2\textsuperscript{nd} Evidence Aid Conference
Prioritising Evidence in Disaster Aid
29-30 October 2012, Brussels

Data Reporting in Disasters

Michel Debacker
The mission of the EMDM Academy is:

a. To support the development of Disaster Medicine as an academic discipline, with specific interest to Humanitarian Medicine.

b. To improve the quality of health prevention, preparedness, response and recovery in emergency and disaster situations, basing skills and knowledge of health providers on scientific evidence, acquired from research and field experience.
“much of the existing operational research related to emergencies and disasters lacks consistency, is of poor reliability and validity and is of limited use for establishing baselines, defining standards, making comparisons or tracking trends.”

V. Murray

No evidence-based disaster medical response (DMR) principles, concepts, structures and processes.
Do operational research studies related to disaster medical response (DMR) exist?

- Very limited number of relevant studies (descriptive or case studies)
- Databases available for DMR research are underdeveloped and often incomplete and inaccurate
- Interventions measured in terms of output (performance) rather than in terms of impact on DMR or outcome of disaster victims
- These studies are important but the lack impact and extrapolation power of conclusions drawn from systematically collected evidence
- Only relevant systematic reviews on care/treatment in disaster situations
Barriers

- **Data quality**
- Healthcare providers prioritize the administration of care over the documentation of cases
- Much of the relevant data becomes less accessible over time
- Lack of uniform reporting methods (which data elements and indicators?)
- Most of the data in «grey» literature difficult to access through electronic indexing services
- Difficulty in designing and implementing appropriate studies (impossible or ethically inappropriate, or both, to identify experimental and control groups essential for the hypothesis testing)
THE MEDICAL SEVERITY FACTOR OF BURN AND EXPLOSIVE DISASTERS

by

James Harrison

Gothenburg Disco Fire

<table>
<thead>
<tr>
<th>Reference</th>
<th>Total Injured</th>
<th>Admitted T1 + T2 Severely injured</th>
<th>Discharged ED T3 Mildly injured</th>
<th>Occupancy</th>
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<th>Initial dead</th>
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Barriers

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Guidelines for Reports on Health Crises and Critical Health Events

Per Kulling, MD; Marvin Birnbaum MD, PhD; Virginia Murray, FRCP; Gerald Rockenschaub, MD, MPH

Disaster medicine reporting: The need for new guidelines and the CONFIDE statement

David A Bradt and Peter Aitken

1 Royal Melbourne Hospital, Melbourne, Victoria, Australia, 2 Center for Refugee and Disaster Response, Johns Hopkins Medical Institutions, Baltimore, Maryland, USA, 3 Emergency Department, The Townsville

DISAST-CIR: DISASTROUS INCIDENTS SYSTEMATIC ANALYSIS THROUGH COMPONENTS, INTERACTIONS AND RESULTS: APPLICATION TO A LARGE-SCALE TRAIN ACCIDENT

Adi Leiba, MD; Dagan Schwartz, MD; Talor Eran, MD; Amir Blumenfeld, MD; Daniel Laor, MD, MHA; Avishay Goldberg, PhD; Gali Weiss, RN, MHA; Eilon Zalzman, MHA; Issac Ashkenazi, MD; Yehezkel Levi, MD; and Yaron Bar-Dayan, MD, MHA

Protocol for Reports from Major Accidents and Disasters in the International Journal of Disaster Medicine

Sten Lennquist
# Data Reporting Templates

<table>
<thead>
<tr>
<th></th>
<th>Villarreal et al</th>
<th>Lennquist</th>
<th>Disast_CIR Leiba et al</th>
<th>Kulling et al</th>
<th>CONFIDE Bradt et al</th>
<th>Utstein Debacker et al</th>
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Medical management of major incidents may be improved through collection and analysis of high-quality standardised data.

Standardised data may elevate the level of scientific evidence within disaster medicine research.
Barriers

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PHYSICAL COMPLAINTS OF HAITIAN CITIZENS IN INTERNALLY DISPLACED PERSON CAMPS TWO WEEKS AFTER THE 2010 EARTHQUAKE

by
Gerlant van Berlaer

Figure 26: Categories of complaints before versus 2 weeks after the earthquake versus one year later.
Barriers

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However, there is an increasing awareness for the need to collect data that supports valid, reproducible conclusions on the effectiveness of the DMR
Lack of adherence to defined standards for collecting and reporting data.

A uniform reporting method and template are essential in order to collect empirical data on DMR management.

Robust databases will allow investigators to collect and interpret valid evidence that will impact disaster survivors’ outcomes and establish evidence-based norms and standards of DMR practice.
To address this issue, the EMDM Academy proposed a set of consensus-derived data elements for the acute medical response and provided definitions and measurable performance and/or outcome indicators for elements of acute DMR.

The consensus process was conducted using the combination of a modified Delphi technique and the Utstein-style method, which is a modified nominal group technique.
The Consensus Group organized a final meeting at the Utstein Abbey, on the island of Mosterøy, off the Coast of Stavanger, Norway (23-25 November 2010)

Data elements or descriptors acute medical response (indicators)

1. Event notification (2)
2. Activation of disaster medical management plan (5)
3. Disaster medical operations coordination (5)
4. On-site triage (10)
5. On-site medical care (3)
6. Scene casualty clearance (7)
7. Distribution of ill/injured survivors (10)
8. Triage in emergency department (7)
Data elements or descriptors acute medical response (indicators)

9. Responder safety and health (4)
10. Deactivation of disaster medical management plan (2)
11. Continuity of care for non-disaster-related victims (2)
12. Emergency department resource utilization (6)
13. Hospital resource utilization (13)
14. Length of treatment (10)
15. Mortality (4)
Pre-event Setting

1. Population demographics
2. Population health status
3. Healthcare System (including capacities)
4. Disaster Medical Response System
   - Medical Incident Management system including the different tiers (lines of authority)
   - Criteria for activation of the disaster medical management plan (DMMP)
   - Medical operations plan
   - Concept of operations
   - Medical information management
   - Medical resources management
Event Description

1. Type of Event
2. Impact intensity/magnitude
3. Impacted Area
4. Subsequent related events
5. Time of onset
6. Environment
7. Overall damage severity
8. Damage to infrastructure and life-sustaining services
9. Damage to healthcare system
10. Casualties
<table>
<thead>
<tr>
<th>Data element Number</th>
<th>Data element name</th>
<th>Type of data</th>
<th>Data element indicator</th>
<th>Metric</th>
<th>Definition of data element</th>
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<tr>
<td></td>
<td></td>
<td>Continuous</td>
<td>Time point at which triage was ordered by the medical incident commander</td>
<td>1. DD:HH:MM 2. Not logged</td>
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<tr>
<td></td>
<td></td>
<td>Continuous</td>
<td>Time point at which the first ill/injured patient has been triaged on the site of the disaster</td>
<td>DD:HH:MM</td>
<td></td>
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</tbody>
</table>
## Disaster Acute Medical Response data elements and indicators

### A. Event notification
*(Notification of disaster to medical or combined dispatch centre.)*

1. **Time point of occurrence of disaster.**
   - **Day:**
   - **Time:**

2. **Time point of incoming call at dispatch centre or equivalent.**
   - **Day:**
   - **Time:**

### B. Activation of disaster medical management plan (DMMP)
*(Engagement of resources (e.g., human, physical assets and physical space) to address the disaster in accordance with jurisdictional (local) management system, standards and practices.)*

3. **Systematic trigger criteria for activation of the DMMP.**
   - **No**
   - **Yes (note trigger criteria)**
   - **Unknown**

4. **Time point of activation of the DMMP.**
   - **Day:**
   - **Time:**

5. **Time point of notification of the first appropriate staff person to assume medical management coordination role.**
   - **Day:**
   - **Time:**

6. **Time point that the last staff person notified has reported to the appropriate location mentioned in the DMMP.**
   - **Day:**
   - **Time:**

7. **The percentage of medical staff on the call-down list who reported at the appropriate location in the predetermined time delineated in the DMMP.**

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[Logo: emdn]
Priorities

Specific health databases

- Standards for data collection, analysis and reporting
- Dissemination of these standards within the disaster academic and practice community
- Utstein-like template for mental health
- Utstein-like template for public health
- Utstein-like template reporting diseases/symptoms ill disaster victims
- Individual and collective data of disaster ill/injured victims
VictimBase is an online victim library for medical professionals to create and share victim simulations for education, training and research. The clinical conditions of these victims change when time progresses or when specific treatments are given.

The tool is specifically focused on creating a database of Mass Casualty Incident (MCI) victims to be used in disaster medicine exercises and research across a number of different platforms including: paper based simulations, computer based (logistic) simulations, live exercises and triage exercises. The individual victims can also be used for small incident simulation and training.

The VictimBase project was launched by the EMDM Academy (http://www.emdmacademy.org), based on the need for a shared user-friendly database of dynamic victim simulations. The EMDM Academy manages independently the use and validity of VictimBase. VictimBase is designed to be used internationally. VictimBase is sponsored and developed by E-Semble and CAE with further financial support from the Safety Region of Utrecht, the Netherlands.

www.victimbase.org
An comprehensive registry including individual and collective data of real ill/injured disaster victims.

Such a database will allow the determination of the average injury severity of specific types of disasters and subsequently an estimation of the needed health capacities.

Injury severity scores, survivability and deterioration rates of the different disaster victim types will allow the modeling of the clinical conditions of disaster victims to be used in simulations.
Table I. Capacity requirements in the Netherlands for various numbers of mechanically injured victims with three different injury severity factors and with a clearance time of 4 hours (see text for further explanation).

<table>
<thead>
<tr>
<th>Number of casualties N</th>
<th>Medical severity factor S</th>
<th>Casualties to be hospitalized N'</th>
<th>Number of medical teams MRC</th>
<th>Number of ambulances MTC</th>
<th>Number of beds HTC</th>
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<td>600</td>
<td>38</td>
<td>552</td>
<td>15 000</td>
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</table>

Quantifying medical disaster management
JAN DE BOER & MICHEL DEBACKER
An comprehensive registry including individual and collective data of real ill/injured disaster victims.

Such a database will allow the determination of the average injury severity of specific types of disasters and subsequently an estimation of the needed health capacities.

Injury severity scores, survivability and deterioration rates of the different disaster victim types will allow the modeling of the clinical conditions of disaster victims to be used in simulations.
The operational research in medical disaster management is limited by the fact that the conduct of prospective and randomized studies under real world conditions is impossible or ethically inappropriate. Computer simulation has been used to overcome these methodological problems.

In contrast to real world disaster exercises, computer simulations of disaster response are able to repeat a particular scenario, changing the occurrences and timing of particular interventions or adding restrictions to the use of human and material resources.

The simulation makes it possible to test (medical) operational interventions in multiple plausible situations and to develop a resource-efficient medical response in every simulated disaster situation without the costs and time investments of full scale exercises.
SIMEDIS Simulation System

Scenario Victim Creation Model → Medical Response Model

Medical intervention trigger

Victim Pathway Model

Time trigger
<table>
<thead>
<tr>
<th>Sc1</th>
<th>Time</th>
<th>Weather</th>
<th>BLS Amb (km)</th>
<th>ALS Amb (km)</th>
<th>MMT (km)</th>
<th>Heli (km)</th>
<th>HCF level (km)</th>
<th>HTC (per hour)</th>
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<td>7 am</td>
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<td>6 Amb (1-20 km)</td>
<td>6 MMTs (0.3-15)</td>
<td>3 Heli (0.3-15)</td>
<td>1 LI (0.3)</td>
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<td></td>
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<td></td>
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<td>43 T2</td>
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Health Care Facilities

Number of victims vs Time (min)

- SC1 T1
- SC1 T2
- SC4 T1
- SC4 T2
- SC3 T1
- SC3 T2
## Mortality

<table>
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Priorities

Ethical Issues

- Team that is not involved in the care of disaster victims dedicated to collect data
- Informed consent represent a particular problem in the disaster setting
- Ethical imperative to ensure that all data collected is of good quality, useful and relevant to as many users as possible

IS1201 EU COST Action on Disaster Bioethics