

Ramaiah Webinar on Prevention and Management of Covid-19 Hospital Surge

The novel coronavirus labelled 'Severe Acute Respiratory Syndrome Coronavirus 2' (SARS-CoV-2) and causing 'Coronavirus Disease 2019' (Covid-19), has spread to more than 200 countries and territories worldwide. The spread has been accompanied by surge in cases, sudden growth in demand for medical facilities, and disruptions in contact and supply chains resulting in breakdown of regular health care operations. The massive disruption to health systems across the globe demands a multi-jurisdictional and multi-functional response and restoration plan. It has been recognized that without adequate emergency plans, local healthcare services can quickly get exhausted by the effort to deliver mass critical care (Aziz et al., 2020).

As the epicenters of the health care system, the hospitals play an integral role in pandemic response by delivering critical care. They have had to deal with issues such as scarcity of ventilators and personnel, the shortage of other facilities and supplies — including, though not limited to, bed, personal protective equipment, biomedical and diagnostic equipment, consumables such as drugs and medical supplies, single-use, test-related and priority devices, and non-clinical resources. These issues have impacted the morbidity and mortality of COVID-19 cases significantly and demand effective management of multidisciplinary, multi-level healthcare workers and resources (Carenzo et al., 2020) for delivering timely care.

Managing the Hospital Surge

According to Merriam-Webster, surge has been defined as “to rise suddenly to an excessive or abnormal value” (‘Merriam-Webster’, n.d.). In the health sector, surge capacity conceptualization has underpinnings in capacity planning during emergencies created by disasters and pandemics. As such, it has been defined generally as the “ability of obtaining additional resources when needed during an emergency” and more specifically as the “healthcare systems’ ability to rapidly expand beyond normal services to meet the increased demand for qualified personnel, medical care, and public health in the event of bioterrorism or other large-scale public health emergencies or disasters”(Kaji et al., 2006, p. 1157). The building blocks of planning for surge capacity are considered to be the four ‘S’s: Staff, Supply, Space and the resulting Structure or System (Barbisch & Koenig, 2006).

The planning for surge requires redefining priorities of the regular times to that of population-level care and expanding the ambit of planning to include systemic requirements. The pursuit of efficiency and cost-effectiveness during regular times has resulted in facilities to almost always run at maximum capacity, hindering quick responses to demand surge (Schultz & Koenig, 2006). Thus, the surge management during a pandemic should involve a paradigmatic shift in the management principles. Achieving this would involve innovative conceptualization, operationalization, and ready adaptation.

The Need for Systemic and Systematic Approaches

The surge capacity literature indicates the imperativeness of the system approach in surge response. The key for successfully integrating the building blocks of surge capacity, namely: the staff, supply and space and the structure is the systems approach (Barbisch & Koenig, 2006). The elusive nature of the Covid-19 pandemic demands systematic surge planning that consider all possible dimensions of a surge event. The interventions must also be systemic to include not only the internal but also external factors such as how the hospitals are placed in the overall pandemic management strategy of the country (World Health Organization, 2020). In other words, traditional and linear models of planning and management need to be replaced with systematic and systemic methods. We employ a systemic map to systematically conceptualize and present the domain of managing hospital surge.

Systemic Map for Preventing and Managing Covid-19 Hospital Surge

Managing*	Health Worker **	Resource ***	Care	Outcome	
				Stage	Covid-19
Planning	Medical	Bed	In-Situ	Prevention	Prospect
Organizing	Generalist	Equipment	Virtual	Treatment	Suspect
Deploying	Specialist	Personal protection	In-Person	Recovery	Mild
Directing	Nurse	Diagnostic	Out-Patient	Transfer	Moderate
Controlling	Paramedic	Biomedical	Virtual	Discharge	Severe
Evaluating	Nursing Associate	Consumable	In-Person		Critical
	Medical Assistant	Drug	In-Patient		Deceased
	Ambulance Worker	Medical Supply	Non-ICU****		
		Device	ICU		
		Priority	ICU with Ventilator		
		Single Use	End-of-Life		
		Test-Related			
		Non-Clinical			
		Information System			

* Based on Longest, B.B., Rakich, J.S. & Darr, K. (2000) Managing Health Services Systems and Organisations, Health Professions Press, Baltimore, MD

** International classification of health workers based on the International Standard Classification of Occupations (ISCO, 2008 revision)

*** World Health Organization - List of Priority Medical Devices for COVID-19 Case Management

**** ICU - Intensive Care Unit

Figure 1: Systemic Map for Preventing and Managing Covid-19 Hospital Surge

The systemic map has been illustrated in Figure 1. It is constituted by a universal management dimension, dimensions for the three surge planning building blocks and the outcome dimensions. The objective of preventing and managing Covid-19 hospital surge is to assure effective and efficient care of all cases, namely: prospects, suspects, mild, moderate, severe, critical, and deceased. It entails managing all the stages of care, namely: prevention, treatment, recovery, transfer, and discharge. The combinations of these are the outcomes shown in the last two columns of the framework.

The care for assuring these outcomes may be delivered in-situ by the hospital at the recipient's location, as an out-patient in a hospital, or as an in-patient. The in-situ and out-patient care may be delivered virtually, in-person, or a combination of the two. The in-patient care may be in a non-intensive care unit (ICU), ICU, ICU with ventilator, or for end-of-life. The types of care are listed in the third column from the right.

The health workers that deliver the care are medical generalists and specialists, nurses, paramedics, nursing associates, medical assistants, and ambulance workers. They are listed in the second column from the left.

The resources required by the health workers to deliver the care are listed in the third column from the left. They include beds, equipment (personal protection, diagnostic, medical), consumables (drugs and medical supplies), devices (priority, single-use, test-related), and non-clinical resources like information systems.

The successful prevention and management of Covid-19 hospital surge will require managing the health workers, the resources, the types of care, and the stages of care for the cases. It entails managing 19,600 potential pathways encapsulated in the five right columns in the figure. Three illustrative pathways are: (a) managing nurse health worker and consumable drug resources for delivering in-patient non-ICU care for timely treatment of severe Covid-19 case, (b) managing paramedic health worker and bed resource for delivering in-situ in-person care for treatment of suspect Covid-19 case, and (c) managing medical-generalist health worker and non-clinical information system resource for delivering out-patient virtual care for timely recovery of moderate Covid-19 case. A hospital's success will be a function of how it plans, organizes, deploys, directs, controls, and evaluates these pathways.

The Ramaiah Webinar on Covid-19 Hospital Surge

Experts predict resurfacing of Covid-19 infection waves in the upcoming months and warn continued disruption of health systems across the globe. It is imperative to learn from the early phases of management of the surge to prevent them in the future. It is also important to document and formalize the lessons for future epidemics and pandemics. While research documents the anecdotal experiences from across the globe, it would be insightful to track them using a systemic framework.

The Ramaiah Webinar on Covid-19 Hospital Surge is an effort in this direction. It will make use of the systemic map (Figure 1) to systematically map the experience of the healthcare workers and managers from the US and India in handling of the hospital surge during the pandemic. The webinar will be a structured free-flowing discussion among the panelists addressing the following issues based on the framework:

Issues

- What is the order of priority among the various components of health care workers(staff), resources(supply), and care (spaces)?
- Which are the stages to be in focus, and how do they interact with the different case types?
- What combinations among the elements of staff, supply, space require attention?
- What are the systemic drivers and barriers in managing the surge?

Date & Time: Saturday, November 21, 2020 10:00 AM to 12:00 PM Indian Standard Time/
Friday, November 20, 2020 8:30 PM to 10:30 PM Pacific Standard Time

Facilitator: Dr Arkalgud Ramaprasad, Director, Ramaiah Public Policy Center; Professor Emeritus, University of Illinois at Chicago, USA

Coordinators: Dr. Anupama Sanjeev, Research Fellow, Ramaiah Public Policy Center
Ms. Sarah Shabbir, Research Associate, Ramaiah Public Policy Center
Mr. Nibras K.Thodika, Research Associate, Ramaiah Public Policy Center

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List of Panellists

Sl.No	Name	Affiliation
1.	Dr Charulata Ramaprasad	Kaiser Permanente, San Jose, USA
2.	Dr David Miller	Kaiser Permanente, San Rafael, USA
3.	Dr Harish Krishnamachar	Ramaiah Medical College and Hospitals, Bengaluru, India
4.	Dr Medha Rao	Ramaiah Medical College and Hospitals, Bengaluru, India
5.	Dr B S Nanda Kumar	Ramaiah Medical College, Bengaluru, India
6.	Dr Naresh Shetty	Ramaiah Memorial Hospital, Bengaluru, India
7.	Dr Ravi Waldron	Kaiser Permanente, San Jose, USA
8.	Dr Rooparani K	Ramaiah Medical College and Hospitals, Bengaluru, India
9.	Dr Sudheesh Kannan	Bangalore Medical College and Research Institute, and Victoria Hospital, Bengaluru, India
10	Dr Tejesh CA	Ramaiah Medical College and Hospitals, Bengaluru, India