The comprehensive study of disasters requires a multidisciplinary perspective. While both the methods and the object of inquiry may have disciplinary overlap, relevant expertise and uses of these methods vary across disciplines. In this chapter we first discuss the disciplinary perspectives that guide this work and on which we build our inference. Second, we introduce and summarize the dataset that was collected and analyzed, forming the backbone of this book.

The Study of Disasters Is Multidisciplinary

Perspectives from several disciplines, including cultural anthropology, sociology, psychology, epidemiology, architecture, engineering, and risk assessment, inform this book. We build on insights from cultural anthropology that has effectively used ethnography as a method to understand human societies and individuals embedded within them. In-depth interviews and participant observation have proven to be useful ethnographic tools to understand the individual experience of a disaster and the role of culture in shaping that experience. Sociology has long aimed to understand the experience and different reactions of groups affected by disasters. For example, after a fire at the Hamilton Distributing Company and Ephrata Paint Store in Ephrata, Pennsylvania, Fischer et al. [1] studied evacuation behavior of residents living near the hazard. The study found that evacuation behavior was linked to the type of information (i.e., clarity and frequency of message, and source of information) and the composition of household members at risk (i.e., presence of children) [1, 2].

We also draw on insight from several health disciplines that have studied the physical and mental health consequences of these events. Psychology uses diagnostic interviews to assess the mental health consequences of disasters, particularly among those who are immediate victims to or participants in some aspects of the pre- or post-disaster process. For example, after the World Trade Center disaster in
New York City in 2001, Gross [3] measured posttraumatic stress disorder and other psychological consequences among World Trade Center clean-up and recovery workers. This research demonstrates the existence of far-reaching health effects of disasters and helps to identify population needs after a disaster. Epidemiologists have employed quantitative studies to measure the consequences of disasters on a defined population that may or may not have been directly affected by the immediate disaster. These studies survey a community at either a single time point or over time. As an example of cross-sectional studies, epidemiologists have identified the prevalence of major depression and posttraumatic stress disorder among the general population after the Madrid train bombings on March 11, 2004 [4]. Longitudinal data, such as a four-wave panel study of families affected by major flooding and mudslides in Mexico in 1999, offer a glimpse at long-term consequences of disasters and patterns of recovery [5].

We are also informed by the emphasis on technical approaches and structural features that are the hallmark of other fields of practice and research concerned with disasters. Engineering, for example, uses surveying of physical structures to assess the degree of architectural stability of buildings and the extent to which structures are vulnerable to the effects of disasters. Architects have studied the design flaws and functionality that may permit a hazard to progress to a disaster. Ultimately, we also build on insights from the field of risk assessment, which has traditionally provided theories of probabilities of hazards and loss. For example, Yue et al. [6] have created models to determine where and at what intensity Aeolian sand disasters will occur in northern China. Risk assessment has been invaluable to our understanding of “what hazard events may occur,” “what is the probability of each event,” and finally, “what is the likely loss created by each event” [7, p. 59].

An Empirical Dataset to Extend the Contextual Study of Disasters

Building on, and borrowing from, these diverse disciplinary perspectives, we aimed to extend how we think about disasters and their consequences through an empirical approach, founded on a database that spans time and place. We are motivated by the observation that much of the disaster research to date has focused either on specific disaster outcomes (such as mental health or economic damage) or on how to conceptualize the factors that affect the severity of common disaster types (such as, for example, architectural enquiry into how buildings may withstand earthquakes). Our intent then was to adopt and borrow from many of the aforementioned disciplinary approaches and their underlying theoretical frameworks to ask ourselves how we can better understand the factors that drive population health after a disaster. First, we set out to identify the vulnerabilities and capacities that may intersect with a hazard to produce health outcomes after disasters, and describe how these vulnerabilities and capacities interact with stressors and protectors. Second we identify a model of population behavior after these events.
Central to our work is an empirical dataset of 339 disasters, which cover different types of disasters over time and place. We constructed our database from a comprehensive list of disasters that took place between 1950 and 2005 and that met at least one of the four criteria for a disaster, as defined by the Centre for Research on the Epidemiology of Disasters (CRED) and the IFRC: (1) at least 10 killed, (2) at least 100 affected, (3) declaration of a state of emergency, or (4) appeal for international assistance. Three primary categories of disasters were considered: natural, technological, and human-made. Natural and technological disasters were sampled from comprehensive lists of disasters globally compiled by the CRED. In an effort to compile an exhaustive human-made disaster list, we used comprehensive lists of all terrorist (broadly defined) attacks created by the Memorial Institute for the Prevention of Terrorism (MIPT). The MIPT’s lists integrate information from the RAND Terrorism Chronology and RAND-MIPT Terrorism incident Databases, the Terrorism Indictment Database, and DFI International’s Research on Terrorist Organizations. We cross-checked the MIPT lists with several other databases to ensure that a comprehensive list of terrorist attacks was included. Finally, we compiled several databases of the human-made disasters that do not fall under the terrorism category (e.g., wars and ethnic conflict) to create the final pool of disasters for this category.

Using this comprehensive sampling frame, we randomly selected a subset of disasters for each category (natural, technological, and human-made) for each of two strata, time period and geographic region. We stratified disasters into three time periods – 1950–1970, 1971–1990, and 1991–2005. Eight geographic regions were identified: North America (the USA and Canada), South and Central America (including Mexico), Caribbean (including Puerto Rico), Africa, Western Europe, Asia, Eastern Europe (including Russia), and Oceania. Thus, 72 unique combinations of disaster type, time period, and place were generated. A total of five disasters were selected for each of these 72 combinations to create the final dataset that could include 360 disasters. There were fewer than five disasters in some of the cells, hence the final total of disasters reviewed was 339 (Diagram 2.1, Table 2.1).
For each of the disasters, we collected information on the characteristics of the instigating hazard, such as type of hazard, magnitude, and duration. We traced the local and international response to the disaster by examining records of material and economic assistance, rescue workers, medical aid (including supplies, medicines, health care professionals, and refugee camps), and government and NGO actions. We also conducted an extensive review of relevant academic research studies, governmental reports, and nonprofit emergency response organizations (e.g., Red Cross) reports to obtain information on the short- and long-term outcomes of the disaster, including economic damage as well as injury, mortality, disease, displacement, mental health effects, and other related factors. We turned to qualitative sources (personal accounts, media reports, and government reports) to better capture the individual, local, national, and international reaction, response, and recovery from the disaster.

In addition to the disaster and its aftermath, we gathered information on the regional and local context. Statistical data at the national and regional level, including demographic information such as urban versus rural distribution, population density, literacy, and linguistic groups in the region, were compiled, along with economic, political, and historical characteristics of the region. Our objective was to synthesize descriptive historical and current information for the affected region to best understand the political, economic, and social institutions governing the affected population contemporaneous with the disaster.

Our Contribution to the Study of Disasters

Using our multidisciplinary perspective and empirical dataset, we aim to contribute to, as well as further, the current discussion on etiology and consequences of disasters. In Part 2, we explore the influence of various contextual factors – which, as later discussed, we consider to be classified as vulnerabilities, capacities, intermittent
stressors, or intermittent protectors – on hazards and how they intersect to produce particular disasters. In Part 3, we begin a dialog about population behaviors after a disaster by articulating stages of such behavior. In this discussion we take into account the influence of underlying vulnerabilities and capacities as well as global variation driven by cross-national contextual differences that extend beyond these categories.

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