COMMENTARY

The Erice Charter on public health management of disasters. Conclusions of the 64th course of the International School of Epidemiology and Preventive Medicine "G. D'Alessandro"

LEILA FABIANI[1], ANTONIO MISTRETTA[2], GAETANO MARIA FARA[3], GIUSEPPE GIAMMANCO[4], CARLO SIGNORELLI[5], MOYSES SZKLO[6], FRANCESCO VITALE[7], THE 64TH COURSE CONTRIBUTORS[‡] AND PARTICIPANTS[§].

[‡]*the 64th course contributors:*

Camilla Lombardo[1], Francesco Barone Adesi[8], Alessandro Belpiede[9], Luigi Bertinato[10], Raffaele Bove[11], Paolo Calistri[12], Alessandra Casuccio[5], Claudio Costantino[5], Giordano D'Aloisio[1], Gianmarco De Felice[13], Donato Di Ludovico[1], Margherita Ferrante[7], Stefano Greco[14], Pasquale Lelio Iapadre[15], Marco Leonardi[16], Andrea Malizia[17], Franco Marinangeli[1], Carola Martino[18], Mario Muselli[1], Elisabetta Pierini[19], Fabrizio Ernesto Pregliasco[20], Silvio Tafuri[21], Elio Tolli[1], Martina Valente[8].

[1]University of L'Aquila, Italy; [2]University of Catania, Italy; [3]Sapienza University of Rome, Italy; [4]G. Garibaldi Hospital, Catania, Italy; [5]University Vita-Salute San Raffaele, Italy; [6]Johns Hopkins Bloomberg School of Public Health, Baltimore, USA; [7]University of Palermo, Italy; [8]University of Eastern Piedmont, Italy; [9]Italian Society of Artificial Intelligence in Medicine (SIIAM); [10]WHO European Office for Investment for Health and Development; [11]CeRVEnE – Regional Veterinary Reference Center for Non-Epidemic Emergencies, Italy; [12]"G. Caporale" Experimental Zooprophylactic Institute of Abruzzo and Molise, Teramo, Italy; [13]Roma Tre University, Italy; [14]Local Health Authority Teramo, Italy; [15]HPC4DR Consortium (High-Performance Computing for Disaster Resilience), Italy; [16]Department of Civil Protection, Health Resources Service, Italy; [17]Roma Tor Vergata University, Italy; [18]Italian Association for Disaster Medicine, Pisa, Italy; [19]European Centre for Disease Prevention and Control; [20]University of Milan, Italy; [21]University of Bari, Italy.

[§]*the 64th course participants:*

M. L. Abruzzese, University of Bari; S. Baldacci, University of Bari; A. Battaglia, Local Health Authority Ragusa; S. Battaglia, University of Bari; R. Bove, University of Foggia; G. F. Brafa Misicoro, Local Health Authority Ragusa; G. Branciforte, University of Catania; Y. Capozzo, University of Bari; E. D. Carnevali, University of Perugia; F. Contorno, University of Palermo; V. Crivello, University of Palermo; G. Cucè, University of Messina; D. D'Alessandro, University of Genova; F. Fiorito, University of Catania; L. Frati, University of Parma; M. Fusari, University of L'Aquila; S. Giurdanella, University of Catania; S. Gronseth, University of Cagliari; of Rome; D. Davì, University of Palermo; M. Di Matteo, University of L'Aquila; O. Ferrante, A. Guarcello, University of Palermo; A. Laganà, University of Messina; E. Langer, Tor Vergata University of Rome; G. Lauria, Local Health Authority Trapani; A. Lorenzon, University of Modena and Reggio Emilia; S. Loschi, Tor Vergata University of Rome; I. Magrì, University of Bari; G. Mangano, University of Catania; R. Mazzoli, University of Modena and Reggio Emilia; V. Nicosia, University of Catania; C. Noviello, University of Bari; I. Nuvolari Duodo, Polytechnic University of Milan; A. Palmeri, Local Health Authority Trapani; E. Pettini, University of Udine; A. Polsinelli, University of L'Aquila; G. Puglisi, University of Catania; A. Salzo, University of Molise; L. A. Saporito, University of Catania; L. Scaringella, University of Bari; I. Schenone, University of Genova; M. Scelfo, University of Palermo; S. Taroni, University of Parma; C. Vecchio, University of Catania.

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Correspondence: *Elio Tolli, MD / Department of Life, Health and Environmental Sciences, University of L'Aquila, Piazzale Salvatore Tommasi 1, 67100, L'Aquila, Italy /
E-mail: elio.tolli@graduate.univaq.it / ORCID: 0009-0001-4683-4102

ABSTRACT

The growing frequency and severity of disasters in today's epidemiological landscape place considerable strain on public health systems, highlighting the need to strengthen prevention, preparedness, and response capacities at a structural level. Evidence demonstrates that effective emergency management relies not only on technical expertise but also on coordinated governance, interdisciplinary integration, and strong institutional frameworks. Disasters exacerbate social inequalities, disproportionately affecting vulnerable populations, and underline the importance of inclusive and equitable health strategies. This paper introduces the framework of the *Erice Charter 2025*, which aims to enhance national capacities to prevent, prepare for, respond to, and monitor public health emergencies. Particular emphasis is placed on mass gathering risk assessment, integrated planning, and the management of population flows, including individuals with special needs. The Charter promotes a systemic approach grounded in interinstitutional collaboration, the One Health perspective, and the development of shared technical language and interoperable monitoring systems. Key priorities include strengthening professional training, improving emergency communication, and establishing standardized protocols based on comparable indicators. The creation of a permanent national observatory is proposed to address current gaps in long-term health impact assessment, enabling continuous monitoring and evidence-based policy development. Furthermore, the document underscores the importance of data transparency, coordinated information systems, and the active involvement of scientific societies and the third sector. Human resources management, operational planning, and simulation exercises are identified as essential components to ensure effective and timely responses. Prevention Departments and public health professionals are recognized as central actors in coordinating interventions and translating scientific evidence into practice. In conclusion, the *Erice Charter 2025* advocates for a paradigm shift in public health, where prevention and preparedness become structural pillars. By fostering resilience, integration, and continuous improvement, the proposed framework aims to strengthen health systems' capacity to mitigate disaster impacts and protect population health in both the short and long term.

Key words: disaster preparedness, public health systems, emergency management, risk assessment, health system resilience, one health approach

Introduction

The contemporary global epidemiologic landscape is characterized by an increasing frequency and severity of health crises and disasters, phenomena that produce direct and indirect health impacts and require a structural strengthening of the Public Health system's prevention and response capabilities (1). Climate change, environmental degradation, rapid urbanization, demographic transitions, and global interconnectedness have contributed to the emergence of increasingly complex emergencies, characterized by significant health, social, and economic consequences (2). According to the United Nations Office for Disaster Risk Reduction (UNDRR), disasters affect millions of people annually and disproportionately impact vulnerable populations, exacerbating existing inequalities and generating long-term health burdens (1).

Over the last decade, disasters have caused more than 700,000 deaths and affected over 1.5 billion people, producing profound direct and indirect health impacts (3). These events do not merely represent acute

disruptions; they impose multifaceted, long-term impacts on individual wellbeing, including physical damage to homes, financial setbacks, and a significant deterioration of mental health that persists well beyond the immediate aftermath (4). Longitudinal evidence suggests that while some indicators of happiness may recover relatively quickly, adverse effects on life satisfaction can remain statistically significant for at least four years, often mediated by diminished financial security (5). Scientific evidence, combined with local experience, demonstrates that effective emergency management requires not only technical expertise, but also a solid institutional framework, a coordinated governance, and the full integration of diverse professionals and disciplines. The issue of disasters therefore requires a broad, participatory vision, consistent with the principles of prevention. On one hand, the recent emergencies have highlighted the system's critical issues but also its potential: the fragility of exposed populations, the need for clear and coordinated communication, and the urgent need for adequate professionalism show how urgent is to increase knowledge, including the analysis of intervention methods and the evaluation of effectiveness. On the other hand, they demonstrate that collaboration between institutions, scientific societies, the third sector, and healthcare professionals can produce effective and sustainable responses, also contributing to the deepening and dissemination of necessary knowledge. It is therefore necessary to consolidate a culture of preparedness that cannot be episodic but structural, supported by training programs, field exercises, interinstitutional plans, a common language among all stakeholders, and continuous monitoring of the effectiveness of interventions and their impact on the health of populations affected by public health emergencies. The growing number of single-point or widespread disasters has highlighted how they constitute a powerful factor in amplifying inequalities and triggering crises for vulnerable or disadvantaged communities and/or groups (3).

Despite the growing human and economic costs, conventional disaster management has frequently been criticized for its fragmented nature and a historical reliance on reactive, episodic strategies (6). Public health systems, particularly in fragile contexts, are often pushed to a breaking point during acute phases, revealing critical vulnerabilities in workforce capacity, infrastructure adaptability, clear communication, and intersectoral coordination (2). A recognized knowledge gap exists regarding the long-term systemic perspective of disaster management; research has traditionally focused on individual psychological impacts or short-term recovery, often neglecting the institutional, structural, and systemic changes required to enhance future preparedness (4). In this context, mass gathering risk assessment is increasingly relevant, referring to the preventive and systematic evaluation of health risks associated with large population concentrations and potential evacuations. The safe management of population flows, including persons with disabilities or special needs, is a core component of preparedness and requires integrated planning, vulnerability assessment, interinstitutional coordination, and specific public health expertise. Planned or emergency events involving large numbers of people provide a concrete test of health systems' capacity to prevent adverse outcomes and ensure equitable protection (7).

To address these challenges, the scientific community and international bodies have advocated for a paradigm shift toward resilience-oriented frameworks (8). Resilience, defined as the capacity of a system to absorb shocks, maintain essential functions, and adapt to changing conditions, is now viewed as the critical connector between climate change adaptation, Disaster Risk Reduction (DRR), and sustainable development (9). Central to this evolution is the "One Health" approach, which recognizes the fundamental interdependence of human, animal, and environmental health, particularly in the emergence of zoonotic diseases (10,11). International directives such as the Sendai Framework for Disaster Risk Reduction (2015–2030) (3) emphasize the necessity of "Building Back Better" to ensure that post-disaster recovery serves as a catalyst for systemic strengthening rather than a return to the status quo (1,2). Furthermore, recent experiences have demonstrated the importance of interoperable monitoring systems, standardized indicators, and effective communication strategies to support timely decision-making and reduce adverse outcomes (12). Within this global strategy, the development of permanent and interoperable systems for observing and monitoring health impacts represents an essential tool

to support evidence-based prevention, preparedness, and recovery policies.

Public health emergency preparedness (PHEP) must therefore be understood as a complex adaptive system supported by training programs, field exercises, interinstitutional plans, and a common language among all stakeholders (13). This framework requires integrated governance, solid institutional networks, and leadership to facilitate interconnectivity, feedback loops, and self-organization among diverse actors, including scientific societies, the third sector, and healthcare professionals. Key elements for building such a system include robust risk analysis, the engagement of communities to foster trust, and the continuous evaluation of institutional learning. Furthermore, the management of disasters must place ethics and values—such as equity, transparency, and the duty to care—at its very core (14).

From this perspective, the Erice Charter 2025 proposes a framework to strengthen the country's capacity to prevent risks, prepare for critical events, respond to emergencies, and monitor health impacts in the medium and long term. This framework emphasizes the strategic role of Prevention Departments public health professionals as guarantors of the integration between epidemiology, healthcare organization, and risk management.

Objectives

Over the years, successive editions of the courses organized by the International School of Epidemiology and Preventive Medicine "G. D'Alessandro" have addressed a range of specific topics within the broader field of public health, resulting in scientific documents developed through the contributions of course directors, speakers and collaborators (15-18). The present document aims to complement this body of work by focusing on natural disaster prevention and preparedness, while reflecting the overarching public health perspective of the School.

The purpose of this Charter is to support a process of continuous improvement in emergency management, fostering a systemic approach that includes collaboration between institutions and scientific societies, improved training for professionals, the integration of skills within a One Health framework, the definition of a shared technical language, the development of permanent and interoperational systems for observing and monitoring health impacts, and the adoption of harmonized multilevel plans. The expected outcome is the consolidation of a public health system capable of anticipating risks, responding promptly, and effectively restoring the health of the affected population.

According with the Sendai Framework for Disaster Risk Reduction 2015–2030 (3), the development of permanent and interoperable systems for observing and monitoring health impacts represents an essential tool to support evidence-based prevention, preparedness, and recovery policies. Such systems contribute to achieving global targets for reducing disaster-related mortality and the number of people affected, while strengthening health systems' capacity to learn from experience and improve over time.

The text of the Charter

At the conclusion of the 64th Course "Prevention, Preparedness, and Disasters: What Role for Public Health?", faculty and students unanimously recognized the need for a renewed commitment to emergency management studies. Climate change, environmental degradation, urbanization, and community vulnerability contribute to making risk scenarios increasingly unpredictable and complex. Consequently, public health intervention cannot be limited to the emergency phase but must include prevention, mitigation, preparedness, response, and recovery. Currently, there is not a single structure or institution specifically responsible for post-disaster assessment, health status, and intervention effectiveness. Although there are studies, analyses, and research on the topic, these activities are voluntary and, more importantly, may remain unrecognized by the organizations responsible for emergency management. This highlights the need for structured and interoperable data-sharing networks across institutional levels, to support timely and evidence-based disaster management. A first key element is collaboration between scientific societies and institutions. This alliance must extend from the definition of strategic directions to the operational translation of scientific evidence, so

that research becomes an integral part of risk governance. Stable cooperation between these actors allows for harmonizing interventions, sharing tools, avoiding duplication, and increasing the healthcare system's response capacity. Shared protocols based on objective and comparable indicators are essential to assess health impacts across different disaster types and territorial contexts. Training emerges as a cornerstone of preparedness, addressing not only technical aspects but also the organizational, communication, and ethical dimensions that are particularly relevant in crisis situations. At the same time, the population must be empowered to understand risks, adopt appropriate behaviours, and actively participate in reducing the impact of disasters.

The complexity of emergency scenarios further requires a multidisciplinary approach, particularly considering the One Health principles. The health effects of disasters involve environmental, animal, and human systems, calling for the integration of diverse competencies. Within this framework, the contribution of the third sector must be recognized, valued, and effectively involved and coordinated.

To ensure the effectiveness of such collaboration, the development of a shared language is essential. Terminological and procedural fragmentation represents one of the major critical issues during response phases. Guidelines, operational glossaries, shared protocols, and information platforms should contribute to establishing a common communicative ground, which is fundamental for effective interventions.

Another priority aspect concerns the evaluation of health effects in the medium and long term. Disasters generate impacts that may emerge years after the acute event. It is therefore necessary to establish a permanent national observatory capable of collecting data, monitoring health indicators, assessing exposure, and guiding policies and interventions.

Such an observatory would address a gap widely recognized at the international level, where most monitoring systems remain focused on the acute phase of disasters. A longitudinal and prospective approach allows for the analysis of persistent health impacts, evolving care needs, and the effectiveness of recovery policies over time.

Emergency communication, as emphasized by both the literature and operational experience, represents a decisive factor. Uncoordinated, inaccurate, or non-professional communication can amplify health damage. Information management must therefore be entrusted to trained professionals capable of engaging with the media, the population, and institutional stakeholders.

A specific element of effective communication is data availability, ensured in full compliance with data protection and confidentiality requirements. Accessible data, based on shared protocols and objective indicators, are a tangible indicator of institutional transparency.

Human resources management represents an essential component of prevention and preparedness. Every intervention requires appropriately trained personnel operating within a clear organizational framework, supported by a well-defined and shared chain of command. The safety of responders is a non-negotiable objective and must be guaranteed at all operational stages, including through effective internal communication and shared strategic goals.

Planning activities must be conceived as tools to prevent disasters from evolving into public health emergencies. The development of integrated plans across institutional levels, regular updating of procedures, adoption of coherent guidelines, and incorporation of scientific research findings, and effectiveness evaluations, all contribute to reducing variability in interventions and improving response quality.

In this context, exercises are an indispensable means of testing plans, assessing coordination capacity, and verifying organizational efficiency. They also promote mutual understanding among professionals who, under real conditions, must operate together under time pressure and in complex settings.

Finally, particular importance is attributed to the role of Prevention Departments and public health physicians, who are inherently involved in every emergency. Prevention Departments should assume responsibility for planning, coordination, intervention evaluation, and scientific oversight. Public health physicians, in particular, may serve as key figures in risk management and in translating scientific evidence into practice.

The decalogue of the Charter

1. The need for scientific societies to engage in stable collaboration with institutions, sharing knowledge and expertise.
2. The fundamental role of training for both professionals and the general population, particularly in acquiring the new competencies introduced by innovative management and early-warning technologies, as part of a genuine culture of preparedness.
3. The recognition that disaster management requires a multidisciplinary One Health approach, including the involvement of third-sector organizations.
4. The requirement for a shared technical language to ensure effective communication among different professional groups.
5. The necessity of evaluating medium- and long-term health effects and establishing a permanent national observatory.
6. The recognition of the central role of emergency communication, to be entrusted to well trained professionals.
7. The importance of appropriate human resource management and a clear chain of command to ensure safety and coordination.
8. The strategic value of multilevel planning and the development of integrated guidelines, protocols, and emergency plans.
9. The importance of exercises as operational tools to test plans and strengthen interdisciplinary collaboration.
10. The crucial role of Prevention Departments in emergency management and of public health physicians as technical and scientific coordinators.

Conclusions

The 64th Course of the School of Epidemiology and Preventive Medicine reaffirms that prevention and preparedness can no longer be regarded as sectorial or marginal activities but must constitute a structural component of modern public health. The increasing number of catastrophic events, also linked to the profound climate changes observed in recent years, demands a cohesive, competent, and coordinated professional community capable of integrating diverse knowledge, tools, and approaches.

The Erice Charter 2025 represents a shared commitment to building a more resilient country, in which public health is able not only to respond to emergencies, but above all to prevent them and mitigate their effects, including in the medium and long term. The signatories commit to promoting the principles and directions outlined in this document within their respective institutional, academic, and professional activities.

We invite Municipalities, Regions, and Local Health Authorities to formally adopt the principles and directions set out in this document, through a specific resolution, as a reference framework for the planning, management, and evaluation of prevention, preparedness, and disaster response activities in the health sector.

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