

Emergency Presentations to Northern Territory Public Hospitals: Demand and Access Analysis

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ABSTRACT

This study aims to quantify trends in emergency presentations to Northern Territory (NT) public hospitals over the past five years with respect to demand and access. Retrospective analysis was undertaken on data extracted from the NT Module of Caresys and the Hospital Morbidity Data System. There has been a 4.6% decrease in presentations to the five public hospitals between 1996 and 2001 compared to a 9.4% growth in the population. Despite the apparent decline in total presentations, the acuity of patients has increased dramatically over the same period. Access analysis of presentations seen within the recommended triage time revealed considerable variability, especially for triage categories 2, 3 and 4. The access block problem, discrepancies in recorded waiting time and irregularities among the regional hospitals within the triage system have also been identified. Recommendations including improved access to inpatient beds and admission to wards were developed in response to the changing role of the emergency department.

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Background

According to the Australasian College for Emergency Medicine (ACEM, 2003), emergency department (ED) should provide a high standard of emergency care to those in the community who perceive the need for or are in need of acute or urgent care including hospitalisation. Emergency services therefore exclude those services that may be "booked", "planned" or "postponed" (West, 2000). However, the historical role of "trauma centre"

for the ED has been challenged by the increasing workload for urgent conditions due to chronic diseases and infections, such as stroke, chest pain and pneumonia (DHAC & AHIW, 1998; Blatchford et al, 1999). Patients seeking 24-hour free medical treatment for non-urgent problems such as fever, cough and diarrhoea have also exerted additional pressure on the ED service delivery (Tiepu, Sayre & Carleton, 1999; DHA, 2002). This continuing increase in medical emergency utilisations has coincided with shortage and high turnover of staff (AIHW, 2001; THS, 2001).

The Northern Territory (NT) has a population of 200,000 of which 29% are Aboriginal (ABS, 2001). Aboriginal people have the worst health status of any ethnic group in Australia, particularly in relation to the growing incidence of chronic diseases (AIHW, 1998). The provision of emergency care services across urban, rural and remote areas of the NT is diverse due to its geographical isolation. This reflects the need to address Aboriginal health within the wider context of service delivery for the entire NT population. Territory hospitals have special service issues including:

- More than 50% of bed days are attributable to Aboriginal patients;
- The severity of illness in these patients is higher than the national average; and
- The vast distance patients have to travel between home and hospital.

(Plant, Condon & Durling, 1995; Legislative Assembly of the Northern Territory, 1996).

This paper provides an overview of the trends in emergency presentations to the five public hospitals in the NT over the past five years. The study was funded by a priority-driven research grant from the Australian Health Minister's Advisory Council through the States/Commonwealth Research Issues Forum in response to the changing ED demands. A steering committee was formed in late 2001 to oversee the management of the project. Several recommendations were formulated based on the quantitative analysis and after extensive consultations with ED staff and other stakeholders.

Methods

The NT public hospital network consists of five hospitals: Royal Darwin Hospital (RDH), Alice Springs Hospital (ASH), Katherine Hospital (KH), Gove District Hospital (GDH), and Tennant Creek Hospital (TCH). Although all five hospitals provide general inpatient and outpatient services along with emergency services, only RDH and ASH are teaching hospitals that offer a wide range of specialists' care and have an ED with specialist emergency physicians.

In this study, the retrospective analysis of ED presentations utilised data extracted from the ED Module of Caresys (96/97-00/01) and the NT Hospital Morbidity Data System (95/96-00/01). Outcome measures with respect to demand (volume) and access (percentage seen within recommended triage time, median waiting time by triage category, waiting time before admission to ward) were identified. Percentage seen within recommended triage time can be regarded as an indicator of ED access and the ability of the ED to provide timely care (DHAC, 2001). Due to inaccurate computer entries in the database, median waiting time (in minutes) was used instead of mean waiting time to better reflect the average time taken from presentation to being seen by a doctor. Percentages admitted through the ED within 6 hours and 12 hours were also reported to examine the access block to wards. Descriptive statistics were undertaken on these measures to assess the yearly trends and patterns. Ethics approval for the project was obtained from the Human Research Ethics Committee of NT Department of Health & Community Services and Menzies School of Health Research.

Results

Demand

The NT population together with the total number of ED presentations from 1996 to 2001 are plotted in Figure 1. Overall there has been a 9.4% increase in the population. A breakdown of the population by gender and Aboriginality showed that 27% of the males and 30% of the females were of Aboriginal descent and these

figures have not changed substantially since 1996. A 4.6% decrease in total presentations was found for the five hospitals over the same period.

Total presentations and proportion of admissions from 97/98 to 00/01 for RDH and ASH based on the national triage scale are shown in Table 1. Triage category 1 is assigned to the most seriously ill patients while triage 5 represents the less urgent. A dramatic increase in each of category 1 to 3 is evident. Since 1997 there has been a 121% increase in triage category 1 (resuscitation), a 92% increase in triage category 2 (emergency), a 111% increase in triage category 3 (urgent), a modest 15% increase in triage category 4 (semi-urgent), but a 80% decrease was recorded in triage category 5 (non-urgent) patients. The corresponding admission rate for triage 4 and triage 5 has also dropped throughout the four-year period.

Access

Figure 2 displays the percentage of presentations seen within the recommended time for each triage category. Overall, there has been a steady improvement in the number of patients being seen within the recommended time for all triage categories. Triage category 1 has attained 100%. The percentage of patients seen within the recommended time for triage 2 increased from 51% in 97/98 to 65% in 00/01. Meanwhile, triage category 3 patients increased from 65% to 72%, triage category 4 improved from 64% to 69%, and triage category 5 also sustained an improvement from 73% to 83% over the same period.

The median waiting times (in minutes) for all five hospitals are given in Table 2, together with the ACEM waiting time threshold target for each triage category. The waiting times generally increase for lower triage categories whenever the number of higher category patients is large. As expected, the shortest waiting time was triage category 1 patients for all hospitals. The longest waiting time for all hospitals except GDH appeared to be triage category 4 presentations. The waiting time for triage category 2 patients at RDH and KH had slightly exceeded the threshold target, yet all hospitals performed well within the 120 minutes recommended for non-urgent patients.

Another measure of access is reflected by the waiting time before admission to ward. Table 3 shows the percentages of admissions through the ED that were within 6 hours and within 12 hours from presentation for the two teaching hospitals. The problem of access block to inpatient beds over the period 97/98-00/01 is evident from the decreasing trends. Unfortunately, data for the regional hospitals were not available for comparison.

Discussion

In the NT there has been increasing pressure to keep up with the demands to provide emergency treatment. The EDs at the two teaching hospitals are operating well in excess of their nominal capacity while current budget constraint does not allow any increase in bed availability. Changes in volume and nature of emergency presentations for the past five years were investigated in this paper. The apparently slight decline in total presentations can be attributed to the closure of three mines within the past three years. Furthermore, both RDH and ASH began to manage their volume of presentations by encouraging patients with non-urgent conditions to attend their local general practitioner as an alternative place of treatment.

The demand analysis further highlighted the acuity of illness being treated has been increasing, despite the apparent decline in total presentations over the study period. The number of patients presenting for triage category 1, 2, and 3 has increased substantially. Both category 1 and 2 presentations are very labour intensive for the ED staff. Although the number of triage 5 cases has decreased, non-urgent visits still continue to occupy a significant portion of the ED presentations especially at the regional hospitals.

At the aggregated level, the access analysis of presentations seen within the recommended time by triage category revealed considerable variability, especially for category 2, 3, and 4. Factors such as staffing levels and the daily activity of the ED can affect whether patients are seen within the recommended time. The variability is similar to those of other States yet data based on the triage system are not directly comparable across States and Territories (AIHW, 2003). Similarly, delays in waiting time were encountered in NT hospitals, possibly owing to constraints imposed by the limited resources and a fixed budget. In some instances non-urgent patients can be treated quickly while waiting for test results for more complicated cases. This partially explains why the

waiting time for triage category 5 was shorter than that of triage category 4. However, data quality problems and irregularities among the regional hospitals within the triage system have been identified.

There are certain limitations which should be taken into account in order to interpret the results sensibly. Due to the dynamic nature of staffing at the study hospitals (particularly ASH) and the absence of quality personnel data, it is difficult to assess the effects of staffing on the operation of the ED. Comparison with other States cannot be made due to the lack of published data on ED time trends. Furthermore, measures of efficiency such as average cost per patient and average cost per occasion of service were not evaluated in this study because of resource constraint and the lack of reliable costing data. The study also identified discrepancies in recorded waiting times that need to be addressed.

Based on results of the demand and access analysis, and after extensive consultations with stakeholders, several recommendations were developed by the project team in collaboration with the steering committee, in response to the changing role of the ED and the increasing levels of acuity of the presentations. These include improving coding practices and associated data quality, ensuring consistency of triage category classifications, and setting up registries for monitoring ED length of stay and staffing level, and costing episode of patient care. Availability of inpatient beds and short stay ED ward are priority issues that should be targeted for reducing the pressure on access block. Other options to be considered include transfer of patients with private health insurance to the Darwin Private Hospital and the provision of GP services, noting that Alice Springs has no after-hours GP alternative at present.

References

- Australian Bureau of Statistics (ABS) 2001, *Population by Age and Sex, Australian States and Territories*, Cat. No. 3201.0, Canberra.
- Australasian College for Emergency Medicine (ACEM) 2003, *Policies and Guidelines*, <http://www.acem.org.au/open/documents/standard.htm>.
- Australian Institute of Health and Welfare (AIHW) 1998, *Health in Rural and Remote Australia*, Cat. No. PHE 6, Canberra.
- Australian Institute of Health and Welfare (AIHW) 2001, *Nursing Labour Force 1999*, Cat. No. HWL 20, Canberra.
- Australian Institute of Health and Welfare (AIHW) 2003, *Australian Hospital Statistics 2001-02*, Cat. No. HSE 25, Canberra.
- Blatchford O, Capewell S, Murray S & Blatchford M 1999, 'Emergency medical admissions in Glasgow: general practices vary despite adjustment for age, sex, and deprivation', *British Journal of General Practice*, vol 49, 444, pp 551-554.
- Department of Health and Aged Care (DHAC) 2001, *Annual Report 2000-2001*, Canberra.
- Department of Health and Aged Care & Australian Institute of Health and Welfare (DHAC & AIHW) 1998, *Cardiovascular Health: A Report on Heart, Stroke and Vascular Disease*, AIHW Cat. No. PHE 9, Canberra.
- Department of Health and Ageing (DHA) 2002, *After Hours Primary Medical Care: 4th Annual National Workshop Presentations*, 22-23 March 2002, Sydney.
- Legislative Assembly of the Northern Territory, 1996. *Report on the Provision of Health Services to Aboriginal Communities in the Northern Territory*, Legislative Assembly of the Northern Territory, Darwin.
- Plant A, Condon J & Durling G 1995, *Northern Territory Health Outcomes, Morbidity and Mortality 1979-1991*, Northern Territory Department of Health and Community Services.
- Territory Health Services (THS) 2001, *Taskforce for the Recruitment and Retention of Nursing Staff, Territory Health Services*, Darwin.

Tiepu L, Sayre M & Carleton S 1999, 'Emergency medical care: types, trends and factors related to non-urgent visits', *Academic Emergency Medicine*, vol 6, pp 1147-1152.

West R 2000, 'Objective standards for the emergency services: emergency admission to hospital', *Journal of the Royal Society of Medicine*, vol 94, S39, pp 4-8.

Table 1: Total presentations and proportion of admissions by triage category, 97/98–00/01.

Triage	Patient category	97/98	98/99	99/00	00/01
1	presentation	300	484	577	662
	admission	73.7%	64.5%	64.8%	62.8%
2	presentation	1738	2846	2797	3333
	admission	61.4%	56.5%	62.9%	60.2%
3	presentation	9121	14202	17473	19250
	admission	40.6%	38.2%	38.4%	39.1%
4	presentation	36088	41452	40480	41558
	admission	17.2%	14.3%	13.3%	12.5%
5	presentation	19748	12647	5973	3893
	admission	4.1%	3.1%	2.7%	2.9%

Table 2: Median waiting time (minutes) by triage category, 99/00–00/01.

Triage	ACEM target	RDH	ASH	KH	TCH	GDH
1	0	1	0	0	0	0
2	10	12	8	11	10	2
3	30	19	29	27	15	6
4	60	40	66	46	22	13
5	120	29	40	43	19	15

Table 3: Percentage of ED admissions to wards within 6 hours and within 12 hours, 97/98–00/01.

Hospital	Waiting time	97/98	98/99	99/00	00/01
RDH	< 6 hours	95.8%	94.5%	92.6%	88.9%
	< 12 hours	98.9%	98.5%	98.2%	96.3%
ASH	< 6 hours	90.8%	89.8%	85.3%	79.9%
	< 12 hours	98.0%	98.3%	97.4%	96.3%

Figure 1: NT Population and emergency presentations, 1996-2001.

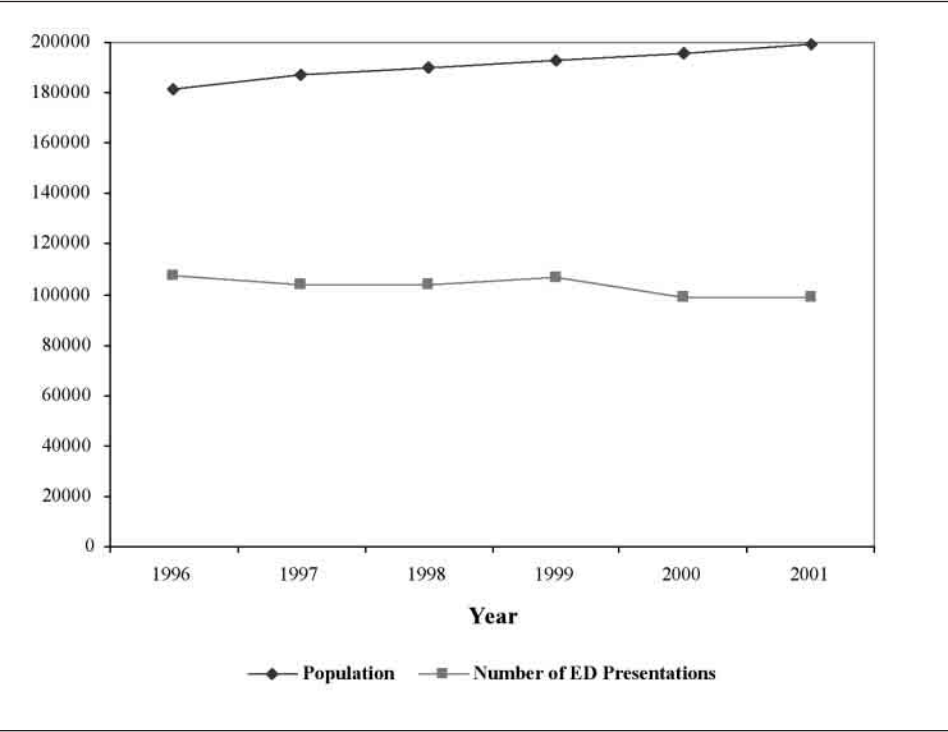


Figure 2: Percentage seen within recommended time by triage category, 97/98–00/01.

