

# Primary care presentations at emergency departments: rates and reasons by age and sex

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## Abstract

Primary care presentations at emergency departments (EDs) have been the subject of much attention in recent years. This paper is a demographic analysis using administrative data from the Emergency Department Information System (EDIS) for 2005 of such presentations in New South Wales EDs and of self-reported reasons for presentation. Age and sex differences in the reasons given by patients for such presentations are analysed using data from a survey of patients conducted in a subset of EDs in 2004.

The rate of “potential primary care” presentations varies greatly with age and to a lesser extent with sex. Almost half (47%) of these presentations are made by people under 25 years of age. Children aged 0–4 years account for 14% of the total. The pattern is distinctly different to the corresponding rate of ED presentations that do not fit the “potential primary care” definition. Reasons given for “potential primary care” presentations are consistent across all age groups, reflecting self-assessed urgency, access to diagnostics and self-assessed complexity. Older “primary care” patients are particularly unlikely to give reasons associated with GP affordability or availability for their presentations. Young adults’ responses are consistent with the overall population, and children under the age of five seem most susceptible to availability issues.

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## What is known about the topic?

The debate on primary care presentations to EDs has concentrated on identifying their proportion of total ED caseload, emphasising definitional problems. Little is known about the demographic profile of these presentations or whether reasons for presentation differ with demographic characteristics.

## What does this paper add?

Despite differences in the presentation rates, patients in all demographic groups were most likely to identify self-assessed urgency; being able to see the doctor and having diagnostics done in the same place; and self-assessed seriousness or complexity as the reasons for presentation.

## What are the implications for practitioners?

Irrespective of age or sex, utilisation of EDs by these patients appears to be premised on reasonable decision-making processes and may not be amenable to programs focussed on clarifying service roles.

LESS URGENT PRESENTATIONS at emergency departments (EDs) have received attention in recent years. As a result of well publicised problems of access to care in emergency departments<sup>1,2</sup> they have been perceived as an issue for concern in ED management not only in Australia but in places as disparate as Canada,<sup>3</sup> Spain,<sup>4</sup> Britain,<sup>5-8</sup> France,<sup>9</sup> Holland,<sup>10</sup> New Zealand<sup>11</sup> and many others.<sup>12,13</sup> A recent study focussed on the reasons that “potential primary care” (PPC) patients give for presenting to EDs rather than to general practitioners.<sup>14</sup> The main finding was that patients identified “very appropriate and sensible reasons for coming to the ED — urgency, complexity and being able to have the diagnostic tests they had anticipated would be required”. It was argued that improvements to GP affordability and availability would hence be unlikely to affect the numbers of such attendances in a large way.

## Importance

Recent publications in the Australian context have focussed on illustrating the small proportion of overall presentations for which this patient group accounts.<sup>15-18</sup> They further emphasise that urgency Category 4 and 5 patients do not equate to primary care patients. If, despite definitional issues, strategies are to be developed to influence patients in this group into altering their pattern of accessing health care, then a broad set of factors must be considered. This includes any discrepancy between self-assessed and clinician-assessed urgency. Further, there needs to be an understanding of variation both between PPC presentations and other presentations (non-PPC), and within the group of PPC cases.

This paper explores presentation patterns specific to PPC cases, how they compare to non-PPC presentations and whether differences exist in reasons for presentation between age and sex subgroups of PPC cases.

## Methods

The paper draws on two data sources that provide the data on patterns of presentation and insight into the possible drivers for any differences between PPC presentations and non-PPC presentations. The first is an administrative data set — EDIS (Emergency Department Information System), which at December 2005 covered 61 EDs in New South Wales, representing 76 per cent of NSW ED attendances.<sup>19</sup> The EDs covered by this system include all major departments in the state of NSW. The departments not included are a selection of small, rural, GP-run services and some very small metropolitan units. The second data source is a survey of patients conducted in 2004, described in detail elsewhere.<sup>14</sup> Patients completed the survey in the Emergency Departments of the Illawarra region of NSW at the time of presentation. The survey included five EDs representing all levels of facility within the state from rural, GP-run service through to major regional referral. Patients were offered 20 possible responses as to reasons for their choice to attend the ED, as well as the option of further

comment. Any number of responses could be selected.

In both sources, the analysis focussed on a group of patients that would represent PPC attendances. Based on a review of the literature,<sup>20</sup> attendances were classified as “potential primary care” in the survey when they met all of the criteria below:

- low urgency and/or acuity, indicated by being classified as Triage Category 4 or 5 on the Australasian Triage Scale;
- did not arrive by ambulance;
- were self-referred. By definition, patients referred by GP/community primary medical services are not primary care cases because a primary care service has referred them on;
- were presenting for a new episode of care; and
- were not expected to be admitted (according to the assessment of staff in the ED).

The same definition was used in EDIS, with two exceptions. “Not admitted” was used as a criterion instead of “not expected to be admitted” since this was a retrospective analysis. Source of referral was not available in EDIS. Irrespective of the definition used, they reflect a group that is only potentially appropriately managed in a primary care setting rather than an ED. The breadth of the definition in either instance will mean that there is a significant overestimate of cases.

De-identified EDIS data were selected for the 2005 calendar year, tabulated by potential primary care status, sex and age in 5-year bands. The number of presentations and presentation rates were calculated from EDIS data and the estimated resident population for NSW at June 2005.<sup>21</sup>

The survey involved a convenience sample of 400 PPC patients invited to participate between 14 January 2004 and 19 April 2004. Of these, only three refused, a response rate of over 99%. About half the participants (those not accompanied by friends or family) were assisted in responding to the questionnaire by the nurse researcher.

The reasons given by patients in the survey were analysed by age and sex. The selection of age categories for the survey analysis was informed by the presentation rate results. The age groups

analysed were 0–4 years, 5–14 years, 15–29 years, 30–64 years and 65+ years. Particular attention is given to the 0–4, 15–29 and 65+ year categories, for reasons discussed below. Only the first 18 reasons for presentation were considered, because the sample of after-hours presentations was too small to analyse by age. The proportions of people selecting each reason as very important or moderately important were tabulated. The mean number of very important or moderately important reasons were also analysed.

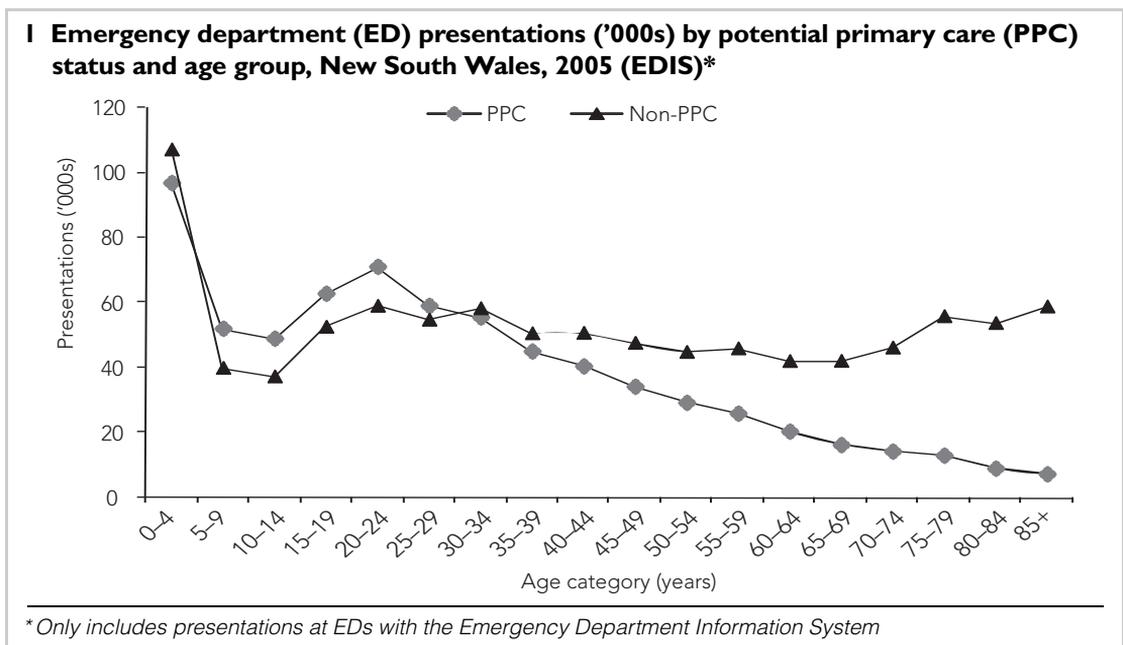
## Results

### Presentations by age and sex

The number of ED presentations in 2005 by age and potential primary care status (PPC or non-PPC) is shown in Box 1. Some 0.5% of records were not classifiable as PPC or non-PPC due to missing data on one or more of the criteria. These records were excluded from the analysis. Almost half (47%) of PPC presentations were by people aged under 25 years. By far the largest number of PPC presentations was by children aged 0–4 years, accounting for 14% of the total. This pattern contrasts with the profile of non-PPC

presentations. The non-PPC profile was characterised by a relatively even age distribution, though it included a high number of presentations by 0–4 year olds. Thus, in raw numbers PPC presentations were dominated by younger age groups, while non-PPC presentations had an even age distribution.

The results shown in Box 1 are partly a function of the age distribution of the population. It is thus informative to consider the rates of ED presentations, equal to the number of presentations in each sex–age group divided by its population. PPC presentation rates are shown in Box 2. Overall, the male rates were 18% higher than the female rates on an age-standardised basis. The PPC presentation rate was clearly highest among the youngest age group (0–4 years) (244 and 210 per 1000 people for males and females, respectively). This was more than twice as high as the overall rate (105). For both sexes, the rate was also relatively high among people aged 15–29 years. It decreased for subsequent age groups to 55–59 years. The rate levelled off for older females, but increased slightly for older males. This shows that the dominance of younger age groups persists even



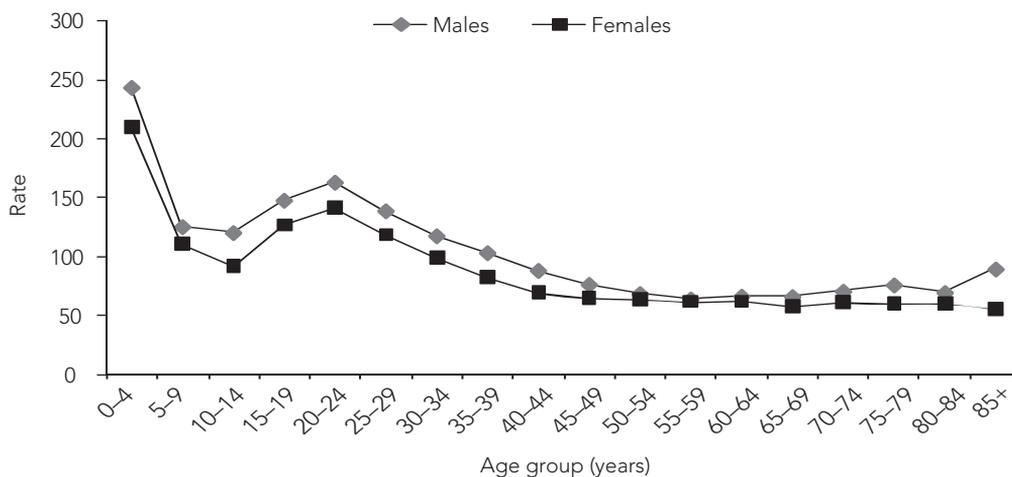
after the age distribution of the population is accounted for.

People aged 65 years and over accounted for only 8.9% of PPC presentations in 2005. However, while the overall PPC presentation rate fell between 1999 and 2006, it increased among people aged 65 years and over.<sup>22</sup> Thus, despite

relatively low PPC presentation rates, older age groups are of particular interest when developing access strategies because of further projected population ageing and their relatively large apparent increase in PPC presentation rates.

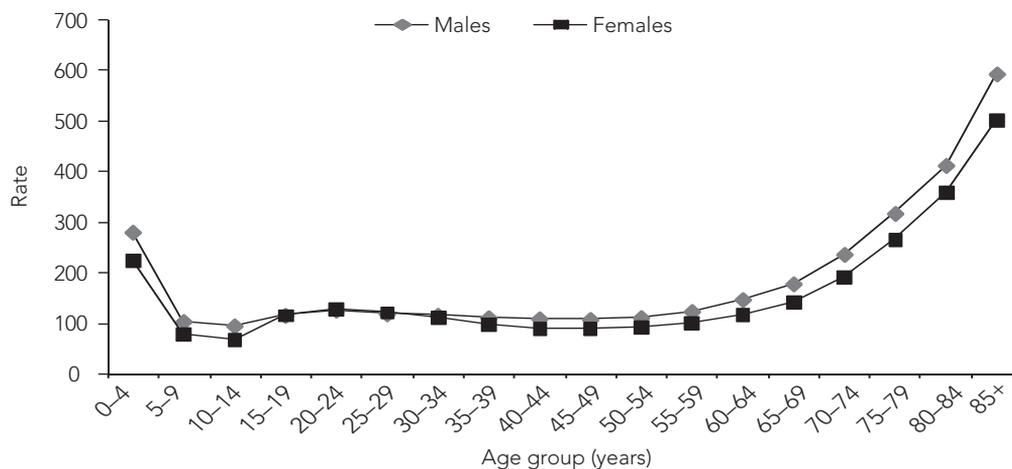
For comparative purposes, non-PPC presentation rates are shown in Box 3. Unlike the PPC

## 2 Emergency department (ED) potential primary care (PPC) presentation rates by sex and age (per 1000 people), NSW, 2005 (EDIS)\*



\* Only includes presentations at EDs with the Emergency Department Information System.

## 3 Emergency department (ED) non-PPC presentation rates by sex and age (per 1000 people), NSW, 2005 (EDIS)\*



\* Only includes presentations at EDs with the Emergency Department Information System.

rate, the non-PPC rate increased greatly with age from about 60 years. The non-PPC rate for persons aged 85 and over was 531, more than 5 times higher than for 45–49 year olds, and 8 times higher than the PPC rate for people aged 85 and over. Thus, older people were utilising EDs much more frequently overall and predominantly for non-PPC issues. As in the PPC rates, males also had a higher non-PPC presentation rate than females (16% higher on an age-standardised basis), though the difference was close to zero in most child-bearing age groups. The 15–29 years age group had slightly higher non-PPC presentation rates than immediately younger and immediately older age groups, but this spike was not as large as it was for PPC rates.

### Reasons for presenting

The reasons given by PPC patients for presentation at an ED, as identified in the survey, are analysed primarily by age. The difference between males and females was not statistically significant for any of the 18 reasons, even at the 10% level, regardless of whether “very important” reasons are considered in isolation, or “very important” and “moderately important” reasons are considered together. This is an important finding in that it suggests that there is no evidence of a gender-based element to this care choice.

Results are shown for all age groups but attention is focussed on:

- Infants (0–4 years) because they had the highest presentation rates;

- Young adults (15–29 years) because they had the next highest presentation rates, which had a sharper spike than corresponding non-PPC rates. They were also hypothesised to be susceptible to issues of GP availability and affordability.
- Older people (65 years and over) because they appeared to have the fastest growth in presentations.

In interpreting the results, it is important to note that the average number of reasons selected by patients differed with age. Younger patients (or their proxies) selected more reasons than older patients (or their proxies) (Box 4). The sample size of each group is also shown. All subsequent results should be interpreted in this context. The sample size is particularly small for children aged less than 5 years.

The complete set of results by age is shown in Box 5. The most striking finding was the consistency of the most prevalently selected reasons across all age groups. Regardless of age, Q1, Q7 and Q2 (in that order) were selected as very important by the greatest proportion of people. These reflect self-assessed urgency, access to diagnostics and self-assessed complexity. When very important and moderately important reasons were analysed together, the same finding was observed, with the exception that for 15–29 year olds, Q1 and Q7 ranked equal first. For all age groups, these three reasons stood out from the other reasons.

Attention is now turned to the subset of reasons that relate to primary care availability or afforda-

#### 4 Sample size and average number of reasons selected, by age of patient

Age group (years)	Sample size (no.)	Average number of reasons*		
		Very important	Moderately important	Very important or moderately important
< 5	19	2.8	2.1	4.8
5–14	36	2.3	1.3	3.6
15–29	105	2.1	2.0	4.1
30–64	154	2.2	1.3	3.5
65+	74	2.2	0.9	3.0
All ages <sup>†</sup>	388	2.4	1.4	3.7

\* Questions 19 and 20 are excluded. † “All ages” excludes those records with missing age to conform to its components.

### 5 Very important and moderately important reasons why patients presented to an emergency department (ED), by age group\*

Summary reason	Age group (years)					
	<5	5–14	15–29	30–64	65+	All ages†
Q1: Problem too urgent	95	86	83	75	81	80
Q2: Problem too serious/complex	68	49	50	50	60	53
Q3: Medical treatment better at ED	42	31	35	34	33	34
Q4: Second opinion	21	8	16	13	13	14
Q5: Did not want GP to know	11	0	2	3	1	2
Q6: Prefer doctor I don't know	11	0	11	4	3	6
Q7: See doctor and have tests/x-rays done in same place	83	69	83	71	70	74
Q8: Not able to see GP as books are closed	17	14	19	19	5	16
Q9: Not happy with GP waiting time	44	22	20	31	11	24
Q10: Do not like making appointments	28	6	19	12	1	12
Q11: Easier to get to the ED	28	28	24	17	23	21
Q12: No charge to see a doctor	17	14	15	8	0	9
Q13: No charge for x-rays or medicine	17	14	18	9	0	10
Q14: Female doctor	0	0	5	2	0	2
Q15: Doctor or interpreter who speaks my language	0	0	5	2	0	2
Q16: Aboriginal health staff	0	0	5	2	0	2
Q17: Prefer ED environment	6	11	8	4	1	5
Q18: Traditional use by family	11	8	14	7	4	9

\* All values are percentage of valid responses. The reasons are in summary format. A copy of the survey has been published previously.<sup>14</sup> † "All ages" excludes those records with missing age to conform to its components.

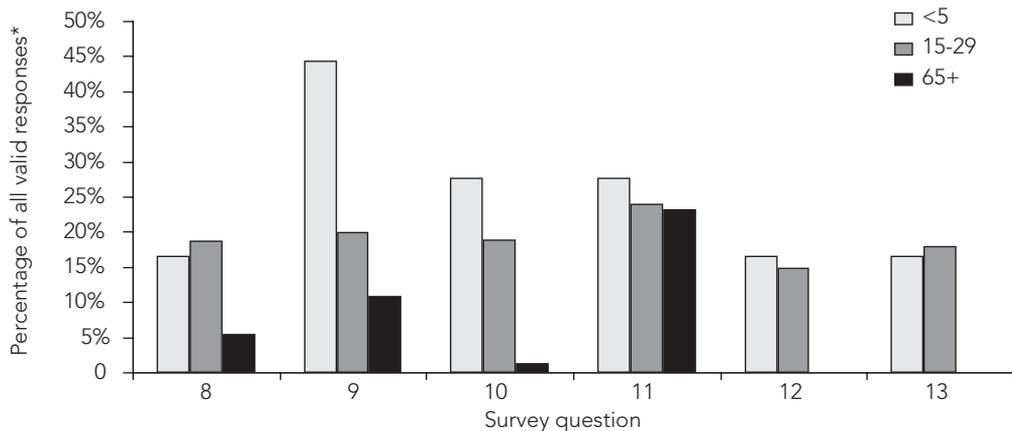
bility and to the age groups selected for particular attention. Questions 8, 9, 10 and 11 all related to availability. Questions 12 and 13 related to affordability. The results (which include both very important and moderately important reasons) are shown in Box 6.

Older patients were very unlikely to select affordability or availability reasons. In fact, of 74 respondents aged 65 or over, not a single person selected an affordability reason as being important. This is perhaps unsurprising, as older people are more likely to be bulk-billed (no direct fee paid by the patient) than others.<sup>23</sup> Older people were also unlikely to select issues of availability. Of all age groups, they were the least likely to select questions 8, 9 or 10. The proportion of older people to select question 11 was similar to the rest of the population. This may reflect a high

reliance on public or community transport. Availability can also be analysed as a single factor, calculated as the sum of Q8, Q9, Q10 and Q11. The average of this variable is significantly smaller ( $P < 0.001$ ) among older people (0.41) than for the other age groups combined (0.78). These results are not a function of older people's apparent tendency to select fewer reasons (Box 4). In fact, these six questions, combined, accounted for most of the difference in average number of reasons selected between older people and the full sample.

A second observation relates to the unremarkable responses of those aged 15–29 years. It was hypothesised that this group may be particularly susceptible to issues of availability and affordability. This did not appear to be the case. Their responses to the availability questions were quite

## 6 Reasons associated with general practitioner availability or affordability, by selected age groups



\* Includes very important and moderately important reasons

similar to those of the full sample. Their responses to the affordability questions were very similar to those made on behalf of children aged under 15 (who were slightly more likely to select these reasons than those aged 30 and over). The unexceptional responses of young adults are not confined to questions of affordability and availability, as can be seen from a closer inspection of Box 5.

Finally, children aged under 5 years appeared to be slightly more vulnerable to availability issues, particularly in relation to waiting time for a general practitioner appointment (Q9). The percentage of persons selecting this as a reason on behalf of children under 5 (44%; 8/18) was almost twice as high as the rest of the sample (23%). Considered in isolation, this difference is statistically significant ( $P < 0.05$ ). However, the general tendency of such respondents to select more reasons than other respondents weakens the strength of the conclusion. When availability is considered as a factor, the difference between the responses for children under 5 and the rest of the sample is not statistically significant. At best, this finding constitutes a weak suggestion that GP waiting time may be a particular issue for children aged under 5. If true, this may be because

parents are likely to escalate their judgement of urgency for infants and they are hence more likely to seek immediate medical attention. This is supported by the observation that urgency was selected as a reason by almost all people (95%) responding on behalf of children aged under 5 years.

### Limitations

As discussed above, this study used data from two data sources. This creates two possible issues. The first is that the survey participants are not a random sample of NSW EDIS cases. However, these results for patients in the Illawarra area may be regarded as a useful indicator for broader inference because of geographic and other characteristics, as discussed elsewhere and repeated in summary form here.<sup>14</sup> EDs in the Illawarra area span all types, from a major referral hospital to small community hospitals. On a number of ED, general practice and socioeconomic indicators, the Illawarra area is very similar to NSW overall. These include ED and general practice utilisation rates, average ED waiting times by triage, and bulk-billing rates. A slightly higher proportion of Illawarra patients were affected by access block

than for NSW overall. Of the 17 NSW health areas at the time of the survey, Illawarra ranked near the middle in remoteness and in socioeconomic status.

The second issue is that the definitions of PPC differed between the sources in two ways. Source of referral was used as a criterion for the survey, but not for the EDIS analysis, because the data item is incomplete. For a subset of hospitals where this variable is complete (Wollongong, Shellharbour and Shoalhaven over 2002–03 and 2003–04), we found that 6% of cases otherwise identified as “PPC” were actually referred, and thus excluded from our preferred definition. This percentage is higher for older age groups (as high as 14% for 70–89 year olds) than younger age groups (as low as 4% for 0–9 year olds), but there was almost no difference by sex. Thus the EDIS results presented here are likely to overestimate PPC presentations relative to non-PPC presentations, especially among older people.

In addition, only those patients who were not admitted were in scope for the EDIS analysis, while patients who were *not expected* to be admitted were in scope for the survey. The EDIS data will thus inevitably include some patients who would not have been selected for the survey. This could occur for a number of clinical reasons, such as a complex presentation that makes the initial assessment difficult or a change in the clinical picture following presentation (such as an abnormal but uncomplicated cardiac rhythm that settles and thus does not require admission).

The same holds true in reverse where patients who are not expected to be admitted ultimately end up admitted for unexpected reasons, such as rapidly progressive illness.

If the premise is taken that expectation of admission is a more appropriate criterion than admission itself, then the definition used in the EDIS data may introduce some error. Given the purposes of the paper, however, such definitional issues are only a problem to the extent that they affect age and sex groups differently. This is expected to be more of an issue for

particularly complex older patients and injury cases, though this is difficult to quantify. Nevertheless, this is unlikely to fully explain the pattern of the findings. The apparent primary care attendance rates of the elderly are already low, even if they are overestimated. The age spikes for 15–29 year olds may again, to some extent, be explained due to the overestimation of potential primary care cases related to trauma. But this issue is unlikely to explain them entirely, and the results are consistent with epidemiological data in reviews of minor injury presentations to any ED.<sup>24–26</sup>

The EDIS database is representative of the population of emergency presentations within NSW as a whole, except for small rural hospitals with less than 5000 admissions per year.

## Conclusion

EDIS data reveal that the age profile of potential primary care attendances at EDs is considerably different to that of other attendances. The rates of both PPC and non-PPC attendances are higher among men than among women, and both are relatively high among infants. Among older people, however, PPC rates are much lower than non-PPC rates. Despite this, the rate of PPC attendances among older people appears to have grown the fastest of all age groups in recent years, and, coupled with the structural ageing of the population, this age group is of particular interest despite its relatively low presentation rate. In this context, it is interesting that older people are reportedly unresponsive to the characteristics of GP services (availability and affordability) in the decision to attend EDs for less urgent cases, since it would suggest strategies that focus on changing these aspects are unlikely to succeed.

There is a spike in the rate of PPC presentations among young adults (aged 15–29), both male and female. This spike is more distinct than in the corresponding pattern of non-PPC presentations. The patient survey data were utilised to examine whether the reasons for presentation might explain this spike. In fact,

there was very little difference between the responses of young adults and the rest of the sample. In particular, compared with other age groups, a similar proportion of young adults identified availability and affordability issues as important reasons. It is possible their higher rate of PPC attendances reflects a higher rate of minor accidents. Another possible explanation is that young adults are perhaps less likely to have established trusting relationships with GPs. This issue was not directly investigated in the survey, and is worthy of further investigation.

Similarly, there are no significant differences between the reasons given by males and females. Thus the higher rate of PPC attendances by males also appears unrelated to GP characteristics or other reasons for presentation. Again it may reflect a higher rate of minor accidents among males.

Overall, however, the main conclusion is clear. While there are differences by age and sex, patients in all age groups were most likely to identify self-assessed urgency; being able to see the doctor and having tests or x-rays done in the same place; and self-assessed seriousness or complexity as the reasons for presentation to the ED. These reasons stand out from all other reasons, regardless of age or sex. The implication here is that utilisation of EDs by these patients is, irrespective of age or sex, premised on reasonable decision-making processes and as such may not be amenable to commonly promoted education programs focussed on clarifying service roles.

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## Competing interests

The authors declare that they have no competing interests.

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