

Preface

On September 18, 2014, the World Health Organization (WHO) reported that the natural hazard ebola epidemic affecting Liberia, Sierra Leone, and Guinea in West Africa had caused 2630 deaths from more than 5357 persons infected by the ebola virus. By July 26, 2015, close to 2 years after the outbreak, at least 27,748 people had been infected with more than 11,279 dead (~40 % mortality rate). That a hazard can tear at the very fabric of societies was evident in West Africa. Many citizens did not go to work for fear of becoming infected with the ebola virus. This caused a slowing or stoppage of commerce and industrial output, disruptions in transport (e.g., bus and taxi service), and a closure of border crossings, airports, and seaports to traffic from countries where the ebola epidemic was not yet controlled in order to prevent entry of citizens that could be infected with the virus that takes 2–21 days to incubate. With no new cases after 21 days, the epidemic can be considered over. At the beginning of March 2015, no new cases had been reported in Liberia, and after a 42-day countdown, Liberia was declared ebola-free. In October 2015, Guinea began the 42-day countdown to being declared free of the disease. However, in November 2015, three new cases of ebola were diagnosed, and health professionals are working to find their source. By the end of 2015, West Africa was declared free of the disease. Other examples of the impacts of twenty-first-century hazards on societies' normal day-to-day activities and what we learned from each disaster that can help us to mitigate the effects of future like events are cited in this book (e.g., in Haiti [earthquake], Japan [tsunami, radiation from damaged nuclear power facility], Indonesia [tsunami], Australia [drought, wildfires], China [flooding, heavy metal health problems], India [flooding], Iceland [volcanic ash eruptions], Europe, [heat waves, flooding], and hazards in other countries). Table 1.1 gives examples of natural and anthropogenic-intensified hazards and the deaths they caused in various parts of the world since the beginning of the twenty-first century to 2015 [1].

Each year sees natural and anthropogenic hazards and secondary events triggered by them, or combinations thereof, threaten, sicken, injure, and kill people globally and damage and destroy buildings and infrastructure. Some are hazards that can last for a year or longer (e.g., drought, epidemics/pandemics), some are instantaneous or last for short periods of time (e.g., earthquakes, tsunamis,

mudslides), and some may last for days, weeks, or months (e.g., floods, heat waves, volcanic eruptions) or recur at somewhat regular intervals (floods). Still others are continuous health threats in given climates such as mosquito-borne malaria, dengue fever, and Zika that have no preventive vaccines and some diseases that have preventive vaccines that are not applied to all (e.g., measles, polio) because of religious belief, coercion by religious zealots, or published misinformation. This endangers the health of the general population as indicated by the measles outbreak in the United States in 2015. Some settlements that were not thought to be sites vulnerable to a hazard when originally established are at risk today. This is because of inadequate land-use planning at the time because planners did not have the benefit of the knowledge about hazards and conditions that favor them that we have today (e.g., floods, pollution, subsidence). In addition, increasing global populations and population density, plus global warming/climate change, were not major actors that affected hazard risk and land-use planning until the second half of the twentieth century.

As the knowledge bases for different natural and anthropogenic hazards have grown over time after analysis of each new event that occurs, so has our ability to mitigate their impacts on society. Hazard mitigation can be achieved in some cases by using prediction and protection methods coupled to early warning systems (e.g., dams and levees for floods), by prevention in other cases with technological advances (e.g., improved building codes and materials, pollutant capture and control systems), by up-to-date land-use planning and preparedness, and by other technological, political, social, and economic means. Control or elimination of diseases and epidemics that may develop can be treated by biotechnical advances in medications and vaccines and by protocols to deal with them. These are discussed in the text that follows.

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