Burn Management in the Developing World
International Volunteerism

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KEYWORDS

• Burn care • International missions • Medical volunteerism • Global health

KEY POINTS

- The burden of burn injury falls predominantly on the world's poor; low-income and middle-income countries (LMICs) account for 96% of burn injuries, yet are least likely to have access to adequate burn care.
- Volunteer organizations provide a significant portion of the health care coverage in the developing world.
- Every underserved area has a unique set of needs, circumstances, customs, resources, and challenges.

INTRODUCTION

From a public health standpoint, burn morbidity and mortality are solvable global health crises that are largely ignored. Worldwide, 11 million people require medical attention for burns and an estimated 265,000 die from burns or their complications annually.[1] The burden of injury falls predominantly on the world's poor, with LMICs accounting for 96% of burn injuries (**Fig. 1**).[1,2] Tragically, these vulnerable populations are also the least likely to have access to adequate medical care.

In addition to their physical impact, burns are among the leading causes of lost disability-adjusted life-years in LMICs and cost approximately $80.2 billion per year in lost productivity (wages and skills) alone.[1] In areas where disability insurance and workers' compensation are nonexistent, this economic impact imparts life-or-death consequences not only for the burn victim but also for all dependent family members. Even in cases where burns are not functionally incapacitating, the stigmata of untreated and visibly deforming burn scars alter the lives of victim and family alike, both socially and economically.

In an era of rapidly advancing medical technology, why do burns remain a top global health problem? In contrast to public health victories, such as the vaccination strategy for polio, successful burn treatment requires intense and prolonged care, in many cases surgery and/or rehabilitation. Burn prevention strategies require government initiative and cooperation from local businesses for the implementation of safety measures. Poverty, corruption, lack of infrastructure, lack of education, and lack of supplies are barriers to burn care from within the developing world. Historically, medical care rather than surgical care has dominated global health initiatives, with surgery nicknamed the "neglected stepchild" of public health.[3] In 2006, however, the World Health Organization and World Bank published the second edition of *Disease Control Priorities in Developing Counties*,[4] which acknowledged for the first time that surgery could play a significant role in effective and cost-efficient global public health strategy.

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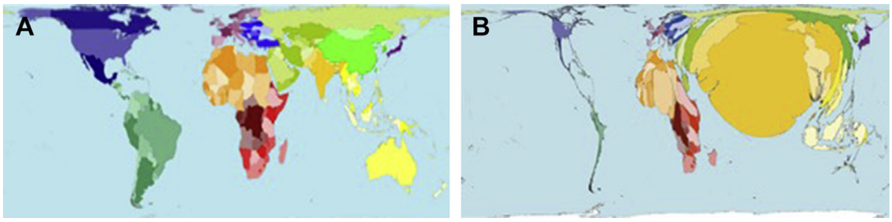

Fig. 1. (*A*) World map distribution based on land mass. (*B*) World map distribution based on burn-related deaths. (*Reprinted from* the World Mapper Team. Available at: www.worldmapper.org. Accessed June 2, 2015; with permission.)

INTERNATIONAL SERVICE: A BRIEF HISTORY

The surgical community has long been involved in international service in a variety of ways, initially with individual efforts. As World War I and World War II prompted the emergence of surgical specialties, they also shed light on the vast needs in war-stricken and resource-poor settings. The 1940s to 1950s saw the establishment of a variety of foundations, including the Reconstructive Surgery Educational Foundation, which promoted international travel and teaching.[3] Since the 1970 to 1980s, the more common means of surgical volunteering has become via nongovernmental organizations (NGOs). According to a study by the World Health Organization in 2008,[5] volunteer organizations provide a significant portion of the health care coverage in the developing world, providing approximately 40% of health services in sub-Saharan Africa.

Surgical volunteerism is approached in a variety of ways, depending on an NGO's philosophy and the needs of the underserved area. Some groups, such as Smile Train, focus on teaching and providing recourses, whereas others strive to treat as many patients as possible within a given time frame. Most groups employ teams on regular short-term (1–3 weeks) missions; some surgeons, including several at CURE International, commit to long-term (1+ years) individual posts. Surgicorps invites nonmedical volunteers; Interplast teams are composed of essential medical professionals only. Regardless of the approach, it is universally recognized that the ultimate goal is always patient safety and the delivery of quality medical care.

Recognizing that standards for volunteer missions are essential to the safe and effective delivery of care, the Volunteers in Plastic Surgery Committee of the American Society of Plastic Surgeons/Plastic Surgery Educational Foundation published in 2006 a series of guidelines to ensure safe, quality, and ethical plastic surgery and anesthesia in developing countries during international missions.[6,7] Due to the paucity of evidence-based surgical research on this topic, these guidelines are derived from a wealth of expert opinion and experience. They have been endorsed by multiple plastic surgery societies and NGOs. Although geared toward pediatric care, much of the advice can be applied to international burn care and the guidelines are a good resource for all plastic surgery volunteers.

PARTICIPATING IN A SURGICAL MISSION

Every underserved area has a unique set of needs, circumstances, customs, resources, and challenges. It is, therefore impossible to create a comprehensive instruction manual for establishing an international burn mission within the confines of this article. The authors' intent is to provide an additional resource for volunteer surgeons who are interested in treating burns, specifically to help prepare new surgical volunteers and to share some ideas and adaptations that may promote safe, efficient burn care in the developing world.

ORGANIZING A SURGICAL TRIP

Establish the Need and Feasibility of Service

Once a need has been expressed in an area, an initial exploratory trip is a necessary component of international service. The team for the introductory trip should encompass only experienced international workers. This initial site visit helps determine the true needs, the feasibility of administering care, and the receptiveness of the local community. To be both efficient and cost effective, the volume of patients requiring care should be high enough to warrant a trip and the team size. An inspection of a hospital and operating room (OR), including the functionality of anesthesia machines/monitors and reliability of electricity, is necessary to determine which major supplies are needed and how many patients the hospital is capable of treating. The importance of this is illustrated in an exploratory trip to Uganda in 2014, in which it was discovered that the "guaranteed" anesthesia capability of the local hospital consisted of an ether mask and a broken blood pressure cuff (**Fig. 2**). Sterilization capabilities, oxygen supply, suction, and basic laboratory services are required for safe surgical care.