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# Terrorism-related trauma in Africa, an increasing problem

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Received 2 March 2014; received in revised form 23 May 2014; accepted 26 May 2014

Available online 15 July 2014

## KEYWORDS

Trauma;  
Terrorism;  
Public health;  
Surgery;  
Surgical public health

**Abstract** Global terrorist activities have increased significantly over the past decade. The impact of terrorism-related trauma on the health of individuals in low- and middle-income countries is under-reported. Trauma management in African countries in particular is uncoordinated, with little or no infrastructure to cater for emergency surgical needs. This article highlights the need for education, training and research to mitigate the problems related to terrorism and surgical public health.

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Global terrorist activities have increased by more than 450% in the past decade [1]. While this rise is largely associated with conflicts in the Middle East and South Asia, recent terrorist activities, such as the Westgate Mall attack in Nairobi, Kenya, and

bombings in Nigeria, have highlighted a growing trend in violence and scope of terrorist activities throughout sub-Saharan and Northern Africa [2–4]. In light of this distressing trend, there is a clear need for an improvement in the management of major incidents, specifically those related to terrorism.

Over the past decade, both the prevalence and mortality resulting from terrorism-related attacks

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<http://dx.doi.org/10.1016/j.jegh.2014.05.006>

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have been on the rise [5]. In Africa, political, cultural and religious unrest has fuelled an increase in terrorism-related blast and gunshot injuries, as well as deaths. In Nigeria, widespread terrorist attacks linked to the extremist group Boko Haram have resulted in at least 8000 deaths since 2009 largely due to suicide bombings and armed firearm attacks [6]. 'Opportunists' in many of these settings take advantage of the underprivileged and those with little or no moral or intellectual education and entice them at a huge cost to humanity to become pawns of civilian warfare. Therefore, education has a crucial role to play to help reduce these attacks on an individual and collective basis.

Countries that are hardest hit by terrorism are often those which also lack fundamental health-care systems to manage individual traumatic injuries and mass traumatic casualties arising from terrorism. In these countries, trauma management systems are often non-existent or drastically under-developed and under-funded. While global public health initiatives have focused on infectious and communicable diseases, trauma accounts for the largest burden of disease in Africa contributing to an average of 10 million disability-adjusted life years [7]. Despite this reality, trauma remains a neglected disease throughout much of the continent. Furthermore, lack of accurate data collection in low- and middle-income countries (LMICs) makes the actual number of casualties difficult to quantify. Consequently, the global burden of trauma in these countries is likely to be grossly underestimated [8]. The cost-effectiveness of surgery in LMICs is grossly undervalued as the true economic and financial impact of traumatic injuries and mass casualties contributing to death and disability is significant, although largely unquantified. Physical disability from trauma in African societies often leaves individuals as community outcasts as there is little or no investment in rehabilitation services or facilities. A number of studies have highlighted surgery and surgical services as being vital in public health strategies [9,10]. A call for surgical leadership in changing the philosophy of care from that of chronicity and elective surgery to that of emergency surgical services, including trauma, is therefore necessary.

The development of a comprehensive emergency response system with adequately trained personnel and a network of functional treatment centres would contribute to minimizing the impact of terrorism-related injuries. A systematic approach is key to the management of mass casualties in terrorist attacks. It is vital to implement a strategic plan which addresses the deficits and rec-

ognizes existing health-care strengths by establishing the logistical infrastructure, knowledge sharing and resource planning required to improve service provision. Therefore, there is a well-defined role for major incident management systems and processes to be applied that would require the training of operational management and clinical personnel in order to deliver standardized optimal care. In addition, digital technology has a role to play in influencing global health initiatives. Mobile phone technology is widespread in Africa and is an accessible medium for training, development, coordination and incident reporting.

In higher income countries, improved outcomes for trauma patients has been associated with better pre-hospital care, on-scene stabilization, improved transportation of injured patients and standardization of training through courses like the Advanced Trauma Life Support (ATLS) programme. The management of major incidents and terrorism-related events has advanced in recent years as a result of practiced protocols, improvements in cross-sector communication and deployment of appropriate resources based on security, safety and clinical needs. These strategic principles can be modified and adapted in Africa following the acceptance of and engagement in the essential need for infrastructure establishment. If trauma as a disease is to be further understood in Africa, research and investment into trauma epidemiology and surveillance networks is also required to ensure adequate and appropriate resource allocation.

It is important that countries in Africa develop structured emergency response services that are prepared and equipped to respond to traumatic incidents. For this to occur, an assessment of current trauma services and the upgrading of regionalized trauma care service delivery with the establishment of a structured training programme are required. Trauma systems in LMICs will benefit from greater planning and health service strengthening across the continuum of care. Not only will surgical public health plans for trauma management help save lives, but they will also have a role in prevention through raising awareness amongst policy makers about the requirement for immediate surgical care, access to medical and rehabilitation facilities, and the necessary infrastructure.

Finally, there needs to be cohesion between charities, governments, and non-governmental organizations in order to mitigate this currently unmet need for surgical care and public health. This will minimize duplication of services and encourage tactical planning and collaboration of resources.

## Conflict of interest

We have no conflicts of interest to disclose.

## Acknowledgement

There are no sources of funding to disclose.

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