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Global Acute Care Surgery – A Public Health Intervention or a Tool for Social Change?

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Introduction

Very few would argue that the provision of essential and life saving surgery around the world is not a paramount and significant health issue. Every year, millions of people die as a result of a lack of access to emergency and essential surgical care. This occurs disproportionately in low-income countries [1]. The mortality rate world-wide from injury (close to six million annually) accounts for 10% of the world's deaths, 32% more than the number of fatalities that result from malaria, tuberculosis, and HIV/AIDS combined (Figure 1) [2]. This is on a backdrop of ongoing and unique surgical issues that occur due to preventable, tropical diseases caused by bacteria, virus, fungus and protozoal or helminthic parasites. With awareness growing, there has been increasing interest in "Global Acute Care Surgery" among health care practitioners in middle and high-income countries. Although this surge has occurred over the last several years, it is accentuated and accelerated with 'natural' disasters, for example the earthquake of Haiti in 2010. Additionally, new technologies, usually reserved for surgeons in middle and high-income countries, are increasingly being made available to surgeons in low-income countries, for example laparoscopy. It remains imperative for global Acute Care Surgeons to recognize the causes and treatments of injury and emergency surgical illness as manifest in the majority of countries around the world. At the same time, access to new technologies must be provided, in balance with a broader public health perspective.

Global Acute Care Surgery

It is important for Acute Care Surgeons to be aware of the burden of immediately life-threatening surgical illness seen in low-income countries, clearly divided into trauma and emergency general surgery. In cases of trauma, blunt trauma is more prevalent an etiology than penetrating, in absence of ongoing armed conflict in the form of interpersonal violence, civil wars, invasions or international conflicts. Road traffic injuries account for 23% of deaths related to injury, followed by suicide and homicide. These three causes of death as related to injury are anticipated to increase in rank for overall cause of death by 2030 [2]. From the perspective of neglected tropical infectious diseases, unique surgical emergencies may present themselves with intestinal perforation (i.e., *Salmonella typhi*), obstruction (i.e., *Ascaris lumbricoides*) or directly with intra-abdominal abscess formation, or tuberculous peritonitis among others. Other surgical emergencies include Inguinal hernias as these continue to present as the most common cause of small bowel closed-loop obstruction in the world [3]. Many of these presentations progress to complications, including death, if not treated in a timely fashion or conversely can be avoided by addressing the poverty behind the etiology. Most notably, this includes but is by no means limited to adequate sanitation, access to clean drinking water, adequate nutrition, education and importantly, timely access to emergency surgical care.

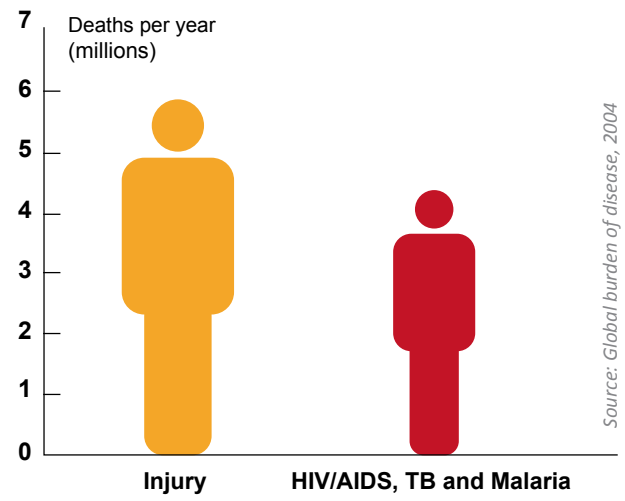

Figure 1: The mortality rate world-wide from injury.

The Global Silver Bullet for the Golden Hour

Opinions vary on the best way to ensure global access to Acute Care Surgery. Some believe that as the need is overwhelming, and any effort to reduce morbidity and mortality from emergency surgical diseases or trauma is beneficial to improve health, even if delivered one patient at a time. Others consider the burden of global surgical challenges so tremendous that individual, surgical interventions may not only be useless but also potentially harmful, re-directing scarce funds to high-technology endeavours. New ideas are emerging, however, that urge a fresh perspective by considering global surgical diseases akin to other threats to public health such as communicable diseases [4]. Many believe that population-based approaches should be entertained. Or, in parallel to other manifestations of a lack of access to adequate health care, this is a pressing human rights issue with causes and consequences beyond the biomedical model [5]. These latter ideas argue that it is irresponsible to ignore the larger social, political and economic context of global surgical disease when this is merely another manifestation of poverty in its worst form. The following is an exploration of the above arguments.

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The Overwhelming Need

The need around the world for timely and lifesaving surgical intervention is undeniable. The Global Initiative for Essential and Emergency Surgical Care is an undertaking of the World Health Organization (WHO) which estimates 15% of the global burden of disease can be addressed with surgery [2]. There are currently 2423 million surgical procedures that are performed around the world. As expected, the disproportionate majority of these procedures (172.3 or 73.6%) occur in high-income countries where 30.2% of the world's population lives. In 2004, an underwhelming 8·1 million (3.5%) surgical procedures were performed in low-income countries that spend significantly less on health care and account for 34.8% of the global population [6]. Given the magnitude of this disparity and the great need that exists, recently the WHO together with nation-based organizations, has established various groups and initiatives to study the problem [7].

This need is certainly accentuated in times of natural and man-made disasters such as the Haitian earthquake that occurred on Jan. 12th, 2010. Urgent surgical intervention, over and above daily requirements for surgical care, was important largely to prevent death from septic limbs. In fact, because of timely surgical intervention, it is estimated that certainly hundreds, if not thousands of lives were saved, but official counts are difficult to obtain [8]. Certainly surgery alone is not enough when antibiotics, intravenous fluids, critical care support and basic water and nutrition were also urgently needed. Conversely, however, without surgery many more Haitians would have died. This is one of many examples where surgical intervention is beneficial, even when faced with overwhelming need and numbers.

More Harm than Good?

Essential surgery by definition is, however, a secondary to tertiary health care intervention, used only to intervene once pathology has been established. There are no recommendations for prophylactic operations that, on a massive scale, should be implemented to keep populations disease-free. Nonetheless, surgical intervention does have a role to play in saving lives, namely after trauma, in obstetrical emergencies, and reducing morbidity and Disability Adjusted Life Years (DALY) as demonstrated with lens replacement in cataract surgery [2]. Without such services, argues the WHO, up to 10% of patients will die from trauma and 5% from obstetrical complications, especially in the productive years of life. Given the economic constraints of health care budgets, particularly in poor countries and chronic shortages of health care workers, some feel that surgery is too much of a financial burden impose on already stretched health care budgets [8-10]. This has been the classic rationale for softening the push for expanded and supported surgical endeavours in economically deprived or low-income countries. Additionally, given the substantial need that exists, we would require surgeons, anaesthesiologists and nurses in the hundreds of thousands to help with these endeavours around the world. Local health services and ministries of education are cash-strapped particularly in low-income countries. For example, it is estimated that the cost per DALY for surgery in poor countries is $33 US, which, while modest by affluent standards, still is close to five times the cost of reducing one DALY for expanded vaccination programs [10].

Additionally, the need to support essential surgery, especially safe surgery, is another focus of the WHO. This is not only a challenge in affluent countries but certainly in low-income countries, where the majority of the world's population is receiving surgical treatment by surgical and anaesthetic technicians [11]. The fact is accepted that there will chronically be a shortage of surgeons in low-income countries, therefore attention shifts to training non-surgeons and even non-physicians for surgery, a concept that would likely be rejected in affluent countries. Although quality indicators are challenging to gather, it is argued that the provision of even basic surgical care is fraught with unacceptably high complication rates and poor outcomes. A third challenge related to the provision of global surgical care, aside from cost and quality, is the overall lack of organization of individual or group endeavours in surgery around the world. Haiti post earthquake is an example of global surgical interventions perhaps doing more harm than good [13]. For example, individual post-operative patients suffered the complications of temporary surgeons long gone, such as surgical site infections, with unclear handover of follow up care. Other post-operative patients became reliant on a non-existent surgical support system for follow up care as exemplified by lack of services to, for example, remove external fixators. Also in the case of Haiti, fragile medical and health infrastructures can and have been destroyed by the imposition of inappropriate foreign models cloaked in good intentions [12]. This has been witnessed in various settings across the globe, with very concerning outcomes and currently no regulatory body to control this. These reasons have continued to support the notion that expanding surgical services globally, including in resource-poor settings, not only may be futile for the number treated compared to the existent need, but also harmful.

Global Acute Care Surgery as a Public Health Challenge

Given the overwhelming need for surgery and the re-evaluation and dismissal of historic arguments against it, few are disputing the notion that not only is essential surgery important to save lives, but surgery must be expanded and viewed as a public health intervention [13]. This is largely given the magnitude of importance of injury and illness related to surgical diseases around the world. The economic constrains are minimal compared to lives saved and DALY's averted by surgical intervention for key procedures ranging from trauma care, hernia repairs, laparotomies, cesarian sections or even cataract surgery. Many are calling for global surgery to be included under the banner of public health interventions and regarded as a tool for primary health care, within a more equitable framework for health. Certain academic institutions are acknowledging this role for global surgery in public health by placing their trainees in overseas electives on a rotating basis to allow for continuity of care [15]. This emphasis of surgery as a population-based global disease, meriting the same attention as their communicable disease counterparts is an important, recent shift. What remains to be seen is how much different a model this is, within a public health context, for true and lasting health equality and poverty reduction, the prime threat to health.

Surgery as a Human Right

Some argue, still, that there is a moral imperative to addressing the unmet burden of global surgical disease. Not doing so would be a violation of the human right to health for millions around the world [5]. It is argued that essential surgical services should be deemed a basic human right to health. Cost-effective and curative surgical procedures can avert disability and premature death from many life-threatening emergencies and other conditions. Others also specifically argue that it is important to use a political approach to understand why priority is not given to essential and emergency surgical services on the international stage–public health or otherwise [14-16]. There is no mention, however, of the use of politics and economy in understanding why people are denied access to health care in the first place. Global access to essential surgery would even fit with the United Nation's

Millennium Development Goals, especially goal #5, to decrease maternal mortality in order to improve maternal health [16]. While these are new and laudable ideas, they still fall short of true health for all.

By focusing on the surgical biomedical model as an individual human right, this ignores the larger social, political and economic picture that influences the collective aspect of global human rights. Surgical endeavours are rendered useless, no matter how admirable the intention and dedication, when operations take place on patients weakened by hunger and disease, unable to either live with dignity or to develop their human potential. It is indeed ironic to be mobilizing as surgeons in the rush to save lives in Haiti post-earthquake. One wonders how many health care workers, including surgeons, mobilized, en-masse pre-earthquake, when Haitians were dying of starvation and turned to eating mud cakes. What of the outcry when our international financial institutions reduced Haitian tariffs on imported food from 38% to 3% as a pre-condition for the return from exile of their democratically elected leader? True health will come from liberation of poor countries from their decades of economic enslavement through structural adjustment programs and debt servicing, frequently costing three to four times more than what poor nations are able to spend on their own health care [18]. Ignoring the economic and political reality of a community, nation and global society is short-sighted, naïve and perpetuates a system anathema for true and equal health for all.

Here, we have demonstrated various approaches to global surgery, especially within the context of global Acute Care Surgery. The historic tendency to abandon these initiatives as being too costly in resource-poor countries is shifting in favour of definitive treatment. Surgical intervention is not only occurring on a massive scale in times of disaster, but it is being viewed alongside other threats to public health such as malaria and HIV/AIDS. The global burden of surgical disease however, is merely another sign of a problematic, global economic and political model. It is one that allows for such inequalities in health to exist around the world [17] while ignoring the upstream "Causes of the Causes" [19]. This is what must change in order for all millennium development goals to be reached so that true health care and collective, global human rights may be equally realized.

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