Survey of Emergency and Surgical Capacity in the Conflict-Affected Regions of Sri Lanka

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Abstract

Background Three decades of internal conflict in the North and East of Sri Lanka have taken a toll on the health care system in that area.

Methods We proposed to quantify the current status of capacity to deliver emergency, anesthesia, and surgical interventions in the conflict affected areas of Sri Lanka. The World Health Organization (WHO) Tool for Situational Analysis to Assess Emergency and Essential Surgical Care (EESC) was used to evaluate 47 health facilities.

Results Although most have trained health care providers capable of basic procedures, infrastructure and supplies were severely lacking.

Conclusion These data can be used as a basis for the recovery and rebuilding of EESC capacity in conflict-affected areas of Sri Lanka.

Introduction

Emergency and surgical care has long been neglected in the global public health arena [1]. Recently, however, in response to reports of the feasibility of treating surgical disease in the developing world [2], surgical capacity in these settings has come to the forefront of global health discussions [3]. A lack of data regarding both the need for surgical procedures and the ability to provide them hinders current efforts. In response, the World Health Organization (WHO) created the Global Initiative for Emergency and Essential Surgical Care (GIEESC) in 2005 [4]. This initiative includes a tool kit for situational analysis developed for countries to assess their existing emergency, anesthesia, and surgical capacities.

Sri Lanka, as a whole, has excellent health indicators [5]. In the north and east of the country, however, there has been internal conflict for three decades. This conflict has taken a toll on the health system in this region [6]. Previous reports show a lack of basic health care supplies [7] and a scarcity of health-related human resources [6]. We proposed to quantify the current status of Sri Lanka’s capacity to deliver life-saving and disability-preventive emergency, anesthesia, and surgical interventions in conflict-affected areas. We studied the infrastructure, human resources, supplies, and procedural capacity of this region as a basis...
for future implementation of the WHO Emergency and Essential Surgical Care (EESC) project.

**Survey methodology**

Assessment was completed using the WHO’s tool for situational analysis to assess emergency and essential surgical care. This tool was developed in 2007 by the WHO GIEESC in collaboration with policymakers and health providers in developing countries [4] and has been used to assess surgical needs in many developing countries, most recently Sierra Leone [8]. The surveys were distributed by the WHO Sri Lanka in collaboration with ministries of health to a convenience sample of hospitals in the northern, north central, and eastern provinces of Sri Lanka during the year 2008. Hospitals surveyed were those that could be accessed by the WHO personnel. The surveys were filled out by hand by an officer of the local institution and collected by the WHO Sri Lanka office in Colombo. Survey responses were then entered into a database and SPSS 16.0 (SPSS, Chicago, IL, USA) was used for analysis. Descriptive statistics were used to characterize survey responses.

**Results**

**Facility characteristics**

A total of 47 health facilities responded to the survey. Among them, 36 (76.6%) are in the northern province, 7 (14.9%) in the eastern province, and 4 (8.5%) from the north central province. Within the northern province, 26 of the 36 (72.2%) are in the district of Jaffna and the other 10 (27.3%) are in Vavuniya. In the eastern province, responding facilities are all from the district of Batticaloa, and in the north central province they are from Anuradhapura. Two facilities returned the questionnaire stating that their building was completely nonfunctional and was providing no services. One completed questionnaire stated that the hospital was “displaced,” providing dispensary services from a location other than their actual building.

Divisional hospitals, which are small peripheral units, comprised 14 of the 47 (29.8%) of respondents: 24 (51.1%) were district hospitals and 7 (14.9%) were base hospitals. One was a teaching hospital, and one hospital recorded their facility type as an unspecified “other.” The latter was functioning as a referral point at the transition between the Tamil-controlled area and the rest of Sri Lanka and therefore did not have a Sri Lankan classification.

The data set was then limited to those hospitals considered district or base hospitals because these are the first referral hospitals and the most appropriate target for the EESC project. The total number of first referral hospitals (district + base) was 31; thus, all subsequent denominators less than 31 were secondary to missing data as not all facilities responded to every question. Populations served by these health facilities ranged from 213 to 175,000. In all, 15 of the 24 (62.5%) district hospitals reported serving a population between 10,001 and 100,000. The district hospital that reported serving a population of only 213 was an outlier; however, and on further inspection this was the hospital functioning only as a dispensary.

Hospitals were asked about the closest institution with a higher level of surgical services to which they would refer patients if the necessary services were not available at their own institution. The distances ranged from 6 to 50 km, with one institution noting that part of the journey was necessarily by sea. Most of the hospitals (17/30, 57%) reported that the hospital to which they would refer was 6 to 25 km away.

**Basic infrastructure**

Running water was consistently available in 24 of 28 (85.7%) health facilities; the water supply was interrupted in 3 (11%) and not available in 1 (3.5%). Electricity was consistently available in 15 of the 28 (53.5%) but interrupted in 13 (46.4%) (Fig. 1). A total of 51.7% (15/29) of health facilities reported having no operating room (OR) in their facility; 8 (27.6%) stated that they had one or two ORs, and 6 (20.7%) reported one OR equipped for minor procedures only. Oxygen was consistently available at 22 of 29 (75.8%) health facilities, but 7 (24.1%) indicated that their supply was interrupted.

In total, 4 of 28 (14.3%) had 10 or fewer beds; and 10 (35.7%) reported that they had 51 to 100 beds. In all, 3 of 28 hospitals reported that they admit no patients, whereas 21 (75%) reported that they admit more than 500 patients/year. When asked about surgical admissions, 8 of 28 (28.5%) did...
not respond. Of those that did respond to the question, 7 of 20 (35%) reported no surgical admissions; and 6 of 20 (30%) of those reporting surgical admissions stated that they comprised 21% to 30% of their admissions.

Human resources

Surgeons were scarce at the first referral level. One base hospital said they had a trained surgeon who was a volunteer from Medecins Sans Frontieres (Fig. 2). In addition, one base hospital reported having one anesthesiologist, and two reported having one obstetrician/gynecologist. Most health facilities (92.8%) had midwives or paramedics, with the number of trained personnel ranging from 0 to 43. In addition, 57.2% of health facilities reported having medical officers who could perform basic surgical procedures in their health facility. Most hospitals, therefore, had someone trained in basic surgical procedures (e.g., incision and drainage, suturing)—most frequently a midwife or a medical officer.

Referral patterns for traumatic injury

Referral patterns for a representative set of specific procedures necessary for treating traumatic injury were studied. For removal of a foreign body (eye, ear, throat, nose), 10 of 28 (35.7%) reported that they would refer the patient to another facility. For a cricothyroidotomy or tracheostomy, 19 of 20 (95%) would send the patient to another hospital; and 12 of 20 (60%) reported that they needed to refer a patient for insertion of a chest tube or for burn management. Finally, all reported that they have to transfer patients with an open fracture to a higher-level health care facility.

Referral patterns for general surgery

A representative set of common general surgical procedures was also identified; and the survey included questions about referral patterns for these procedures. All first-level health facilities referred patients requiring a laparotomy. Likewise, 19 of 20 (95%) health facilities referred patients for hernia repair. Patients requiring a skin graft are referred by all health facilities, whereas incision and drainage of abscesses are referred by only 5 of 21 (23.8%). Most of the institutions that referred patients for incision and drainage did so for lack of supplies, not because of the lack of ability to perform the procedure.

Availability of supplies

Resuscitator bags were present in 11 of 22 (50%) health facilities surveyed. In all, 13 of the 22 (59%) had examination gloves, and 12 of the 22 (54.5%) had sterile gloves. Most health facilities (14/22, 63.6%) had a sterilizer available. Only 12 of 22 (54.5%) reported having both intravenous infusion sets and cannulas to start an intravenous infusion. Nasogastric tubes (4/20, 20%) and eye protection (1/20, 5%) were scarce (Fig. 3).

Discussion

Sri Lanka is a country of 20 million people and a land area of 65.6 thousand square kilometers [9]. Sri Lanka is known...
for health indicators and education levels higher than those of similarly economically situated countries [5]. Life expectancy at birth was 72 years in 2007, and the percent of births with skilled attendants was 99% [9]. The northern, north central, and eastern provinces were chosen for this survey because they comprise the areas most affected by the decades of internal conflict. All aspects of health care delivery have suffered in these areas, leading to poor access and availability of care [10]. Nagai et al. [6] found the distribution of health-related human resources in Sri Lanka to be uneven, with the most severe shortages in the northern province which has been severely affected by years of conflict.

On May 18, 2009 reports in the news stated that the Sri Lankan government had declared victory in the 26-year war with the Tamil Tiger rebels, also known as the Liberation Tigers of Tamil Eelam [11]. The total number of displaced persons was estimated to be more than 265,000 [11]. WHO Sri Lanka is currently working with the Ministry of Health to support health care for internally displaced persons (IDPs) [12]. Rotating surgical teams are now stationed at the Padaviya Hospital as part of these efforts [12]. As Sri Lanka enters this new postconflict phase, the health system in the north and east of the country will have to be rebuilt. Our data give some insight into the lack of surgical capacity and identify specific gaps in the provision of emergency and essential surgical care. This analysis is to be used by the Ministry of Health as a preliminary needs assessment for planning the reconstruction of health care delivery system in the conflict-affected areas.

Despite the recent end of the conflict, emergency and essential surgical services are expected to remain in high demand, as traffic injuries and fatalities constitute another major public health problem in this area [13]. Traumatic injury has been the number one cause of hospitalizations in Sri Lanka every year from 1996 to 2006 [14] and in 2006 accounted for 17% of all hospitalizations [14]. These patients necessarily present initially to referral-level facilities, and our analysis shows that these facilities are ill-equipped for these patients, primarily owing to the lack of infrastructure and supplies. These findings underscore the need for further attention to infrastructure and supplies for the delivery of surgical services in this area of Sri Lanka.

### Limitations

The information presented has several limitations. The presence of volunteers from relief agencies was not specifically addressed, and thus the number of providers might be slightly underestimated. The participation of individual volunteer organizations in surgical delivery in these regions has been previously documented [10]. In addition, forms from the Vavuniva District were missing about half of the data that might have been collected; thus, the referral patterns and supply availability do not represent this area. This accounts for the varying denominators presented in the results section. Although the survey instrument has been previously piloted [8], data remain subject to any of the biases typically found in survey research methodology. Finally, and perhaps most important, is the constantly changing situation in areas of humanitarian crisis. Since the collection of these data, conflict escalated throughout the spring of 2009 prior to its end; thus, the data collected may no longer reflect the current capacity. We maintain, however, that this initial survey is still valuable even though the situation has likely deteriorated further.

### Conclusions

Whereas most first referral-level health facilities in the conflict-affected areas of Sri Lanka have some skilled personnel, most do not have the capacity to deliver emergency, anesthesia, or surgical care owing to their limited infrastructure and supplies. With decades of conflict ended in northern and eastern Sri Lanka, life-saving and disability-preventive emergency and essential surgical care must be considered during reconstruction of the health system. With the increased incidence of traumatic injury in the displaced population, especially, surgical capacity will continue to be in high demand. Resources and capacity building for the delivery of surgical care are in need at first-referral health facilities to create a strong health system in conflict-affected areas of Sri Lanka. With the epidemiologic and demographic transition that is taking place, postwar Sri Lanka faces new challenges for the delivery of quality health care and health care financing. This analysis will be used to plan innovative and cost-effective strategies for the delivery of emergency and essential surgical care.

### References