

# Current challenges in the provision of ambulance services in New Zealand

Sultan Al-Shaqsi

Received: 29 March 2010 / Accepted: 6 September 2010 / Published online: 4 November 2010  
© The Author(s) 2010. This article is published with open access at Springerlink.com

**Abstract** Emergency Medical Services (EMS) in New Zealand has been serving the society since the first ambulance in 1892. Since then it has developed rapidly following national health system reforms and changes in lifestyle that increase demands and expectations from local communities. Today, the system provides high-quality pre-hospital emergency care. This article will briefly introduce some of the issues facing EMS that will impact the future of this crucial system in New Zealand. These issues include demands because of an aging population funding, double crewing, and volunteerism, registration, and unified standards.

**Keywords** Ambulance · New Zealand · EMS · Challenges · Funding · Registration · Paramedics · Double crewing · Volunteer

The provision of EMS in New Zealand, unlike in other Commonwealth countries, is voluntary and contractual rather than regulated. The system in New Zealand is facing challenges because of the aging population, changes in lifestyle, and changes in health care provision. These factors, especially the aging population, drive a high demand for emergency services despite scarce funding [1]. There is a recognized increase of elderly patients using emergency medical services who would have been taken

care of adequately with better quality, greater dignity, and lower costs in alternative settings than in the traditional emergency services. These patients do not always call ambulances because of emergencies or accidents, but rather because their daily networks of support fail to function, and they face unplanned—not necessarily unforeseen—deterioration in their health status, and thus ambulance services and emergency departments become the only option. It is estimated that the annual increase in 111 calls is about 4 to 6 percent per annum mainly as a result of medical cases rather than injury-related ones in the older age groups [2]. This paper will discuss some of the issues shaping the future of EMS in New Zealand. This includes sustainability of funding, staffing, and volunteering; registration of paramedics as a profession; and performance and standards.

## Sustainable funding

Currently, there are two types of funding for New Zealand ambulances, private and public. Private funding is from trusts, donations, fundraising activities, and bequests. Public funding to ambulance services is provided through contractual agreements between providers and the Accident Compensation Commission (ACC) and the Ministry of Health (MOH). The ACC covers the funding for all emergency services to injury-related calls, and the Ministry of Health funds the medical emergency calls. The public funding is split about 35:65 between the ACC and the Ministry of Health [3]. This ratio reflects the nature of emergency calls, which are more to medical than injury-related in nature.

Private funding provides a big bulk of funding for ambulance services in New Zealand. For example, in the financial year 2007/2008, St John's ambulance received NZ

---

The views expressed in this paper are those of the author(s) and not those of the editors, editorial board or publisher.

---

S. Al-Shaqsi (✉)  
Department of Preventive and Social Medicine,  
Dunedin School of Medicine, University of Otago,  
P.O. Box 913, Dunedin, New Zealand  
e-mail: Alssu455@student.otago.ac.nz

\$ 19.2 million, which was 11% of its total annual revenue [4]. Also, Wellington Free Ambulance (WFA) received NZ \$ 3.0 million, which was about 23% of its annual revenue in the same financial year [5]. This shows the support of the local community for the service, the commitment, and the willingness of the society to support its local services. However, it also indicates the implications of relying on private funds to provide pre-hospital care. This is because this source of revenue is unsustainable and does not provide the sense of security and certainty required for future planning and long-term development.

Public funding for ambulance services is via the ACC and the Ministry of Health on a contractual and fee-for-service basis as a yearly agreement. In 2006/2007 the Ministry of Health spent \$38.48 million and \$3.81 million to purchase medical ambulance services from St John's ambulance and WFA, respectively [3]. However, there is a discrepancy between the ACC and the Ministry of Health in regard to the rate at which they pay providers. For example, in 2006/2007, Wellington Free Ambulance responded to 22,982 call-outs under its contract with the ministry and received \$3.81 million in funding, equating to \$165 per call-out. In contrast, it responded to 10,281 call-outs under its contract with ACC and received \$2.52 million in funding, equating to \$245 per call-out [3]. This shows the inconsistency among state funders for ambulance services.

In the current ACC contract, the ambulance providers are paid for transported live injury-related cases, which means that injury-related victims who die on the scene and are not transported are not covered by the ACC scheme [2, 3]. This might influence the professional attitudes of practicing paramedics by making them feel pressure to transport and over triage patients because of the transport incentives. Also, it can be argued that responding to a call-out imposes costs on service providers whether the patient is transported or not and whether the patient attended is alive or has died before transportation. Furthermore, the current ACC funding specifies the response by ambulance services, which excludes fire services attending to emergency cases as first responders, especially in rural areas. Despite this, medical emergency cases attended by fire services have doubled between 2004 and 2007, but the current funding policy does not have a policy to cover cases attended by non-ambulance services [2].

The recent review of sustainable funding for emergency medical services in New Zealand highlighted some of the financial issues facing this essential service in New Zealand. It concluded that even though providers might not run on deficits now, the current funding strategy of fee-for-service requires a better reformation to ensure sustainability and a sense of certainty to help develop future plans. The funding has to be unified across funding agencies (i.e., the ACC and Ministry of Health). Furthermore, the current

funding policy does not provide a sense of sustainability, which is very essential for future planning for emergency medical services in New Zealand [3].

### Staffing and volunteer issues

Staff and volunteers are the backbone of emergency medical services. Emergency medical services in New Zealand face some staffing issues, such as single crewing of ambulance vehicles and the sustainability and retention of non-paid volunteers.

It has been estimated that in some areas of New Zealand about 70% of emergency cases are attended by a "single crew" ambulance [2]. This could be seen to have a negative impact on the quality of care provided and the safety of providers. Double crewing (two pre-hospital providers per ambulance vehicle) allows for continuous care and monitoring of the patient during transportation to the health care facility. Furthermore, it provides a sense of safety for attending personnel and reduces work-related injuries (e.g., back pain due to a single crew lifting stretchers). Another way to achieve double crewing is via the utilization of rapid response vehicles or other public safety vehicles accompanying the single-crew ambulance. The current cost of staffing is \$45.5 million, and this will need to increase by 36% if full double crews per ambulance are to be implemented [3]. Providing rapid response vehicles costs more, even though it is more flexible in terms of the ability to measure the response according to the need and severity of the case (i.e., BLS vs. ALS) [6]. Despite all this, the benefits of double crewing are based on faith and yet to be defined in order to justify the scale of the investment. In addition, the cost-effectiveness of double crewing has to be established first, especially in low call volume stations in remote and rural areas of New Zealand. The double-crewing policy has to be viewed in conjunction with the local patients' acuity, local resources, and local protocols for pre-hospital care provision.

The New Zealand emergency service providers rely heavily on volunteers. In 2008, St John's had 7,647 volunteers serving alongside 2,211 paid staff [4]. This shows the willingness of our society to support the service. On the other hand, it might indicate an emerging danger of high reliance on volunteers to provide quality health care. The danger is from the high rates of turnover among volunteers and the issue of sustainability and retention of volunteers, especially during high demand times, i.e., disasters. This was demonstrated during the 1991 Gulf War when the Kuwaiti EMS system, which was run by 75% volunteers, collapsed during the first days of the war because of the lack of contractual governance of volunteers [7]. The sustainability of the volunteer input to the

ambulance service is uncertain, but the cost of replacing volunteers with paid staff can be estimated to give a view of the magnitude of the risk should this input wane. It is estimated that volunteers in New Zealand contribute about \$33 million per annum [3].

Increasing the number of paid personnel is needed to ensure the sustainability of the staff, but this issue is tightly associated with cash flow and availability of funds. Meanwhile, simple measures have to be adopted in order to attract and retain volunteers if the service is to continue.

## Registrations

This is a very debatable issue in New Zealand. Currently practicing paramedics are not registered as allied health professionals under the Health Practitioners Competency Assurance Act (HPCAA) of 2003. Thus, they are not termed professionals, although they work independently in an uncontrolled environment making clinical judgments, carrying out complex and invasive procedures, and using controlled medications. In addition, the scope of paramedics is usually stretched beyond the scope of their registered colleagues, such as physiotherapists and nurses, yet paramedics are still unregistered. The aim of paramedic registration is to provide a consistent system for protecting public safety by ensuring consistency in clinical services across providers and to establish a process of competency monitoring. Registration means that paramedics will also become subject to a standard and comprehensive regulatory system that oversees unified education, qualifications, and competency reviews. It is expected that registration will lead to increased professional recognition, public confidence and trust, mobility in an international market, and a higher flow of income. Most importantly, users of the ambulance service will benefit from this competency assurance process.

In addition, registration allows other professionals to recognize and appreciate the scope of practice of paramedical personnel. Furthermore, it allows paramedics to take on the responsibility of developing and improving this crucial discipline of emergency medicine by formulating a body of knowledge that is essential in the professional discipline. Thus, self-determination should be catered to as an essential element for the future provision of ambulance services in New Zealand.

Registration requires an authority body that sets the standards and minimal requirements for practicing paramedics to be certified to practice autonomously [8]. This has to be independent from ambulance unions, and it involves stakeholders and representatives from interested parties in society. The independent body has the responsi-

bility to set the standards and regulate the registration and certification process. Also there has to be a unified educational curriculum and a recognized undergraduate degree in paramedical science for the profession to be registered. Currently, there is one tertiary-level undergraduate bachelor course in paramedical science provided by Auckland University of Technology (AUT) [9].

Registration is needed for paramedics in New Zealand to ensure the uniformity and the delivery of high-quality pre-hospital services. However, the practicality of implementing the process is not fully comprehended by policy makers who are concerned about issues brought by the process itself, such as the logistics of the transition period to full registration of paramedics and the cost of upgrading skills and registering the currently practicing paramedics who might not have the minimum qualifications required. Another issue to bear in mind is the fact that 77% of paramedics in New Zealand are volunteers who largely do not have a tertiary qualification in pre-hospital care to qualify them to be registered. Therefore, registration of paramedics is a complex issue tied up with financial, logistical, and quality implications.

## Standards and performance

Currently the provision and delivery of pre-hospital emergency care in New Zealand is under contractual arrangements between providers and funders. The funders are the Ministry of Health and the ACC, which purchase services from emergency providers under the New Zealand Standards for Ambulance and Paramedical Services (NZS 8156:2008). The standards are not mandatory, and the Ministry of Health or ACC does not monitor compliance to the standards. Thus, providers are only required to show ‘reasonable endeavors’ to meet the standards [10]. The standards themselves are very non-specific and are not universally achievable. They target the structural standards more than the process standard. Thus, the current standards are far from a patient-centered approach.

The current key performance indicator used by ambulance providers in NZ is based on the response time. The standards document defines the response time as the time taken from receiving enough information to the arrival of ambulance at the incident scene [10]. This definition excludes two important periods, time taken to process the initial information and time from arrival to first intervention, which might correlate more to patient outcome than the arrival time alone, especially at crime scenes and dangerous environments. Response time as an indicator has been widely used, but its value correlation to patient outcomes in emergency medical service performance is questioned, especially in medical cases [11–14]. However,

its significance in trauma cases has been demonstrated [12, 14]. Furthermore, the value of the response time to the outcome declines with lower acuity cases, so it is set to only cover priority one (red cases), which one large study estimated to be only 8% of the calls to emergency medical providers in urban areas [15]. Therefore, the time interval is not able to truly reflect the total performance of a system. Thus, from an appraisal point of view, the time interval does not inform much other than a distance to the incidence divided by the speed of an attending ambulance. It has been shown that advocating response time as a gold standard target performance might even be misleading and harmful to providers and the wider public in some instances [13]. For example, hypothetically, if an ambulance arrived on time but the patient died because the paramedics did not defibrillate on time, then if we consider response time as the target for performance, this case meets the standard, but from the patient outcome point of view it does not. Nevertheless, it is still used in EMS standards in New Zealand, and Table 1 below shows the targets of response time specified in the contract document and the Standards NZS 8156:2008 document for different geographical areas [3]:

A recent review of 210 land ambulance stations showed that only 47 (22.3%) stations do report according to this definition of the geographical areas separately. Another 69 (32.9%) stations report for the main area of their coverage only. From the 47 stations that reported their response time accordingly, it was found to be 2% below the standards, and in the other 69 stations, it was found to be 7.7% below the standards [2].

The provision of EMS in NZ has to be based on targets that account for patient outcome as the main performance indicator rather than time intervals, because the usefulness of this indicator in measuring performance has been seriously questioned. The first step towards achieving outcome-based performance indicators is to gain consensus agreement from stakeholders in the system about the priorities of patient outcome in the provision of EMS. Emergency medicine physicians in New Zealand should be proactive in developing performance indicators appropriate

**Table 1** Targets of response time specified in the contract document and the Standards NZS 8156:2008 document for different geographical areas

Source document	Percentile	Urban	Rural	Remote rural
Contract	80%	10 min	16 min	30 min
Contract	95%	20 min	30 min	60 min
Standards	50%	8 min	12 min	25 min
Standards	95%	20 min	30 min	60 min

The definition of "urban" has to be equivocal with a population greater than 15,000 person [10].

to the local context as part of their clinical governance oversight. This will also facilitate the steps towards full registration of paramedics as health professionals. Many are advocating the inclusion of patient outcomes and best clinical practice as criteria for performance standards.

## Conclusion

Emergency medical services (EMS) in New Zealand are evolving rapidly and facing a wide range of concerns impacting the future of this crucial service. Increased utilization, the aging population, funding, paramedic registration, and ambulance double crewing and staffing are several key issues that might impact the implementation of proposed changes and universally provided services. It will be interesting to follow how these issues are addressed, and how the future of EMS in New Zealand is designed, funded, and implemented may serve as a model for other systems facing similar challenges. These challenges are shared by many EMS systems around the world, and innovative solutions to tackle these issues are globally needed.

**Conflicts of interest** None.

**Open Access** This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.

## References

- Wyatt C (1999) Roadside to bedside: a 24-hour clinically integrated acute management system for New Zealand. Wellington: Ministry of Health 10
- Kedgley S (2008) Inquiry into the provision of ambulance services in New Zealand: Report of the health committee. Presented to the New Zealand House of Representatives
- Hodgson H (2008) Ambulance Services Sustainable Funding Review. Ministry of Health New Zealand
- St John's Annual Report 2008. New Zealand 2008
- Wellington Free Ambulance Annual Report 2008. New Zealand 2008
- Henderson S, Mason A, eds (1999) Estimating ambulance requirements in Auckland, New Zealand: ACM New York, NY, USA
- Munk MD, Dtm, H SDW, Bhs MLP, PgDipIcp TEP, Hardan MS et al (2009) Physician Medical Direction and Clinical Performance at an Established Emergency Medical Services System. Informa Healthcare p. 185–92.
- Reynolds L, Adelaide S. Is Prehospital Care Really a Profession? International eJournal of Prehospital Care Research, Education, Clinical Practice, Policy and Service Delivery, <http://www.jephccom/uploads/990086pdf2004>
- Kate Diesfeld BS JD (2008) Commentary on the AUT submission and inquiry into the provision of ambulance services in New Zealand. Journal of Emergency Primary Health Care [editorial]. 6(3)

10. NZ standards for ambulance and paramedical services. New Zealand 2008
11. Braun O (1993) EMS system performance: the use of cardiac arrest timelines. *Ann Emerg Med* 22(1):52–61
12. Carr BG, Caplan JM, Pryor JP, Branas CC, Carr BG, Caplan JM et al (2006) A meta-analysis of prehospital care times for trauma. *Prehosp Emerg Care* 10(2):198–206 [Meta-Analysis Research Support, Non-US Government Research Support, US Government, PHS Review]
13. Price L (2006) Treating the clock and not the patient: ambulance response times and risk. *Qual Saf Health Care* 15(2):127–130
14. Myers JB, Slovis CM, Eckstein M, Goodloe JM, Isaacs SM, Loflin JR et al (2008) Evidence-based performance measures for emergency medical services systems: a model for expanded EMS benchmarking. *Prehosp Emerg Care* 12(2):141–151
15. Victor C (1999) Who calls 999 and why? A survey of the emergency workload of the London Ambulance Service. *Br Med J* 16(3):174–178

**Sultan Al-Shaqsi** is a medical and a PhD student from Dunedin School of Medicine, University of Otago, New Zealand. He is a researcher in pre-hospital and hospital emergency care. He has special interest in Mass Casualty and Disaster Medicine. His PhD project investigates disaster preparedness in acute care services.