

Education and Training Initiatives for Crisis Management in the European Union: A Web-based Analysis of Available Programs

Pier Luigi Ingrassia, MD, PhD;¹ Marco Foletti, MD;¹ Ahmadreza Djalali, MD, PhD;¹ Piercarlo Scarone, MD;¹ Luca Ragazzoni, MD;¹ Francesco Della Corte, MD;¹ Kubilay Kaptan, PhD;² Olivera Lupescu, MD, PhD;³ Chris Arculeo;⁴ Gotz von Arnim, Dipl.-Ing;⁵ Tom Friedl;⁵ Michael Ashkenazi, MPhil, PhD;⁶ Deike Heselmann, MA;⁷ Boris Hreckovski, MD;⁸ Amir Khorram-Manesh, MD, PhD;⁹ Radko Komadina, MD, PhD;¹⁰ Kostanze Lechner, Dipl., PhD;¹¹ Cristina Patru, MD, PhD;¹² Frederick M. Burkle, Jr., MD, MPH, DTM;¹³ Philipp Fisher, MD⁷

1. CRIMEDIM—Università del Piemonte Orientale, Novara, Italy
2. Disaster Research Center (AFAM), Istanbul Aydin University, Istanbul, Turkey
3. URGENTA—Clinical Emergency Hospital, Bucharest, Romania
4. Hanover Associates, Teddington, London, United Kingdom
5. NHCS—National Health Career School of Management, Hennigsdorf/Berlin, Germany
6. Bonn International Center for Conversion, Bonn, Germany
7. University Clinic Bonn, Department of Orthopedics and Trauma Surgery, Bonn, Germany
8. CROUMSA—Croatian Urgent Medicine and Surgery Association, Slavonski Brod, Croatia
9. Prehospital and Disaster Medicine Centre, Sahlgrenska Academy, Gothenburg, Sweden
10. SBC-General and Teaching Hospital Celje, Medical Faculty, Celje, Slovenia
11. German Aerospace Center (DLR), Oberpfaffenhofen, Germany
12. Clinical Emergency Hospital, Bucharest, Romania
13. Harvard Humanitarian Initiative, Harvard University, Cambridge, Massachusetts USA

Correspondence:

Pier Luigi Ingrassia, MD, PhD
 Università del Piemonte Orientale –
 CRIMEDIM
 Via Lanino 1
 Via Ferrucci 33 Novara 28100 Italy
 E-mail: pierluigi.ingrassia@med.unipmn.it

Abstract

Introduction: Education and training are key elements of disaster management. Despite national and international educational programs in disaster management, there is no standardized curriculum available to guide the European Union (EU) member states. European-based Disaster Training Curriculum (DITAC), a multiple university-based project financially supported by the EU, is charged with developing a holistic and highly-structured curriculum and courses for responders and crisis managers at a strategic and tactical level. The purpose of this study is to qualitatively assess the prevailing preferences and characteristics of disaster management educational and training initiatives (ETIs) at a postgraduate level that currently exist in the EU countries.

Methods: An Internet-based qualitative search was conducted in 2012 to identify and analyze the current training programs in disaster management. The course characteristics were evaluated for curriculum, teaching methods, modality of delivery, target groups, and funding.

Results: The literature search identified 140 ETIs, the majority (78%) located in United Kingdom, France, and Germany. Master level degrees were the primary certificates granted to graduates. Face-to-face education was the most common teaching method (84%). Approximately 80% of the training initiatives offered multi- and cross-disciplinary disaster management content. A competency-based approach to curriculum content was present in 61% of the programs. Emergency responders at the tactical level were the main target group. Almost all programs were self-funded.

Conclusion: Although ETIs currently exist, they are not broadly available in all 27 EU countries. Also, the curricula do not cover all key elements of disaster management in a standardized and competency-based structure. This study has identified the need to

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Keywords: crisis management education and training; ELRHA; European Union; humanitarian health; professionalization

Abbreviations:

DITAC: Disaster Training Curriculum
 E-learning: electronic learning
 ECTS: European Credit Transfer and Accumulation System

ELRHA: Enhancing Learning and Research for Humanitarian Assistance
 ETI: educational and training initiative
 EU: European Union
 MOODLE: Modular Object-Oriented Dynamic Learning Environment
 WADEM: World Association for Disaster and Emergency Medicine

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develop a standardized competency-based educational and training program for all European countries that will ensure the practice and policies that meet both the standards of care and the broader expectations for professionalization of the disaster and crisis workforce.

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Introduction

Both the frequency of disasters and the population affected have increased during the last century, though the number of people killed because of disasters has decreased.^{1,2} In Europe, disasters have killed more than 120,000 people and have affected 33 million during the last three decades.³ To meet the multiple health needs of populations affected by disasters a well-prepared response system is necessary.⁴

Education and training are key elements of disaster preparedness.^{4,5} Knowledge of response, coordination, and integration of resources with other authorities are essential for each and every organization.⁶ Therefore, all professionals in different settings (eg, search and rescue, Emergency Medical Services, hospitals, fire brigades, etc) must be trained to contribute to disaster management activities and to practice standards of care with competency-based specialized knowledge and skills in critical situations.⁷⁻⁹ The Hyogo Framework, a worldwide strategy in disaster risk reduction, emphasizes the transfer of knowledge and expertise to strengthen disaster preparedness for an effective response to disasters at all levels.¹⁰

The essential role of first responders and managerial professionals during disasters underlines the need for standardized all-hazard disaster educational programs.^{11,12} As such, there have been both international and national attempts to develop educational curricula and materials for these professionals, with respect to disaster management.¹¹⁻¹⁵ However, while the number of disaster management educational programs continues to grow, there are no common standards upon which these programs are based.⁴

Disaster Training Curriculum (DITAC) is a research project funded by the European Commission under the 7th Framework Program.¹⁶ Its goal is to develop a holistic and standardized training curriculum for first responders and strategic/tactical crisis managers in the 27 European Union (EU) member states. In order to best inform first responders, crisis managers, and policy makers, DITAC identified that it must begin with a comprehensive review of existing disaster medicine and management education and training assets at the postgraduate level within the EU. This paper represents the initial phase of the process to meet professional competency within all EU countries required by DITAC.

Methods

Step I

Two researchers representing the DITAC working group performed a web search of Google (Google Inc., Mountain View, California USA) and Bing (Microsoft Corporation, Redmond, Washington USA) search engines using the terms (expressed in both English and French): [disaster], [crisis], [management], [education], [master], [diploma], and [certificate].

Considering the study objectives, inclusion criteria were defined as follows:

1. A postgraduate program;
2. Delivered by either an accredited academic center, or a national or international governmental institution;
3. Conducted in EU member states;
4. Awarding a certificate recognized, at a minimum, at a national level.

Forty-one representatives from all the EU countries working for national institutions involved in disaster management, and belonging to either the European Master in Disaster Medicine degree program¹⁷ faculty, or the alumni association who are involved in DITAC tasks, were contacted to submit additional relevant training courses that fulfilled the inclusion criteria. This process contributed 20 additional training courses that met the inclusion criteria and were integrated with the web search results.

Step II

A standardized online survey instrument was developed for the EU-based survey, hosted on SurveyMonkey (SurveyMonkey LLC, Palo Alto, California USA), and designed utilizing similar models from the 2011 Humanitarian Health Curriculum Survey issued by the Harvard Humanitarian Initiative for North America and the worldwide Enhancing Learning & Research for Humanitarian Assistance (ELRHA) scoping survey (2009 and 2011) of the International Working Forum on Humanitarian Professionalization.^{18,19} The survey was used to capture program data from each identified course's official webpage. Data were then analyzed in terms of key aspects identified by a consortium panel of experts from various DITAC/EU participating academic institutions.

Step III

The DITAC consortium utilized a 3-round web-based Delphi method to review the survey instrument and finalize the captured content/information. Modular Object-Oriented Dynamic Learning Environment (MOODLE Pty Ltd, Perth, Western Australia Australia) licensed, free open-source software was used as an e-platform and served as a repository of content and communication center.²⁰

The expert panel achieved consensus on a survey instrument made of seven open-ended questions and 18 multiple-choice questions (12 allowed a single answer and six were multiple choices). All the items were associated with one or more of the key aspects shown in Table 1.

Data Analysis

The official web pages of the identified training courses were analyzed using the online survey instrument to categorize the

Variable	Measurement
Geographical distribution	One or some of European Union member states
Granted certificate	1- Doctorate
	2- Master
	3- Postgraduate Diploma
	4- Postgraduate Certificate
	5- others
Delivery mode	1- On-site
	2- Distance E-learning
	3- Hybrid of them
Education and training method	1- Lecture
	2- Books & Papers
	3- Discussion-based exercises: seminars, workshops, games
	4- Operation-based exercises: drills, functional, full scale
Program description	1- Multidisciplinary
	2- Related on Health/Medicine
Core discipline	1. Management
	2. Hazard and Vulnerability analysis
	3. Logistics and Transportation
	4. Law and Ethics
	5. Protection and Safety
	6. Health care
	7. Research methods
	8. Public Health and Nutrition
	9. The European Community's Civil Protection Mechanism
	10. Urban Search and Rescue
	11. Mental Health
	12. Others
Curriculum design ¹⁸	1- Competency based
	2- Outcome based
	3- Objective based
	4- Situation-based

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Table 1. List of the Variables Evaluated in the Survey on Education and Training Initiatives, in Terms of Disaster Management, and in European Union Member States (continued)

Variable	Measurement
Duration	Month
Official language	One or some of EU languages
Academic credit system	1- ECTS
	2- M-level credits
	3- Credito Formativo Universitario (Italy)
Prerequisites	1- Field Experience
	2- Technical Education or Training
	3- To speak the Language of the Course
Target audience	1- Strategic level
	2- Operational level
	3- Tactical level
Funding	1- Yes
	2- No
Fee for the course	Euro

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Table 1 (continued). List of the Variables Evaluated in the Survey on Education and Training Initiatives, in Terms of Disaster Management, and in European Union Member States

information provided. Data were coded on a master sheet using a Microsoft Office Excel spreadsheet (Version 12.0, Microsoft Corporation, Redmond, Washington USA) and expressed as frequencies.

Ethical Consideration

On the basis of evaluation and report of the ethical subcommittee of DITAC, in this study, data was collected from websites to retrieve information about relevant training programs. The information within this research is publicly available on the internet, and therefore, ethics committee approval was not necessary.

Results

The review identified 140 educational and training initiatives (ETIs) which met the inclusion criteria in EU Member States (Table 2).

Geographical Distribution

Thirty-five percent of the identified ETIs were based in the United Kingdom, 14% in France, and 13% in Germany. The remaining 38% were based in 13 EU member states, while no ETIs were available in 11 EU countries (Figure 1).

Type of Certificate Granted

Out of 140 identified postgraduate ETIs, a master's degree was the most common certificate (52%) granted. Other types of certification (40%) also were granted, but particulars on these were not available (Figure 2).

Country	Program Title	Institution
Austria	Security and Safety Management	Donau Universität Krems
Austria	Emergency Services Management	Donau Universität Krems
Austria	Emergency Services Management	Donau Universität Krems
Austria	European NGO Management	Fachhochschule Kufstein
Austria	Socioeconomic and Psychosocial Crisis and Disaster Management	UMIT—The Health & Life Sciences University
Belgium	European Master in Disaster Medicine	Vrije Universiteit Brussel ^a
Denmark	Master of Disaster Management	Universities of Copenhagen & Lund
Denmark	Master of International Health	University of Copenhagen
Denmark	Master of Disaster Management	University of Copenhagen
France	Expertise in the Management of Emergency Health PgD	Université Paris Est Creteil
France	Capacity of Disaster Medicine	Université Paul Sabatier Toulouse III
France	Capacity of Disaster Medicine	Université Paris Descartes
France	Capacity of Disaster Medicine	Université de Lorraine
France	Capacity of Disaster Medicine	Université Montpellier 1
France	Capacity of Disaster Medicine	Université Lyon 1
France	Capacity of Disaster Medicine	Université Lille II
France	Sanitary Disasters PgD	Université Bordeaux Segalen
France	Sanitary Disasters PgD	Université Bordeaux Segalen
France	Capacity of Disaster Medicine	Université Amiens
France	Capacity of Disaster Medicine	Université Montpellier I
France	Capacity of Disaster Medicine	Université de Paris Est Creteil
France	Capacity of Disaster Medicine	Université Lille 2 Droit et Santé
France	Disaster Medicine	Université Claude Bernard—Lyon 1
France	Capacité de Médecine de Catastrophe	UFR de Médecine
France	Gestion des Catastrophes et des Risques Naturels	Université Montpellier III
France	Defence, Security and Crisis Management	IRIS SUP
France	Master Risk Management of Civil Protection	Ecole Nationale Supérieure des Officiers de Sapeurs-Pompiers
France	Master Management of Crisis of Global Security	Ecole Nationale Supérieure des Officiers de Sapeurs—Pompiers
France	Professional Master for the Global Risk and Disaster Management	Université Paris 1—Panthéon—Sorbonne
Germany	Seminar on Rural Development	Humboldt Universität Berlin
Germany	Integrated Flood Risk Management of Extreme Events	Technische Universität Dresden
Germany	Master in Integrated Safety and Security Management	Fachhochschule Bremerhaven

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Table 2. List of Identified Training and Educational Initiatives in European Union Member States in 2012 (*continued*)^adelivered by two academic centers from two countries.

Country	Program Title	Institution
Germany	Risk Management of Natural and Civilization Hazards on Buildings and Infrastructure	Technical University of Braunschweig
Germany	Environmental Health and Safety Risk Management	Neisse-University
Germany	Safety Technology	Fachhochschule Kaiserslautern
Germany	Global Change Ecology	Universität Bayreuth
Germany	International Master Study Program Global Change Management (GCM)	Eberswalde University for Sustainable Development
Germany	Natural Hazards Mitigation in Structural Engineering	Bauhaus Universität Weimar
Germany	Security and Fire Protection	Bergische Universität Wuppertal
Germany	Security and Fire Protection	Bergische Universität Wuppertal
Germany	Joint European Master's in International Humanitarian Action	Ruhr-Universität Bochum
Germany	Master in Disaster Management and Risk Governance	University of Bonn
Germany	Ecological Impact Assessment in Freshwater Ecosystems	Universität Koblenz-Landau
Germany	Ecological Impact Assessment in Freshwater Ecosystems	Universität Koblenz-Landau
Germany	Rescue-Engineering	Cologne University of Applied Sciences
Germany	Rescue-Engineering	Cologne University of Applied Sciences
Germany	Safety and Security	Hochschule Magdeburg-Stendal
Germany	Safety and Security	Hochschule Magdeburg-Stendal
Greece	Master's Course in International Medicine/Health Crisis Management	University of Athens
Hungary	Chief Medical Officer Seminar	National Ambulance Service
International	Major Incident Medical Management and Support (MIMMS) Course (COE-MED-M4-002)	NATO
International	NATO Medical Evaluation (MEDEVAL) Course (COE-MED-M4-003)	NATO
International	The International CBRN Training Curriculum	NATO
Ireland	Emergency Management – (M.Sc.)	Dublin City University
Ireland	MSc in Emergency Management	Dublin City University
Italy	European Master in Disaster Medicine	Università del Piemonte Orientale ^a
Italy	Executive Master in Civil Protection and Disaster Management	Stogea Business School
Italy	Master in Disaster Management and Civil Protection	Università Internazionale di Scienze Sociali
Italy	European and International Policies and Crisis Management	Università La Sapienza Roma
Latvia	Training Course in First Aid for Instructors	State Emergency Medical Service
Netherlands	Humanitarian Action	University of Groningen
Netherlands	Applied Earth Sciences, with Specialization in Natural Hazards and Disaster Risk Management	ITC University of Twente
Netherlands	Master of Arts in International Relations	University of Groningen

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Table 2. List of Identified Training and Educational Initiatives in European Union Member States in 2012 (*continued*)^adelivered by two academic centers from two countries.

Country	Program Title	Institution
Netherlands	Disaster Risk Management and Environmental Assessment for Spatial Planning	University of Twente
Netherlands	MSc in Crisis and Security Management	Universiteit Leiden
Slovakia	Preparation to National Board Exam in Emergency Medicine for physicians	Slovak Medical University
Spain	Master in Emergency and Disaster	University San Pablo CEU Madrid
Spain	Master's Degree in Emergency Nursing, Emergency, Disaster and Humanitarian Action	Grupo Samu
Spain	Master Universitario Modular en Medicina de Urgencias, Emergencias, Catàstrofes y Acciòn Humanitaria	Grupo Samu
Spain	International Master in Disasters, Emergencies and Humanitarian Aid	Fundacion Cultural y de Estudios Sociales
Spain	Graduate Certificate in Emergencies and Catastrophes	Universitat Autònoma de Barcelona
Spain	Master of Emergencies, Disaster and Humanitarian Aid	University of Seville
Spain	Master in Analysis and Emergency and Disaster Management	University of Oviedo
Spain	Master in Security, Crisis, and Emergency Management	University Research Institute Ortega y Gasset, Madrid
Spain	Post-degree in Disaster Medicine	University of Zaragoza
Spain	Specialist in Emergencies and Disaster Assistance	Universidade de Santiago de Compostela
Spain	Master of Counseling and Intervention in Emergencies and Disaster	University of Malaga
Spain	Nursing Specialist in Emergencies and Disaster	University of Cadice
Spain	Expert in Prevention and Management of International Crisis	Universidad Carlos III de Madrid
Spain	Graduate Certificate in Emergencies and Catastrophes	Universitat Autònoma de Barcelona
Spain	Specialization in Crisis Management	Universitat Oberta de Catalunya
Sweden	DEMC—Disaster and Emergency Medical Center	Stockholm Prehospital Centre
Sweden	Courses in Risk Management	Karlstad University, Karlstad Sweden
Sweden	Risk and Crisis Research Center	Risk and Crisis Research Center in Östersund-Sundsvall
Sweden	Emergency and Disaster Medicine	Acute and Disaster Medicine Center in Umeå
Sweden	Medical Disaster Preparedness	Prehospital and Disaster Medicine Center in Gothenburg
Sweden	Senior Instructor Course—Simulation Exercising in Disaster Medicine	Center for Teaching and Research in Disaster Medicine and Traumatology KMC Linköping Sweden
Sweden	MSB Exercises	Swedish Civil Contingencies Agency
Sweden	ICM—International Crisis Management Course	The Swedish National Defence College (SNDC)
Switzerland	Master of Advanced Studies in Natural Hazards Management (MAS NATHAZ)	Swiss Federal Institute of Technology
Switzerland	Master of Advanced Studies in Humanitarian Logistics and Management	MASHLM, Università della Svizzera Italiana
Switzerland	Master of Advanced Studies in Security Policy and Crisis Management (MAS ETH SPCM)	Swiss Federal Institute of Technology Zurich

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Table 2. List of Identified Training and Educational Initiatives in European Union Member States in 2012 (continued)

Country	Program Title	Institution
UK	Postgraduate Certificate in the Management of Passenger Transport Emergency Incidents	University of Wolverhampton, School of Health and Wellbeing
UK	Risk, Crisis and Disaster Management	University of Leicester, Department of Civil Safety and Security Unit, Institute of Lifelong Learning
UK	Post-graduate Certificate in Disaster and Emergency Management Systems	University of Hull, Institute for Chemistry in Industry
UK	Environmental Hazards & Geographical Information Systems	Coventry University
UK	MA in International Disaster Management	University of Manchester, Humanitarian and Conflict Response Institute (HCRI)
UK	International Crisis Management Association (ICMA) Courses	International Crisis Management Association (ICMA)
UK	Disaster Management MSc	Coventry University
UK	Disaster Management PgDip	Coventry University
UK	Disaster Management Pg Cert	Coventry University
UK	Emergency Planning and Management MSc	Coventry University
UK	Emergency Planning and Management PgDip	Coventry University
UK	Emergency Planning and Management PgCert	Coventry University
UK	MSc International Public Health	Liverpool School of Tropical Medicine
UK	MSc Humanitarian Health Program Management	Liverpool School of Tropical Medicine
UK	Msc Disaster Health Care (Online Delivery)	University of Glamorgan
UK	Postgraduate Certificate Emergency Planning Resilience and Response	University of Wolverhampton
UK	MSc Emergency Planning Resilience and Response	University of Wolverhampton
UK	Risk, Crisis and Disaster Management MSc	University Leicester
UK	MSc in Emergency Planning Management	University of Leicester
UK	Postgraduate Certificate in Disaster and Emergency Management	University of Hull
UK	Risk, Disaster and Environmental Management MSc	University of Huddersfield
UK	MSc in Earthquake Engineering with Disaster Management	University College London
UK	Disaster Management and Sustainable Development MSc	Northumbria University
UK	Shelter after Disaster PgCert	Oxford Brookes University
UK	Resilience PgCert	Cranfield University
UK	Resilience PgDip	Cranfield University
UK	Resilience MSc	Cranfield University
UK	International Disaster Management	Bournemouth University
UK	MSc Disaster Healthcare (Online Delivery)	University of Glamorgan
UK	Emergency Planning and Management PgCert	Coventry University
UK	Emergency Planning and Management PgDip	Coventry University

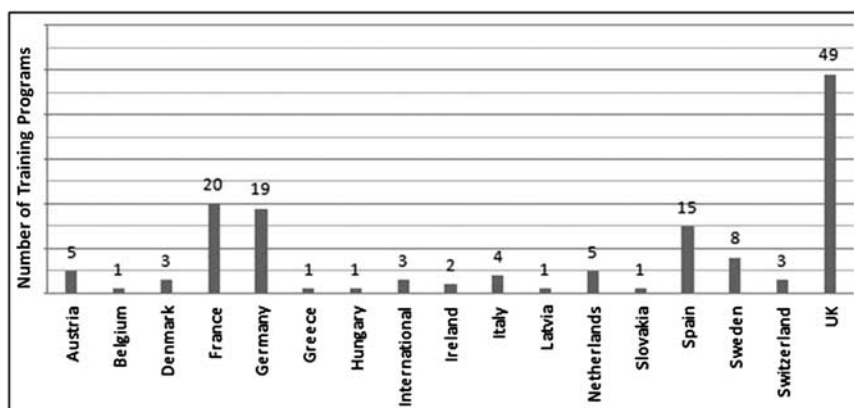
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Table 2. List of Identified Training and Educational Initiatives in European Union Member States in 2012 (continued)

Country	Program Title	Institution
UK	Emergency Planning and Management MSc	Coventry University
UK	Disaster Management Pg Cert	Coventry University
UK	Disaster Management PgDlp	Coventry University
UK	Disaster Management MSc	Coventry University
UK	Infrastructure in Emergencies (Distance Learning)	Loughborough University
UK	Infrastructure in Emergencies (Distance Learning)	Loughborough University
UK	Infrastructure in Emergencies (Distance Learning) MSc	Loughborough University
UK	MSc International Development and Humanitarian Emergencies	The London School of Economics and Political Science
UK	Risk Analysis MA MSc	Kings College London
UK	Disasters, Adaptation & Development Ma MSc	Kings College London
UK	Hazards and Disaster Management MSc	Kingston University London
UK	MRes in Science of Natural Hazards	University of Bristol
UK	MSc Crisis and Disaster Management	University of Portsmouth
UK	Masters in Global Health	University of Manchester
UK	Postgraduate Diploma in Global Health	University of Manchester
UK	Online Postgraduate Certificate in Global Health	University of Manchester
UK	MA in International Disaster Management	University of Manchester
UK	Risk, Crisis and Disaster Management MSc	University of Leicester

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Table 2 (continued). List of Identified Training and Educational Initiatives in European Union Member States in 2012



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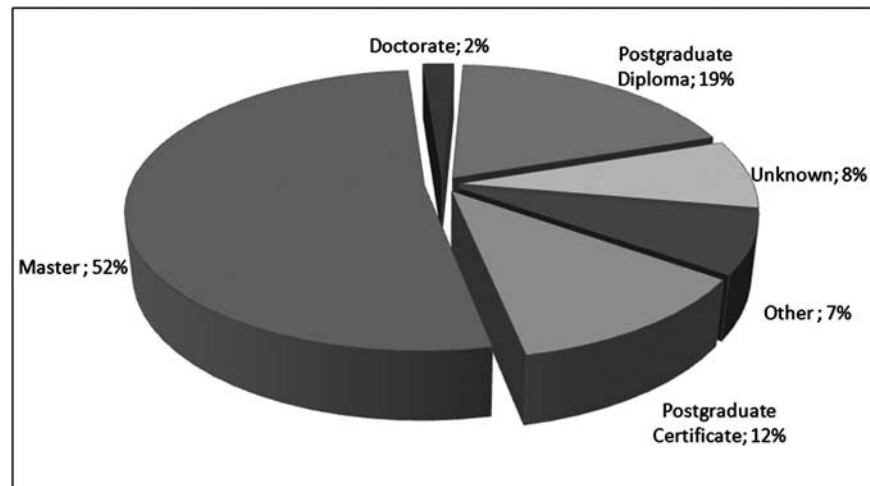
Figure 1. Geographical Distribution of Training Programs Distribution of identified educational and training programs in the European Union member states in 2012. One initiative is delivered by two academic centers from two countries (Italy and Belgium) *International* refers to international programs delivered by NATO.

Course Delivery Modality

On-site education was the most common delivery method for the ETI courses (67%). Both distance electronic learning (E-learning) (11%) and blended learning (14%) also were utilized. No information was provided in eight percent of the ETIs.

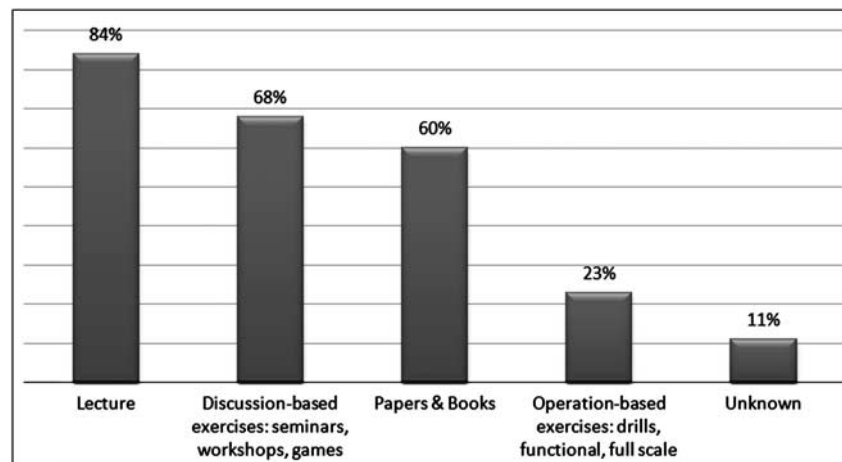
Education and Training Method

Frontal (face-to-face) lectures were used in 84% of the ETI programs. Discussion-based exercises, operation-based exercises, and required review of peer-reviewed publications and book chapters also were utilized (Figure 3). Furthermore, 66% of the



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Figure 2. Types of the Certification Granted by the Identified Education and Training Initiatives



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Figure 3. Teaching Methods Used in the EU Education and Training Initiatives

ETIs used a combination of theoretical content and exercises (either discussion-based or operation-based). However, both discussion-based and operation-based exercises were found in only 17% of ETI programs.

Program Description and Core Discipline

Seventy-one percent of the ETIs offered a multidisciplinary disaster management program, while in 20%, the topic content was exclusively health related. No information was available for nine percent.

Analysis of core disciplines offered identified that “management” was the most common subject (63%), followed by “hazard and vulnerability analysis” (58%). Other commonly offered topics were “logistics and transportation”, “law and ethics”, and “protection and safety” (Figure 4).

Curriculum Design

Sixty-one percent of ETIs had competency-based designs, 35% had objective-based curriculum designs, and one percent had situation-based designs.

Duration

Seventy-three percent of ETIs were full-time programs and 26% were part-time. Time to completion was 6-12 months in 66%, 13-24 months in 14%, and 24+ months in nine percent. No information was available for 11%.

Official Languages

Programs usually employed their host country language (eg, Italian, Swedish, etc) as the official language of the initiative. However, English was the most common language used (54%), followed by French (14%), German (12%), and Spanish (9%).

Academic Credit System

This study revealed that 43% of the ETI used the European Credit Transfer and Accumulation System (ECTS) as the academic credit system. M-level credits and Credito Formativo Universitario were used in three percent. The range of granted credits was 15-180 credits; however no information on the academic credit system was available in 54%.

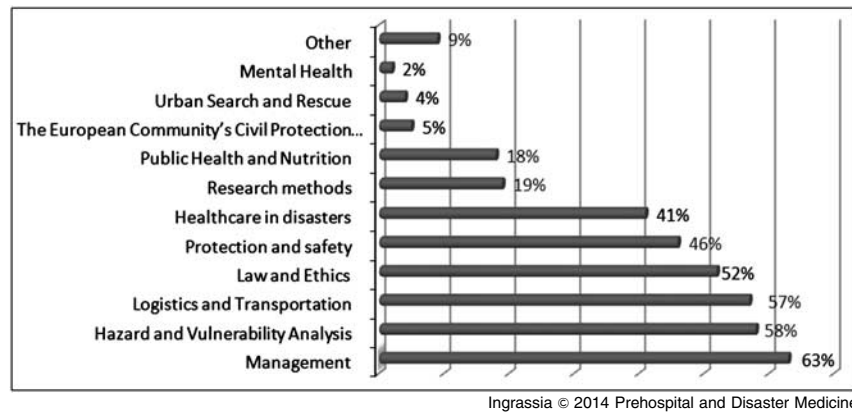


Figure 4. Distribution of Core Disciplines Used by EU Education and Training Initiatives

Participants' Prerequisites

In 18% of the ETIs, the applicants were required to have previous field experience. Having previous technical education or training was a prerequisite in 26%, and 80% required their participants to speak proficiently the official language of the course.

Target Audience

In 29% of the ETIs, the target group was strategic-level (gold) managers who represented the leaders/commanders, who were in overall charge of each service, and who were responsible for formulating the strategy for disaster/crisis management. In 39%, the target group was tactical-level (silver) personnel who represent responders who attend the crisis scene and are charged with the responsibility of formulating the tactics to be adopted by their service. In 22%, the target audience was personnel at the level where immediate "hands-on" work is undertaken at the crisis scene (operational or bronze). In three percent, both silver and bronze groups were the target audience for training. There was no available information for seven percent.

Tuition and Funding

Sixty three percent of the ETIs reported that their funding is self-sustaining through tuition paid by students. The average cost of ETI program funding was 6750€, with a range of 15- 49300€. Four percent of the training programs did not charge students a fee. No information was available for 33%. Financial support, in the form of as a scholarships or loans, was available for 29% of applicants.

Discussion

With respect to disaster and crisis management, this study identified 140 ETIs in the 27 EU countries. However, such instruction is available in only 16 countries, with only eight having more than one ETI program. Considering the geographical area (4,325,000 km²) and the population (500 million) of the EU, and the high economical and human impact of disasters in this area,³ there is lack of educational capability in the EU with respect to both the number of ETIs and their distribution. Recognizing that education and training are essential elements of capacity building in disaster management,¹⁰ it is necessary to enhance this capacity in the EU, to establish more ETIs in member states, especially in disaster-prone areas. This also fulfills the initial phase in a broader professionalization process in order to guarantee that EU

sponsored Foreign Medical Teams provide quality performance to global crises if called upon to respond.

Analysis showed that only 61% of the ETIs have a competency-based curriculum design. A competency-based approach is a necessity.^{21,22} To be effective, education and training in disaster management require consensus on a set of core competencies, with curricula based on a well-defined package of knowledge and skills.^{7,8} All professions in disaster management need staff competent in their specific areas of work, and the competency gaps must be integrated into training programs. The disaster training centers in the EU should have standardized, competency-based curricula and approach their ETI programs in order to fulfill professional needs.

Although one-fifth of the initiatives did focus on a unique subject, most of the ETIs were considered multidisciplinary disaster training programs. This is compatible with the international standards and guidelines on education and training in the field of disaster management, developed by the World Association for Disaster and Emergency Medicine (WADEM), which emphasizes that education and training programs should be multidisciplinary, case or scenario-based, and utilizing a modular approach.²² The results of this study showed that one-quarter of the identified ETIs used a computer-assisted learning methodology in terms of crisis management. Currently, there are several software programs available to provide an E-learning opportunity for students and instructors. The benefits of E-learning outweigh the limitations.²³ Disaster management is particularly suitable for E-learning because of E-learning's capability to present to trainees virtual and simulated disaster scenarios and relevant educational content which are often difficult to get from usual training methodologies.^{24,25} The use of E-learning methods by disaster training initiatives may enhance their capability to educate both managers and responders.

This study showed that the use of the operation-based learning is at low level compared to theory-based methods, including lectures, documents, and discussion. Education is best as a mixture of both theory and practice. However, available evidence is insufficient to determine whether a given training intervention (using lecture and documents in disaster preparedness) is effective in improving the knowledge and skills in disaster response.²⁶ Evidence-based disaster training and exercises can improve the effectiveness of disaster responders' performances, which are based on knowledge and skill, and demonstrate the capabilities and competencies.²⁶⁻²⁸ Currently, a balance between

theory and practice seems insufficient in European ETI programs. Spending more time and resources on the operation-based exercises may repair this gap to enhance the efficacy of training.

Many existing academic training programs result in a degree (Master or Doctorate). These programs can be more comprehensive and contain most of the core competencies; the graduate staff also can be deeply involved in the research and education with respect to disaster management. On the other hand, to attend an extended training program might be difficult for many disaster responders and managers. However, the most crucial achievement of educational objectives is the demonstration of core competencies in the course content, which may, in and of themselves, be related to both duration and broader opportunities for content adequacy of the training programs.²⁸ To increase the amount of competency-based content, specific short-term training courses create a suitable balance between long-term and short-term initiatives, which can be chosen by responders and managers, while considering time and cost of the choices available.

This study showed that the survival of most of the ETIs was dependent on the fee paid by students. High course fee, in addition to other relevant costs, such as travel and accommodation, can be barriers for the trainees. Using distance E-learning methods can diminish these barriers. In addition, financial support from governmental or nongovernmental organizations, as a capacity building action, can encourage potential trainees to attend and assist the ETI to develop more standardized training approaches and content.

Two most common core disciplines of the evaluated initiatives were “management” and “hazard and vulnerability analysis.” Although hundreds of competencies for disaster management have been developed, the universal acceptance of these competencies have not been validated.⁴ “Management” and leadership, as well as “hazard and vulnerability analysis,” are included as major components in the content of training curricula suggested by different studies.^{9,12,15,29} This study confirms these findings. However, it is worrisome that “mental health” was at a very low level of consideration in current ETI content in the EU. No one who experiences or responds to a disaster is untouched by its psychological impacts,³⁰ therefore considering “mental health” as a subject in both disaster preparedness programs and disaster training curricula is a necessity. A standardized competency set for disaster management should be developed to ensure acceptance by EU/ETI program planners.

This study showed that responders and managers of all three levels of response to disasters (strategic, tactical, and operational levels) were target groups of ETI programs in the EU. Although it seems that ETI could offer the courses on the basis of their institutional strengths or preferences, putting these three target groups together may enhance educational efficacy and result in higher coordination among different levels during disasters in some of the initiatives.

Few ETI programs in the EU consider prerequisites related to either previous field experience or technical education of the applicants. Some professionals may deal with basic emergencies in their routine work, and may also have disaster experience and knowledge; many others, however, may lack critical knowledge and experience with disasters.⁹ Considering training course content and objectives, the trainees should come together at the completion with a similar level of knowledge and skills. It is suggested that all initiatives clarify standardized prerequisites for the applicants. Most of the ETI are full-time programs.

Although being full time can result in more attention and effort by the trainees, it may prohibit attendance of the managers and responders in these types of programs.

English was not the language of all ETI programs. All 27 EU countries speak different languages. However, all multinational training initiatives should include English in their programs. Traditionally, both English and French are the recognized United Nations health languages.

Based on survey responses in this study, ECTS was the most common credit system used. Each academic credit or credit hour is a unit that defines the quantity, level, and time of student learning foreseen by educational institutions. A standardized and common credit system facilitates comparison among the training initiatives and institutions, and also improves student learning and choice. It is recommended that ECTS should be used by all ETI programs as the standardized credit system in Europe.

Limitations

Despite performing an in-depth search using several means, some relevant training courses could have been missed. In addition, there was, at times, a high rate of data missed on the identified initiatives. This is probably due to the lack of a comprehensive database for training and educational initiatives both at the EU and the national level. However, this is the first comprehensive study in the EU, and the results can be useful to identify and include the missed data. Furthermore, during the second phase of this study, the managers or coordinators of the initiatives were contacted to complete the requested documentation.

Queries performed in English and French may not have retrieved results provided in other languages or websites without English or French keywords. However, the DITAC partners were asked to contribute information on programs that are running in other languages in their countries.

Data extrapolated from each website were analyzed and categorized on the basis of a questionnaire which had not been validated to ensure it reflected the real situation with respect to disaster management requirements. However, there was consensus of the experts on the questionnaire items, and the study benefitted from the worldwide ELRHA project that served as a model for this survey.

Conclusions

This survey showed that there are currently 140 ETI programs in the EU member states, with the majority based in just a few countries. Most involve competency-based curriculum design, and the most common disciplines addressed are management and hazard/risk assessment. An E-learning method is not widely used in the EU countries. Although all levels of disaster management are covered by the initiatives, a few involve a combination of these levels in the same program.

This survey brought the EU/ETI programs, with respect to disaster management, together for the first time. Moreover, it showed relevant gaps and barriers. Characteristics of current ETI were analyzed, and they can be used to develop standardized training programs, based on core competencies, for different professionals in disaster management. As an objective of DITAC, the professional experience and contribution of the training centers in the EU may be used in the development of disaster core curriculum and establish a consortium-wide website that contains standardized educational material and core competencies. While DITAC has as its final goal to ensure that

all EU countries will have the capacity to respond to disaster and crisis events within the EU, a further, yet unstated, obligation is to guarantee that EU sponsored Foreign Medical Teams will also provide quality performance to global crises if called upon to

respond. In this regard, this process fulfills the initial phase in a broader professionalization process in which the EU becomes both a partner and stakeholder with other regional initiatives under the ELRHA global network.

References

1. Natural Disasters Trends. The international disaster database. <http://www.emdat.be/natural-disasters-trends>. Accessed November 20, 2012.
2. The Economic and Human Impact of Disasters in the last 12. PreventionWeb. http://www.preventionweb.net/files/25833_20120318disaster20002011v2.pdf. Accessed November 20, 2012.
3. Disaster Statistics: Europe. PreventionWeb. http://www.preventionweb.net/english/countries/statistics/index_region.php?rid=3. Accessed December 7, 2012.
4. Daily E, Padjen P, Birnbaum M. A review of competencies developed for disaster healthcare providers: limitations of current processes and applicability. *Prehosp Disaster Med.* 2010;25(5):387-395.
5. FEMA. Developing and Maintaining Emergency Operations Plans. <http://www.fema.gov/library/viewRecord.do?=&id=5697>. 2010. Accessed August 25, 2012.
6. Huntington MK, Gavagan TF. Disaster medicine training in family medicine: a review of the evidence. *Fam Med.* 2011;43(1):13-20.
7. Burkle Jr, FM. The development of multidisciplinary core competencies: the first step in the professionalization of disaster medicine and public health preparedness on a global scale. *Disaster Med Public Health Prep.* 2012;6(1):10-12.
8. Burkle Jr, FM, Walls AE, Heck JP, et al. Academic affiliated training centers in humanitarian health, Part 1: program characteristics and professionalization preference of centers in North America. *Prehosp Disaster Med.* 2013;28(2):1-8.
9. Walsh L, Subbarao I, Gebbie K, et al. Core competencies for disaster medicine and public health. *Disaster Med Public Health Prep.* 2012;6(1):44-52.
10. Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters. International Strategy for Disaster Reduction. <http://www.unisdr.org/2005/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf>. 2005. Accessed August 25, 2012.
11. Archer F, Seynaeve G. International guidelines and standards for education and training to reduce the consequences of events that may threaten the health status of a community. A report of an Open International WADEM Meeting, Brussels, Belgium, 29-31 October, 2004. *Prehosp Disaster Med.* 2007;22(2):120-130.
12. Schultz CH, Koenig KL, Whiteside M, et al. Development of national standardized all-hazard disaster core competencies for acute care physicians, nurses, and EMS professionals. *Ann Emerg Med.* 2012;59(3):196-208.
13. World Association for Disaster and Emergency Medicine. Health disaster management: guidelines for evaluation and research in the Utstein Style. Volume I. Conceptual framework of disasters. *Prehosp Disaster Med.* 2003;17(Suppl 3):1-177.
14. Collander B, Green B, Mollo Y, et al. Development of an "all-hazards" hospital disaster preparedness training course utilizing multi-modality teaching. *Prehosp Disaster Med.* 2008;23(1):63-67; discussion 68-69.
15. Subbarao I, Lyznicki JM, Hsu EB, et al. A consensus-based educational framework and competency set for the discipline of disaster medicine and public health preparedness. *Disaster Med Public Health Prep.* 2008;2(1):57-68.
16. Disaster Training Curriculum (DITAC). <http://www.ditac.info/>. Accessed May 10, 2012.
17. European Master in Disaster Medicine. <http://www.dismaster.com/>. Accessed December 7, 2012.
18. Walker P, Russ C. Professionalizing the Humanitarian Sector: A scoping study, ELRHA. 2010. http://www.elrha.org/uploads/Professionalising_the_humanitarian_sector.pdf. Accessed May 10, 2012.
19. Russ C. Global survey on humanitarian professionalization. 2012. <http://www.elrha.org/uploads/Global%20Humanitarian%20Professionalisation%20Survey.pdf>. Accessed May 10, 2012.
20. Moodle: Open-source software for producing internet-based courses. <http://moodle.com>. Accessed April 15, 2012.
21. Frank JR, Snell LS, Cate OT, et al. Competency-based medical education: theory to practice. *Med Teach.* 2010;32(8):638-645.
22. Seynaeve G, Archer F, Fisher J, et al. International standards and guidelines on education and training for the multi-disciplinary health response to major events that threaten the health status of a community. *Prehosp Disaster Med.* 2004;19(2):S17-S30.
23. Rainhorn JD, Smailbegovic A, Jieckak S. University training and education in humanitarian action. Geneva center for education and research in humanitarian action. http://www.cerahgeneve.ch/conferences/colloques/humanitarian_studies_guide.pdf. 2010. Accessed April 15, 2012.
24. Della Corte F, La Mura F, Petrino R. E-learning as educational tool in emergency and disaster medicine teaching. *Minerva Anesthesiol.* 2005;71(5):181-195.
25. Gillett B, Silverberg M, Roblin P, et al. Computer-facilitated assessment of disaster preparedness for remote hospitals in a long-distance, virtual tabletop drill model. *Prehosp Disaster Med.* 2011;26(3):230-233.
26. Williams J, Nocera M, Casteel C. The effectiveness of disaster training for health care workers: a systematic review. *Ann Emerg Med.* 2008;52(3):211-222.
27. Lynn M, Gurr D, Memon A, et al. Management of conventional mass casualty incidents: ten commandments for hospital planning. *J Burn Care Res.* 2006;27(5):649-658.
28. Standard Guide for Hospital Preparedness and Response, E2413-04. American Society for Testing and Materials, ASTM. 2009. <http://www.astm.org/Standards/E2413.htm>. Accessed December 9, 2012.
29. Hsu EB, Thomas TL, Bass EB, et al. Healthcare worker competencies for disaster training. *BMC Med Educ.* 2006, 20;6:19.
30. Disaster Mental Health for Responders: Key Principles, Issues and Questions. Center for Disease Control and Prevention. <http://www.bt.cdc.gov/mentalhealth/responders.asp>. Accessed December 9, 2012.