
The Evolution of Surgical Humanitarian Missions

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Abbreviations

FMTs Foreign medical teams
NGOs Nongovernmental organizations

Introduction

International aid agencies have traditionally focused on infectious diseases in resource-limited settings. Global health initiatives, however, are now increasingly addressing surgical conditions as well. A growing awareness of the heavy burden of surgically treatable diseases and conditions has led to extensive involvement of both public and public resources in surgical international humanitarian missions, which perform and teach surgery in order to improve healthcare worldwide [1, 2]. These services can be in the form of a preplanned mission to an underserved region, or an acute response in the aftermath of a major disaster or humanitarian crisis. The latter is provided by medical and surgical units, collectively referred to as “foreign medical teams” (FMTs). A “global burden of surgical disease working group” was established in 2008, and it arrived at a strategy consensus of how to measure

the burden of surgical conditions and the unmet needs for surgical care [3].

Every year thousands of physicians and nurses travel to developing countries, with stays ranging from days to years. The increased ease of world travel and transport and the heightened interest in international matters have led to greater numbers of healthcare providers involved in these humanitarian efforts. Humanitarian assistance can be in the form of a single individual, a group, part of a nongovernmental organization (NGO), a government agency, or under the auspices of a United Nations (UN) Organization, such as the World Health Organization (WHO).

This chapter will briefly describe the history of surgical missions, update the current situation and identify the main global players, and then focus on the main challenges and dilemmas faced by these missions. The benefits will be balanced against any potential harm resulting from their deployment. Some of those challenges will be described in greater detail than others. Just as little guidance exists on how to measure the benefits of outreach trips, even less is known about what harm they might cause or how to deal with that harm. This chapter will conclude with a vision for the future.

History

Before World War II (WWII), two institutions dominated international health development: The Pasteur Institutions (functioning mainly in

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the Far and Middle East and Africa) and the Rockefeller Institute (functioning mainly throughout Latin America). Their efforts were largely directed to the control or eradication of major infectious scourges, such as malaria, typhoid, plague, and other tropical and sanitation-based public health problems. Basch characterized international health after WWII as having evolved through four distinct stages [4]:

1. 1945–1950: Period of general international stability with intergovernmental cooperation for reconstruction.
2. 1950–1970: Development of various UN agencies largely around a medical model focused on eradication of diseases.
3. 1970–1980: UN agencies' development of a series of "agendas," such as primary health care, community empowerment, and women's issues.
4. 1980–1990: The World Bank, the International Monetary Fund (IMF), and various NGOs focusing more on underlying health and societal system-level issues as obstacles to optimum health.

The publication of the Global Burden of Disease Report in 1996 [5] has increased the awareness of the impact of chronic diseases and injuries on the overall health burden, leading to recognition by international development agencies that more attention must be directed toward them. Remarkably little attention was drawn to surgical missions throughout this entire period.

The Present

Global health policy in the developing world traditionally emphasized primary prevention and categorical vertical programs aimed at communicable disease, maternal health, perinatal and child health, and nutritional deficiencies. Such categorical health initiatives have achieved considerable success in developing countries [6]. They emphasize healthcare delivery at the primary care level, and provide preventative measures, health promotion activities, and essential primary care services. Their premise is that "an ounce of prevention is worth a pound of cure." It makes sense to focus

on communicable and infectious diseases, since about 25 % of deaths in developing countries are secondary to those diseases compared to only 3–4 % in developed countries. It became evident over the last decade, however, that global epidemiologic and demographic shifts have been changing the burden of disease in all societies. Developing countries are now facing a dramatic increase in noncommunicable diseases, including injuries and chronic illnesses [7]. This change is gradually producing a parallel shift in the focus of healthcare provision in terms of individual patients vs. cohorts/populations. Today, surgeons and anesthesiologists are becoming involved in humanitarian efforts to a much greater extent than ever before.

Although there is an increasing awareness of the importance of unmet needs for surgical care worldwide, it is still estimated that up to one-half of the world's population lacks access to basic surgical needs [8]. The burden of surgical care is potentially enormous. It was estimated that 2–3 billion people (approximately one-third to one-half of the world's population) have no access to basic surgical care [9, 10]. Despite this clear imbalance around the world, surgery is still "the neglected stepchild of global health" as noted by Farmer and Kim [11]. There are probably many reasons for this, one of which is that international health was dominated for decades by those concerned with communicable diseases, from smallpox to AIDS. Another reason is that surgery is much more complex and more expensive to deliver than vaccinations [11].

The international projects that aimed to fill the gaps in surgical needs may be classified into three types: clinical, relief projects, and developmental projects.

Clinical: These are preplanned delegations that deal mainly with chronic conditions and diseases, often targeted to a specific disease. Humanitarian missions to underserved areas throughout the world aim to relieve specific surgical conditions. Examples include plastic surgical procedures [12, 13], pediatric cardiology surgery [13, 14], ophthalmology (mainly cataract surgery) [15, 16], pediatric neurosurgery [17],

and combined specialties, such as otorhinolaryngologists and plastic surgeons who repair facial deformities [18], among others.

Relief: These include surgical teams that respond to needs that result from natural disasters or wars (see Chap. 11). They are “acute” missions, organized within a short time frame, and frequently deal with many uncertainties. Their aim is to alleviate a time-limited crisis. These include foreign medical teams (FMTs) that respond in the aftermath of sudden impact disasters, either to substitute or complement the local medical system. They have three distinct purposes [19]:

1. Early emergency care. This period lasts up to 48 h following the onset of an event.
2. Follow-up care for trauma cases, emergencies, and routine health care (from day 3 to day 15). During this phase, the local health services are progressively overwhelmed by the need for secondary or maintenance care for the trauma victims. The primary roles of the FMTs are to temporarily fill the gaps in emergency medical assistance resulting either from a large number of casualties or the inability of the local health services to respond to the usual emergencies.
3. Act as a temporary facility to substitute for damaged local facilities during the rehabilitation phase until a permanent solution (reconstructive phase) is available. This phase usually starts from the second month and can last up to several years.

Developmental: These are organized for a long-term framework and their aim is to create or augment local capacity to address the burden of surgical disorders. There is an increasing understanding that short-term medical missions cannot substitute for a continuing investment in the local health infrastructure and staff training that will allow low- and middle-class countries to develop their own long-term surgical capacity [20]. Training programs, when carefully considered and implemented, can be mutually beneficial and provide a sustainable and lasting solution to the unmet health needs of the developing world. The outcome of such a training program should

be reasonably self-sufficient local surgeons who are able to cope with most of the surgical problems in district hospitals in the developing world.

Major Players in Humanitarian Assistance

The total number of humanitarian aid workers around the world was 210,800, as calculated in 2008 by the Active Learning Network for Accountability and Performance in Humanitarian Actions (ALNAP), a network of agencies working in the humanitarian system [21]. The last decade has witnessed increasing involvement in the provision of humanitarian aid: it is estimated that the humanitarian fieldworker population has been increasing by approximately 6 % per year [21]. Those workers include medical students, residents, senior and retired surgeons who were involved in short-term missions and physicians/nurses who devoted longer periods (months/years) in order to treat the needy and train local health providers.

The involvement of medical students in this system has been increasing. For example, 22 % of US medical students had completed an international educational experience in 2004 [22], and 47 % of accredited MD-granting medical schools had established initiatives, centers, institutions, or offices of global health by 2008 [23]. All of the plastic surgery residents who participated in such missions reported that this experience had an important impact upon their life and career [13]. Two-thirds of responders to an American College of Surgeons (ACS) survey asked to be placed on a mailing list of surgeons interested in volunteerism [24]. Similar responses were received to a questionnaire of the American Association of Thoracic Surgeons [25].

The major participants in humanitarian assistance typically fit into one of the five following categories [26]:

1. United Nations (UN) organizations and other international organizations. Included are the UN High Commissioner for Refugees (UNHCR), the WHO, and the International Committee of the Red Cross (ICRC).

These organizations typically provide the oversight, coordination, and funding for NGOs and program implementers.

2. Governmental organizations. Various industrialized countries maintain funding agencies dedicated to relief and development. Examples include the US agency for International Development and the relief and disaster branch, the United Kingdom's Department for International Development, The European Commission Humanitarian Aid Office, the Canadian, Danish, and Australian Agencies for International Development, and many more. These governmental agencies set priorities for funding and provide financial support for implementing partners through grants and contracts.
3. NGOs and private voluntary organizations. The World Bank defines NGOs as being private, independent organizations that initiate activities to relieve suffering, promote the interests of the poor, provide basic social services, and/or undertake community development [27]. These organizations are the primary implementers of relief assistance. Today, there are over 40,000 actively engaged NGOs [28]. They can be large or small, local or international, religious or secular, and have a wide range of expertise. In some countries, like Haiti, NGOs account for over 70 % of the total healthcare delivery. The need for external governments not to be seen as directly intervening in another sovereign territory is one cause for the NGO's expansion. Government-funded NGOs generally work from a position of neutrality and impartiality and are therefore regarded as being free of political influence. Their ability to gain easier cross-border access and attract less attention and scrutiny than governmental agencies has motivated major funding from governmental donors and spurred their global growth. This increased funding has promoted the growth of some well-known established international agencies, such as the *Medecins Sans Frontiers* (MSF: Doctors without Borders). The MSF received the 1999 Nobel Peace Prize in recognition of its members' continuing efforts to provide medical care in acute crises, as well as raising international awareness of potential humanitarian disasters. Other large organizations include the International Rescue Committee, CARE International, Catholic Relief Services, and World Vision.
4. Private industry, consulting firms, and academic organizations. There has been a significant growth in the participation of for-profit organizations and consulting firms in humanitarian aid and post-disaster reconstruction. Similarly, greater numbers of academicians in the various fields of medicine, public health, human rights, epidemiology, and social services have been providing assistance. Universities, such as Johns Hopkins, Harvard, Tufts, Columbia, and others, have academic programs in various aspects of humanitarian aid. The American College of Surgeons (ACS) has also become involved in volunteer activities by establishing the volunteer initiative, Operation Giving Back (OGB) [29].
5. The military. Various military branches are involved in important humanitarian aid in the form of security, communications, and logistic operations, as well as the provision of medical assistance, food, shelter, and public health around the globe. The Office for the Communication of Humanitarian Affairs developed a set of guidelines for the use of military assets in non-conflict relief operations known as the "Oslo guidelines" [30].

Challenges

A foreign team is parachuting into a foreign environment. Medical care in underserved and under-resourced areas is provided in a difficult environment for a foreign medical team. Primary care is often not available in many of these areas, and therefore many medical conditions are underdiagnosed and undertreated. Surgeons on overseas missions will wrestle with challenges that are a far cry from their usual clinical practice, sometimes to the point of appearing surreal.

Surgeons on humanitarian missions are invariably engaged in a noble cause, but good intentions

alone cannot ensure success. The principle of non-maleficence, often defined as the obligation to “do no harm,” must be rigidly upheld under all conditions. Many medical initiatives automatically focus on what and how to provide appropriate medical/surgical care. Equally imperative, however, is what *not* to offer. One has to be aware of the risk in conducting a mission that provides temporary, short-term solutions but fails to take in the entire picture.

It is impossible to establish clear-cut guidelines before embarking upon humanitarian missions in foreign countries, but it is important to take appropriate precautions when planning and executing such missions. The line between an exemplary voluntary humanitarian effort of altruistic health providers that has an important positive impact and a mission criticized and labeled as “neocolonialism,” “surgical safari,” “medical tourism,” and “short-term overseas work in poor countries by clinical people from rich countries” [31] is sometimes not clear enough. Not infrequently, and despite the best of intentions, mistakes are made in attempts to help others. Groups must be aware of and avoid, as much as possible, “the seven sins of humanitarian medicine” [32] and the potential pitfalls [33, 34].

The following *Ten Commandments* are proposed to describe some of the unique challenges in planning and executing surgical humanitarian missions. They are based on accounts in the literature as well as on personal insights after responding to disaster areas around the globe:

1. *Careful selection of cases and of the most appropriate anesthesia.* One important surgical challenge in these short-term missions is to perform the right procedure. It is a common temptation to perform complex surgery when indicated. However, once the short-term mission leaves, the local physicians will have to deal with any complications from surgeries which they themselves cannot perform, or do not have the knowledge or expertise to properly treat. It is sometimes better to do a simpler procedure within the abilities of a given local system. Better to leave with hope than with desperation. When choosing the proper procedure the best interest of the patient, the hospital, and the local physicians should clearly prevail. According to Welling et al., “One good rule is to offer the types of procedures that are minimally invasive, relieve immediate discomfort, and require little follow-up care, especially for missions that are short term” [32]. Complications may be inevitable, but when they affect an impoverished patient in a developing country who was treated by a volunteer physician, the situation can be politically as well as emotionally charged [35].
2. *Follow-up.* Short-term missions provide clinical/surgical care for patients who may never be seen again by the foreign team. Continuum of care which is a basic and essential part of surgical treatment is lacking. The local community sometimes criticizes this failure to provide follow-up care. One example was the accusation of Operation Smile volunteers by local surgeons of “dumping” their complications once their mission was over. The organization refuted this charge [35], but one should bear in mind that this can be a sensitive issue. When it is not possible to provide long-term follow-up care, it is recommended that chronic care medications and elective surgery be avoided.
3. *Cultural competence.* This item refers to the ability of healthcare providers to deliver effective services to racially, ethnically, and culturally diverse patient populations. A culturally competent physician is aware of different cultural beliefs or concepts of illness and health and has the skills to explore how and whether these beliefs are relevant to a specific individual [36]. There are several models available that emphasize the important concepts of cross-cultural communication

process. One such example is the RESPECT model, developed by the Boston University Residency Training Program in Internal Medicine, Diversity Curriculum Taskforce [37]. The RESPECT model stands for: Respect, Explanatory model, Sociocultural context, Power, Empathy, Concerns and fears, Therapeutic alliance/trust. Personnel involved in such work should understand and respect the local culture and be aware of the local customs. How we dress, how we act, what we drink, and other behaviors will define us to our hosts. Miscommunication and misunderstanding may lead to potential harm. Therefore, one should establish an effective method of communication and become familiar with cultural norms before departure. Awareness of a given culture's beliefs and practices is important because it fosters an environment of trust and mutual respect, which may translate to better compliance and greater effectiveness of medical treatment [38].

4. *Informed consent.* The principle of informed consent is aimed at the legality of health assistance and reflects the concept of autonomy and of decisional auto-determination of the patient. Operating even in a disaster scenario does not allow another individual to decide for a conscious and coherent patient. The same rules apply as they do within the United States. The World Medical Association (WMA) 1994 statement on medical ethics in the event of disasters states there may not be enough time for informed consent to be a realistic possibility in a disaster response situation [39]. This may also apply when responding to disasters in one's own country, but we believe that a different approach should be taken when one arrives to a foreign country as a relief delegation. Our team, which has vast experience in response to natural disasters, is very strict about this issue. We never operate or perform an invasive procedure on a patient without his/her consent (or consent of a surrogate) after a clear explanation by a local interpreter. It should be borne in mind that cultural and

religious differences may exist, and that relief workers are at risk of delivering culturally inappropriate services.

5. *Cooperation with local authorities.* Foreign healthcare teams are supposed to support and reinforce the national health system, not replace it. Every attempt should be made to collaborate with the local system. By ignoring local healthcare providers, many volunteer programs undermine the local infrastructure, create new barriers to care, and cause harm. Local practitioners who must earn a living in the community cannot compete with volunteers who donate their services. While assisting the Philippine people after the 2013 typhoon, it was the decision of our group to integrate our team with the local hospital, creating one coordinated facility [40]. Collaboration with local surgeons is especially critical in surgical missions since the latter need to provide follow-up care and treat complications after the guest surgeons' departure.
6. *Triage and ethical dilemmas.* Mass casualty triage needs to be implemented when available resources are insufficient to meet the needs of all patients in a disaster situation. The basic principle is to do the maximum good for the most casualties with the least amount of resources. Disasters require physicians to shift to "utilitarian-based ethics" in which medical decisions are based on available resources, much in the way that a triage system prioritizes victims who are predicted to have the best chance of survival [32]. The WMA statement on medical ethics in disasters recognizes these unique situations and noted "The physician must act according to the needs of patients and the resources available. He/she should attempt to set an order of priorities for treatment that will save the greatest number of lives and restrict morbidity to a minimum" [39]. Such situations will inevitably lead to serious ethical dilemmas. Efforts will be needed in order to achieve a balance between individual and collective rights. There is generally a conflict between autonomy of the individual and the desire to

protect and promote public health. This “dual loyalty” also exists in many disaster situations. It is necessary to develop a system that identifies patients by their medical/surgical needs and the likelihood of benefit, especially in the context of disaster response, but also during short-term initiatives. Because of the complexity of triage in such conditions, the basic concept underlying the process should be decided before departure. In addition, the process must be fair, transparent, and meet the principles of distributive justice [41]. Triage can conflict with human rights legislation, and even with humanitarian laws, but “accountability for reasonableness” can temper the disagreements on the setting of priorities. Triage in a disaster setting, however, requires a basic change in thinking. Of necessity, this adjustment includes dealing with ethical dilemmas for which there is little preparation [42, 43]. Among the many proposed approaches to triage, perhaps the most common is the utilitarian notion of doing the most good for the most people. Our personal recommendation after dealing with ethical and triage issues while responding to the Haiti earthquake is that it is imperative to establish and strictly follow clear-cut guidelines [44].

The ethical “code of conduct” of the International Red Cross (ICRC)/Red Crescent seeks to outline the principles of conduct of foreign teams responding to a disaster [45]. The main ethical principles in the provision of health services during an event and during the early response phase of disasters pertain to non-maleficence, beneficence, justice, and the respect of autonomy.

7. *Licensure, credentialing, and malpractice issues.* Unlike country/state licensure and hospital accreditation which is standardized, there is no comparable international system, and this is an area that causes much concern for surgeons. These issues cannot be dealt with before departure to disaster areas. Recent discussions have highlighted the difficulties and concerns with using untrained volunteers to deliver care in international settings.

International humanitarian volunteers have different levels of knowledge, medical education, and levels of competence. Medical personnel in resource-poor locations are subject to the same ethical principles of their own countries. Licensure is important since it may serve as restraint against unethical conduct [46]. Although medical negligence lawsuits are not currently a significant problem for humanitarian medical/surgical groups [47], many of them are becoming more concerned that such lawsuits may soon have an impact upon their missions [48].

8. *Mutual expectations.* A key to success is to promise less than what can be delivered, and to deliver more than what was promised. Accordingly, humanitarian aid providers should avoid creating false or unreasonable expectations on the part of the recipients.
9. *Standard of care.* Volunteers should not provide medical services beyond their level of expertise. Personnel must be aware of the pitfalls in practicing beyond their abilities. Alarming, medical students and residents often view medical missions to developing countries as opportunities to gain unrestrained exposure to techniques and procedures they are not qualified to perform in their home countries [49]. One has to find the right balance in this twofold goal: allow residents an opportunity to both learn and serve. Visiting physicians sometimes feel compelled to treat patients outside their specialty, simply because no specialist is available, even though lowering the standard of care for patients in developing communities is unprofessional, unsafe, unethical, and oftentimes illegal [50]. Healthcare providers working in humanitarian missions should be able to recognize their limitations and act accordingly. Humanitarian missions can have an important role in modern surgical training, but they should never turn into a self-serving opportunity for the visitor at the expense of the recipient nation which could feel that it is being treated as an experimental guinea pig.
10. *Know and understand what is unique to the operating zone.* Diseases can be encountered

with unfamiliar presentations and with unexpected patient profiles. All of these factors should have direct implication on clinical decision-making. Members operating in remote areas should be familiar with endemic local pathology. We encountered patients in Haiti, and later on in the Philippines, who presented with abdominal pain which we initially considered as being caused by an acute abdomen (with which we were familiar), but which turned out to be typhoid fever (which we had never seen before). In resource-poor countries, one may encounter higher rates of malnutrition and underweight in children, and of low plasma protein concentration and anemia in adults. Thus, patients treated by members of a surgical mission may be more prone to wound infection, wound dehiscence, and other related complications, factors that have to be taken into account when offering surgical care.

The Future

More and more individuals and teams are involved in surgical humanitarian aid with understandably varied levels of quality. Questions concerning the competence of some of the deployed medical teams have recently been raised. These findings have promoted the international community to call for “greater accountability, stringent performance oversight, reporting, and better coordination” [51]. In the coming years, we will be seeing a trend toward better and closer control in some of the following areas:

1. Classification and accreditation of FMTs. The foreign medical teams working under the auspices of the global health cluster and the WHO recently (2013) commissioned a document entitled: “Classification and minimum standards for foreign medical teams in sudden onset disasters” [52]. It introduces a simple classification, minimum standards, and a registration form for FMTs that arrive to provide surgical and trauma care in the aftermath of a sudden disaster. These guidelines can also serve as tools to improve the coordination between foreign medical teams, and be the
- reference to registration on arrival. According to this document, the foreign medical teams are expected to declare to which of three distinct categories they belong according to their capacity and capabilities. Once an FMT declares its capability to offer a specific type of care and any additional services, it is expected to comply with the technical standards related to those services. The next step will be registration of that FMT [53]. This concept of an international registration process could be a first step toward future accreditation of FMTs.
2. Operational guidelines. The WHO/Pan-American Health Organization (PAHO) published essential guidelines for the FMTs as follows [19]:
 - Be fully operational within 3–5 days.
 - Be self-sufficient with minimal need for support from the local communities.
 - Have basic knowledge of the health situation and language and respect for the culture.
 - Include health professionals in selected specialties.
 - Ensure capacity for sustainability, including appropriate technology costs.

Of the 44 FMTs responding within the first month after the Haiti earthquake, only 11 adhered to essential deployment requirements and none followed all the requirements of WHO/PAHO [54]. Volunteer efforts need to be preplanned in order to respond within an adequate time frame. Individuals interested in taking part should belong to a designated team ready to be deployed. One example is the Disaster Medical Assistance Teams (DMATs), which are groups of medical personnel set up to respond to disasters or unusual events. Composed of about 35 individuals or more, they are rapid responders and provide primary care or augment local staff [55].
 3. Sustainability. Suchdev et al. [33] suggested a model for sustainable short-term international medical trips. They identified seven areas of focus: developing a clear mission, collaborating with the local community, educating travelers and the local community, making the commitment to serve the needs of the local

community, engaging in teamwork, having sustained capacity building, and developing a system for periodic evaluation. The benefits of these medical initiatives should extend beyond the presence of foreign medical assistance. Sub-specialized surgical care may be best addressed with visiting teams, but a much more preferred expanded model of sustainable delivery of surgical care, which emphasizes empowerment of local healthcare practitioners through education, equipment support, and quality benchmarks, has been described [56].

4. **Accountability.** There is no single official definition of accountability in the humanitarian context. Accountability per se is defined as having three components: transparency, responsiveness, and compliance [19]. Accountability is mainly at the organization level, but there is also a component of individual accountability. We should expect that missions would use evidence-based medicine as the benchmark, although it is difficult to come up with a single set of outcome measures and levels that fits all the different environments in which these missions operate. Working with its partners, disaster survivors, and others, Humanitarian Accountability Partnership International (HAP International) produced the HAP 2007 Standard in Humanitarian Accountability and Quality Management. This certification scheme aims to provide assurance that certified agencies manage the quality of their humanitarian actions in accordance with the HAP standard [57].
5. **Data collection.** Humanitarian missions deliver health care in especially difficult environments where patients may be more prone to complications. This makes the evaluation of these different programs of utmost importance. Only a few groups have collected data, and even fewer have evaluated those data or statistics [58]. Our group has developed a specially tailored information technology solution which is implemented in the field hospital we deploy in disasters [59]. This solution includes a hospital administration system as

well as a complete electronic medical record and a lightweight picture archiving and communication system (PACS). Patient transfers within the hospital are noted, and an online command dashboard screen is generated. Patient care is delivered by means of an electronic medical record. Digital radiographs are acquired and transmitted to stations throughout the hospital. The system helps to introduce order into an otherwise chaotic situation and enables adequate utilization of scarce medical resources by continually gathering information, analyzing it, and presenting it to the decision-making command level. The establishment of electronic medical records promotes facilitated continuity of care. Based on our experience, we encourage disaster response teams and agencies to consider the use of information technology as part of their contingency plans.

A 2011 Davos global health risk forum conference reviewed emergency surgical findings to date and called for improved data collection [60]. There is a consensus of a strong need to establish an international standardized reporting format. A proposed standard data collection form for sudden onset humanitarian crisis and natural disasters was suggested [61]. Multiple FMTs were mobilized following the recent large-scale disasters specifically, the 2010 Haiti earthquake. Thousands of surgical procedures were performed to alleviate pain, save lives, and allow rehabilitation and recovery. Many of these FMTs provided high-quality care, but they lacked basic medical record-keeping. In the absence of systematic information management and data collection, it is unlikely that the true impact, both positive and negative, of FMTs in a crisis setting will ever be known. It is disappointing to note that the massive medical response, presumably at immense cost, is inadequately documented. Without basic outcome data, there can be neither accountability nor a report of lessons learned.

Some groups recently began to collect and report outcome measures. In 2005, Operation Smile International (OSI) implemented an electronic medical record system that helps monitor a

number of critical indices that are essential for quality assurance reviews of surgical missions. In one retrospective analysis of more than 8,000 cases (mostly cleft palate procedures in children), the complication rates were similar to those reported in the United States and United Kingdom [62]. This finding is in accordance with other reports. In an analysis of data from three otology surgical missions conducted in Paraguay and Honduras from 2003 to 2006, the authors concluded that the results fall within those expected in developed nations [63]. The information in these reports are testimony to the importance of precise record-keeping and self-monitoring which would be invaluable to the efforts of organizing and regulating surgical humanitarian aid the world over.

Concluding Remarks

Humanitarian aid is a young science. The medical/surgical care provided in disasters or remote areas is unique and different than that of routine practice in the industrialized countries. Adaptability to the different scenarios is essential. As more and more medical personnel become involved, we may see these missions turning into a separate medical specialty. Toward that end, Farmer et al. [64] described a novel concept of creating a global health equity residency at Harvard's Brigham and Women's Hospital. Those of us involved in surgical humanitarian aid are acutely aware of the shortcomings of current practices and are actively striving to overcome them. We are optimistic that the next decade will witness major improvements in all of the areas that were described in this report, in full recognition of our responsibilities to provide care for the victims of global disasters that we are powerless to prevent.

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