COMMENTARY

The Language of Disease Outbreaks, Disasters, and Public Health Emergencies: The Role of the US National Library of Medicine

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In a recent issue of this journal,[1] Posid, Goodman, and Khan, who are among the world's experts in public health and disaster medicine, emphasize the need to standardize and accurately classify the terminology used to describe a disease outbreak, such as might result from dispersion of *Bacillus anthracis*. They point out that using historical terms such as *naturally occurring* to classify an infectious disease outbreak is neither scientifically nor epidemiologically useful. The authors suggest various strategies to improve terminology for classifying outbreaks. Recommendations (singly or in combination) include categorizing infectious outbreaks as dichotomous—intentional or unintentional, nominal—newly emerging or well established, or ordinal—ranked by severity and the potential for person-to-person transmission.[1]

The authors indicated that their intent is to work within the disaster and public health community to create "an improved and more accurate terminology that public health agencies can use to develop and conduct the most rapid, efficient, and effective response strategies to interrupt infectious disease outbreaks." They encourage the readers to recommend strategies of classification and taxonomy that enhance clarity and utility in classifying infectious disease outbreaks.

THE NATIONAL LIBRARY OF MEDICINE

The National Library of Medicine (NLM)[2] Unified Medical Language System (UMLS)[3] and Medical Subject Headings (MeSH)[4] are resources for terminology describing biological outbreaks as well as other natural and manmade disasters, and may prove useful to the authors. The UMLS integrates and distributes key terminology, classification and coding standards, and associated resources to promote the creation of more effective and interoperable biomedical information systems and services.

MeSH is the NLM controlled vocabulary or thesaurus of descriptors in a hierarchical structure that aids searching the medical literature in PubMed at various levels of specificity. MeSH terms provide a consistent way to retrieve information that may use different terminology for the same concepts. MeSH may, therefore, be a useful reference to assist Posid et al in recommending new strategies for classification and taxonomy, as it responds to the medical literature and changes as terms evolve in the literature. As new terms enter into the published literature, MeSH adds those terms. Thus, when new classifications and terminologies are published and used in describing infectious disease outbreaks, or other types of disasters, MeSH responds. Once a MeSH term is defined, that term may become widely used and a de facto standard. Suggestions for additions or changes to MeSH can be sent to the NLM website (*http://www.nlm.nih.gov/mesh/meshsugg.html*).

We suggest that in addition to asking the public health community for suggestions for better taxonomies and terminologies to describe a biological outbreak, a first step should be to query the disaster literature and MeSH to identify the common terms currently used in PubMed.

THE DISASTER INFORMATION MANAGEMENT RESEARCH CENTER

The NLM Disaster Information Management Research Center (DIMRC),[5] with its network of disaster information specialist librarians,[6] can search the disaster literature for terminology, the frequency of use of a particular term, possible use of big data analytics,[7,8] and identify terminology that enhances descriptions of best practices and outcomes. Also helpful is the capacity of the MeSH thesaurus to recognize synonyms and cross-reference terms with the same meaning. For example, one can search "hurricanes," "cyclones," or "typhoons" in PubMed and MeSH will retrieve the same citations.

NLM coverage of disaster information dates from the earliest days of the Index-Catalogue, Library of the Surgeon-General's Office 1880-1961, the predecessor to PubMed. Use of disaster-related subject headings has changed and grown constantly to reflect the

changes in medical literature and practice. In 2008 to 2009, MeSH headings related to disasters were substantially reorganized. Also in 2008, NLM established the DIMRC within the Division of Specialized Information Services.[9]

The mission of DIMRC is to develop, collect, organize, and disseminate health information resources and technology for disaster preparedness, response, and recovery. DIMRC also trains and supports librarians to serve as disaster information specialists in support of their communities' disaster-related health information needs. DIMRC promotes the use of the scientific journal literature as well as gray (non-commercial) literature. One DIMRC database, *Disaster Lit: the Resource Guide for Disaster Medicine and Public Health* (*http://disasterlit.nlm.nih.gov/*), includes evaluations, field assessments, after-action reports, lessons learned, guidelines, and other forms of gray literature as a supplement to the commercially published literature in PubMed.

DIMRC also lists MeSH terms used in indexing disaster-related journal articles and tracks new terms added each year (*http://disasterinfo.nlm.nih.gov/dimrc/glossaries.html*). For example, the term *Influenza A Virus, H7N9 Subtype* was added in 2014. DIMRC has a web page of disaster glossaries, another rich source of terminology (*http://disasterinfo.nlm.nih.gov/dimrc/glossaries.html*).

At present, DIMRC is researching the use of virtual world technologies to train first responders and first receivers for incident response. When new taxonomies and terminologies are suggested, they can potentially be tested by trainees who are using virtual reality for immersive training. Trainees' experiences using new terms for disease outbreak classification can be compared to training (or past experience) using historical terms. Dichotomous, nominal, and ordinal systems alone or in various combinations can be tested and evaluated using virtual reality, allowing testing and feedback before final recommendations are made on changes to current terminology and classification.

The authors are to be congratulated for this important and timely article stressing the need to improve terminology for classifying infectious disease outbreaks.

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REFERENCES

1. Posid JM, Goodman RA, Khan AS. Classifying infectious disease outbreaks to improve timeliness and efficiency of response. *Disaster Med Public Health Prep*. 2014;8(1):89-94.
2. US National Library of Medicine. Databases. National Library of Medicine website. *https://www.nlm.nih.gov/*.
3. US National Library of Medicine. Unified Medical Language System. National Library of Medicine website. *http://www.nlm.nih.gov/research/umls*.
4. US National Library of Medicine. Medical Subject Headings. National Library of Medicine website. *http://www.nlm.nih.gov/mesh*.
5. US National Library of Medicine. Disaster Information Management Research Center. National Library of Medicine website. *http://disasterinfo.nlm.nih.gov*.
6. Featherstone RM. The disaster information specialist: an emerging role for health librarians. *J Library Admin*. 2012;52(8):731-753.
7. Gardner D. Healthcare turns to big data analytics for improved patient outcomes. ZDNet website; December 12, 2013. *http://www.zdnet.com/healthcare-turns-to-big-data-analytics-for-improved-patient-outcomes-7000024237/*.
8. Harness your data resources in healthcare. IBM Corp website. *http://www-01.ibm.com/software/data/bigdata/industry-healthcare.html*.
9. US National Library of Medicine. Specialized Information Services. National Library of Medicine website. *http://sis.nlm.nih.gov/index.html*.

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