

# ANALYSIS OF DEMAND AND UTILISATION OF METROPOLITAN EMERGENCY DEPARTMENTS IN WESTERN AUSTRALIA

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## 1. INTRODUCTION

The Demand Management Working Party was formed in late October 2005 with the aim to report to State Health Executive Forum (SHEF) on potential strategies to address the increase in emergency department presentations and admissions.

The Terms of Reference as agreed at SHEF was to determine:

- Who attends hospital emergency departments and who attends for acute admission?
- The principal diagnostic categories leading to presentation and admission.
- Reasons for attendance.
- When they attend (time of day, day of the week etc.)
- Referral source.
- End disposition.
- Any seasonal variation.

Membership of the Working Party consisted of:

Dr Shirley Bowen (Chair and Executive Sponsor)  
Mr John Banfield  
Ms Anne Bourke  
Ms Muriel Leclercq  
Ms Liz Lloyd  
Mr Antony Monaco  
Mr Gerard Montague  
Dr Debra O'Brien  
Dr Peter Sprivulis

Given the short time frame, the Working Party concentrated on identifying the key drivers that have resulted in an increase in emergency department presentations and subsequent hospital admission. This report provides a record of the findings of the data analysis.

Dr Jim Codde, Dr Shirley Bowen and Liz Lloyd prepared this report.

Suggested citation: Codde JP, Bowen S, Lloyd E (2006). *Analysis of demand and utilisation of metropolitan emergency departments in Western Australia*, Health Reform Implementation Taskforce, Department of Health, Perth, Western Australia.

## 2. KEY FINDINGS

- Between 2001/02 and 2004/05 the number of emergency department (ED) presentations at metropolitan public hospitals increased by 16%. This was more than three times the population growth rate.
- While increased utilisation of ED services occurred across all ages, some of the major factors that contributed to the increased number of ED presentations included:
  - More older persons presenting with chronic conditions, especially circulatory, respiratory and digestive system disorders.
  - An increasing number of people of all ages presented for injury and poisoning related conditions, but noticeably those aged 15-24 years.
  - Increased presentations by children aged 0-4 for a range of acute respiratory conditions.
- The data demonstrated that the shift to utilisation of the outer metropolitan hospitals had commenced, as people generally attend their closest hospital for care.
- The highest rates of ED presentation generally occurred in the outer metropolitan areas where the number of GP clinics tends to be lower. A high proportion of these presentations were triaged as 'semi-urgent' or 'non-urgent'.
- While semi-urgent and non-urgent presentations accounted for 60% of all ED presentations, only 10% of these cases were admitted into hospital.
- Daily ED presentations spiked on Saturdays and Sundays largely due to an increased number of semi-urgent cases. A significant portion of these presentations was due to 'semi-urgent' injuries in the 15 to 35 year age group.
- Children aged less than 15 years of age accounted for almost 25% of all ED presentations. Many of these presentations were due to injury, respiratory disease and infections. With the exception of asthma cases, most presentations did not result in hospital admission.
- Although low in number, patients from residential care facilities are a significant contributor to ED workload from an acuity perspective with approximately a third of patients being admitted into hospital. Major reasons for admission include pneumonia and other respiratory diseases, injury (largely involving the hip and thigh) and circulatory diseases.
- Of all people who attended a metropolitan ED during 2004/05, almost 75% only attended once with 90% having less than three visits during that year. Children aged 0-4 years and people aged 25-34 years were among those age groups that made the most frequent use of EDs. Repeat presentation to ED was most commonly associated with respiratory, mental health or injury related conditions.

### 3. CONCLUSIONS AND RECOMMENDATIONS

Meeting the health care needs of the Western Australian population is a complex task. Strategies to manage demand are only one portion of the task, but when considered in the context of an aging population and the predicted health care workforce shortage,<sup>1</sup> it is vital that “demand” management becomes a focus in our system.

While some stakeholders have emphasised the need for more hospital beds, the capital development plan will ensure that hospital accommodation is appropriately available to those who truly need it. Of equal importance is the recognition that while a physical bed is perceived as being the essential building block, the more important issue to address is “the better utilisation of that bed “ through the development of “smarter” and “alternative” models of care.

Demand management is now established as a year round activity. The past practice of developing winter demand management strategies to address only seasonal issues is no longer adequate and the responsibility is now with the Area Health Services to understand and manage local demand issues.

Any solutions to the problem areas represented by demand management, ED practice and efficiency and access block are all inter-related and cannot be considered in isolation.

#### 1. Demand Management

Demand management processes seek to improve the efficiency and effectiveness of health care delivery through a careful analysis of factors that influence demand and supply, interaction between available services and consideration of alternative models of care. Demand management is essential given the current and predicted environment in which the number of aged in the population will increase, thereby increasing the burden of disease.

Health system-wide demand management strategies need to address:

- Primary and secondary prevention of illness and injury,
- Availability and quality of primary care,
- Improving community based chronic disease management,
- Ambulatory models of care, including those that provide options for caring for acute patients,
- Better use of technology,
- Workforce availability, and
- Improved communication between health service providers.

These types of strategies intersect across the continuum of life and are relevant to every age group and to all types of illness.

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<sup>1</sup> For further information on this topic please see:  
[www.health.wa.gov.au/HRIT/clinicalplanning/docs/Workforce\\_Challenge\\_Presentation.pdf](http://www.health.wa.gov.au/HRIT/clinicalplanning/docs/Workforce_Challenge_Presentation.pdf)



## 2. Emergency Department efficiency and best practice

Emergency departments are the “turnstiles” in the hospital system. As such, addressing the components of demand management, alternative models of care and access block are essential to ensure that the “turnstiles” are not jammed.

A great deal of work has been done to ensure that emergency departments work as efficiently as possible. Redesigning the patient flow, streaming at point of triage, ensuring efficient timing of tests and treatments are all essential. However, even the most efficient ED cannot do any better if the volume and complexity of presentations increase and inpatient beds are not available to enable transfer out of the emergency room.

Possibly due to shortages in other types of care, emergency departments appear to have become the default venue for many types of health care. The increasing rate of demand for emergency department resources highlighted in this report clearly demonstrates the need for additional models of care. Alternatives that are adequate and community based or which “by-pass” ED must be considered to reduce the pressure on emergency departments.

## 3. Access Block

Access block is a term used to define the percentage of patients who are formally admitted to hospital from the ED, but who have waited more than eight hours for an inpatient bed.

Access block creates a number of linked problems such as:

- Over-crowding in ED.
- Staffing problems, especially for nursing, due to the increase in burden of care created by dependent patients.
- Ultimately, ED blocking demonstrated by ambulance diversion.

Access block must be correctly defined as a problem that should be addressed by hospital based clinicians *in the wards*. Improved bed utilisation must occur to ensure that patients who need care, can access it in a timely manner and in an appropriate setting. Tertiary hospitals are not places to convalesce. They are complex settings where acute interventions and high acuity care is provided by teams of experts. All clinicians must ensure that beds are utilised to the maximum to ensure that everyone can access this care within a reasonable period. Reducing the average length of stay is pivotal to ensuring that beds are available for both unplanned and planned admissions. This work should include some of the following areas:

- Clear and immediate care planning for individual patients on admission or preadmission.
- Immediate identification of patients capable of being treated in an ambulatory setting such as by Hospital in the Home or Rehab in the Home programs.
- Early identification of patients capable of being streamed into early discharge to home (with or without after-care) and community based investigation and follow-up.
- Ensuring best clinical practice to reduce the average length of stay (ALOS) across BOTH medical and surgical specialities.
- Effective use of pre and post admission protocols to reduce LOS for multi-day surgery.

- Ensuring post-surgical care at home is available for wounds, catheters, drains etc to enable step-down or after-care.
- Consideration of the day of the week in terms of surgical lists and its potential impact on access block. For example, Monday morning will always be a peak day for all forms of bed use.

## *Conclusion*

Demand management needs to be a year round activity. The past practice of developing winter demand management strategies to address only seasonal issues is no longer adequate and the responsibility is now with the Area Health Services to understand and manage local demand issues.

Through a process of careful analysis and evaluation, new programs that target certain areas of health service delivery and/or specific target groups are needed to help balance demand and service availability.

Findings highlighted in this report demonstrate that health benefits could be made by programs that address the following areas:

### **Area 1: Community based services that target frequent users of ED**

- Older Western Australians with an emphasis on models of care that enable people to stay at home (including residential care facilities) for as much of the care as possible, with special emphasis on cardiovascular and chronic respiratory diseases.
- Young children through better management of infectious diseases and acute respiratory conditions.
- Increased focus on injury prevention with an emphasis on people aged 15 to 35 years.

### **Area 2: Different models of care within EDs**

- New models of care that better manage emergency care of people, especially those with injuries, mental health disorders and chronic diseases.

### **Area 3: Improved access to hospital beds by ED patients**

- Greater cooperation and coordination of the linkages and processes between EDs and wards.
- Proactive early identification and 'fast-tracking' of patients out of ED by the wards.
- Greater involvement by medical and ward staff to provide an effective and timely discharge that links to a range of community based services as appropriate.

While many new initiatives such as Hospital-in-the-Home, Eating Disorder Clinics, Outpatient Direct Hotline and Chronic Disease Management teams are already in operation, the comprehensive non-inpatient framework currently under development will further develop strategies within these areas.

## 4. CHANGING PATTERNS IN ED PRESENTATIONS

### 4.1 NUMBER OF PRESENTATIONS

Between 2001/02 and 2004/05, the number of ED presentations at public hospitals increased by an average of almost 14,000 cases per year (5.3%) with significant average annual increases in both the tertiary (3.1%) and non-tertiary (10.4%) hospitals. Hospital specific information is shown in the following table.

*Table 1: Annual number of ED presentations by hospital*

	01/02	02/03	03/04	04/05	Ave %Δ <sup>a</sup>
<b>Tertiary hospitals</b>					
RPH	51,699	52,029	52,184	54,623	1.7%
SCGH	38,313	39,039	39,042	44,703	5.1%
FH	40,316	40,911	40,458	44,295	2.9%
KEMH	9,478	10,112	10,954	10,881	5.3%
PMH	40,995	41,707	43,051	44,119	2.6%
<b>Non-tertiary hospitals</b>					
Armadale	29,699	33,688	36,504	39,211	10.4%
Rockingham	27,489	27,493	29,325	33,183	7.1%
Swan	22,108	26,537	29,887	31,659	14.1%
<b>Private hospitals</b>					
Joondalup <sup>b</sup>			41,061	42,119	
Peel <sup>c</sup>			27,152	n/a	

Notes: (a) Average annual percentage change determined by linear regression.

(b) 03/04 data not from EDIS; 04/05 figure obtained from JHC as EDIS data for July 04/05 data is incomplete (DOH collections shows 39,531 presentations for the year).

(c) 03/04 data direct from PHC (ie not EDIS); technical issues at PHC prevention provision of 04/05 data.

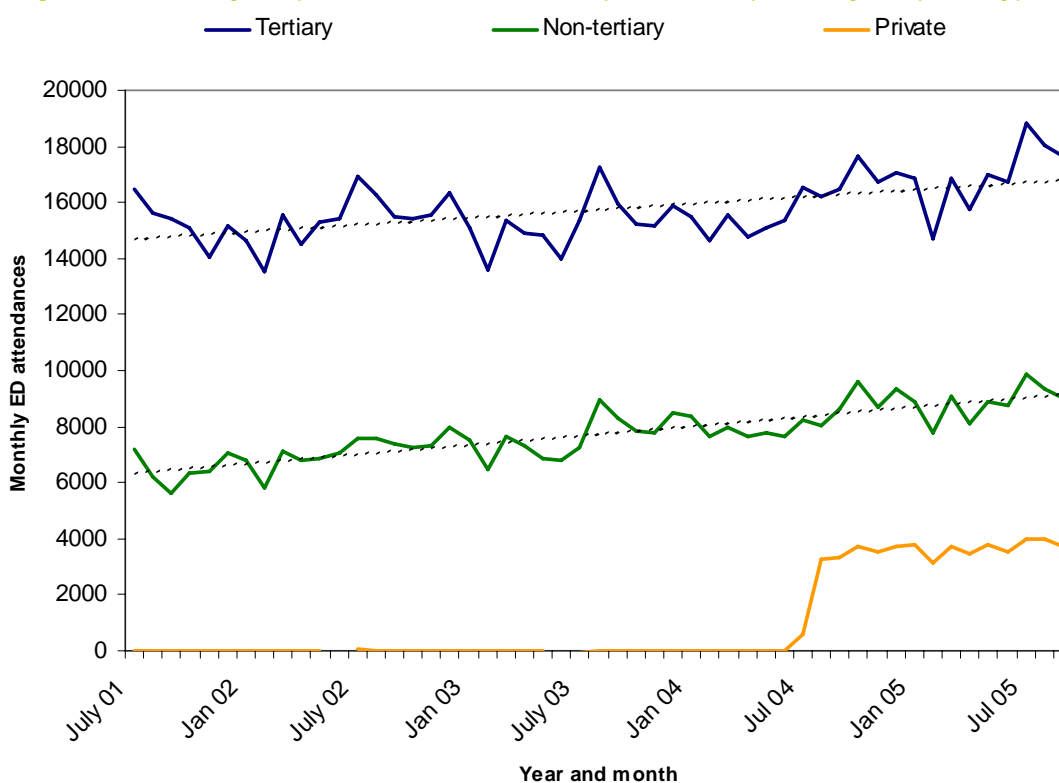
Within the tertiary sector hospitals, the largest average annual increase in ED presentations occurred at SCGH and KEMH. In terms of cases however, the average annual number of additional cases at SCGH during the 2001/02 – 2004/05 period was 1900 compared to only 500 at KEMH. While the largest average annual increase occurred at Swan District Hospital, most of this occurred between 2001/02 and 2002/03 with growth rates being more comparable to that of Armadale between 2002/03 and 2004/05 (ie 10.6%).

Due to the wide fluctuation of monthly presentation rates to ED, data from July 2001 and September 2005 was also examined. Analysis showed that monthly ED presentations in the public sector increased from 23,700 to approximately 28,700 cases. A further 6,500 private sector ED presentations (Joondalup, Peel and Murdoch) were estimated to occur per month although actual figures were not available due to the lack of centralised data collection.

While the numbers fluctuate from month to month, ED presentation patterns at tertiary and non-tertiary public hospitals reveal a small but steady increase in the number of monthly<sup>2</sup> presentations during the study period. While the linear regression line predicted 71% of the non-tertiary ED presentations over this period, far greater variability was observed in the tertiary sector EDs ( $R^2 = 31\%$ ).

<sup>2</sup> Based on linear line of best fit across the entire July 2001 – Sept 2005 period.

Figure 1: Monthly ED presentations to metropolitan hospitals by hospital type



Notes: (1) Source: EDIS system via ICAM, DOH.  
 (2) Private hospital type only includes Joondalup Health Campus.  
 (3) Dotted lines show linear trends.

## 4.2 RATES OF PRESENTATION

Between 2001/02 and 2004/05, the number of ED presentations to public sector hospitals increased by 16%. By contrast the population of the Perth metropolitan area only increased by 5% (1,456,000 vs. 1,532,000<sup>3</sup>). During the same period, the median age of metropolitan residents also increased from 35.3 years to 36.1 years.

As the increasing size and age of the population could both impact on the number of ED presentations, annual age standardised rates were calculated and are shown in the table below.

Table 2: Annual age standardised rates of ED presentation to public hospitals

	2001/02	2002/03	2003/04	2004/05
<b>Tertiary hospitals</b>	12,595	12,607	12,561	13,147
<b>Non-tertiary hospitals</b>	5,477	5,982	6,437	6,855
<b>Rate ratio</b>	2.30	2.11	1.95	1.92

Notes: (a) Rates are per 100,000 persons and standardised to the 2001 Australian population.  
 (b) Rate ratios were calculated by dividing the tertiary ASR by the non-tertiary ASR.

Trend analysis<sup>4</sup> of these rates shows after controlling for both age and population size, that the average annual percent of change in the rate of ED presentations

<sup>3</sup> Source: Estimates derived from Estimated Resident Population figures published by the ABS.

<sup>4</sup> By Poisson Regression with average annual percent change significant at the 95% level.

increased significantly by 1.3% and 7.8% in the tertiary and non-tertiary hospitals respectively.

The rate-ratio data show that during the four-year period that the rate of presentation to EDs in the tertiary setting has decreased relative to the rates of presentation to non-tertiary hospitals.

Due to difficulties in determining hospital catchment area populations, rates for each public hospital were determined using the entire metropolitan population as the denominator, except for KEMH where only the female population was used.

*Table 3: Rate and annual average percent change of hospital ED presentations*

	01/02	02/03	03/04	04/05	Ave % $\Delta$ <sup>a,d</sup>
<b>Tertiary hospitals</b>					
RPH	3,578	3,519	3,463	3,537	0.4
SCGH	2,673	2,659	2,602	2,902	2.5
FH	2,804	2,790	2,712	2,900	0.9
KEMH <sup>c</sup>	1,281	1,353	1,460	1,433	4.0
PMH	2,899	2,963	3,054	3,092	2.3
<b>Non-tertiary hospitals</b>					
Armadale	2,047	2,295	2,451	2,580	7.8
Rockingham	1,904	1,881	1,980	2,194	5.1
Swan	1,526	1,806	2,006	2,082	10.6

Notes: (a) Average annual percentage change in age standardised rates of ED presentations.  
 (b) Rates are per 100,000 persons and standardised to the 2001 Australian population.  
 (c) Rates for KEMH are per 100,000 women.  
 (d) While ASR vary if Health District populations are used as the denominator for non-tertiary hospitals, the average annual rate of change of the rate is similar to that using metropolitan population estimates.

These results show that while ED presentations at RPH have increased from 51,700 in 2001/02 to 54,600 in 2004/05, this change is largely explained by changes in population size and ageing. Similar findings were found for Fremantle Hospital. The increased rates of presentation at Swan District, Armadale, Rockingham, KEMH, SCGH and PMH cannot be explained by demographic factors.

### 4.3 MEASURES OF URGENCY

As changing demographic factors alone do not account for the increased rates of presentation to metropolitan emergency departments, other causes must be driving the change. In the absence of alternative sources of care, it is possible the increased utilisation could be due to an increased level of “GP-level” cases - that is, those cases whose urgency or severity do not warrant attention at ED. As there is no direct measure of this, several surrogate measures were investigated.

#### A. Visit type

The visit type variable provides information about referrals, unplanned return visits, transfers and spontaneous presentations to ED. Due to the staged implementation of Emergency Department Information System (EDIS) into public hospitals during the 2002/03 period, analysis of the visit type was only possible from July 2003 onwards.

As shown in the figure below, ‘Spontaneous presentations’ account for approximately 83% of all cases; a figure that has remained relatively constant over the 27-month

period. Similarly, 'GP referrals' (8%), 'Inter-hospital transfers' (2.6%), 'Referrals from HealthDirect' (1.7%) and 'Unplanned return visits' (1.7%) all remained relatively constant over the period. A 'Planned return visit' was the only category that showed a small but consistent increase from 0.8% to 1.5% during this time.

Figure 2: Types of visits to metropolitan public hospital EDs by month

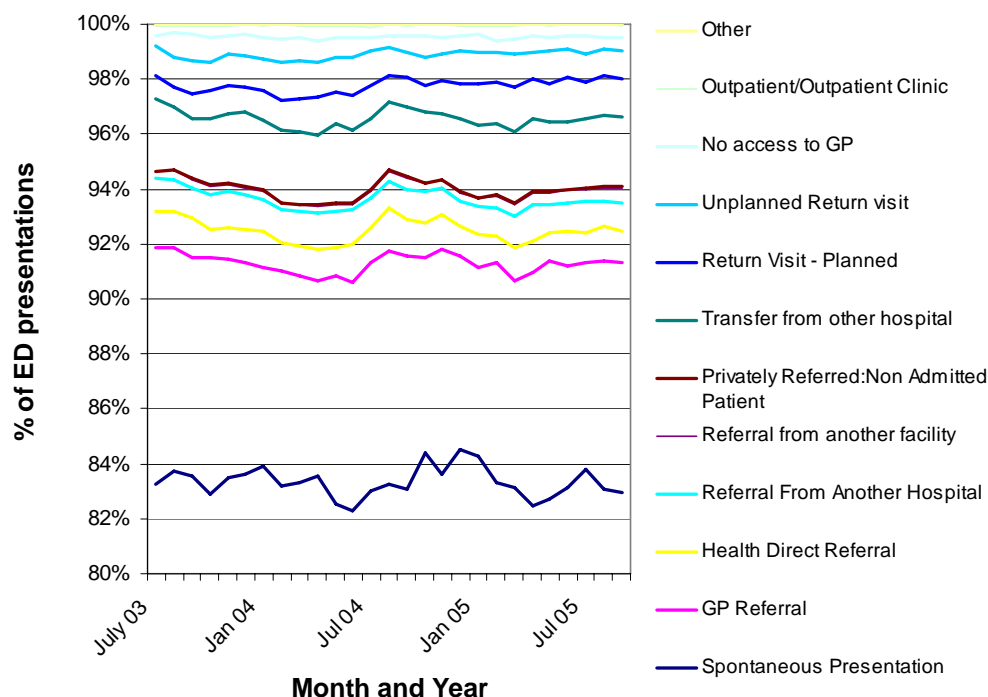


Table 4: Average percentage of ED presentations by visit type

	Hospital Type		
	Tertiary	Non-tertiary	Private
Spontaneous presentation	79.8%	88.9%	89.1%
GP Referral	9.9%	4.3%	7.7%
Health Direct referral	0.8%	2.0%	0.8%
Referral from another hospital	1.8%	0.0%	0.0%
Referral from another facility	0.4%	0.0%	1.0%
Privately referred: Non Admitted Patient	0.1%	0.0%	0.0%
Transfer from other hospital	4.1%	0.0%	0.1%
Return visit - planned	1.0%	1.7%	0.7%
Unplanned return visit	1.1%	1.3%	0.5%
No access to GP	0.3%	1.4%	0.0%
Outpatient/Outpatient Clinic	0.5%	0.3%	0.2%
Other	0.0%	0.1%	0.0%
Total	100.0%	100.0%	100.0%

Notes: (a) Numbers highlighted in red indicates gradual increase during the study period.

(b) Public sector data covers July 2003 – Sep 2005 while private hospital data (JHC) for July 2004 – Sep 2005.

While spontaneous presentations still remain the most common visit type to all hospitals, tertiary hospitals had a greater proportion of their patients presenting due to GP referrals and transfers or referrals from other hospitals. During the period July 2003 – September 2005 the proportion of planned returned visits increased slightly, but otherwise monthly variations obscured any time related trends.

No apparent changes occurred in the visit types recorded at non-tertiary hospitals during the 27-month period. This group of hospitals tended to have a higher proportion of spontaneous presentations and referrals from HealthDirect to their EDs than was seen in the tertiary sector.

The ED at Joondalup Health Campus showed almost a two-fold increase in the proportion of GP referrals between July 2004 (5.5%) and September 2005 (10.2%). During this time, small increases in proportion of planned and unplanned return visits were also observed.

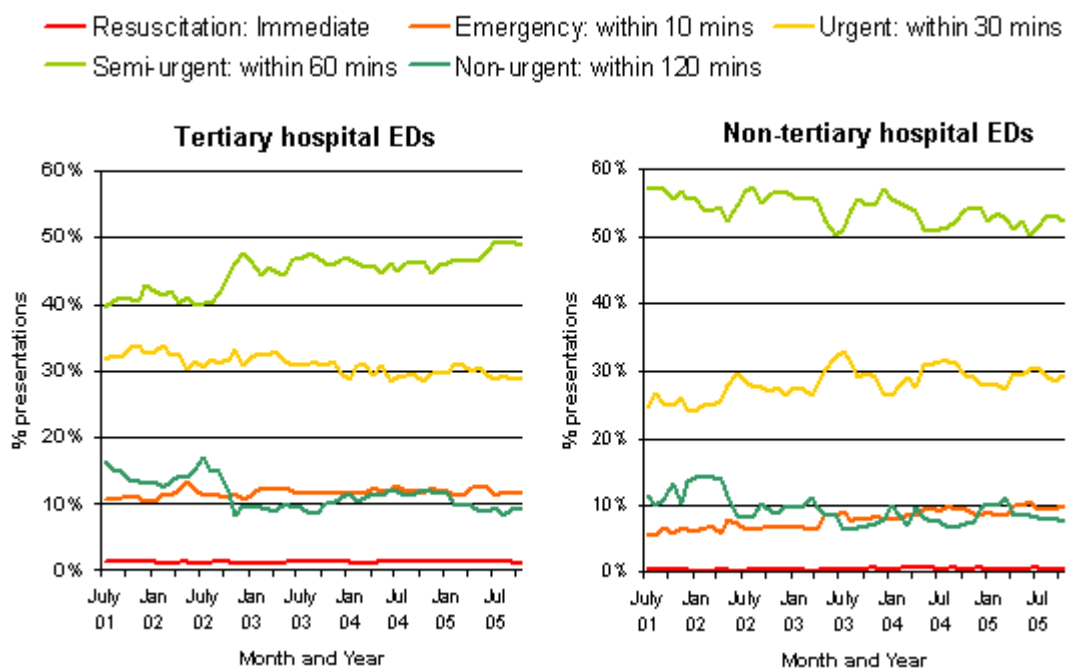
Analysis of individual hospitals is difficult as not all sites capture all the visit types and the data collection period varies. Despite this, while the mix of visit types vary between sites, in most cases the proportions remained relatively stable during the study period.

Therefore it seems unlikely that the increase in ED presentation rates described above can be explained by changes in referral patterns.

## B. Triage category

EDIS records a triage category for all presentations based on nationally defined criteria. This measure provides an estimate of the maximum amount of time a patient should wait to receive medical care and includes a 'Non-urgent' category. Changes in proportion of ED presentations by triage category for both tertiary and non-tertiary hospitals are shown in the figure below.

Figure 3: Triage categories in metropolitan public hospital EDs by month



Non-urgent emergency department cases (aqua-blue lines) do not represent an increasing proportion of total presentations in either tertiary or non-tertiary metropolitan hospitals. Similar findings were observed for individual hospitals where

the proportion of non-urgent presentations remained relatively steady except for Fremantle Hospital where there was an average increase of 4% (only 2.2% if referrals to after hours GP and 'did not waits' are removed).

As it has been argued that triage category is not a reliable measure of complexity or severity<sup>5</sup>, other indicators may be more sensitive to changes in "GP-level" type demand on ED services.

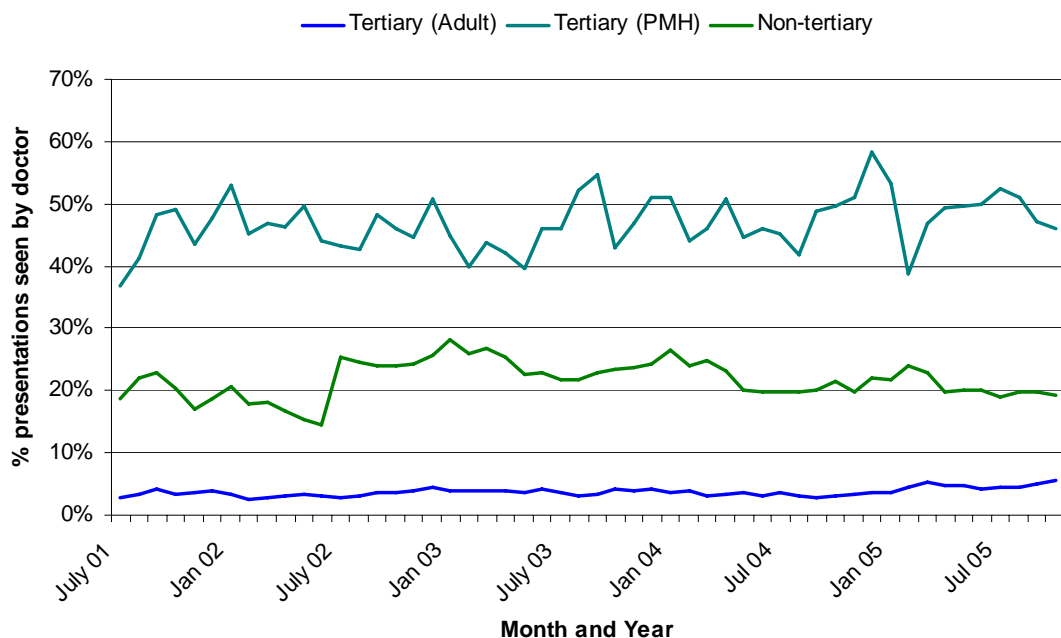
### C. Low acuity presentations

Cases that present to ED that could be managed by a GP are known as 'low acuity' presentations. A method for identifying these cases has been developed by the Australian College of Emergency Medicine and is based on a number of factors:

- Triage category 4 or 5, AND
- Self referred, AND
- Did not arrive by ambulance, AND
- Presented between 0800 and 2400 hours, AND
- Treatment time (time seen by doctor and time ready for discharge) less than 60 minutes, AND
- Subsequently discharged from ED.

The figure below shows the proportion of low acuity cases in metropolitan public emergency departments between July 2001 and Sept 2005.

*Figure 4: Proportion of low acuity cases by hospital type*



Due to the marked difference in results, data from PMH was analysed separately from the other tertiary hospitals. The proportion of low acuity cases presenting at adult tertiary hospitals has, on average, remained relatively stable although this has shown a slight increase in the most recent months. Low acuity presentations at non-

<sup>5</sup> *The Relationship between Emergency Department overcrowding and alternative after-hours GP clinics. Australian College of Emergency Medicine, 2004, [www.acem.org.au/open/documents/after\\_hoursgp.pdf](http://www.acem.org.au/open/documents/after_hoursgp.pdf)*



tertiary hospital EDs have decreased over time. These findings are reflected in the hospital specific data shown in the table below.

*Table 5: Percent of ED presentations classified as low acuity.*

	01/02	02/03	03/04	04/05	Ave %Δ <sup>a</sup>
<b>Tertiary hospitals</b>					
RPH	4.4%	5.0%	4.1%	2.5%	-0.7%
SCGH	2.1%	2.9%	3.0%	4.7%	0.8%
FH	3.3%	3.4%	4.0%	3.0%	0.0%
KEMH <sup>b</sup>	n/a	n/a	n/a	8.3%	n/a
PMH	31.2%	30.7%	32.5%	32.7%	0.6%
<b>Non-tertiary hospitals</b>					
Armadale	32.5%	31.9%	28.9%	27.8%	-1.7%
Rockingham	9.7%	10.0%	10.4%	9.1%	-0.1%
Swan <sup>b</sup>	n/a	15.2%	14.3%	13.0%	-1.1%

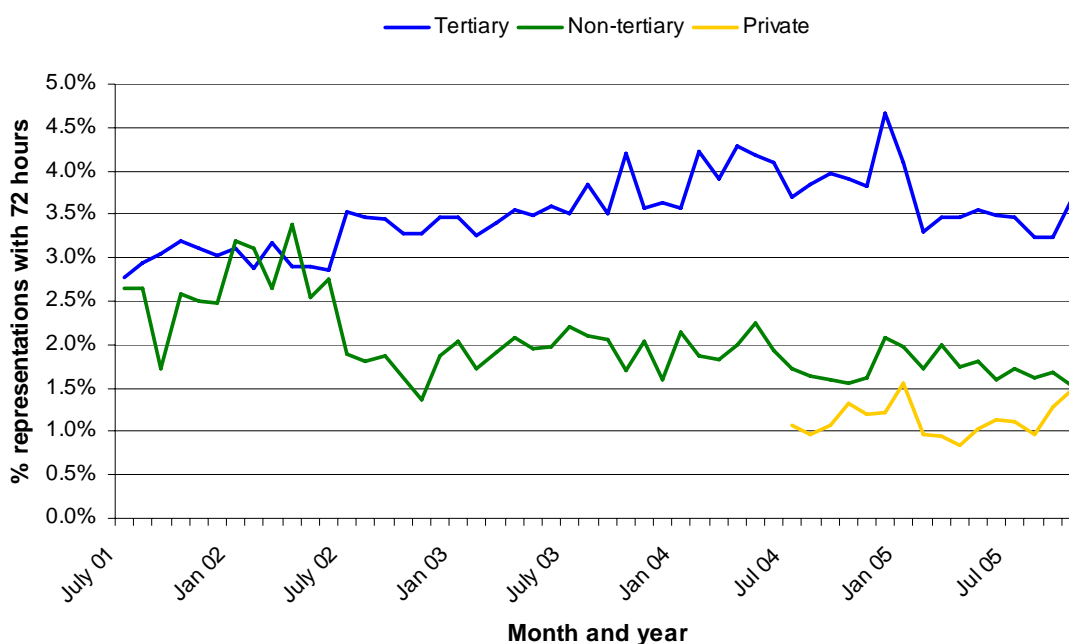
Notes: (a) Average annual percentage change determined by linear regression.  
 (b) Discharge destination not recorded in EDIS and hence low acuity could not be calculated.

Low acuity cases amount to approximately 40,000 presentations each year. While it is clear that increased presentation of “GP-level” cases as measured by “low acuity” does not explain the increased rates of presentation described earlier, further evaluation of these cases may provide insight on how this need could be better met by an alternative model of care.

#### D. 72 hour representations to ED

Increased number of presentations to ED could be as a result of repeat visits by an individual. Such cases were determined as individuals who attended any public ED on two or more occasions within 72 hours of the initial visit and had the same doctor-based diagnosis.

*Figure 5: Proportion of cases with a 72-hour representation*



On average, the percentage of ED presentations that represent within 72 hours with the same diagnosis is 3.4% and 2.0% in the tertiary and non-tertiary hospitals respectively. Not surprisingly, these percentages vary by triage category as shown below with over 60% of representations being classified as semi-urgent or non-urgent at triage.

*Table 6: Percent representations within 72 hours by triage category*

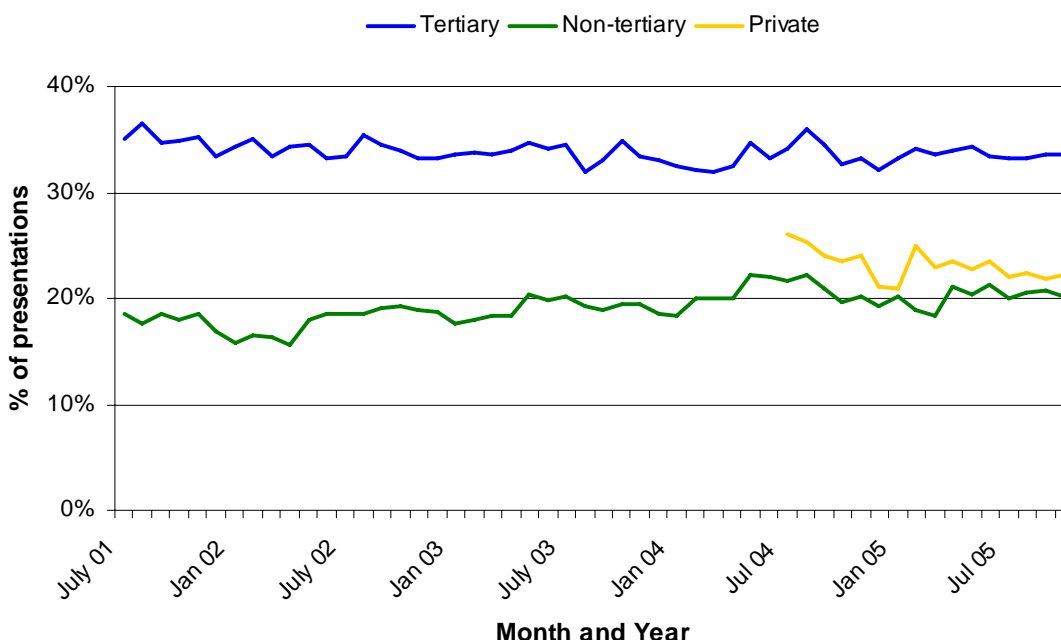
	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
<b>Tertiary hospitals</b>	1.9%	2.6%	3.2%	2.8%	7.7%
<b>Non-tertiary hospitals</b>	0.6%	0.9%	1.8%	1.7%	5.2%
<b>Private hospitals</b>	0.3%	0.4%	1.3%	1.1%	1.7%

Similar patterns of representation are seen for hospitals within each type with the exception of KEMH that has a much higher rate of representation (13.8%). As with the other hospitals, most of these are due to planned appointments (80%).

## E. Admissions or transfers to hospital

Although a number of factors influence whether an ED patient is subsequently admitted into hospital or transferred to another hospital for further care, it is reasonable to assume that such cases have greater complexity or severity than those where patients are discharged to home or elsewhere. Based on this logic, increased presentations of less complex cases should result in a decrease in the admission/transfer rate.

*Figure 6: Changes in admission and transfer rates<sup>6</sup> by hospital type*



As is apparent in the figure above, the proportion of presentations to emergency departments that subsequently are admitted into hospital or transferred to another hospital has remained relatively constant, especially for the past two to three years.

<sup>6</sup> Includes admissions, intra-hospital transfers and deaths in ED.

*Table 7: Hospital admissions<sup>7</sup> as a percentage of ED presentations*

	01/02	02/03	03/04	04/05	Ave %Δ <sup>8</sup>
<b>Tertiary hospitals</b>					
RPH	41.1%	42.5%	42.1%	41.6%	0.1%
SCGH	43.8%	43.1%	44.0%	46.3%	0.8%
FH	31.0%	29.5%	29.0%	28.2%	-0.9%
KEMH	21.0%	18.5%	17.0%	19.4%	-0.6%
PMH	24.3%	22.7%	20.4%	20.4%	-1.4%
<b>Non-tertiary hospitals</b>					
Armadale	18.0%	19.9%	20.4%	21.6%	1.1%
Rockingham	16.7%	16.6%	18.2%	18.0%	0.6%
Swan <sup>9</sup>	n/a	19.7%	20.6%	21.1%	0.7%

Data in the table above shows that the percentage of admissions is significantly higher in the adult tertiary hospitals (34%). Both RPH and SCGH have the highest percentage of ED presentations that result in hospital admission; with both sites showing a small average annual increase over the four-year period. The other tertiary sites show a small decrease in the average annual admission rate over the same period.

Approximately 20% of ED presentations to non-tertiary hospitals result in admission into hospital. During the study period, there was a small increase in the proportion admitted.

Anecdotal evidence suggests that at least some of the increase in hospital admissions from non-tertiary hospital EDs is due to improved services in these sites and a policy to reduce presentations at the tertiary hospitals.

#### 4.4 RATES OF PRESENTATION BY DOCTOR DIAGNOSIS

As shown above, analysis of ED presentations rates within the Perth metropolitan area suggests that neither referral patterns (Visit type), changes in severity (Triage category, low-acuity cases and admissions into hospital) or 72 hour representations could explain the increase in demand. As a result, further analysis was undertaken to determine whether the increases were due to changing patterns of presentation for specific conditions based on the ICD-10 coded doctor's diagnosis.

Annual age standardised rates were calculated for all presentations after being assigned to one of 21 ICD-10 chapters on the basis of the coded doctor's diagnosis field. As the coding was less complete in 2001/02 than subsequent years, trend analysis was limited to the three-year period 2002/03 – 2004/05. Results are shown in the table below.

<sup>7</sup> Admission defined as admitted, transferred or died in ED.

<sup>8</sup> Average annual change in hospital admission rates was determined from the slope of a fitted regression line.

<sup>9</sup> Admission into hospital not recorded at Swan Districts Hospital by EDIS in 2001/02.

**Table 8: Changing rates of ED presentations by doctor diagnosis<sup>10</sup>**

ICD 10 Chapter	Tertiary hospitals				Non-tertiary hospitals			
	Cases	%	%Δ <sup>11</sup>	Signif	Cases	%	%Δ	Signif
Injury and poisoning	49,000	28.1%	2.2	↑	30,800	32.2%	8.6	↑
Symptoms & ill-defined	23,700	13.6%	-1.8	↓	10,300	10.7%	-0.0	
Respiratory system	16,900	9.7%	0.7		9,600	10.0%	10.7	↑
Other factors for contact	13,600	7.8%	8.6	↑	8,900	9.3%	8.1	↑
Infectious disease	12,100	6.9%	-7.9	↓	6,600	6.9%	-4.1	↓
Digestive system	11,400	6.5%	3.7	↑	5,350	5.6%	9.4	↑
Circulatory system	11,300	6.4%	-3.3	↓	4,100	4.2%	8.2	↑
Mental disorders	7,200	4.1%	-3.3	↓	3,650	3.8%	7.2	↑
Genitourinary system	6,600	3.8%	5.0	↑	3,050	3.2%	5.3	↑
Skin & subcut. tissue	5,100	2.9%	4.5	↑	2,700	2.8%	13.3	↑
Musculoskeletal system.	4,800	2.7%	2.6	↑	2,350	2.4%	9.0	↑
Nervous system	3,700	2.1%	-0.4		2,000	2.1%	6.3	↑
Ear & mastoid process	2,200	1.3%	-1.2		1,650	1.7%	0.3	
Eye & Adnexa	2,100	1.2%	8.3	↑	1,250	1.3%	11.9	↑
Endocrine diseases	1,700	1.0%	-2.1		1,025	1.1%	0.5	
Neoplasm	1,050	0.6%	4.5	↑	600	0.6%	20.1	↑
Blood diseases	1,000	0.6%	8.2	↑	175	0.2%	17.3	↑
Pregnancy & childbirth	800	0.5%	50.1	↑	130	0.1%	9.5	↑
EC of Morb & Mort codes	220	0.1%	2.1		120	0.1%	2.8	
Perinatal period	175	0.1%	242.0	↑	50	0.1%	10.5	
Congenital malformations	100	0.0%	-35.1	↓	30	0.0%	-62.8	↓
Total	174,745	100.0%	1.4	↑	94,430	98.4%	6.6	↑

The 'total' rates of ED presentation are similar to those reported earlier (Section 3.2) despite being estimated over a three-year period rather than four, and a number of records being excluded from the analysis due to absence of a coded doctor diagnosis (Tertiary hospitals: 7.7%; Non-tertiary hospitals: 1.6%). The majority of the missing data from tertiary hospitals were for appointments at KEMH.

This analysis revealed that while the overall rates of ED presentation were increasing annually, the amount varied between the hospital types and chapter<sup>12</sup> of diagnosis. For example, presentations due to 'Injury and Poisoning' account for approximately a third of all ED presentations at both tertiary and non-tertiary facilities. For both hospital types the annual percentage change in the age standardised rates due to 'Injury & Poisoning' increased significantly between the period 2002/03 – 2004/05 (Tertiary: 2.2%; Non-tertiary: 8.6%). Numerically this is equivalent to approximately an additional 3,700 presentations due to 'Injury & Poisoning' annually (Tertiary: 1,080<sup>13</sup>; Non-tertiary: 2,650).

Some other conditions with increased ED presentation rates that impact on annual ED workload include 'Other factors for health service contact'<sup>14</sup> (Tertiary: 1,200; Non-tertiary: 700), 'Respiratory Diseases' (Tertiary: 120; Non-tertiary: 1140) and 'Digestive Disorders' (Tertiary: 425; Non-tertiary: 925).

<sup>10</sup> ICD-10 codes for doctor diagnosis were limited in 2001/02 so trend analysis is limited to the period 2002/03 – 2004/05. Number of cases and percentage shown is a rounded average for the period

<sup>11</sup> Average annual percentage change in age-standardised rates of ED presentation with  $P < 0.05$  indicated by arrows in the 'Signif' column.

<sup>12</sup> ICD-10 codes can be grouped into 22 broad categories known as 'chapters' that include 'Infectious Diseases', 'Respiratory diseases', 'Cancer', 'Circulatory diseases' and 'Injury & Poisoning'.

<sup>13</sup> Estimated by multiplying the average annual number of cases by the average annual change in ASR.

<sup>14</sup> See Table 26 (in Appendix) for more detail of the services that fall into this category.

Both 'Circulatory Diseases' and 'Mental Disorders' had decreased rates of presentation at tertiary hospital Eds, but corresponding increases at non-tertiary EDs. As the estimated number of presentations in both hospital types was numerically similar, this observation may reflect a change in admission practices or ambulance delivery protocols.

Thus, analysis shows that much of the increased rates in ED presentation reported earlier is due to 'Injury & Poisoning', 'Respiratory Diseases', 'Digestive Disorders', 'Skin & Subcutaneous Conditions' and 'Genitourinary Disorders'. The data also shows that presentations for 'Other factors for health service contact' also increased substantially over the three-year period in both hospital types. This probably reflects changing patterns in ED treatment, with more patients returning to ED for pre-organised follow-up and further investigations rather than changes in underlying disease prevalence (see Section 4.12E for further details).

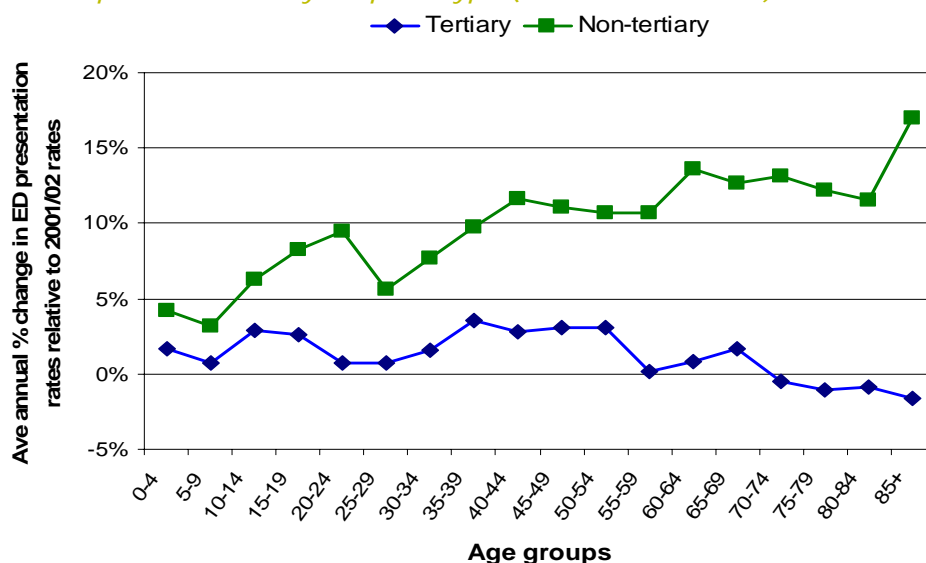
#### 4.5 AGE SPECIFIC VARIATIONS IN ED PRESENTATION RATES

Demand for ED services within the Perth metropolitan area has grown at a rate over the past four years that exceeds changes in population size and ageing. Further analysis by age group may help determine whether the increased rates reported for the whole population are due to changes in a specific age group.

The figure below shows the average annual changes<sup>15</sup> in the age specific ED presentation rates as a percent of the 2001/02 rates. Three key points are readily shown:

- Average annual changes in age specific ED presentation rates for all age groups have increased more rapidly in the non-tertiary hospitals than in tertiary hospitals.
- The percentage change in non-tertiary hospitals generally increases with age.
- For people aged 70 years and over, the rate of ED presentation has actually reduced in tertiary hospitals over the period.

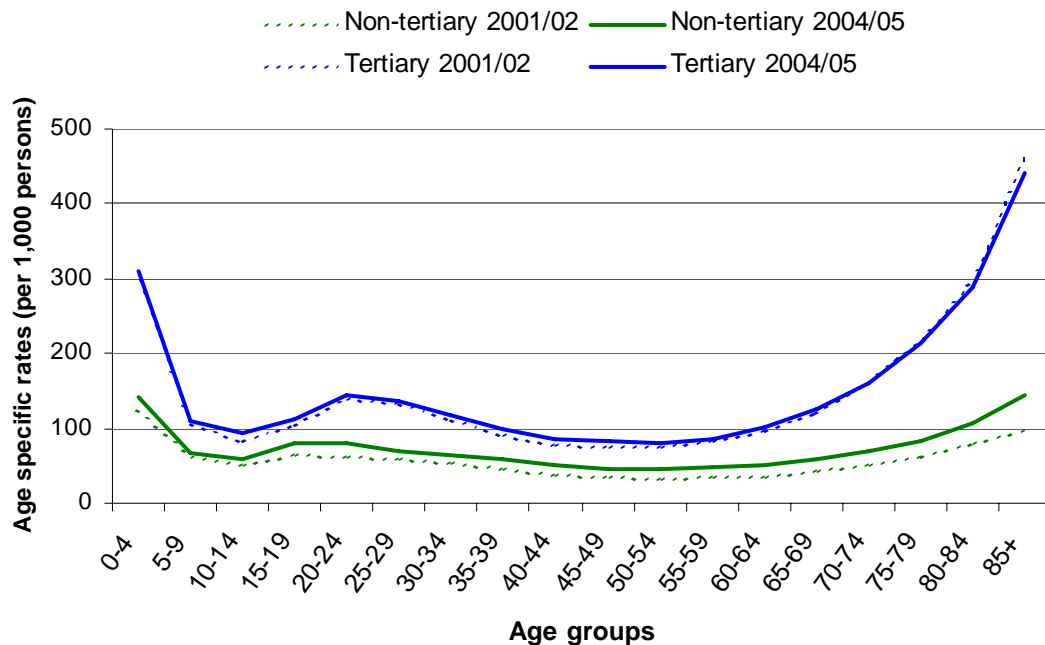
Figure 7: Average annual percentage change in age specific rates of ED presentations by hospital type (2001/02 - 2004/05)



<sup>15</sup> The average annual change in age specific rates were determined by calculating the slope from the line of best fit through actual data points and expressing this as a percentage of the estimated 2001/02 rate.

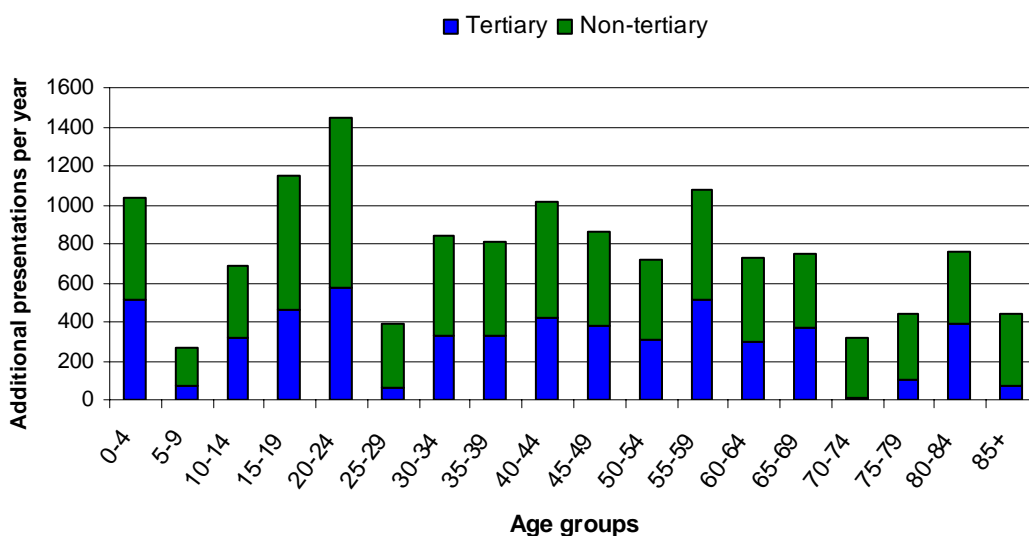
While these results show substantial changes in age specific rates these findings must be kept in context with the actual rates of ED presentations. As shown in the next figure, while the differences are narrowing, the rates of non-tertiary ED presentations are still substantially lower than those of tertiary hospital EDs.

*Figure 8: Annual age specific ED presentation rates by hospital type*



While the actual change in age specific rates appears relatively small, the impact on workload is indicated when the rates are converted to numbers, representing an annual growth of 3% (5,500 cases) and 8.6% (8,200 cases) in tertiary and non-tertiary ED presentations respectively. It should be noted that this figure is in close agreement with the average annual increase in ED presentations described in Section 3.1.

*Figure 9: Average number of additional ED attendances due to changes in age-specific rates*



Note: Estimates based on age specific rate changes during the 2001/02 – 2004/05 period.

Thus, while the underlying cause for increased age specific rates of ED presentation are unknown, they are adding to the demand on services. Those age groups of greatest demand for services appear to be children aged 0-4 years, adolescents and young adults (15-24 years) and persons aged 55 years and over.

Table 9 shows the major reasons for presentation to metropolitan EDs by these identified age groups as major contributors to the annual increase in ED presentations. For each age group, the shown chapters account for approximately 90% of all ED presentations.

*Table 9: Age specific ED presentations by chapter of doctor diagnosis*

<b>Age group of special interest</b>	<b>Cases<sup>16</sup></b>	<b>Percent</b>	<b>Cumm. %</b>
<b>0 - 4 year olds</b>			
Respiratory system	10,000	24.2%	24.2%
Infectious disease	8,850	21.3%	45.5%
Injury & poisoning	8,200	19.7%	65.2%
Symptoms, signs & ill-defined conditions	4,350	10.5%	75.7%
Other factors for HS contact	3,200	7.7%	83.4%
Digestive system	1,500	3.7%	87.1%
Ear & mastoid process	1,400	3.5%	90.5%
<b>15 - 24 year olds</b>			
Injury & poisoning	17,900	42.3%	42.3%
Other factors for HS contact	4,650	11.0%	53.4%
Symptoms, signs & ill-defined conditions	3,950	9.3%	62.7%
Respiratory system	2,350	5.5%	68.2%
Mental disorders	2,320	5.5%	73.7%
Infectious disease	2,200	5.2%	79.0%
Digestive system	2,050	4.9%	83.8%
Genitourinary system	1,850	4.4%	88.2%
Skin & subcutaneous tissue	1,190	2.8%	91.0%
<b>55+ year olds</b>			
Injury & poisoning	14,600	20.1%	20.1%
Symptoms, signs & ill-defined conditions	12,350	17.0%	37.1%
Circulatory system	11,600	15.9%	53.0%
Respiratory system	6,500	8.9%	61.9%
Digestive system	5,900	8.1%	70.0%
Other factors for HS contact	4,500	6.2%	76.3%
Genitourinary system	3,475	4.8%	81.1%
Musculoskeletal system & CT	2,650	3.7%	84.7%
Skin & subcutaneous tissue	1,950	2.7%	87.4%
Mental disorders	1,850	2.5%	89.9%

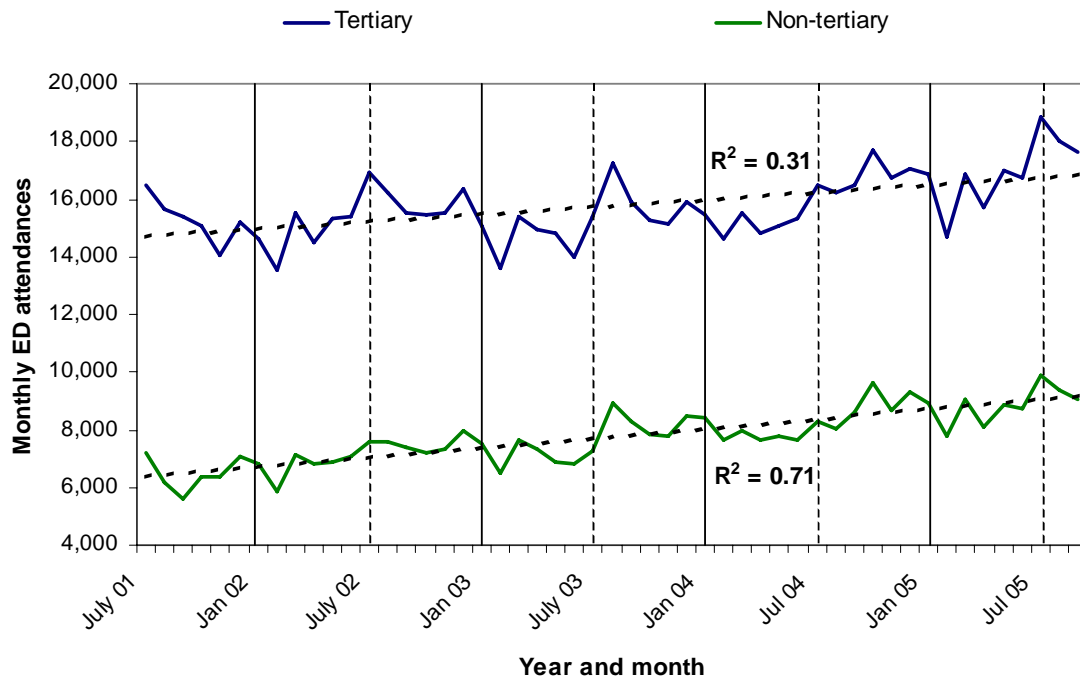
A breakdown of this data into more specific conditions and the proportion that are admitted into hospital is provided in the Appendix.

<sup>16</sup> Cases represent a round average annual number of presentations between 2002/03 – 2004/05.

## 4.6 SEASONAL EFFECTS AND FUTURE TRENDS

As described in Section 4.1, the number of monthly presentations at metropolitan emergency departments displays a gradual but steady increase in a roughly linear manner. However, as shown in the figure below, periodic peaks and troughs occur on a repetitive basis over the study period.

*Figure 10: Monthly number of ED presentations by hospital type*



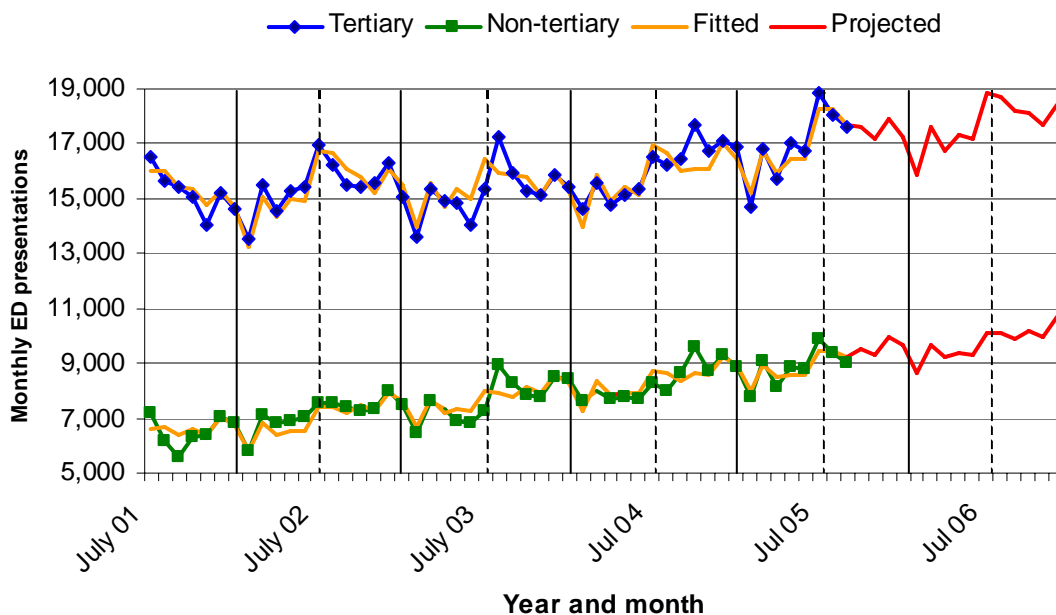
Not only does linear regression not explain the monthly fluctuations in ED presentations, non-linear models indicated that while the number of ED presentations at non-tertiary hospitals is increasing at a constant rate, in tertiary hospitals the rate is increasing with time.

More sophisticated time series analysis using seasonal decomposition techniques<sup>17</sup> proved even better able to explain the variation in the monthly ED presentation (79.7% and 85.1% for the tertiary and non-tertiary hospitals respectively; see next figure).

<sup>17</sup> This technique enables more accurate trend analysis by taking into account any systematic periodic (seasonal) fluctuations in the data. Data was smoothed using Winter's Additive exponential smoothing (SPSS V14.0).

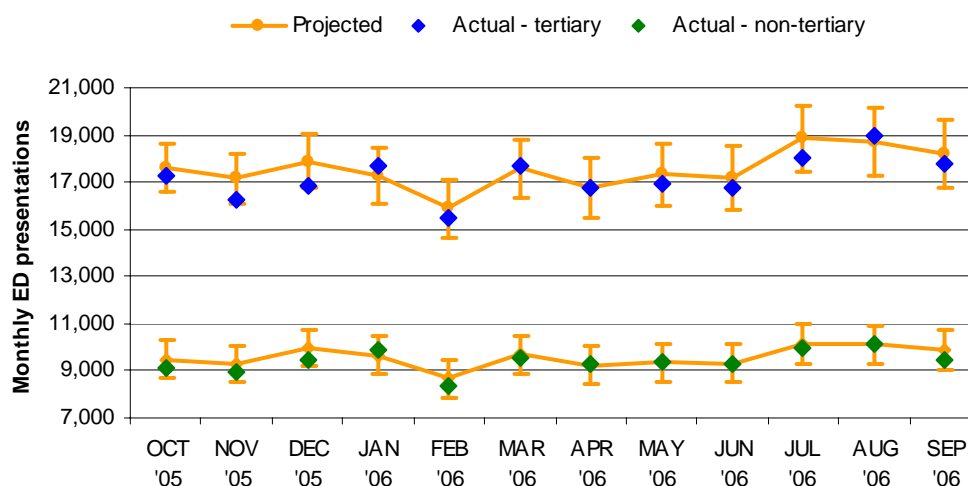


Figure 11: Actual and modelled monthly ED presentations



The projected number of ED presentations based on the time series model shows a continued increase during the later part of 2005 and throughout 2006 with anticipated peaks in July and August (Tertiary:  $n = 18,750 \pm 1,400$ ; Non-tertiary:  $n = 10,120 \pm 810$ ), and again in December ( $n = 18,400 \pm 1,550$  and  $9,800 \pm 830$  respectively).

Figure 12: Goodness of fit of predicted presentations with actual ED data



To test how well the model projected future monthly ED presentations, actual attendance data that became available after the commencement of this study was obtained<sup>18</sup>. As shown in the figure above, the actual number of monthly presentations at both tertiary and non-tertiary EDs all fell within the estimated range during the twelve month period of October 2005 through to September 2006.

(Note: this figure has been updated. The original report only showed 4 months data)

<sup>18</sup> Monthly totals for metropolitan tertiary and non-tertiary ED presentations were obtained from ICAM, 25 Oct 2006.

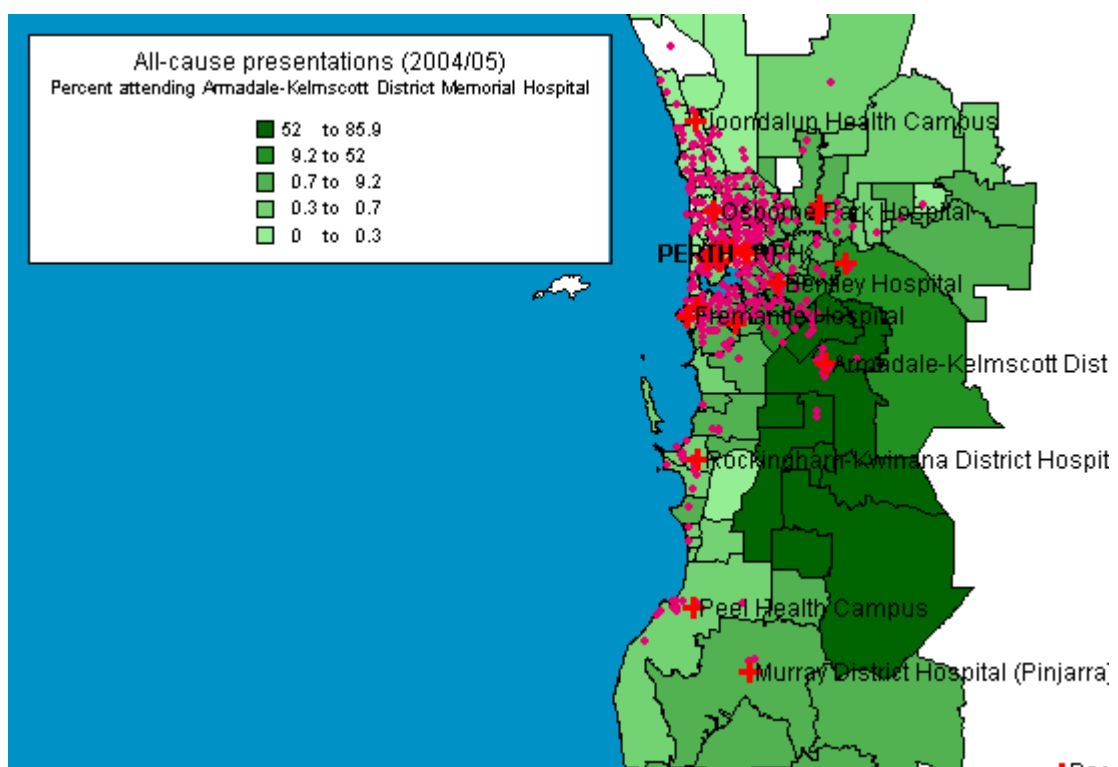
## 5. PATTERNS OF CARE DURING 2004/05

Detailed examination of utilisation patterns and service provision may provide insights on alternative models of care that could reduce the increasing demand on emergency departments.

### 5.1 HOSPITAL CATCHMENTS AREAS

Of the 345,000 metropolitan ED presentations that occurred during 2004/05, 96% were by metropolitan residents. While many factors determine which emergency department a person presents, it should be remembered that for most, their local hospital still provides a large proportion of local community need. For example, while Armadale Kelmscott Memorial Hospital lacks the tertiary facilities of the major hospitals, it still provided between 52% – 86% of ED presentations for adjacent residential areas during 2004/05.

*Figure 13: Armadale Kelmscott Memorial Hospital - Percent of all emergency department presentations by postcode of residence*



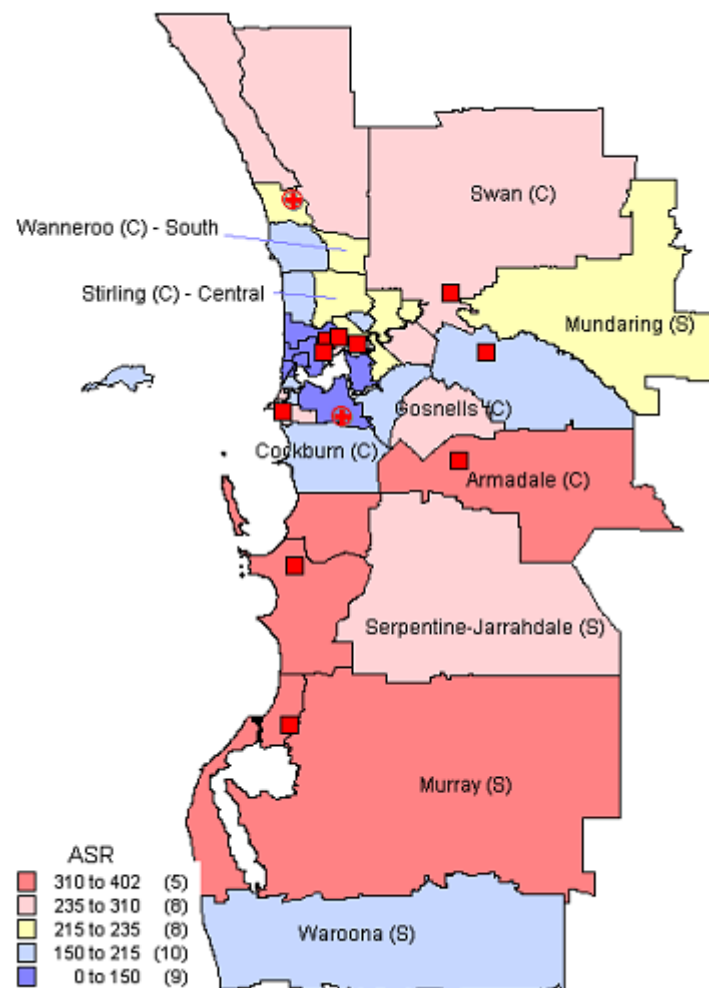
Note: Pink dots represent the location of GP practices.

Maps and tables showing number of ED presentations by area of residence are shown in the Appendix.

## 5.2 RATES OF ED PRESENTATION BY AREA OF RESIDENCE

While the previous map, and the others in the Appendix, provides an indication of the hospital ED catchment areas, this analysis provides an indication of relative rates of ED utilisation by area of residence.

*Figure 14: Rates of ED presentation to metropolitan EDs by SLA<sup>19</sup> of residence*



Note: Areas with rates of ED presentation significantly higher (Red/Pink) or lower (dark/light Blue) than the metropolitan average.

Address information from people collected via EDIS<sup>20</sup> and the Peel Health Campus<sup>21</sup> was geocoded to provide the Statistical Local Area (SLA) of residence. Over 95% of records were accurately placed into the SLA of residence with the remaining 5% allocated on the basis of their suburbs or postcode of residence.

As apparent in the map above and the table below, ED utilisation was lowest in the city region and western SLAs with greatest use being made by those people who live in the northern and southern parts of the metropolitan area.

<sup>19</sup> SLA stands for Statistical Local Areas.

<sup>20</sup> As data collection for JHC commenced in late July 2004, data from August was substituted to provide a more complete estimate of presentation rates by residents living in the northern suburbs.

<sup>21</sup> ED data from Peel Health Campus for 2004/05 was not available at the time of this study so data from 2003/04 was used.

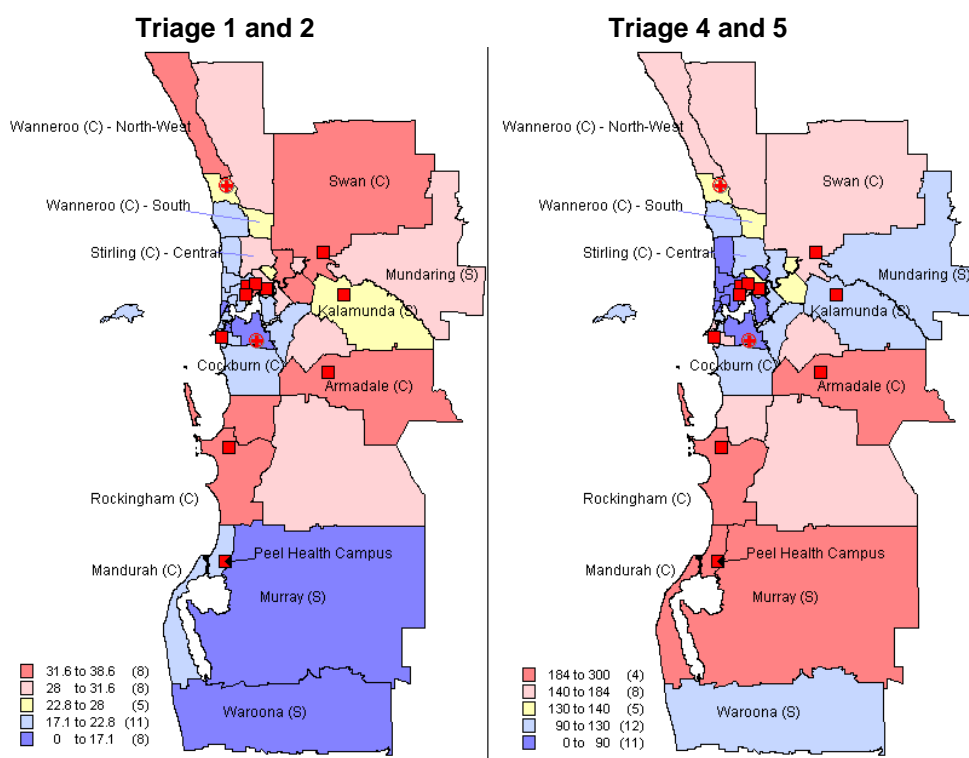
**Table 10: Rates of ED presentation by SLA of residence**

SLA of residence	ASR	SLA of residence	ASR
Armadale	401.1	Mundaring	218.3
Mandurah	385.8	Fremantle - Inner	216.5
Rockingham	373.9	Perth - Inner	207.4
Kwinana	319.4	Kalamunda	195.9
Murray	316.4	Subiaco	192.7
Serpentine - Jarrahdale	282.3	Cockburn	191.4
Swan	280.1	Waroona	179.5
Wanneroo - North-East	275.4	Mosman Park	173.9
Wanneroo - North-West	269.8	Joondalup - South	170.1
Fremantle - Remainder	260.3	Stirling - South-Eastern	166.3
Perth - Remainder	258.9	Canning	162.4
Gosnells	258.7	Stirling - Coastal	161.2
Belmont	241.8	East Fremantle	153.2
Bassendean	232.5	South Perth	147.1
Wanneroo - South	230.8	Cambridge	141.3
Vincent	226.5	Nedlands	136.9
Joondalup - North	224.9	Claremont	136.5
Stirling - Central	224.1	Cottesloe	133.3
Bayswater	223.5	Melville	112.5
Victoria Park	218.8	Peppermint Grove	84.7

Note: Rates are age standardised to Australian 2001 population and expressed per 1,000 people.

The average rate of ED presentation for metropolitan residents was 225.2 per 1,000 people. Those SLA between Bassendean and Perth – Inner had rates of presentation that did not differ significantly from the metropolitan rate. Patterns of presentation were generally similar for males and females although the rates for males were slightly higher.

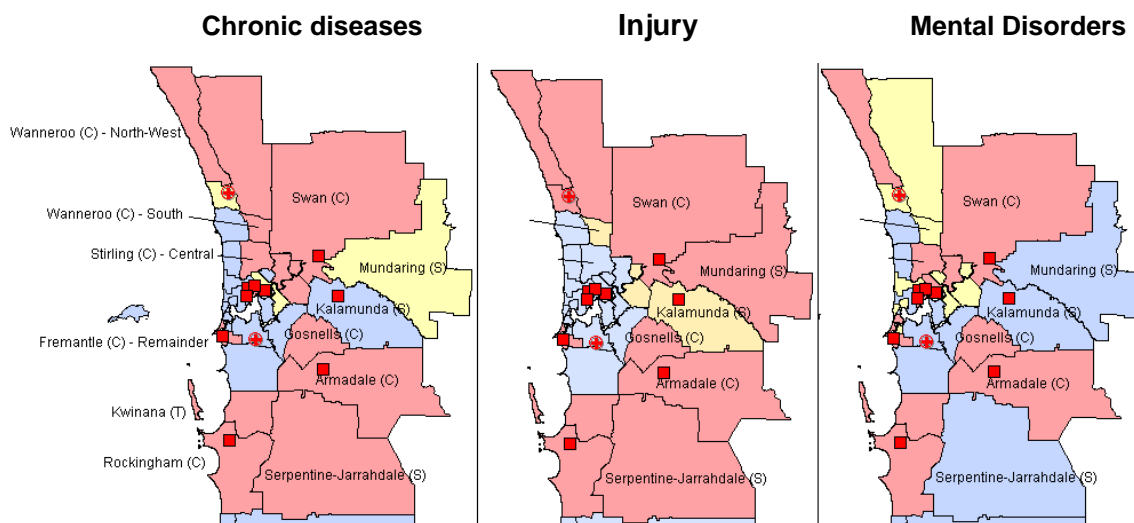
**Figure 15: Rates of ED presentation as triage 1-2 and triage 4-5 by SLA**



The maps above show the age standardised rates of ED presentation for people triaged as category 1 or 2 and category 4 or 5. As a greater proportion of presentations are coded as triage 4 or 5, this map looks similar to the 'all-presentations' maps shown earlier.

Unlike EDIS that captures doctor's diagnosis, the system at Peel Health Campus doesn't. As PHC provided over 80% of ED services to residents of Mandurah, Waroona and Murray Shires, these areas were not included in the determination of rates of ED presentation by ICD-10 Chapters.

*Figure 16: Standardised rates ratios<sup>22</sup> of ED presentation for chronic diseases, injury and mental disorders by SLA*



Note: Areas where rates of ED presentation significantly higher (Red/Pink) or lower (dark/light Blue) than the metropolitan average.

As shown above, some geographical differences occur across the metropolitan area for rates of ED presentation due to chronic diseases (classified as respiratory, circulatory, musculoskeletal and endocrine), injury and mental disorders.

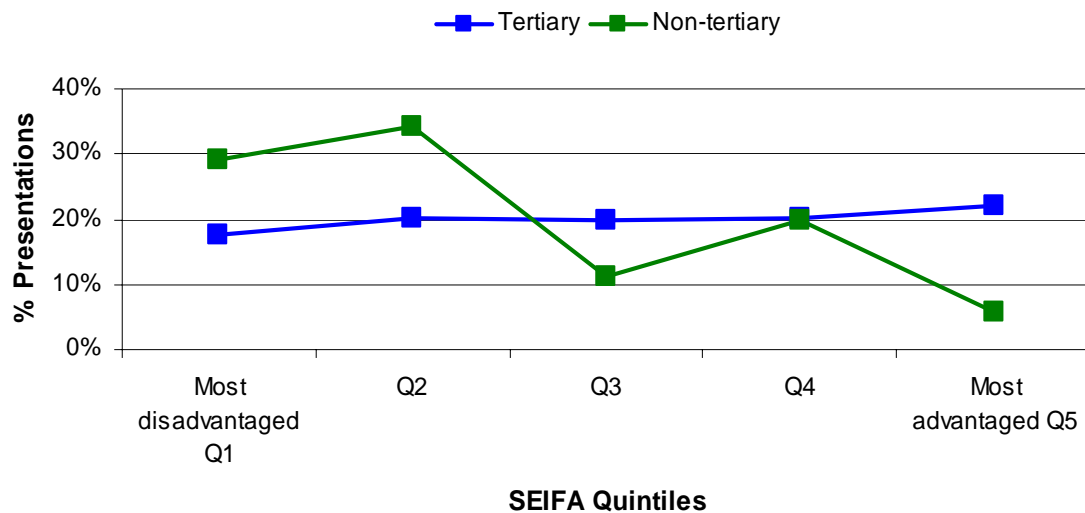
Further analysis of this type may prove useful for targeting services aimed at reducing ED attendances.

<sup>22</sup> Rate ratios for each SLA were determined by indirect standardisation techniques with red and blue areas being statistically greater or lower than the metropolitan rate respectively.

### 5.3 IMPACT OF SOCIO-ECONOMIC STATUS

Demand for ED services may be partially driven by those people requiring free medical attention. Using postcode level SEIFA<sup>23</sup> for Disadvantage scores calculated by the Australian Bureau of Statistics, emergency department clients were assigned to a socio-economic status quintile based on their residential postcode<sup>24</sup>.

Figure 17: Percentage of ED presentations by SES and hospital type



A breakdown by hospital type reveals that while there is almost equal utilisation of ED facilities located in the tertiary hospitals across all classes of socio-economic status, there was almost a linear gradient of usage in the non-tertiary hospital EDs with greatest use being made by those living in the poorest areas.

These indicative results should be interpreted with caution. Further analysis should control for age, gender and Aboriginality and assignment of SEIFA should preferably be based on smaller geographical area than postcode.

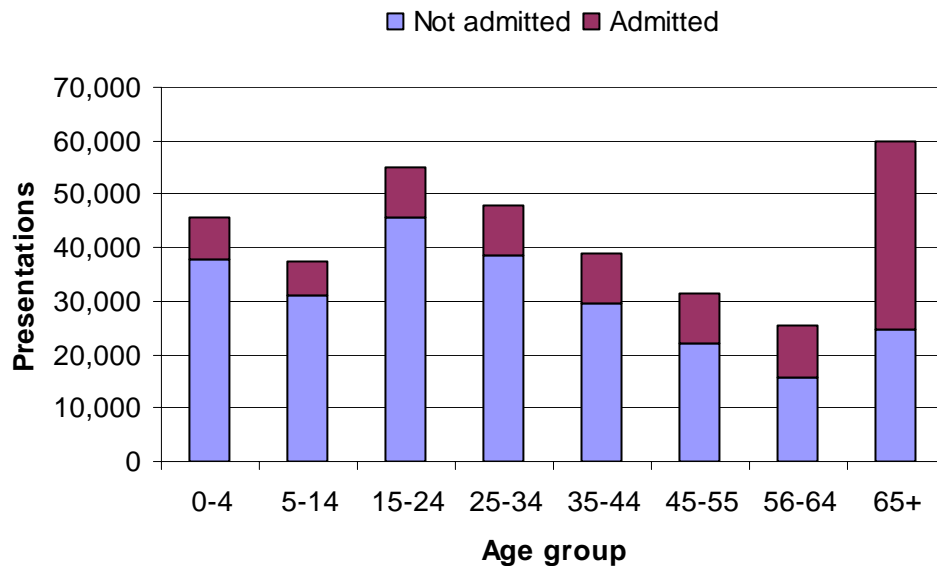
<sup>23</sup> The Australian Bureau of Statistics (ABS) has produced a number of indexes based on 2001 Australian Census data which measures the level of 'disadvantage' in any given area. These are known as the 'SEIFA' indexes (Socio-Economic Indexes For Areas). SEIFA indexes are developed from factors such as household income, education, profession, household and dwelling size etc.

<sup>24</sup> As the 2004/05 ED data didn't have any ED presentations from Peel Health Campus or residential information from people attending Joondalup Health Campus, 2003/04 data from these two hospitals was used to provide a measure of total metropolitan ED presentations.

## 5.4 AGE AT PRESENTATION

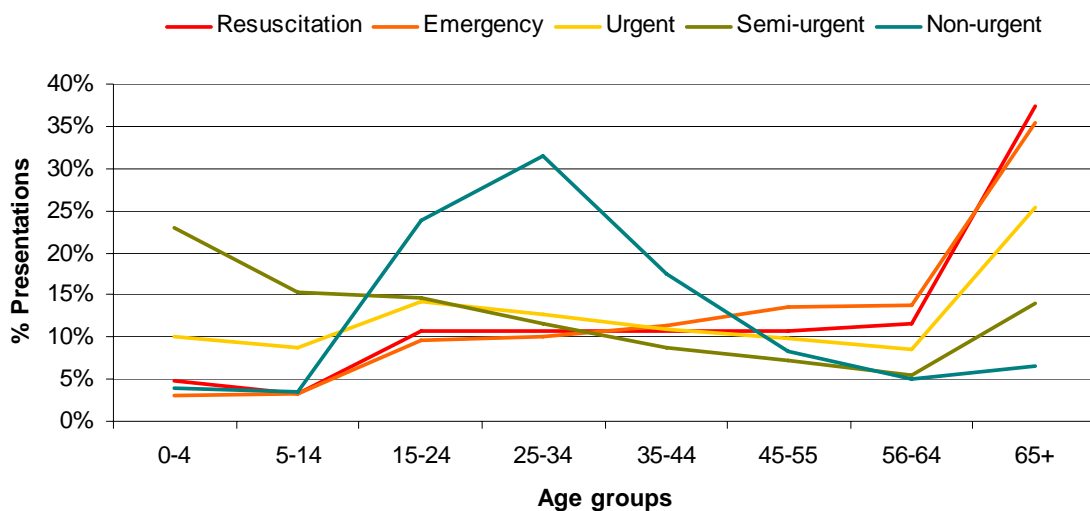
Older persons (aged 65 years and older) consume the largest proportion (17%; 60,000 visits) of metropolitan ED services followed by 'Youths' (15-24 years, 16%, 55,000 visits), 'Young adults' (25-34 years, 14%, 48,000 visits) and 'Children' (0-4 years, 13%, 46,000 visits). Under the age of 44 years, less than 25% of presentations are hospitalised. This gradually increases to 38% in the 56-64 year olds before jumping to 59% in the over 65 year olds.

Figure 18: Total ED presentations by admission status and age group



As shown in the graph below, older people are responsible for the largest number of ED presentations triaged as Categories 1 – 3. Children represent the age group most commonly triaged as Category 4 while young adults (15-34 years) are commonly triaged as Non-urgent (Category 5).

Figure 19: Percentage of triaged ED presentations by age group.

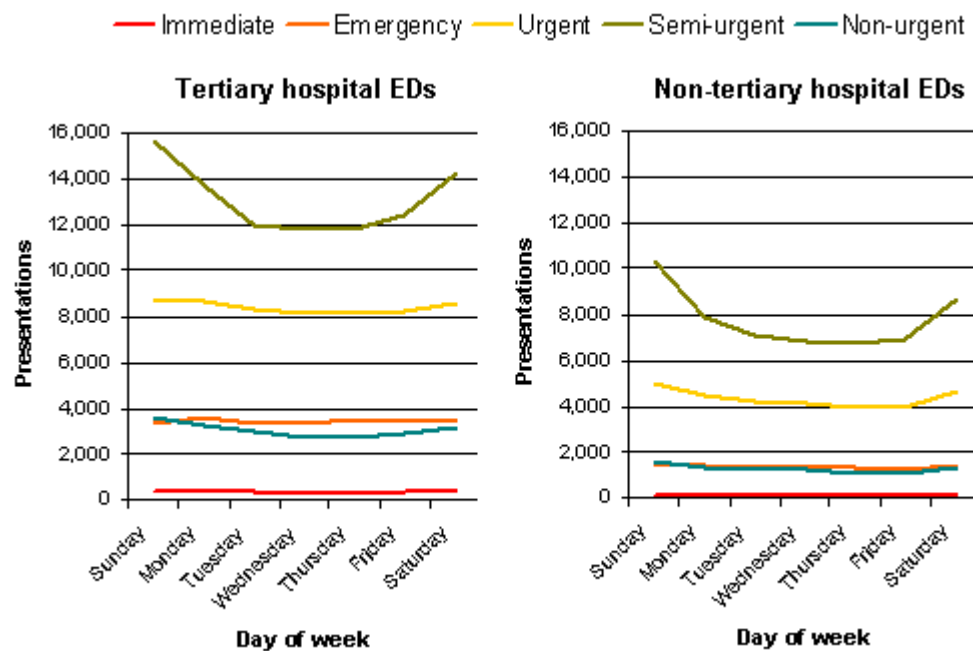


The top 10 causes for presentation to ED by age group are shown in the 'Doctor Diagnoses' section of this report.

## 5.5 WEEKDAY OF PRESENTATION

Different patterns of presentation to ED may provide insight to an underlying risk factor. As seen in the figure below, the semi-urgent presentations, and to a lesser degree, urgent and non-urgent presentations, peak on Saturday and Sunday.

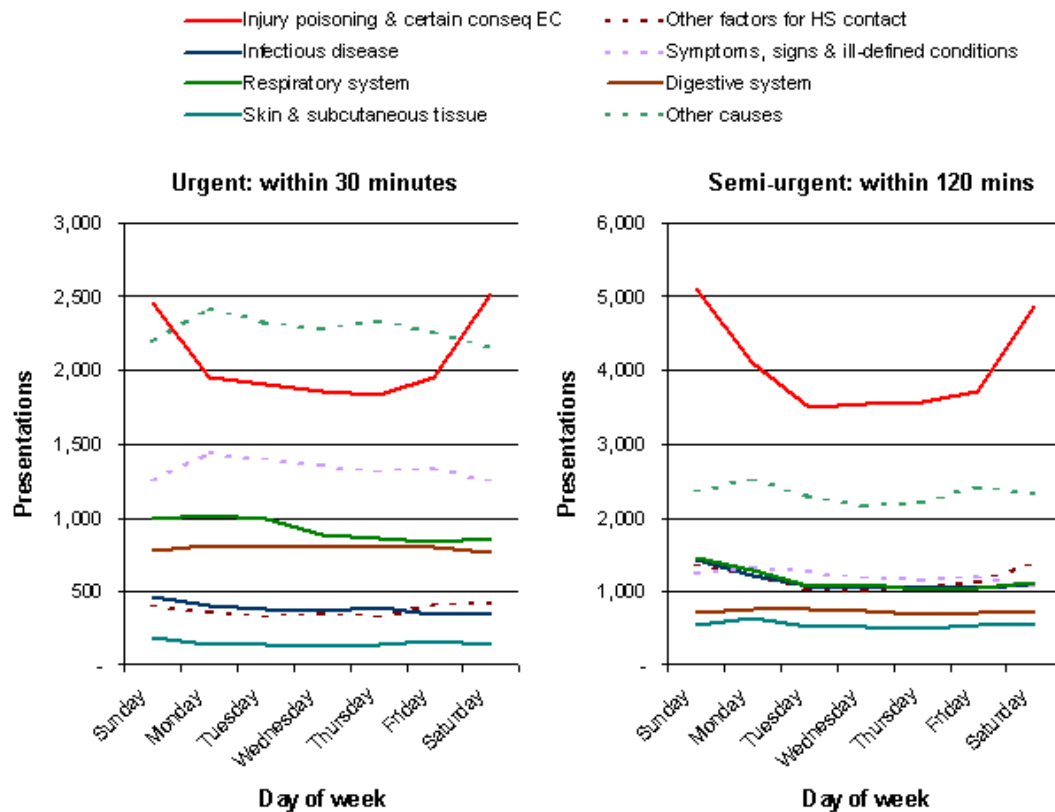
*Figure 20: Weekday of ED presentation by triage category and hospital type*



The greatest number of daily presentation at EDs occurs on Saturday and Sunday. As can be seen from the figure above, most of this occurs in people triaged as Categories 3 – 4.



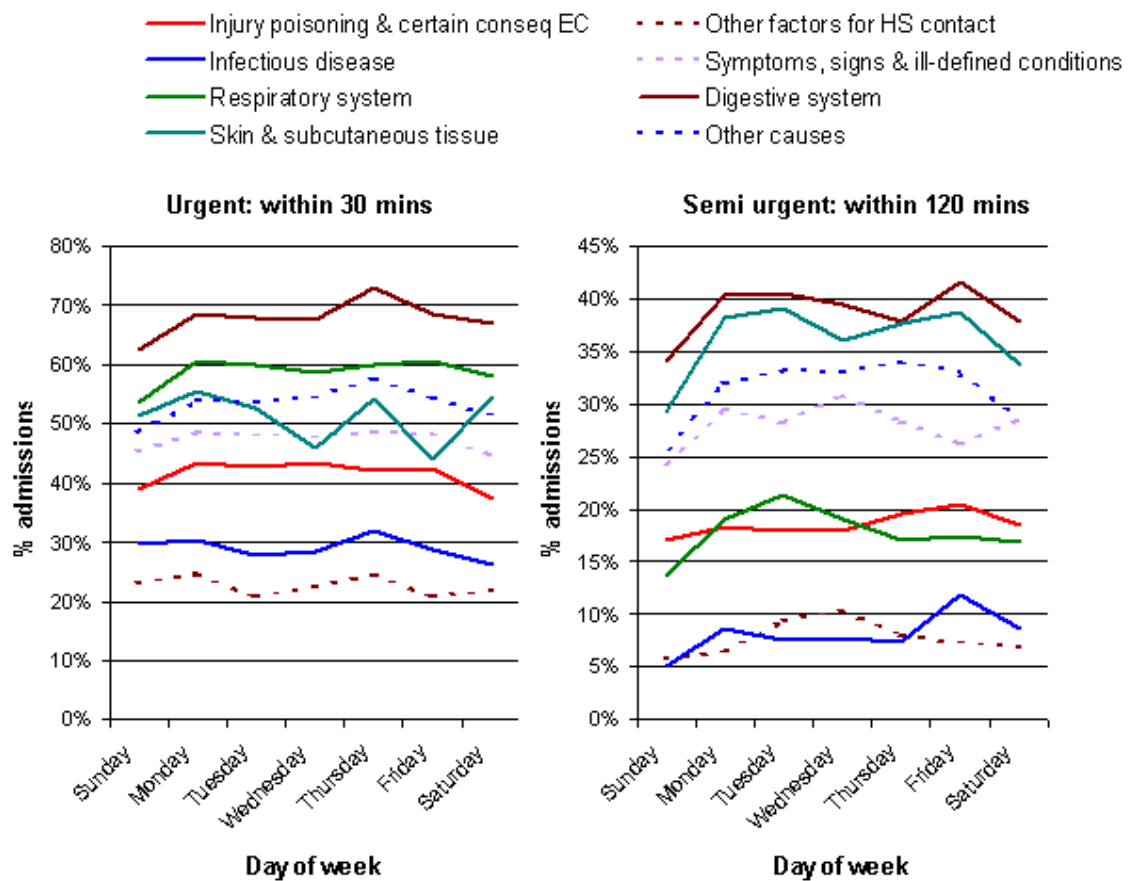
Figure 21: Chapter of diagnosis for tertiary ED presentations by triage category and weekday of presentation



Note: Urgent and Semi-urgent y-axes are on different scales.

For these two triage categories, the peak activity observed in the previous figure is predominantly due to injury and poisoning, although increased weekend activity is also seen for respiratory and infectious diseases and ‘Other factors for health service contact’.

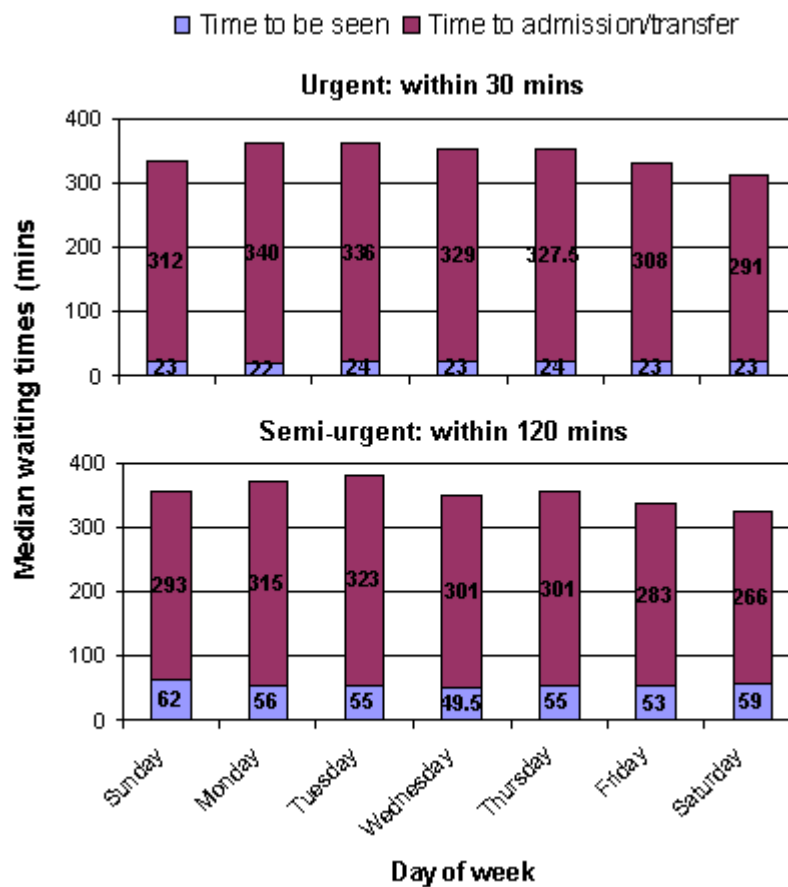
Figure 22: Percentage of admissions & transfers at tertiary EDs by chapter of diagnosis by triage category and weekday of presentation



Note: Urgent and Semi-urgent y-axes are on different scales.

By contrast, for those presenting on Saturday and Sunday, the proportion of hospital admissions is slightly lower than for other days of the week.

Figure 23: Median<sup>25</sup> wait times for admissions & transfers at tertiary hospital EDs by triage category and weekday of presentation



Notes: Time to be seen = time between arrival to being first seen by a doctor or nurse.  
 Time to discharge = time between being first seen by doctor or nurse and discharge time<sup>26</sup>.

To see if access block was impacting on hospital admission rates on Saturday and Sunday, the times between arrival, triage, being seen by at doctor or nurse, being ready to depart and finally discharged were examined.

Unfortunately differences in recording this information prevented detailed analysis. However, using the time between arrival and being first seen by a doctor and nurse and subsequently being admitted or transferred to another hospital is shown in the figure above.

For those cases that are hospitalised, these data do not provide any evidence of delays on the weekend relative to other days of the week.

Although not shown, similar findings were made for the non-tertiary hospital EDs although the median times for both stages (being seen and subsequently being admitted) were much shorter.

<sup>25</sup> This data is highly skewed with some patient waiting times being very long. Mean waiting times are approximately 50% greater than the median values described above.

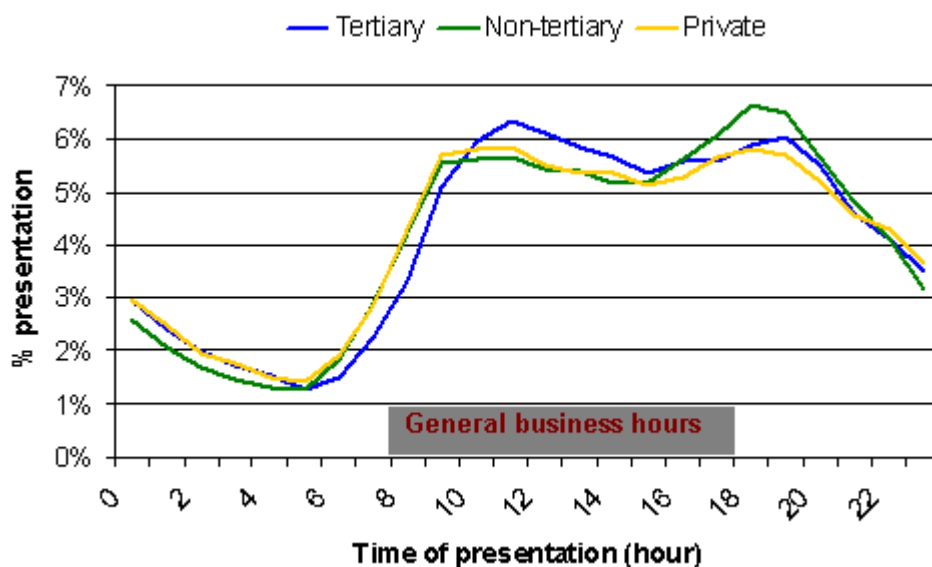
<sup>26</sup> The data suggests that the 'Ready to depart' and 'Discharge' date fields are not used consistently between hospitals. While the date:time information in these two fields is different for SCGH, the values in the two fields are identical for RPH. Consequently time between 'Ready to leave' and 'Discharge time' has not been used.

## 5.6 TIME OF PRESENTATION

Emergency departments in the metropolitan area provide a 24-hour service but 60% of all presentations occur during 8:00am and 6:00pm. Patterns of attendance are not dissimilar between the tertiary, non-tertiary and private sector hospitals with a bimodal peak activity around 11:00 am and 7:00pm.

*Figure 24: Time of presentation to EDs*

Using tertiary hospital data, time of presentation does show a relationship with age with peak presentation for those aged 65 years and over around midday, and children under the age of 15 tending to peak around 7:00 – 8:00 pm.



*Figure 25: Time of presentation to tertiary EDs by selected age groups*

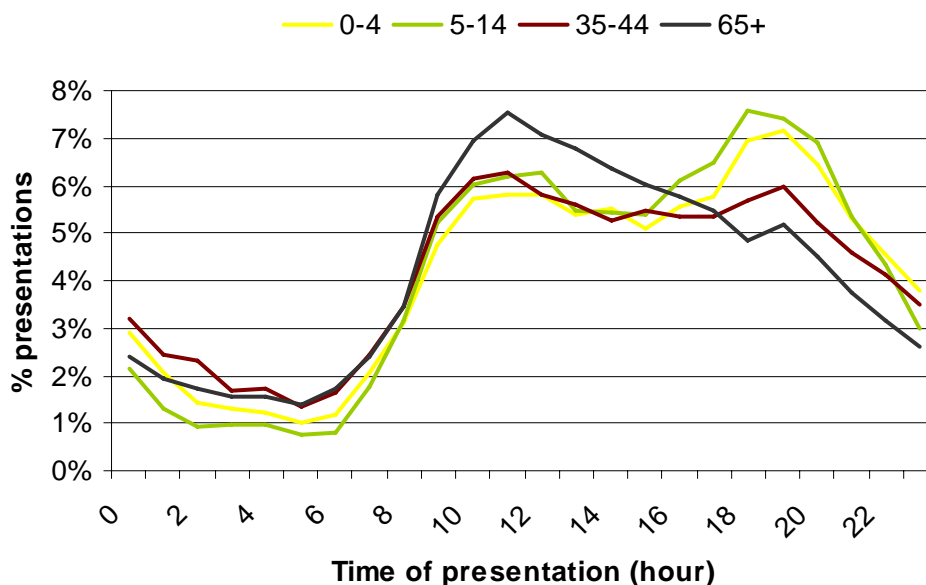
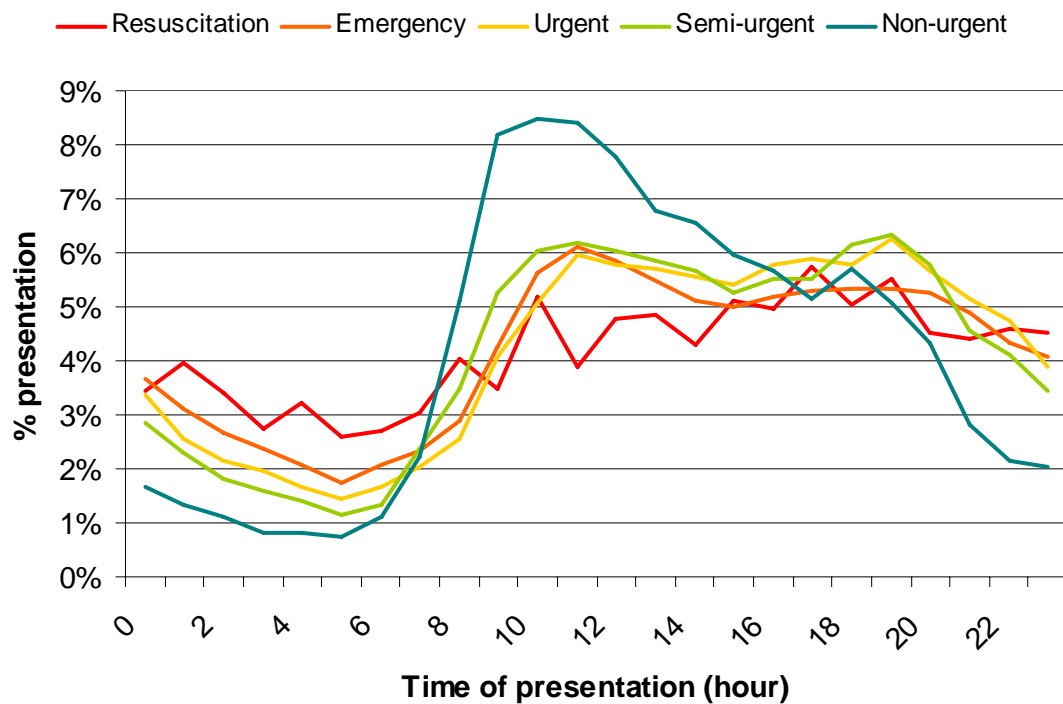


Figure 26: Time of presentation to tertiary EDs by triage category

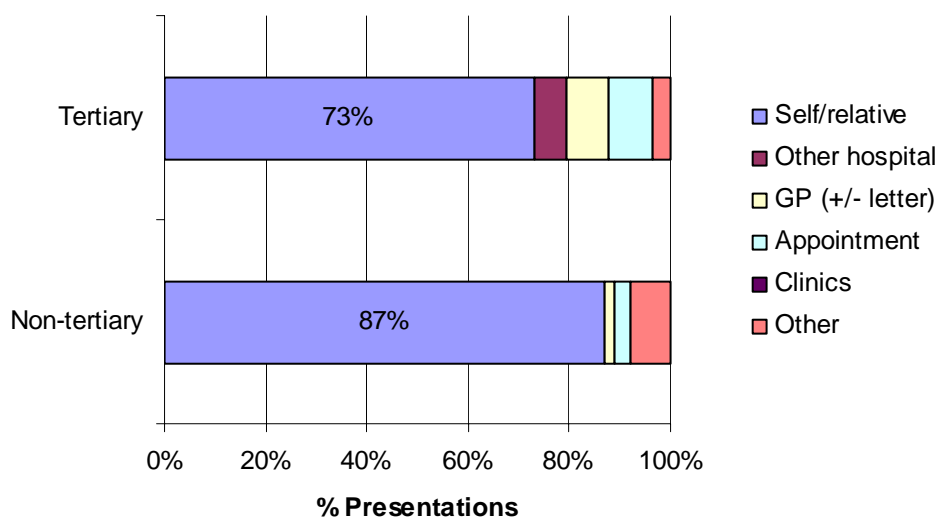


Not surprisingly, time of presentation to tertiary hospital EDs also vary with triage category. Category 1 triaged patients show the least variation throughout the day, but this gradually becomes more marked as the triage category becomes less urgent.

## 5.7 SOURCE OF REFERRAL

In total, approximately three quarters of all ED presentations are due to the patient or their relative deciding to attend. Tertiary hospital EDs have a larger proportion of their patient mix being referred by other hospitals (6%), GPs (8%) or as booked appointments (9%). 'Other' is the largest category outside of self-referral in the non-tertiary hospital EDs with GP referral and booked appointments only accounting for 5% of the total workload.

Figure 27: Source of referral to EDs by hospital type



Note: EDIS data from JHC does not provide a breakdown of referral source so data not shown.

A more detailed breakdown of referral patterns by triage category is shown below. Not surprisingly, referral from another hospital tends to have more Category 1 patients while 'Appointments' consist more of Category 5 patients.

Table 11: Source of referral by triage category and hospital type.

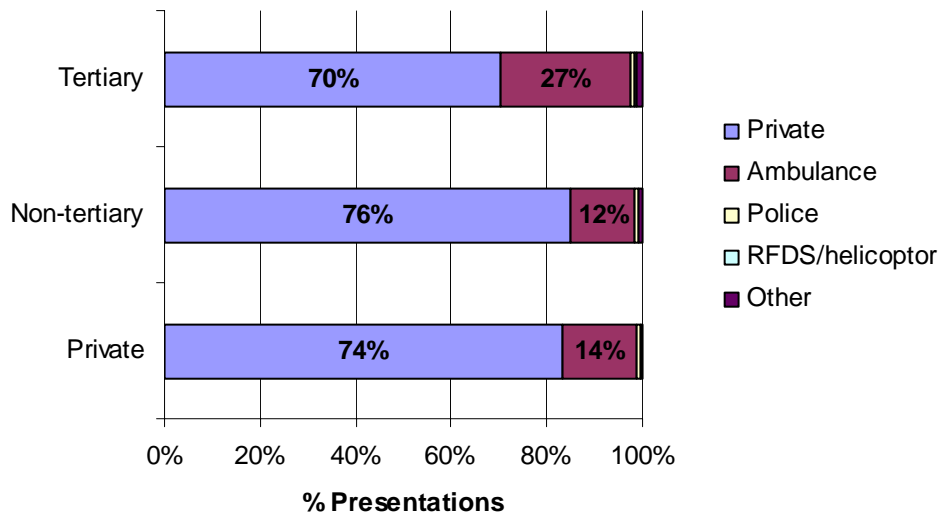
	Triage category				
	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5 <sup>27</sup>
<b>Tertiary</b>					
Self/relative	70%	77%	75%	79%	43%
Other hospital	16%	9%	9%	5%	1%
GP (+/- letter)	1%	8%	9%	9%	4%
Appointment	7%	1%	2%	6%	50%
Clinics	0%	0%	0%	0%	0%
Other	7%	5%	5%	3%	2%
<i>Presentations (N)</i>	2,476	23,872	58,638	91,469	21,365
<b>Non-tertiary</b>					
Self/relative	62%	81%	85%	89%	87%
Other hospital	2%	0%	0%	0%	0%
GP (+/- letter)	0%	3%	3%	1%	1%
Appointment	7%	4%	3%	3%	6%
Clinics	0%	0%	0%	0%	0%
Other	28%	12%	10%	6%	5%
<i>Presentations (N)</i>	670	9,592	30,445	54,471	8,831

<sup>27</sup> Exclusion of KEMH only affects Category 5 with 'Self/relative' becoming 59% and 'Appointments' (34%).

## 5.8 MEANS OF ARRIVAL

By far the most common means of presenting to ED is via private transport. This tends to be a little lower at tertiary hospital EDs due to the larger number of cases delivered by ambulance (27%). Other forms of arrival comprise less than 3% of the total regardless of the hospital type.

*Figure 28: Means of arrival to EDs by hospital type*



A more detailed breakdown of means of arrival is shown in the table below. For triage Category 1 and 2 patients, ambulance is the most common form of transport. Private transport is the most common method of arriving at ED for Category 3-5 patients and becomes more frequent as the triage category becomes less urgent.

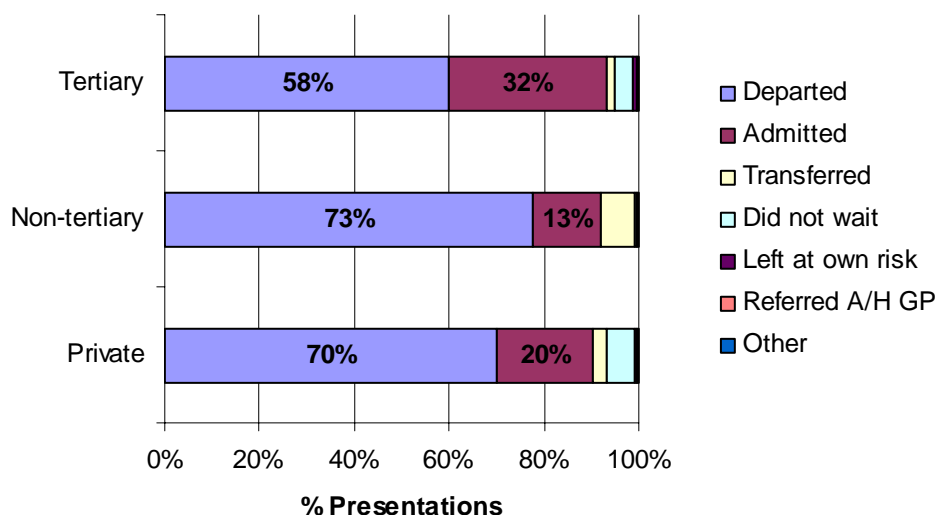
*Table 12: Mode of arrival by triage category and hospital type*

	Triage category				
	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
<b>Tertiary</b>					
Private	6%	43%	59%	81%	94%
Ambulance	86%	54%	38%	17%	4%
Police/corrective	1%	1%	1%	1%	1%
RFDS/helicopter	6%	1%	1%	0%	0%
Other	1%	1%	1%	1%	1%
<i>Presentations (N)</i>	<i>2,476</i>	<i>23,872</i>	<i>58,638</i>	<i>91,469</i>	<i>21,365</i>
<b>Non-tertiary</b>					
Private	23%	70%	79%	90%	96%
Ambulance	72%	27%	19%	9%	2%
Police/corrective	0%	1%	1%	1%	1%
RFDS/helicopter	0%	0%	0%	0%	0%
Other	5%	2%	1%	0%	1%
<i>Presentations (N)</i>	<i>670</i>	<i>9,592</i>	<i>30,445</i>	<i>54,471</i>	<i>8,831</i>

## 5.9 END DISPOSITION

Most patients attending an ED leave following treatment. Almost a third of those presenting to a tertiary hospital ED are admitted into hospital for further care. This proportion is lower in the non-tertiary hospital EDs although a larger proportion (7%) is transferred to another hospital.

Figure 29: Disposition from EDs by hospital type



In 2004/05, 18% of people presenting to a tertiary hospital ED and triaged as Category 5 were referred to an after hours GP clinic. Unfortunately EDIS does not collect information on these patients once they leave ED.

Table 13: End disposition by triage category and hospital type

	Triage category				
	Cat 1	Cat 2	Cat 3 <sup>28</sup>	Cat 4	Cat 5
<b>Tertiary</b>					
Departed	7%	37%	49%	69%	64%
Admitted	80%	58%	47%	20%	10%
Transferred	5%	4%	2%	1%	0%
Did not wait	0%	0%	1%	5%	7%
Left at own risk	1%	1%	1%	1%	1%
Referred to A/H GP	0%	0%	0%	4%	18%
Other	8%	0%	0%	0%	0%
<i>Presentations (N)</i>	2,476	23,872	58,638	91,469	21,365
<b>Non-tertiary</b>					
Departed	11%	48%	67%	81%	81%
Admitted	31%	30%	22%	7%	3%
Transferred	49%	21%	10%	3%	1%
Did not wait	0%	0%	1%	8%	14%
Left at own risk	0%	1%	0%	0%	0%
Referred to A/H GP	0%	0%	0%	1%	1%
Other	9%	0%	0%	0%	0%
<i>Presentations (N)</i>	670	9,592	30,445	54,471	8,831

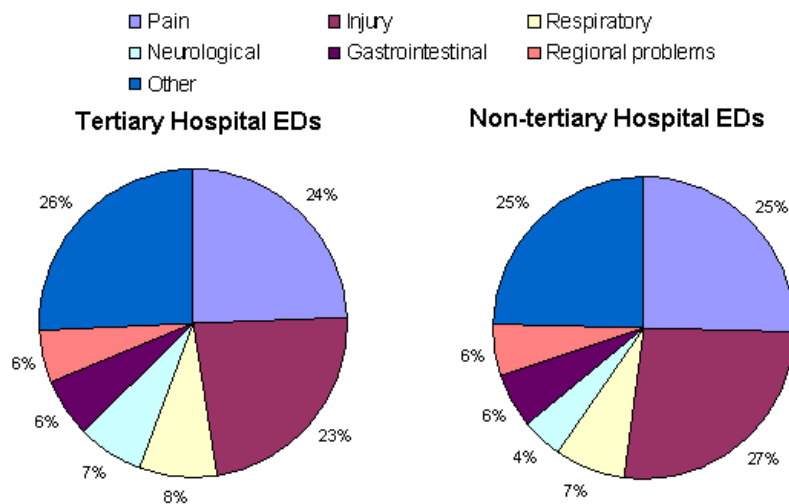
<sup>28</sup> Persons aged >55 years account for 45% of Cat 3 hospital admissions at tertiary hospital EDs largely for injury (16%), circulatory (14%), digestive (14%) and respiratory (14%) related conditions.



## 5.10 PRESENTING SYMPTOMS

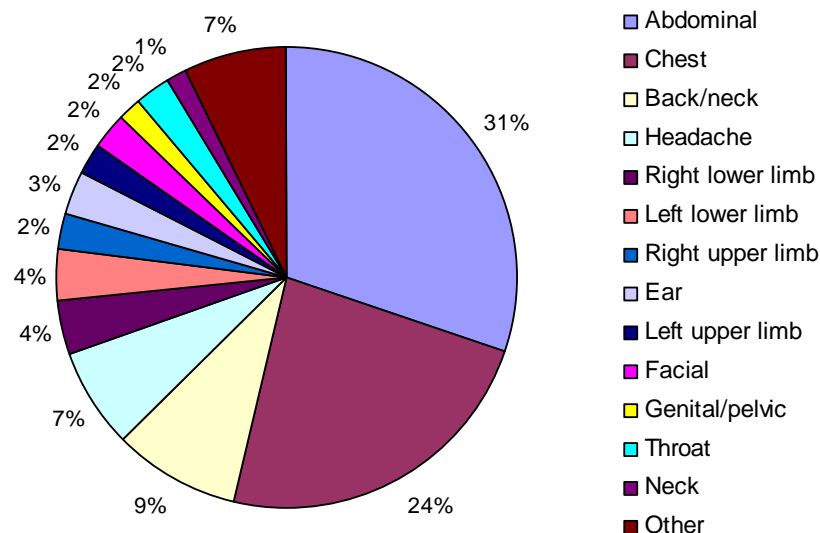
Presenting symptom codes in EDIS describe the nature of the client’s condition prior to medical diagnosis. They provide an insight to the reasons people attend ED although symptoms such as pain can have multiple underlying causes.

*Figure 30: Presenting symptoms by hospital type*



Pain and injury were the most common symptoms for patient who present to emergency departments, accounting for almost 50% of cases. Further breakdown of the top two presenting symptoms is shown in the figures below.

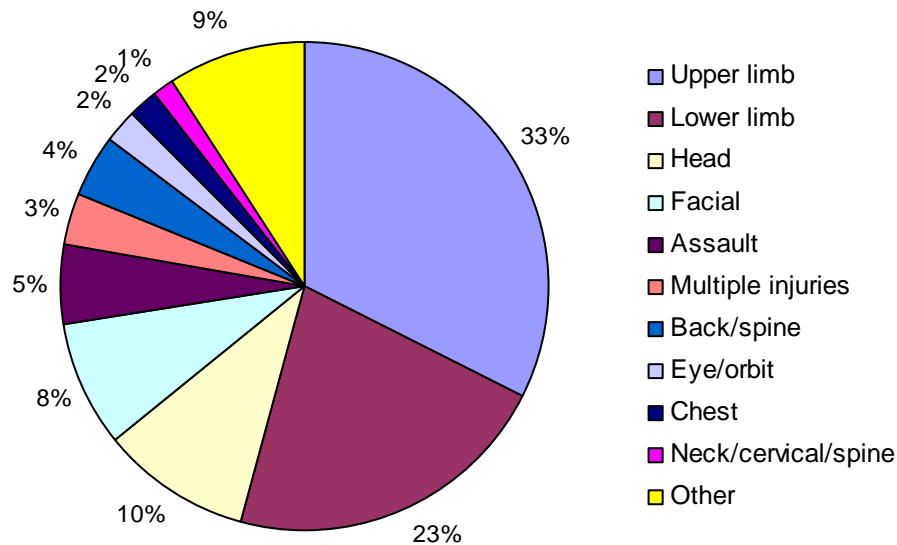
*Figure 31: Proportion of cases presenting to ED with pain, by pain type*



Note: Based on all ED presentations during 2004/05

A breakdown of presenting pain by hospital type showed very similar profiles in the tertiary, non-tertiary and private hospitals. As a consequence the data has been grouped for presentation.

Figure 32: Proportion of cases presenting to ED with injury, by injury type



Once again, very little differences were seen between the different hospital types for patients presenting with injury related symptoms so grouped data is shown above.

## 5.11 DOCTOR DIAGNOSES

'Injury & poisoning' account for over 30% of all emergency department patients seen by a doctor. While 'Symptoms, signs and ill-defined conditions' and 'Other factors for health service contact' represents a further 20% of cases, the other top disease based conditions for presentation are 'Respiratory' (9%), 'Digestive' (6.4%), 'Infectious' (6.1%) and 'Circulatory' (5.4%).

While 'Injury & poisoning' is the major reason for presentation across all age groups except the 0-4 years (where it ranks second), the ranking of the other conditions varies with age as shown in the table below.

'Infectious disease's decreased as a major cause for presentation between the ages of 0-4 through to 35-44 years of age with 'Circulatory diseases' became more common with increasing age. 'Respiratory disease's were prevalent across all ages but especially those aged less than 15 years of age and over 65 years. Presentations for 'Mental disorders' were prevalent in the 15-34 year olds, but reduced in number by the age of 64 years.

Table 14: Top 10 causes for presentations by chapter and age group

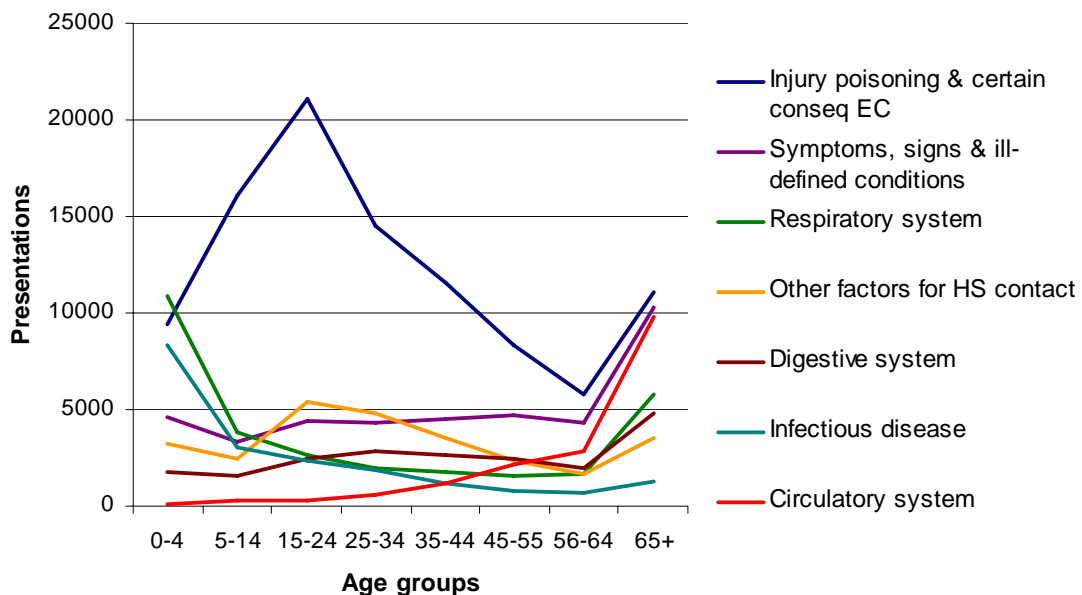
<b>0-4 year olds</b>				<b>5-14 year olds</b>			
	Cases	%	% *		Cases	%	% *
Respiratory system	10,838	24.6	23%	Injury poisoning & certain conseq EC	16,069	44.3	15%
Injury poisoning & certain conseq EC	9,376	21.3	15%	Respiratory system	3,776	10.4	21%
Infectious disease	8,319	18.9	10%	Symptoms, signs & ill-defined conditions	3,359	9.3	23%
Symptoms, signs & ill-defined conditions	4,632	10.5	35%	Infectious disease	3,052	8.4	9%
Other factors for HS contact	3,225	7.3	2%	Other factors for HS contact	2,466	6.8	2%
Digestive system	1,794	4.1	19%	Digestive system	1,571	4.3	43%
Skin & subcutaneous tissue	1,600	3.6	13%	Skin & subcutaneous tissue	1,202	3.3	16%
Ear & mastoid process	1,475	3.3	3%	Ear & mastoid process	1,174	3.2	3%
Genitourinary system	878	2.0	28%	Genitourinary system	894	2.5	33%
Eye & Adnexa	458	1.0	15%	Musculoskeletal system & CT	698	1.9	27%
<b>15-24 year olds</b>				<b>25-34 year olds</b>			
	Cases	%	% *		Cases	%	% *
Injury poisoning & certain conseq EC	21,059	42.5	15%	Injury poisoning & certain conseq EC	14,539	34.7	18%
Other factors for HS contact	5,408	10.9	5%	Other factors for HS contact	4,764	11.4	6%
Symptoms, signs & ill-defined conditions	4,444	9.0	21%	Symptoms, signs & ill-defined conditions	4,265	10.2	24%
Respiratory system	2,658	5.4	24%	Digestive system	2,802	6.7	36%
Mental disorders	2,633	5.3	26%	Mental disorders	2,636	6.3	31%
Digestive system	2,483	5.0	42%	Genitourinary system	2,071	4.9	28%
Infectious disease	2,350	4.7	10%	Respiratory system	1,918	4.6	28%
Genitourinary system	2,316	4.7	24%	Pregnancy childbirth & puerperium	1,876	4.5	30%
Skin & subcutaneous tissue	1,415	2.9	24%	Infectious disease	1,854	4.4	13%
Pregnancy childbirth & puerperium	1,308	2.6	30%	Skin & subcutaneous tissue	1,262	3.0	34%
<b>35-44 year olds</b>				<b>44-54 year olds</b>			
	Cases	%	% *		Cases	%	% *
Injury poisoning & certain conseq EC	11,532	32.4	20%	Injury poisoning & certain conseq EC	8,379	28.1	20%
Symptoms, signs & ill-defined conditions	4,521	12.7	29%	Symptoms, signs & ill-defined conditions	4,686	15.7	33%
Other factors for HS contact	3,516	9.9	7%	Digestive system	2,403	8.1	47%
Digestive system	2,650	7.4	42%	Other factors for HS contact	2,347	7.9	7%
Mental disorders	1,983	5.6	36%	Circulatory system	2,116	7.1	70%
Respiratory system	1,754	4.9	34%	Respiratory system	1,576	5.3	44%
Genitourinary system	1,697	4.8	32%	Genitourinary system	1,522	5.1	40%
Musculoskeletal system & CT	1,375	3.9	16%	Mental disorders	1,397	4.7	34%
Circulatory system	1,212	3.4	58%	Musculoskeletal system & CT	1,394	4.7	20%
Infectious disease	1,182	3.3	15%	Skin & subcutaneous tissue	977	3.3	36%
<b>55-64 year olds</b>				<b>65 years and over</b>			
	Cases	%	% *		Cases	%	% *
Injury poisoning & certain conseq EC	5,784	23.6	25%	Injury poisoning & certain conseq EC	11,096	18.9	44%
Symptoms, signs & ill-defined conditions	4,276	17.4	40%	Symptoms, signs & ill-defined conditions	10,267	17.5	54%
Circulatory system	2,877	11.7	74%	Circulatory system	9,772	16.6	82%
Digestive system	1,976	8.1	53%	Respiratory system	5,762	9.8	80%
Other factors for HS contact	1,702	6.9	8%	Digestive system	4,841	8.2	66%
Respiratory system	1,694	6.9	61%	Other factors for HS contact	3,577	6.1	32%
Genitourinary system	1,130	4.6	44%	Genitourinary system	2,834	4.8	60%
Musculoskeletal system & CT	1,039	4.2	25%	Musculoskeletal system & CT	2,129	3.6	44%
Skin & subcutaneous tissue	798	3.3	38%	Skin & subcutaneous tissue	1,449	2.5	59%
Mental disorders	685	2.8	36%	Nervous system	1,440	2.4	55%

Notes: (1) Of the 320,000 presentations to EDs in 2004/05 recorded in EDIS, 94% received a diagnosis.  
(2) % \* column data represents the percentage of cases admitted or transferred to hospital.

A graphical representation of some of the data shown in the table above is provided below. This clearly shows a relationship between diagnosis chapter and age. A more detailed breakdown of the diagnoses by age group is provided in the Appendix tables.

From these tables it is apparent that injuries to the head and other parts of the body (wrist, forearm, shoulder etc) account for over 60% of all injury presentations across all age groups. Further analysis by external cause provides details on causes of these injuries (see next section).

Figure 33: Number of ED presentations by age groups for selected conditions

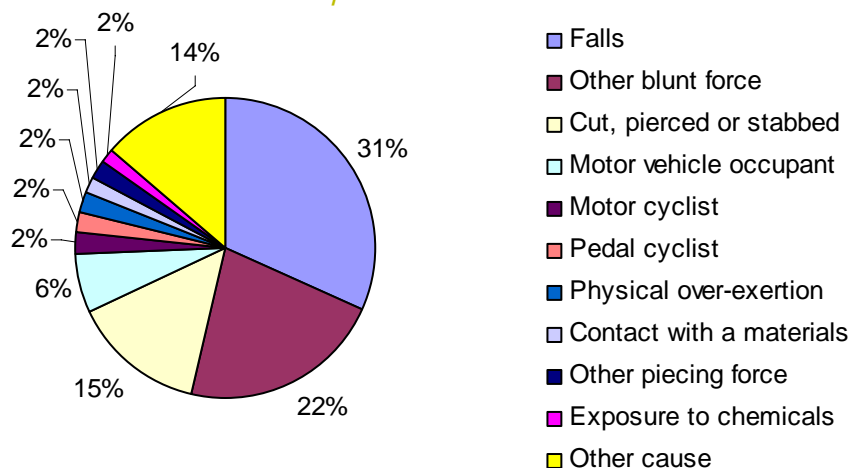


The importance of considering the age of people attending EDs is illustrated with 'Respiratory System' presentations. As shown in the Appendix tables, for people aged less than 25 years, croup, asthma and tonsillitis accounted for the majority of ED presentations with a high proportion being subsequently hospitalised. However, for those aged 55 years and older groups, influenza, pneumonia and chronic obstructive pulmonary disease (COPD) were the major reasons for presentation. Furthermore, those in the older age groups were more likely to be admitted into hospital for additional care.

### 5.12 CAUSE AND INTENT OF INJURY

Of the 345,000 presentations to metropolitan emergency departments during 2004/05, approximately 95,000 cases<sup>29</sup> (28%) had an external cause recorded. As shown in the figure below, of those cases, 'Falls' was the largest (31%) category.

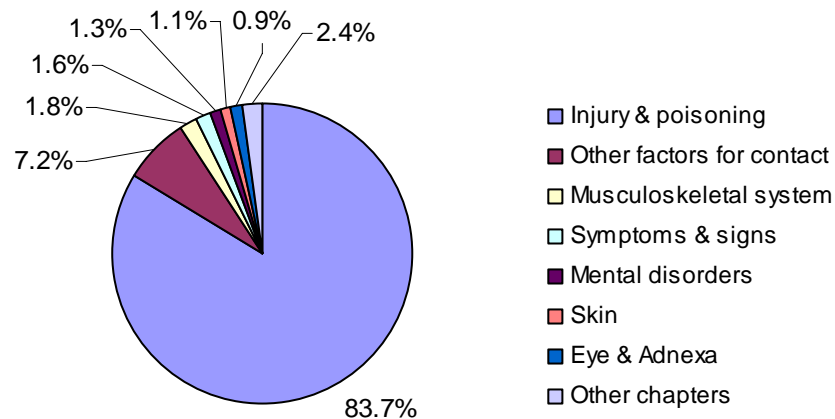
Figure 34: External cause for ED presentation



<sup>29</sup> Note: This analysis excludes KEMH as this information is not collected at that site.

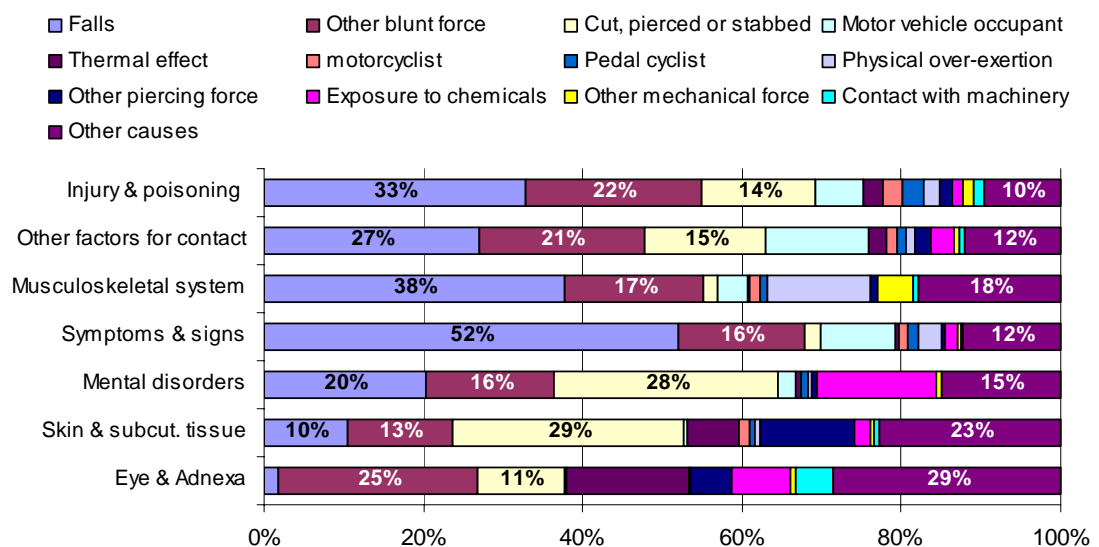
Other than for PMH, all the other metropolitan hospitals showed a similar distribution of external causes to that shown in the figure above. At PMH, 'Falls' accounted for 44% of records with an external cause recorded, with 'Other blunt force' (18%), 'Cut, pierced or stabbed' (8%) and 'Motor vehicle occupant' (2%) all being correspondingly lower.

Figure 35: External cause by chapter of doctor diagnosis



As expected, the vast majority of records (84%) with an external cause had a doctor's diagnosis that fell within the 'Injury & poisoning' chapter.

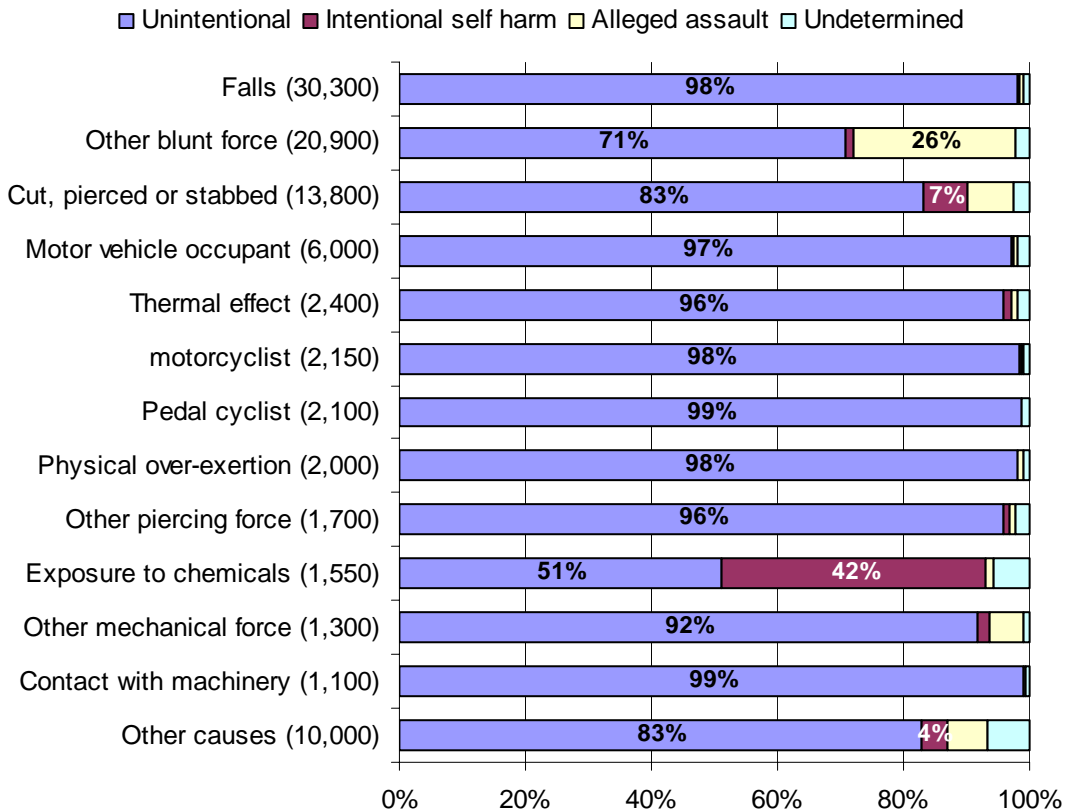
Figure 36: Distribution of external causes by chapter of diagnosis



The pattern of external causes varies with the chapter of doctor diagnosis as shown above. For example, patients with a mental disorder present with a large number of injuries due to 'Cutting or piercing' (28%) or 'Exposure to chemicals' (15%) while those with a musculoskeletal system diagnosis have a high proportion of

presentations due to 'Falls' (38%), 'Other blunt force' (17%) and 'Physical over-exertion' (13%).

Figure 37: External cause by human intent

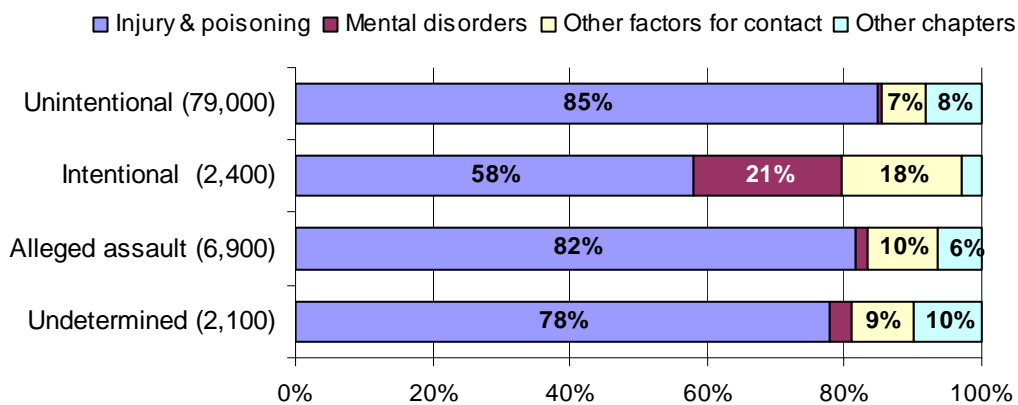


Note: Numbers in brackets represent approximate number of presentations during 2004/05.

On average, of those cases with an external cause record, 88% were accidental (i.e. unintentional), 8% were due to alleged assault, 2% intentional and 2% were undetermined. However, as shown in the figure above, these percentages varied with the external cause. For example, intentional harm was more common with 'Exposure to chemicals' (42%) and 'Cutting, piercing and stabbing' (7%) than with other forms of external cause.

It is important to realise that due to the different number of presentations, that while 42% of presentations with an external cause of 'Exposure to chemicals' were due to intentional self-harm, this only accounted for 27% (n= 650) of all intentional self-harm cases. The primary means of intentional self-harm was by 'Cutting, piercing or stabbing' (40%, n=1,000).

Figure 38: Intent by chapter of doctor's diagnosis



For those cases records as intentional self-harm, 21% had a doctor's diagnosis of 'Mental disorder' with a corresponding decrease in the 'Injury & poisoning' category.

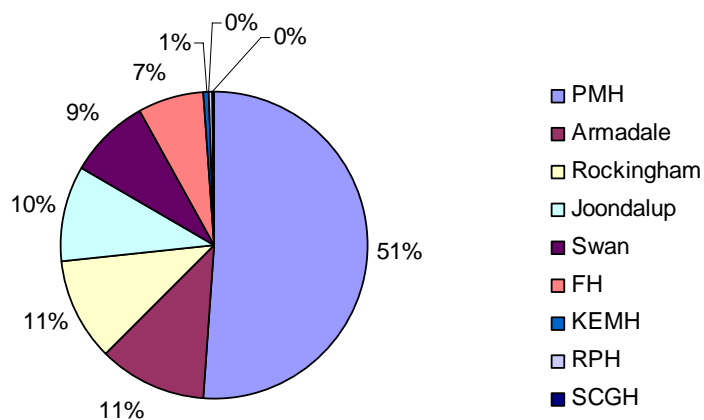
### 5.13 SPECIAL INTEREST SUB-GROUPS

Special interest sub-groups are those sections of the community that have some unique common factors that may be useful in developing an understanding of why they utilise metropolitan EDs. These common factors may be age (e.g. young, elderly), place of residence (e.g. country, residential care facility), or type or frequency of presentation. This section outlines the finding of this type of analysis.

#### A. Children at emergency departments

Twenty four percent of all ED presentations (84,000 visits) were in children aged less than 15 years. Fifty five percent (44,000 visits) of these were in those aged 0-4 years, with almost equal numbers (18,000 visits) for the 5-9 and 10-14 year age groups. The hospitals of attendance are shown in the figure below.

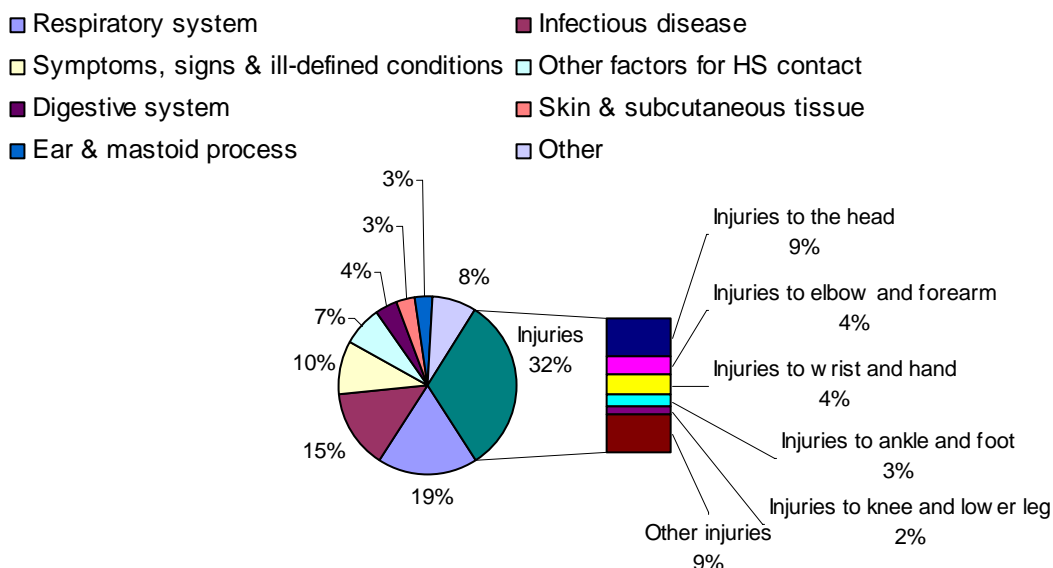
Figure 39: Site of ED presentation for children aged less than 15 years



Just over half of the ED presentations by children were at PMH with a further 40% of cases presenting to non-teaching hospitals.

For children aged 0-14 years of age, 'Injury & poisoning' was the major reason for presentation (32%, 25,500 visits), followed by 'Respiratory' (19%) and 'Infectious diseases' (15%).

Figure 40: Major causes for presentation



Of the presentations for injury, 29% were due to injury to the head. Burns comprised only 3% of all injury presentations with poisoning by drug and medicines being half of that.

Table 15: Breakdown of chapter of diagnosis by age group

Chapter of Diagnosis	Age Group (years)		
	0 - 4	5 - 9	10 - 14
Injury poisoning & certain conseq EC	21%	38%	51%
Respiratory system	25%	14%	7%
Infectious disease	19%	11%	6%
Symptoms, signs & ill-defined conditions	11%	9%	9%
Ear & mastoid process	3%	4%	2%
Mental disorders	0%	0%	3%

As can be seen from the table above, the major reasons for presentation do vary with age. The proportion of presentations for injury and poisoning increase with increasing age while those for respiratory and infectious diseases actually decrease. Conditions not listed above were relatively consistent across the ages.



*Table 16: Triage category by age group*

	Triage category				
	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
<b>Age group</b>					
0 – 4 years	0%	3%	25%	67%	4%
5 – 9 years	0%	3%	23%	68%	6%
10 – 14 years	0%	4%	25%	63%	8%
<i>Presentations (N)</i>	310	2,788	20,713	55,354	4,196

Analysis of category of triage shows very little difference between the age groups with most children being triaged as semi-urgent. This pattern was similar in PMH and all the non-tertiary hospitals (due to low numbers, data from RPH, SCGH KEMH was excluded). FH tended to triage more children to Categories 3 and 5.

*Table 17: Source of referral for children aged 0-14 years*

	Triage category				
	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5 <sup>30</sup>
<b>Referral Source</b>					
Self/relative	79%	79%	85%	89%	70%
Appointment	5%	2%	2%	3%	24%
Other hospital	9%	10%	5%	1%	0%
GP (+/- letter)	2%	5%	6%	6%	2%
Clinic	0%	0%	0%	0%	0%
Other	5%	3%	2%	1%	3%
<i>Presentations (N)</i>	287	2,423	18,236	50,776	3,355

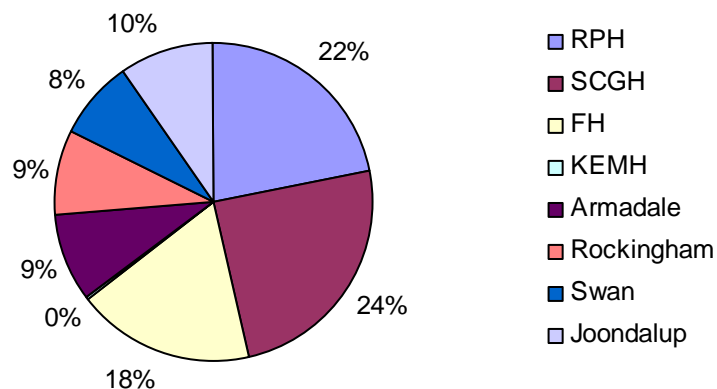
As with adults, self-referral was the most common reason for presentation to ED. Inter-hospital transfers represented another common reason for ED presentation.

<sup>30</sup> Excludes Joondalup Health Campus data as it is all recorded as Appointments.

## B. Older patients

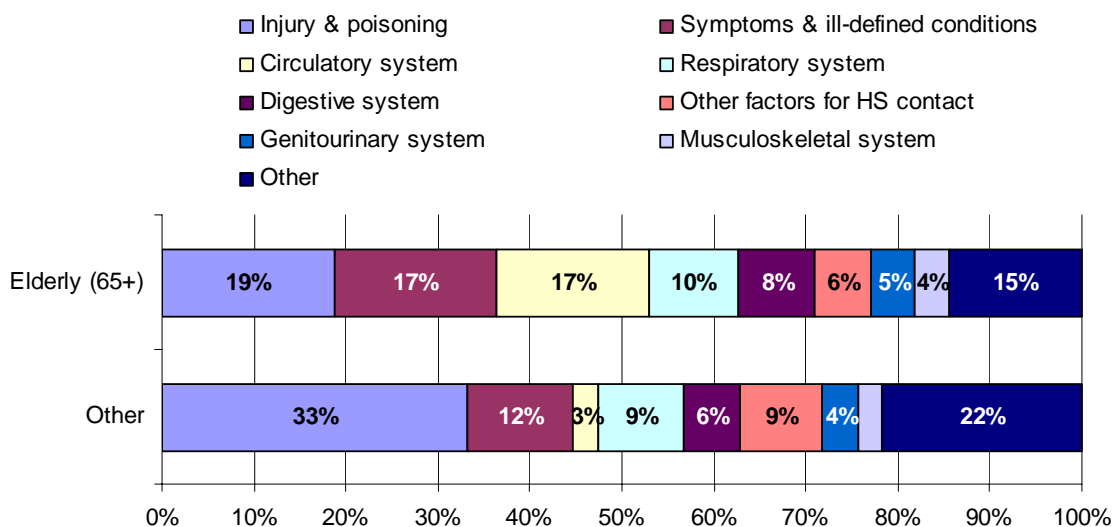
During 2004/05 there were 60,000 ED presentations by people aged 65 years or more (17% of all presentations). Almost 65% of these people presented at a tertiary hospital emergency department. A breakdown by hospital of presentation is shown below.

Figure 41: Site of ED presentation for people aged 65 years and older



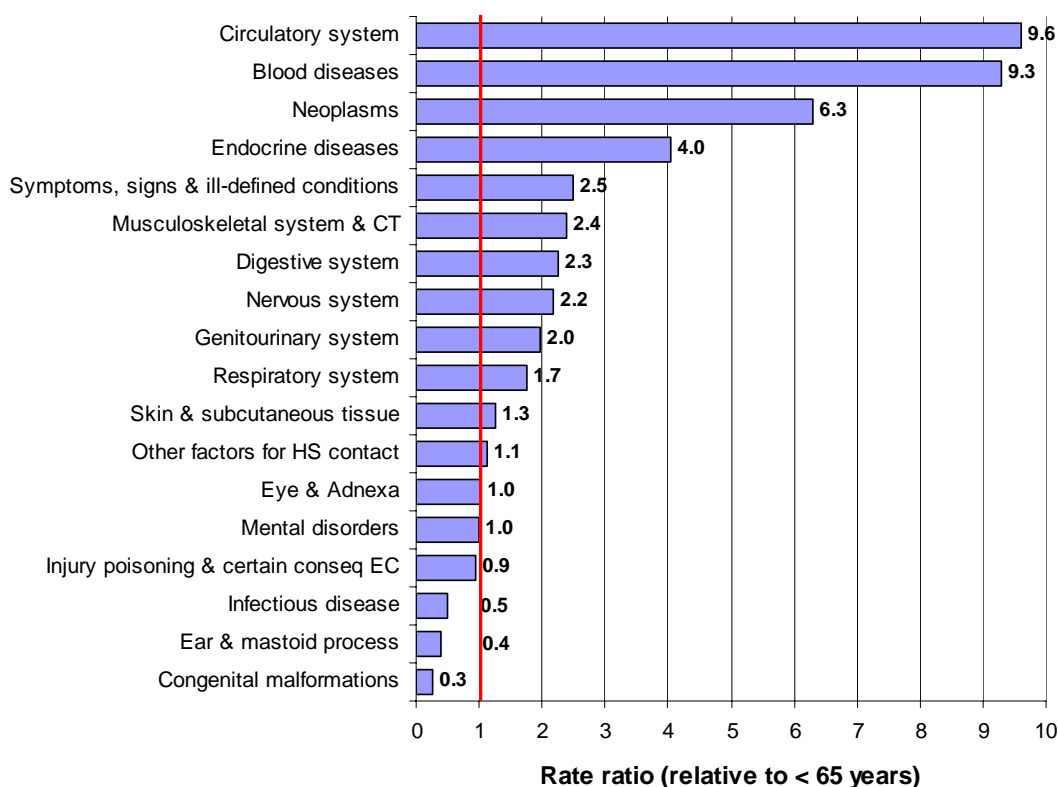
Based on doctor's diagnoses, 'Injury & poisoning', 'Symptoms & ill-defined conditions' and 'Circulatory system related conditions' were the major reasons for presentation by older people.

Figure 42: Major causes for ED presentation by older people



Compared to the younger age groups, the percentage of presentation for 'Injury & poisoning' was substantially less in the older population while for 'Circulatory diseases' was significantly greater. However, conversion to age specific rates shows that the rate of presentation for 'Injury & poisoning' is comparable to the remainder of the population while that for 'Circulatory disease' is almost 10 times higher (see figure below).

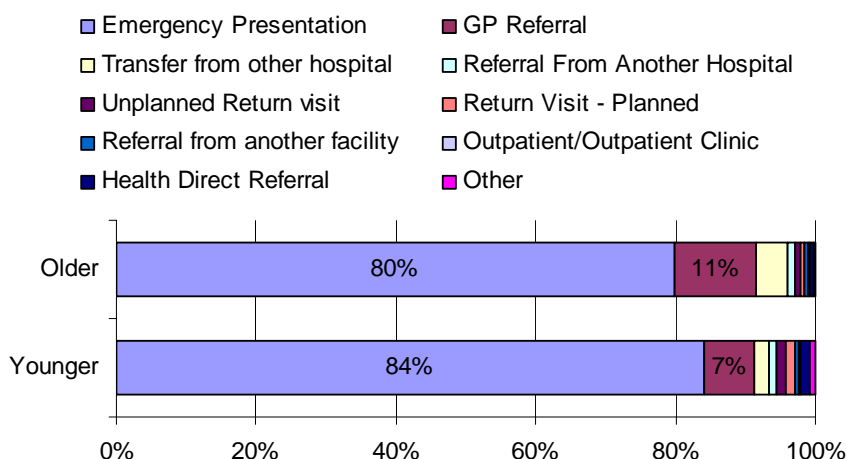
Figure 43: Rate ratio of age specific rates<sup>31</sup> by chapter of doctor's diagnosis



Note: "Blood diseases" include conditions such as anaemia of differing causes and coagulation disorders.

Not surprisingly, age specific rates of ED presentation for chronic diseases (e.g. circulatory, cancer, endocrine, musculoskeletal) were greater in the 65+ age group than in the younger population. Perhaps surprisingly, age specific rates for 'Injury & poisoning' and 'Mental disorders' were similar to the rest of the population.

Figure 44: Visit type by age category

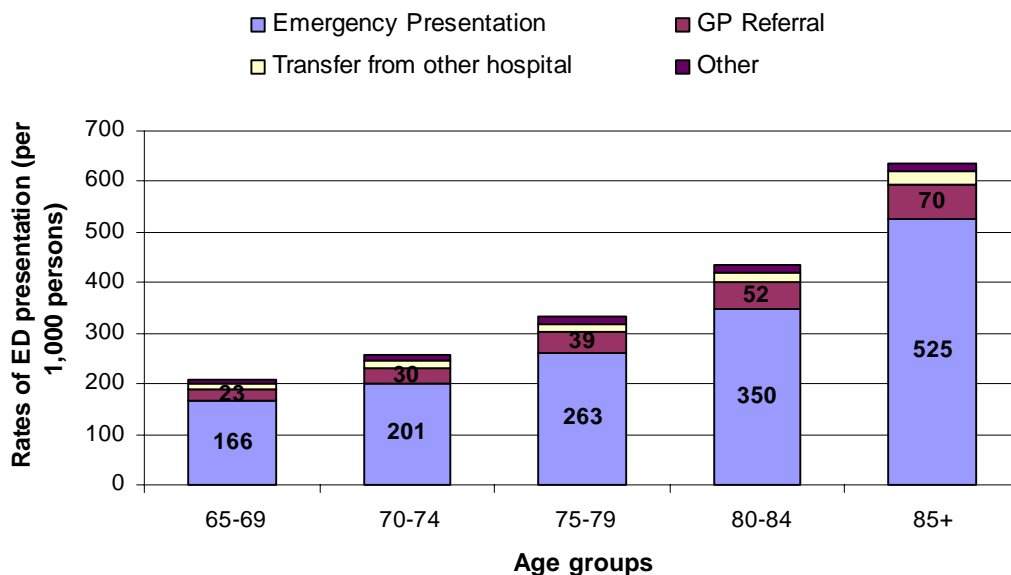


Emergency presentation is the most common visit type for the whole community regardless of age. GP referral account for 11% of presentations and is approximately 50% greater than for the younger age groups.

<sup>31</sup> Age specific rates were estimated by dividing the number of ED presentations by the number of people age 0-64 years or 65+ year who lived in the Perth metropolitan area. The rate ratio was calculated by dividing the age-specific rate of the older age group by that of the younger age group.

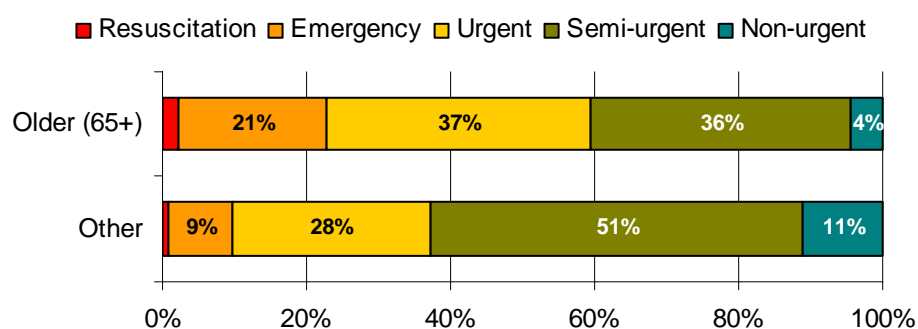
While the percentage of the various visit types remained relatively constant within the 65+ age group, the age specific rates of presentation do vary markedly as shown in the figure below.

*Figure 45: Age specific rates of ED presentation by visit type*



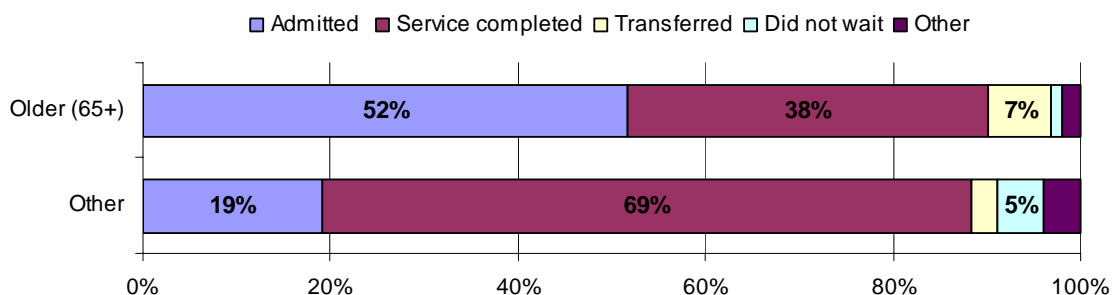
Although population size diminishes with increasing population age after the age of 65 years, the number of ED presentations remains similar across the age groups. As a result, age specific rates of ED presentation rise with increasing age with rates in the 85+ age group being three times that of the 65-69 year age group.

*Figure 46: Triage at presentation by age group*



Sixty percent of people aged 65 years and more are triaged as urgent or higher. Analysis by individual five-year age groups within the 65+ age group revealed remarkably consistent findings. Further analysis by age specific rates showed an age related increase for all triage categories except the non-urgent (data not shown).

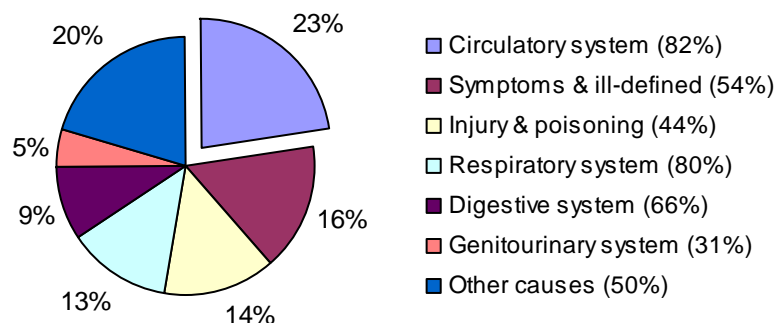
Figure 47: End disposition by age group



Compared to the rest of the population attending ED, a larger proportion of older people were either admitted or transferred to hospital (59% vs 22%). For these people, increasing age was associated with an increased likelihood of being admitted into hospital (directly or by transfer) with the proportion increasing from 47% in the 65-69 year olds to 67% in the over 85 year olds.

The combination of the high proportion of older persons who present at ED with circulatory disease (17%; see Figure 41 and Table 15), and the fact that 82% of these patients are hospitalised, makes circulatory diseases the largest reason for hospitalisation following presentation to ED (23%).

Figure 48: Major conditions for hospitalisation



Note: The numbers shown in the legend of the figure represent the percentage of ED presentations by older people who were ultimately admitted into hospital.

As shown in the table below, rates of hospitalisation increase with age within this group of patients.

Table 18: Age specific hospitalisation rates<sup>32</sup> for the most common chapter of diagnosis

Common diagnoses	Age groups (Older persons)				
	65-69	70-74	75-79	80-84	85+
Circulatory system	23.2	34.2	46.3	64.4	85.4
Symptoms & ill-defined conditions	16.5	23.4	30.8	44.3	61.3
Respiratory system	12.6	18.6	27.5	37.0	52.6
Injury & poisoning	11.7	14.4	23.2	41.2	80.9
Digestive system	10.1	14.6	17.0	23.7	35.0
Genitourinary system	4.4	5.4	9.2	14.9	24.2

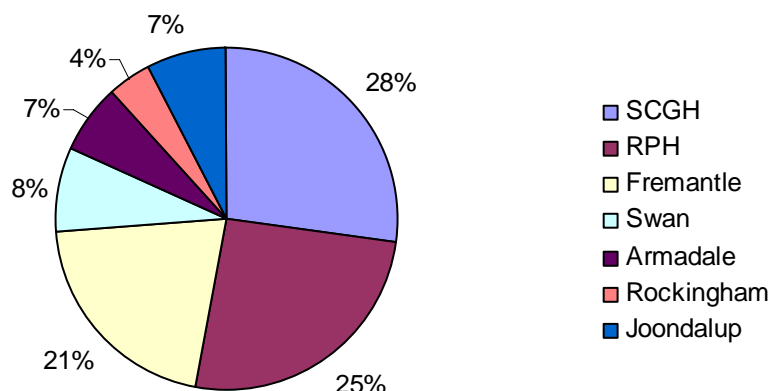
<sup>32</sup> Age specific rates are expressed as per 1,000 persons.

### C. Residential care facilities

Data collected at emergency departments does not adequately allow the identification of patients who routinely live in a residential care facility (RCF). As a consequence, alternative data sources were accessed to help develop an understanding of the impact of these people on ED services.

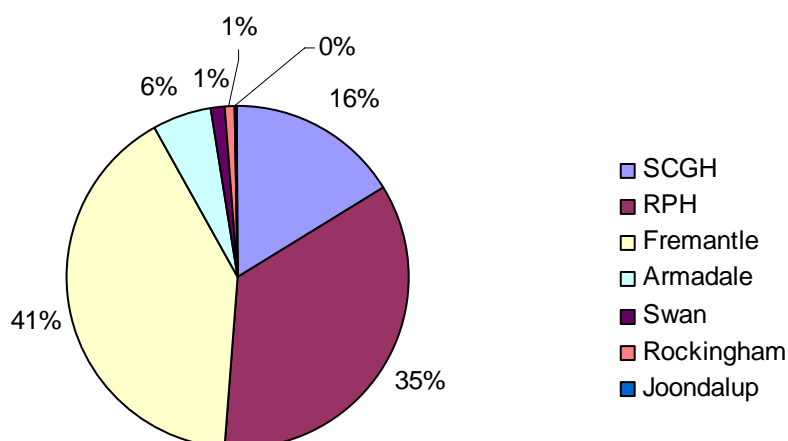
Using data from St John's Ambulance, it was revealed that during 2004/05 there were almost 7,000 ambulance trips between a residential care facility and a metropolitan emergency department. Almost half of these were to SCGH and RPH.

*Figure 49: Destination for RCF patients delivered to ED by ambulance*



Using data from the Department of Health's Hospital Morbidity Data System (HMDS) it appears that more than half of the patients from residential care facilities return to the facility after treatment in ED.

*Figure 50: Place of hospitalisation of RCF patients*

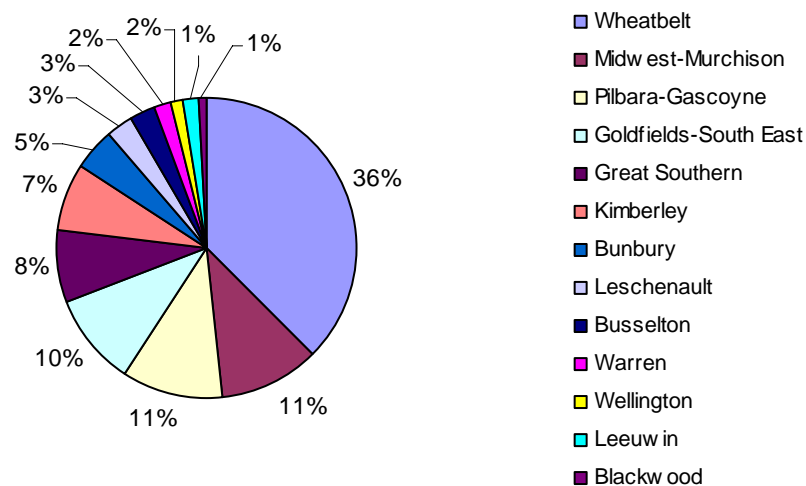


Analysis of HMDS data indicates that only 31% (2,152 admissions) of these patients were hospitalised. The majority of these occurred at Fremantle (41%) and RPH (35%). Nearly 50% of these admissions were due to 'Injury & poisoning', 'Circulatory' and 'Respiratory diseases' (data not shown).

## D. Country residents

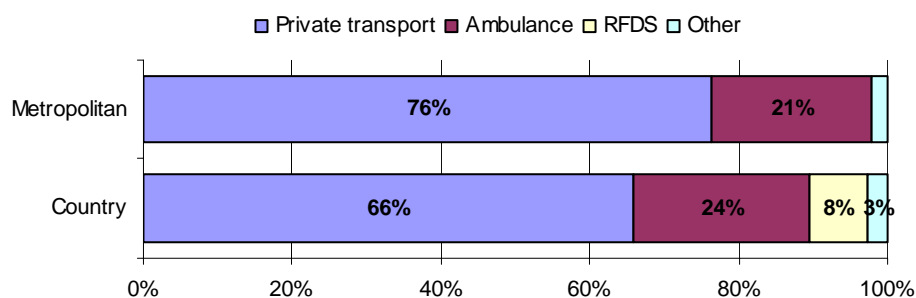
During 2004/05 approximately 4% of presentations (n = 12,160) at metropolitan EDs were by people who live in country<sup>33</sup> Western Australia.

Figure 51: Country health district of residence for patients attending ED



Proximity to Perth seems to be a factor as approximately half of these people live in country areas close to Perth (Wheatbelt: 36%; Midwest-Murchison: 11%, Bunbury-Busselton: 8%).

Figure 52: Mode of arrival to ED



While private transport is still the most common method of arrival to ED by country residents almost a quarter arrive by ambulance. A further 8% (n=935) are delivered to hospital by Royal Flying Doctor Service (RFDS). Once again, mode of arrival is greatly influenced by where in the country the patient lives. The vast majority of country residents whom arrive by private transport live in the Western (28%) and Southern (7%) Wheatbelt, Northern Goldfields (6.4%) and Geraldton (6%). Thirty percent of all ambulance arrivals come from the Wheatbelt with the majority of RFDS deliveries originating from the Kimberley (18%) and Goldfields (13%).

<sup>33</sup> Unless otherwise specified 'country' consists of all non-metropolitan areas.

As shown in the figure below, the majority of country residents attended RPH (29%) while a further 16% (n = 1900) went to PMH. Once again, rural area of residence seems to affect the ED attended with a higher proportion of residents from the South West presenting at Fremantle Hospital while those living in the Wheatbelt attend Joondalup and Swan hospitals (see tables in Appendix).

Figure 53: Site of ED presentation by country residents

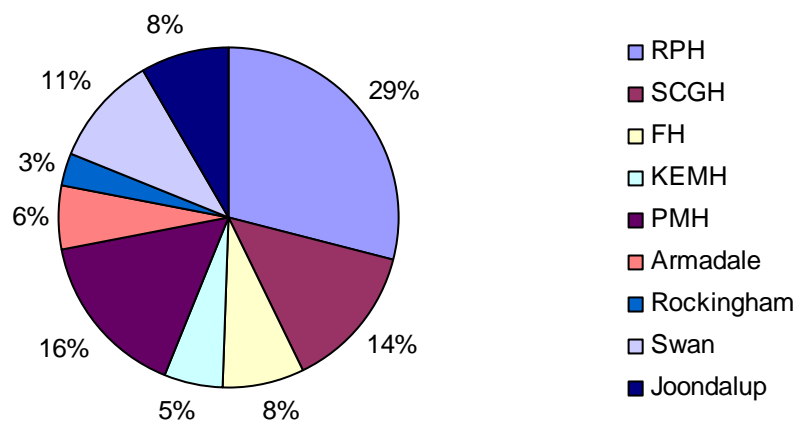
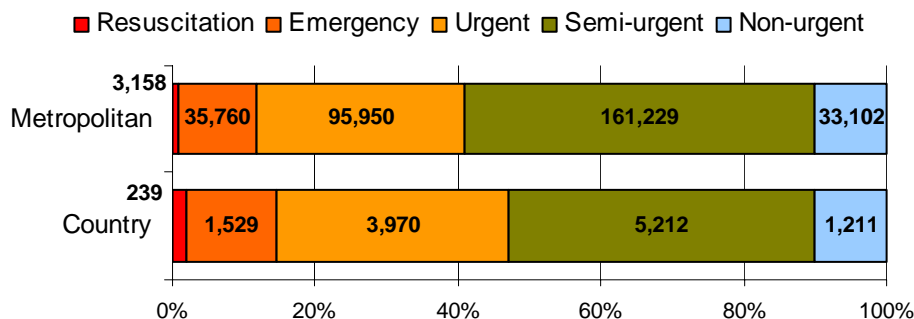


Figure 54: Triage level at presentation



Compared to metropolitan residents, a higher proportion of country residents are triaged as Category 1, 2 and 3 (Country: 2%, 13%, 33%; Metro: 1%, 11%, 29%). This is not surprising as a larger proportion of patients are referred from other hospitals (see below).

Figure 55: Source of referral for country residents

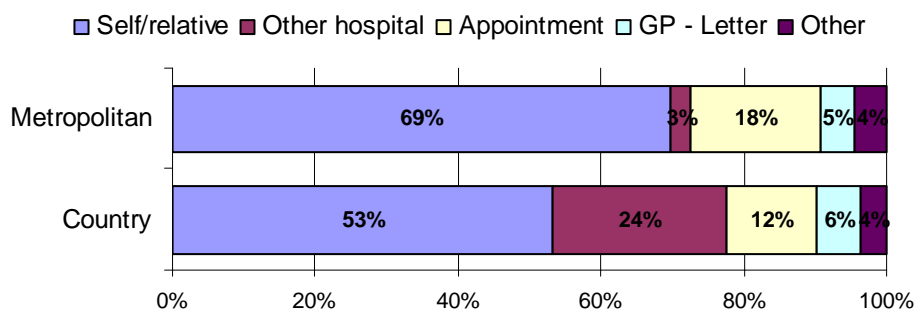
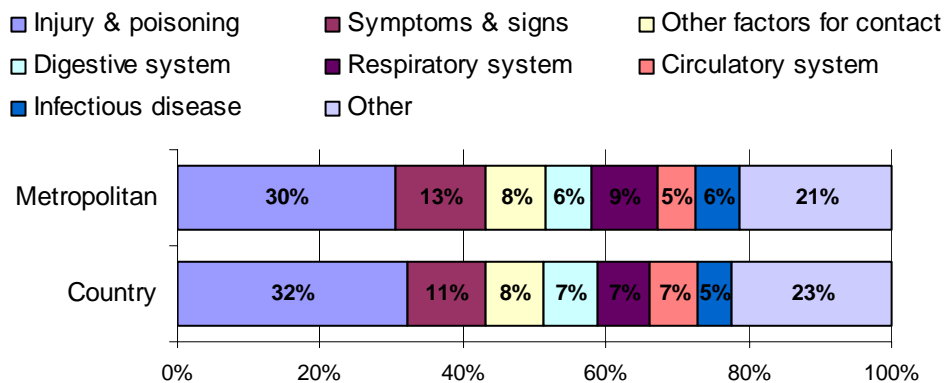


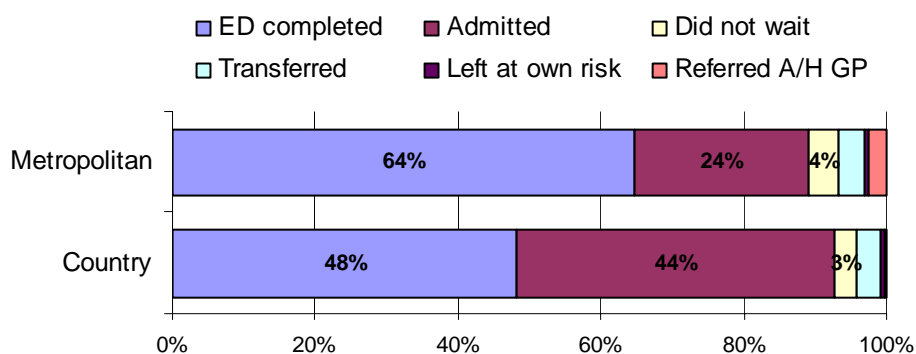


Figure 56: Chapter of doctor diagnosis



'Injury & poisoning' accounted for almost a third of all presentations by country residents to a metropolitan ED. This is slightly higher than that seen for metropolitan residents. While presentations for 'Digestive' and 'Circulatory' system related conditions were also slightly higher in country residents, the overall pattern in reasons for presenting to ED were similar to those for metropolitan residents.

Figure 57: End disposition



Although almost half of country residents who present at a metropolitan ED leave under their own care following treatment, 44% are admitted into hospital with a further 3% being transferred to other hospital. Country residents who arrived at a metropolitan ED by ambulance or RFDS were more likely to be admitted into a hospital (77%, n=2,050 and 97%, n=890 respectively).

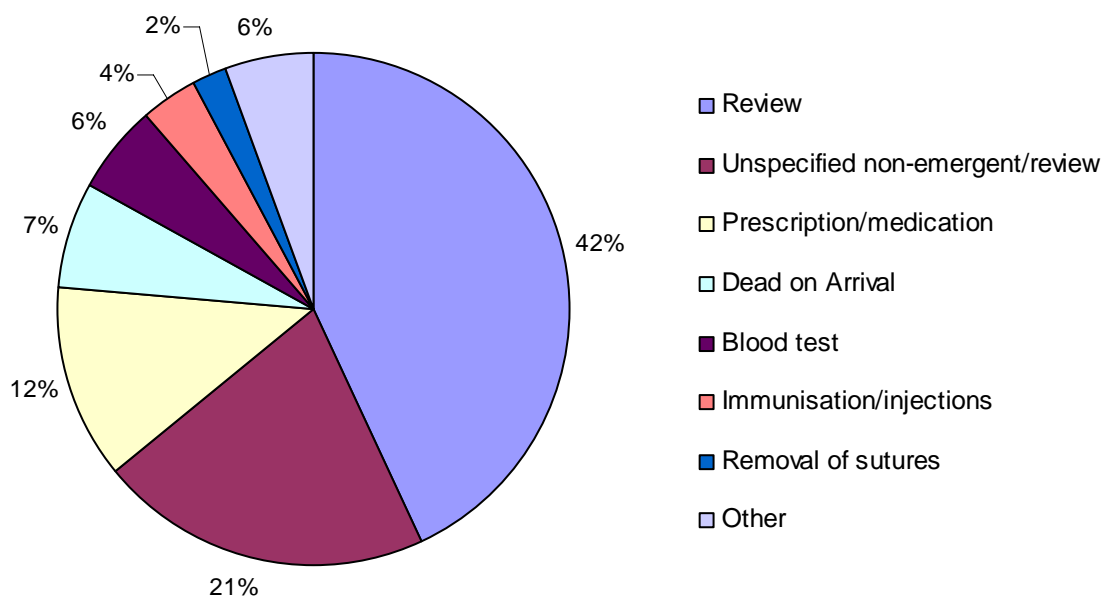
## E. Non-emergent and review presentations

Non-emergent and review cases are those when the patient's presenting symptoms, vital signs, medical history and age indicate that immediate medical care is not necessary within 12 hours.

Under the 'presenting symptom' codes collected in EDIS, a section allows recording of non-emergent and review cases. These include conditions such as alcohol blood tests, direct admission into hospital, immunisation, medical certificates, suture removal and dead on arrival.

Within the tertiary, non-tertiary and private hospital ED attendances during 2004/05, non-emergent/review cases account for 3% (approximately 11,000 cases) of all presentations. The age groups most likely to present with a non-emergent/review condition are the 15-24 (17%) and 25-34 (19%) year olds.

Figure 58: Breakdown of services provided to non-emergent cases



Most of the non-emergent cases were for review (42%). This category includes recall by ED staff, plaster and wound dressings, x-rays, eye review and non-ED specialties.

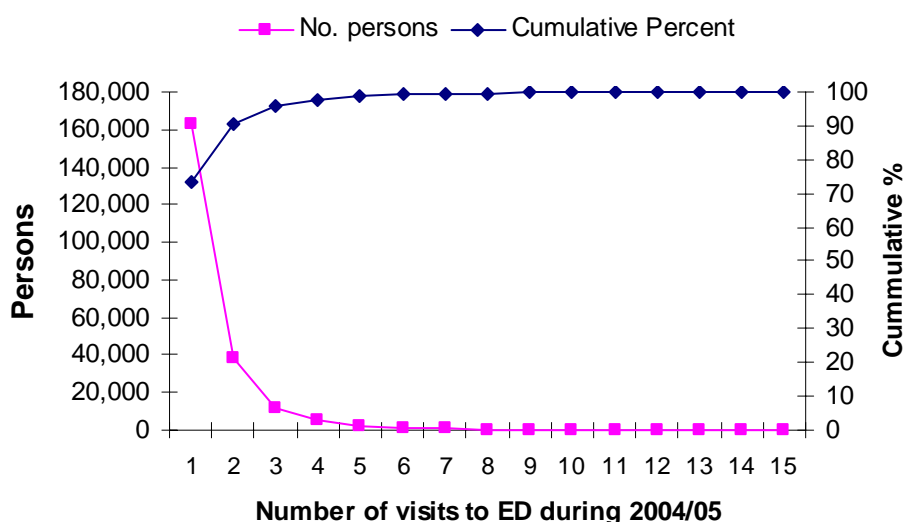
Following assignment of a doctor's diagnosis, most of the non-emergent/review cases are grouped into the 'Other factors for health service contact' (52%), 'Injury & poisoning' (12%) and 'Symptoms, signs and ill-defined conditions' (10%).

## F. Repeat use of emergency departments

Using the unique 'Unit Medical Record Number' that is assigned to all patients who attend a metropolitan public hospital, it is possible to calculate individual utilisation patterns<sup>34</sup>. Applying this approach to ED data allows investigation of people who make repeated use of emergency department facilities.

As shown in the figure below, of the approximate 330,000 ED presentations that occurred in metropolitan public hospitals in 2004/05, 49% were as single, once only visits. This cohort of people represents 73% of all persons who attended ED during that period.

Figure 59: Number and percentage of representations to ED



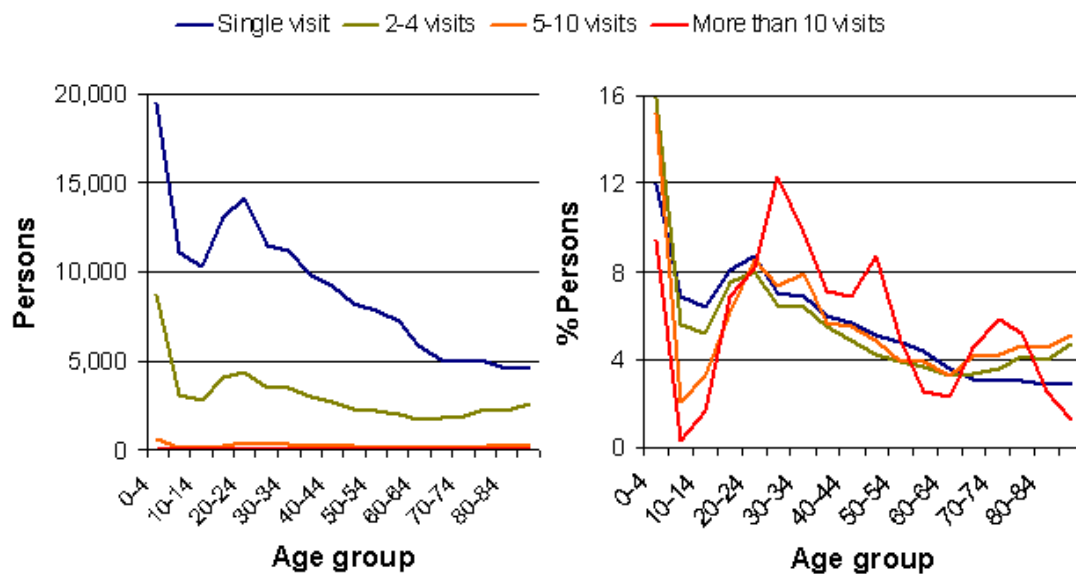
Ninety percent of all people (approximately 200,000 persons) who attended a metropolitan public hospital ED had less than three visits during 2004/05. A further 16,750 had between 3-4 visits, 4,700 had 5-10 visits and only approximately 300 had over 10 visits per year.

As shown in the figures below, of people attending ED during 2004/05, a breakdown by age reveals that the greatest number were in the 0-4 age group (13%) with a further 30% of people being aged between 15-34 years.

Single visits were the most common level of ED utilisation for all age groups with peaks in both the 0-4 and 20-24 year age groups. Although the numbers are considerably lower, the age specific patterns of utilisation are similar for each category of representation.

<sup>34</sup> It should be noted that while this method provides a reasonable estimate, UMRNs are known to not be 100% unique in their allocation to patients. A more accurate method would be to utilise data from the department's Data Linkage Unit.

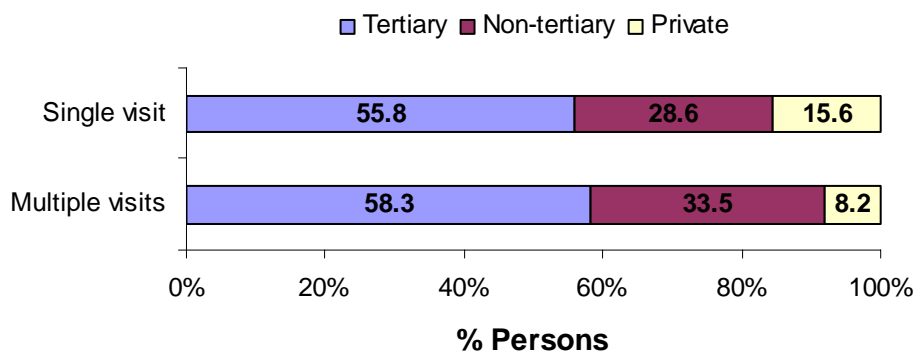
Figure 60: Representations to ED by frequency and age group



The second figure shows the proportion of each age group that attends ED by frequency of visits. This shows that for all frequencies of visit, except 10 or more, that the 0-4 year old group comprises the largest proportion. In the over 10 visits per year category, people aged 25-34 years (22%) made up the largest proportion of attendees.

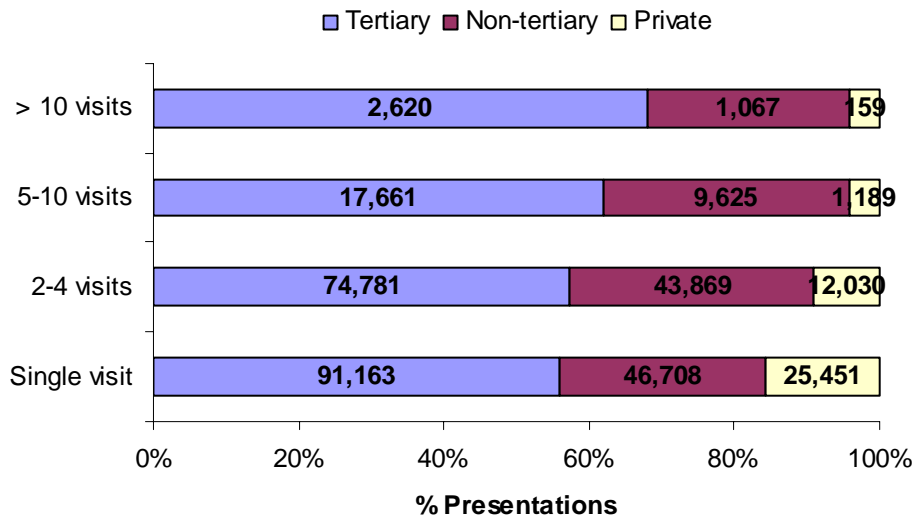
The types of hospital ED utilised by single-visit and multi-visit users of ED services do not differ greatly. Private hospital ED usage is about half that seen in single visit users with a consequential flow on to the public sector facilities (see figure below).

Figure 61: Multi-visit ED utilisation patterns by hospital type



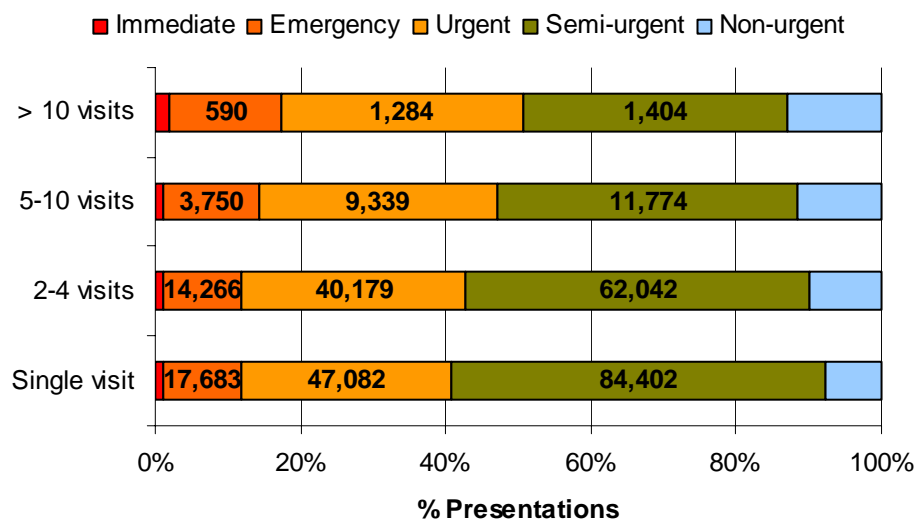
As shown in the figure below, the use of tertiary sector EDs increased with increased frequency of ED visits.

Figure 62: ED utilisation patterns by number of visits per year



The increased usage of tertiary hospital ED facilities may be explained by the larger proportion of cases triaged as Categories 1-3 as the number of ED visits increase. However, there are also an increasing proportion of cases classified as non-urgent as the visit number increases. This may reflect a separate sub-population within the multi-user group.

Figure 63: ED utilisation patterns by number of visits and triage category



The chapter of diagnosis is shown on the following table and shows some differences in disease profile between the single- and multi-visitors to ED.

*Table 19: Chapter of diagnosis as a percentage by visit frequency*

<b>Chapter of doctor diagnosis</b>	<b>Single visit</b>	<b>2-4 visits</b>	<b>5-10 visits</b>	<b>&gt; 10 visits</b>
Infectious disease	6.3	6.3	5.6	3.5
Neoplasms	0.4	0.5	0.4	0.2
Blood diseases	0.3	0.6	0.7	0.4
Endocrine diseases	0.6	0.9	1.6	1.2
Mental disorders	2.7	3.4	6.8	12.2
Nervous system	1.8	2.0	2.6	2.3
Eye & Adnexa	1.5	1.1	0.6	0.3
Ear & mastoid process	1.6	1.4	1.0	0.6
Circulatory system	4.7	6.0	6.9	5.7
Respiratory system	8.1	10.6	12.0	10.4
Digestive system	5.9	6.9	7.2	7.5
Skin & subcutaneous tissue	3.0	3.4	3.1	2.4
Musculoskeletal system & CT	2.8	2.7	2.4	3.0
Genitourinary system	3.8	4.7	4.6	3.3
Pregnancy childbirth & puerperium	0.7	1.6	2.3	1.5
Conditions of perinatal period	0.1	0.1	0.1	0
Congenital malformations	0	0	0	0
Symptoms, signs & ill-defined conditions	11.9	12.7	14.2	14.5
Injury poisoning & certain conseq EC	37.2	26.5	16.6	15.5
EC of Morb & Mort codes	0.1	0.1	0.1	0.2
Other factors for HS contact	6.5	8.6	11.3	15.4

Compared to those who only attended ED once during 2004/05, those who present more often had a higher proportion of respiratory, digestive and endocrine diseases, mental problems and ill-defined signs and symptoms. There was also an increase in the proportion attending for '*Other factors for health service contact*'.

A breakdown by age group and chapter of diagnosis for those in the '>10 visits' per year is shown in the next table.

*Table 20: Percentage of visits by chapter of diagnosis and age group for people with > 10 visits*

Chapter of diagnosis	Age group								Visits
	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65+	
Infectious disease	57.6	0.8	8.8	12.0	8.0	1.6	2.4	8.8	125
Neoplasms	14.3	0.0	0.0	0.0	0.0	28.6	0.0	57.1	7
Blood diseases	0.0	0.0	0.0	15.4	23.1	0.0	23.1	38.5	13
Endocrine diseases	2.3	2.3	36.4	15.9	4.5	15.9	2.3	20.5	44
Mental disorders	0.2	2.1	19.5	31.8	19.9	13.5	5.5	7.6	437
Nervous system	0.0	2.4	21.7	28.9	13.3	16.9	2.4	14.5	83
Eye & Adnexa	18.2	9.1	0.0	36.4	36.4	0.0	0.0	0.0	11
Ear & mastoid process	61.9	9.5	0.0	14.3	0.0	4.8	0.0	9.5	21
Circulatory system	0.0	0.0	1.5	5.4	5.0	13.4	11.9	62.9	202
Respiratory system	37.6	2.7	4.9	3.8	6.2	9.7	1.6	33.5	370
Digestive system	3.7	1.9	12.7	21.6	21.3	11.6	2.6	24.6	268
Skin & subcutan. tissue	9.2	5.7	5.7	12.6	21.8	25.3	1.1	18.4	87
Musculoskeletal system	0.0	0.9	5.7	27.4	11.3	27.4	3.8	23.6	106
Genitourinary system	6.8	3.4	16.1	13.6	18.6	7.6	9.3	24.6	118
Pregnancy & childbirth	0.0	0.0	48.1	30.8	21.2	0.0	0.0	0.0	52
Conditions of perinatal	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
Symptoms, signs.	5.4	3.9	14.7	17.8	10.5	13.6	7.2	26.9	516
Injury and poisoning	5.2	2.0	18.6	28.3	12.6	18.6	4.7	9.9	554
EC of Morb & Mort codes	0.0	0.0	33.3	16.7	50.0	0.0	0.0	0.0	6
Other factors for contact	3.8	1.1	17.9	24.6	17.3	17.7	4.7	12.8	548
<i>Total visits</i>	<i>334</i>	<i>78</i>	<i>519</i>	<i>734</i>	<i>493</i>	<i>509</i>	<i>175</i>	<i>727</i>	<i>3569</i>
<i>Number of persons</i>	<i>29</i>	<i>6</i>	<i>45</i>	<i>67</i>	<i>42</i>	<i>42</i>	<i>15</i>	<i>60</i>	<i>306</i>

Individual case management of the 300 or so people who have greater than 10 visits to metropolitan EDs within a single year may be possible. This table provides some additional information about such a group.

For example, of those presenting with respiratory conditions, 37.6% are aged less than 4 years and most likely to have had asthma and other acute respiratory diseases. However, 33.5% are aged 65 years and over and more likely to have COPD and related chronic diseases.

The most common age groups presenting with mental disorders are those people aged 15-44 years of age while those with endocrine diseases are mainly aged 15-24 years.

## 6. APPENDIX

Table 21: Total ED attendances by hospital and year and month of visit

	Hospital									Total
	RPH	SCGH	FH	KEMH	PMH	Armadale	Rockingham	Swan	Joondalup	
July 01	4404	3335	3483	787	4484	2399	2633	2176		23701
2	4454	3146	3295	791	3940	2386	2405	1394		21811
3	4420	3151	3337	810	3696	2294	2264	1045		21017
4	4182	3320	3408	772	3409	2390	2262	1692		21435
5	4096	3009	3252	752	2955	2373	2125	1883		20445
6	4500	3227	3584	793	3092	2719	2364	1967		22246
Jan 02	4384	3224	3452	810	2742	2639	2234	1940		21425
8	3972	2952	3123	760	2737	2147	1944	1742		19377
9	4460	3367	3540	896	3262	2642	2358	2118		22643
10	4225	3172	3268	796	3057	2555	2262	1999		21334
11	4452	3281	3290	792	3491	2512	2288	2079		22185
12	4150	3129	3284	719	4130	2643	2350	2073		22478
July 02	4471	3371	3583	831	4666	2944	2344	2294		24504
14	4310	3354	3434	825	4329	2890	2418	2267		23827
15	4227	3255	3382	848	3784	2796	2417	2184		22893
16	4240	3228	3466	854	3644	2803	2229	2197		22661
17	4501	3266	3378	779	3617	2807	2337	2175		22860
18	4640	3474	3801	871	3545	3045	2487	2468		24331
Jan 03	4553	3281	3503	895	2853	2934	2364	2199		22582
20	3950	2959	3189	826	2677	2460	2016	1991		20068
21	4477	3350	3601	873	3067	2878	2429	2318		22993
22	4428	3297	3305	815	3075	2835	2207	2303		22265
23	4312	3287	3288	874	3074	2682	2172	2037		21726
24	3920	2917	2981	821	3376	2614	2073	2104		20806
July 03	4178	3193	3306	877	3832	2815	2208	2242		22651
26	4325	3438	3576	892	4993	3358	2724	2873		26179
27	4158	3283	3257	835	4385	3231	2487	2586		24222
28	4447	3133	3228	963	3485	2932	2353	2530		23071
29	4405	3131	3351	836	3442	2983	2295	2501		22944
30	4632	3390	3560	914	3378	3261	2575	2646		24356
Jan 04	4646	3406	3588	992	2826	3173	2556	2668		23855
32	4243	3179	3291	945	2963	2902	2348	2379		22250
33	4408	3338	3427	976	3400	3009	2514	2463		23535
34	4264	3199	3260	921	3143	2957	2441	2273		22458
35	4253	3213	3288	958	3391	2962	2370	2434		22869
36	4225	3139	3326	845	3813	2921	2454	2292		23015
Jul 04	4539	3499	3614	943	3914	3141	2600	2526	566	25342
38	4410	3585	3607	853	3782	3101	2467	2448	3244	27497
39	4447	3591	3484	956	3999	3321	2703	2602	3301	28404
40	4688	3977	3959	1033	4018	3593	3114	2904	3698	30984
41	4597	3680	3622	1042	3803	3250	2811	2640	3549	28994
42	4810	3805	3863	969	3640	3441	2997	2886	3736	30147
Jan 05	4995	3944	3828	898	3209	3361	2790	2750	3797	29572
44	4134	3364	3468	768	2951	2868	2428	2472	3109	25562
45	4717	3823	3880	948	3474	3430	2915	2734	3714	29635
46	4345	3705	3562	839	3284	3052	2619	2434	3494	27334
47	4661	3948	3758	827	3813	3325	2890	2677	3763	29662
48	4280	3782	3650	805	4232	3328	2849	2586	3560	29072
Jul 05	4761	4302	4133	841	4809	3651	3283	2945	4017	32742
50	4592	4054	3850	811	4729	3473	3057	2843	3969	31378
51	4649	3985	3796	823	4380	3372	3011	2656	3733	30405
52	3675	3118	2992	682	3068	2602	2417	2064	3045	23663

Source: ICAM, derived from EDIS.

Notes: (a) Joondalup data commenced in July 2004 but is incomplete for that month.

(b) Attendance figures for Oct 2005 (52) are incomplete and are usually excluded from analysis.

(c) Peel Health Campus and SJOG Murdoch ED data is not available via the EDIS system.



Table 22: Breakdown of injury and poisoning related presentations by age group - 2004/05

<b>0-4 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>5-14 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Injuries to the head	3994	43%	11%	Injuries to the head	3433	21%	12%
Injuries to elbow and forearm	1070	11%	10%	Injuries to wrist and hand	2764	17%	9%
Effects of foreign body entering through natural orifice	621	7%	18%	Injuries to elbow and forearm	2537	16%	25%
Injuries to wrist and hand	595	6%	18%	Injuries to ankle and foot	1752	11%	5%
Injuries to ankle and foot	502	5%	11%	Injuries to knee and lower leg	1371	9%	22%
Burns	478	5%	32%	Injuries to shoulder and upper arm	867	5%	14%
Toxic effects of nonmedicinal substances	379	4%	15%	Injuries to abdomen, lower back, lumbar spine & pelvis	460	3%	22%
<b>15-24 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>25-34 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Injuries to the head	4340	21%	15%	Injuries to wrist and hand	2519	17%	16%
Injuries to wrist and hand	3909	19%	13%	Injuries to the head	2419	17%	14%
Injuries to ankle and foot	2232	11%	4%	Injuries to ankle and foot	1479	10%	6%
Injuries to knee and lower leg	1608	8%	17%	Injuries to knee and lower leg	1015	7%	21%
Injuries to elbow and forearm	1276	6%	21%	Injuries to shoulder and upper arm	782	5%	8%
Injuries to shoulder and upper arm	1073	5%	7%	Poisoning by drugs, medication and biological substances	770	5%	55%
Poisoning by drugs, medication and biological substances	972	5%	48%	Injuries to elbow and forearm	733	5%	25%
<b>35-44 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>45-54 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Injuries to wrist and hand	1872	16%	19%	Injuries to wrist and hand	1279	15%	19%
Injuries to the head	1698	15%	16%	Injuries to the head	1150	14%	14%
Injuries to ankle and foot	1156	10%	8%	Injuries to ankle and foot	719	9%	6%
Injuries to knee and lower leg	902	8%	27%	Injuries to knee and lower leg	635	8%	27%
Injuries to elbow and forearm	622	5%	23%	Injuries to the thorax	508	6%	19%
Injuries to abdomen, lower back, lumbar spine & pelvis	613	5%	24%	Injuries to abdomen, lower back, lumbar spine & pelvis	505	6%	24%
Effects of foreign body entering through natural orifice	558	5%	7%	Effects of foreign body entering through natural orifice	451	5%	8%
<b>55-64 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>65 years and over</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Injuries to wrist and hand	849	15%	22%	Injuries to hip and thigh	1929	17%	86%
Injuries to the head	722	12%	19%	Injuries to the head	1554	14%	29%
Injuries to knee and lower leg	525	9%	32%	Injuries to knee and lower leg	985	9%	39%
Injuries to ankle and foot	494	9%	10%	Injuries to wrist and hand	874	8%	25%
Complications of surgical and medical care NEC	419	7%	43%	Complications of surgical and medical care NEC	865	8%	39%
Injuries to the thorax	399	7%	22%	Injuries to abdomen, lower back, lumbar spine & pelvis	861	8%	53%
Injuries to abdomen, lower back, lumbar spine & pelvis	374	6%	29%	Injuries to shoulder and upper arm	773	7%	37%

Notes (1) % = Percentage of all injury cases by age group.  
 (2) % \* = Percentage of cases admitted or transferred to hospital.

Table 23: Breakdown of symptoms, signs and abnormal clinical & laboratory findings NEC by age group - 2004/05

<b>0-4 year olds</b>				<b>5-14 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
General symptoms & signs	1968	43%	46%	Symp & signs involving digestive system	1773	53%	24%
Symp & signs involving digestive system	1135	25%	23%	General symptoms & signs	699	21%	32%
Symptoms & signs involving circ. & resp. system	742	16%	38%	Symptoms & signs involving circ. & resp. system	488	15%	7%
Symp & signs involving skin & subcutaneous tissue	508	11%	16%	Symp & signs involving skin & subcutaneous tissue	218	6%	10%
Ill-defined and unknown causes of mortality	106	2%	22%	Symp & signs involving urinary system	91	3%	19%
Symp & signs involving nervous & musclo. system	59	1%	24%	Symp & signs involving nervous & musclo. system	42	1%	24%
Symp & signs involving urinary system	52	1%	29%	Symp & signs involving cognition & behaviours	19	1%	37%
<b>15-24 year olds</b>				<b>25-34 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Symp & signs involving digestive system	2186	49%	24%	Symp & signs involving digestive system	1690	40%	30%
General symptoms & signs	986	22%	24%	Symptoms & signs involving circ. & resp. system	1105	26%	16%
Symptoms & signs involving circ. & resp. system	812	18%	8%	General symptoms & signs	972	23%	26%
Symp & signs involving skin & subcutaneous tissue	151	3%	7%	Symp & signs involving cognition & behaviours	127	3%	20%
Symp & signs involving cognition & behaviours	95	2%	19%	Symp & signs involving skin & subcutaneous tissue	117	3%	11%
Symp & signs involving urinary system	72	2%	24%	Ill-defined and unknown causes of mortality	88	2%	9%
Ill-defined and unknown causes of mortality	60	1%	5%	Symp & signs involving urinary system	68	2%	34%
<b>35-44 year olds</b>				<b>45-54 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Symptoms & signs involving circ. & resp. system	1710	38%	25%	Symptoms & signs involving circ. & resp. system	1981	42%	30%
Symp & signs involving digestive system	1298	29%	36%	Symp & signs involving digestive system	1081	23%	37%
General symptoms & signs	965	21%	30%	General symptoms & signs	927	20%	35%
Symp & signs involving cognition & behaviours	167	4%	21%	Symp & signs involving cognition & behaviours	227	5%	25%
Symp & signs involving skin & subcutaneous tissue	100	2%	12%	Ill-defined and unknown causes of mortality	134	3%	15%
Ill-defined and unknown causes of mortality	83	2%	10%	Symp & signs involving urinary system	108	2%	47%
Symp & signs involving urinary system	80	2%	31%	Symp & signs involving skin & subcutaneous tissue	96	2%	21%
<b>55-64 year olds</b>				<b>65 years and over</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Symptoms & signs involving circ. & resp. system	1884	44%	37%	Symptoms & signs involving circ. & resp. system	3598	35%	48%
Symp & signs involving digestive system	852	20%	43%	General symptoms & signs	2601	25%	61%
General symptoms & signs	780	18%	46%	Symp & signs involving digestive system	1813	18%	64%
Symp & signs involving urinary system	221	5%	41%	Symp & signs involving urinary system	926	9%	51%
Symp & signs involving cognition & behaviours	220	5%	37%	Symp & signs involving cognition & behaviours	622	6%	48%
Ill-defined and unknown causes of mortality	126	3%	20%	Ill-defined and unknown causes of mortality	341	3%	20%
Symp & signs involving skin & subcutaneous tissue	73	2%	23%	Abnormal findings on exam. of blood without diag.	115	1%	60%

Notes: (1) % = Percentage of all injury cases by age group.  
 (2) % \* = Percentage of cases admitted or transferred to hospital.

Table 24: Breakdown of diseases of the respiratory system by age group - 2004/05

Age Group	Disease	Cases	%	% *
<b>0-4 year olds</b>	Acute upper respir. infections - Multiple or unspecified sites	3517	32.7%	5.0%
	Acute upper respir. infections - Croup	1874	17.4%	14.8%
	Other acute lower respiratory infections	1764	16.4%	45.0%
	Chronic lower respir. diseases - Status asthmaticus	1072	10.0%	43.9%
	Acute upper respir. infections - Tonsillitis	888	8.2%	7.0%
	Influenza and pneumonia	798	7.4%	56.5%
Chronic lower respir. diseases - Asthma	422	3.9%	48.3%	
<b>15-24 year olds</b>	Acute upper respir. infections - Tonsillitis	637	25%	20%
	Chronic lower respir. diseases - Status asthmaticus	621	24%	21%
	Acute upper respir. infections - Multiple or unspecified sites	371	14%	2%
	Influenza and pneumonia	277	11%	41%
	Acute upper respir. infections - Other	199	8%	5%
	Other diseases of upper respir tract - Pertonsillar abscess	130	5%	94%
Other diseases of pleua	114	4%	63%	
<b>35-44 year olds</b>	Influenza and pneumonia	399	25%	55%
	Chronic lower respir. diseases - Status asthmaticus	373	23%	38%
	Acute upper respir. infections - Multiple or unspecified sites	230	14%	8%
	Acute upper respir. infections - Tonsillitis	152	9%	20%
	Acute upper respir. infections - Other	120	7%	8%
	Other acute lower respiratory infections	59	4%	15%
Other diseases of upper respir tract - Chronic sinusitis	58	4%	10%	
<b>55-64 year olds</b>	Influenza and pneumonia	518	33%	73%
	Chronic lower respir. diseases - COPD	401	26%	78%
	Chronic lower respir. diseases - Status asthmaticus	188	12%	52%
	Acute upper respir. infections - Multiple or unspecified sites	110	7%	13%
	Other acute lower respiratory infections	88	6%	39%
	Acute upper respir. infections - Other	48	3%	15%
Lung diseases due to external agents	32	2%	91%	
<b>5-14 year olds</b>	Chronic lower respir. diseases - Status asthmaticus	912	24%	35%
	Acute upper respir. infections - Multiple or unspecified sites	781	21%	4%
	Acute upper respir. infections - Tonsillitis	549	15%	10%
	Acute upper respir. infections - Croup	520	14%	10%
	Influenza and pneumonia	310	8%	43%
	Chronic lower respir. diseases - Asthma	288	8%	35%
Acute upper respir. infections - Other	136	4%	7%	
<b>25-34 year olds</b>	Chronic lower respir. diseases - Status asthmaticus	441	24%	25%
	Influenza and pneumonia	337	18%	46%
	Acute upper respir. infections - Tonsillitis	291	16%	25%
	Acute upper respir. infections - Multiple or unspecified sites	241	13%	5%
	Acute upper respir. infections - Other	144	8%	9%
	Other diseases of upper respir tract - Pertonsillar abscess	94	5%	85%
Other diseases of upper respir tract - Chronic sinusitis	67	4%	6%	
<b>45-54 year olds</b>	Influenza and pneumonia	409	29%	61%
	Chronic lower respir. diseases - Status asthmaticus	282	20%	41%
	Chronic lower respir. diseases - COPD	160	11%	59%
	Acute upper respir. infections - Multiple or unspecified sites	154	11%	11%
	Acute upper respir. infections - Other	80	6%	13%
	Other acute lower respiratory infections	71	5%	21%
Acute upper respir. infections - Tonsillitis	47	3%	28%	
<b>65 years and over</b>	Influenza and pneumonia	2297	43%	89%
	Chronic lower respir. diseases - COPD	1763	33%	85%
	Other acute lower respiratory infections	276	5%	67%
	Acute upper respir. infections - Multiple or unspecified sites	232	4%	30%
	Chronic lower respir. diseases - Status asthmaticus	171	3%	58%
	Lung diseases due to external agents	121	2%	88%
Other resp. dieases mainly affecting the interstitium	102	2%	90%	

Notes: (1) % = Percentage of all injury cases by age group.

(2) % \* = Percentage of cases admitted or transferred to hospital.

*Table 25: Breakdown of factors influencing health status and contact with health services by age group - 2004/05*

<b>0-4 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>5-14 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Health services for specific procedures and care	1582	49%	0%	Health services for specific procedures and care	1376	56%	0%
Persons encountering health services for examination	1423	44%	2%	Persons encountering health services for examination	960	39%	3%
Other encounters with health services	125	4%	2%	Other encounters with health services	74	3%	1%
Potential health hazards related to socioeconomic circum.	61	2%	59%	Potential health hazards related to socioeconomic circum.	33	1%	15%
Potential health hazards related to communicable diseases	24	1%	0%	Potential health hazards related to family or personal history	13	1%	69%
Health services related to reproduction	10	0%	10%	Potential health hazards related to communicable diseases	7	0%	0%
Potential health hazards related to family or personal history	0	0%	0%	Health services related to reproduction	3	0%	33%
<b>15-24 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>25-34 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Health services for specific procedures and care	2699	50%	0%	Health services for specific procedures and care	2186	46%	1%
Persons encountering health services for examination	1854	34%	4%	Persons encountering health services for examination	1584	33%	5%
Potential health hazards related to family or personal history	372	7%	50%	Potential health hazards related to family or personal history	385	8%	48%
Other encounters with health services	212	4%	0%	Health services related to reproduction	268	6%	6%
Health services related to reproduction	209	4%	6%	Other encounters with health services	264	6%	1%
Potential health hazards related to socioeconomic circum.	37	1%	24%	Potential health hazards related to socioeconomic circum.	41	1%	34%
Potential health hazards related to communicable diseases	25	0%	4%	Potential health hazards related to communicable diseases	36	1%	0%
<b>35-44 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>45-54 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Health services for specific procedures and care	1554	44%	1%	Health services for specific procedures and care	1095	47%	1%
Persons encountering health services for examination	1269	36%	4%	Persons encountering health services for examination	882	38%	5%
Other encounters with health services	271	8%	2%	Other encounters with health services	165	7%	4%
Potential health hazards related to family or personal history	265	8%	54%	Potential health hazards related to family or personal history	145	6%	54%
Health services related to reproduction	93	3%	6%	Potential health hazards related to socioeconomic circum.	41	2%	44%
Potential health hazards related to socioeconomic circum.	45	1%	29%	Potential health hazards related to communicable diseases	15	1%	7%
Potential health hazards related to communicable diseases	19	1%	11%	Health services related to reproduction	4	0%	0%
<b>55-64 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>65 years and over</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Persons encountering health services for examination	785	46%	8%	Persons encountering health services for examination	2262	63%	33%
Health services for specific procedures and care	685	40%	2%	Health services for specific procedures and care	817	23%	7%
Other encounters with health services	110	6%	5%	Potential health hazards related to socioeconomic circum.	327	9%	86%
Potential health hazards related to family or personal history	62	4%	52%	Other encounters with health services	131	4%	21%
Potential health hazards related to socioeconomic circum.	51	3%	45%	Potential health hazards related to family or personal history	27	1%	59%
Potential health hazards related to communicable diseases	9	1%	22%	Potential health hazards related to communicable diseases	13	0%	0%
Health services related to reproduction	0	0%	0%	Health services related to reproduction	0	0%	0%

Notes: (1) % = Percentage of all injury cases by age group.

(2) % \* = Percentage of cases admitted or transferred to hospital.

*Table 26: Breakdown of circulatory diseases by age group - 2004/05*

<b>0-4 year olds</b>				<b>5-14 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Diseases of veins, lymphatic vessels and nodes NEC	74	76%	14%	Diseases of veins, lymphatic vessels and nodes NEC	198	80%	18%
Other forms of heart disease	17	17%	59%	Other forms of heart disease	33	13%	33%
Diseases of arteries, arterioles and capillaries	4	4%	50%	Other and unspecified disorders of circulatory system	6	2%	33%
Pulmonary heart disease & pulmonary circulation	1	1%	100%	Cerebrovascular diseases	4	2%	100%
Cerebrovascular diseases	1	1%	100%	Diseases of arteries, arterioles and capillaries	4	2%	25%
Other and unspecified disorders of circulatory system	1	1%	0%	Pulmonary heart disease & pulmonary circulation	2	1%	50%
Chronic rheumatic heart disease	0	0%	0%	Chronic rheumatic heart disease	1	0%	100%
<b>15-24 year olds</b>				<b>25-34 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Other forms of heart disease	126	38%	33%	Diseases of veins, lymphatic vessels and nodes NEC	201	35%	18%
Diseases of veins, lymphatic vessels and nodes NEC	122	37%	16%	Other forms of heart disease	195	34%	35%
Pulmonary heart disease & pulmonary circulation	34	10%	91%	Ischaemic heart diseases	58	10%	84%
Cerebrovascular diseases	27	8%	93%	Pulmonary heart disease & pulmonary circulation	44	8%	93%
Other and unspecified disorders of circulatory system	10	3%	20%	Cerebrovascular diseases	43	8%	100%
Diseases of arteries, arterioles and capillaries	6	2%	33%	Diseases of arteries, arterioles and capillaries	13	2%	46%
Ischaemic heart diseases	5	2%	80%	Other and unspecified disorders of circulatory system	12	2%	17%
<b>35-44 year olds</b>				<b>45-54 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Symptoms & signs involving circ. & resp. system	1710	38%	25%	Ischaemic heart diseases	383	32%	85%
Symp & signs involving digestive system	1298	29%	36%	Other forms of heart disease	310	26%	40%
General symptoms & signs	965	21%	30%	Diseases of veins, lymphatic vessels and nodes NEC	258	22%	22%
Symp & signs involving cognition & behaviours	167	4%	21%	Cerebrovascular diseases	104	9%	94%
Symp & signs involving skin & subcutaneous tissue	100	2%	12%	Pulmonary heart disease & pulmonary circulation	75	6%	80%
Ill-defined and unknown causes of mortality	83	2%	10%	Diseases of arteries, arterioles and capillaries	33	3%	79%
Symp & signs involving urinary system	80	2%	31%	Other and unspecified disorders of circulatory system	17	1%	35%
<b>55-64 year olds</b>				<b>65 years and over</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Ischaemic heart diseases	1347	48%	89%	Ischaemic heart diseases	3583	37%	88%
Other forms of heart disease	756	27%	55%	Other forms of heart disease	3455	36%	78%
Cerebrovascular diseases	302	11%	95%	Cerebrovascular diseases	1287	13%	96%
Diseases of veins, lymphatic vessels and nodes NEC	197	7%	32%	Diseases of veins, lymphatic vessels and nodes NEC	361	4%	44%
Pulmonary heart disease & pulmonary circulation	91	3%	92%	Diseases of arteries, arterioles and capillaries	326	3%	79%
Diseases of arteries, arterioles and capillaries	75	3%	73%	Other and unspecified disorders of circulatory system	311	3%	57%
Other and unspecified disorders of circulatory system	41	1%	34%	Pulmonary heart disease & pulmonary circulation	240	2%	95%

Notes: (1) % = Percentage of all injury cases by age group.

(2) % \* = Percentage of cases admitted or transferred to hospital.

Table 27: Breakdown of infectious diseases by age group - 2004/05

<b>0-4 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>5-14 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Other viral diseases	3984	48%	5%	Other viral diseases	1468	48%	6%
Intestinal infectious diseases	3049	37%	14%	Intestinal infectious diseases	1034	34%	13%
Viral infections of skin	900	11%	6%	Viral infections of skin	297	10%	2%
Other bacterial diseases	185	2%	64%	Other bacterial diseases	69	2%	28%
Mycoses	122	1%	5%	Protozoal diseases	61	2%	28%
Pediculosis, acariasis and other infect.	36	0%	14%	Pediculosis, acariasis and other infect.	43	1%	5%
Helminthiases	17	0%	0%	Mycoses	42	1%	5%
<b>15-24 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>25-34 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Intestinal infectious diseases	1236	53%	7%	Intestinal infectious diseases	1122	61%	13%
Other viral diseases	772	33%	10%	Other viral diseases	489	26%	7%
Viral infections of skin	149	6%	9%	Viral infections of skin	103	6%	12%
Mycoses	51	2%	2%	Mycoses	32	2%	3%
Infections of a mainly sexual mode of transm.	44	2%	11%	Other bacterial diseases	29	2%	59%
Other bacterial diseases	38	2%	58%	Viral infections of the CNS	23	1%	70%
Viral infections of the CNS	22	1%	36%	Infections of a mainly sexual mode of transm.	21	1%	10%
<b>35-44 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>45-54 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Intestinal infectious diseases	643	55%	13%	Intestinal infectious diseases	454	55%	16%
Other viral diseases	328	28%	7%	Other viral diseases	201	24%	8%
Viral infections of skin	77	7%	13%	Other bacterial diseases	65	8%	88%
Other bacterial diseases	42	4%	74%	Viral infections of skin	61	7%	8%
Mycoses	22	2%	0%	Mycoses	20	2%	10%
Protozoal diseases	20	2%	80%	Viral infections of the CNS	6	1%	83%
Viral infections of the CNS	19	2%	74%	Protozoal diseases	6	1%	17%
<b>55-64 year olds</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>	<b>65 years and over</b>	<b>Cases</b>	<b>%</b>	<b>% *</b>
Intestinal infectious diseases	417	62%	22%	Intestinal infectious diseases	757	62%	52%
Other viral diseases	127	19%	9%	Other viral diseases	165	13%	23%
Viral infections of skin	62	9%	11%	Viral infections of skin	130	11%	28%
Other bacterial diseases	39	6%	82%	Other bacterial diseases	126	10%	93%
Mycoses	16	2%	0%	Mycoses	39	3%	23%
Protozoal diseases	5	1%	100%	Other infectious diseases	4	0%	50%
Tuberculosis	3	0%	100%	Tuberculosis	2	0%	50%

Notes: (1) % = Percentage of all injury cases by age group.  
(2) % \* = Percentage of cases admitted or transferred to hospital.

*Table 28: Breakdown of digestive diseases by age group - 2004/05*

<b>0-4 year olds</b>				<b>5-14 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Other diseases of intestines	565	32%	18%	Diseases of appendix	540	34%	97%
Diseases of oral cavity, salivary glands and jaws	421	23%	8%	Other diseases of intestines	472	30%	12%
Noninfective enteritis and colitis	295	16%	15%	Diseases of oral cavity, salivary glands and jaws	295	19%	11%
Diseases of oesophagus, stomach & duodenum	286	16%	20%	Diseases of oesophagus, stomach & duodenum	121	8%	10%
Hernia	118	7%	44%	Noninfective enteritis and colitis	51	3%	20%
Other diseases of the digestive system	82	5%	40%	Other diseases of the digestive system	45	3%	44%
Diseases of appendix	22	1%	91%	Hernia	19	1%	26%
<b>15-24 year olds</b>				<b>25-34 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Diseases of appendix	623	25%	97%	Diseases of oral cavity, salivary glands and jaws	610	22%	14%
Diseases of oesophagus, stomach & duodenum	563	23%	9%	Diseases of oesophagus, stomach & duodenum	604	22%	12%
Diseases of oral cavity, salivary glands and jaws	393	16%	14%	Disorders of gallbladder, biliary tract & pancreas	523	19%	45%
Disorders of gallbladder, biliary tract & pancreas	347	14%	44%	Diseases of appendix	363	13%	95%
Other diseases of intestines	290	12%	26%	Other diseases of intestines	336	12%	32%
Other diseases of the digestive system	109	4%	35%	Other diseases of the digestive system	163	6%	53%
Noninfective enteritis and colitis	77	3%	39%	Noninfective enteritis and colitis	87	3%	45%
<b>35-44 year olds</b>				<b>45-54 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Diseases of oesophagus, stomach & duodenum	625	24%	14%	Other diseases of intestines	543	23%	57%
Disorders of gallbladder, biliary tract & pancreas	497	19%	57%	Diseases of oesophagus, stomach & duodenum	504	21%	16%
Other diseases of intestines	434	16%	47%	Disorders of gallbladder, biliary tract & pancreas	448	19%	58%
Diseases of oral cavity, salivary glands and jaws	417	16%	11%	Diseases of oral cavity, salivary glands and jaws	312	13%	15%
Diseases of appendix	226	9%	98%	Other diseases of the digestive system	201	8%	73%
Other diseases of the digestive system	187	7%	65%	Diseases of appendix	125	5%	96%
Hernia	88	3%	40%	Diseases of liver	107	4%	87%
<b>55-64 year olds</b>				<b>65 years and over</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Other diseases of intestines	547	28%	63%	Other diseases of intestines	1803	37%	65%
Diseases of oesophagus, stomach & duodenum	424	22%	19%	Other diseases of the digestive system	1140	24%	87%
Disorders of gallbladder, biliary tract & pancreas	357	18%	67%	Diseases of oesophagus, stomach & duodenum	758	16%	29%
Other diseases of the digestive system	232	12%	75%	Disorders of gallbladder, biliary tract & pancreas	579	12%	83%
Diseases of oral cavity, salivary glands and jaws	119	6%	14%	Hernia	190	4%	53%
Hernia	97	5%	45%	Diseases of oral cavity, salivary glands and jaws	112	2%	25%
Diseases of liver	68	3%	87%	Noninfective enteritis and colitis	82	2%	59%

Notes: (1) % = Percentage of all injury cases by age group.

(2) % \* = Percentage of cases admitted or transferred to hospital.

Table 29: Breakdown of mental disorders by age group – 2004/05

<b>0-4 year olds</b>				<b>5-14 year olds</b>			
	Cases	%	% *		Cases	%	% *
Behavioural & emotional disorders	28	47%	4%	Neurotic, stress-related and somatoform disorders	267	48%	25%
Neurotic, stress-related and somatoform disorders	15	25%	27%	Behavioural & emotional disorders	132	24%	20%
Organic, including symptomatic, mental disorders	9	15%	67%	Mental & behavioural disorders due to psychoactive subs.	59	11%	15%
Mental & behavioural disorders due to psychoactive subs.	5	8%	100%	Mood (affective) disorders	51	9%	45%
Disorders of psychological development	2	3%	0%	Organic, including symptomatic, mental disorders	27	5%	48%
Behavioural syndromes	1	2%	100%	Behavioural syndromes	10	2%	60%
Schizophrenia & dilusional disorders	0	0%	0%	Schizophrenia & dilusional disorders	9	2%	67%
<b>15-24 year olds</b>				<b>25-34 year olds</b>			
	Cases	%	% *		Cases	%	% *
Neurotic, stress-related and somatoform disorders	979	38%	18%	Neurotic, stress-related and somatoform disorders	882	34%	17%
Mental & behavioural disorders due to psychoactive subs.	757	29%	22%	Mental & behavioural disorders due to psychoactive subs.	641	25%	27%
Mood (affective) disorders	376	14%	32%	Mood (affective) disorders	464	18%	41%
Schizophrenia & dilusional disorders	244	9%	60%	Schizophrenia & dilusional disorders	417	16%	55%
Disorders of adult personality and behaviour	103	4%	24%	Disorders of adult personality and behaviour	90	3%	21%
Behavioural & emotional disorders	64	2%	17%	Organic, including symptomatic, mental disorders	59	2%	44%
Organic, including symptomatic, mental disorders	56	2%	38%	Behavioural & emotional disorders	28	1%	21%
<b>35-44 year olds</b>				<b>45-54 year olds</b>			
	Cases	%	% *		Cases	%	% *
Neurotic, stress-related and somatoform disorders	696	36%	22%	Neurotic, stress-related and somatoform disorders	476	34%	14%
Mental & behavioural disorders due to psychoactive subs.	507	26%	32%	Mental & behavioural disorders due to psychoactive subs.	368	27%	37%
Mood (affective) disorders	349	18%	48%	Mood (affective) disorders	309	22%	42%
Schizophrenia & dilusional disorders	268	14%	62%	Schizophrenia & dilusional disorders	136	10%	67%
Disorders of adult personality and behaviour	61	3%	33%	Organic, including symptomatic, mental disorders	53	4%	68%
Organic, including symptomatic, mental disorders	54	3%	48%	Disorders of adult personality and behaviour	32	2%	25%
Behavioural & emotional disorders	18	1%	28%	Behavioural & emotional disorders	6	0%	33%
<b>55-64 year olds</b>				<b>65 years and over</b>			
	Cases	%	% *		Cases	%	% *
Neurotic, stress-related and somatoform disorders	243	36%	11%	Organic, including symptomatic, mental disorders	796	58.5%	87%
Mental & behavioural disorders due to psychoactive subs.	164	24%	35%	Neurotic, stress-related and somatoform disorders	328	24.1%	19%
Mood (affective) disorders	129	19%	52%	Mental & behavioural disorders due to psychoactive subs.	99	7.3%	56%
Organic, including symptomatic, mental disorders	75	11%	80%	Mood (affective) disorders	91	6.7%	47%
Schizophrenia & dilusional disorders	52	8%	52%	Schizophrenia & dilusional disorders	31	2.3%	61%
Behavioural & emotional disorders	10	1%	20%	Behavioural & emotional disorders	14	1.0%	71%
Disorders of adult personality and behaviour	4	1%	25%	Disorders of adult personality and behaviour	2	0.1%	50%

Notes: (1) % = Percentage of all injury cases by age group.

(2) % \* = Percentage of cases admitted or transferred to hospital.



Table 30: Breakdown of endocrine disorders by age group - 2004/05

<b>0-4 year olds</b>				<b>5-14 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Metabolic disorders	86	64%	77%	Diabetes mellitus	105	57%	94%
Diabetes mellitus	19	14%	95%	Metabolic disorders	38	21%	47%
Other disorders of glucose regulation	11	8%	100%	Other disorders of glucose regulation	27	15%	67%
Other nutritional deficiencies	9	7%	11%	Disorders of other endocrine glands	9	5%	78%
Disorders of other endocrine glands	8	6%	63%	Obesity and other hyperalimentionation	3	2%	0%
Disorders of thyroid gland	1	1%	0%	Disorders of thyroid gland	1	1%	100%
Malnutrition	1	1%	100%	Malnutrition	0	0%	0%
<b>15-24 year olds</b>				<b>25-34 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Diabetes mellitus	91	41%	80%	Diabetes mellitus	91	41%	80%
Metabolic disorders	60	27%	33%	Metabolic disorders	60	27%	33%
Other disorders of glucose regulation	45	20%	13%	Other disorders of glucose regulation	45	20%	13%
Disorders of thyroid gland	16	7%	19%	Disorders of thyroid gland	16	7%	19%
Disorders of other endocrine glands	10	4%	80%	Disorders of other endocrine glands	10	4%	80%
Malnutrition	1	0%	100%	Malnutrition	1	0%	100%
Other nutritional deficiencies	0	0%	0%	Other nutritional deficiencies	0	0%	0%
<b>35-44 year olds</b>				<b>45-54 year olds</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Other disorders of glucose regulation	76	33%	24%	Metabolic disorders	101	39%	59%
Diabetes mellitus	72	32%	78%	Other disorders of glucose regulation	83	32%	24%
Metabolic disorders	67	29%	66%	Diabetes mellitus	59	23%	69%
Disorders of thyroid gland	10	4%	30%	Disorders of thyroid gland	9	3%	56%
Disorders of other endocrine glands	3	1%	100%	Disorders of other endocrine glands	5	2%	60%
Malnutrition	0	0%	0%	Obesity and other hyperalimentionation	1	0%	100%
Other nutritional deficiencies	0	0%	0%	Malnutrition	0	0%	0%
<b>55-64 year olds</b>				<b>65 years and over</b>			
	<b>Cases</b>	<b>%</b>	<b>% *</b>		<b>Cases</b>	<b>%</b>	<b>% *</b>
Metabolic disorders	124	46%	65%	Metabolic disorders	555	60.8%	83%
Other disorders of glucose regulation	93	34%	43%	Other disorders of glucose regulation	277	30.3%	51%
Diabetes mellitus	35	13%	80%	Diabetes mellitus	61	6.7%	79%
Disorders of other endocrine glands	10	4%	80%	Disorders of thyroid gland	9	1.0%	67%
Disorders of thyroid gland	6	2%	17%	Disorders of other endocrine glands	6	0.7%	83%
Malnutrition	1	0%	0%	Malnutrition	3	0.3%	100%
Obesity and other hyperalimentionation	1	0%	100%	Obesity and other hyperalimentionation	2	0.2%	100%

Notes: (1) % = Percentage of all injury cases by age group.

(2) % \* = Percentage of cases admitted or transferred to hospital.

Figure 64: RPH - catchment area by PC of residence

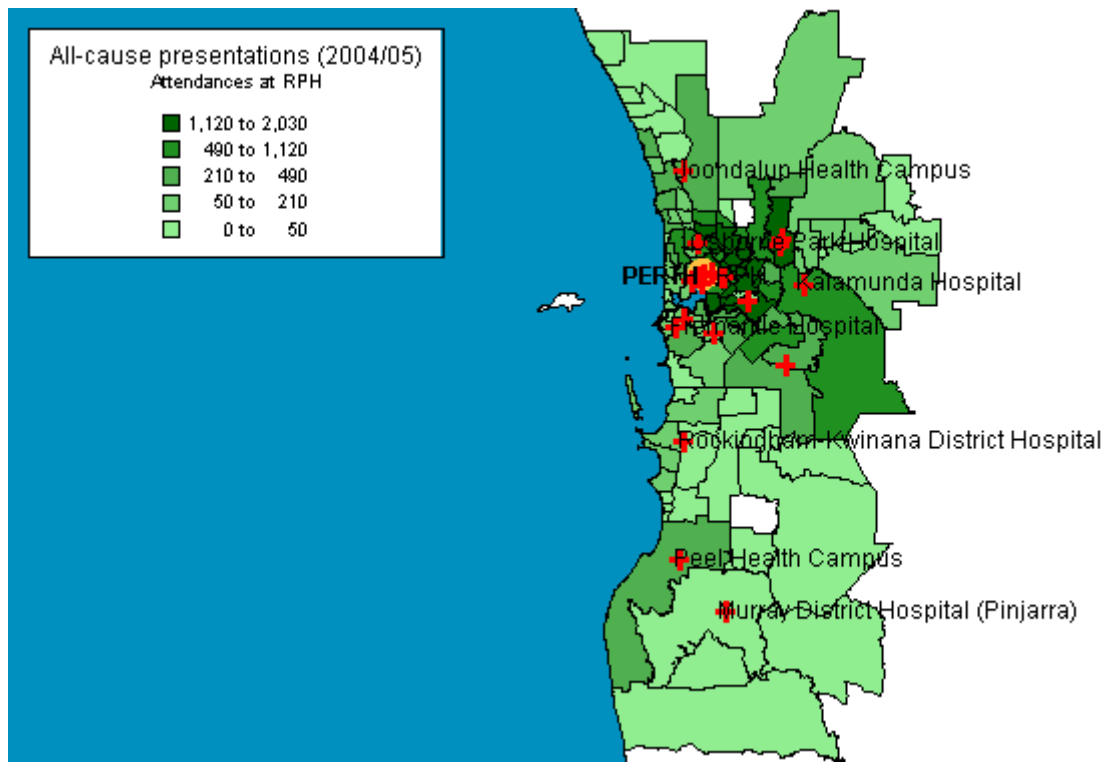


Figure 65: RPH - Percent presentations by PC of residence

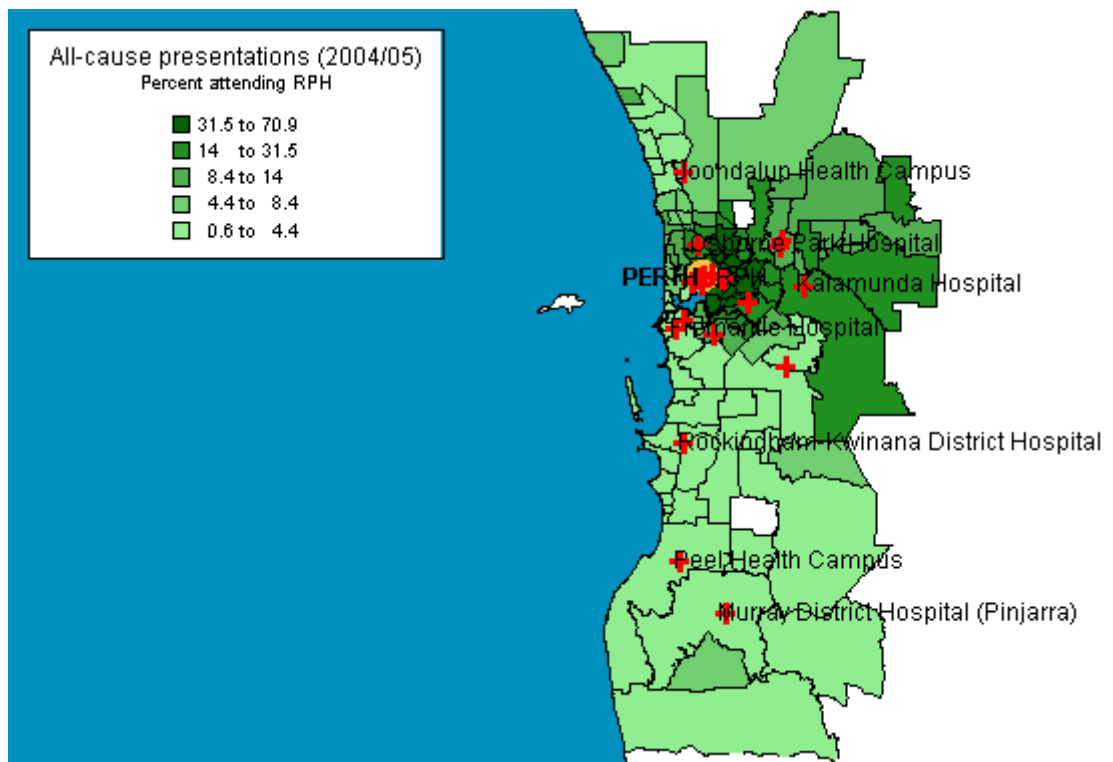


Figure 66: SCGH - catchment area by PC of residence

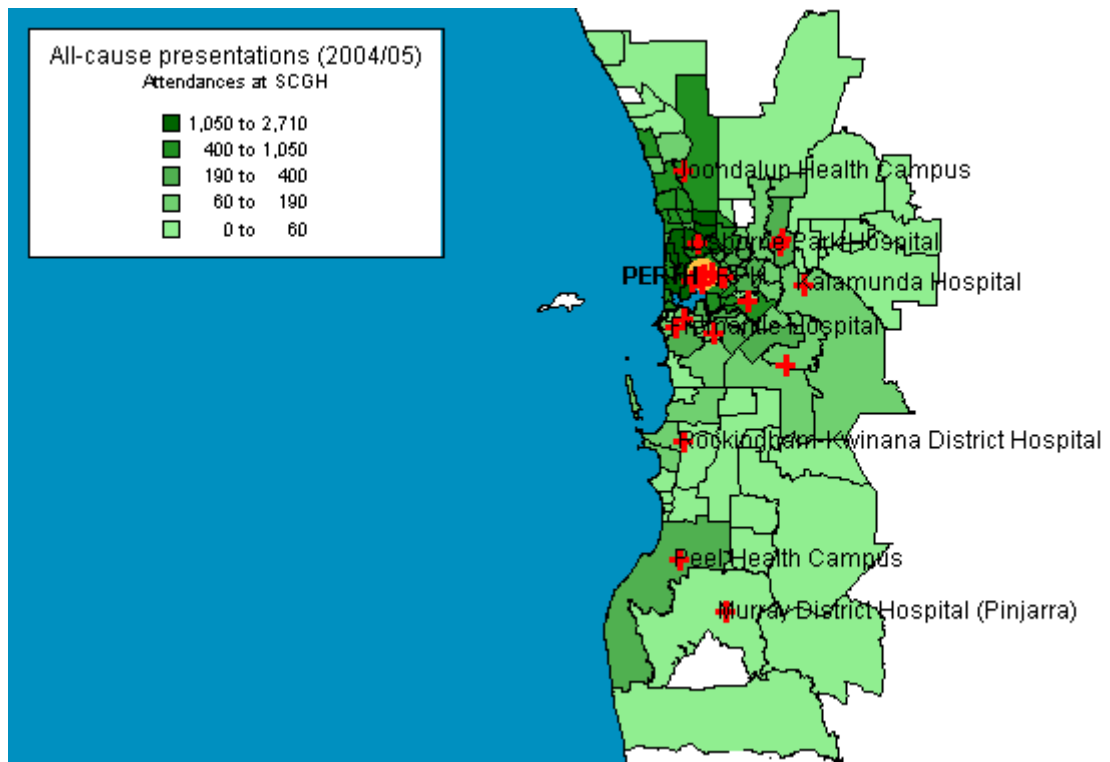


Figure 67: SCGH - Percent presentations by PC of residence

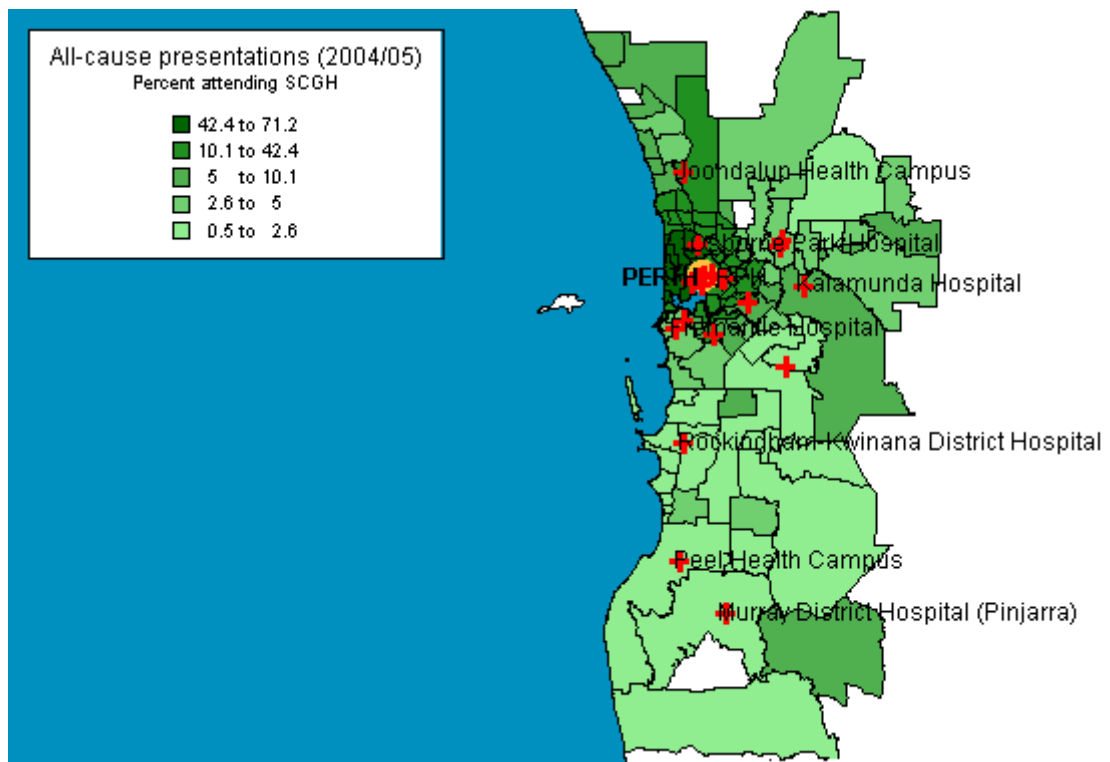


Figure 68: Fremantle Hospital - catchment area by PC of residence

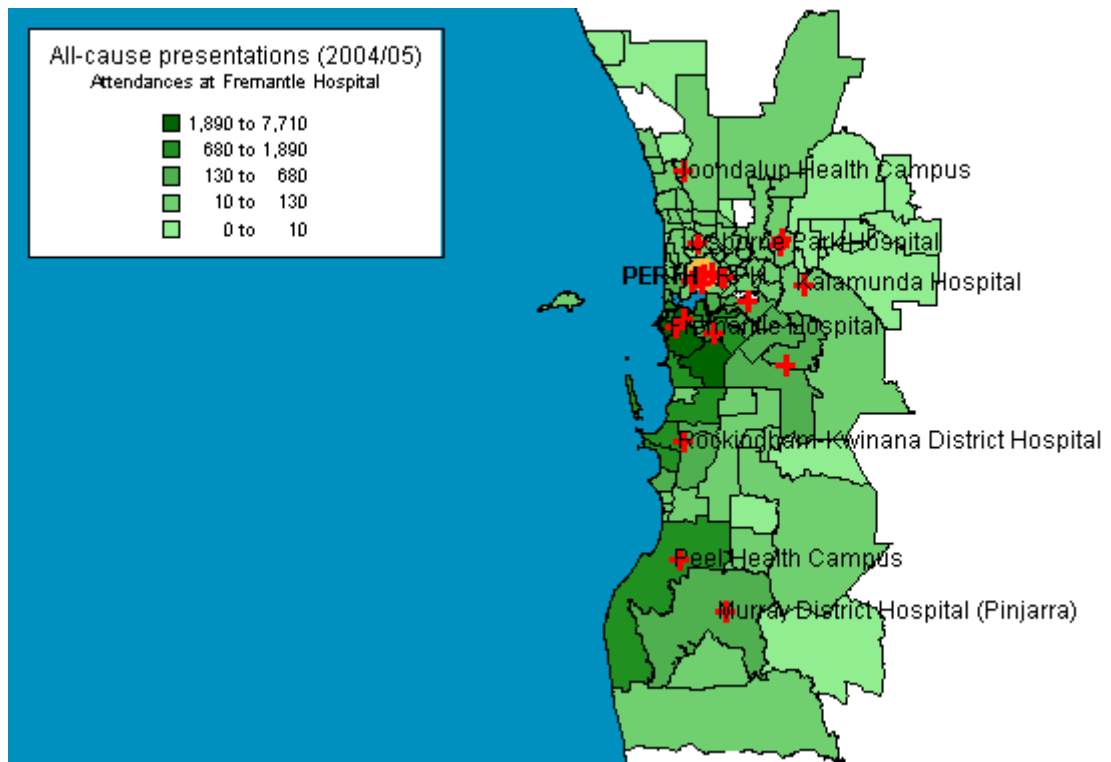


Figure 69: Fremantle Hospital - Percent presentations by PC of residence

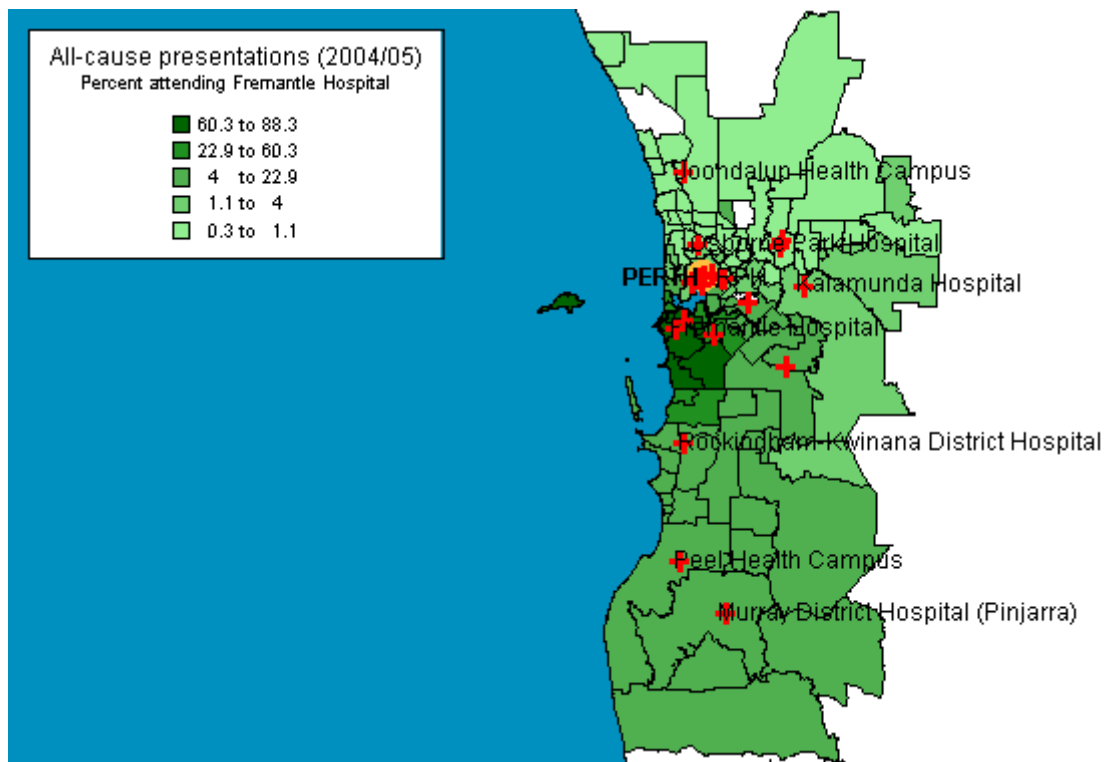


Figure 70: PMH - catchment area by PC of residence

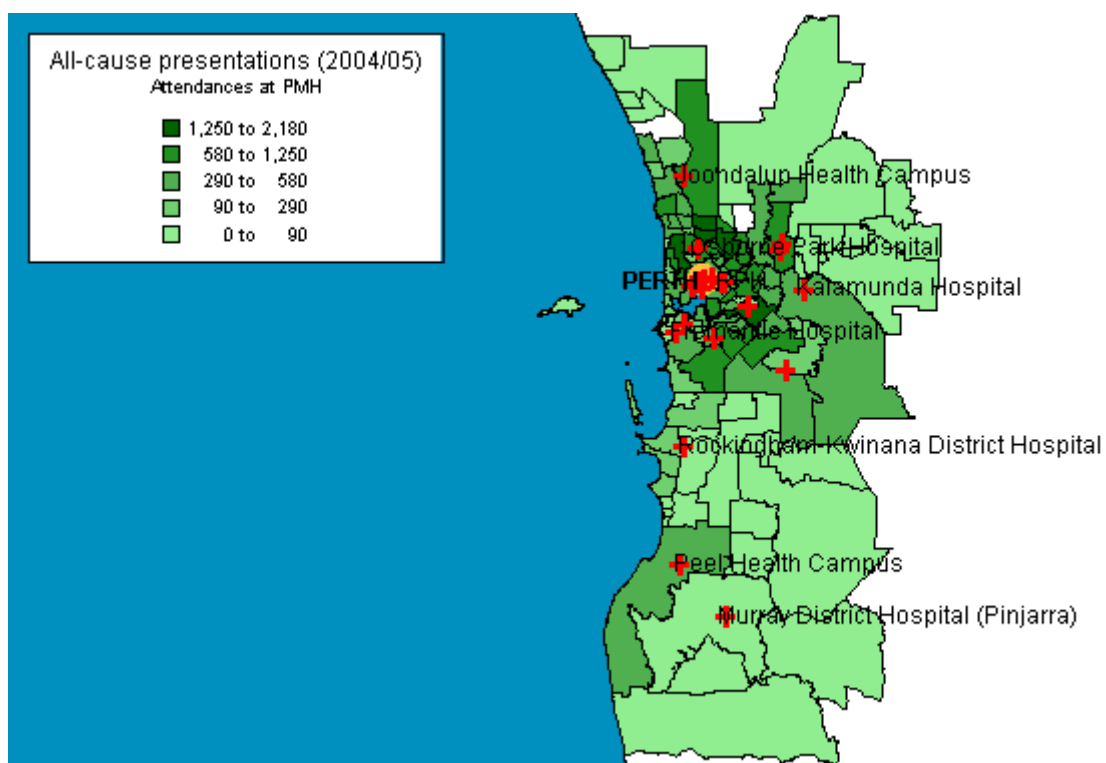
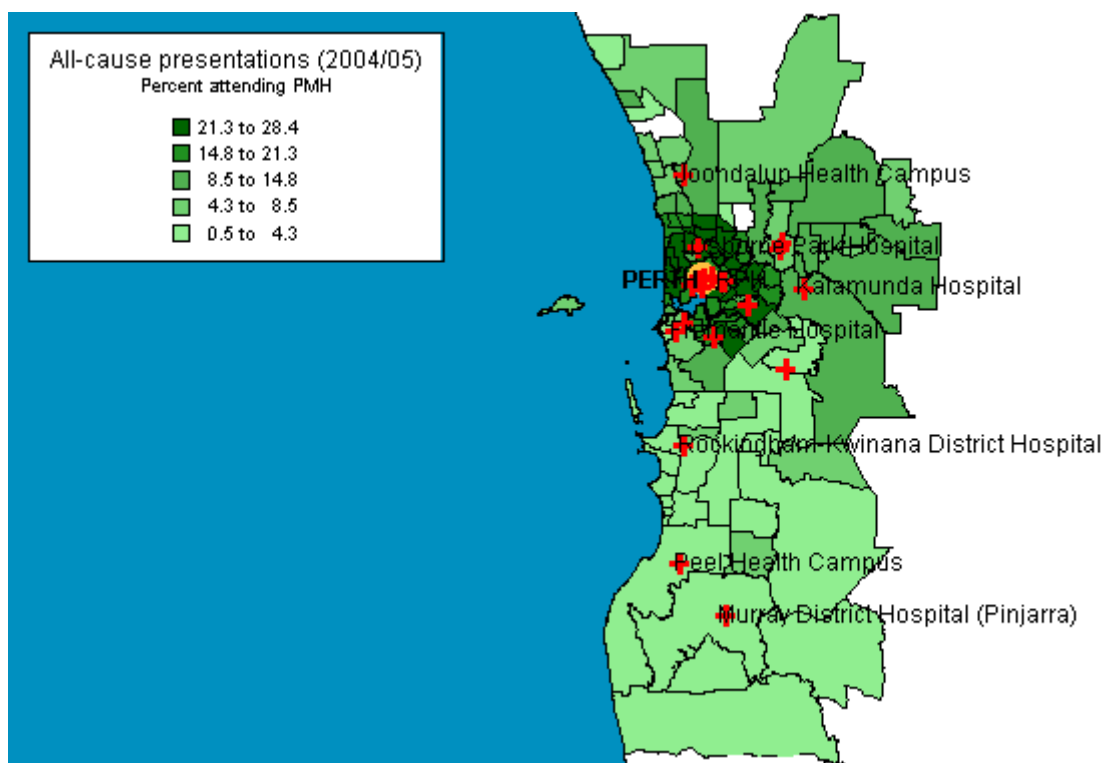


Figure 71: PMH - Percent presentations by PC of residence



Note: these statistics are not age-specific

Figure 72: KEMH - catchment area by PC of residence

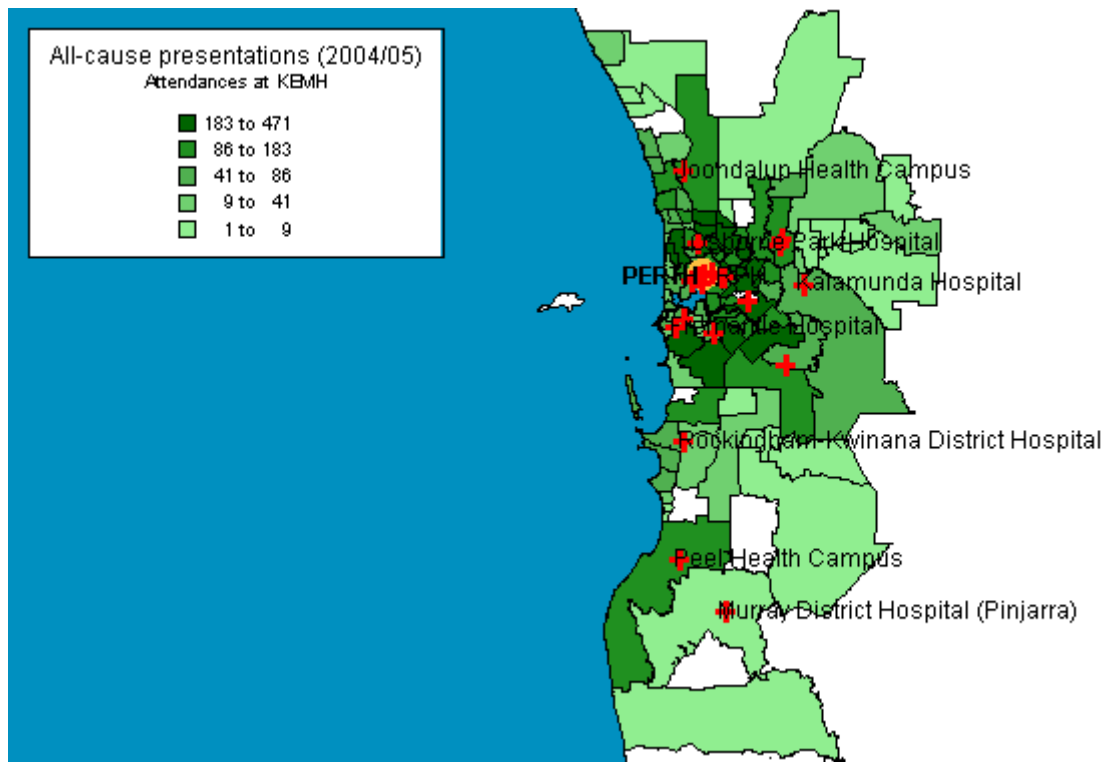


Figure 73: KEMH - Percent presentations by PC of residence

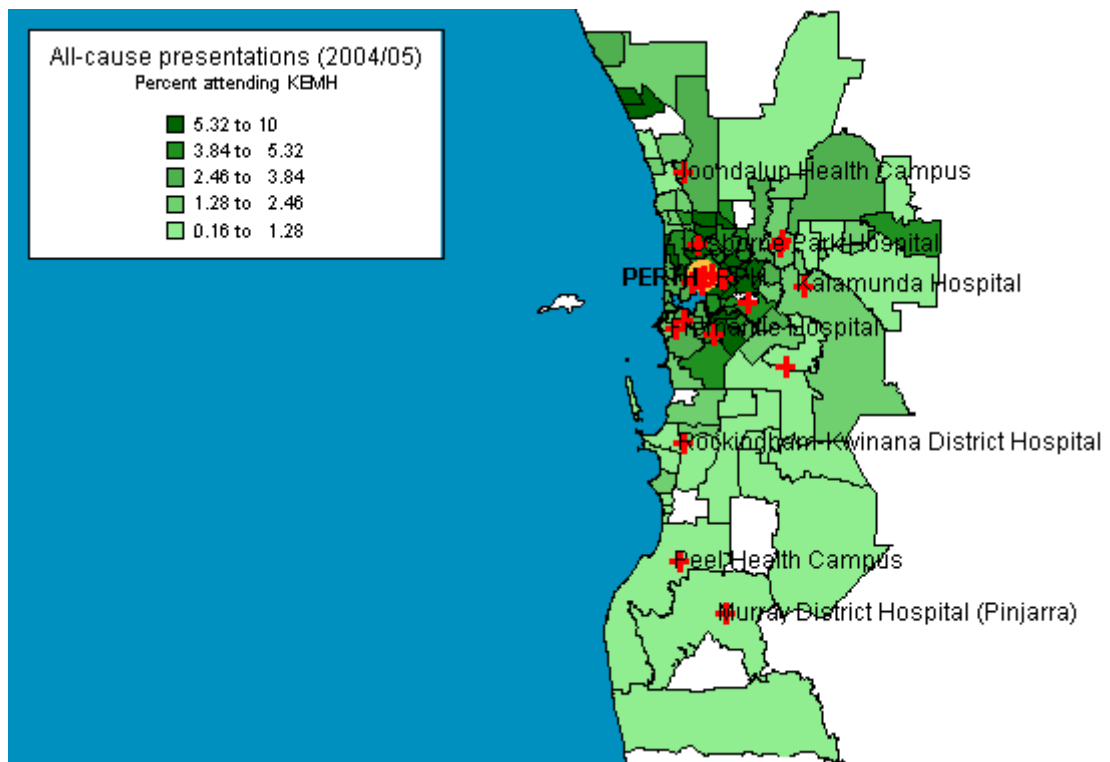


Figure 74: Joondalup Health Campus - catchment area by PC of residence

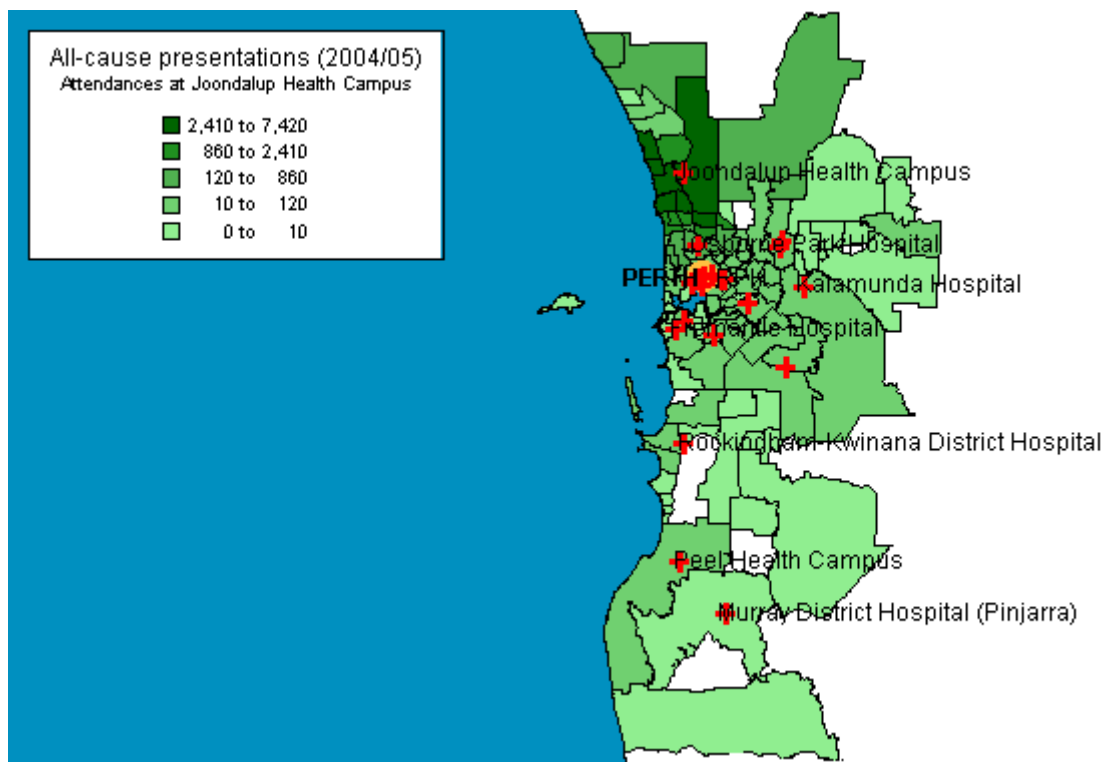


Figure 75: Joondalup Health Campus- Percent presentations by PC of residence

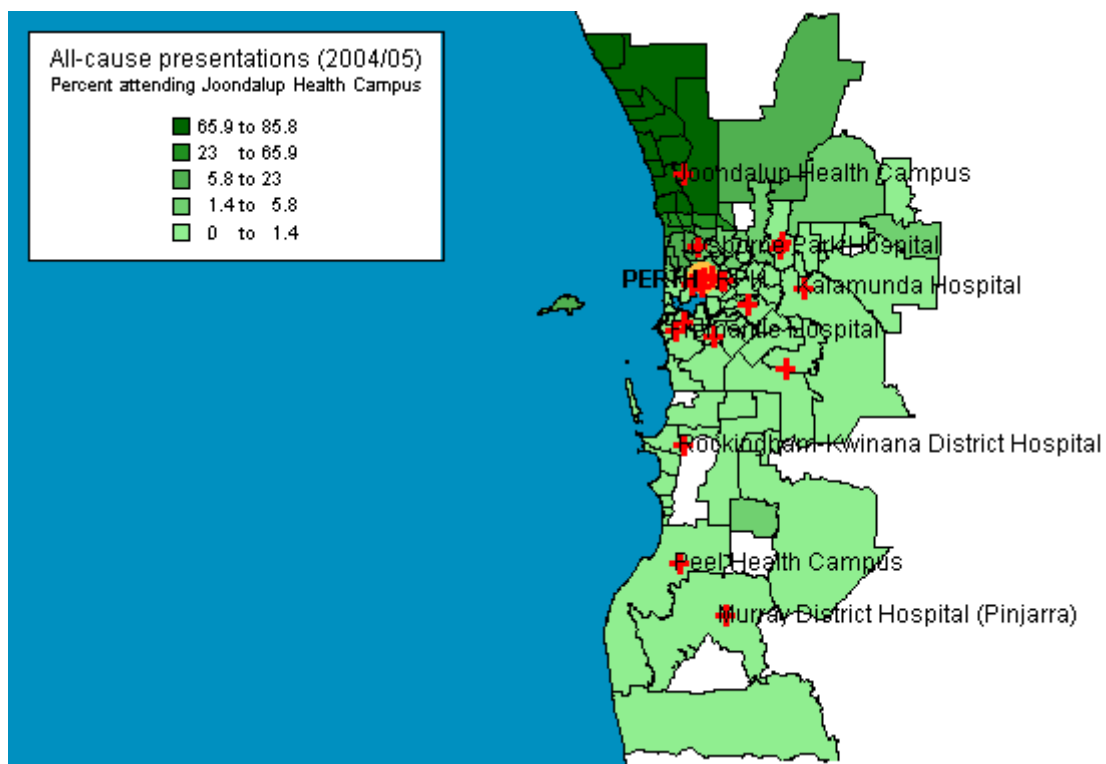


Figure 76: Swan District Hospital – catchment area by PC of residence

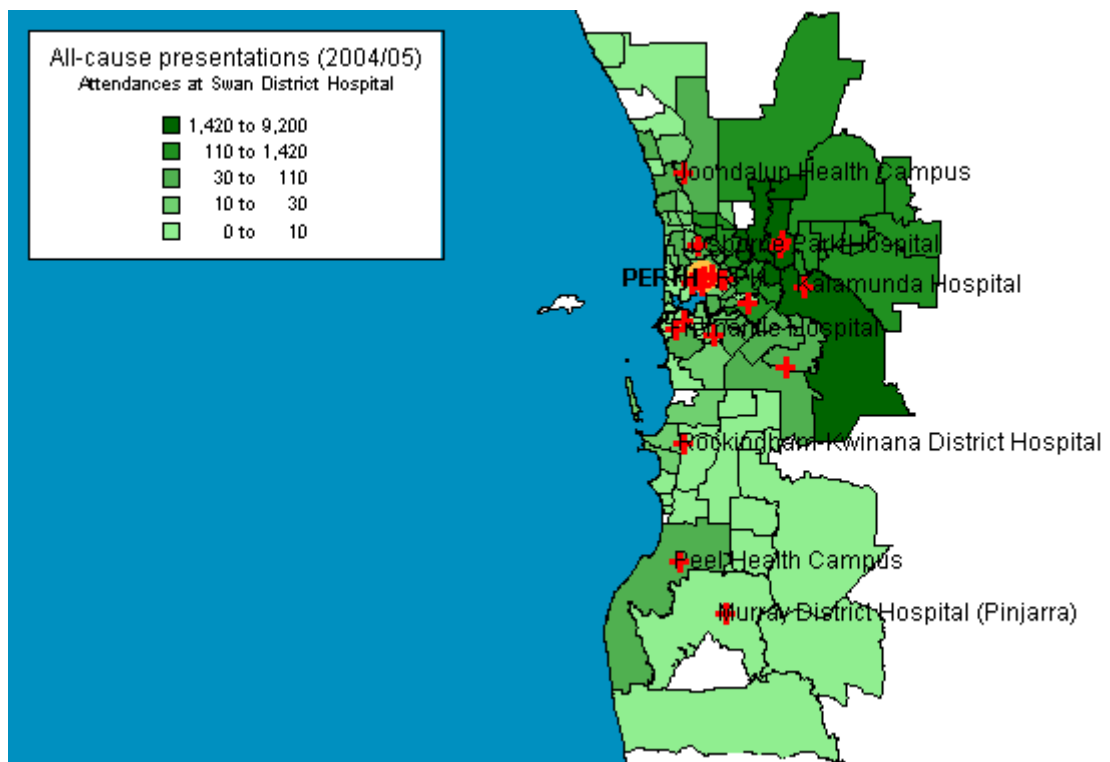


Figure 77: Swan District Hospital – Percent presentations by PC of residence

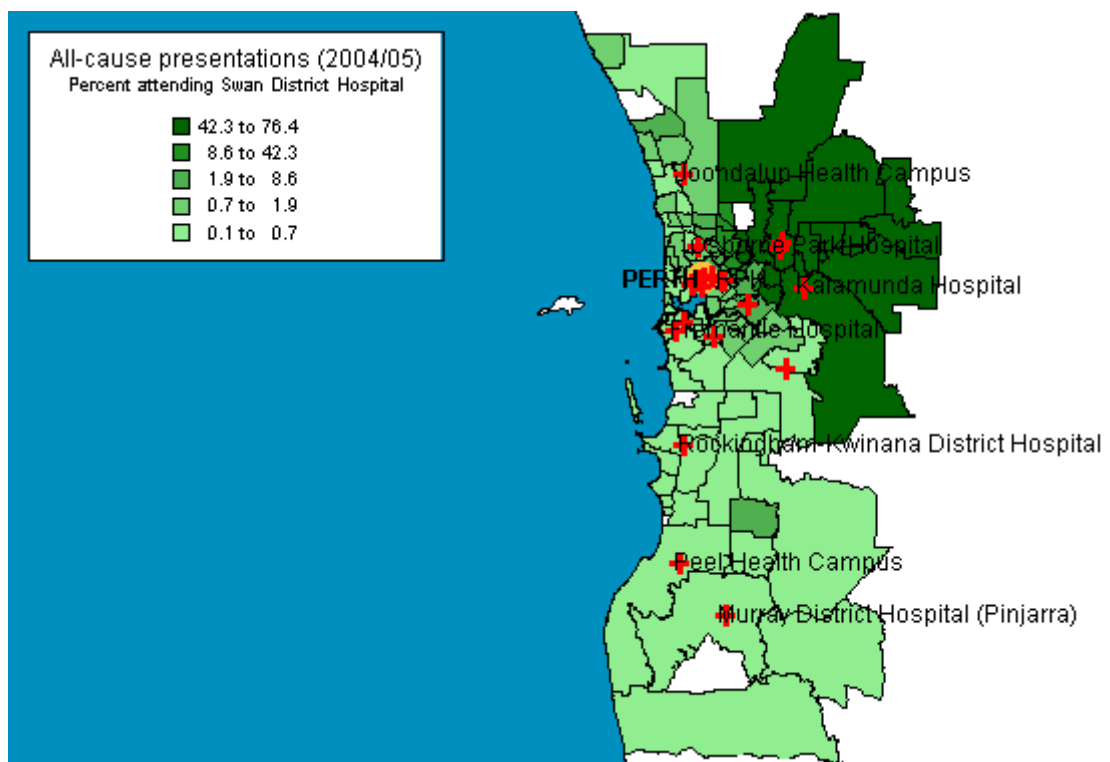




Figure 78: Armadale Kelmscott Memorial Hospital - catchment area by PC of residence

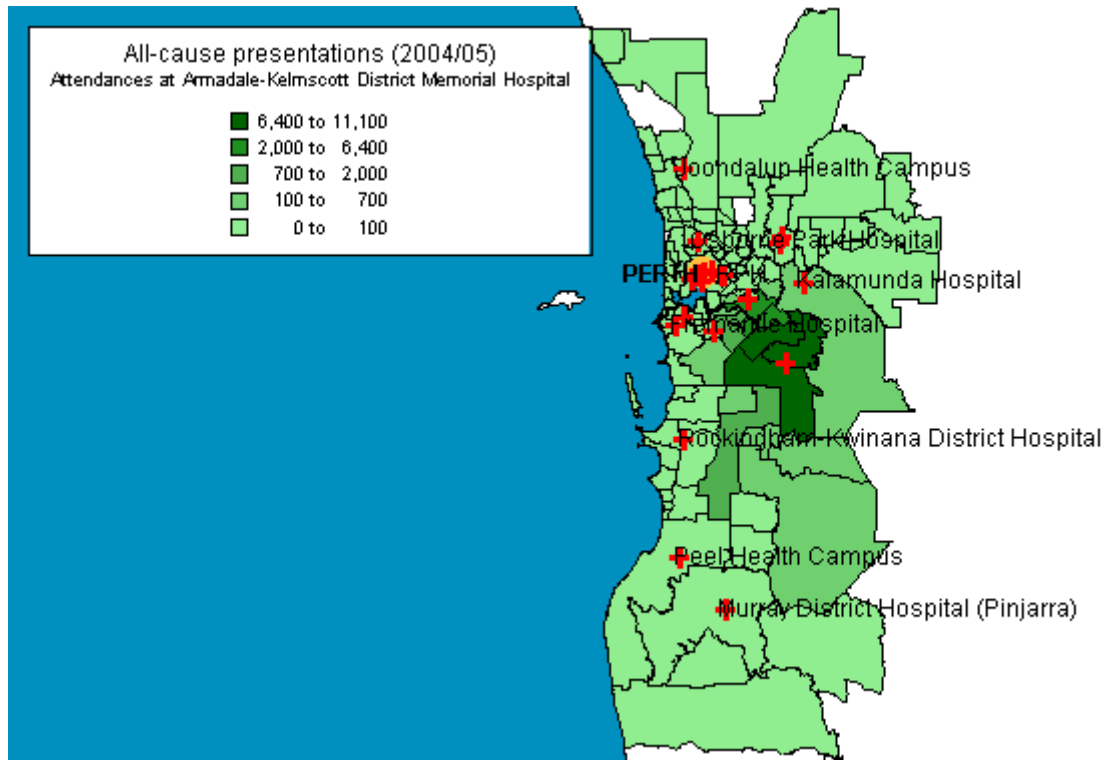


Figure 79: Armadale Kelmscott Memorial Hospital - Percent presentations by PC of residence

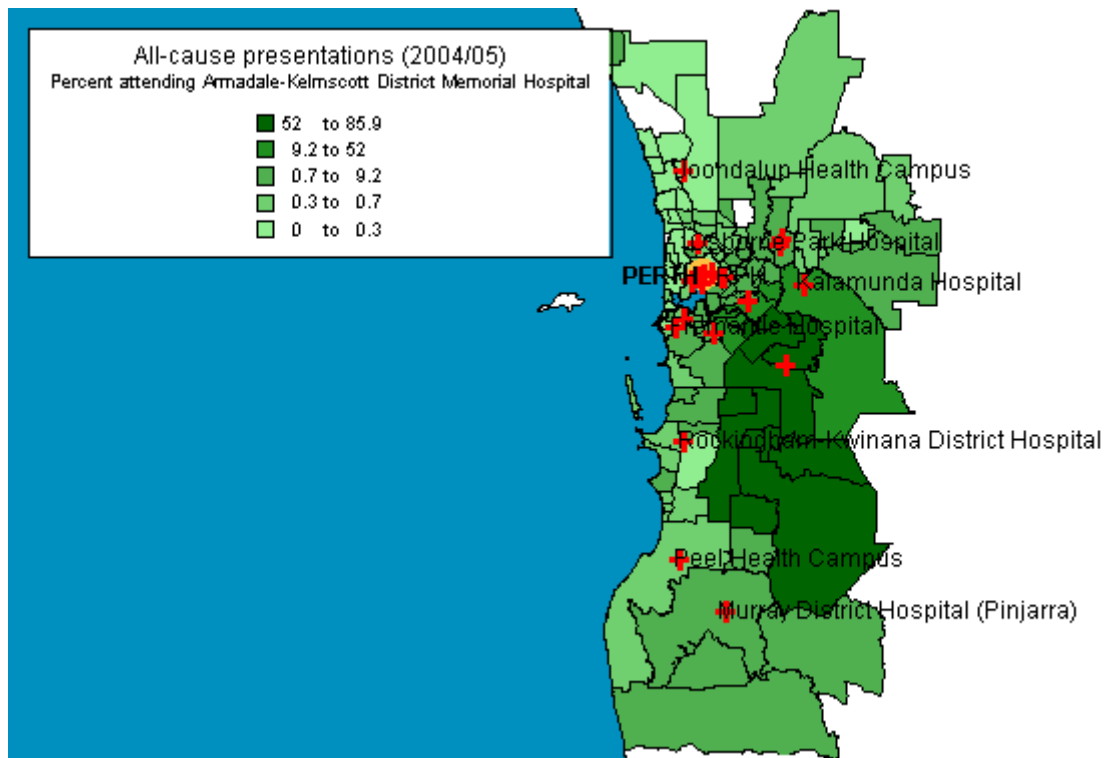


Figure 80: Rockingham/Kwinana District Hospital - catchment area by PC of residence

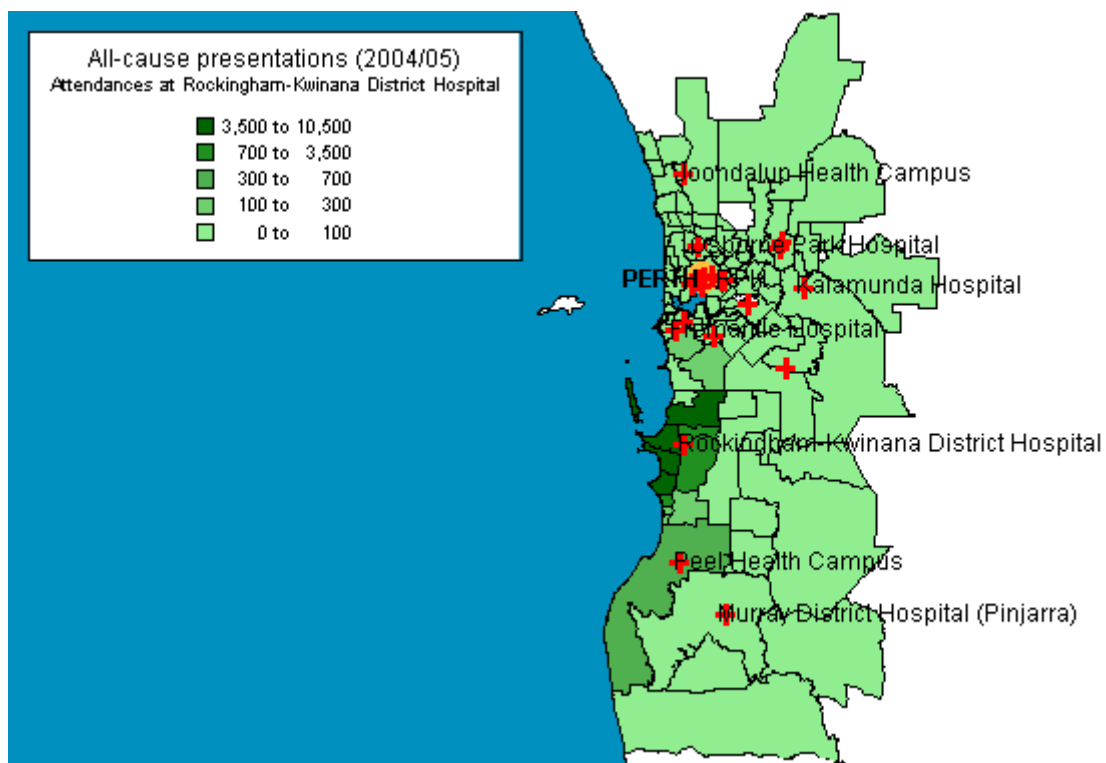


Figure 81: Rockingham/Kwinana District Hospital - Percent presentations by PC of residence

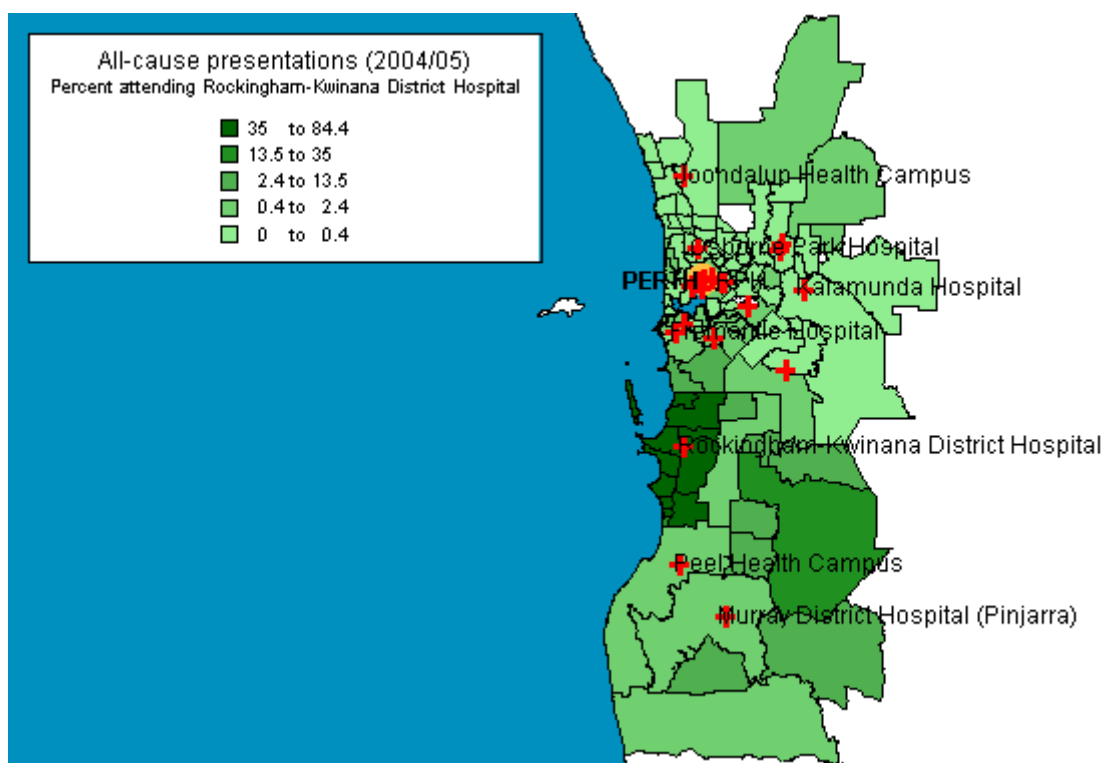


Figure 82: Peel Health Campus<sup>35</sup> - catchment area by PC of residence

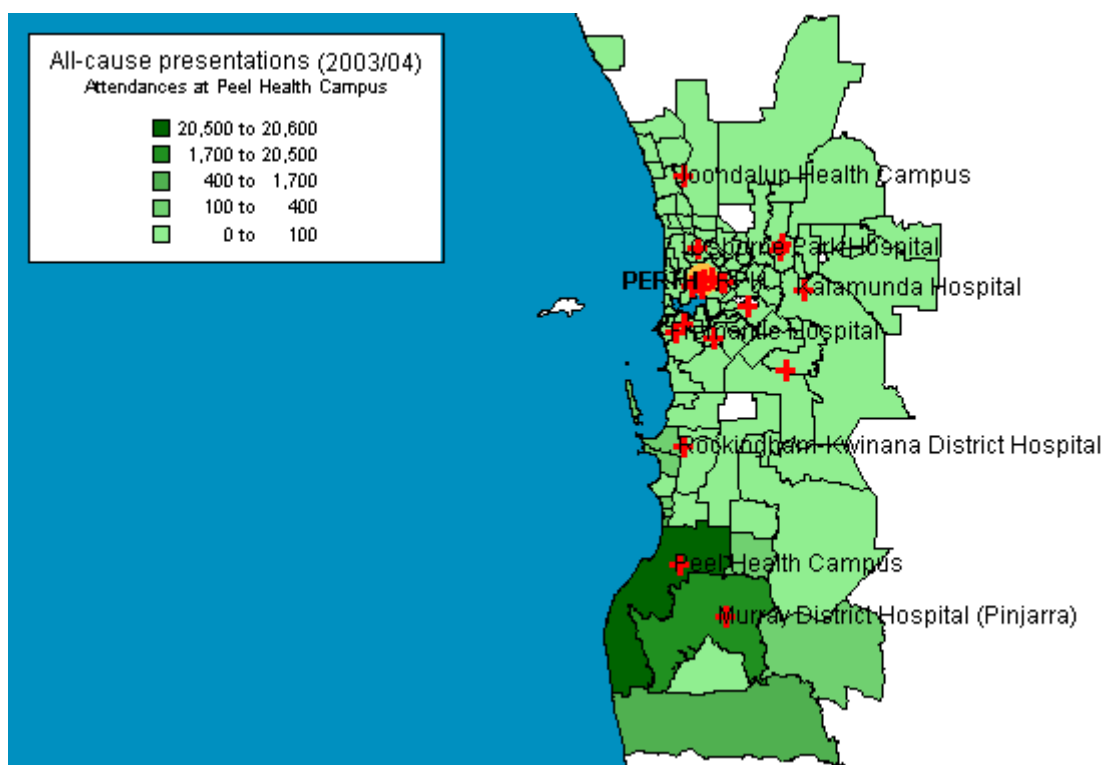
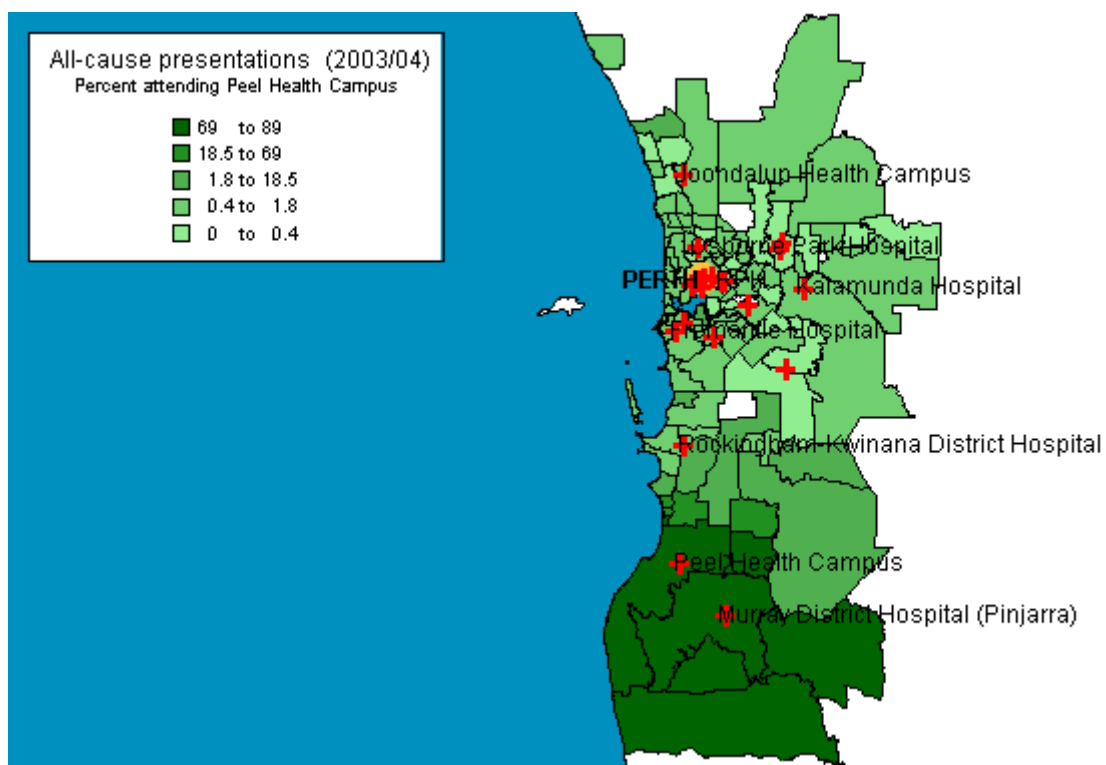


Figure 83: Peel Health Campus - Percent presentations by PC of residence



<sup>35</sup> Due to PHC data not been collected by EDIS, this data is actually from another source and is for 2003/04.

Table 31: Number of ED presentations by hospital and area of residence - 2004/05

Area of Residence	RPH	SCGH	FH	KEMH	PMH	Armadale	Rockingham	Swan	Joondalup	Total
NMAHS - Central	11,471	4,568	348	1,428	5,664	846	90	8,530	408	33,353
NMAHS - Joondalup	1,111	3,005	160	458	2,569	57	37	162	17,098	24,657
NMAHS - Oceanic	1,080	8,143	1,331	582	3,040	41	40	74	123	14,454
NMAHS - Stirling	7,426	13,511	368	1,840	8,752	124	124	652	3,728	36,525
NMAHS - Valley and Hills	3,795	1,437	200	754	3,732	192	78	18,803	1,425	30,416
NMAHS - Wanneroo	1,512	2,642	128	706	3,123	74	45	284	14,819	23,333
<i>NMAHS - Subtotal</i>	<i>26,395</i>	<i>33,306</i>	<i>2,535</i>	<i>5,768</i>	<i>26,880</i>	<i>1,334</i>	<i>414</i>	<i>28,505</i>	<i>37,601</i>	<i>162,738</i>
SMAHS - Armadale	2,501	869	2,014	625	2,314	31,257	372	313	108	40,373
SMAHS - Bentley	13,339	4,691	3,550	2,092	8,146	4,394	169	831	240	37,452
SMAHS - Fremantle	1,306	1,613	24,285	998	2,941	498	425	158	130	32,354
SMAHS - Peel	282	347	1,355	97	359	144	396	54	54	3,088
SMAHS - Rockingham-Kwinana	507	499	4,081	380	906	289	29,138	79	58	35,937
<i>SMAHS - Subtotal</i>	<i>17,935</i>	<i>8,019</i>	<i>35,285</i>	<i>4,192</i>	<i>14,666</i>	<i>36,582</i>	<i>30,500</i>	<i>1,435</i>	<i>590</i>	<i>149,204</i>
SWAHS - Blackwood	24	16	19	7	18	9	6	3	4	106
SWAHS - Bunbury	154	78	84	38	65	55	25	27	22	548
SWAHS - Busselton	66	71	55	8	59	17	15	16	19	326
SWAHS - Leeuwin	34	40	35	8	31	8	10	8	8	182
SWAHS - Leschenault	81	60	60	26	57	31	27	21	10	373
SWAHS - Warren	55	37	21	7	35	11	13	18	3	200
SWAHS - Wellington	47	36	21	8	41	17	13	8	6	197
<i>SWAHS - Subtotal</i>	<i>461</i>	<i>338</i>	<i>295</i>	<i>102</i>	<i>306</i>	<i>148</i>	<i>109</i>	<i>101</i>	<i>72</i>	<i>1,932</i>
WACHS - Kimberley	446	80	106	69	84	19	6	22	24	856
WACHS - Pilbara-Gascoyne	493	189	76	110	231	65	36	73	50	1,323
WACHS - Midwest-Murchison	447	226	91	86	216	62	42	96	66	1,332
WACHS - Wheatbelt	1,008	548	179	192	679	265	95	865	720	4,551
WACHS - Goldfields-South East	422	154	73	61	249	72	32	75	64	1,202
WACHS - Great Southern	231	175	110	42	174	105	46	55	28	966
<i>WACHS - Subtotal</i>	<i>3,047</i>	<i>1,372</i>	<i>635</i>	<i>560</i>	<i>1,633</i>	<i>588</i>	<i>257</i>	<i>1,186</i>	<i>952</i>	<i>10,230</i>
<b>Total</b>	<b>47,838</b>	<b>43,035</b>	<b>38,750</b>	<b>10,622</b>	<b>43,485</b>	<b>38,652</b>	<b>31,280</b>	<b>31,227</b>	<b>39,215</b>	<b>324,104</b>

Note: Yellow coloured cells highlight the nearest local ED service (Note that Peel Health Campus data not available)

Table 32: Hospital of ED presentation as a percentage by area of residence - 2004/05

Area of Residence	RPH	SCGH	FH	KEMH	PMH	Armadale	Rockingham	Swan	Joondalup	Total
NMAHS - Central	34%	14%	1%	4%	17%	3%	0%	26%	1%	100%
NMAHS - Joondalup	5%	12%	1%	2%	10%	0%	0%	1%	69%	100%
NMAHS - Oceanic	7%	56%	9%	4%	21%	0%	0%	1%	1%	100%
NMAHS - Stirling	20%	37%	1%	5%	24%	0%	0%	2%	10%	100%
NMAHS - Valley and Hills	12%	5%	1%	2%	12%	1%	0%	62%	5%	100%
NMAHS - Wanneroo	6%	11%	1%	3%	13%	0%	0%	1%	64%	100%
<i>NMAHS - Subtotal</i>	16%	20%	2%	4%	17%	1%	0%	18%	23%	100%
SMAHS - Armadale	6%	2%	5%	2%	6%	77%	1%	1%	0%	100%
SMAHS - Bentley	36%	13%	9%	6%	22%	12%	0%	2%	1%	100%
SMAHS - Fremantle	4%	5%	75%	3%	9%	2%	1%	0%	0%	100%
SMAHS - Peel	9%	11%	44%	3%	12%	5%	13%	2%	2%	100%
SMAHS - Rockingham-Kwinana	1%	1%	11%	1%	3%	1%	81%	0%	0%	100%
<i>SMAHS - Subtotal</i>	12%	5%	24%	3%	10%	25%	20%	1%	0%	100%
SWAHS - Blackwood	23%	15%	18%	7%	17%	8%	6%	3%	4%	100%
SWAHS - Bunbury	28%	14%	15%	7%	12%	10%	5%	5%	4%	100%
SWAHS - Busselton	20%	22%	17%	2%	18%	5%	5%	5%	6%	100%
SWAHS - Leeuwin	19%	22%	19%	4%	17%	4%	5%	4%	4%	100%
SWAHS - Leschenault	22%	16%	16%	7%	15%	8%	7%	6%	3%	100%
SWAHS - Warren	28%	19%	11%	4%	18%	6%	7%	9%	2%	100%
SWAHS - Wellington	24%	18%	11%	4%	21%	9%	7%	4%	3%	100%
<i>SWAHS - Subtotal</i>	24%	17%	15%	5%	16%	8%	6%	5%	4%	100%
WACHS - Kimberley	52%	9%	12%	8%	10%	2%	1%	3%	3%	100%
WACHS - Pilbara-Gascoyne	37%	14%	6%	8%	17%	5%	3%	6%	4%	100%
WACHS - Midwest-Murchison	34%	17%	7%	6%	16%	5%	3%	7%	5%	100%
WACHS - Wheatbelt	22%	12%	4%	4%	15%	6%	2%	19%	16%	100%
WACHS - Goldfields-South East	35%	13%	6%	5%	21%	6%	3%	6%	5%	100%
WACHS - Great Southern	24%	18%	11%	4%	18%	11%	5%	6%	3%	100%
<i>WACHS - Subtotal</i>	30%	13%	6%	5%	16%	6%	3%	12%	9%	100%
<b>Total</b>	<b>15%</b>	<b>13%</b>	<b>12%</b>	<b>3%</b>	<b>13%</b>	<b>12%</b>	<b>10%</b>	<b>10%</b>	<b>12%</b>	<b>100%</b>

Note: Yellow coloured cells highlight the nearest local ED service (Note that Peel Health Campus data not available)

Table 33: Percent of hospital ED presentations by area of residence - 2004/05

Area of Residence	RPH	SCGH	FH	KEMH	PMH	Armadale	Rockingham	Swan	Joondalup	Total
NMAHS - Central	24%	11%	1%	13%	13%	2%	0%	27%	1%	10%
NMAHS - Joondalup	2%	7%	0%	4%	6%	0%	0%	1%	44%	8%
NMAHS - Oceanic	2%	19%	3%	5%	7%	0%	0%	0%	0%	4%
NMAHS - Stirling	16%	31%	1%	17%	20%	0%	0%	2%	10%	11%
NMAHS - Valley and Hills	8%	3%	1%	7%	9%	0%	0%	60%	4%	9%
NMAHS - Wanneroo	3%	6%	0%	7%	7%	0%	0%	1%	38%	7%
<i>NMAHS - Subtotal</i>	<i>55%</i>	<i>77%</i>	<i>7%</i>	<i>54%</i>	<i>62%</i>	<i>3%</i>	<i>1%</i>	<i>91%</i>	<i>96%</i>	<i>50%</i>
SMAHS - Armadale	5%	2%	5%	6%	5%	81%	1%	1%	0%	12%
SMAHS - Bentley	28%	11%	9%	20%	19%	11%	1%	3%	1%	12%
SMAHS - Fremantle	3%	4%	63%	9%	7%	1%	1%	1%	0%	10%
SMAHS - Peel	1%	1%	3%	1%	1%	0%	1%	0%	0%	1%
SMAHS - Rockingham-Kwinana	1%	1%	11%	4%	2%	1%	93%	0%	0%	11%
<i>SMAHS - Subtotal</i>	<i>37%</i>	<i>19%</i>	<i>91%</i>	<i>39%</i>	<i>34%</i>	<i>95%</i>	<i>98%</i>	<i>5%</i>	<i>2%</i>	<i>46%</i>
SWAHS - Blackwood	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SWAHS - Bunbury	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SWAHS - Busselton	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SWAHS - Leeuwin	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SWAHS - Leschenault	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SWAHS - Warren	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SWAHS - Wellington	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<i>SWAHS - Subtotal</i>	<i>1%</i>	<i>1%</i>	<i>1%</i>	<i>1%</i>	<i>1%</i>	<i>0%</i>	<i>0%</i>	<i>0%</i>	<i>0%</i>	<i>1%</i>
WACHS - Kimberley	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%
WACHS - Pilbara-Gascoyne	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%
WACHS - Midwest-Murchison	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%
WACHS - Wheatbelt	2%	1%	0%	2%	2%	1%	0%	3%	2%	1%
WACHS - Goldfields-South East	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%
WACHS - Great Southern	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<i>WACHS - Subtotal</i>	<i>6%</i>	<i>3%</i>	<i>2%</i>	<i>5%</i>	<i>4%</i>	<i>2%</i>	<i>1%</i>	<i>4%</i>	<i>2%</i>	<i>3%</i>
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Note: Yellow coloured cells highlight the nearest local ED service (Note that Peel Health Campus data not available)

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