

Epidemic preparedness for COVID-19: A major challenge!

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ABSTRACT

Epidemic outbreaks and biological disasters pose serious challenges to the country due to enormous population and weak public health system; to combat the same, we need epidemic preparedness. The steps of epidemic preparedness embrace and incorporate to anticipate, prevent, prepare, detect, and respond. The four stages of the present epidemic COVID-19 have been described. The requirement of proper coordination among the epidemiologist, clinician, laboratory personnel, and health educator is sum and substance of it. Levels for epidemic preparedness inculcate preparation at four levels including central, state, local, and health facility. The impact of epidemic has adverse health, social, as well as economic implications.

Keywords: COVID-19, epidemic preparedness, impact, steps

INTRODUCTION

Archives from the past illustrate several examples where epidemic outbreaks turned into a biological disaster.^[1] Such biological disasters can result from the accidental or deliberate release of harmful microorganisms. With the advent of bioterrorism, it has been realized that those biological agents can also further used as weapons of mass destruction.^[2] Moreover, due to globalization, these disasters can spread at a faster rate than anticipated. The spread of coronavirus, i.e., COVID-19, is one such example of a biological disaster that is testing the capacity and preparedness of the health system of several countries. The World Health Organization (WHO) has

declared COVID-19 as a Public Health Emergency of International Concern.^[3-5]

The spread of COVID-19 within India in the past few weeks has posed severe challenges for the health system throughout the country. These challenges can further also get magnified due to the enormous population and weak public health system. Thus, to reduce the harmful consequences of such an emergency, a robust epidemic preparedness is required national, regional, and local levels [Figure 1].

STEPS OF EPIDEMIC PREPAREDNESS^[6,7]

Anticipate

A very first stage of response to any disaster is preconception, as emergence not to be predicted, but it should be anticipated. Anticipation enables us to

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How to cite this article: Gogia P, Melwani V, Melwani S, Gogia R. Epidemic preparedness for COVID-19: A major challenge! Digit Med 2020;6:9-12.

Submitted: 25 Apr 2020

Revised: 27-Apr-2020

Accepted: 08-July-2020

Published: 26-Aug-2020

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Access this article online

Quick Response Code



Website:

www.digitmedicine.com

DOI:

10.4103/digm.digm_11_20

focus on the most likely threats that might result in the epidemic, and it encompasses forecasting the most likely disease to emerge. At this stage, it is crucial to define case definition and quickly identify sources and modes of transmission to guide the development of a preparedness plan. Preparedness plans are usually developed based upon the existing knowledge, lessons learned from the experience, or from the mistakes and strategies adopted by other countries to respond to the emerging epidemic.

Prevent

The International Health Regulations (2005) or IHR (2005) provides an international law that helps countries to collaborate and work together to save lives and livelihoods caused by the global spread of diseases and other health risks. The IHR (2005) aims to prevent, protect against, control, and respond to the global spread of disease while avoiding unnecessary interference with international traffic and trade.^[8]

- Public health measures to prevent the spread of coronavirus that need to get implemented include
- Creating awareness about the disease using appropriate communication techniques and media platform
- Frequent handwashing and hand hygiene
- Social/physical distancing to reduce human-to-human transmission
- Isolation of patients and their contact
- Quarantine of healthy caregivers
- Restriction of mobility with the help of nationwide lockdown
- Use of personal protective equipment (PPE) to prevent and reduce the transmission among health-care professionals.

As there is no vaccine or treatment available for COVID-19, a Research and Development (R and D) Blueprint for action to prevent epidemics at global levels has been developed by the WHO that allows the rapid

activation of R and D activities during epidemics. It aims to fast-track the availability of useful diagnostic and screening tests, vaccines, and medicines that should get used to save lives and avert a large-scale crisis.

Prepare

International funding and attention are required to enable the development of adequate resources, including human capacity, skills, adequate funding, and medical tools such as diagnostic kits and treatment modalities. It is essential to address the availability of improved and essential diagnostic tools for early detection and diagnosis and thereby, management of the cases as well as carriers.

Detect

Optimally functioning surveillance system is crucial during this step (including serological and microbial surveillance) as regular case finding using both active and passive surveillance is the breaking point for stopping contamination. Passive surveillance provides the baseline details of the cases, but still, the data may remain incomplete. Thus, active surveillance through contact tracing must be an ongoing process to control and then eliminate or eradicate such contagious and fatal disease. Moreover, multisectoral collaboration (partnership with

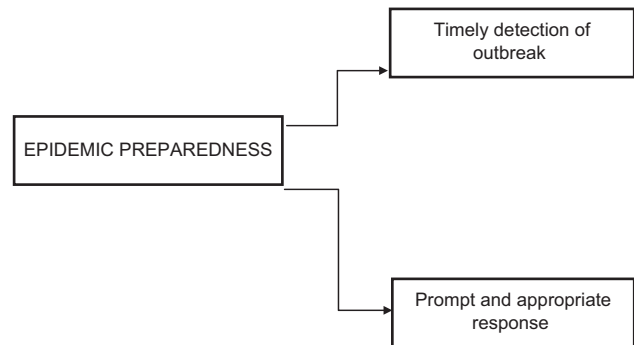


Figure 1: Epidemic preparedness

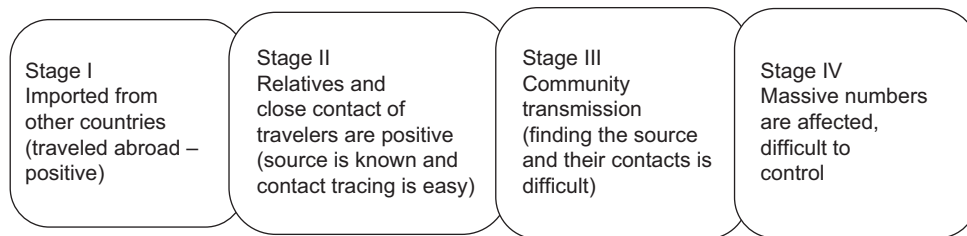


Figure 2: Stages of COVID 19

other sectors such as technology, education, transport any many more) and appropriate use of digital and information technology are essential to track suspected and confirmed cases. Furthermore, necessary measures should be taken to ensure protection of health-care providers and other frontline workers dealing with the outbreak.

Respond

- a. Comply with the rules of IHR to arrest the spread of infection across the border
- b. Training of doctors and other health-care staff: Need for health-care workers to be familiar with the emerging epidemic and its management framework. Formation of the rapid response team to manage patients as well as their contacts
- c. Building Public Health Capacity-Development of separate buildings for isolation of patients, adequate supply of ventilators, PPE kits, investigations, and emergency drugs
- d. Following the guidelines for handling, treatment, and disposal of waste generated during treatment/diagnosis/quarantine of COVID-19 patients
- e. Proper disposal of dead bodies using standard precautions, followed by terminal disinfection
- f. Dissemination of evidence-based information and establishing effective communication. Developing a health literacy action plan to respond to the health needs of a diverse population
- g. Evaluation – an epidemic management would not be complete without an evaluation to identify

what went right and wrong before and during the outbreak.

Stages of COVID-19 – the ICMR has described four stages of COVID-19 epidemic based upon its transmission.^[9] These stages are depicted in Figure 2.

Epidemic preparedness is a multidimensional task, thus coordinating authorities during epidemic preparedness should include stakeholders from various sectors [Figure 3]. Figure 4 depicts levels of epidemic preparedness which must be ensured at central, state, local and health facility level [Figure 4].

COVID-19 epidemic can affect multiple dimensions such as health, social, and economic dimensions.^[10-12] Figure 5

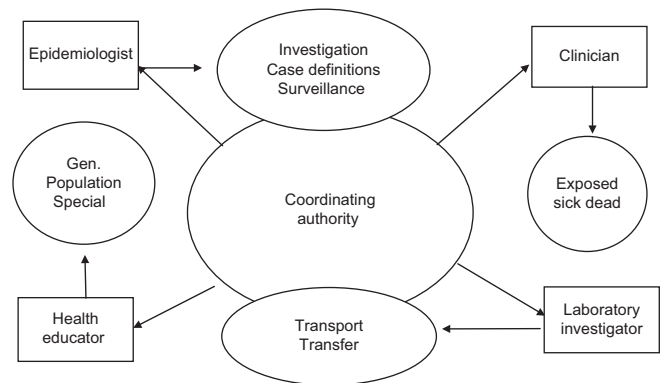


Figure 3: Coordinating authorities during epidemic preparedness

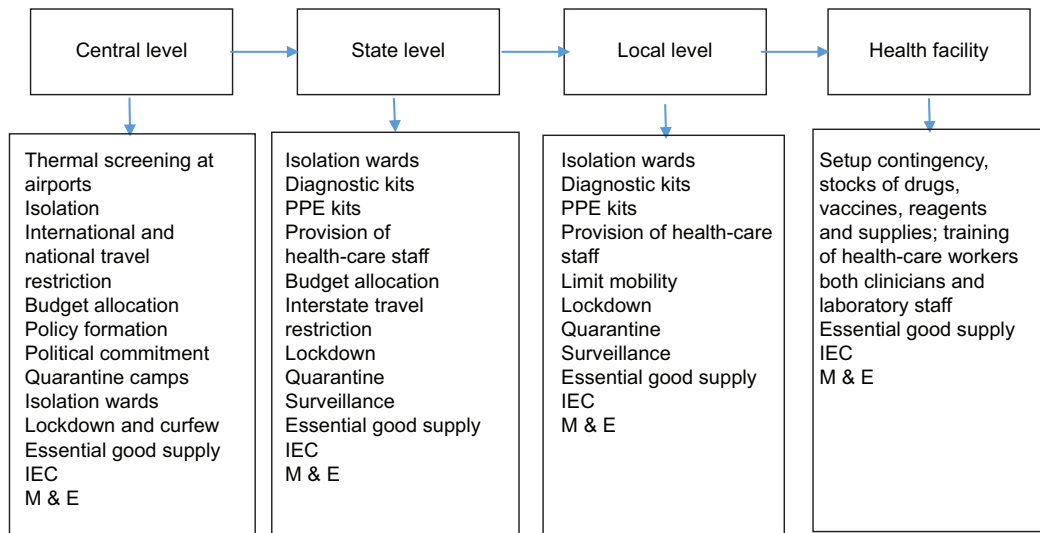


Figure 4: Levels for epidemic preparedness

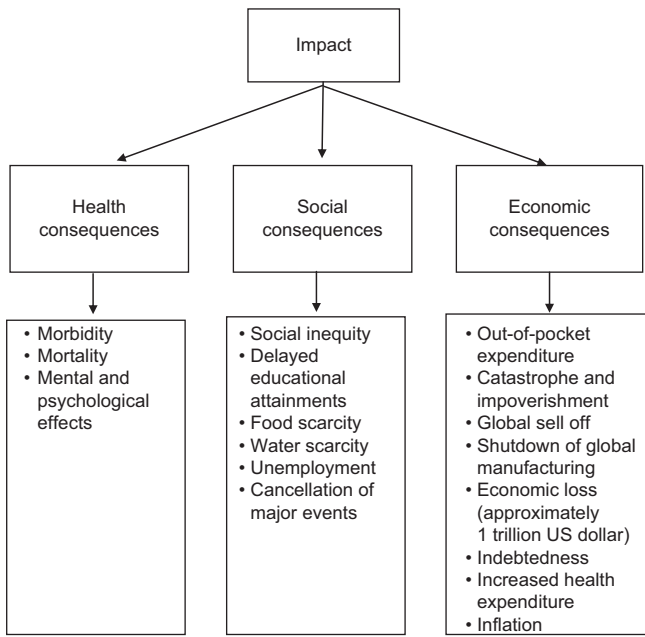


Figure 5: Impact of COVID 19 epidemic

illustrates impact of COVID-19 epidemic on various dimensions.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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