

# Disaster surge planning in Australia: measuring the immeasurable

Andrew G Robertson and David M Cooper

## *A call for better data and focused research*

Surge capacity has been defined as the “health care system’s ability to manage a sudden or rapidly progressive influx of patients within the currently available resources at a given point in time”.<sup>1</sup> This term entered the disaster medicine lexicon after “9/11” 2001, and has become a key feature of health disaster planning since the severe acute respiratory syndrome (SARS) outbreaks, the rising threat of pandemic influenza, and the Madrid and London bombings in 2004 and 2005.

Mass trauma events in urban environments create surge problems for hospitals in the first 4 hours, with the majority of casualties likely to arrive at hospital in the first 60–90 minutes.<sup>2</sup> Health systems need to be able to meet this increased demand after acute mass casualty events, with an influx of patients who may require “specialised evaluation or intervention”,<sup>3</sup> including surgery for penetrating trauma. As the epidemiology of traumatic events will differ depending on the cause, any preparations to manage a mass casualty event need to be flexible enough to deal with a range of disaster types, including infectious disease emergencies and bioterrorism, with their more insidious and later-peaking surge.

Meeting the challenges of surge capacity enhancement calls for cooperative action at the complex interface between clinical practice, health systems management, logistics, facilities management and personnel deployment. In this issue of the Journal, Traub et al<sup>4</sup> quantify the physical assets needed for surge preparedness of Australasian hospitals and conclude that they do not meet United States surge preparedness benchmarks, currently the only ones available. This is the first published study to assess Australian capacity in this area and the need for further research.

So what are these US benchmarks and are they an appropriate measure for Australia? The US Health Resources and Services Administration has set a minimum benchmark for surge capacity of 500 adult and paediatric patients per million population for infectious disease events and at least 50 patients per million population sustaining trauma or burns in a mass casualty event.<sup>5</sup> These figures have not been validated and, based on other traumatic events, 100–300 patients per million may be more accurate for burns or trauma.<sup>6</sup> The consensus from a series of articles on the “science of surge” in the November 2006 issue of *Academic Emergency Medicine*<sup>7</sup> was that there is little or no quantifiable measurement for managing an acute “sudden impact” surge or the even less predictable surge resulting from infectious disease emergencies or obscure events.

Even the utility of redundant infrastructure has not been formally evaluated and is known to be costly to bring into operation in response to an incident. In addition, the benchmarks don’t consider the need for management systems to be innovative in dealing with a surge situation. Establishing the exact number of required physical facilities fails to give adequate credence to what is a dynamic, non-linear and complex system. Some of the ways of increasing the capability of hospitals to respond to a local disaster include:

- creating temporary hospital facilities within public hospitals by having caches of medical supplies and equipment available;

- using alternative health facilities, such as operating theatres, beds and diagnostic resources in private hospitals and day procedure units for the “walking wounded” and “decanted” patients (patients already in hospital who can be transferred elsewhere to make way for disaster victims);
- using general and private health practitioners to provide a range of care for the walking wounded and decanted patients; and
- applying modified models of care, such as longer shifts and extended scope of practice for nurses, allied health practitioners, and medical and other health students.<sup>8</sup>

Health authorities in various Australian states and territories are putting such arrangements in place as part of their surge planning. Further research to quantify the effect these measures may have on hospitals’ response capability, and whether they can prevent critical bottlenecks, is urgently required.

The sustainability of the response is also critical. Some events will overwhelm local capabilities. Having national approaches in place, such as the Australian Burn Plan (AUSBURNPLAN),<sup>9</sup> can ensure that appropriate care is provided regardless of the site or prolonged nature of the disaster. The Australian Health Protection Committee and its predecessor the Australian Health Disaster Management Policy Committee have been working since February 2003 to put policies and plans in place to ensure that such a response will occur. A detailed review of the work of the Australian Health Disaster Management Policy Committee until the end of 2005 has been published in the *MJA*.<sup>10</sup> The recent development of the Australian Health Management Plan for Pandemic Influenza,<sup>11</sup> the National Medical Stockpile,<sup>12</sup> the establishment and deployment to Java, Indonesia, of Australian disaster medical assistance teams in May and June 2006 (in response to the Yogyakarta earthquake); and the improved communication and coordination of health disaster responses between individual states and territories and the Australian Government have all enhanced the national capability to respond to a disaster.

What remains, however, is the continuing need for further research in disaster medicine, particularly into surge capacity, so that hospitals and health services can better gauge whether the steps they are putting in place will be effective. Historically, disaster medicine has grappled with the difficulties of evidence-based research, particularly in terms of measuring outcomes through randomised controlled trials. However, without better data and focused research, we will continue to “measure the immeasurable”.

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