ELECTIVE (SSC5b) REPORT (1200 words)

A report that addresses the above four objectives should be written below. Your Elective supervisor will assess this.

'Major trauma' describes serious and often multiple injuries and is a significant cause of mortality and morbidity worldwide. According to the World Health Organisation, over 16,000 people die from trauma each day, with thousands more being injured, many with life-changing injuries. It remains to be the most common cause of death in individuals under the age of 40 and each year, it is responsible for more deaths than malaria, HIV and tuberculosis combined. As such, trauma is a significant public health concern. The burden of trauma facing countries can demonstrate significant heterogeneity, such as the incidence of firearm-related injuries in Jamaica compared to that of the UK, but in both developed and developing countries the most common mechanisms of trauma remain to be road traffic collisions, falls and deliberate harm inflicted on others or oneself.

Despite the fact that most 'disasters' occur in the developing world and more than nine out of ten deaths due to trauma occur in developing countries, there is worrying lack of research on trauma originating these countries. Perhaps this is unsuprising, as in the face of the limited resources, research is unfortunately unlikely to be considered a priority. The lack of resources within these developing countries mean that the largest group of trauma patients in fact contribute insignificantly to the world's peer-reviewed literature on trauma. Of the research that I found orginating from low-income countries, I found two papers originating Nigeria and Tanzania to be particularly interesting. Authors highlighted the high mortality rates following trauma and that with increasing delay to definitive medical management, mortality unequivocally rises. Authors also highlighted the absence of effective services for survivors of significant of trauma who had developed post-traumatic stress disorder (PTSD), an often over-looked complication of trauma, with less wealthy survivors of trauma more prone to develop PTSD.

Compared to the UK, a high-income country with advanced trauma care systems in place, developing countries experience challenges in the provision of trauma care on several fronts. Firstly, developing countries should have a robust reporting and surveillance system in place, whereby detailed data on trauma is collected and routinely analysed on a continous basis. It is only through having such systems in place that location-specific information can be obtained to devise superior bespoke trauma care systems and pathways. The nature of an effective trauma network would differ from country to country and from region to region, depending on several variables, such as existing infrastructure, population density and country size. As such the importance of location-specific surveillance systems cannot be understated.. The Royal London Hospital for example, has several levels of surveillance systems at a local and national level. Secondly, whilst it is highly unlikely that any healthcare system will ever be able to prevent all trauma cases, prevention remains key to minimising the number of casualties. Road traffic accidents remain to be significant cause of major trauma and are perhaps the first cause of major trauma that comes to mind when considering prevention. Aside from improving infrastructure, such as lighting, signage and quality of the roads, public health campaigns (such as drinkaware in the UK) backed by legislative measures can prevent an untold number of accidents. It is inherently difficult to predict and measure the effectiveness of preventative interventions but for developing countries to implent logical steps to counter factors that lead ultimately result in trauma, such as what more developed countries have done in the past and continue to do, it is hoped that the burden of trauma will fall. Thirdly, as most deaths due to trauma occur before the patient has even

arrived to hospital, the importance of pre-hospital care in initial management of trauma patients cannot be understated. Many developing countries are in need of reliable, well-equipped ambulance services, and that at least one member per ambulance staff should be appropriately trained to provide very basic emergency procedures. In one study conducted in Southern Ghana, I was surprised to learn that most trauma patients were brought to hospital in a taxi or bus. Fourthly, as one might imagine, in-hospital care of trauma patients in developing countries needs significant improvement. Most hospitals in the developing world are not adaquately staffed by well-trained medical professionals, with many staff unfamiliar with critical life-saving procedures e.g. establishing a patent airway, or surgical repair of a single abdominal organ injury. The World Health Organisation created a 106-page document titled 'Guidelines for essential trauma care', detailing the needs of an injured patient, the inputs required to meet those needs, guidelines for essential trauma care and methods to promote the trauma care services (1).

An editorial titled 'Major Trauma Networks in England', written by McCullough et al, provides an excellent overview of the state of trauma care in England (2). Over the past few decades there have been a number of changes in the national delivery of trauma care. Previously, patients who had sustained trauma were simply taken to the nearest hospital regardless of the injuries they have sustained and whether the hospital was capable of providing definitive treatment. Over the years, in a national effort to enhance trauma care, regional major trauma centres were established, with our own Royal London Hospital emerging as a centre of excellence. Despite this progress, evidence of suboptimal care continued to emerge. This resulted in yet another organisational change in the setup of trauma care, with the establishment of regional Major Trauma Networks, again with London leading the way. Compared to the rest of the UK, the trauma set-up in London is unique given the high population density and relatively small geographic area. In London, when a patient is identified pre-hospital to have sustained major trauma, the patient is immediately transferred to the nearest available major trauma centre, bypassing more local hospitals that would be unable to provide definitive care (e.g. neurosurgery, cardiothoracic surgery or interventional radiology). There are four major trauma centres in London, the Royal London Hospital, St Thomas' Hospital/King's College Hospital, St Mary's Hospital and St George's Hospital, with practically all patients arriving to hospital within 45 minutes (with an average transfer time of just over 15 minutes), supported of course by the air ambulance. Research has shown that such a system significantly improves outcomes and that more patients are consequently surviving major trauma. Outside London, regions have developed trauma networks considering local resources and transfer times, comprising of Major Trauma Centres, Trauma Units and local emergency hospitals. If a patient is identified by prehospital triage to be in need of a Major Trauma Centre care, he/she is immediately transferred to the Centre if the transfer time is under 45 minutes, bypassing nearer hospitals unless there is an immediately life-threatening issue such as airway obstruction. For patients with longer transfer times, they are transferred to a Trauma Unit, capable of providing resuscitation and managing most immediately life-threatening injuries such as abdominal trauma requiring emergency laparotomy. Once the patient is sufficienty stabilised, the patient is transferred to a Major Trauma Centre if needed, e.g. for neurosurgical care. The establishment of Major Trauma Networks has improved outcomes for major trauma patients right across England, with even further improvement expected as the networks 'mature'. Regarding the research that I conducted during my elective, this has been discussed at length with my Supervisor and we are currently collecting more data, with a plan to publish in the near future.

1) WHO, Guidelines for Essential Trauma Care. Geneva, Switzerland, 2004.

2) McCullough et al., Major trauma networks in England. British Journal of Anaesthesia. 2004; 113(2): 202-6.