
International Emergency Medicine: A Review of the Literature from 2007

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Abstract

The subspecialty of international emergency medicine (IEM) continues to grow within the United States, just as the specialty of emergency medicine (EM) continues to spread to both developed and developing countries around the world. One of the greatest obstacles, however, faced by IEM researchers and practitioners alike, remains the lack of a high-quality, consolidated, and easily accessible evidence-base of literature. In response to this perceived need, members of the Emergency Medicine Resident Association (EMRA) International Emergency Medicine Committee, in conjunction with members of the Society for Academic Emergency Medicine (SAEM) International Health Interest Group, have embarked on the task of creating a recurring review of IEM literature. This publication represents the third annual review, covering the top 30 IEM research articles published in 2007. Articles were selected for the review according to explicit, predetermined criteria that included both methodologic quality and perceived impact of the research. It is hoped that this annual review will act as a forum for disseminating best practices, while also stimulating further research in the field of IEM.

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This past year has seen many important developments in the field of international emergency medicine (IEM). This February, the Medical Council of India officially recognized the specialty of emergency medicine (EM), adding the world's second most populous country to the list of more than 30 nations that currently allow physicians to become board-certified in the specialty.¹ Interest among emergency physicians (EPs) and residents in the field of IEM continues to grow, as evidenced by the fact that the IEM sections and committees of the American College of Emergency Physicians (ACEP), the Society for Academic Emergency Medicine (SAEM), and the Emergency Medicine Resi-

dents Association (EMRA) all boast the highest membership of any section or committee within their respective organizations. Finally, the series of cyclones and hurricanes that killed thousands and displaced millions of people in South Asia, East Africa, and Central America over the past year remind us of the continued need for improved international disaster and humanitarian response.

As interest in EM continues to grow around the world, and as IEM continues to flourish as its own subspecialty in the United States, the need for more and better-quality IEM research is more urgent than ever. Recognizing this need, EMRA IEM Committee, with mentorship from members of the SAEM International Interest Group, developed an annual review of the IEM literature. This review, now in its third year, compiles a diverse array of articles, drawn from a variety of different fields and encompassing several languages, that have the potential to impact some aspect of IEM. This review is not intended to serve as a systematic review for clinical guidance, nor is it a comprehensive repository of all literature relevant to IEM. Instead, we hope that it will assist IEM academics and practitioners alike to stay up to date on the latest research in the field, while also spurring ideas for further research and collaboration.

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One of the most difficult aspects of conducting a review of the IEM literature remains defining the boundaries of the field. We included topics falling into one of two categories: development of emergency medical care systems in both developed and developing nations and provision of direct patient care during humanitarian and disaster relief efforts. Emergency medical care development encompasses clinical, educational, and systems components at both the national and the local levels. Included within this rubric are efforts as diverse as developing a national disaster relief plan, creating a citywide emergency medical services (EMS) system, and training rural health practitioners to provide basic emergency services. The field of humanitarian relief also encompasses several different domains, including disaster assessment, organizational response, treatment guidelines, mitigation, and ongoing monitoring. We also include articles related to preparation for and response to disease outbreaks and issues relating to the management and provision of services in refugee camps.

METHODS

Based on our prior experience and comments from readers, we updated our list of search terms for our 2007 review. Similar to prior years, our search included both a list of “international” terms, including *world health, developing countries, international, global, tropical medicine, third world, middle income countries, and low income countries*, and a set of “emergency” terms, including *emergency medicine, emergency medical services, prehospital, acute disease, critical illness, emergencies, wounds and injuries, relief work, rescue work, disasters, refugees, disease outbreaks, multiple trauma, triage, humanitarian, war, vulnerable populations, conflict, and emergency treatment*. We performed an Ovid search of Medline for articles published in 2007 containing at least one “international” term and one “emergency” term. We limited our search to articles published in English, French, German, or Spanish, based on the language capabilities of our team of reviewers. The search produced 865 articles, of which 822 were in English, 21 were in French, 16 were in German, and 6 were in Spanish.

The 865 citations were divided up among our 14 reviewers, with each citation and abstract reviewed by at least 2 reviewers. Eighty-one articles deemed by at least 1 reviewer to be relevant to the field of IEM were abstracted for full text review. In addition, our reviewers performed a hand search of all the articles published in *Academic Emergency Medicine, Annals of Emergency Medicine, Emergency Medicine Journal, the European Journal of Emergency Medicine, and the Journal of Emergency Medicine*, in 2007. The hand search identified 23 additional articles relevant to the field of IEM, for a total of 104 articles selected for full review.

Each article selected for full text review was read by two separate reviewers and graded based on a set of eight predetermined criteria, including five methodologic criteria and three impact criteria used in our prior reviews (Table 1). For original research articles and

Table 1
Review Criteria

Quality	
Study objective	Did the study authors develop a clear hypothesis or purpose prior to undertaking the study?
Study design	Was it an observational study/ randomized controlled trial or a cross-sectional survey? Were random samples or convenience samples used?
Quality control	Were routine quality control checks performed on the data? Do the methods specify how study staff were trained?
Data analysis	Were the correct statistical tests used to analyze the data and were the results statistically significant?
Research ethics	Was the study approved by a local/international institutional review board? Did it follow standard ethical practices (i.e., Declaration of Helsinki)?
Importance	
Overall significance	Was the study objective meaningful? Were the differences measured “clinically significant” in the population studied?
External validity	Would the results and conclusions of the article likely apply to a diverse range of international settings?
Likely impact	Would the conclusions of this article, if widely publicized, be likely to affect IEM practice?
IEM = international emergency medicine.	

meta-analyses, the reviewers gave each article a score of 1–5 for each of the predetermined criteria, for a maximum score of 40. To adjust for the fact that non-original research articles had lower scores than original research articles, because several of the methodologic criteria did not apply to nonoriginal research articles, we calculated an average percentage score for each article by dividing the average total score for the article by the maximum possible points for the article type. The total scores for each article from each of the two separate reviewers were averaged together to create an average total score for each article.

For our final review, we chose to include articles with an average percentage score of 70% or greater. Thirty articles met this criterion and were formally reviewed by both an EM resident with international experience and a faculty editor with extensive knowledge and experience in the field of IEM.

RESULTS

The results of our IEM literature review are presented in Table 2.^{2–31} The articles are listed alphabetically by the name of the lead author. An annotated bibliography, including a summary and critical analysis of each article, can be found in Data Supplement S1, available as supporting information in the online version of this paper.

Table 2
Top 30 IEM Articles of 2007

Author	Title	Journal	Location
Alagappan et al. ⁶	International emergency medicine and the role for academic emergency medicine.	Acad Emerg Med	International
Beck-Razi et al. ¹³	The utility of focused assessment with sonography for trauma as a triage tool in multiple-casualty incidents during the second Lebanon war.	J Ultrasound Med	Lebanon
Blackwell and Bosse ¹²	Use of an innovative design mobile hospital in the medical response to Hurricane Katrina.	Ann Emerg Med	United States
Cherpitel ¹⁸	Alcohol and injuries: a review of international emergency room studies since 1995.	Drug Alcohol Rev	Multiple
de Guzman et al. ¹⁹	A survey of the use of foreign-purchased medications in a border community emergency department patient population.	J Emerg Med	United States
Diez Roux et al. ²⁰	Intraurban variations in adult mortality in a large Latin American city.	J Urban Health	Argentina
El-Chemaly et al. ²¹	Hospital admissions after pediatric trauma in a developing country: from falls to landmines.	Int J Inj Contr Saf Promot	Lebanon
Eytan et al. ¹⁴	Transcultural validity of a structured diagnostic interview to screen for major depression and posttraumatic stress disorder among refugees.	J Nerv Ment Dis	Switzerland
Garfield ¹¹	Measuring humanitarian emergencies.	Disaster Med Public Health Prep	International
Gomez et al. ⁸	Management and analysis of out-of-hospital health-related responses to simultaneous railway explosions in Madrid, Spain.	Eur J Emerg Med	Spain
Handel et al. ²²	Improving rural access to emergency physicians.	Acad Emerg Med	United States
Hiltunen et al. ²³	Prehospital emergency care and medical preparedness for the 2005 World Championship Games in Athletics in Helsinki.	Prehosp Disaster Med	Finland
Hsieh et al. ¹⁵	Impact of quarantine on the 2003 SARS outbreak: a retrospective modeling study.	J Theor Biol	Taiwan
Hupert et al. ¹⁶	Anticipating demand for emergency health services due to medication-related adverse events after rapid mass prophylaxis campaigns.	Acad Emerg Med	International
Jang et al. ²⁴	Can the Broselow tape be used to estimate weight and endotracheal tube size in Korean children?	Acad Emerg Med	Korea
Larrance et al. ²⁵	Health status among internally displaced persons in Louisiana and Mississippi travel trailer parks.	Ann Emerg Med	United States
Laverick et al. ⁹	Asian earthquake: report from the first volunteer British hospital team in Pakistan.	Emerg Med J	Pakistan
Lerner et al. ²	A comprehensive framework for determining the cost of an EMS system.	Ann Emerg Med	International
Morse ¹⁷	Global infectious disease surveillance and health intelligence.	Health Aff. (Millwood)	International
Nicholl et al. ²⁶	The relationship between distance to hospital and patient mortality in emergencies: an observational study.	Emerg Med J	United Kingdom
Roudsari et al. ³	International comparison of prehospital trauma care systems.	Injury	Multiple
Rutland-Brown et al. ²⁷	Traumatic brain injuries after mass-casualty incidents: lessons from the 11 September 2001 World Trade Center attacks.	Prehosp Disaster Med.	United States
Savadogo et al. ²⁸	Management of severe acute malnutrition in an urban nutritional rehabilitation center in Burkina Faso.	Rev Epidemiol Sante Publique	Burkina Faso
Schreiber et al. ²⁹	Early predictors of massive transfusion in combat casualties.	J Am Coll Surg	Iraq
Singer et al. ³⁰	Medical lessons from terror attacks in Israel.	J Emerg Med	Israel
Telford and Cosgrave ⁷	The international humanitarian system and the 2004 Indian Ocean earthquake and tsunamis.	Disasters	Multiple
Ungchusak et al. ³¹	The need for global planned mobilization of essential medicine: lessons from a massive Thai botulism outbreak.	Bull World Health Organ	Thailand
Vanholder et al. ¹⁰	Earthquakes and crush syndrome casualties: lessons learned from the Kashmir disaster.	Kidney Int	Pakistan
Walker et al. ⁴	Trends and challenges in international pediatric emergency medicine.	Curr Opin Pediatr	International
Wilson and Itagaki ⁵	Characteristics and trends of published emergency medicine research.	Acad Emerg Med	International

EMS = emergency medical services; SARS = severe acute respiratory syndrome.

DISCUSSION

The 30 articles chosen for this year's review represent the full diversity of topics included within the rubric of IEM. They come from more than a dozen different countries and were published in a wide variety of journals spanning the medical and public health literature. Reading carefully through the list, however, a few coherent themes seem to emerge, including the development of EM and out-of-hospital systems, the delivery of humanitarian aid during natural disasters, and the use of computer modeling as a tool for outbreak planning.

Several articles focused on the development of EM and EMS around the world. Lerner et al.² devise a model for estimating the cost of introducing an EMS system into a country, while Roudsari et al.³ attempt to compare outcomes between countries utilizing a physician-based EMS system and those utilizing an advanced cardiac life support-trained paramedic-based EMS system. Walker et al.⁴ focus on the development of international pediatric emergency medicine, a field still in its infancy throughout most of the world. Wilson and Itagaki⁵ evaluate the international EM literature itself, estimating the relative proportion of EM research published in various countries and types of journals, as well as common (and uncommon) funding sources of EM research. Finally, Alagappan et al.⁶ provides a commentary on how academic EPs can best aid their colleagues around the world in developing the specialty.

Several authors turn a critical eye toward the field of humanitarian relief, analyzing the performance of the humanitarian community in several recent disasters and offering prescriptions for improvement. Telford and Cosgrave⁷ provide a critical evaluation of the humanitarian relief provided during the 2004 Indian Ocean Tsunami, noting several important deficiencies in the international response. Gomez et al.⁸ gathered together a panel of firsthand responders to the March 2004 Madrid terrorist bombings, to rate the quality of 13 different aspects of the care provided. Finally, Laverick et al.⁹ and Vanholder et al.¹⁰ each discuss issues related to the 2006 Pakistan earthquake from the point of view of two different international response teams providing assistance on the ground.

A number of articles focus on the development of new tools that can be used to aid providers during disasters and complex emergencies. To more systematically evaluate and rate disasters or complex emergencies, Garfield¹¹ created a scoring system based on four epidemiologic variables that can be used to objectively rate the humanitarian need, providing policy-makers with a better way to apportion limited humanitarian aid resources. Blackwell and Bosse¹² describe an innovatively designed mobile hospital that was able to respond to the variety of health needs in the aftermath of Hurricane Katrina. Eytan et al.¹⁴ provide transcultural validation of an instrument developed to detect major depression and post traumatic stress disorder in disaster survivors, while Beck-Razi et al.¹³ discuss the use of ultrasound as a triage tool for mass casualty incidents during the second Israeli-Lebanon war.

Two studies use computer modeling as a tool for investigating the effects of an infectious disease outbreak. Hsieh et al.¹⁵ model the effects different quarantine strategies would have had on the 2003 severe acute respiratory syndrome (SARS) outbreak in Taiwan; Hupert et al.¹⁶ estimate the expected demand for emergency health services due to an anticipated mass prophylaxis campaign in the wake of an anthrax or smallpox outbreak. Finally, Morse¹⁷ provides an overview of the currently operating global infectious disease surveillance systems, noting a variety of deficiencies in these systems that might leave populations vulnerable in the setting of an outbreak.

CONCLUSIONS

The studies included in our review span the breadth and depth of the burgeoning new field of IEM. Although not intended to be a complete repository of all the important IEM literature, we anticipate that our review will provide IEM practitioners with information on the most recent evidence in their field and IEM academics with ideas for new research and collaboration.

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APPENDIX A

EMRA International Emergency Medicine Literature Review Group Members:

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Supporting Information

The following supporting information is available in the online version of this paper:

Data Supplement S1. IEM reviews for 2007.

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