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Co-Chair: Dr. Knut Ole Sundnes,¹ Prof. Marvin Birnbaum²

1. Head, War Office for War Surgery and Emergency Medicine, Norway; Chair: Task Force on Quality Control of Disaster Management; President, World Association for Disaster Medicine
2. Emeritus Professor of Medicine and Physiology, University of Wisconsin-Madison; Steering Committee, Task Force on Quality Management of Disaster Medicine; Editor-in-Chief, *Prehospital and Disaster Medicine*

Guidelines for Evaluation and Research of Health Disaster Management in the Utstein Style — Background and Principles

Dr. Knut Ole Sundnes

President, World Association for Disaster and Emergency Medicine; Chair, Task Force for Quality Management of Disasters; Oslo, Norway

Disasters always have been a part of life. The occurrence of a disaster creates varying degrees of chaos combined with a mismatch between resources and needs. Therefore, to restore an affected society back to its pre-event status requires extraordinary efforts. But, much of the aid provided is based on intuition and anticipation, and not necessarily is rooted in understanding and knowledge. Today, we can respond with the provision of timely relief, but the accuracy of what we provide to meet the needs of the stricken society may have deteriorated. Without structured and objective evaluations of the responses to and the measures taken to prevent or mitigate the effects of events resulting in disasters, it is not possible to optimize the absorbing and buffering capacities of a society and the responses to such disasters. Evaluations are designed to enhance the effectiveness, efficiency, and benefits of such activities at the lowest costs possible. They should be viewed as efforts at continuous quality improvement.

Prior to the introduction of these Guidelines and Templates, there did not exist any universally accepted organized methodology for the conduct and reporting of the evaluations of the medical effectiveness, efficacy, and cost:benefit relationships of disaster medical responses and relief efforts or of efforts directed at the prevention or mit-

igation of disasters. In addition, both the responses and the projects for their evaluation are multidisciplinary, and there are no universally recognized, common definitions of terms and acronyms used among the multiple disciplines involved in reporting the results.

The overall objective for the use of the Guidelines and their Templates is to attenuate or eliminate the damage from disasters. This could result from the elimination of hazards, decreasing the risks for the actuation of the hazard, augmenting the absorbing and/or buffering capacities of the society and environment at risk, and enhancing the efficiency, effectiveness, and cost:benefit of preparedness and responses to the disaster.

The Guidelines and Templates are based into a conceptual framework that assimilates what is known into a series of definitions and concepts that provide new ways of looking at disasters, the hazards and events that cause them, and the overall and health-related damages that result. They include a conceptual formula for identifying factors that affect the probability of damage resulting from an event. The formula and the concepts that it entails also should facilitate identification of the impact of measures taken to eliminate or decrease hazards (prevention, modification) and/or the risk of hazards becoming a devastating event. The concepts should facilitate the evaluation of responses and includes the use of both quantitative and qualitative indicators of damage and recovery, especially as they relate to the Basic Functions of the Society that is devastated. These concepts are directed at identifying interventions that are the most effective, efficient, and produce the greatest benefits at the lowest costs. This conceptual framework now is available from WADEM as a printed volume.

Fourteen major functional elements of a society that may be affected either directly or indirectly by an event resulting in a disaster are: (1) Public health; (2) Medical; (3) Sanitation and water supplies; (4) Shelter and Clothing; (5) Food; (6) Energy supplies; (7) Search and rescue; (8) Public works and engineering; (9) Environment; (10) Logistics and transport; (11) Security; (12) Communications; (13) Economy; and (14) Education. These basic societal elements are linked together by a Coordinating and Control function provided by the respective governments. During a disaster, each of these elements will be affected (damaged) to a varying degree depending upon the nature of the event and the absorbing and buffering capacities of the respective elements of function in the affected society. The relative damage sustained to each of the component subelements may render the major societal

function inadequate. Thus, the interaction and relative impairment of any function can be depicted as a change from the pre-event status.

A series of three templates provides a structure for the study of disasters. Template (A) fits the aspects of a disaster into working units required for study. For the purpose of analysis, there is an absolute need to group the chronological, continuous mayhem of a disaster into recognizable, well-defined phases: (1) Pre-Event Status; (2) Event; (3) Assessments of Overall Damage; (4) Disturbances in Health Status; (5) Needs Assessment; (6) Responses; (7) Changes in Health Status; and (8) Restoration of Health Status. The endpoint of the management a disaster is the time when the pre-event situation for the societal function has been recovered. The second provides a structure and guidelines for the conduct of such studies, and the third provides a structure and guidelines for the design of such studies. The Guidelines presented in the two research/evaluation Templates outline the steps in detail for the performance of studies related to situations in that do not lend themselves to collection of experimental data collection. The Templates provide a structure for the design, conduct, and reporting of evaluations and research into disasters. Their use should enhance the reproducibility of the studies, and hence, increase the external validity of studies in a more complete and rapid fashion.

Two severity scores are proposed: (1) A Disaster Severity Score; and (2) A Health Disaster Severity Score. The use of the proposed severity scores will facilitate the comparison of the damage of disasters of similar severity and should facilitate the identification of factors that mitigate or intensify the effects.

A set of recommendations for implementation and testing of the Guidelines and their templates is provided. The Guidelines are a dynamic document. The application of these Guidelines should result in more efficient, efficacious, and cost-effective medical responses to disasters.

Keywords: benefit; conceptual framework; cost; damage; definitions; disasters; effectiveness; efficiency; evaluation; Guidelines; mitigation; preparedness; prevention; research; responses; severity scores; templates

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Guidelines for Evaluation and Research of Health Disaster Management in the Utstein Style — Progress and Outcomes

Prof. Marvin Birnbaum

Emeritus Professor of Medicine and Physiology, University of Wisconsin-Madison; Steering Committee, Task Force on Quality Management of Disaster Medicine; Editor-in-Chief, *Prehospital and Disaster Medicine*

Background: As noted in the preceding presentation by Dr. Sundnes, the development of Guidelines, thus far, have consumed eight years. The papers that follow have been based on the original version of the severity scores. Nonetheless, the basic findings have substantial implications for Disaster Medicine in that they demonstrate the potential utility of the use of severity scoring in Disasters: Events of different types may produce similar damage and dysfunction of the same basic societal functions. Further, a

given level of damage may or may not produce a disaster in different societies.

Progress: This presentation reviews each of the phases of the Disaster Template with emphasis on the following processes that are necessary to validate the concepts: (1) Fit previous reports and studies into the Template and re-analyze them in the context of the Template in order to identify similarities and differences; (2) Score the severity of the previously reported disasters that resulted from different events in terms of the overall disaster and the functional status of the medical and public health functions; (3) Revise the proposed severity scores in accordance with the findings from historical data; (4) Define similarities and differences between historical events; (5) Design and implement all new evaluation and research studies in accordance to the Guidelines; (6) Develop appropriate indicators of function and of adequacy of supplies that can be tested against historical and new data; and (7) Evolve mechanism for the collection, storage, maintenance of pre-event inventories for each of the basic societal functions with particular emphasis on the medical and public health functions. Appropriate example are used for each of these processes.

Expected outcomes from the use of the Guidelines include: (1) Gaining a progressively more accurate understanding of the pathophysiology of disasters; (2) Apply the knowledge gained into the prevention of events or mitigation of the damage and likelihood of disasters developing from specific hazards in a given society/culture; (3) Apply the knowledge obtained into the mitigation of unnecessary pain and suffering; (4) Optimize the use of limited resources to decrease the human, economic, and environmental costs of disasters; and (5) Enhance the ability of the persons in the multiple disciplines involved in disaster preparation and responses to communicate with each other.

Conclusions: The application and testing of the Guidelines and Templates must be initiated. The Guidelines are dynamic and will need to be adjusted following re-examination of historical data and design and implementation of new evaluation or research studies. Indicators must be defined and validated. The Guidelines will be refined progressively as we learn more and more of the pathophysiology of disasters.

Keywords: adequacy; comparison; design; disaster; evaluation; function; Guidelines; indicators; outcomes; pathophysiology; progress; review; research; scores; severity; supplies

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Assessment of Disaster Medical Responses Using the Utstein Template: Preliminary Comparison between the Great Hanshin Earthquake, West Tottori Earthquake in Japan, and the Chi-Chi Earthquake in Taiwan

Shinichi Nakayama; Yukibiro Watoh; Naoki Okada; Akira Takahashi; Hiroyuki Nakao; Yuji Maeda; Shigenari Matsuyama; Yutaka Omori; Masahiko Nakamura; Noboru Ishii

Department of Disaster and Emergency Medicine, Kobe University School of Medicine, Kobe, Japan; Kanazawa Medical University, Kanazawa, Japan