

Evidence for Disaster Risk Management – Information and knowledge needs for policy makers and field practitioners

TASK for HFA Mid Term Review:

Case study on how data/information relating to all risks, hazards and disaster management is collected, held and analyzed, in order to facilitate the use of high quality information by decision makers at all levels

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This study is intended to highlight the importance of making evidence-based multi-hazard impact assessments. It identifies tools that can be borrowed from the scientific community to achieve a better understanding of disaster risks and to define their predictability.

<http://www.preventionweb.net/english/hyogo/hfa-mtr/studies/case/study5.php>

1. Briefing note summary:

The availability of information databases and various web sites help disaster risk managers apply best practices before, during and after extreme events. When properly constructed and evidence based readily available databases and websites can promulgate best practice in real time, aid response, save lives and reduce losses. This study is intended to highlight the importance of generating and publishing information from evidence-based multi-hazard impact assessments after emergencies to provide the information and knowledge that policy makers will need by:

- Taking the health sector as an example, shows how evidence-based actions norms and standards in health services can mitigate suffering in disaster situations, especially for vulnerable populations
- Learning what use can be made of disaster response case studies in future planning.
- Systematically identifying the difficulties in collating and comparing data from the wide variety of currently available databases which have been created for a wide variety of different purposes.
- Identifying common problems with data collection at all stages of disaster risk management, especially in disaster response and recovery
- Encouraging the development of baseline data sets to provide comparison data.
- Applying and promoting tools currently used by the scientific community to achieve a better

understanding of disaster risks and to define their predictability.

- Looking at two possible ways forward to develop more comprehensive data and knowledge about disasters

2. Introduction

Databases in the area of disasters documentation are few and have significant limitations, such as not being standardized, often incomparable and do not use baseline information. Sometimes the databases provide simply descriptive reviews or even only anecdotal evidence. Data are often *ad hoc*, fragmented and too superficial for in real time decision making and action. Much of the information is not readily available. Best, evidence-based practice cannot be developed without information from previous disasters (including reviews of risk reduction and response measures), collated in a systematic way. There are standard methods of using operational and applied field research to develop evidence based norms and standards in many fields of public health practice. Such methods should be applicable to saving lives and reducing suffering of people at risk of or affected by emergencies and disaster situations.

However, 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. While valuable data may be collected at the individual project level, there is rarely sufficient real-time evidence on whether and how outcomes are improving or deteriorating due to the management decisions and actions taken.¹ Applying existing knowledge and evidence based decision making is especially challenging in disaster situations because of the nature of the risks.

One of the major challenges as noted in a review completed by the WHO Mediterranean Center for Health Risk Reduction² is the diversity of information, which organisations hold it and what purpose it is collected for. This applies across the spectrum of activities, in risk assessment, hazard prevention, vulnerability reduction, mitigation, preparedness, operational response and recovery measures. This information may not be efficiently coordinated, organized and utilized by field staff. A critical factor that further compounds this challenge is the limited development of and/or partial or total collapse of systems for routine information collection and analysis as a result of a disaster. Compromised information systems stifle the process of prioritization at all levels, limit the capacity to detect, analyze and monitor trends and hinder evidence informed priority setting and resource allocation.

The current processes usually used to generate knowledge about the health risks of emergencies

and disaster situations is generally dominated by academics and research centers from developed countries. Low-income and emerging countries maybe faced with a diverse range of donor-driven research agendas that may weaken national priorities. Many countries are facing significant challenges in training and retaining researchers. Therefore there is a need for a consensus on a common global operational research framework and to promote a more equitable and sustainable research and knowledge generation capacity to define user driven, evidence-based best practice.

In trying to address this challenge a range of tools have been developed for collecting information and research on public health practice related to emergencies and disasters. These include:

- The Cochrane Collaboration³ and the National Library of Medicine (NLM)⁴ who have taken steps to help address some of the operational research gaps through the categorization of existing literature in the public domain.
 - the **Cochrane Collaboration**, through its *Evidence Aid* project, uses knowledge from Cochrane Reviews and other systematic reviews to provide reliable, up-to-date evidence on interventions that might be considered in the context of natural disasters and other major healthcare emergencies⁵
 - the **National Library of Medicine (within the National Institutes of Health of the US Department of Health and Human Services)**, through its *Disaster Information Management Research Center (DIMRC)*, aims to provide access to quality disaster health information at all stages of preparation, response, mitigation and recovery.⁶
- the **World Association for Disaster and Emergency Medicine (WADEM)** organizes the biannual World Congress on Disaster and Emergency Medicine with a primary focus on education and research;
- most recently the **Wellcome Trust** held a meeting entitled *Research To Strengthen The Public Health Response In Disasters And Humanitarian Emergencies*. The meeting brought together academic researchers in public health, NGOs and multilateral agencies to help identify gaps and opportunities to encourage collaboration for joint research initiatives to improve the evidence base around addressing the public health impacts of natural and humanitarian disasters.

The above does not represent an exhaustive list of institutions or entities engaged in field and operational research. In fact research in health and emergencies is generally conducted by a variety of academic institutions (mainly based in the North America and Europe).

3. Work undertaken highlighting disparities in evidence based measures for risk reduction, response and recovery

Three specific pieces of work have been undertaken. These are:

- Value of case studies
- Disaster databases – use of systematic reviews
- Developing of tools and guidelines

3.1 Value of case studies

A review of the literature, was undertaken to provide an overview of how and why case studies can be used to improve disaster risk reduction. The resulting paper⁷ will be published in 2011 in the Journal of Prehospital and Disaster Medicine.

The paper explores how case studies can be used and why they are relevant to disaster reduction. Case studies can be used to:

- *Explain* what occurred, illustrate a hypothesis, use as an educational tool,, to encourage best practice and raise awareness about disaster risk reduction
- *Research the causal factors of an event:* analyse the causes of and protective factors in a disaster through a narrative overview of available data. Such investigative case studies can provide valuable analyses of processes and practices in disaster risk management. They offer an opportunity to learn from experience and identify evidenced-based good practice.

Case studies are particularly useful in the field of disaster risk management because:

- *Case studies capture the complexity of disaster risk and disaster situations:*
Not many research methods or strategies allow the investigator to capture the overall

picture of multi-factorial situations akin to disaster situations, where interdependent variables of a different nature, such as the geographical, social, economic, and structural components of vulnerability and capacities, are the key to understanding the event. Case studies allow the investigator to study situations in their real-life context, indeed with an emphasis on the role of context.

- *Case studies appeal to a broad audience*
Multidisciplinary collaborations and sharing information between scientists and decision-makers has been repeatedly put forward as a key element of more effective disaster risk reduction. Case studies can be very tools for cross boundary information sharing and highlighting the challenges others have experienced.. The case study format is familiar to many professionals involved in preparing for and responding to emergencies, emergency aid technicians and policy makers, including those in high risk countries.
- *Disaster risk management needs to make the most of each single case*
The relative rarity of well-reported disasters and lack of available data make it difficult to use rigorous research methods to study disaster risk management, including disaster response. Case studies are better suited to gaining an in-depth understanding of a single situation.
- *Feasibility of implementing different study designs*
The unpredictability of disasters makes it extremely difficult to implement many study designs such as randomised controlled trials and cohort studies. Case studies provide an alternative design for retrospective learning, evaluation, and design of risk management strategies.

Improving the quality and consistency of how case studies are reported in the scientific literature could provide an improved basis for researchers' and policy-makers' ability to compare different disasters. Standardised reporting protocols may also enable compilation of case studies as case series to allow greater generalisation beyond individual disasters or disaster risk scenarios.

3.2 Disaster databases – use of systematic reviews¹

¹ ¹ The authors would like to thank the help and advice provide by the sub-committee on databases of the UNISDR Science and Technical Committee, specifically Dr Walter Ammann; Professor Gordon McBean; Professor Mohsen Ghafory-Ashtiany; Professor Laban Ogallo; Dr Kaoru Takara; Professor Dennis Wenger; Dr

This work was undertaken with input from Professor Mike Clarke, Director of the UK Cochrane Centre to examine whether systematic review methods are applicable to the evidence from disaster databases. Two health-related questions were posed as 'case studies' in order to focus the interrogation of various databases. Full outcomes from this work are currently being written up for publication.

The study demonstrated that none of the databases interrogated were able to meet the needs of healthcare professionals for answers to questions on health impacts of disasters. It should be noted that many of the databases interrogated had not have been set up with health-related objectives in mind. Nonetheless the lack of detailed health data on natural disasters and lack of adequate health-specific databases is a gap in itself.

The more fundamental limitation, however which has been noted in the literature before, was the quality and relevance of primary data being collected.⁸ Databases (or any secondary source of information) are limited by the primary data that feeds them and the difficulties surrounding the collection of primary data including lack of standardised case definitions, difficulty defining population denominators, attributing causality, lack of comparability between sources to name just a few have already been commented on.^{9,10,11}

At the same time, there is often a lot of activity in the post-disaster period with many agencies intervening and collecting data for internal use, but too stretched coordinate and share it. There is an ethical imperative to ensure that all data collected is of good quality, useful and relevant to as many users as possible.

The key overarching theme to emerge was the need for better information governance.

Good quality, relevant information is crucial but should not be collected for its own sake. As a first step stakeholders should be consulted and information needs clearly articulated, followed by setting up of processes to meet these needs.

3.3 Tools and guidelines- a common structure for health risk reports?

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A number of relevant tools have been developed and applied on a global basis. These include the Global Risk Analysis for the Global Assessment Report on Disaster Risk Reduction¹², Initial Rapid Assessment tool (IRA)¹³ developed by the UN Interagency Standing Committee's (IASC), the UN Post-Disaster Needs Assessment (PDNA),¹⁴ and UN Post-Conflict Needs Assessment (PCNA)¹⁵. The aim of many of these tools is to measure the extent and magnitude of disruption to a given population. The ability to demonstrate these are limited by the availability and access to baseline data sets.

A set of guidelines for a common structure for reports on health risks and critical events has been proposed to capture the experiences gained promote a standardised methodology for sharing results and experiences.¹⁶ Such a common standardised approach will facilitate the analysis and comparison of findings in order to improve risk assessment, risk reduction including preparedness, response, recovery and advance international collaboration and learning. It would allow lessons learned within an individual field of activity and to apply to other related preparedness activities. It could also facilitate the implementation of multisectoral activities and reports involving.

This proposed method for a common report structure on health crises and critical health events, including natural or human made disasters has been derived mainly from processes summarised below:

- 'Health Disaster Management: Guidelines for Evaluation and Research in the Utstein Style' was the result of an extensive development that has taken place within the framework of the World Association for Disaster and Emergency Medicine;¹⁷
- This was revised and modified by the experiences of the Swedish Disaster Medicine Study Organization (KAMEDO);^{18,19}
- The framework of the Swedish Emergency Management Agency network of observers;²⁰
- Further development of these Guidelines were undertaken within the WHO Regional Office for Europe project 'Support Health Security, Preparedness Planning and Crisis Event Management in the EU, EU accession and neighbouring (ENP) countries—Health Security in the European Region' (2008 WHO EURO) and finally by the WHO Europe expert consultation on 'Health System Crisis Preparedness', Antalya, Turkey 25–27 May 2010. The project has been supported by the EU Directorate General for Health & Consumers.²¹

The guidelines for a common report structure need to be pilot tested to evaluate their applicability

and usefulness. The pilot testing should be followed by an extensive review process. The guidelines should be supplemented further with determinants and indicators when the guidelines are used for in-depth reporting to evaluate health emergency and disaster risk management, including emergency situations and response operations. The development of indicators should be in line with existing international references and guidelines and other related activities such as the Global Risk Identification Programme, Sphere Project²², UNDP-Disaster Inventory System (DesInventar) or the framework developed for the Tsunami Recovery Impact Assessment and Monitoring System (TRIAMS) initiative.²³

The emerging theme is the need to co-ordinate global efforts to agree on a common method to document and standardise an approach, which will facilitate the analysis and comparison of findings in order to improve disaster risk management and advance international collaboration and learning. Good quality, relevant information is crucial; at the same time it should not be collected for its own sake. These pieces of work will help towards wider agreement on what data and why needs to be collected and how it can be best used and accessed.

4. Possible ways forward

Standardised reporting will need international agreement is a priority. As well as establishing standards for data collection, analysis and reporting, it will be crucial to ensure that these standards are widely disseminated within the disaster scientific community and achieve credence as benchmarks to work to. Examples of standards of good practice from the health domain include: CONSORT and PRISMA which are sets of reporting standards for randomised controlled trials, and systematic reviews respectively. It would be very informative to examine the processes through which these and other standards from various domains have become embedded within their respective scientific communities. As part of the next phase of work HFA MTR may wish to consider identifying and implementing measures including developing an international consensus.

Two possible ways forward are summarised below:

4.1 Proposal to develop a series of in-depth, post-disaster, multi-disciplinary investigations

In 2008 there was a proposal for a three-year phase by the International Council for Science (ICSU)'s Integrated Research on Disaster Reduction (IRDR)²⁴ for a series of in-depth, post-

disaster, multi-disciplinary investigations be carried out, with the primary objective of describing the limits of existing knowledge and identifying a set of key research questions. The IRDR investigations are described as 'forensic', because of their all-encompassing, arms-length, careful and detailed analysis, such as is common practice for example following a major international transportation or airline 'accident'. The use of the word 'forensic' should not be taken to imply that lessons and insights can only be derived from 'failures' or cases where mistakes were made. It would also be important to conduct forensic investigations of success stories to help accumulate evidence of good practices or other success factors.

4.2 Three-step process to address current research gaps in public health and emergencies developed by the WHO's Mediterranean Center for Health Risk Reduction (Tunis, Tunisia)

This work has developed and published for public comment, a three-step process involving partners to improve operational research measures and better serve field practitioners. It aims to combine efforts globally and address the various operational research gaps related to public health risk management, emergencies and disaster situations,

- Step 1: Identify current Trends, Gaps and Needs in Operational Research Related to Public Health in Crisis Situations
- Step 2: Promoting a Common Global Research Agenda for health and emergencies
- Step 3: Creating Opportunities for Interactive Knowledge Development and Transfer to the field

It is hoped that this common public health and disasters research agenda/framework can gradually bridge the divide between academic knowledge and practice in emergency settings and in disaster risk management. However this process only addresses part of the challenge of addressing the broader information and knowledge management issues that need to be integrated into disaster risk management programs.

5. Conclusion

Evidence is imperative for strengthening all aspects of disaster risk management. The HFA Mid Term Review could encourage greater national and international investments in standardised collection and use of high-quality data, information and evidence to set up relevant baselines before events occur and ensure that tools used in disaster risk management can be evaluated

against agreed benchmarks. Data, information and knowledge management are critical measures for saving lives and reducing suffering of people at risk of or affected by emergencies disasters

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