
9. Poppe et al. "Supportive needs of informal caregivers of people with amyotrophic lateral sclerosis in Switzerland: a qualitative study" *Palliative care and social practice* (2022) doi:10.1177/26323524221077700
10. Qureshi et al. "Deep learning-based ambient assisted living for self-management of cardiovascular conditions" *Neural computing and applications* (2021) doi:10.1007/s00521-020-05678-w
11. Petrides et al. "Pandemic Response in the Clinical Laboratory: The Utility of Interactive Dashboards" *Journal of pathology informatics* (2022) doi:10.1016/j.jpi.2022.100010
12. Jo et al. "The psychological impact of the coronavirus disease pandemic on hospital workers in Daegu, South Korea" *Comprehensive psychiatry* (2020) doi:10.1016/j.comppsy.2020.152213
13. Khan et al. "Prevalence and determinants of violence against health care in the metropolitan city of Peshawar: a cross sectional study" *Bmc public health* (2021) doi:10.1186/s12889-021-10243-8
14. Harshavardhan et al. "LSGDM with Biogeography-Based Optimization (BBO) Model for Healthcare Applications" *Journal of healthcare engineering* (2022) doi:10.1155/2022/2170839

15. Pournik "The Internet of Medical Things: Opportunities, Benefits, Challenges and Concerns" (2023) doi:10.3233/shti230809
16. Íslind et al. "Invisible Work Meets Visible Work: Infrastructuring from the Perspective of Patients and Healthcare Professionals" (2021) doi:10.24251/hicss.2021.431
17. Engstrom et al. "A Comparison of Leximancer Semi-automated Content Analysis to Manual Content Analysis: A Healthcare Exemplar Using Emotive Transcripts of COVID-19 Hospital Staff Interactive Webcasts" International journal of qualitative methods (2022) doi:10.1177/16094069221118993
18. Amri and Abed "The Data-Driven Future of Healthcare: A Review" (2023) doi:10.58496/mjbd/2023/010
19. Azzopardi-Muscat et al. "A call to strengthen data in response to COVID-19 and beyond" Journal of the american medical informatics association (2020) doi:10.1093/jamia/ocaa308
20. Íslind and Hult "Data-Driven Healthcare: Critically Examining the Role of Self-care and Data-Driven Decision-Making in Diabetes Management" Complex systems informatics and modeling quarterly (2022) doi:10.7250/csimq.2022-33.03
21. Dwivedi et al. "Potential of Internet of Medical Things (IoMT) applications in building a smart healthcare system: A systematic review" Journal of oral biology and craniofacial research (2022) doi:10.1016/j.jobcr.2021.11.010
22. Ríos-Zertuche et al. "Implementing electronic decision-support tools to strengthen healthcare network data-driven decision-making" Archives of public health (2020) doi:10.1186/s13690-020-00413-2
23. Garcia et al. "Health Information Systems for Older Persons in Select Government Tertiary Hospitals and Health Centers in the Philippines: Cross-sectional Study" Journal of medical internet research (2022) doi:10.2196/29541
24. Verdonck et al. "Osteoporosis care through an Integrated, People-Centred Health Services framework lens: a hybrid qualitative analysis of international patient experiences" Bmj open (2023) doi:10.1136/bmjopen-2023-072031