Priorities in Global Emergency Medicine Development

Jefrey Smith, MD, MPH, FACEP
Tenagne Haile-Mariam, MD

Department of Emergency Medicine, George Washington University Medical Center,
2300 Eye Street NW, Washington, DC 20037, USA
Ronald Reagan Institute of Emergency Medicine, 2150 Pennsylvania Avenue NW,
Suite 2-B Washington, DC, 20037, USA

Over the past 20 years, emergency medicine (EM) development has primarily occurred in upper-income and upper middle-income countries (MICs). There has been limited development in a small percentage of lower-income countries (LICs) and lower MICs. The priorities in global EM development over the next 10 to 20 years should focus on enhancing acute care service delivery and EM development in LICs and MICs.

Global health policy in the developing world has traditionally emphasized primary prevention and categorical vertical programs aimed at communicable diseases, maternal health, perinatal and child health, and nutritional deficiencies. Such categorical health initiatives have achieved marked success in developing countries [1,2]. Primary health care initiatives appropriately place the emphasis on health care delivery at the primary care level, which provides prevention and health promotion activities and essential primary care services. Despite the success of these initiatives, they do not adequately meet the needs of patients who present with life- or limb-threatening medical emergencies and injuries that require prompt recognition and management.

Over the past 10 years it has become evident that global epidemiologic and demographic shifts are changing the burden of disease in all societies [3]. Developing countries face the double burden of disease of traditional health problems associated with communicable diseases and high maternal and infant mortality plus the health problems faced by more industrialized
These developing countries are facing a dramatic increase in noncommunicable diseases, including injuries and chronic illnesses such as coronary artery disease, hypertension, diabetes, strokes, and cancer. These trends, which are intensified by the effects of an aging society and increasing urbanization, are forcing developing countries to refocus their initiatives, priorities, and resources. If a health care system is to respond to these new challenges, it must provide efficient and effective emergency medical care.

Despite the growing recognition of the need for emergency services in all countries, many public and primary health care practitioners and planners consider emergency medical health care an inefficient use of limited health care resources. Priority has long been placed in preventative health care services with the premise that “an ounce of prevention is worth a pound of cure.” Historically, the patient who presents to an emergency department (ED) is thought to represent a failure in the public or primary health care systems. Consider the case of a passenger who was not wearing a seat belt and is critically injured as a result of being ejected from a car during a motor vehicle crash. Such a patient can consume large amounts of medical resources at a considerable cost. One could argue that these expenditures could have been better spent on initiatives such as public education and legislation promoting seatbelt use, which have been shown to decrease morbidity and mortality from road traffic accidents [5]. Likewise, the intensive and possibly prolonged care of a person who suffers a stroke from untreated hypertension might have been averted by aggressive antihypertensive treatment and preventative teaching in a primary care setting. Therefore, the stroke in such a patient could be regarded as a failure in the primary health care system.

Although one cannot deny the essential role of good primary and public health care systems, the need to provide the acute and episodic health care for all populations is also undeniable. Patients can fall prey to sudden and potentially catastrophic changes in their health, such as a severe asthma attack, acute appendicitis, a severe allergic reaction, a life-threatening pulmonary infection, a motor vehicle crash, or a job-related injury. Large numbers of people can present with acute emergency medical care needs as a consequence of a chemical spill, a passenger train derailment, or an earthquake in a populated region. Emergency health care systems are necessary and should be incorporated into the design and implementation of primary and public health care systems, especially in resource-limited LICs. Emergency medical care can be efficient and cost effective only if it is integrated into the general health care system. If it is not, it is doomed to be fragmented, expensive, and less effective.

The ideal emergency health care delivery system is applicable to the local health care needs and economic realities. For example, the emergency health care system of an urban, industrialized area should be designed to accommodate victims of vehicular and industrial accidents. Planning should be developed to integrate mass casualty incidents, such as a fire in
a congested area, that could easily overwhelm the health care system. A rural emergency health system should be tailored to meet the demands of that community. Mass casualty events are unlikely in this setting, and planning for their occurrence is less important. Instead, the likelihood of an obstetrical emergency or a farming accident is increased in this setting, and the appropriation of resources and training of emergency medical care providers should be focus on such needs. Emergency health care delivery systems should also accommodate countrywide and regional health care priorities and resource constraints.

It is essential that health policy experts and funders who influence health initiatives in developing countries recognize that emergency and acute care services are an integral part of any health care system. The availability of emergency services strengthens the effectiveness of the primary care system by responding throughout the day and night to the needs of patients who present with acute and unscheduled health care needs and with illnesses that cannot be managed in a primary care setting. Once the acute care needs of such patients have been addressed, the patients can be referred to the primary care setting for ongoing longitudinal care. It is therefore essential that the treatment and protocols initiated in the emergency care setting be fully integrated into the primary health care system to insure continuity of patient care.

This article reviews current global health priorities, discusses some guiding principles influencing the success of international EM initiatives, discusses key priorities in advancing EM in developing countries, and proposes a framework for EM development in LICs.

Priorities in global health

Global health priorities center on health system reforms, key clinical initiatives, and public health and health promotion activities (Box 1). Most developing countries are undergoing substantial sector-wide health care reforms. The underlying objective of these reforms is to improve the equity, efficiency, and quality of health systems. A priority is to ensure that the needs of the poor and the underprivileged are met. Major areas of health-sector reform include upgrading health care facilities, pharmaceutical reforms, and reorganization of health care financing with innovations such as the creation of private profit/nonprofit facilities. Changes in civil service structure and health care administration and management have included decentralization, deconcentration, and devolution. Emphasis is also being placed on local capacity building and strengthening the public health system. Clinical service priorities in developing countries continue to focus on maternal and child health, integrated management of childhood illness, supplementing micronutrient deficiencies, and prevalent infectious diseases including malaria, measles, tuberculous, STDs, and HIV/AIDS [6].
Box 1. Priorities in global health

Health system/sector reform
- Organization and management
  - Decentralization
  - Pharmaceutical reform

Health care financing
- Private-public partnerships
- Privatization
- Insurance funds

Health care delivery
- Primary health care/family medicine initiatives
- Capacity building
- Strengthening public health systems

Clinical services
- Integrated management of childhood illness
- Maternal and child health
- Infectious diseases (tuberculous, STDs, HIV/AIDS)
- Nutritional supplementation (micronutrient deficiencies)
- Limited care/emergency care

Public health/health promotion services
- Immunization
- STD/HIV prevention
- Road traffic safety
- Tobacco, alcohol initiatives

In the 2003 World Health Report, the WHO drew attention to the increasing burden of noncommunicable (cancer, chronic lung disease—both highly correlated to tobacco use) and chronic diseases (diabetes, ischemic heart disease, and stroke), trauma (especially road traffic accidents) and depression [4]. Table 1 lists several leading causes of global morbidity and mortality for which improved access to emergency health services would likely reduce the morbidity and mortality based on experiences in cultures with more advanced emergency health systems. This shifting burden of disease has led the WHO to call for "rapid and sustainable expansion of emergency treatments" [7]. Bilateral and multilateral donor organizations and many members of the large nongovernmental organization (NGO) community dedicated to international health closely follow the lead of the WHO in establishing health priorities for developing countries. Therefore, the paradigm shift that is occurring at this policy-setting level can be
Table 1
Leading causes of mortality and burden of disease *, 2002, potentially affected by improved emergency services

<table>
<thead>
<tr>
<th>Cause</th>
<th>AdultsDeaths, rank order</th>
<th>Disease burden (DALYs), rank order</th>
<th>Children Cause</th>
<th>Percentage of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged 15-59 y</td>
<td>Aged 60+ y</td>
<td>Aged 15-59 y</td>
<td>Aged 60+ y</td>
<td></td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>3</td>
<td>9</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Road traffic accidents</td>
<td>4</td>
<td>4</td>
<td>Diarrheal disease</td>
<td>15.2</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>5</td>
<td>2</td>
<td>Malaria</td>
<td>10.7</td>
</tr>
<tr>
<td>Self-inflicted injuries</td>
<td>6</td>
<td>10</td>
<td>Measles</td>
<td>5.4</td>
</tr>
<tr>
<td>Violence</td>
<td>7</td>
<td>8</td>
<td>Pertussis</td>
<td>2.9</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>9</td>
<td>4</td>
<td>Tetanus</td>
<td>1.3</td>
</tr>
<tr>
<td>COPD</td>
<td>10</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>6</td>
<td>9</td>
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Abbreviations: DALY, disability-adjusted life year (total amount of healthy life lost to all causes premature mortality of disability) [4]; COPD, chronic obstructive pulmonary disease.

* In DALYs lost.

expected to result in new programs aimed at the delivery of acute care medical services and organizing national and local responses to the rising incidence of noncommunicable diseases.

In the early 1990s, The World Bank proposed a Minimum Package of Health Services for developing countries (especially LICs) [8]. The package looked at diseases that were responsible for 1% or more of the burden of disease in developing countries that could be controlled in a cost-effective manner at less than $100 per DALY gained or healthy year of life gained [9]. The burden of disease and cost effectiveness of health interventions was the basis for determining the minimum package. The package calls for "limited care interventions" in the acute care setting designed to provide pain relief, diagnose, advise on, and treat simple conditions such as conjunctivitis, skin allergies, and pharyngitis. Treatment for trauma patients includes initial therapy of simple fractures, laceration repairs, and tube thoracostomy for pneumothorax. Limited acute care includes simple diabetes care, management of hypertension, and post-myocardial infarction (MI) low-cost interventions such as aspirin and beta-blockers. Although the cost effectiveness of these interventions is unknown, the World Bank estimates
that 1 out of 10 individuals will benefit from this program of acute care services [8]. An integral component of the limited care program is referral to the district hospital for more advanced emergency care.

The Integrated Management of Childhood Illness (IMCI) initiative, developed by UNICEF and the WHO in early 1995, is a successful initiative that highlights the advantages of integrative approaches to common illnesses [10]. The IMCI offers a set of interventions that promote rapid recognition and effective treatment of major killers of children under 5 years of age. Globally, about 11 million children under 5 years of age die annually of common preventable diseases such as acute respiratory infections, diarrhea, malaria, measles, and malnutrition. Many of these deaths occur in countries in sub-Saharan Africa. Projections based on an analysis, completed in 1996 of the global burden of disease, indicate that these conditions will continue to be major causes of morbidity and mortality up to the year 2020 unless significantly more efforts are made to control them. Key components of early triage, rapid assessment and management, and appropriate referral are essential acute management components of the IMCI initiative. IMCI's impact on childhood mortality reduction is achieved through improving health worker skills; improving family and community practices that support child survival; and educating caregivers so that they recognize appropriate warning signs, provide necessary home therapies, and promptly take their children to receive appropriate acute care.

Global health priorities continue to emphasize public health and health promotion activities. With the global shifting of the burden of disease, public health and health promotion activities are expanding beyond immunization, nutrition, safe water, and STD/HIV prevention to include a focus on the growing neglected epidemics of cardiovascular disease, increasing tobacco use, and road traffic accidents.

Global priorities in emergency medicine development

Guiding principles

There are several guiding principles that should be followed when assisting with EM advancement in developing countries:

- Identifying and involving major stakeholders
- Insuring program appropriateness and local applicability
- Linking EM initiatives to primary care and public health programs
- Local capacity building and insuring program sustainability
- Application of lessons learned from other EM systems and professionals
- One size does not fit all

There are many stakeholders who can affect the success of EM programs. These stakeholders understand the local political and social landscape and
are essential in identifying key obstacles and insuring that programs are feasible, culturally appropriate, clinically relevant, and sustainable. Stakeholders can be regional or local and range from governmental and nongovernmental entities to key individuals. Examples of stakeholders are national Ministries (Health, Education, Finance), universities and allied health schools, physician and nursing professional organizations, civil service agencies (police, EMS, fire), NGOs, key professionals (eg, physicians, nurses), and civic leaders. In many instances, a highly motivated, respected, and visionary physician takes the lead in championing the EM efforts in a given country [11-13]. The larger and more robust the EM initiative, the greater the importance of buy-in by multiple stakeholders.

Programs need to be relevant, appropriate, and based on available resources. Development in any given area of EM should complement developmental efforts in other components of the health care system. For example, developing an advanced prehospital care system should complement improvements in the hospital-based EM services at receiving facilities. If a program is developed to improve disaster preparedness of first responders, it should be buttressed by coordination of the prehospital response system and strengthening of hospital-based services that receive disaster victims. Clinical programs should be targeted to common acute illnesses and should be tailored to the overall capacity of the system. For example, training physicians in rapid sequence intubations when ventilators are unavailable or implementing advance trauma prehospital care in a system with no hospital-based essential trauma training and services does little to improve patient outcomes.

The WHO, bilateral and multilateral organizations, and many international health NGOs emphasize health initiatives in developing countries that support the primary care and public health systems. This is especially true for LICs and lower-MICs and non-urban areas of upper-MICs. EM initiatives will gain greater governmental and donor support if their initiatives can be tied into the basic framework of the primary and public health system. Developing EM programs that support these initiatives promotes improved emergency care throughout LICs, and not just in major urban areas.

Essential cornerstones of any successful developmental program are capacity building and sustainability. We must strive to improve the local capacity for EM development and clinical care. By educating legislators, planners, administrators, academicians, researchers, and clinicians, we build the capacity for ongoing EM system and service development. Designing and implementing programs that are appropriate, desirable, and reproducible can achieve sustainability. Programs and projects assisted by NGOs and the donor community must be designed so that the local capacity and funding exist to sustain key initiatives when external support has ended. Train-the-trainer programs are one model providing a proven means of promoting ongoing education and training of personnel [14,15].
With any development comes mistakes, misadventures, and missed opportunities. Mistakes have been made in international health development, in international EM development, and in the development of all existing mature EM systems. With international EM development projects, suboptimal results have occurred due to incomplete system analysis and prioritization of initiatives, incomplete identification of key stakeholders, unrealistic and inappropriate program goals, project design and implementation that is unsustainable, and failure to identify long-term financial support [16,17]. Most mature EM systems have evolved in a proactive and reactive manner, with many lessons learned along the way. Professionals working in global EM development can take these collective experiences and apply them toward positive changes in emergency services that are supported by the existing health system, are culturally appropriate and acceptable, and can mature with continued health system development. For example, the pressing problem of overcrowding has forced major medical centers in the United States to increase use of point-of-care laboratory testing devices to decrease patient throughput times. Urine dipstick, urine pregnancy, basic metabolic panels, hemograms, cardiac enzymes, and other rapid bedside tests can facilitate rapid diagnosis and throughput. ED overcrowding is a global phenomenon, and practices such as point-of-care testing can be evaluated as one strategy in these developing systems [18].

As with other complex service delivery systems, the development of EM programs requires an organized and well-calculated approach. Depending on the country, culture, political environment, funding (internal and external), and preferences of key stakeholders, good emergency services may develop using components of several EM models. Although most countries opting to develop organized emergency services are focusing on the specialty model in their EM systems, there is no clear evidence that patient outcomes are better in a specialty-based EM practice model compared with a multispecialty EM practice model. There are several different successful models of emergency care delivery systems globally that are able to provide good emergency care to their populations. Prehospital services with physicians providing a high intensity of services and paramedics providing less intense services in an ED-based focus of emergency care seem to have similar outcomes [19]. In low-income, resource-limited environments, a paradigm shift focusing on informal or less-formal EM systems and alternative providers of acute care services and closely tying acute care services into the primary care framework may be the most realistic model to improve essential emergency services.

Global emergency medicine priorities

Demands for EM services and practitioners continue to grow in all countries. Although one could argue that a number of wealthier countries with varying prehospital and hospital-based emergency services need to
continue to strive for comprehensive specialty-oriented emergency services and systems, the greatest challenge to insuring adequate global emergency care is in LICs. Box 2 lists key global priorities in EM development. Global priorities in EM development must focus on initiatives in MICs and LICs.

Advocacy for emergency medicine development

One of the most important roles of emergency physicians in advancing EM globally is to advocate for policies and programs supporting appropriate EM development and acute care services. We need to advocate strongly to the leaders and funders in donor countries and host countries. We must constantly work to recruit and educate local stakeholders who can push for EM development. Advocacy must be realistic and should promote a degree of EM development based on the country, the region in the country, the prevalence of diseases, and available resources. Even LICs (gross national annual income per capita <$735 US) are capable of supporting advanced emergency care in major urban areas, whereas rural areas should strive for essential emergency services. Advocacy may involve work with national and local governments, academic institutions, professional organizations, civil agencies (eg, police, fire, EMS), medical professionals, public health officials, and the public. Winning support for

<table>
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<tr>
<th>Box 2. Global priorities in emergency medicine development</th>
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<tbody>
<tr>
<td>Advocacy for EM development</td>
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<tr>
<td>Collaboration</td>
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<tr>
<td>Equity in emergency care</td>
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<tr>
<td>EM development</td>
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<td>Clinical service delivery</td>
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<tr>
<td>Education and training</td>
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<tr>
<td>Needs assessment followed by strategic planning</td>
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<tr>
<td>Scope of clinical and public health services</td>
</tr>
<tr>
<td>Service providers (physicians, nurses, paramedics, field</td>
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<tr>
<td>health workers)</td>
</tr>
<tr>
<td>Professional and academic development</td>
</tr>
<tr>
<td>Information systems</td>
</tr>
<tr>
<td>Financing</td>
</tr>
<tr>
<td>Education and training</td>
</tr>
<tr>
<td>Multiple levels of providers</td>
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<tr>
<td>Appropriate to provider/acute illness epidemiology/resources</td>
</tr>
<tr>
<td>Specialty development</td>
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<tr>
<td>Research</td>
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<tr>
<td>Public/community education</td>
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EM development at multiple levels in a country has been shown repeatedly to lead to advancement of EM initiatives [20].

Collaboration

Transnational and international collaboration by medical professionals, medical societies and organizations, NGOs, and donor organizations is essential to advancing EM globally [20,21]. International EM, disaster, and EMS conferences have created the setting for professionals from many countries to meet and exchange valuable information and forge alliances. The success of international and transnational EM societies and interest groups stems from the motivation of their members to collaborate on common issues and challenges. International exchange of information (eg, graduate medical training curricula), international adoption of practice guidelines (eg, resuscitation guidelines), and international research have contributed to global EM development. On a smaller scale, partnering of “sister” institutions, exchange programs, and short in-country training programs have allowed EM initiatives to succeed in many developing systems. Professionals from very-low-income countries have little representation in these collaborative ventures, and more effort needs to be made to reach out to them.

At a national level, the success of EM depends on collaboration between organizations. Government leaders, professional societies, universities, hospitals, individual practitioners, public health officials, and civil agencies (police, fire, EMS) must collaborate to develop and sustain programs. Competition between various EM groups vying for leadership positions in the evolving EM system can be destructive in immature or developing systems and should be discouraged. Opponents to EM development will take advantage of this rift and undermine the process. Those involved with international EM development should strongly promote collaboration and inclusiveness among all stakeholders.

Equity in emergency care

There are many inequities in EM globally, including inequities in allocation of resources for emergency care, clinical services, access to information for patients and providers, and education and training programs. These inequities result in vast differences in the use of acute medical care, standards of care, access to essential drugs and other treatments, and social and economic support for health care.

Inequalities result in variations in treatment based on occupation, socioeconomic status, gender, age, geography, disease status, and cultural factors. Socioeconomic factors have long been recognized as perhaps the major contributing factor in health inequity within countries and between countries. The infant mortality in the United Kingdom, for example, has a ratio of approximately twice that among the lowest social class compared with the highest, and this higher mortality among the poorest is maintained
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Throughout childhood. There are similar differential rates of health-related child mortality worldwide (i.e., ratios for death from noncommunicable [4.9:1] and communicable [63.7:1] diseases between the poorest and richest 20% of the world). Studies in the United States have shown increased mortality in uninsured pediatric trauma patients and differential ED evaluations and treatments for chest pain with respect to race/ethnicity, gender, and insurance status [22-24]. Geography is also a major determinant of health inequity internationally (e.g., differential life expectancies are 48.4 years in Africa, 57.9 years in India, 65.8 years in Latin America, and 73.4 years in established market economies) and within any given country [25].

There are marked discrepancies in rural versus urban health care access for primary care services, emergency services, and tertiary care services. Rural residents generally have poorer living standards than their urban counterparts, face greater health risks because of less-developed infrastructure, and must travel greater distances to visit health providers [1]. The disparities in access to and quality of basic acute care services is generally most pronounced in MICs where urban areas tend to have more developed health care systems compared with rural areas. In comparison, LICs show lower overall access to emergency care in urban and rural areas and less disparity between regions [2].

As physicians advocating for increased EM development globally, we must encourage stakeholders to implement emergency systems that are equitable, accessible, and provide a safety net for all individuals needing acute care services. As we advocate for improved emergency services globally, we must continue to support the growing trend in many countries to enact legislation supporting the populations’ right to emergency services irrespective of race, religion, ethnicity, gender, geography, and socioeconomic status.

EM physicians interested in improving emergency care globally can help to reduce inequities by promoting emergency care systems in LICs and lower MICs and by promoting essential emergency services in rural areas of LICs and MICs. Most international EM development initiatives have focused on upper-middle and higher income countries and in major urban areas. We need to focus more priority on EM development in LICs. We need to collectively advocate to our government to include the provision of essential emergency services in developing countries in our government's foreign aid assistance programs. We need to encourage the large international NGO community and academic and nonacademic medical centers capable of facilitating exchange programs to do so. We should encourage our national EM organizations and societies to assist with facilitating EM development in LICs. American College of Emergency Physicians (ACEP) and American Academy of Emergency Medicine (AAEM) offer discounted membership fees and meeting registration fees. Offering discounted on-line subscriptions support critical information exchange. Distance-based learning and low-cost telemedicine services offer additional potential opportunities for EM organizations, societies, and
academic departments to provide ongoing exchanges, especially as the digital divide narrows in developing countries.

Needs assessment followed by strategic planning

Effective international EM development requires a careful needs assessment and a systems-based approach to providing solutions. Emergency medical systems are complex systems involving many components, including prehospital and hospital-based clinical services, specialized clinical services (eg, trauma, burns, toxicology, and pediatrics), disaster preparedness components, public health services, education and training programs, professional organizations, and academic initiatives (eg, graduate medical education, research, and journals) [26,27]. The development of each of these components involves planning, administration, operations, information systems, and financial structuring.

EM initiatives should be based on a careful needs assessment, and each initiative should support the overall strategic plan. The reality of international work is that professionals working in international EM development are often working with incomplete data, limited assessment capabilities, biased stakeholder input, and focused funding support. This can lead to piecemeal efforts and fragmented planning. In LICs with limited resources and high demand for emergency services, defining the scope of services, appropriate and available providers of emergency services, and financing of services remains a challenge. The challenge is greatest in nonurban areas where resources are limited. Fortunately, the framework for EM development consists of essential building blocks, and many component programs can be applied to different countries with limited modifications.

Education and training

Physician, nursing, paramedical, and health-worker training in EM is one of the most important priorities to improving emergency services globally. Training needs to occur at many different levels and must be knowledge based and skill based. Each training program should have clearly defined goals and objectives and must include tools to use to assess acquired knowledge and skills [28]. Educational and training programs should include identification and tutoring of potential trainers who will eventually be able to independently conduct the course for additional providers. Successful train-the-trainer courses require careful planning, execution, and mentoring of trainers [15].

Modular courses have been a successful means of providing emergency training for providers and instructors in many countries. Advance Trauma Life Support, Advanced Cardiac Life Support, Pediatric Advanced Life Support, Advanced Disaster Life Support, Trauma Nurse Core Curriculum, emergency ultrasonography, wound care courses, prehospital trauma and cardiac life support courses, and Integrated Management of Childhood Illnesses are examples of successful modular programs. These programs
impart essential assessment and initial management skills, yet none of these programs replaces formal residency or fellowship programs.

In country short courses; international short courses; international fellowship programs (including faculty development fellowship programs; national, transnational, and international conferences; exchange programs, distance educational programs, and full residency and nursing programs) abroad are means of providing education and training. The more a specific educational program can be tailored to complement the education and training of the participant, the more efficient the training process. Educational and training programs in LICs must be tailored to the clinical environment and the prevalence of disease and injuries. Modular programs focusing on triage, initial assessment and management, and problem resolution or referral to a higher level of care are appropriate in more rural areas. This training is needed at all levels of providers, from physicians to field health workers [29,30]. This training for all levels of providers is essential when advancing EM locally and globally.

International experiences in a country with a mature EM system can be invaluable, although there are difficulties in processing visas in the current political environment. Observing the clinical, operational, administrative, and academic components of a mature EM system can provide the necessary vision for talented and motivated professionals interested in advancing EM in their country [31].

Emergency medicine specialty development

Specialty development, which encompasses organizational, administrative, clinical, and academic components, is not the first priority in advocating for improved emergency services. Yet, specialty development in EM is critical to the sustained development of comprehensive emergency services. Key physician stakeholders have been instrumental in specialty development in most countries. While striving for improved emergency care, physicians organize to form a society and as a collective group advocate for specialty recognition, specialty development, and legislation to promote equitable emergency care. Academic development typically follows organizational development and includes graduate medical educational programs, journals, academic meetings, and research [17].

The establishment of EM graduate medical educational programs at major universities can greatly facilitate the advancement of the specialty in a country. EM physicians from mature systems can closely collaborate with newly appointed EM faculty in developing programs to assist with faculty mentoring, curriculum development, program evaluation, and ongoing recruitment efforts. Faculty development fellowships in mature systems can teach new faculty how to establish strong training programs. EM development in Iran is an excellent example of academic development propelling countrywide EM advancement. In 2000, eight faculty members from Iran
University with varying specialty backgrounds completed a 6-month faculty development fellowship at George Washington University and Penn State. The program focused on various areas of EM, including clinical, administrative, and academic development. The eight faculty members returned to their country to begin an EM residency program in 2001. By 2004, the first class of 10 residents had graduated, and 30 additional residents were in training. Over this 3-year period, the faculty group presented 12 papers at international meetings, published 10 articles on original research, and implemented a medical student EM program and a training program for emergency nurses. These original eight faculty members worked closely with the Ministry of Health and Education promoting EM, which contributed to three new EM residency programs beginning in 2004. Most of the graduates of the first class of residents are assuming faculty positions in these new programs [32].

Research

Promoting research in evolving emergency medical systems is critical to ensure that clinical, public health, academic, and administrative practices are supported by the best available evidence. It is natural to assume that the research outcomes in one country or region can be applied to other countries and regions. However, there are many local factors that can influence outcomes. For example, when implementing standard programs (e.g., seatbelt use) to reduce morbidity and mortality from road traffic accidents, local factors that can directly affect outcomes may include cultural beliefs and practices, vehicle design, communications infrastructure, traffic patterns, EMS availability and EMS provider skills, presence of a trauma system, hospital resources, physician and nursing expertise, rehabilitation services, and adequacy of data collection and information systems [33]. From a systems perspective, there are many different models of EM delivery, but there is a paucity of data on emergency medical systems performance.

Many clinicians and academicians in developing countries have limited training in research methodology. One of the best ways emergency physicians interested in international work can improve the local capacity of professionals to improve their emergency system is by training and collaborating with these professions in relevant outcome-based research projects.

Public education

Popular television shows, such as Emergency, 911, Casualty, and ER, have played important roles in educating the public on EM issues such as access, use of services, and early warning signs of serious medical conditions. Additionally, governmental organizations (e.g., the National Highway Traffic Safety Administration and Department of Health and Human Services), other organizations (e.g., the American Heart Association, National Emergency Medicine, Cardiology and Pediatric societies), and national NGOs
(eg, the National Safe Kids Coalition) play an important role in educating the public about common deadly diseases and important prevention strategies.

These public education strategies are an essential element of any developing emergency service system [34]. Educational programs focusing on the leading contributing causes of morbidity and mortality (eg, accidents, heart attacks, respiratory problems, job injuries, tobacco and alcohol use, and others) should be an important component of any comprehensive system [35]. All of these acute conditions bring patients to the acute care setting for diagnosis and treatment and provide the practitioner with an opportunity to gather epidemiologic data, provide medical care, and address public health priorities at an individual level. For example, a factory worker who presents with a work-related hand injury can have his injury managed and also receive teaching on safe work techniques.

Public education programs can have a strong impact in rural and underserved areas where immediate access to medical care is not available. Public education programs should focus on key areas of prevention, early recognition, initial first aid, and access to appropriate services.

Determining the right level of emergency medicine development

The goal in advancing EM is to develop a comprehensive system that meets the needs of the population. Even in less developed areas, all the components of the system should be in place to provide appropriate prevention and early identification strategies, initial prehospital assessment, appropriate transportation, hospital-based management, and the capacity to respond to potential community disasters. At the local and national levels, planning, logistical support, administration, operations, information systems, academic development, and financing must be considered. EM initiatives are part of the foundation of the health care system and should be integrated into the primary health and public health initiatives. The specialty model of EM with a uniquely integrated horizontal body of medical knowledge and skills concerning the acute phases of all types of disease and injury is gaining recognition globally as a preferred model for EM development. The clinical and academic focus of the specialty model promotes excellence in service delivery, education and training, and research [26].

An achievable model is one in which the sophistication of the local EM system parallels the local health system development and the sophistication of the countrywide EM system parallels the health system development of that country.

Resource-constrained settings

In rural systems and towns with basic essential health services, local providers should be trained to provide emergency assessment, triage, management, or referral to regional centers. There are several successful examples of essential acute care services using local providers. An emergency
Triage assessment and treatment algorithm has been developed as a core component of the IMCI primary health care strategy [36]. This algorithm is based on a set of simplified guidelines to identify significantly ill children in triage and shorten the time to initiation of appropriate treatment. The IMCI strategy uses a tiered response strategy that may involve follow-up or urgent referral visits or the transfer of sick children for further management. These guidelines have been shown to be sensitive and specific for triaging sick children and have been generally effective when implemented in district health clinics. A study of first-level health facilities using IMCI guidelines in several sub-Saharan countries found that improved acute care treatment guidelines in conjunction with a minimal upgrading in inventoried supplies may improve the treatment of seriously ill infants and children who were unable to be transferred to central facilities [37].

The development of simplified protocols to identify and manage maternal hemorrhage and patients with trauma and chest pain may allow for more rapid stabilization, initiation of life-saving treatments, and admission or appropriate transfer to a facility providing a higher level of care. Informal EMS systems using truck drivers, taxi drivers, and other laypersons completing short training programs have had positive outcomes [30,31,38,39]. Life- and limb-saving acute care interventions, such as hemorrhage control, fracture reduction, wound management, prevention of hypothermia, and tube thoracostomy, have been successfully taught to field health workers with minimal formal medical training. Although improved prehospital care is an important component in the effort to reduce trauma morbidity and mortality, studies have pointed out the necessity of improved hospital- or clinic-based acute care to reduce trauma-related DALYs [40]. Because over 80% of traumatic injuries may be successfully managed non-operatively using simplified protocols, an emphasis on the proper training of providers initiating rapid evaluation and stabilization can optimize outcomes and reduce the demand for referral to higher-level facilities for care. Pilot programs for the improved management of trauma victims have been implemented in several developing countries and have demonstrated improved outcomes within these cost-constrained environments [30,41]. Although the management of Ischemic heart disease (IHD) is often thought to be resource intensive and to require dedicated tertiary care facilities, the pharmacologic management of IHD with aspirin, beta-blockers, and oxygen improves outcomes without incurring significant costs and may be undertaken in less developed settings. Furthermore, streptokinase continues to be a lower-cost therapeutic option for thrombolysis in resource-constrained settings. Approximately 61% of the total 30-day mortality reduction over the past 10 years is attributable to the use of pharmacologic therapies in the acute setting [42]. However, contingent on the use of these interventions is the rapid and correct recognition of patients with MI. Providers with expertise in acute care medicine can evaluate patients, risk stratify them to determine appropriate interventions, and
initiate life-saving therapies in a timely and accurate manner. Alternatively, expanding the training of primary health providers to stratify patients and acutely manage IHD at the local level can have a significant impact on patient outcomes in regions of the developing world without immediate prehospital transport systems or hospital-based emergency care. Algorithms, based on best evidence, can be used to guide health workers in managing IHD in rural clinics, local and regional clinics, and district hospitals. Triage guidelines based on specific criteria can be used for determining the appropriateness of transport to regional hospitals and tertiary centers.

Urban settings

Large urban areas with tertiary health facilities should provide more comprehensive emergency services. These areas have high (and growing) population density, high health care use, increased injuries and violence, and larger numbers of disenfranchised individuals with limited access to health care. This environment requires an organized, efficient emergency service program. Formal EMS systems, hospital-based emergency services, specialty expertise (eg, trauma, burns, toxicology, and pediatrics), disaster preparedness initiatives, and key public health initiatives should be components of the system. Even in the poorest of countries, large urban areas demand advanced emergency care and planning.

Summary

EM initiatives are gaining global acceptance as a result of emergency physicians; local advocates; national, transnational, and international EM organizations; and governmental leadership, organizations, and agencies involved in international health and an evolving global health agenda. Spanning the spectrum from basic initiatives to improve acute care services to mature EM specialty development, all countries acknowledge the need for emergency care.

The level of EM development in a country is fluid and depends on many variables, including status of health development, burden of disease, resources, advocacy, available expertise, and public demand. Emergency physicians should support the promotion of EM in the context of essential public health and primary care initiatives in these developing countries. Additionally, emergency physicians should work closely with stakeholders, health policy experts, health economics, and international organizations involved in health care to promote the advancement of EM worldwide.

References

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