

## Chapter 12

# Mobile Technologies in Disaster Healthcare: Technology and Operational Aspects

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### ABSTRACT

*The increasing penetration of smartphones and their ability to host mobile technologies have shown valuable outcomes in disaster management; albeit, their application in disaster medicine remains limited. In this chapter, the authors explore the role of mobile technologies for clinical applications and communication and information exchange during disasters. The chapter synthesizes the literature on disaster healthcare and mobile technologies before, during, and after disasters discusses technological and operational aspects. They conclude by discussing limitations in the field and prospects for the future.*

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## **1. INTRODUCTION**

Disasters are an inseparable part of human life disrupting the functioning of a community or a society by causing widespread human, material, economic, or environmental losses. According to the data from EM-DAT (Centre for Research on the Epidemiology of Disasters, n.d.), the numbers, severity and complexity (damage to life and property) of disasters have grown exponentially over recent decades. In 2019, 440 natural disasters were identified: these caused 24,117 deaths and affected a further 96.5 million people.

This chapter deals primarily with the human aspects of disasters and with the issues associated with the recent development and the role of mobile technologies in improving the delivery of disaster healthcare.

The chapter first describes the nature and types of disasters and introduces the concept of the disaster management cycle which provides a useful framework to illustrate the role of mobile and other e-health technologies. It proceeds by outlining the key aspects of healthcare needs in disasters and then describes in detail the current roles of mobile technologies in improving clinical care and information sharing in such events. The chapter ends with a look at the current limitations and future possibilities.

## **2. DISASTERS: NATURE, TYPES, AND LIFECYCLE**

A disaster is a catastrophic disruption of the functioning of a community or a society overwhelming its capacity to respond.

Disasters can be natural or man-made. Environmental disasters, typified by earthquakes, volcanic eruptions, floods etc., are often short term in duration but they can cause massive destruction and loss of life leading to long-term human, material, economic and/or environmental consequences. Other catastrophes such as wars, terrorism, and pandemics are human centred in origin and frequently extend over a longer time scale than a point event but they parallel environmental disasters in their extended impact on individuals and societies. Climate change can be seen as an example of a potential disaster which has both natural and human sources.

The effects of all disaster types, especially those with a human origin, are readily magnified by globalisation, particularly by trade and travel, as is regrettably clear from epidemics such as Ebola, Zika, and the on-going and devastating COVID-19 pandemic.

Whether natural or man-made, a disaster is conveniently characterised by four phases that comprise its lifecycle: mitigation, preparedness, response and recovery (Baldini, Braun, Hess, Oliveri, & Seuschek, 2009). The first phase, mitigation, is concerned with preventing or minimising the negative impacts of disasters. The preparedness phase focuses on planning and preparing for possible disaster occurrence. The response phase, which often receives more attention than other phases, refers to the activities conducted immediately after the occurrence of the disaster to save lives and deal with damages. The fourth stage is the recovery stage which aims at restoring pre-disaster situations or improving them (Center for Disaster Philanthropy, n.d.).

These four phases are often referred to as the Disaster Management Cycle (DMC).

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