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POLICY AND SERVICE DELIVERY

Managing mass casualty events is just the application of normal activity on a grander scale for the emergency health services. Or is it?

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Introduction

The aim of this paper is to examine the proposition that emergency health services can manage mass casualty events by adopting a grander scale to their normal activity. Emergency Management Australia uses the term ‘medical emergency’ in its glossary to describe mass casualties which are ‘events in which trained personnel are required to respond effectively to a medical crisis beyond the accepted routine of the health care facility’.¹ In other words, a mass casualty event goes beyond the normal activity of emergency health services, ‘which generates more patients at one time than locally available resources can manage using routine procedures. It requires exceptional emergency arrangements and additional or extraordinary assistance’.^{2, p.6} However, the proposition suggests that emergency health services could boost normal activity to manage mass casualty events. In this paper, I argue against this proposition and take the ‘or is it’ position and demonstrate that mass casualty events challenge emergency health services by:

1. Going beyond normal activity
2. Extending day-to-day triage; and
3. Requiring a surge response

I use research literature and publically available documents to support my argument.

Going beyond normal activity

The disruption to normal activity in mass casualty events was most poignantly portrayed in media coverage of the recent Haitian earthquake and the 2004 Indian Ocean earthquake. Numerous media images of these and similar disasters put on view just how devastating and impossible the emergency situation can be for emergency health care workers. Responding effectively to a medical crisis of this nature goes beyond the accepted normal routine of many health care facilities and the capacity of its staff. The devastation from the Haitian earthquake generated a global humanitarian response which continues to the present day. The United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) provides overall coordination, while the World Health Organisation (WHO) leads the response for health through its leadership of the ‘Global Health Cluster’.³

Similarly, in 2009, the Pandemic (H1N1) and the Victoria Bushfires tragedy countered the idea that boosting normal activities in emergency health services would be sufficient to manage mass casualty events. The pandemic demonstrated the need to revise the Victorian Health Management Plan for Pandemic Influenza 2007.⁴ Canestra⁵ discussed the difficulties the Victorian Department of Health experienced once the State Government activated its public health emergency operation plan. Managing the pandemic revealed weaknesses in the plan whereby hospitals, general practitioners and laboratories received constant updates on procedures, vaccines and vaccinations. This information was subject to change based on on-going surveillance and risk assessment. This event also stretched the resources of Ambulance Victoria.⁶ The Pandemic (H1N1) 2009 influenza virus remained the predominant influenza virus circulating worldwide in 2009, with the Australian Emergency Hotline providing updates on the 37,713 confirmed cases in Australia to February 2010.⁷

In the setting of a pandemic, and other events with global health implications, the WHO International Health Regulations (2005), add an additional dimension. These Regulations, to which Australia is a signatory, aim to ‘help the international community prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide’.⁸ They place a range of legal requirements on the whole of government, all health service providers and health professionals which go beyond normal activity.

The Victorian Black Saturday bushfires also highlighted the inadequacy of normal emergency health services. In one incident, an ambulance took five hours to take a badly injured patient to hospital because it could not pass through a roadblock.⁹ This response time, grossly exceeds the expectations of normal activity. The environmental conditions preceding Black Saturday and the bushfires were unprecedented in Victorian history and compelled the Victorian Premier to call a Royal Commission¹⁰ which was established on 16 February 2009 to investigate the causes and response to this mass casualty event. The emergency health services were not the focus of the Commission’s inquiry. Nonetheless, changes have already resulted from reflections on the management of this mass casualty event. The *State Health Emergency Response Plan (SHERP)*¹¹ is one such plan which revised its system and infrastructure to managing mass casualty events. SHERP is a framework for a coordinated whole-of-health approach to emergencies, including mass casualties. Its recent revisions include updates on the planning and preparedness framework which now incorporates the addition of ‘Field Primary Care Response Sub Plan’ under the State Health Emergency Response Plan to enable better responses to health emergencies.^{11 p.6} The management of an incident also includes a more explicit statement about the coordination between Incident Management Team and the Emergency Management Team to ensure a common understanding and a unified approach.^{11 p.8} The presence of these plans acknowledges that mass casualty events require additional arrangements beyond normal activity.

One specific element of these additional arrangements is that of ‘cultural competency’. Whilst the NH&MRC Guidelines for ‘Cultural Competency in Health’¹² require all health care organisations and health professionals to demonstrate the principles of cultural competency in their normal professional activities, these are usually applied to one-on-one care, even in the acute situation. In mass casualty situations, the CALD communities are one of a number of community groups who experience increased vulnerability.¹³ Emergency health services are required to adapt their normal practices by introducing additional procedures and practices which accommodate the challenges of concurrently meeting the needs of multiple, culturally diverse and geographically spread community-based individuals and groups.

The idea that emergency health services cannot just scale-up their normal activity to manage mass casualty events adequately is articulated at an international level, by the WHO. Acting under the auspices of the United Nations, WHO develops guidelines to help policy makers, decision makers and emergency managers overcome gaps in health system preparedness for managing mass casualty incidents. Mass casualty events require more than emergency health services, instead, needing a multi-sectoral approach which is dependent on the ‘cooperation of many sectors – communications, transportation, law and order, security, water and sanitation, social services, and other non-health sectors’.^{2 p.12} These requirements are demonstrated by the new ‘clusters approach’ introduced under the banner of ‘humanitarian reform’.¹⁴ Because mass casualty events do not occur every day, they sit outside the domain of normal activities. Emergency health services are designed to manage everyday emergencies, while mass casualty events require different management approaches such as those in the WHO Mass casualty management systems,² SHERP¹¹ and Ambulance Victoria’s Emergency Response Plans,¹⁵ whilst also managing the normal business of the emergency health service. One principle which crosses the spectrum from managing normal daily activity to that of a mass casualty event is triage.

Extending day-to-day triage

The triage principle derives from the French term ‘*trier*’ and Napoleon’s battlefields where its applications was first recorded for classifying and prioritising the wounded for their evacuation.¹¹ In this context, the least injured soldiers received priority treatment so they could return quickly to the battlefield where a larger fighting troop force was needed to produce a victorious outcome. Wounded soldiers expected to live received the next priority, while mortally wounded soldiers received little care and were often left to die with fallen comrades. On the battlefield, triage meant that those who were treated first needed the least of available resources and those treated last need the most resources.¹⁶ Mitchell¹⁷ describes the historical development of triage to its modern day form in which disaster medicine today has shifted the approach from ‘doing our best in a bad situation’^{17 p. S6} to a systematic approach.

The systematic and contemporary use of day-to-day triage in Australian hospitals applies the principles of the Australasian Triage Scale (ATS) which is a tool for rating clinical urgency to ensure hospital emergency staff see patients in a timely manner.¹⁸ In normal circumstances, a specifically trained and experienced registered nurse triages one patient at a time, allocating one of the five ATS categories – ATS 1 being the most critical and requiring immediate treatment while ATS 5 requires treatment within 120 minutes. Triage in this setting concentrates resources on a few and pays little attention to whether the resources are used wisely.¹⁶ Day-to-day triage is physiologically based and aims to save lives by treating the worst first. Likewise, under normal circumstances the ATS is used as the basis for performance indicators in emergency departments which do not apply to mass casualty settings.

In the hospital emergency setting, this approach is contrary to what once occurred in the battlefield. Today, in a mass casualty event, triage reverts to its historical roots. When a large number of patients require triage to establish those who can be cared for with the available resources, emergency health services cannot put all resources into the patient who is close to death. In the instance of mass casualty events, applying a grander scale of normal activity would be difficult, if not impossible. In the first instance, scaling-up might appear a desirable option, however, a number of issues demonstrate the impracticality of such an approach. Disaster response often differs from assumptions about planning. These include: self-rescue;

bystanders performing sporadic and atypical dispatch; and, ineffective triage with many patients self-transporting to the closest facility, or hospitals receiving limited notification with the least injured arriving patients first,¹⁹ Indeed, the day-to-day triage is adapted to the ‘Sieve and Sort’ two-step triage process in mass casualty events.²⁰

The consequences of large scale catastrophic events vary in scope, nature and severity which influence triage management. Disaster specific triage management plans and goals would therefore differ from one disaster to another, for example public health emergencies. Triage in the midst of disasters requires appropriate and adequate pre-event planning and preparedness that is different to normal activity. Often, assumptions about how emergency health services respond include appropriate notification, and that they will function normally, providing effective despatch of emergency resources, scene assessment and security, functional incident command with rescue triage determining patients for emergency transport to an appropriate healthcare facility.¹⁹ However, in reality, managing community-based public health emergencies requires the disaster response community to reconceptualise disaster-specific triage as a ‘population-based systemic process that addresses all potential points of contact between individuals and the health care system’.²² Burkle’s SEIRV model aims to separate the infectious from the vulnerable and is directed at keeping most infectious patients out the hospital emergency department which is a different approach to day-to-day triage.²²

Depending on the nature of mass casualty events, emergency health service providers may find it necessary to shift daily operational triage principles from treating the most severely injured patients first, to the principle of providing the greatest good for the greatest number of casualties.¹⁹ This 18th century utilitarian ethical principle ‘strives to produce the greatest possible balance of good over harm’,²³ or in medical ethics principles, it is better to save more lives rather than fewer, particularly when allocating scarce resources in a triage model.¹⁶ In mass casualty events, patient care could be compromised if emergency staff use excessive resources on one patient, thus shifting the balance from helping one patient to harming many through lack of care. A significant increase of large-scale mass casualty events²⁴ presents a particular challenge for emergency health services to successfully manage incidents that involve an unprecedentedly large number of casualties with different types and severities of injury which have unpredictable outcomes. Triage in mass casualty events, thus requires additional skills. Indeed, ‘mass casualty triage is a critical skill’.²⁵

Myriad triage systems could complicate the management of triage, resources and training, which may result in ineffective planning for mass casualty incidents. For example, the management of large scale mass casualty events can result in a scarcity of essential medical resources, necessitating the implementation of triage management policies to guarantee that available resources benefit affected populations.¹⁹ This predicament could be further complicated due to the conceptual inadequacy of some triage guidelines. The ATS principles refer to an isolated procedure which occurs in the emergency department and determines how patients will engage with the health service from this single point of entry. While the ATS rates clinical urgency, its inadequacy lies in its failure to interrelate with all aspects of patient care within the broader health services programs. An alternative approach for benefiting patients is ‘a systematic approach to disaster-specific triage management that integrates care at all points of interaction’²¹ between patients and the emergency health services, as was recognised after Black Saturday.²⁶ In addition, precision in the management of mass casualty events relies on triage as one of the critical determinants for successful disaster plans.²⁷

The early identification of disaster specific resources is critical in mass casualty events, such as the Indian Ocean tsunami, Haiti and the Pandemic (H1N1) 2009 influenza. During public

health emergencies, the destructive elements directly affects medical and public health facilities, health priorities quickly emerge, dominate and force reconsideration of triage decision making processes and protocols.²⁸ During the 2003 avian influenza (H5N1), the allocation of resources, such as ventilators and antiviral medications overwhelmed the critical care system²⁹ and such concerns remain current in 2010.³⁰ Developing plans to cater for the allocation of critical care resources raises ethical issues about equity and need,^{30,31} particularly if resources become scarce. Should a pandemic overwhelm resources, international law dictates that a triage plan provides equitable opportunity for every person to survive. In 2006, the development of a Canadian triage protocol provided guidance for making triage decisions during the initial phases of a pandemic if resource scarcities occurred.²⁹ In this environment, unlike normal circumstances when patients should receive equal access to health care, intensive care resources become scarce and are reserved for patients who are likely to benefit, and a restriction placed on resources to those who will gain no benefit. Such an approach replicates the 18th century ethical principle of providing the greatest good for the greatest number, and emulates battlefield and current military practices.

The reconceptualisation of disaster-specific triage, which in some ways re-invents the 18th century model, has been further developed after 9/11 and the extraordinary numbers of patients received in health care facilities, and with subsequent public health emergencies providing further rationales for continued modification. Since 9/11, debates flourish about the capacity of emergency health services to provide simultaneous acute care for critical and non-critical casualties.³¹⁻³⁵ The ability of emergency health services to cope with unprecedented numbers of casualties is known as surge capacity.

Requiring a surge response

Surge capacity is the ability of hospital staff to deliver simultaneous acute care to both critical and non-critical mass casualties in a disaster situation.³⁴ However, little consensus exists on how to differentiate between surge capacity and daily patient care capacity.²⁷ Nonetheless, in recent years, Australian emergency health services experienced mass casualties when receiving burn victims following the 2002 and 2005 Bali bombings. More recently, three events placed unprecedented demands on Victorian health care services in terms of surge capacity; namely, Black Saturday, particularly from the primary care perspective and patients with major burns,³⁶ H1N1 outbreak,⁶ and the Victorian Heat Wave.³⁷

In theory, the triage model provides a means for sorting patients to ensure they receive appropriate treatment at suitable health facilities and specialist units. In practice, however, evidence suggests that in the case of an urban disaster, hospitals will respond to fifty percent of casualties within an hour.³² Obviously, if or when such an event was to occur, its impact would quickly overwhelm emergency health services, as was seen in the Victorian response to the H1N1 outbreak. Ambulance Victoria (AV) recognised that, despite comprehensive and useful pandemic preparedness plans, AV failed to adequately guide the response to the pandemic, which presented less severely than first anticipated.⁶ With each Australian winter and the continued presence of H1N1 and, as noted earlier, the increase of large-scale mass casualty events,²⁴ emergency health services face an imminent challenge in managing incidents that could entail unprecedentedly large numbers of casualties who present with distinct injuries of various severity and unpredictable outcomes. The challenge for emergency health services is real, especially if H1N1 mutates into a more severe strain. Such a possibility presents an even greater threat if the physical assets of Australasian hospitals are inadequate for managing mass casualty events.

A recent study of surge capacity in Australasian hospitals, as compared to American benchmarks concluded that should such an event occur, a high percentage of patients would not have access to care.³⁴ The authors suggest the system is already operating close to capacity with inpatient access block, overburdened operating theatres and intensive care units, and staff shortages. Existing bottlenecks and a sudden influx of large numbers of patients would further limit the ability of hospital staff and its resources to receive critical and non-critical mass casualty patients, stabilise and provide simultaneous acute care before operating and transferring for on-going care. A contrary view published in the same journal, suggested Australian health authorities had been putting into place arrangements as a part of surge planning since 2003.³⁵ For example, the Australian Burn Plan (AUSBURNPLAN) ensures appropriate care irrespective of the location or extended nature of disaster. The Australian Health Protection Committee developed policies and plans in 2003 to ensure such a response would occur. Such developments, however, seem to occur after major events and resemble post-disaster planning, rather than pre-disaster planning. A statement in the Executive Summary of AUSBURNPLAN exemplifies how such planning occurs after the event:

*The need for a national burn response plan is important given recent world terrorist events such as New York (2001), Bali (2002), and Madrid (2004). All three events highlight the fact that many patients suffered significant burn injuries as well as other multiple system trauma. Indeed, in the Bali bombing, 62 patients were admitted across Australia, occupying all adult burn beds. This extra patient surge occurred on the background of normal operations where severe burn patients from other incidents also required care.*³⁸

Similarly, the article explains another initiative about how the Australian Health Management Plan for Pandemic Influenza and the National Medical Stockpile enhanced the national capability to respond to a disaster. While developments of this nature fit better with the concept of pre-disaster planning, the irony of the article was that two years after its publication, H1N1 took hold and seriously challenged the National Medical Stockpile for antiviral therapy and personal protective equipment (PPE).³⁹ Restrictions on antiviral treatment and the failure of PPE being deployed rapidly in adequate numbers to where it was needed revealed a major flaw in pandemic planning for General Practitioners. While hospitals may not have been directly impacted on this occasion, the question remains ‘what could have happened had H1N1 virus been a particularly virulent strain?’

Surge capacity requires a different approach to normal capacity and capability of day-to-day emergency health services. A sudden and unexpected increase on demand for patient care challenges not only supplies, personnel, physical space, and management and infrastructure, such an event also tests the ability of emergency staff.⁴⁰ One research project indicated that following a terrorist bombing, trauma care providers demonstrated an inadequate mass casualty knowledge base which adversely affects treatment decisions⁴¹ while another reported that in one National Health Service Trust there was scope to further improve awareness and knowledge during mass casualty incidents.⁴²

At a fundamental level, hospital disaster plans incorporate arrangements to manage surge capacity which demonstrates the requirement of additional and usually more senior administrators involved in a multi-agency collaborative response which may even include the Premier and Cabinet. These arrangements go well beyond normal activity.

Conclusion

This paper examines the proposition that emergency health services can manage mass casualty events by adopting a grander scale to their normal activity. I argue against this statement and take the 'or is it' position by demonstrating that mass casualty events go beyond normal activity, undermine day-to-day triage and require a surge response to manage such an event. While a belief might exist about emergency health services having the capacity to effectively manage a medical crisis, in reality this is misguided. Emergency health services require exceptional emergency arrangements and additional or extraordinary assistance. Indeed, without greater knowledge and awareness, trauma care providers may adversely affect treatment decisions.

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