

Is there equity in emergency medical care? Waiting times and walk-outs in South Western Sydney hospital emergency departments

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Abstract

This study explores the association between selected socioeconomic characteristics of emergency patients with waiting times in emergency departments and walk-outs (those who did not wait for treatment) in South Western Sydney Area Health Service hospital emergency departments. Bivariate and multivariate analyses indicated that waiting times to see a doctor and walk-out rates varied by age, sex, country of birth, insurance status, socioeconomic status, severity of patient illness and day of arrival. Patients who were female, from a non-English-speaking background, self-referred, uninsured and those from lower socioeconomic status showed significantly longer waiting times than others. Patients who left emergency departments without treatment showed higher waiting times from arrival to triage than other groups. This applied across socioeconomic categories. These findings indicate that prolonged waiting times for triage, which occur at the busiest periods, may be one of the main indicators for patients leaving emergency departments without treatment. The study also demonstrates variability in waiting times, which could possibly be partly addressed by more standardised triage policies, but may be influenced by other non-clinical factors, which require further investigation.

Introduction

In recent years, inequality in health outcomes and access to health care services has been a central issue in public health policy and health services research (Nutbeam et al. 1993). To meet the health needs of the people of New South Wales, the roles of emergency department services are important. Over the years, the total number of hospital admissions in Australia has increased substantially and most of this increase flows from an increase in the number of admissions to emergency departments (Australian Institute of Health and Welfare 1994). The emergency department is the front door of the hospital and is often the primary contact people have with the health system. It provides an important interface between the community and the hospital, and is critical to public appreciation of the quality of the health system.

An analysis in a paediatric setting in the United States highlighted that waiting time is one of the quality care issues in emergency departments (Burstein & Fleisher 1991). A review of seven years of complaints in the accident and emergency department at King's College Hospital, London, has found that long waiting times are one of the main causes of complaints (Hunt & Glucksman 1991). Another study in the United Kingdom concluded that patient satisfaction is directly correlated with waiting times to see a doctor (Maitra & Chikhani 1992). One study at the Children's Hospital in Sydney on quality of care in the emergency department and patient satisfaction argued that waiting times are a particular problem that needed attention (Worsley, Hanson & Yu 1985). A Canadian study found that because of prolonged waiting times a substantial number of patients left emergency departments without treatment (Fernandes et al. 1994). Other researchers found that, as waiting times increase, patients are more likely to leave emergency departments without being seen by a doctor (Dershewitz & Paichel 1986; Baker, Stevens & Brook 1991; Bindman et al. 1991; dos Santos, Stewart & Rosenberg 1994; Hanson, Clifton-Smith & Fasher 1994). They argued that many patients are discouraged from even seeking medical care because of the prospect of unacceptably long delays. This contingency in some cases even led to fatal consequences (Schwartz 1975).

In Australia, the increased utilisation of hospital emergency department services has been well documented by numerous surveys (National Health Survey 1992). However, few studies have focused on the problem of emergency room waiting times and patient walk-outs. One study by Cameron and colleagues (1989) of a Melbourne metropolitan hospital compared the average length of stay in the emergency department between two different periods of times. A recent study on patient satisfaction at the Children's Hospital in Sydney concluded that the waiting time is the main reason for patient walk-outs (Hanson, Clifton-Smith & Fasher 1994).

The existing literature argues that sociodemographic and economic factors may influence the delay between the awareness of symptoms and the arrival of an individual at an emergency department (Meischke, Eisenberg & Larsen 1993; Dracup et al. 1995; GISSI 1995). However, little attention has been given to exploring the association between sociodemographic and economic factors and waiting times in emergency departments and walk-outs of patients. This study explores the association between patient factors (age, sex, ethnicity, insurance status, socioeconomic status), day of arrival and triage category (as a measure of urgency of care or disease severity) and waiting times to see a doctor in an emergency department. The study also examined the factors associated with those who walked out of emergency departments without treatment.

Data and methodology

The Emergency Department Information Systems (EDIS) were introduced into emergency departments in New South Wales as a pilot project in April 1994 and implemented across the State from August 1994. In the South Western Sydney Area Health Service (SWSAHS), EDIS was first introduced into Liverpool hospital in mid-October 1994, and after that into the other hospitals in SWSAHS. EDIS provides standardised information about emergency department patients regarding triage category (urgency of care), waiting times and discharge status. The National Triage Scale directly relates triage codes to the severity of illness (admission rate, length of stay, mortality rate) and resource consumption (staff time). The use of emergency department data provides an opportunity for linking triage status with a number of performance parameters in emergency departments (casemix, operational efficiency, utilisation review, outcome effectiveness and cost).

This study utilised the current EDIS data (November 1994 to July 1996) from the five largest SWSAHS hospitals – Liverpool, Bankstown, Campbelltown, Fairfield and Camden. These hospitals service a large geographic region of 6237 square kilometres in outer metropolitan Sydney, and 750 000 residents. The demographic characteristics of SWSAHS suggest that the residents have more social disadvantage than other areas in New South Wales, in particular, increased proportions of non-English-speaking residents and those who are unemployed (Sullivan et al. 1995). The National Triage Scale comprises five categories of urgency – resuscitation, emergency, urgent, semi-urgent and non-urgent. In this study, the time between arrival and triage, time between triage and being seen by a doctor, and between arrival time and time being seen by a doctor were considered as measures of ‘waiting times’. Socioeconomic status scores were

derived from patients' postcode of residence (Australian Bureau of Statistics 1991), and the score categorised at the median value for the SWSAHS population. Patients with socioeconomic status scores of low to 980 and of 981 to high were coded as being in lower and higher socioeconomic status groups respectively. To explore the independent contribution of each of the selected sociodemographic variables on waiting times and walk-outs in emergency departments, bivariate and multivariate analyses were carried out using SPSS 6.1 for Windows.

Results

General characteristics of emergency department patients

During the study period, a total of 207 751 patients were triaged in SWSAHS hospital emergency departments. The majority of visits were made by males (54.1%). The age profiles of males and females were similar. Of the total patients, 26.8% were aged 0–14 years, 43.0% were aged 15–44 years, 15.7% were aged 45–64 years and 14.5% were aged over 65 years. The proportion of paediatric (0–14 years) visits was higher for males (28.6% versus 24.6%) and the opposite was true for age groups 15–44 and 65+ years. The highest proportion of attendances in both males (42.5%) and females (43.6%) were for the 15–44 year age group. Of the total patients, 25.2% were from a non-English-speaking background, 81.0% were self or family-referred, 52.7% were from lower socioeconomic status and 86.3% were without health insurance. Patient triage classification categories were resuscitation (1.2%), emergency (6.0%), urgent (32.4%), semi-urgent (44.4%) and non-urgent (16.0%). There were negligible differences by sex or day of the week in the proportion who were emergency patients, or who were classified as non-urgent.

Waiting times

Bivariate analysis

The mean waiting time between arrival and triage was 10.7 minutes (SD: 20.3 minutes) and the waiting time between triage and being seen by a doctor was 43.2 minutes (SD: 53.2 minutes). Waiting times between triage and being seen by a doctor varied by sociodemographic characteristics of patients (Table 1). The waiting times for females were significantly ($p < 0.001$) longer than for males. The results also revealed that waiting times significantly ($p < 0.001$) differed by age groups of patients. The longest waiting time was found for the 15–44 year age group and the shortest for the paediatric group (0–14 years) and older adult (65+ years) attenders. Patients who were self-referred, from lower socioeconomic status

and who had no health insurance waited longer than others. The waiting times for patients from an English-speaking background were significantly shorter than for patients from a non-English-speaking background. The results also showed that waiting times varied by urgency of condition (triage category) and day of attendance. The longest waiting times were observed for those who arrived on Sunday, followed by those arriving on Saturday and Monday.

The mean waiting time between arrival and being seen by a doctor was 52.8 minutes (SD: 56.4 minutes) and it varied by age, sex, insurance status, ethnicity, urgency of condition (triage category), socioeconomic status of the patients and day of arrival (Table 1). The waiting time between arrival and being seen by a doctor was longer for females than for males and longer for 15–44 year age group patients than for others. Patients who were from higher socioeconomic status or insured and from an English-speaking background waited less than the others to see a doctor.

Table 1: Mean waiting times (in minutes) and standard deviations (SD) by selected characteristics of emergency department patients¹

Characteristics of patients	Time between triage and being seen by a doctor (minutes) Mean (SD)	Time between arrival and being seen by a doctor (minutes) Mean (SD)
Sex		
Male	42.3 (52.2)	51.8 (55.6)
Female	44.4 (53.6)	54.1 (56.6)
	($p < 0.001$)	($p < 0.001$)
Age		
0–14	41.5 (49.3)	51.7 (52.9)
15–44	45.3 (54.3)	55.0 (57.5)
45–64	42.9 (53.4)	52.1 (62.3)
65+ years	41.2 (54.1)	49.9 (63.4)
	($p < 0.001$)	($p < 0.001$)
Insurance status		
Uninsured/DK	43.6 (52.9)	53.1 (56.2)
Insured	41.4 (52.1)	51.6 (55.1)
	($p < 0.001$)	($p < 0.01$)

continued

Table 1: Mean waiting times (in minutes) and standard deviations (SD) by selected characteristics of emergency department patients¹ *continued*

Characteristics of patients	Time between triage and being seen by a doctor (minutes) Mean (SD)	Time between arrival and being seen by a doctor (minutes) Mean (SD)
Socioeconomic status index		
Low-980	46.2 (55.3)	55.8 (58.8)
981+	40.1 (49.7)	49.7 (52.6)
	(p<0.001)	(p<0.001)
Country of birth		
Non-English-speaking-born	46.4 (56.4)	55.2 (59.8)
English-speaking-born	42.2 (51.5)	52.1 (54.7)
	(p<0.001)	(p<0.001)
Triage category		
Resuscitation	4.3 (21.4)	12.3 (41.8)
Emergency	19.1 (36.0)	25.9 (40.7)
Urgent	36.0 (47.0)	45.8 (50.7)
Semi-urgent	52.1 (56.4)	61.9 (59.0)
Non-urgent	46.4 (54.8)	56.0 (57.6)
	(p<0.001)	(p<0.001)
Source of referral		
Self-referred	43.5 (59.0)	52.3 (73.3)
Others	42.4 (55.0)	55.2 (65.4)
	(p<0.001)	(p<0.001)
All cases	43.3 (52.9)	52.8 (56.4)

Note:

1. Excludes those who didn't wait for triage, those who were dead on arrival, and those who left the emergency department without diagnosis.

Multiple regression analysis

Multiple regression was employed to examine the influences of explanatory variables on waiting times of patients. Two variables, the 'times between triage and being seen by a doctor' and 'times between arrival and being seen by a doctor' were considered as the dependent variables. The explanatory variables were the same for both dependent variables. Two models were constructed for each of the dependent variables to explore the association with health insurance

status alone (Table 2). Model 1 included all predictor variables, and Model 2 excluded the socioeconomic index variable. This was to test the independent effects of health insurance status and socioeconomic index upon waiting times.

Table 2: Results from multiple regression analysis: Dependent variable as the time between triage and being seen by a doctor

Variables	Standardised regression coefficients			
	Model 1 ¹	P values	Model 2 ²	P values
Age	0.009	.000	0.012	.000
Sex	0.016	.000	0.017	.000
Triage category	0.175	.000	0.167	.000
Country of birth	-0.033	.000	-0.042	.000
Source of referral	0.014	.000	0.015	.000
Insurance status	-0.003	.177	-0.009	.000
Socioeconomic status index	-0.073	.000	–	–
Multiple R	0.185		0.171	
R square	0.034		0.029	
Adjusted R square	0.034		0.029	
F statistic	807.823		813.137	
p value	0.0000		0.0000	

Notes:

1. Model 1 included all the variables, for example, age, sex, triage category, country of birth, health insurance status and socioeconomic status index.
2. Model 2 excluded socioeconomic status index.

Definitions of variables:

Time between triage and being seen by a doctor: in minutes (continuous)

Sex: 0 = male, 1 = female

Age: 1 = 0–14, 2 = 15–44, 3 = 45–64, 4 = 65+ years

Country of birth: 0 = non-English-speaking-born, 1 = English-speaking-born

Source of referral: 1 = self-referred, 0 = others

Insurance status: 0 = uninsured, 1 = insured

Triage category: 1 = resuscitation, 2 = emergency, 3 = urgent, 4 = semi-urgent, 5 = non-urgent

Socioeconomic status index: 0 = 0–980, 1 = 981+

The results from multivariate Model 1 showed that age, sex, clinical urgency (triage category), referral status, country of birth and socioeconomic status were

significantly associated with the waiting time between triage and being seen by a doctor. The regression coefficients also indicate that females, patients from a non-English-speaking background, patients from lower socioeconomic status, and semi-urgent or non-urgent and self-referred patients were more likely to wait to see a doctor after triage. Though insurance status was not found to be statistically significant, the direction of the regression coefficient indicated that those who were uninsured waited longer than others.

Table 3: Results from multiple regression analysis: Dependent variable as the time between arrival and being seen by a doctor

Variables	Standardised regression coefficients			
	Model 1 ¹	P values	Model 2 ²	P values
Age	0.001	.767	0.002	.495
Sex	0.016	.000	0.017	.000
Triage category	0.147	.000	0.139	.000
Country of birth	-0.023	.000	-0.032	.000
Source of referral	-0.014	.000	-0.013	.000
Insurance status	-0.002	.355	-0.007	.005
Socioeconomic index	-0.065	.000	–	–
Multiple R	0.157		0.143	
R square	0.025		0.020	
Adjusted R square	0.024		0.020	
F statistic	575.489		567.767	
p value	0.0000		0.0000	

Notes:

1. Model 1 included all the variables, for example, age, sex, triage category, country of birth, health insurance status and socioeconomic status index.
2. Model 2 excluded socioeconomic status index.

Definitions of variables:

Time between triage and being seen by a doctor: in minutes (continuous)

Sex: 0 = male, 1 = female

Age: 1 = 0–14, 2 = 15–44, 3 = 45–64, 4 = 65+ years

Country of birth: 0 = non-English-speaking-born, 1 = English-speaking-born

Source of referral: 1 = self-referred, 0 = others

Insurance status: 0 = uninsured, 1 = insured

Triage category: 1 = resuscitation, 2 = emergency, 3 = urgent, 4 = semi-urgent, 5 = non-urgent

Socioeconomic status index: 0 = 0–980, 1 = 981+

The results also revealed that if the socioeconomic index variable was not included in the model, then the variable 'health insurance status' became highly significant (Model 2). Regression analysis on waiting times between arrival and being seen by a doctor reconfirmed that waiting times varied by sex, country of birth, triage (urgency of condition), insurance status and socioeconomic status of the patient (Table 3). These analyses defined the factors independently associated with waiting times in emergency departments.

Walk-outs from emergency departments

Bivariate analysis

The next analyses examined the characteristics of 'walk-outs', that is, those patients who left the emergency department without waiting for treatment, and assessed whether waiting time was one of the factors associated with walk-outs. During the study period, 4.9% of the triaged patients were walk-outs from SWSAHS emergency departments (excluding those without a diagnosis coded in EDIS, or those who were dead on arrival in the emergency department). The percentages of walk-outs varied by sociodemographic characteristics of patients (Table 4). The walk-out rate for males was higher than for females, and was higher for younger patients, with the highest walk-out rates for the 0–14 and 15–44 year age groups. Patients from lower socioeconomic status or uninsured patients demonstrated significantly higher walk-out rates ($p < 0.001$) than the insured, more socially advantaged. Triage category showed a linear relationship to walk-out rates, with rates increasing as severity decreased; one in ten non-urgent patients were walk-outs, compared to 0.3% of emergency patients and 2.3% of urgent patients.

Walk-outs were more frequent among patients from an English-speaking background. The highest proportion of walk-outs were observed for those who arrived on Sunday (5.6%), followed by those who arrived on Saturday (5.1%). Walk-out rates were also associated with increased waiting times. The time from arrival to triage was significantly greater for walk-outs than non-walk-outs ($p < 0.001$, mean waiting times 18.1 versus 10.1 minutes). This association between waiting times and walk-out rates was true across all socioeconomic variables. This suggested that a longer waiting time for triage, which is associated with lower clinical urgency, was one of the factors associated with leaving the emergency department without treatment, irrespective of socioeconomic variables.

Table 4: Proportion of walk-outs and mean waiting times for triage by selected characteristics of patients¹

Patient characteristics	Walk-outs Number (%)	Mean times: Arrival to triage (minutes)		
		Walk-outs	Others	All
Age ²				
0–14 years	2797 (5.6)	18.5	10.7	11.2
15–44	4438 (5.5)	17.6	10.3	10.7
45–64	1186 (4.0)	18.2	9.6	9.9
65+	711 (2.6)	19.9	9.2	9.5
Sex				
Male	5038 (4.9)	17.8	10.0	10.5
Female	4098 (4.8)	18.5	10.2	10.6
Country of birth ³				
Non-English-speaking-born	2154 (4.6)	16.8	9.3	9.7
English-speaking-born	6982 (5.0)	18.5	10.4	10.8
Insurance status ²				
Not insured	8081 (5.0)	17.9	10.0	10.5
Insured	1055 (4.1)	19.8	10.7	11.1
Socioeconomic status index ²				
Low–980	5302 (5.5)	18.1	10.2	10.6
981+	3687 (4.2)	18.1	10.1	10.5
Referral status ²				
Self-referred	8279 (5.4)	17.4	9.4	9.8
Others	857 (2.5)	25.3	13.2	13.5
Triage category ²				
Resuscitation ⁴ & emergency	36 (0.3)	13.4	7.5	7.6
Urgent	1400 (2.3)	16.2	10.2	10.4
Semi-urgent	4764 (5.7)	15.9	10.4	10.7
Non-urgent	2936 (9.6)	22.8	10.5	11.7
Waiting times for triage (minutes) ²				
<10	4226 (3.5)			
10–19	1739 (5.7)			
20–29	1122 (7.8)			
30–59	1390 (10.6)			
60+	429 (12.9)			
All triaged patients	9136 (4.9)	18.1	10.1	10.5

Notes:

1. Excludes those who did not wait for triage and those who had no diagnosis code.
2. Walk-out rates significantly varied at $p < 0.001$.
3. Walk-out rates significantly varied at $p < 0.01$.
4. Only 2 patients from resuscitation category had left emergency department without treatment.

Logistic regression analysis

Multivariate logistic regression analysis was used to assess the independent influence of explanatory variables on walk-out rates of patients (dependent variable). Considering walk-outs as the dependent variable, two multivariate logistic regression analyses were done. (Model 1 included all variables including the socioeconomic status index and Model 2 included all variables excluding the socioeconomic status index.) Odds ratios (OR), adjusted for the effects of other variables, with their 95% confidence limits, are shown to express the likelihood of walk-out for each independent variable.

The results (Table 5) from the logistic regression analysis (Model 1) show that age, waiting times for triage, triage category, referral status, insurance and socioeconomic status of the patient were significantly associated with patient walk-outs. The logistic regression coefficients indicate that self-referred patients were two and a half times as likely to walk out as referred patients (OR = 2.59, 95% CI: 2.42–2.80), and those triaged as ‘non-urgent’ were over 30 times as likely to walk out as other National Triage Scale categories (OR = 32.61, 95% CI: 25.46–49.73). Those who waited longer for triage were more than twice as likely to walk out (OR = 2.41, 95% CI: 2.31–2.53) without treatment. The regression coefficients also showed that females, the elderly (OR = 0.61, 95% CI: 0.54–0.65), the insured (OR = 0.85, 95% CI: 0.80–0.91) and those from a higher socioeconomic status (OR = 0.63, 95% CI: 0.60–0.66) were significantly less likely to leave the emergency department without treatment. The results also revealed that as the waiting times for triage increased the chance of walk-outs also increased. Though country of birth was not statistically significant in Model 1, after excluding socioeconomic status score (Model 2), country of birth (OR = 0.94, 95% CI: 0.86–0.96) suggested that those from a non-English-speaking background were less likely to walk out than those from an English-speaking background.

Table 5: Results from logistic regression analysis: Dependent variable as walk-out from emergency department without treatment¹

Variables	Logistic regression coefficients			
	Model 1 ²		Model 2 ³	
	Coefficients	p values	Coefficients	p values
Age		0.0000		0.0000
0–14(Reference)	–	–	–	–
15–4	-0.037	0.1556	-0.037	0.1551
45–64	-0.239	0.0000	-0.232	0.0355
65+	-0.526	0.0000	-0.482	0.0000
Sex	-0.017	0.4589	-0.016	0.4734
Country of birth	-0.008	0.7758	-0.075	0.0003
Triage time	0.883	0.0000	0.883	0.0000
Triage category		0.0000		0.0000
Resuscitation and emergency (Reference)	–	–	–	–
Urgent	2.041	0.0000	2.020	0.0000
Semi-urgent	2.929	0.0000	2.866	0.0000
Non-urgent	3.572	0.0000	3.484	0.0000
Source of referral	0.956	0.0000	0.952	0.0000
Insurance status	-0.161	0.0000	-0.215	0.0000
Socioeconomic status index	-0.467	0.0000	–	–
(Constant)	-6.511	0.0000	-6.590	0.0000
-2 log likelihood	64058.435		65528.309	
Model chi square	5953.677		5608.968	
p value	0.000		0.000	

Notes:

1. Excludes those who did not wait for triage and those who had no diagnosis code.
2. Model 1 included all the variables, for example, age, sex, triage time, country of birth, health insurance status and socioeconomic status index.
3. Model 2 excluded socioeconomic status index.

Definitions of variables:

Walk-outs from emergency department: 1 = left emergency department without diagnosis, 0 = others

Sex: 0 = male, 1 female

Age: 1 = 0–14, 2 = 15–44, 3 = 45–64, 4 = 65+ years

Source of referral: 1 = self-referred, 0 = others

Country of birth: 0 = non-English-speaking-born, 1 = English-speaking-born

Insurance status: 0 = uninsured, 1 = insured

Triage time (time between arrival and triage): 0 = 0–14 minutes, 1 = 15+ minutes

Triage category: 0 = resuscitation and emergency, 1 = urgent, 2 = semi-urgent, 3 = non-urgent

Socioeconomic status index: 0 = low–980, 1 = 981+

Discussion

This study seeks to address some of the issues of equity and access in emergency medical care. To examine this issue, the study examined the association between selected socioeconomic characteristics of emergency patients and waiting times and walk-outs in emergency departments. The findings showed that waiting times between triage and being seen by a doctor and between arrival and being seen by a doctor were associated with the age, sex, country of birth, referral status, days of arrival, urgency (triage category), socioeconomic status and health insurance status of patients. Waiting times for female patients were significantly longer than for males. Patients who were uninsured, from a non-English-speaking background, of lower socioeconomic status or were self-referred had longer waiting times than others. These waiting times were longer after adjustment for age, gender and triage category (as a proxy for disease severity). These adjusted analyses suggest that the effects were independent, so that socioeconomic status was associated with waiting times, independent of age or gender differences in socioeconomic status. Note that socioeconomic status and health insurance status were correlated, and hence only socioeconomic status was significant in Model 1. But when socioeconomic status was removed, an independent association with health insurance status was observed (Model 2), suggesting that this dimension of social disadvantage is related to waiting times, for both methods of assessing it.

The longest waiting times were observed for those who arrived on weekends when there may have been limited access to alternative services. Another explanation may be that other primary care services were less available on weekends, or more likely to refer patients to emergency departments during weekends. Staffing in emergency departments is consistent across the week, but access to other medical backup and ancillary services such as interpreters may be more difficult on weekends, which may partly further explain these findings. These independent findings (adjusted for age and urgency of condition) suggest that some non-clinical characteristics are associated with inequity in access to emergency medical care and waiting times, particularly measures of gender, social disadvantage and ethnicity.

A second research question in this study examined factors associated with those who walked out of the emergency department without waiting for treatment. Walk-outs varied by sociodemographic characteristics, with higher rates for males than for females. Patients from an English-speaking background, lower socioeconomic status and the uninsured showed higher walk-out rates. Those who were triaged as non-urgent had much higher walk-out rates than those triaged to more urgent categories. A higher proportion of walk-outs were

observed for those who arrived on Sunday or Saturday, compared to those who arrived on weekdays.

The patients who left the emergency department waited from arrival to triage for a longer period than those who stayed in the emergency department (18.1 minutes versus 10.1 minutes). This was true across any socioeconomic breakdown. This suggests that longer waiting times for triage, which tend to occur at busier periods, may be one of the factors for leaving the emergency department without treatment. The issue of waiting times appears, in these data, to have an independent effect upon walk-outs, with those waiting longer more than twice as likely to leave. Thus waiting times are important as they may reflect delay in doctor access times, but also increase the likelihood of the patient not staying in the emergency department for treatment. While lower clinical urgency was a factor, other non-clinical factors also appeared to have an influence.

The possible influence of delay in triage data entry must also be considered. This is a potential methodological limitation of the EDIS data system. It is possible that, at the times of highest activity, triage data entry may not occur in real time, but may be done retrospectively without accurate recording of the actual time of triage. This issue warrants further examination.

The main goal of the Australian health system is universal access to appropriate services regardless of income or health insurance status. However, the findings of this study suggest that waiting times in emergency departments and walk-outs differed by country of birth, referral status, socioeconomic status and health insurance status of patients. For any socioeconomic breakdown, prolonged waiting times are associated with walk-outs of patients from emergency departments. From a policy perspective, the ultimate question is whether differences in access to emergency care are in fact 'inequities'. Since, after adjusting for age, sex and clinical urgency, this study found that waiting times and walk-outs in emergency departments varied by referral status, country of birth, socioeconomic status and health insurance status of patients, inequity appears to exist in access to emergency medical care. Self-referred patients are another group who may experience inequitable access. In terms of urgency, self-referred patients are at least as likely to be as urgent (National Triage Scale criteria) as other referred patients. Hence there may be some inequity in terms of management by patient referral status.

The findings also showed that children (0–14 years) and the elderly have more rapid access to emergency medical care than working age adults (15–44 years). This finding can be explained by the appropriately greater clinical and organisational urgency accorded to patients at the extremes of age, recognising them as groups of relatively high risk.

The importance of financial barriers was illustrated by the findings of socioeconomic index and health insurance coverage from the multivariate analyses. The multivariate results indicated that non-English-speaking background and lower economic status patients had less access to emergency medical care even when insurance status was present in the model.

Various factors which may be influential in increasing waiting times for patients of non-English-speaking background may include the requirement for an interpreter, lack of knowledge of alternative services, and the inability or reluctance to negotiate for more urgent care. The latter two influences may also operate for English-speaking patients of lower socioeconomic status.

These findings suggest the need to more closely examine and target prolonged waiting times and reasons for walk-outs that appear to apply to specific groups of patients. The causes of these differences must be addressed in an equitable health system. If it is found that, for example, the need for an interpreter (or other difficulty in communication) is a significant cause of delay, then this factor should be considered in service planning and resource allocation.

More detailed and standardised triage guidelines may reduce the influence of non-clinical factors on the urgency for and time to receive emergency care. More generally, as the demand for medical care in emergency departments throughout Australia increases, there is a need for comparative studies at State, Territory or national levels that will document and account for avoidable areas of delay in the care of emergency patients.

References

Australian Bureau of Statistics. *Socioeconomic Status Index (SES) by Postcode Address for 1991 Census Population*.

Australian Institute of Health and Welfare 1994, *Australia's Health 1994*, Australian Government Publishing Service, Canberra.

Baker DW, Stevens CD & Brook RH 1991, 'Patients who leave a public hospital emergency department without being seen by a physician: Causes and consequences', *JAMA*, 266, pp 1085–90.

Bindman AB, Grumbach K, Keane D, Rauch L & Luce JM 1991, 'Consequences of queuing for care at a public hospital emergency department', *JAMA*, 266, pp 1091–96.

- Booth AJ, Harrison CJ, Gardener GJ & Gray AJ 1992, 'Waiting times and patient satisfaction in the accident and emergency department', *Archives of Emergency Medicine*, 9, pp 162–8.
- Burstein J & Fleisher GR 1991, 'Complaints and compliments in the pediatric emergency department', *Pediatric Emergency Care*, 7, pp 138–40.
- Cameron AP, Edmonds ER & Epstein J 1989, 'Emergency medicine – no longer a casualty', *The Medical Journal of Australia*, 150, pp 546–8.
- Dershewitz RA & Paichel W 1986, 'Patients who leave a pediatric emergency department without treatment', *Annals of Emergency Medicine*, 15, pp 717–20.
- dos Santos LM, Stewart G & Rosenberg NM 1994, 'Pediatric emergency department walk-outs', *Pediatric Emergency Care*, vol 10, no 2, pp 76–8.
- Dracup K, Moser DK, Eisenberg M, Meischke H & Alonzo AA 1995, 'Causes of delay in seeking treatment for heart attack symptoms', *Social Science and Medicine*, vol 40, no 3, pp 379–92.
- Fernandes AMB, Daya MR, Barry S & Palmer N 1994, 'Emergency department patients who leave without seeing a physician: The Toronto Hospital experience', *Annals of Emergency Medicine*, 24, pp 1092–96.
- GISSI 1995, 'Epidemiology of avoidable delay in the care of patients with acute myocardial infarction in Italy – A GISSI generated study', *Archives of Internal Medicine*, 155, pp 1481–8.
- Hanson R, Clifton-Smith BC & Fasher B 1994, 'Patient dissatisfaction in a paediatric accident and emergency department', *J Qual Clin Practice*, 14, pp 137–43.
- Hunt MT & Glucksman ME 1991, 'A review of 7 years of complaints in an inner-city accident and emergency department', *Archives of Emergency Medicine*, 8, pp 17–23.
- Maitra A & Chikhani C 1992, 'Waiting times and patient satisfaction in the accident and emergency department', *Archives of Emergency Medicine*, 9, pp 388–9.
- Meischke H, Eisenberg MS & Larsen MP 1993, 'Prehospital delay interval for patients who use emergency medical services: The effect of heart related medical conditions and demographic variables', *Annals of Emergency Medicine*, 22, pp 1597–1601.

National Health Strategy 1992, *A Study of Hospital Out Patient and Emergency Department Services*, Background Paper No. 10.

Nutbeam D, Wise M, Bauman A, Harris E & Leeder S 1993, *Goals and Targets for Australia's Health in the Year 2000 and Beyond*, Australian Government Publishing Service, Canberra.

Schwartz B 1975, *Queuing and Waiting, Studies in the Social Organisation*, University of Chicago Press, pp 47–62, 110–32.

Sullivan E, Michael F, Bauman A, Close G, Nash N & Kiernan C 1995, *Health in South Western Sydney: An Epidemiological Profile 1995*, Epidemiology Unit, South Western Sydney Area Health Service.

Worsley LW, Hanson RM & Yu JS 1985, 'Pediatric accident and emergency services: Are we meeting the need?' *Australian Health Review*, 8, pp 189–93.