

SYSTEMATIC REVIEW

Core Competencies in Disaster Management and Humanitarian Assistance: A Systematic Review

Alba Ripoll Gallardo, MD; Ahmadreza Djalali, MD, PhD; Marco Foletti, MD; Luca Ragazzoni, MD; Francesco Della Corte, MD; Olivera Lupescu, MD, PhD; Chris Arculeo, DipEP; Gotz von Arnim, Dipl-Ing; Tom Friedl; Michael Ashkenazi, MPhil, PhD; Philipp Fisher, MD; Boris Hreckovski, MD; Amir Khorram-Manesh, MD, PhD; Radko Komadina, MD, PhD; Konstanze Lechner, Dipl, PhD; Marc Stal, Dipl Geo; Cristina Patru, MD, PhD; Frederick M. Burkle, Jr., MD, MPH, DTM; Pier Luigi Ingrassia, MD, PhD

ABSTRACT

Disaster response demands a large workforce covering diverse professional sectors. Throughout this article, we illustrate the results of a systematic review of peer-reviewed studies to identify existing competency sets for disaster management and humanitarian assistance that would serve as guidance for the development of a common disaster curriculum. A systematic review of English-language articles was performed on PubMed, Google Scholar, Scopus, ERIC, and Cochrane Library. Studies were included if reporting competency domains, abilities, knowledge, skills, or attitudes for professionals involved disaster relief or humanitarian assistance. Exclusion criteria included abstracts, citations, case studies, and studies not dealing with disasters or humanitarian assistance. Thirty-eight papers were analyzed. Target audience was defined in all articles. Five references (13%) reported cross-sectorial competencies. Most of the articles (81.6%) were specific to health care. Eighteen (47%) papers included competencies for at least 2 different disciplines and 18 (47%) for different professional groups. Nursing was the most widely represented cadre. Eighteen papers (47%) defined competency domains and 36 (94%) reported list of competencies. Nineteen articles (50%) adopted consensus-building to define competencies, and 12 (31%) included competencies adapted to different professional responsibility levels. This systematic review revealed that the largest number of papers were mainly focused on the health care sector and presented a lack of agreement on the terminology used for competency-based definition. (*Disaster Med Public Health Preparedness*. 2015;9:430-439)

Key Words: disaster medicine education, competency-based education, professionalization, humanitarian aid

Globally, 2013 was characterized by 330 natural disasters.¹ The poorest countries are typically the most affected, with a total of 5 low- or lower-middle income countries among the top 10 in terms of disaster mortality. Aid workers are often required to operate within disrupted political systems with no pre-existing disaster plans² and to perform tasks that fall outside their area of expertise, especially the management of refugees and internally displaced populations, communicable diseases, and the lack of critical resources.³ Lessons learned from relevant disasters—such as Haiti (2010), the Asian tsunami (2004), the Haiyan Typhoon (2013), and the current Ebola virus disease tragedies in West Africa—call for attention to the limited capability of foreign medical teams to meet challenges posed by complex emergencies.⁴⁻⁹ These concerns have prompted the international community to devise means for the

development of both competence and professionalism within the humanitarian assistance sector.^{4,6}

Disaster response demands a large workforce with diverse professional disciplines, subspecialty categories, and levels of professional experience and cultural expertise. Regardless of their professional background, education for personnel operating in disaster situations should be based on the acquisition of task-related, profession-specific, and cross-disciplinary competencies obtained through accredited education and training programs implemented by academically affiliated centers.¹⁰⁻¹²

Competency-based education has already been implemented by several academic institutions worldwide. These programs traditionally build credibility based on the evaluation of trainees' subsequent performance.¹³

These educational initiatives often rely too heavily on competencies developed by single training programs and, as such, lack a “common standards” framework.¹⁴ However, in this study, we strongly suggest that an agreed-upon set of cross-sectorial competencies would best provide the basis for standardized educational program framework.^{10,12,15,16} This would allow for the assessment of aid workers’ performance and knowledge acquisition based on their designated tasks and would further ensure international recognition and best-practices comparison¹⁷ by regulatory stakeholders.¹⁴ Unfortunately, assessment of competency-based post-education and training skill sets has been sparse to date.¹⁸

This systematic review of peer-reviewed studies aims to identify existing competency sets for disaster management and humanitarian assistance that would serve as guidance for the development of a common disaster curriculum and content.

METHODS

Study Design

A systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist.¹⁹ The review included English-language papers published from January 2004 to January 2014 on PubMed, Google Scholar, Scopus, ERIC, and Cochrane Library.

Data Collection

A combination of the following keywords in the title was used: *Disaster/s* OR *Public health emergency/ies* OR *Crisis/es* OR *Humanitarian* OR *Complex emergency/ies* AND *Competency/ies* OR *Ability/ies* OR *Knowledge* OR *Attitude/s* OR *Skills* OR *Professionalization*. In addition, a grey-literature manual search was conducted to identify existing competency sets published on the websites of relevant universities, governmental organizations (GOs), nongovernmental organizations (NGOs), and other professional entities. Finally, an ancestry search was also performed to identify additional references on the reference section of the articles.

Inclusion Criteria

- Articles reporting competencies or competency domains, abilities, knowledge, skills, or attitudes for professionals involved in disaster relief or humanitarian assistance.

Exclusion Criteria

- Case studies;
- Abstracts;
- Citations;
- Articles not specifically related to abilities or performance;

- Articles not dealing with disasters or humanitarian assistance.

Titles and abstracts of the identified literature were scanned. Literature not complying with the inclusion criteria was excluded. The full text was obtained for uncertain articles, and references were independently screened and selected by two members of the research working group. When disagreement occurred, the opinion of a third reviewer was sought.

Data Analysis

References were described on the basis of their sectorial (eg, health, logistics, communication) and disciplinary approach (eg, emergency medicine, public health). Within a specific discipline, an additional distinction was made amongst different professional groups or *cadres* (eg, physicians, nurses, technicians) and proficiency levels (eg, informed worker/student, practitioner, and leader). Target audiences (eg, physicians, nurses, social workers) were also analyzed. Out of the selected papers, we described how many of them reported either competency domains, competencies, or sub-competencies. Additionally, we analysed the method used by authors to define the competency domains, competencies, and subcompetencies. When identified, performance objectives were also reported.

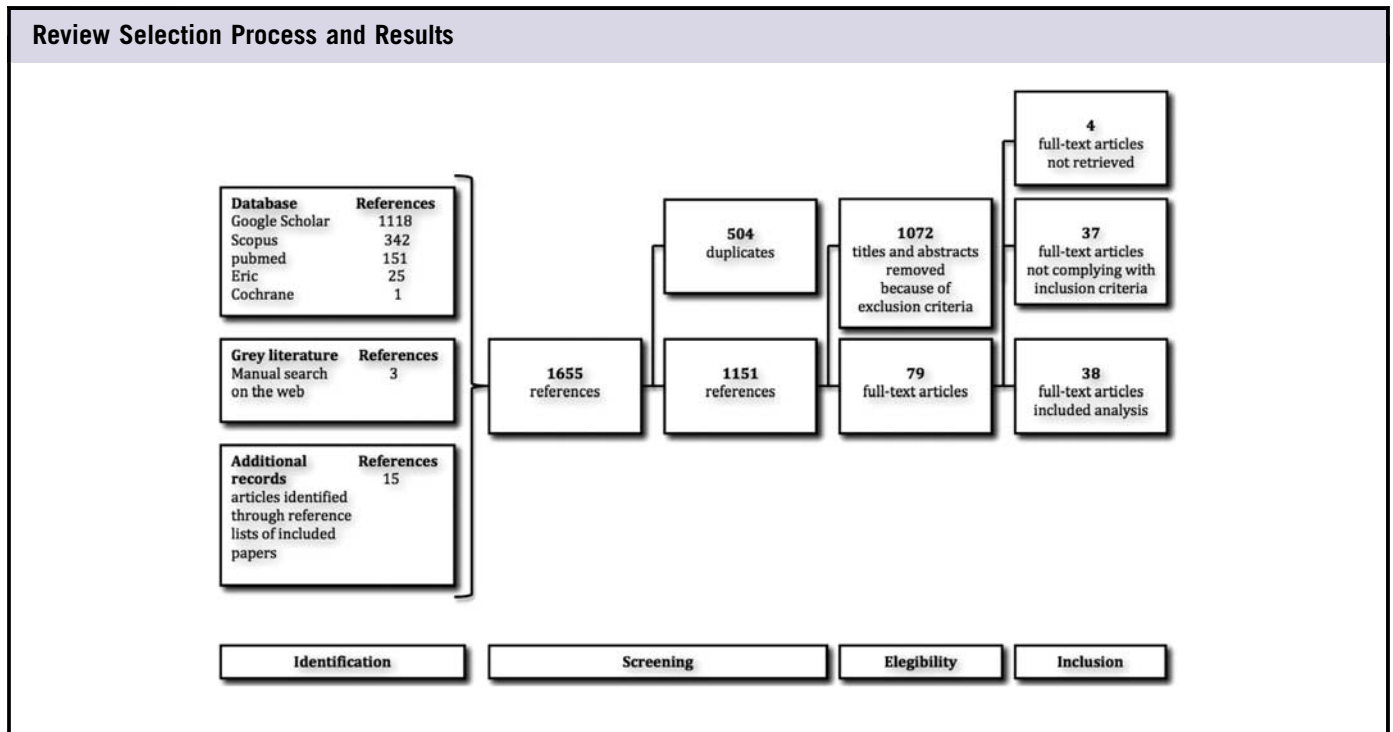
RESULTS

The search strategy yielded a total of 1637 references; 3 additional articles resulted from the manual search on the web, and 15 were drawn from the reference sections of other articles. After exclusion of duplicates, 1151 titles were identified for further screening. A total of 1072 titles and abstracts were removed according to the exclusion criteria. This resulted in 79 full-text articles; 4 full-text articles could not be retrieved, and 37 did not meet the inclusion criteria, leaving 38 references for analysis (Figure 1).^{2,4,5,14-16,20-51}

Twenty-seven references were peer-review articles,^{2,5,14-16,21,22,24,27-29,31-34,36,37,38-40,42,43,45,48-51} one was a book chapter,⁴ 4 were reports,^{25,26,41,44} and 6 were documents available on the websites of relevant organizations.^{20,23,30,35,46,47}

Articles were referred to a single sector references. Only 5 (13%) reported cross-sectorial competencies (Table 1).^{23,26,27,47,51} Most of the articles (81.6%) were health care specific (Table 2) and, among them, 1 reported competencies for military health care staff.⁴² Thirteen (34%) articles referred to a single discipline, 18 (47%) to at least 2 different disciplines, and 7 (18%) were determined to be unclear as to discipline specificity by the reviewers (Table 1). Eighteen articles (47%) included competencies for diverse professional groups. The most target audiences were nurses and disaster medicine and public health professionals (Table 3).

FIGURE 1



Of the articles reviewed that specified global humanitarian response, only 18 (47%) articles defined competency domains. However, most of them referred to suggestive and poorly defined labels such as competency subject areas,²² competency areas,⁴⁹ competency clusters,²⁶ and simply as competencies alone.^{33,35,41,46}

Thirty-six papers (94%) provided a list of competencies. Some authors named competencies as knowledge,^{25,51} competency description,^{31,41,49} skills,^{2,27,48,51} skills and knowledge,^{42,50} skills and traits,^{27,39} or behaviors.²⁷ Only 5 (13%) of the articles described subcompetencies and 5 (13%) defined performance objectives.^{15,16,34,40,46}

Thirty-one articles (81%) clearly described the method adopted to define competencies. A total of 19 (50%) used consensus-building,^{5,15,16,20,22–26,28,29,31–33,40,41,43,46} 3 articles identified competencies by survey or self-assessment questionnaires,^{27,37,48} 6 reported competencies based solely on a literature review,^{2,14,39,42,49,50} and 4 reported or adapted competencies originally described by previously published articles.^{4,21,36,38}

A total of 12 (31%) defined competencies based on professional “responsibility” levels; 1 article defined competencies for frontline professional staff,²¹ supervisory and management staff, health officials and governance boards, and senior level professional staff; 1 reported different levels of expected proficiency according to the disciplines being considered;²² 1 supplied additional behaviors for first-level line managers in

humanitarian response; and 2 included category-specific competencies for informed worker/students, practitioners, and leaders.^{5,24} One paper included competencies for basic-, mid-, and advanced-level personnel involved in both chemical and nonchemical environments;²⁵ finally, 1 split competencies into 4 different levels of performance.²⁶

DISCUSSION

This study reviewed the competencies published for professionals involved in disaster relief and humanitarian assistance regardless of their professional sector, discipline, role, or category.

Whereas the term *competency* embraces the set of knowledge, skills, and attitudes necessary to effectively and efficiently accomplish a task, this review revealed a lack of consensus even among the terminology used through different articles to define competency, competency domains, and so on. Likewise, a “competency statement” best describes the specific observable and measurable activities that individuals are able to perform.^{21,44,52} Thus, a competency statement would be expected to include an action verb, describing the level of performance (eg, apply, recognize), a description of the subject matter, type of performance, outcome performance, or specific operational task (eg, disaster response or recovery, public health emergency), and the context to which the competency statement is referred.^{21,52} To be effective, education and training require consensus on a set of core competencies with curricula based on a well-defined package of knowledge and skills. It is already well known that

TABLE 1

Summary of Data Extraction for the Selected Literature: ✓ Yes; O No; NS Not Specified

REF.	YEAR	TITLE	Target Audience Clearly Defined	Multi-Sectorial Approach	Multi-Disciplinary Approach	Multi-Professional Group Approach	Include Competency Domains	Include Competencies	Include Subcompetencies/Competency Descriptors	Include Performance Objectives	Define Responsibility/Proficiency Levels	Method Adopted for Competency Definition Clearly Stated
2	2013	Interprofessional non-technical skills for surgeons in disaster response: a literature review ²	✓	O	NS	O	O	✓	O	O	O	✓
4	2012	Cross-Disciplinary Competency and Professionalization in Disaster Medicine and Public Health ⁴	✓	O	✓	✓	O	✓	O	O	✓	✓
5	2008	A consensus-based educational framework and competency set for the discipline of disaster medicine and public health preparedness ⁵	✓	O	✓	✓	✓	✓	O	O	✓	✓
14	2010	A review of competencies developed for disaster health care providers: limitations of current processes and applicability ¹⁴	✓	O	✓	✓	✓	O	O	O	O	✓
15	2012	Core competencies for disaster medicine and public health ¹⁵	✓	O	✓	✓	O	✓	✓	✓	✓	✓
16	2012	Development of national standardized all-hazard disaster core competencies for acute care physicians, nurses, and EMS professionals ¹⁶	✓	O	O	✓	✓	✓	O	✓	O	✓
20	2010	Public health preparedness & response core competency model ²⁰	✓	O	O	✓	✓	✓	O	O	✓	✓
21	2008	Assessing competencies for public health emergency legal preparedness ²¹	✓	O	O	✓	✓	✓	O	O	✓	✓
22	2005	Preparing health professions students for terrorism, disaster, and public health emergencies: core competencies ²²	✓	O	✓	✓	✓	✓	O	O	✓	✓
23	2012	Core humanitarian competencies framework ²³	✓	✓	✓	✓	✓	✓	O	O	✓	✓
24	2010	Emergency preparedness and disaster response core competency set for perinatal and neonatal nurses ²⁴	✓	O	✓	✓	✓	✓	O	O	✓	✓
25	2011	Recommended hospital staff core competencies for disaster preparedness ²⁵	✓	O	✓	✓	O	✓	O	O	✓	✓
26	2006	Emergency capacity building project staff capacity initiative. Humanitarian competencies study ²⁶	✓	✓	✓	✓	✓	✓	O	O	✓	✓

Table 1. Continued

REF.	YEAR	TITLE	Target Audience Clearly Defined	Multi-Sectorial Approach	Multi-Disciplinary Approach	Multi-Professional Group Approach	Include Competency Domains	Include Competencies	Include Subcompetencies/ Competency Descriptors	Include Performance Objectives	Define Responsibility/ Proficiency Levels	Method Adopted for Competency Definition Clearly Stated
27	2011	Crisis management competencies: The case of emergency managers in the USA ²⁷	✓	✓	NS	NS	0	✓	0	0	✓	✓
28	2005	Development and implementation of a public health workforce training needs assessment survey in North Carolina ²⁸	✓	0	0	✓	0	✓	0	0	0	✓
29	2007	Expanding the public health emergency preparedness competency set to meet specialized local and evolving national needs: a needs assessment and training approach ²⁹	✓	0	0	✓	0	✓	✓	0	0	✓
30	2004	Core public health worker competencies for emergency preparedness and response ³⁰	✓	0	0	✓	0	✓	0	0	✓	NS
31	2006	Preparing nurses internationally for emergency planning and response ³¹	✓	0	✓	0	0	✓	0	0	0	✓
32	2008	Public health nursing competencies for public health surge events ³²	✓	0	0	0	0	✓	0	0	0	✓
33	2008	American College of Occupational and Environmental Medicine competencies ³³	✓	0	0	0	✓	✓	0	0	0	✓
34	2004	Predoctoral dental school curriculum for catastrophe preparedness ³⁴	✓	0	0	0	0	✓	0	✓	0	NS
35	2004	Develop nursing students' disaster competency by working with the american red cross ³⁵	✓	0	0	0	✓	0	0	0	0	NS
36	2005	Assessing bioterrorism and disaster preparedness training needs for school nurses ³⁶	✓	0	0	0	0	✓	0	0	0	✓
37	2012	Disaster Work in China: Tasks and Competences for Social Workers ³⁷	✓	0	0	0	✓	✓	0	0	0	✓
38	2005	Development of a training curriculum for public health preparedness ³⁸	✓	0	✓	NS	0	✓	0	0	0	✓
39	2012	What Skills Are Needed to be a Humanitarian Logistician? ³⁹	✓	0	0	NS	0	✓	0	0	0	✓
40	2006	Health care worker competencies for disaster training ⁴⁰	✓	0	✓	✓	0	✓	✓	✓	0	✓
41	2008	Integrating Emergency Preparedness and Response into Undergraduate Nursing Curricula ⁴¹	✓	0	✓	0	✓	✓	✓	0	0	✓

42	2013	Clinical skill and knowledge requirements of health care providers caring for children in disaster, humanitarian and civic assistance operations: an integrative review of the literature ⁴²	✓	0	✓	✓	0	✓	0	0	0	✓
43	2005	Disaster competency development and integration in nursing education ⁴³	✓	0	✓	0	✓	✓	0	0	0	✓
44	2009	ICN framework of disaster nursing competencies ⁴⁴	✓	0	✓	0	✓	✓	0	0	0	NS
45	2008	On academics: training for disaster response personnel: the development of proposed core competencies in disaster mental health ⁴⁵	✓	0	✓	NS	0	✓	✓	0	0	NS
46	2009	Napa County Public Health Division Public Health Preparedness ⁴⁶	✓	0	NS	0	✓	✓	0	✓	0	✓
47	2009	Humanitarian coordination competencies ⁴⁷	✓	✓	NS	0	✓	✓	0	0	0	NS
48	2011	A survey of the practice of nurses' skills in Wenchuan earthquake disaster sites: implications for disaster training ⁴⁸	✓	0	NS	0	0	✓	0	0	0	✓
49	2004	Emergency preparedness competencies: assessing nurses' educational needs ⁴⁹	✓	0	NS	0	✓	✓	0	0	0	✓
50	2012	Knowledge and skills of Emergency Care During Disaster For Community Health Volunteers: A Literature Review ⁵⁰	✓	0	NS	0	0	✓	0	0	0	✓
51	2004	Worker training for new threats: a proposed framework ⁵¹	✓	✓	✓	✓	0	✓	0	0	0	NS

TABLE 2

References Categorized by Targeted Sector

Sector	References
Multisector	23,26,27,47,51
Health care sector	2,4,5,14–16,20–22,24,25,28–36,38,40–46,48–50
Public/social welfare sector	37
Consumer goods/operational sector	39

TABLE 3

References Categorized by Targeted Audience

Audience	References
Social workers	37
Volunteers	50
Medical reserve corps	46
Humanitarian personnel	23,26,39,47
Crisis managers	27
Disaster workers	51
Military health care providers	42
Disaster medicine professionals	4,5,15,29,45
Public health professionals	4,5,10,15,20,21,28,29,30,38,45
Disaster health care professionals	14
Acute care medical professionals	16
Occupational and environmental physicians	33
Dentists	34
Surgeons	2
Hospital personnel	25,40
Nurses	24,31,32,36,43,44,48,49
Health students	22,35,41

competency-based education and training represents the cornerstone in the professionalization of disaster medicine and humanitarian aid.⁵³ Ultimately, definitional uniformity will also facilitate the establishment of this discipline at an operational level.

In a previous study, the disagreement in the terminology used among articles in defining these concepts was attributed to a general lack of understanding of the competency-based education framework or foundation building-process,¹⁴ sub-competencies, and performance objectives.

While competency statements include a broad description of a task, performance objectives describe a specific outcome that workers are expected to accomplish as a result of their work activity.⁵⁴ Furthermore, they define measurable goals that can be used to evaluate learning⁴⁰ and, therefore, are necessary to assess whether or not students gain new competencies as result of their participation in education and training programs. However, only a few among the selected articles reported performance objectives.

The lack of homogeneity in terms of competency definition and related characteristics—such as performance objectives or specific expected outcome—poses an additional challenge to educational designers in the field of humanitarian assistance and disaster management. A previous study showed, in fact, that only 61% of the educational and training initiatives offered in European countries have a competency-based curriculum design.⁵⁵

Little agreement on the terminology used was also found in the definition of proficiency levels within target groups. In 2011, an internationally accepted framework to define target audiences on the basis of their level of responsibility was developed: strategic-level (gold), tactical-level (silver), and operational (bronze).⁵⁶ A common terminology, would facilitate the ongoing standardization process in education, certification (among providers), and accreditation (among academic-affiliated education and training institutions) in disaster response and humanitarian assistance.

It is a well-recognized consensus that all the professionals involved in disaster preparedness and response (eg, search and rescue, fire brigades, etc) should receive specific training regardless of the professional sector to which they belong.⁵⁵

However, even if this literature review has been conducted through different search engines, including but not limited to medical databases, the vast majority of articles reviewed still reported competencies directed to the health care sector. Accordingly, similar results came from an analysis on training opportunities in mass destruction weapons (CBRNE), including the following professional sectors: general manufacturing, transportation, health care, emergency response, and skilled support.⁵¹

As such, this expanded the available competencies and resulted in considerably more training opportunities for health care workers compared to other professional sectors.

It is crucial to underline that while health care plays a relevant role in disaster response, education must also be extended to other actors equally involved in disaster management. Indeed, international standards on education and training in the field for disaster management emphasize that education and training programs should be both multi-disciplinary and transdisciplinary and based on a modular approach;⁵⁷ this strongly implies that the definition of *relevant competencies* must first consider the wide audience the education and training might include.

Most articles were nursing-centric. Since September 11, 2001, numerous efforts have been made to enhance preparedness within this specific professional group, as they are early responders to disasters, represent skilled human resources within the health sector, and play active roles in national preparedness plans.⁴³ Among the studies that included multi-disciplinary competencies, that of the American Medical

Association Center for Public Health Preparedness and Disaster Response provides a comprehensive consensus-based set of competencies that integrates all the health specialties involved in disaster medicine and public health.⁵

Supporting previous research, the majority of the competency sets were based on consensus building.¹⁴ However, surveys have also demonstrated a method to extract competencies, skills, and behaviors based on the opinion and field experience of a number of providers from the target audience. The combination of both methods could provide good evidence on the existing educational gaps from an academic and operational standpoint.

While searching peer-reviewed literature yielded a number of articles, several papers were reports, and others were web-based resources that were not accessible through the search engines utilized. This demonstrates that over the last decade, several competency sets for professionals working in disaster response and humanitarian assistance have been developed; however, some of them remain published as grey literature.

Limitations

This search was restricted to English-language articles, which might have narrowed our search spectrum; however, it is a comprehensive systematic review and covers most of competency-based disaster education and training elements in the studies reviewed.

This study only included articles published over the last decade. Related studies that could have supplied relevant information but fell outside this time period were not taken into consideration.

Even if it would have been useful and of great interest to develop a comprehensive competency framework on the basis of all the competencies provided by the articles reviewed, the huge number of competencies listed—along with the aforementioned lack of standard terminology—made this task difficult if not impossible to accomplish. However, it is hoped that this study will draw attention to the potential causes that currently prevent professionals in disaster medicine and humanitarian action from receiving a standardized and globally recognized education and training opportunities. The authors suggest that more directed research, discussions, and debates on the reasons for these gaps is required before the expected level of professionalism is realized.

CONCLUSIONS

This systematic literature review revealed a huge number of competencies published over the last decade for different professional sectors involved in disaster response and humanitarian assistance. Studies reviewed (both peer reviewed and grey literature) were mainly focused on the health care sector and presented a lack of agreement on the terminology used for competency-based definition and phrasing. The most

targeted discipline was nursing, and the main method adopted for competency development was consensus building. Further engagement to standardize competency-based education in disaster medicine and humanitarian assistance is needed; the development and validation of a common competency-framework for all the professionals involved in crisis response will represent a decisive step forward for professionalization and certification and will facilitate greater accountability, transparency, and performance oversight.

About the Authors

CRIMEDIM, Università del Piemonte Orientale, Novara, Italy (Dr Ripoll Gallardo, Dr Djalali, Dr Foletti, Dr Ragazzoni, Dr Della Corte, Dr Ingrassia); URGENTA, Clinical Emergency Hospital, Bucharest, Romania (Dr Lupescu); Hanover Associates, Teddington, London, UK (Mr. Arculeo); NHCS, National Health Career School of Management, Hennigsdorff/Berlin, Germany (Dipl-Ing von Amim, Mr Friedl); Bonn International Center for Conversion, Bonn, University Clinic Bonn Department of Orthopedics and Trauma Surgery, Bonn, Germany (Dr Ashkenazi, Dr Fisher); CROUMSA, Croatian Urgent Medicine and Surgery Association, Slav. Brod, Croatia (Dr Hreckovski); Prehospital and Disaster Medicine Centre, Sahlgrenska Academy, Gothenburg, Sweden (Dr Khorram-Manesh); SBC, General & Teaching Hospital Celje, Medical Faculty Ljubljana, Slovenia (Dr Komadina); German Aerospace Center (DLR), Oberpfaffenhofen, Germany (Dr Lechner); Global Risk Forum GRF Davos, Davos, Switzerland (Dipl Geo Stal); Clinical Emergency Hospital Bucharest, Romania (Dr Patru); and Harvard Humanitarian Initiative, Cambridge, Massachusetts (Dr Burkle).

Correspondence and reprint requests to Alba Ripoll Gallardo, Centro di Ricerca Interdipartimentale in Medicina d'Emergenza e dei Disastri (CRIMEDIM), Università del Piemonte Orientale Via Ferrucci 33/Via Lanino 1, 28100 Novara, Italy (e-mail: ripoll@med.unipmn.it).

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Conflict of Interest

There are no situations which this manuscript that may be perceived as conflict of interest or as a copyright constraint.

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