Chapter 3 – Research Methods and the Practice of Emergency Management

School of Criminology and Justice Studies
University of Massachusetts Lowell
Chapter Objectives

- Discuss the relevance of disaster research to the practice of emergency management and the benefits of having a basic understanding of research methods and findings.
- Outline the historical origins of disaster research and identify some of the key research centers active in the field today.
- Understand the value of studying disasters from a multidisciplinary perspective and provide examples of contributions made by researchers in various fields.
- Explain the methods used to gather disaster data and provide examples of how they are used to study the four phases of disaster.
- Describe ethical guidelines for studying human subjects and identify challenges involved in conducting disaster research.
Key Points

- It is important to have a knowledge-based understanding of disasters to be a more effective emergency manager
- Multiple scientific disciplines have contributed to our understanding of disasters
- We study disasters in order to improve our:
  - Theories
  - Ability to manage disasters
- Disaster research has both theoretical and applied goals
- There are numerous methodological tools we can use to study disasters
Benefits of Understanding Research

- Acquire transferable skills that are applicable to various job settings
  - Gather information and data
  - Analyze information and data
  - Communicate the results
- Develop a knowledge-based view of disaster behavior that will make you a more effective emergency manager.
- Identify “lessons learned” that will improve your ability to manage future disasters.
Sources of Knowledge for Emergency Managers

- Formal education
- Field experience
- Disaster research
  - Involves *systematic* observations (documentation of what is seen or heard)
  - Based on *empirical evidence* (facts vs. stories and anecdotes)
  - Researchers collect *perishable information* (also brings neutrality)
Military influences

- After WWII the U.S. military funded social scientists to study disasters as a proxy for how communities might be impacted by a nuclear attack.

Early disaster studies

- University of Chicago’s National Opinion Research Center (and others)
- Focused largely on disaster victims and how they react/behave
- Found that society is resilient.

Establishment of the Disaster Research Center

- Initially at The Ohio State University (1963) and currently at the University of Delaware (1985)
- Focused on organizations, not individual victims
- Found that organizations are adaptive and resilient.
Brief History of Disaster Research (Cont.)

- Contemporary research centers
  - University of Delaware’s Disaster Research Center
  - University of Colorado’s Natural Hazards Center
  - Texas A&M’s Hazard Reduction and Recovery Center
  - University of South Carolina’s Hazards and Vulnerability Research Institute
  - Colorado State University’s Center for Disaster and Risk Analysis
  - Millersville University’s Center for Disaster Research and Education
  - Oklahoma State University’s Center for the Study of Disasters and Extreme Events
  - Louisiana State University’s Stephenson Disaster Management Institute
Brief History of Disaster Research (Cont.)

- Disaster research in the international context
  - Researchers outside the United States have conducted studies of disasters in some of the least developed countries in the world
  - Increased involvement of scholars around the world has broadened our research horizons
  - Researchers have increased efforts to reach, expand and strengthen the sense of community in the emergency management (i.e. International Research Committee on Disasters)
Multidisciplinary Research on Hazards and Disasters

Source: Figure 3.1 in Text
Disaster Research as a Multidisciplinary Field

- **Natural Sciences**
  - Ecosystems and earth’s processes

- **Engineering**
  - Structural—building design and performance.
  - Civil—transportation systems and utility lifelines

- **Social Sciences**
  - Sociology — societal responses to disasters
  - Geography—mapping hazards and vulnerable populations
  - Anthropology—cultural adaptations to disasters
  - Political science—disasters and public policy
  - Psychology—disaster impacts on individuals (i.e. PTSD)
  - Economics—financial costs of disasters
Social Scientists conducting field studies of disaster quickly discovered, however, that disasters also provide an exceptionally valuable opportunity to study some basic and enduring scientific problems about the nature of human nature and group life. Disasters provide a realistic laboratory for testing the integration, stamina, and recuperative power of large-scale social systems. They are the sociological equivalent of engineering experiments that test the capacity of machines to withstand extreme physical stresses.” (Fritz 1961, p. 654)
Types of Research

- **Basic and Applied**
  - Basic research is *theoretical*, while applied research seeks a more immediate answer to a *practical* problem.

- **Primary and Secondary**
  - Primary research involves collecting *original data* while secondary research relies on *existing data*.

- **Cross-Sectional and Longitudinal**
  - Cross-sectional research takes a “*snapshot*” at one point in time, while longitudinal research tracks *changes over time*. 
Individual and Aggregate

Unlike individual research, aggregate research seeks to learn about larger groups, including families and households, organizations, communities, and entire societies.

Quantitative and Qualitative

Quantitative research applies statistics to identify and explain patterns in social life, while qualitative research seeks an in-depth understanding of ongoing social processes.
Research Methods and the Phases of Disaster: Surveys

- Surveys must to be:
  - Reliable and consistent
  - Valid and accurate

- Surveys typically involve random sampling techniques to:
  - Ensure representative samples
  - So that the samples can be generalized

- Surveys have been used extensively in disaster research to study a wide variety of topics to determine behavior during the phases of the disaster life cycle
Research Methods and the Phases of Disaster: Surveys (Cont.)

- **Preparedness:**
  - Household and organizational precautionary measures
    - Identify factors such as household income or organizational size related to preparedness levels

- **Response:**
  - Evacuation decision making
    - Factors such as family size, previous disaster experience and mobility

- **Recovery:**
  - Satisfaction with recovery efforts and assistance

- **Mitigation:**
  - Public support for proposed mitigation policies
  - Location of hazardous and controversial facilities
Focused discussions conducted to gain an understanding of the views and experiences of respondents

Different from surveys because they:

- Usually use an interview guide
  - More flexible than a survey
- Use purposive sampling* rather than random sampling
  - Purposive sampling may lead to snowball sampling
- Transferability rather than generalization
  - Transferability is the degree to which insights gained from studying one social setting or groups are applicable to others

*Purposive sampling is used in an interview process constructed to serve a specific need or purpose where a researcher may have a specific group or topic in mind.
Research Methods and the Phases of Disaster: Interviews (Cont.)

- *Preparedness:*
  - Degree to which communities are ready for disasters

- *Response and Recovery:*
  - Can capture social processes as they develop
    - Activities and challenges

- *Mitigation:*
  - Such as systematic evaluation of FEMA’s Project Impact (Four pronged program: establish partnerships, assess community risks, prioritize and identify resources; and apply lessons learned to reduce the impact of future disasters)
Research Methods and the Phases of Disaster: Observations

- Involves the methodical identification of patterns and trends in a social setting
- Issues to consider:
  - Deciding what to observe
  - Devising an effective strategy for recording observations (notes, photographs, video, etc.)
  - Deciding degree of researcher involvement
    - Participant observation
    - Non-participant observation
- Preparedness:
  - Disaster drills and exercises
Response and Recovery:
- Capturing dynamic and perishable social processes as they unfold
- Can accurately reconstruct what happened
Research Methods and the Phases of Disaster: Archives

- Documents that attest to or provide an account of historical happenings
  - Newspapers
  - Organizational memos
  - Meeting minutes
  - Transcripts of congressional testimony
- Sources are usually plentiful, easily accessible and inexpensive to obtain
- Many studies in disaster research are based on archival data
Technological advances have enabled researchers to gather massive amounts of data related to disasters, to include:

- Laptops
- Digital voice recorders
- Statistical software
- GPS
- Remote sensing
- Satellite imagery

Most helpful is Geographical Information Systems (GIS)

- Allow researchers to attach spatial coordinates to various sources of data (which can be depicted on maps)
Research Methods and the Phases of Disaster: Spatial Tools (Cont.)

- **Preparedness:**
  - Maps locating hospitals, schools, nursing homes, hazardous facilities
  - Maps of survey data related to household preparedness levels

- **Response:**
  - GIS and remote sensors allow:
    - Rapid damage assessment
    - Emergency Managers prioritize efforts

- **Recovery:**
  - Can be used to track recovery efforts

- **Mitigation:**
  - Can be used to identify hazards and vulnerable populations
  - Can impact land use decisions
Research ethics should:
- Show respect for individuals
  - Voluntary participation
  - Be confidential
- Communicate the benefit and risks
- Consider justice among all involved
  - Risks and benefits should be distributed equitably in society
  - New medicines are often available only to select groups

Research Challenges
- Logistics of getting to/from the disaster or incident
- Respondent availability and accessibility given the circumstances
- Impact of emotions and human suffering