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A Framework for Assessing Mortality and Morbidity After Large-Scale Disasters

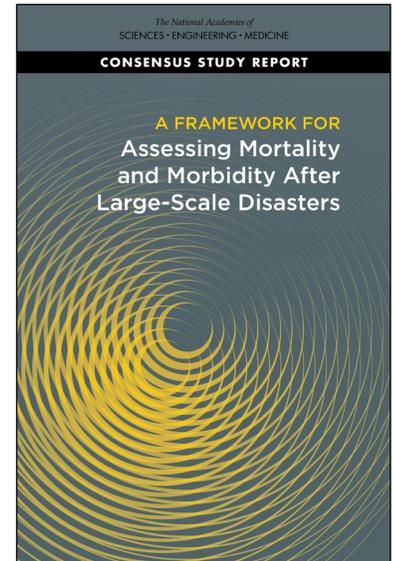
In the wake of a large-scale disaster, protecting the health and well-being of affected individuals and communities is paramount. Accurate and timely information about mortality—or deaths related to the disaster—and significant morbidity—illnesses or injuries related to the disaster—is critical. This information can support situational awareness for the disaster management enterprise and drive public health action to save lives and prevent further health impacts. Conversely, failure to capture mortality and morbidity data accurately and consistently can undercut the nation's capacity to protect its population. Disaster-related mortality and morbidity data add value at all phases of the disaster management cycle and the accurate and complete assessment of these data can lead to a clearer understanding of the extent, types, and causes of mortality and morbidity and drive change in policy, practice, and behavior that will prevent suffering and save lives.

Following the October 2018 passage of the Disaster Recovery Reform Act (as part of the Federal Aviation Administration Reauthorization Act), the Federal Emergency Management Agency tasked the National Academies of Sciences, Engineering, and Medicine to carry out a consensus study of best practices in conducting mortality and morbidity assessments after large-scale disasters. To meet this charge, the National Academies formed an ad hoc committee that would review and assess the current state of the field and best practices, with a specific focus on disasters declared under the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

KEY FINDINGS

In its exploration of the current landscape of practices, systems, and tools for assessing mortality and significant morbidity after large-scale disasters, the committee identified several persistent, systemic challenges, including

- pervasive variation across the nation in data collection, recording, and reporting practices for mortality and significant morbidity at state, local, tribal, and territorial (SLTT) levels;



- insufficient prioritization of accurate and consistent data collection, recording, reporting, analysis, and use on mortality and significant morbidity by stakeholders;
- poor functionality of data systems to uniformly and effectively capture, record, and report mortality and morbidity data across multiple stakeholders;
- a need for better training on data collection, recording, and reporting and other support for medicolegal death investigation system professionals and SLTT agencies;
- poor utilization and usability of individual counts and population estimation data for providing value to disaster management and lack of access to actionable data for SLTT entities; and
- a need for additional research to develop and evaluate analytical methods for assessing mortality and morbidity and to create and test new tools.

The committee noted that an overarching enterprise-wide approach is essential to the implementation of systemic improvements across multiple, siloed stakeholders and systems. Leadership at all levels—federal and SLTT—are responsible for championing change. Times of crisis necessitate the adoption of cross-agency responsibilities and activities designed to meet the mission for domestic action during and after disasters and emergencies.

DEVELOPING A MORTALITY AND MORBIDITY FRAMEWORK

To address the need for a uniform approach for conceptualizing and assessing mortality and morbidity data after large-scale disasters, the committee developed a framework to serve as an initial guide that can be adopted across all systems and jurisdictions. This framework (1) incorporates the two primary methodological approaches for estimating mortality and morbidity—individual counts and population estimates—and (2) clarifies case definitions to uniformly characterize how an individual death or morbidity can be attributed to a disaster. These two general approaches highlighted in the framework each have their own strengths, weaknesses, appropriate uses, and methodologies. The committee recommended that federal and state agencies should adopt the use of such a framework and support stakeholders in applying this framework to practice, including the routine use of uniform case definitions and data collection, recording, and reporting practices.

STRENGTHENING SYSTEMS, PRACTICES, AND APPROACHES

Disaster management in the United States is composed of a diverse and often disjointed network of federal and SLTT actors and systems as well as an abundance of stakeholders ranging from health care, government agencies, the general public, policy makers, and the public and private sectors. Additionally, the diversity in practices for collecting and recording data and the methods for developing estimates compound these administrative challenges. There is a pressing need for disaster management professionals to be able to extract the maximum value from data on morbidity and mortality after large-scale disasters and doing so requires these stakeholders and systems to coordinate efforts effectively and uniformly across the disaster management enterprise.

To guide its deliberations and the development of recommendations, the committee developed a series of precepts that synthesize the ethos and key characteristics of a highly effective system for mortality and morbidity assessment (see Box 1).

BOX 1 GUIDING SYSTEM PRECEPTS FOR A MORBIDITY AND MORTALITY FRAMEWORK—ABRIDGED

A highly effective system for assessing morbidity and mortality of major disasters would:

- Collect and use data for community health protection as an essential component across all phases of disaster management
- Incorporate both individual counts and population estimates to better understand a disaster's true effect
- Leverage morbidity data as well as mortality data to support response, recovery, mitigation, preparedness, and prevention
- Build on and use existing systems, capacities, and methodologies

- Commit to the continuous improvement of systems over time
- Adopt an enterprise approach to activate stakeholders and systems in times of crisis as well as during the inter-disaster period
- Support the resilience and strengths of historically disadvantaged populations by using data to understand, mitigate, and eliminate inequalities in disaster impacts

A BLUEPRINT FOR ACTION

In response to the spectrum of needs identified, the committee developed a series of crosscutting recommendations that are intended to serve as a blueprint for moving forward. These recommendations couple short-term actions, which can be undertaken immediately for rapid impact, with long-term priorities, which are geared toward investments in the capacity and capability of the nation to capture, track, and use mortality and morbidity data to inform disaster management and save lives (see Box 2). For a full listing of the committee's recommendations, see the Recommendations insert.

BOX 2 RECOMMENDED IMMEDIATE ACTIONS AND FUTURE PRIORITIES

Recommended immediate actions needed to address current gaps in policy, practice, and infrastructure for mortality and morbidity assessment include

1. Adoption and use of a uniform framework for collecting, recording, and reporting mortality and morbidity data (Recommendations 2-1 and 2-2).
2. Investment in improvements to data systems and tools for collecting, recording, and reporting individual count data at a state, local, tribal, and territorial level (Recommendations 3-1 and 3-2).
3. Update of the Model State Vital Statistics Act and Regulations to facilitate more robust and uniform mortality data collection across the nation (Recommendation 3-2).
4. Creation of a process to develop, validate, and promulgate national standards for reporting on a core set of morbidity impacts specific to the common types of major disasters (Recommendation 3-3).
5. Investment in and development of the capacity to collect and analyze the data necessary for population estimates of mortality and morbidity (Recommendation 4-2).
6. Implementation of new tools and approaches to share and use mortality and morbidity data (Recommendation 4-3).
7. Creation of a separate Emergency Support Function dedicated to mortality management (Recommendation 3-5).

Recommended future priorities to strengthen the nation's ability to prepare for and respond to disasters and emergencies of all types via the enhanced assessment of individual counts and population estimates of mortality and morbidity include

1. Integration of new technologies, as these become available, into existing electronic data systems and tools (Recommendation 3-1).
2. Investment in research to advance the science of mortality and morbidity assessment (Recommendations 3-1, 4-1, and 4-2).
3. Development and dissemination of resources for training professionals in the medicolegal death investigation system and for inclusion in state, local, tribal, and territorial disaster management (Recommendations 3-4 and 3-5).

Committee on Best Practices for Assessing Mortality and Significant Morbidity Following Large-Scale Disasters

Ellen J. MacKenzie (*Chair*)
Johns Hopkins Bloomberg School of Public Health

Sue Anne Bell
University of Michigan School of Nursing

H. Russell Bernard
Arizona State University

Aram Dobalian
The University of Memphis

Marcella F. Fierro
Fierro Forensics

Elizabeth Frankenberg
University of North Carolina

John L. Hick
Hennepin Healthcare
University of Minnesota

Ali S. Kahn
University of Nebraska Medical Center

Maureen Lichtveld
Tulane University School of Public Health and Tropical Medicine

Charles Rothwell
National Center for Health Statistics (retired)

Richard Serino
Harvard T.H. Chan School of Public Health

Michael A. Stoto
Georgetown University

W. Craig Vanderwagen
East West Protection, LLC

Daniel Wall
City of Ventura

Matthew Wynia
University of Colorado

Study Sponsor

Federal Emergency Management Agency

Study Staff

Scott Wollek
Study Director (*from August 2019*)

Michelle Mancher
Study Director (*until August 2019*)

Daniel Cork
Senior Program Officer

Olivia Yost
Program Officer

Mariam Shelton
Research Associate (*until December 2019*)

Michael Berrios
Research Associate

Andrew M. Pope
Senior Director, Board on Health Sciences Policy

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