A TEMPLATE FOR MULTIDISCIPLINARY VIRTUAL RECONNAISSANCE RESEARCH

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What is Virtual Reconnaissance Research?

Virtual reconnaissance research is the gathering of data from online sources before or after an extreme event. This preliminary data collection, analysis, and information sharing informs research plans, improves the quality and rigor of field reconnaissance and quick response research, and reduces participant burden in disaster affected communities.

Why Conducting Virtual Reconnaissance Research is Important

Before conducting fieldwork, it is critical that researchers do all that they can to prepare in advance. Being educated about the historical context and demographics of a community is key to conducting ethical and culturally competent research.

Collecting background data on a community before entering the field helps to ensure that you are educated about the context where you will be conducting research. Being an informed researcher reduces unnecessary questioning and inquiry burdens on participants while in the field. For example, if you already know the hazard history of the community and impacts from previous disasters, you will not need to spend valuable time asking residents to describe those details. This preparation work also has the added benefit of speeding up the data analysis and writing phases of a study, which often require contextual descriptions of the disaster and the affected community.

Information and Data Sources

There is typically a wealth of information available online that researchers can gather in advance of entering the field. News media, social media, websites, and government communication outlets are often the most readily available and credible sources for getting a sense of what is happening on the ground in the immediate aftermath of a disaster. In addition, available secondary data can provide valuable demographic and contextual information. This section describes approaches to collecting disaster-specific information and the topics research teams might want to explore for each location.

- Search local and national news stories and news video footage to get a sense of the unfolding response and recovery in the community
- Search Twitter, Facebook, Instagram, and other social media threads related to the disaster for context
- Analyze pre-existing secondary data from websites such as the U.S. Census Bureau, the Centers for Disease Control and Prevention, the Federal Emergency Management Agency (FEMA), and local government websites and social media outlets
- Locate records on disaster assistance applications from FEMA, the U.S. Small Business Administration, state disaster-assistance agencies, Red Cross, etc.
- Search for recorded community meetings, community disaster plans, and after-action reports from fire, police, and other public safety agencies

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- Find statistics from local government agencies and departments, including building departments that document damage and social impacts
- Compile information about agencies providing crisis intervention and mental health services in the affected area

Topics for Virtual Reconnaissance Research

Researchers should do their homework before considering launching a field investigation. Combining background information on the community with the unfolding disaster context will help researchers understand major questions and issues that are emerging and in need of academic research. Some potential topics to focus on include:

- *Past Hazards and Disaster Information*
  - Community hazard risk: This should include the type of hazards they face and the level of risk (e.g., very high, high, moderate, low)
  - Past disaster experience (e.g., disaster type, dates, intensity)
  - Past disaster losses (e.g., deaths, injuries, economic losses, building damage)
  - Current building codes and other relevant disaster mitigation efforts
  - Building permits required for new construction and code enforcement
  - Important disaster-related legislation
  - Disaster preparedness planning for key social institutions and critical facilities (e.g., hospitals, schools, government)
  - Governmental body responsible for assessing hazards and risks

- *Socio-Demographic and Economic Indicators*
  - Population size
  - Population diversity: Ethnicity, religion, age, gender, disability, income, educational attainment, etc.
  - Key employment/economic sectors
  - Common types of buildings and other important infrastructure
  - Internet availability
  - Emergency management structure and capacity
  - School information (e.g., type of school system; number of primary, secondary, university facilities)
  - Hospital information (e.g., number of hospitals, inpatient facilities, respite homes)

- *Disaster Impacts*
  - Transportation: Damage to roadways, bridges, air, rail, and public and private transportation
  - Residential and commercial building damage: Single- and multi-family residential buildings; commercial, profesional, historical, and government buildings
  - Economic disruption: Lost employment/days of work; local and corporate business status; and other household/business economic losses
  - Evacuation and displacement: Records from and information about evacuation sites, shelters, and hotels about meals served; number of beds and housing provided; number of children served (and any other relevant information they may have collected); first-aid care given; resources distributed; and other displacement data
  - Educational facilities: Public and private K-12 schools; daycares; universities and colleges
  - Healthcare facilities: Information on hospital staffing and patients; clinics, urgent care facilities, doctor's offices, and other mental and physical health services
  - Emergency services: Fire and police stations and emergency operations centers
  - Lifelines: Commercial and residential water/wastewater facilities, power, and communication
  - Funding sources: Private insurance; federal, state, and local government grants and loans; nonprofit donation sources; faith-based donations
  - Community/social networks: Information on neighborhood services; demographics; community satisfaction and well-being; religious/cultural institutions; recreation centers
    * Nonprofit Organizations: Disaster related, faith-based, other
    * Social Services: Domestic violence shelters, food banks, other
    * Other Built/Natural Infrastructure: Levees and dams

Compiling and Sharing the Information

Even a cursory glance at this check sheet reveals that there is much "desk research" that can be done before you even consider entering the field. As you are compiling this information, you may want to consider developing a system for downloading and storing data, news articles, photos, and other resources. The more organized you are now, the more this will help you as your research progresses.

In addition, you may want to compile and even consider publishing your Virtual Reconnaissance report. Organizations such as the Structural Engineering Extreme Events Research (StEER) network publish Preliminary Virtual Reconnaissance Reports (PVRR) developed by Virtual Assessment Structural Teams (VASTs) after disasters. And the Earthquake Engineering Research Institute (EERI) Virtual Earthquake Reconnaissance Teams (VERT) begin quickly collecting data after an event to support field reconnaissance teams and partner organizations. They then disseminate information and virtual earthquake reconnaissance reports to the larger engineering community. These types of efforts will not only help advance and improve your own research, but can also be a valuable resource to other researchers when you make your work publicly available.

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