Editorial

Surgery in low-income countries during crisis: experience at Médecins Sans Frontières facilities in 20 countries between 2008 and 2014*

Miguel Trelles1, Lynette Dominguez1 and Barclay T. Stewart2,3

1 Surgery, Anesthesia, Gynecology and Emergency Medicine Unit, Médecins Sans Frontières, Brussels, Belgium
2 Department of Surgery, University of Washington, Seattle, WA, USA
3 Department of Surgery, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

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The global burden of trauma and surgical conditions fall disproportionately on low- and middle-income countries (LMICs) [1, 2]. Inopportunely, developing countries are least equipped to provide essential surgical care [3]. As a result, LMICs have a significant burden of unmet surgical needs [4]. When these fragile health systems are disrupted by conflict, a natural disaster or an epidemic the capacity for and quality of surgical care decreases even further [5]. In response, Médecins Sans Frontières (MSF) provides surgical humanitarian assistance in countries affected by crisis through one of the five operation centres; one of these is Operations Centre Brussels (OCB).

Describing the epidemiology of surgical care at MSF-OCB projects improves planning for humanitarian assistance and provides a unique opportunity to examine surgical needs that were otherwise unmet by national healthcare systems [6]. From 2008 through 2014, MSF-OCB performed 119,524 operations at 45 projects in 20 countries. The majority of operations were obstetric (range 28–42% of operations by year), general surgical (e.g. hernias, appendicitis; range 15–49%) and unintentional trauma-related (e.g. road traffic crash, burn; range 10–42%). Violence was also a common cause of surgical need (e.g. land mine or bomb injury, gunshot wound; range 7–15%) (Table 1). MSF-OCB teams provided safe anaesthesia, often by task sharing, in the face of complex care needs evidenced by low perioperative death rates (i.e. death from time of anaesthesia care to discharge from the recovery ward; 0.2–0.3% of operations). From 2008 through 2014, the orthopaedic care capacity was deliberately improved to meet the needs of conflict-related projects (Figure 1). This was done by developing fracture care guidelines for non-orthopaedists, as well as recruiting expatriate orthopaedic surgeons. More detailed operative epidemiology of these sites has been reported previously [6–8].

Commitment to quality surgical care

MSF-OCB uses data from operational and clinical research at each project to identify opportunities to better the care provided by both national and international staff [9]. Some examples of published quality improvement programmes and lessons learned from the process are listed below:

• establishing minimum standards of skill and training required for humanitarian surgery before field missions [6];
• creating management pathways for complex genital fistulas [10];
• strengthening local ambulance services to reduce maternal and neonatal mortality [11];
• monitoring post-operative surgical infection rates in austere contexts [8];
• providing and maintaining minimum resource inputs for humanitarian surgical activities during conflict or disaster [12];
• ensuring safety while relying on surgical and anaesthetic task sharing in Africa [13].

These studies further MSF’s mission to improve surgical care despite crisis and build capacity useful long after a conflict or disaster subsides [14, 15]. Lessons learned in these reports might be instructive for other humanitarian assistance programmes or surgical teams operating in similar contexts.

Meeting challenges with solutions

Beyond operating in resource-poor and insecure settings, MSF-OCB faces several major challenges that have
required innovative strategies to avoid compromising surgical quality. Among the greatest challenges are those that stem from human resource deficiencies. The number and scope of projects that MSF-OCB supports require many well-trained surgeons, anaesthetists and nurses to function successfully. Further, providing surgical care for patients with complex pathologies in the absence of advanced resources requires a highly skilled team to achieve satisfactory outcomes. Given that these projects operate in settings without a well-trained cadre of healthcare providers, the demand–supply gap is difficult to overcome. In response, models for surgical and anaesthesia task sharing in areas where well-trained personnel are not available have been developed [13]. These teams have similar perioperative death and complication rates as projects with qualified national or expatriate surgeons and anaesthetists [13]. MSF associations created a shared human resource pool by keeping a register of specialised staffs ‘on call’ when emergently needed for new or evolving crises. The register allows quick creation of qualified and skill-complementary teams when rapid deployment of a large number of specialised humanitarian staff is needed. Such models might be useful for other humanitarian sectors or organisations that rely on immediate availability of a highly trained staff.

In addition to a shortage of specialised staffs, many of the surgeon or anaesthetist volunteers only perform one mission. Certain skills are only acquired by having previously performed in high-intensity, low-resource environments or operating with teams practiced in caring for the dramatic pathologies commonly encountered by humanitarian surgical teams [6]. Unfortunately, such skills are

**Table 1** Number of projects and causes of surgical procedures and anaesthesia provided by Médecins Sans Frontières Operational Centre Brussels from 2008 to 2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of sites</th>
<th>Causes of surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ongoing</td>
<td>Unintentional trauma</td>
</tr>
<tr>
<td></td>
<td>Opened</td>
<td>Violence</td>
</tr>
<tr>
<td>2008</td>
<td>7</td>
<td>618 (7)</td>
</tr>
<tr>
<td>2009</td>
<td>9</td>
<td>940 (11)</td>
</tr>
<tr>
<td>2010</td>
<td>10</td>
<td>1904 (12)</td>
</tr>
<tr>
<td>2011</td>
<td>14</td>
<td>1954 (10)</td>
</tr>
<tr>
<td>2012</td>
<td>11</td>
<td>2211 (12)</td>
</tr>
<tr>
<td>2013</td>
<td>12</td>
<td>2465 (13)</td>
</tr>
<tr>
<td>2014</td>
<td>10</td>
<td>2648 (15)</td>
</tr>
</tbody>
</table>

Handed-over refers to projects that MSF-OCB returned to national healthcare systems for management. Brief assistance refers to projects where assistance was provided for less than 1 year.

**Figure 1** Types of operations performed by Médecins Sans Frontières Operations Centre Brussels from 2008 to 2014. OBGYN, obstetrics and gynaecology.
not usually available for serial deployments. To avoid conceding quality of care or team efficiency, MSF-OCB developed protocols for managing common conditions for which the care might be different between high-income and LMICs (e.g. tropical infections, genital fistulas, fracture care for non-orthopaedic surgeons) [10, 16, 17]. By doing so, staff without significant humanitarian surgical experience can immediately operate safely and effectively despite working in foreign contexts.

Routine analysis of MSF-OCB operative logbooks identified projects where complex pathologies (e.g. complicated wounds, traumatic brain injury, major burns, traumatic or obstetric genital fistulas) were particularly common. To avert excess death and disability that would otherwise be incurred without specialised services, permanent centres were developed to provide needed expert care. For example, a high burden of obstetric and traumatic genital fistulas was found in Burundi [10]. In response, MSF-OCB developed a comprehensive fistula care centre. Data from this project were used to develop protocols for complex, multistage fistula repairs. The centre helps women cope with the trauma of living with a fistula and the psychosocial implications of returning home. These protocols standardised genital fistula care at MSF and might be useful for other teams operating in areas with a similar burden [10].

Lessons from unanticipated natural disasters, such as the 2010 Haiti earthquake, highlighted the importance of having a quick, coordinated and robust humanitarian surgical response [18]. In efforts to improve agility during the hyperacute phase of a crisis, three escalating ‘packages’ of surgical care resources were developed: (i) rapid intervention surgical kit – all essential resources for life-and limb-saving surgery designed to be functional within 3 days of the start of a crisis; (ii) rapid deployable surgical unit – include inputs to perform more complex operations and can be available within 1 week; inflatable hospital – infrastructure and resources necessary for advanced surgical care and can be functional within 2 weeks. To further improve response times, the packages are stored at strategic locations around the world, pre-emptive import agreements with national governments and WHO have been made, potential supply chains outlined, and a surgical mass disaster plan established. Together, these preparations may lead to a more swift response to sudden crises and further reduce avertable death and disability in future disasters.

The way forward

Certain inputs and process improvements are considered to be particularly important for providing quality humanitarian surgical assistance on the way forward, such as: (i) recruiting expatriate staff with a broad skill set (e.g. general, orthopaedic and obstetric surgery) and practiced in operating with severe resource limitations; (ii) developing formal training and mentoring programmes with local staff to sustainably build surgical and anaesthesia capacity; (iii) supporting specialised activities (e.g. complex wound reconstruction, thoracic and vascular surgery, and advanced orthopaedic care); (iv) creating comprehensive but user-friendly protocols that further efforts to ensure all patients receive a defined standard of care; and (v) expanding routine data collection to capture data required for better monitoring and evaluation (e.g. specific complications, in-hospital deaths) of these interventions. By doing so, MSF will continue to advance surgical care in the most challenging of circumstances, relieve a substantial proportion of the avertable disease burden that results from conflict or disaster and facilitate lasting improvements to local healthcare systems emerging from crisis.

References


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**Corresponding Author** Barclay T. Stewart, Department of Surgery, University of Washington, 1959 NE Pacific St., Suite BB-487, PO Box 356410, Seattle, WA 98195-6410, USA. Tel:+1 206 543 3680; E-mail: stewarb@uw.edu