

What is a health emergency? The difference in definition and understanding between patients and health professionals

Amee Morgans^{1,2,3} PhD, Research Development Manager (Ambulance Victoria),
Honorary Research Fellow (Monash)

Stephen J. Burgess¹ BHthSc, Grad Dip Emerg Health (MICA), MPH, MPA,
Research Fellow

¹Department of Community and Emergency Health and Paramedic Practice, Monash University,
PO Box 527, Frankston, VIC 3199, Australia.

²Ambulance Victoria, 1 Lakeside Drive, Tally Ho Business Park, Burwood East, VIC 3151, Australia.

³Corresponding author. Email: amee.morgans@ambulance.vic.gov.au

Abstract

Background. Investigations into ‘inappropriate’ use of emergency health services are limited by the lack of definition of what constitutes a health emergency. Position papers from Australian and international sources emphasise the patient’s right to access emergency healthcare, and the responsibility of emergency health care workers to provide treatment to all patients. However, discordance between the two perspectives remain, with literature labelling patient use of emergency health services as ‘inappropriate’.

Objective. To define a ‘health emergency’ and compare patient and health professionals perspectives.

Method. A sample of 600 emergency department (ED) patients were surveyed about a recent health experience and asked to rate their perceived urgency. This rating was compared to their triage score allocated at the hospital ED.

Results. No significant relationship was found between the two ratings of urgency ($P=0.51$).

Conclusions. Differing definitions of a ‘health emergency’ may explain patient help-seeking behaviour when accessing emergency health resources including hospital ED and ambulance services. A new definition of health emergency that encapsulates the health professional and patient perspectives is proposed. An agreed definition of when emergency health resources should be used has the potential to improve emergency health services demand and patient flow issues, and optimise emergency health resource allocation.

What is known about the topic? Although many patients’ access emergency healthcare services in an emergency, many patients’ access emergency healthcare services when their condition is non-urgent, and avoid using emergency health care when their condition requires.

What does this paper add? This paper identifies that health professionals and patients have different perspectives on what constitutes an emergency and when emergency health resources should be used. This paper also provides a review of literature and triage policy papers that identify key differences in the assessment of a health event, and shows that health professionals base their assessment on knowledge and physiological measures, whereas patients used socio-emotional cues to identify medical urgency.

What are the implications for practitioners? Practitioners cannot expect their patients to be able to accurately evaluate the urgency of a health event. An emergency is difficult to define as health conditions are dynamic, and may change in urgency over time, and relative urgency is a continuous variable, rather than a dichotomous ‘health emergency’ v. ‘not a health emergency’.

Additional keywords: emergency health, inappropriate, resource allocation, review, utilisation.

‘When I use a word,’ Humpty Dumpty said, in a rather scornful tone, ‘it means just what I choose it to mean, neither more nor less.’

‘The question is,’ said Humpty Dumpty, ‘*which* is to be master – that’s all.’

[Quotation from *Alice’s Adventures in Wonderland* by Lewis Carroll]

‘The question is,’ said Alice, ‘whether you *can* make words mean so many different things.’

Introduction

The allocation of finite emergency health resources could potentially be improved through redirecting patients with non-emergency problems to other appropriate sources of healthcare. Different guidelines for healthcare providers exist to define what situations constitute a health emergency. The definition has been heavily debated in the United States (US), as some medical insurance claims are only reimbursed if they are considered to be resulting from 'an emergency medical condition',¹ and recent publications in the Australian context have debated 'inappropriate' emergency health service users, which refer to 'non-emergency cases'.²⁻⁶ The definition and classification of a 'health emergency' therefore requires investigation. There is a body of published work on 'inappropriate' or non-emergency attendees at hospital emergency departments (EDs); however, the definition of what is a health emergency and what is an inappropriate attendance is contested. The absence of a useful definition hampers the debate about utilisation of emergency health services and hinders the development of appropriate responses.

This paper explores the definition of a health emergency, first via a comparison of patient and ED ratings of urgency, and then compares these results to published literature and policy guidelines to compare the patient and health professional's perspectives on what a health emergency is. It aims to develop a new definition of 'health emergency' that encapsulates both the health professional and patient perspectives.

Method

A survey was distributed to 600 randomly selected ED attendees from three different Australian (Victorian) hospitals and 157 surveys were returned. Participants were asked to self-rate the level of urgency of their presentation on a five point Likert scale ranging from one (most serious life-threatening emergency) to five (no urgency at all, minor injury or illness). This scale is a simplified version of the Australasian Triage Scale (ATS) used in all Australian hospital EDs to allocate patients to a medical category of clinical urgency. Patients' self-reported ratings of urgency were then compared to their ATS allocated at the hospital ED. Human Research Ethics Committee approval was received from Monash University and all three participating hospitals.

Results

Participants' average rating of urgency was 2.78 (s.d. = 1.0), indicating that they typically reported that either their lives were under threat or would soon be at risk. Participants' self-ratings are shown in Table 1 below.

A Chi-square analysis was performed to determine if there was any relationship between the ED allocated level of clinical urgency and the patient's perceived clinical urgency. Results showed that there was no significant relationship between the two assessments ($\chi^2 = 3.349$, $P = 0.51$). This demonstrates that there is no congruence between the patients' and health professionals' perception of what constitutes a health emergency.

Table 1. Participants' self-ratings of urgency relative to the Australasian Triage Scale

Rating of urgency	<i>n</i>	%
Most serious life-threatening urgency ¹	23	14.6
Medium seriousness, important time critical treatment ²	29	18.5
Potentially life-threatening or severe discomfort ³	74	47.1
Potentially serious or urgent situation ⁴	21	13.4
No urgency at all, minor illness or injury ⁵	10	6.4
Total	157	100.0

Discussion

The results of this comparison demonstrate an incongruence between the perceptions of patients and health professionals about the urgency of their medical condition.

The grouping of participants into high and low triage score groups 'blunts' the ATS as a measure for urgency, as it is designed to be a five level categorical scale to allow for the classification of relative urgency, rather than a dichotomous 'emergency' or 'not emergency' distinction. However, the statistical analysis provides strong evidence that even at a grouped level, there is absolutely no correlation between the triage category and the patients' perception of relative urgency.

A comparison of literature and guidelines pertaining to the definition of an emergency, and classifications of urgency, may provide some insight into these results.

Definition of a health emergency

A literature review was conducted to explore the published definitions of health emergency to examine where the key differences are between patient and health professionals' perspectives and to assist in developing a definition of health emergency that encapsulates both perspectives. A prehospital search strategy developed by the Cochrane Collaboration's Prehospital and Emergency Health Field⁷ was also utilised to identify articles with a prehospital focus; however, the search was not limited to prehospital-based research. Terms used to search the databases included: health, decision, definition, emergency, patient, help-seeking, decision making, acute, time critical.

The electronic databases searched included:

- AMI/Meditext (1968–present). Australasian Medical Index that includes journals not indexed in Medline.
- APAIS-Health (1978–present). Index to Australian public affairs information for health and medicine in Australia.
- CINAHL (1982–present). Cumulative Index to Nursing and Allied Health Literature.
- Cochrane Database of Systematic Reviews (1993–present). Includes comprehensive meta-analyses of controlled trials.
- Health and Society (1980–present). Source of information on Australian health policy, services, social, psychological, legal and ethical issues.

- Index Medicus (Medline) (1966–present). An index to medicine and related health science journals.

These searches yielded in excess of 138 potential articles, of which the title and abstract were screened for relevance. Of the initial 138 articles, ~36 articles were used to inform this literature review.

Health professionals' definition of a health emergency

Within acute health services, specific decision making processes and assessments are used by health professionals to allocate the patient to a category of clinical urgency. This practice of assessing and allocating a category is termed 'triage'.⁸ All staff practising in emergency health settings are trained in triage, and this is most commonly used in hospital EDs and in multiple patient situations as a tool to allocate resources, and to ensure patients are treated in order of clinical urgency.⁹

General practice

No research or resources were identified that defined an emergency from a General Practice (GP) perspective. One study in Queensland surveyed 512 GPs to determine the type and frequency of a list of situation specific emergencies in general practice.¹⁰ GPs surveyed reported managing 5640 emergencies over the preceding 12 months. Non-metropolitan GPs saw ~30% more emergencies than their metropolitan counterparts, and the most common emergencies (seen by more than 30% of all GPs) were acute asthma, psychiatric emergencies, convulsions, hypoglycaemia, anaphylaxis, impaired consciousness, shock, poisoning and overdose. Results show 95% of GPs surveyed saw at least one patient annually who required resuscitation. The most commonly encountered emergency was acute asthma.

In terms of GP management of emergencies, an audit of 1000 GP referred ED attendees in Sydney identified an inappropriate underutilisation of emergency ambulances.¹¹ The study found that despite referring patients to the ED for immediate care, only 9% were treated and transported by paramedics. Only 25% of acute coronary syndrome patients and 12.5% of stroke patients were referred to the ED via emergency ambulance. These research outcomes raise questions about the definition of a health emergency by GPs, and their understanding of the role of emergency ambulance services and their appropriate utilisation. However, detailed exploration of this issue is beyond the scope of this paper.

Prehospital: ambulance

Ambulance guidelines

Surprisingly, Ambulance Victoria (AV) does not offer a description of an 'emergency' anywhere in its Clinical Practice Guidelines (CPGs). The CPGs do offer guidelines for identification of 'Time Critical' patients (p. 1 of CPG: A0105).¹² The guidelines for physiological changes in the adult patient that are considered 'actually time critical' are a pulse rate <60 or >100, a respiratory rate <10 or >30, systolic blood pressure of <100 mm Hg or impaired conscious state scoring ≤13 on the Glasgow Coma Scale (GCS).¹² These guidelines are modified by extremes of age and pregnancy.

Within AV, patients can be further classified as less acutely unwell, but still possibly 'time critical' even when physiological signs are within a normal range. There are three different categories.¹² Patients whose vital signs do not suggest physiological distress, but who have a pattern of illness or injury which has a high probability of deteriorating are classified as 'emergent time critical'. Finally, patients with no pattern of injury or illness, and whose vital signs do not indicate physiological distress can also be included in the time critical category, based on a 'mechanism of injury', which is known to have the potential to deteriorate. An example of a potential time critical patient would be a patient who fell from a height of greater than 3 m but who has normal vital signs.

These time critical guidelines were developed to ensure patients are triaged appropriately, and to ensure that patients at known risk of deteriorating into a dangerous state also receive appropriate care, even if the presenting injuries or illness are not causing immediate physiological distress. Therefore, within paramedic practice in Victoria, a health emergency can include a range of physiological and situational factors.

Hospital triage

A policy statement released by the Australasian College for Emergency Medicine¹³ details the patient's rights to access EDs for care. Although directed at ED users, the policy acknowledges that all people have the right to access emergency healthcare if they believe there is a threat to their health. It also acknowledges that the ED may be the only source of care for homeless and socially disadvantaged people. The Policy concludes that care will not be declined for any patients purely on the basis of the ATS score, and ED staff will not refuse to treat any patient requiring care. Therefore it is the explicit role of ED staff in Australia to treat conditions that patients believe are a threat to their health or wellbeing.

The ATS has been implemented in all Australian EDs¹⁴ to assess the urgency of patient treatment. The ATS has five categories to which patients can be allocated.

The five categories are:

- *ATS Category 1.* Immediately life-threatening, includes resuscitation. Treat immediately.
- *ATS Category 2.* Imminently life-threatening, or important time critical treatment or very severe pain. Patient should be seen within 10 min.
- *ATS Category 3.* Potentially life-threatening, situational urgency or severe discomfort or distress. Patient should be assessed and treated within 30 min.
- *ATS Category 4.* Potentially life-serious, situational urgency, significant complexity or severe discomfort or distress. Patient should be assessed and treated within 60 min.
- *ATS Category 5.* Less urgent or administrative problems. Patient should be assessed and treated within 120 min.

The ATS was developed to address the allocation of resources on the basis of clear clinical criteria. Within each of these categories, clinical data are collected to allocate patients to the appropriate category. Objective physiological data used to allocate patients include airway and breathing, heart rate and blood pressure, conscious state and level of pain. Inclusion of distress in

these criteria allow for psychiatric emergencies and personal or social crises to be included in some categories.

It is evident from this literature review that a health professional's perspective of a health emergency is structured around physiological metrics that suggest a threat to life. Using physiological measurement to determine urgency is not an option for layperson patients, who instead depend on other factors to determine urgency.

Laypersons' definition of a health emergency

Concept of urgency

Early studies of patient and bystander understanding of medical emergencies found that delay in seeking help was due to a combination of confusion about what constituted an emergency and not knowing if the symptoms were serious enough to call an ambulance.¹⁵ This uncertainty significantly predicts delay in seeking healthcare.¹⁶ A US-based study investigated a sample of 268 patients whose reason for attendance was deemed non-urgent by the triage nurse. Of the patients surveyed 82% rated their reason for attendance as 'urgent'¹⁷, suggesting that patient perception of urgency is based on factors other than clinical urgency. Most researchers agree that there are no demographic factors which directly predict patterns of health service utilisation.¹⁸ Psychosocial factors have been explored in a range of studies, although often as an afterthought rather than the study's main aim. Australian research into patients with asthma found that coping style predicted ED use,¹⁹ and a large US-based study found that older patients (age over 40 years) and insurance status affected ambulance utilisation for chest pain.²⁰ The effect of GP management style and continuity of preventative and primary healthcare has been identified as affecting ambulance service utilisation in several studies.²¹ Australian researchers found that patient delay in seeking help when experiencing chest pain was related to social and psychological factors such as waiting to see if the pain goes away, not wanting to cause a fuss, and embarrassment.²² These results are consistent with the international literature.²³

The prudent layperson standard for medical insurance reimbursement

Investigators attempted to quantify what a 'prudent layperson' would define as a medical emergency in a US-based population.²⁴ Participants ($n = 1018$) were offered four possible definitions of an emergency medical condition that warranted ED attendance. Almost 50% of the participants agreed with an abbreviated Emergency Medical Treatment and Active Labor Act (US) definition of 'a condition that may result in death, permanent disability, or causes severe pain', whereas 32% of respondents preferred 'any condition at any time as determined by the patient'.

A notable omission from these criteria are mental health emergencies, a much neglected area of emergency health. In terms of inappropriate use of emergency healthcare resources, research has shown that people experiencing acute psychological symptoms would rather access their case worker or primary care professional than attend an ED²⁵; but lack of after hours access prevents this.

Despite the development of the prudent layperson standard, a survey of US-based health maintenance organisations (HMOs) (health insurance companies) reviewed the information that was sent to patients with regard to accessing emergency health services and the situations that constituted an emergency. Instructions and definitions varied widely, with only 40% of HMOs including chest pain in their definition of an emergency and only 13% including symptoms of stroke. The review also found that 27% of HMOs provided no recourse to ED or emergency medical services, and 20% actively discouraged use of ED; instead prompting members to call their primary care physician to determine if the visit was really required. This information is not consistent with the prudent layperson standards, and creates continued patient confusion about the definition of a health emergency and actions that should be taken.

Colloquialisms and themes

The use of the words 'accident', usually in 'Accident and Emergency or A&E department' also implies that the role of the ED and ambulance services is for the treatment of traumatic injury. A study in rural Victoria asked participants when ambulance services should be accessed, and the general consensus was 'for heart attacks and car accidents'.²⁶ A phone survey of a rural area in the US found that 36% of interviewees failed to recognise chest pain as an emergency symptom. When asked what situations might be a medical emergency, patients most commonly reported heart attack, accident, poisoning, stroke, fractures, bleeding and burns.²⁷

Situational determinants

One way to assess the population's perception of what constitutes an emergency is to assess what situations prompt them to seek help. A medical record review of over 10 000 patients found that most ED attendance was for fever, chest pain or abdominal pain,²⁸ perhaps indicating that these conditions are perceived as emergencies. One study used ICD-9 classifications of diseases, and 252 layperson participants were asked to determine what conditions they believed constituted emergencies.²⁹ Results show that laypersons identified loss of consciousness, seizure, lack of recognition of one side of the body, paralysis, shock, gangrene, coughing blood, trouble breathing, chest pain, and choking as emergencies. Pain, except for renal colic or chest pain, was not considered an emergency. No symptoms or signs specifically related to gynecological disorders were considered emergencies. Unfortunately this study failed to detail how respondents were recruited, so selection bias may be present. However, the authors did disclose that layperson participants had no medical training.

Psychosocial factors

Results of a qualitative study into patient decision making behaviour³⁰ revealed that patients reported making decisions based on level of discomfort or pain, and on the advice of fellow laypersons, such as family and friends. This study identified that patients classify symptoms as an emergency not on physiological criteria, but rather when they are beyond the capabilities of the patient to control and manage, which has been identified as a particular problem with parents of paediatric

patients.³¹ Data collected from focus groups, interviews and questionnaires reported that patients did not recognise medically significant symptoms as prompting them to seek emergency help; instead focussing on the nature of the presenting symptoms. Symptom onset that was sudden and severe was interpreted as urgent, whereas slow onset or mild and intermittent symptoms were interpreted as less urgent. The patient's tendency to focus on rapid development rather than medically significant symptoms is a key difference between the medical and non-medical categorisation of urgency. These findings are consistent with international research.¹⁸ This may explain why patients report non-life threatening symptoms as potentially serious, and therefore present 'inappropriately' with symptoms that are of little medical urgency, or alternatively neglect to seek prompt help for slow onset or intermittent symptoms of a potentially serious nature, such as chest pain or shortness of breath, and therefore delay seeking help.³⁰

Conclusions about the definition of 'health emergency'

It is clear from the results of the study and the review of literature that there is little congruence between the understanding and definition of a health emergency between health professionals, who use physiological cues to determine medical urgency, and patient's perceptions, which are based on layperson advice, psychosocial factors, and the pattern of symptom onset. An emergency is difficult to define as changes in health conditions are dynamic, and may change in urgency over time, and relative urgency is a continuous variable, rather than a dichotomous 'health emergency' v. 'not a health emergency'. However, the definition of a health emergency is useful when classifying health events for the purposes of resource allocation.

If the definitions from these sources are combined, the definition would include these features: a health emergency is any condition that may result in death, permanent disability, or is potentially life-threatening, causing severe physiological discomfort or distress, or any condition at any time considered an emergency by the patient. A combined definition of these two perspectives would be reflected in the following definition:

A health emergency is a sudden or unexpected threat to physical health or wellbeing which requires an urgent assessment and alleviation of symptoms.

The allocation of limited emergency health resources could potentially be optimised through redirecting non-emergency cases to other appropriate sources of healthcare. The creation and adoption of an agreed definition of health emergency actually will assist the clarification of the issue for patients, providers of urgent health services and policy makers about what a health emergency case is, and what it is not. A new definition of health emergency that encapsulates both the health professional and patient perspectives has the potential to improve patient education strategies which have been unsuccessful at changing patient help seeking behaviour to date.³²

Competing interests

The authors declare that no conflicts of interest exist.

Acknowledgements

The researchers acknowledge funding support from Ambulance Victoria (formerly the Metropolitan Ambulance Service), Melbourne, Australia.

References

- 1 Irvin CB, Fox JM. Effect of a state definition of an 'emergency medical condition' legislation on medicaid managed care organization reimbursement. *Ann Emerg Med* 2000; 35(3): 283–6. doi:10.1016/S0196-0644(00)70081-3
- 2 Dent AW, Phillips GA, Chenhall AJ, McGregor LR. The heaviest repeat users of an inner city emergency department are not general practice patients. *Emerg Med* 2003; 15: 322–9. doi:10.1046/j.1442-2026.2003.00470.x
- 3 Lee A, Lau FL, Hazlett CB, Kam CW, Wong P, Wong TW, *et al.* Factors associated with non-urgent utilization of Accident and Emergency services: a case-control study in Hong Kong. *Soc Sci Med* 2000; 51(7): 1075–85. doi:10.1016/S0277-9536(00)00039-3
- 4 Koziol-McLain J, Price D, Weiss B, Quinn A, Honigman B. Seeking care for nonurgent medical conditions in the emergency department: through the eyes of the patient. *J Emerg Nurs* 2000; 26(6): 554–63. doi:10.1067/men.2000.110904
- 5 Sprivilis P. Pilot study of metropolitan emergency department workload complexity. *Emerg Med Australas* 2004; 16: 59–64. doi:10.1111/j.1742-6723.2004.00558.x
- 6 Sprivilis P, Carey M, Rouse I. Compliance with advice and appropriateness of emergency presentation following contact with the Health Direct telephone triage. *Emerg Med Australas* 2004; 16: 35–40. doi:10.1111/j.1742-6723.2004.00538.x
- 7 Smith E, McDonald S, Wasiak J, Jennings P, MacPherson C, Archer F. The development of a prehospital search filter for the Cochrane Library. *J Emerg Prim Health Care* 2004; 2(1–2): CC990071.
- 8 LeVasseur S, Charles A, Considine J, Berry D, Orchard T, Woiwood M, *et al.* Consistency of Triage in Victoria's Emergency Departments: Literature Review. Melbourne: Department of Human Services and Monash Institute of Health Services Research; 2001.
- 9 Kennedy K, Aghababian RV, Gans L, Lewis CP. Triage: techniques and applications in decision making. *Ann Emerg Med* 1996; 28(2): 136–44. doi:10.1016/S0196-0644(96)70053-7
- 10 Johnston CL, Coulthard MG, Schluter PJ, Dick ML. Medical emergencies in general practice in south-east Queensland: prevalence and practice preparedness. *Med J Aust* 2001; 175(2): 99–103.
- 11 Ramrakha S, Giles A. Take a letter... an audit of GP referrals in south west Sydney. *Aust Fam Physician* 2001; 30(4): 395–8.
- 12 Clinical Practice Guidelines for Ambulance and MICA Paramedics, Revised Edition. Melbourne: Ambulance Victoria; 2009.
- 13 Australasian College of Emergency Medicine. Patient's right to access emergency department care. *Emerg Med Australas* 2004; 16: 256. doi:10.1111/j.1742-6723.2004.00603.x
- 14 Policy on the Australasian Triage Scale. Australasian College for Emergency Medicine; 2000. Available at http://www.acem.org.au/media/policies_and_guidelines/P06_Aust_Triage_Scale_-_Nov_2000.pdf [verified 8 June 2011]
- 15 Mogielnicki RP, Stevenson KA, Willemain TR. Patient and bystander response to medical emergencies. *Med Care* 1975; 13(9): 753–62. doi:10.1097/00005650-197509000-00005
- 16 Clark RD, Word LE. Where is the apathetic bystander? Situational characteristics of the emergency. *J Pers Soc Psychol* 1974; 29(3): 279–87. doi:10.1037/h0036000
- 17 Gill JM, Riley AW. Nonurgent use of hospital emergency departments: urgency from the patient's perspective. *J Fam Pract* 1996; 42(5): 491–6.

- 18 Veitch C, Crossland L, Hays R. Consumers' after-hours health care decisions. Comparison between those who did and those who did not seek care in an Australian provincial city. *Aust Fam Physician* 1999; 28(10): 1078–83.
- 19 Adams RJ, Smith BJ, Ruffin RE. Factors Associated with hospital admissions and repeat emergency department visits for adults with asthma. *Thorax* 2000; 55(7): 566–73. doi:10.1136/thorax.55.7.566
- 20 Billittier AJ IV, Moscati R, Janicke D, Lerner EB, Seymour J, Olsson D. A multisite survey of factors contributing to medically unnecessary ambulance transports. *Acad Emerg Med* 1996; 3(11): 1046–50. doi:10.1111/j.1553-2712.1996.tb03352.x
- 21 Brown AL, Mann NC, Daya M, Goldberg R, Meischke H, Taylor J, et al. Demographic, belief, and situational factors influencing the decision to utilize emergency medical services among chest pain patients. *Circulation* 2000; 102(2): 173–8.
- 22 Dracup K, McKinley SM, Moser DK. Australian patients' delay in response to heart attack symptoms. *Med J Aust* 1997; 166(5): 233–6.
- 23 McKinley S, Moser DK, Dracup K. Treatment-seeking behavior for acute myocardial infarction symptoms in North America and Australia. *Heart Lung* 2000; 29(4): 237–47. doi:10.1067/mhl.2000.106940
- 24 Derlet RW, Ledesma A. How do prudent laypeople define an emergency medical condition? *J Emerg Med* 1999; 17(3): 413–8. doi:10.1016/S0736-4679(99)00014-1
- 25 Theinhasu O, Ford J, Hillard JR. Factors related to patients' decisions to visit the psychiatric emergency service. *Psychiatr Serv* 1995; 46(12): 1227–8.
- 26 Morgans AE, Archer F, Walker T, Thuma E. Barriers to accessing ambulance services in rural Victoria for acute asthma: patient's and medical professional's perspectives. *Aust J Rural Health* 2005; 13: 116–20. doi:10.1111/j.1440-1854.2005.00665.x
- 27 Knolle LL, McDermott RJ, Ritzel DO. Knowledge of access to and use of the emergency medical services system in a rural Illinois county. *Am J Prev Med* 1989; 5(3): 164–9.
- 28 MacLean SL, Bayley EW, Cole FL, Bernado L, Lenaghan P, Manton A. The LUNAR project: a description of the population of individuals who seek health care at emergency departments. *J Emerg Nurs* 1999; 25(4): 269–82. doi:10.1016/S0099-1767(99)70052-8
- 29 Li J, Galvin HK, Johnson SC. The 'prudent layperson' definition of an emergency medical condition. *Am J Emerg Med* 2002; 20(1): 10–3. doi:10.1053/ajem.2002.30108
- 30 Morgans AE, Archer F, Allen FCL. Patient decision making in prehospital health emergencies: determinants and predictors of patient delay. *J Emerg Prim Health Care* 2008; 6(3): 990295.
- 31 Lindenskov L, Bronderslev L, Andersen KV. Why do parents of small children visit casualty ward when their children suffer of acute illness? *Ugeskr Laeger* 2001; 163(8): 1089–92.
- 32 Grilli R, Freemantle N, Minozzi S, Domenighetti G, Finer D. Mass media interventions: effects on health services utilisation. *Cochrane Database Syst Rev* 2001; (1) CD000389. doi:10.1002/14651858.CD000389

Manuscript received 18 May 2010, accepted 27 October 2010