CDC Activities to Improve State and Local Fatality Management and Disaster-related Mortality Reporting Practices

Read-ahead Materials for August 2019 Meeting

National Academies of Science Committee on “Best Practices for Assessing Mortality and Significant Morbidity Following Large-scales Disasters”
Outline

- Describe importance of mortality data during a disaster
- Introduce mortality data, Electronic Death Registration (EDR) and Medical Examiner/Coroner (ME/C) systems
- Summarize gaps in disaster-related mortality reporting
- Describe CDC tools and activities to improve disaster-related mortality reporting
- Recommend ways to integrate tools into a jurisdiction’s preparedness activities
Importance of Disaster-related Mortality Data
Important Uses of Disaster-related Mortality Data

- Measure and record the burden and severity of disasters
- Identify ongoing hazards during response
- Guide and evaluate response effort
- Support community resiliency – timely and accurate issuance of FEMA* funeral benefits to families
- Identify risk factors to guide public health prevention efforts
- Plan for future disasters

*Federal Emergency Management Agency
Data-driven Strategies are needed during the Preparedness, Response, and Recovery Phases of a Disaster

- Preparedness
- Response
- Recovery
Introduction to Mortality Data and ME/C Systems
National State-based Network of Interoperable, Electronic Mortality Data Systems

*State and Territorial Exchange of Vital Events, **CDC National Vital Statistics System, ***CDC National Center for Health Statistics.
Flow of and Access to Disaster-related Mortality Data

NOTE: Not all ME/C jurisdictions have electronic systems & not all states have fully electronic death reporting systems.

* The capabilities of the systems to output disaster information varies from basic line list to electronic transfer.
Medical Examiner and Coroner System (ME/C)

- **Types of deaths investigated**
  - Sudden unexpected deaths
  - Unattended deaths (e.g., deaths outside the health care system)
  - Unnatural deaths (i.e., unintentional, homicides, suicides)

- **Medical certifiers determine cause/manner of death and complete death certificate**
  - MEs are usually physicians, are appointed, and can be county-based or statewide
  - Coroners often have no medical background, are certified in some states/jurisdictions, and are elected or appointed
Medical Examiner and Coroner System (ME/C) (2)

- ME/Cs certify ~20% of all deaths (450,000) in U.S. each year
  - Varies by jurisdiction

- More than 2,300 medical death investigation jurisdictions
  - Systems and procedures are governed by state and local laws and regulations
  - Centralized at state or organized by county (or district or parish)
  - Systems vary other ways (see next slide)
Variations of ME/C Systems in U.S.

- State-, district-, or county-based
- Chief medicolegal death investigation officer either ME or Coroner
- Some county-based systems also have a State ME
- Housed in health, public safety, or justice departments, or independent
- Some offices have university affiliations

Existing Federal Recommendations for ME/C Data

- Envision/adopt a 21st Century electronic data system while strengthening/promoting interoperability among current electronic systems used, including EDRS

- Establish essential data elements and data-element specifications
  - Facilitate timely data sharing and statistical reporting, which are critical to informing policy generation, rulemaking, monitoring public health and safety, and evaluating science and technology investment
  - Explore opportunities to inform and further policy and program impact through enhanced data quality and accessibility

https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/strengthening_the_medicallegal_death_investigation_system_final.pdf
Identifying Gaps in Disaster-related Mortality Data
## Discrepancy in Reported Number of Deaths

<table>
<thead>
<tr>
<th>Disaster Event</th>
<th>State Response Agencies*</th>
<th>Red Cross</th>
<th>FEMA*</th>
<th>NOAA - NWS*</th>
<th>Vital Statistics*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurricane Ike, TX (2008)</td>
<td>74</td>
<td>38</td>
<td>104</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>April 27 Tornado, GA (2011)</td>
<td>15</td>
<td>15</td>
<td>9</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Hurricane Sandy, NJ (2012)</td>
<td>75</td>
<td>34</td>
<td>61</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>May Tornadoes, OK (2013)</td>
<td>48</td>
<td>42</td>
<td>19</td>
<td>30</td>
<td>36</td>
</tr>
</tbody>
</table>

*Response agencies=Medical examiners/Coroners and Emergency Operations Center(s); FEMA=Federal Emergency Management Agency; NOAA-NWS=National Weather Service; Vital Statistics=Post-disaster review of death certificates in state-based vital statistics systems.
Need for Mortality Tools

- Disaster-related deaths underreported in vital statistic systems
- Certificates missing any key words or reference to incident (e.g., Hurricane Harvey not listed in “HOW INJURY OCCURRED” box)
Causes for Underreporting on the Death Certificates

- Underappreciate or do not realize the importance of including the disaster details or terms on the death certificate
- Use different case definitions for disaster-related deaths (i.e., what is a disaster-related death?)
- Lack sufficient death scene investigation information to attribute death to the disaster
CDC Efforts to Improve Disaster-related Mortality Reporting – Historical and Present
CDC’s Early Efforts to Improve Disaster-related Mortality Reporting

- 1986: Established the Medical Examiner and Coroner Sharing Program (MECISP), which ended in 2004
- 1999: Published uniform disaster mortality case definition
- 2007: Developed disaster-related surveillance 1-page form, which was first piloted by Texas during Hurricane Ike in 2008
- 2006: Developed and refined 3-page guidance on “Completion of Death Certificates in the Aftermath of a Hurricane”
CDC’s Recent Tools and Activities to Address Reporting Challenges During a Disaster

- CDC Disaster-related Mortality Tools (2017)
  - Death Scene Investigation Toolkit
  - Death Certification Completion Reference Guide

- Enhancements to State-based Electronic Death Registration Systems (EDRS)
  - Use of alerts, pop-up boxes, flags
  - Support jurisdictions to build capacity
Tool 1: Death Scene Investigation Toolkit

- Weather-specific disasters (i.e., heat, hurricane, tornado)
- Data collections forms
- Identifies data sources for death investigators
- Online training with credits: https://www.train.org/cdctrain/course/1083843/

www.cdc.gov/nceh/hsb/disaster/docs/DisasterDeathSceneToolkit508.pdf
Toolkit Data Collection Forms

Capture uniform data
- Circumstance(s)
- Cause of death
- Risk identification
- Relationship with the disaster
- Protective action(s) by the decedent
Tool 2: Death Certification Completion Reference Guide

- Provides disaster mortality case definitions and a framework to determine if a death is associated with a disaster
- Based on a 1999 manuscript* published by CDC
- Supports inclusion of indirect deaths

Reference Guide Content

- Definition of disaster-related deaths
- Steps to determine if a death is related to a disaster
- Guidance on death certificate completion
- Flow chart
- Scenarios

https://www.cdc.gov/nchs/data/nvss/vsrg/vsrg01.pdf
Reference Guide’s Flow Chart: Determination of Disaster-related Deaths

Step 1 – Consider whether the death occurred during a disaster

Use sources such as:
- National Weather Service
- Emergency Management
- Federal Declarations
Reference Guide’s Flow Chart: Determination of Disaster-related Deaths (2)

**STEPs 2a and 2b:** If yes, use the questions to explore whether the death was directly or indirectly related to the disaster.

- **Step 2a** – ask “Was the death caused by direct physical force of the hazard?”

- **Step 2b** – ask “Was the death caused by unsafe or unhealthy conditions created by the hazard?”

**STEP 3:** Record disaster type AND event name (e.g., Hurricane Sandy) on death certificate
Reference Guide: Disaster Death Scenarios

- 12 scenarios
- Topic specific
- Guidance on completing the death certificate
- Key prevention measures to report

Scenario 1: Carbon monoxide during natural disaster

A 39-year-old female died during Hurricane Sandy in her home. The storm caused a regional blackout and she had used charcoal in her fireplace for heat. According to emergency medical services (EMS) officials, high carbon monoxide levels were detected in the home.

Comment: By stating in the “Describe how injury occurred” field that exposure to fumes from charcoal in the fireplace was due to the power outage during Hurricane Sandy, the certifier is providing information that this death was disaster-related. Such information would be challenging to find retrospectively.

When a carbon monoxide-related death is determined, the death certificate should identify:

- SOURCE OF CARBON MONOXIDE—Gas range, generator, charcoal grill, power washer, or other.
- LOCATION OF THE SOURCE—Basement, outside near window, house, garage, automobile, or other.
- CIRCUMSTANCE(S)—Indicate if the carbon monoxide death is disaster-related and the circumstances, such as power outage, using alternative heat source during snowstorm, no smoke detector in home, or other.
- MANNER—Consider that the carbon monoxide poisoning might be intentional.
Tool 3: Use of Alerts/Flags in EDRS

- Remind the ME/C to include incident term on death certificate
- Enable vital records staff to track flagged deaths
EDRS by Vital Statistic Jurisdiction, 2018 (N=57)

*Death record = death certificate
Advancing the Development of State-based EDRS

- Four states – WV, NC, CT, and RI need EDRS
- Territories
  - Several need EDRS
  - Others need considerable support to demonstrate functionality of their EDRS
- CDC/NCHS* will be
  - Funding jurisdictions to build and install EDRS
  - Will expand functionality of existing EDRS

*National Center for Health Statistics

- Funds 62 state, territorial, and local jurisdictions for emergency preparedness activities
- Now includes language supporting vital records

Coordinate with epidemiological and vital records partners to implement electronic death registration (EDR) systems.

PHEP recipients must coordinate with epidemiological partners to implement processes for active and passive mortality surveillance and EDR use. Depending upon the jurisdiction’s prior experience with utilizing EDR systems during a response, several steps can be taken to further the implementation and use of EDR systems.

www.cdc.gov/cpr/readiness/phep.htm
EDR Improvement Strategies and Activities

- Convene meeting with jurisdiction’s epidemiologist, PHEP director, vital registrar, ME/C, and information technology (IT) staff regarding mortality surveillance and EDR capabilities
- Map mortality data flow in the state and identify opportunities (IT and business practices) to streamline reporting
EDR Improvement Strategies and Activities (cont.)

- Target hospital systems for EDR participation & improved interoperability between EDRS and hospital IT systems
- Expand adoption of ME/C case management systems that are interoperable with EDRS
- Develop system “flags” to identify specific, prioritized information to be collected during public health emergencies
- Develop protocols for real-time reporting of deaths related to public health emergencies

- Clarified activities to support mortality tracking
- Added new mortality tools
- Encouraged engagement of new partners (e.g., FEMA and vital records)
  - Funeral benefits
  - Interoperable ME/C case management and EDR systems
Updates to PHEP Operational Readiness Review (ORR)

- Rigorous, evidence-based assessment that evaluates state, local, and territorial planning and operational functions (operational readiness)
- Evaluation results help identify strengths and opportunities for improvement
- Initially focused on two medical countermeasures capabilities – expanding to all 15 capabilities
- Mortality activities and tools added to ORR (in progress)

www.cdc.gov/cpr/readiness/orr.html
Mortality Tools Training and Awareness of Disaster

- **Death Scene Investigation Toolkit (Tool 1)**
  - Free, online training published on CDC Train with continuing education credits
  - Orient participants (ME/C, scene investigators) to concepts and content in the Toolkit

- **Death Certification Reference Guide (Tool 2)**
  - In-person training for medical certifiers (e.g., ME/C, physicians) and vital records staff in 2017 hurricane-affected jurisdictions (Puerto Rico, Texas, & U.S. Virgin Islands)
  - Orient participants to concepts and content in the Reference Guide

- **Electronic Reporting (Tool 3)**
  - National webinars on “Leveraging EDRS” and “PHEP Supporting Vital Records”
  - Orient participants (PHEP awardees and vital records staff) to EDRS alerts and flags and PHEP Cooperative Agreement
Suggestions to Improve Mortality Reporting
Integrate Tools into Phases of Fatality Management to Improve Mortality Reporting

**Tool 1:**
Capture More Complete Data during a Death Scene Investigation

**Tool 2:**
Apply CDC’s Case Definition and Guidance for Certifying Disaster-related Deaths

**Tool 3:**
Create and Use Reminders/Alerts/Flags in EDRS during Disasters
Key Points for Improvements

- Data quality (e.g., capture of disaster-relatedness on death certificates) can be improved through capacity building
  - Promote standardized death scene data collection
  - Use a uniform case definition across disciplines and jurisdictions
  - Leverage electronic reporting systems (e.g., flags, reminders)

- Data quality and timeliness can be improved through enhancements to electronic mortality data infrastructure

- Effective data reporting/sharing requires strong engagement and coordination between emergency management, preparedness, ME/C, PH, and VS offices
Specific Suggestions to Improve Jurisdictional Reporting

1. Improve awareness and capacity of data providers to identify and document disaster-related deaths
   - Train medical certifiers (e.g., ME/C, physicians) and vital statistics (VS), preparedness, DMORT*, and emergency management staff on available tools
   - Disseminate CDC disaster-related mortality tools and encourage their adoption into disaster mortality reporting processes

*Disaster Mortuary Operational Response Team
Specific Suggestions to Improve Jurisdictional Reporting (2)

1. Improve awareness and capacity of data providers to identify and document disaster-related deaths (cont.)
   - Pilot mortality reporting capabilities and protocols during exercises and drills
   - Assess data quality and timeliness of reporting into ME/C case management and EDR systems during an incident and make necessary improvements
Specific Suggestions to Improve Jurisdictional Reporting (3)

2. Strengthen existing electronic mortality data infrastructure
   - Develop or enhance ME/C case management systems that facilitate data exchange (e.g., standardized data elements, automated reports for emergency response)
   - Improve interoperability between ME/C case management and EDR systems
   - Ensure ME/C case management and EDR systems have capability to create alerts and flags to track deaths during disasters
   - Examine EDRS capability to automate reports of deaths
Specific Suggestions to Improve Jurisdictional Reporting (4)

3. Increase engagement and coordination among ME/Cs and VS and public health staff in emergency planning and response
   – Engage VS & epidemiologists in development and implementation of mortality tracking and reporting protocols
   – Incorporate criteria for use of alerts and flags in ME/C and EDR systems into mortality tracking and reporting protocols
   – Coordinate final adjudication of post-disaster-related deaths
   – Include VS & public health staff in mass fatality trainings and exercises
Thank you

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.