Analysis of A&E data for a medium sized emergency department

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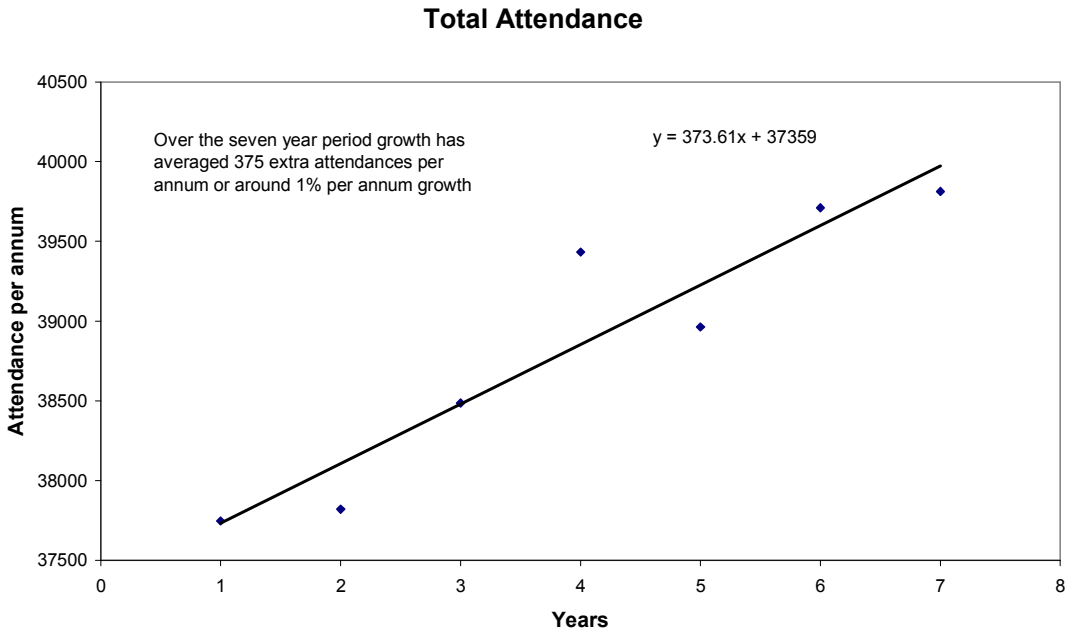
Executive Summary

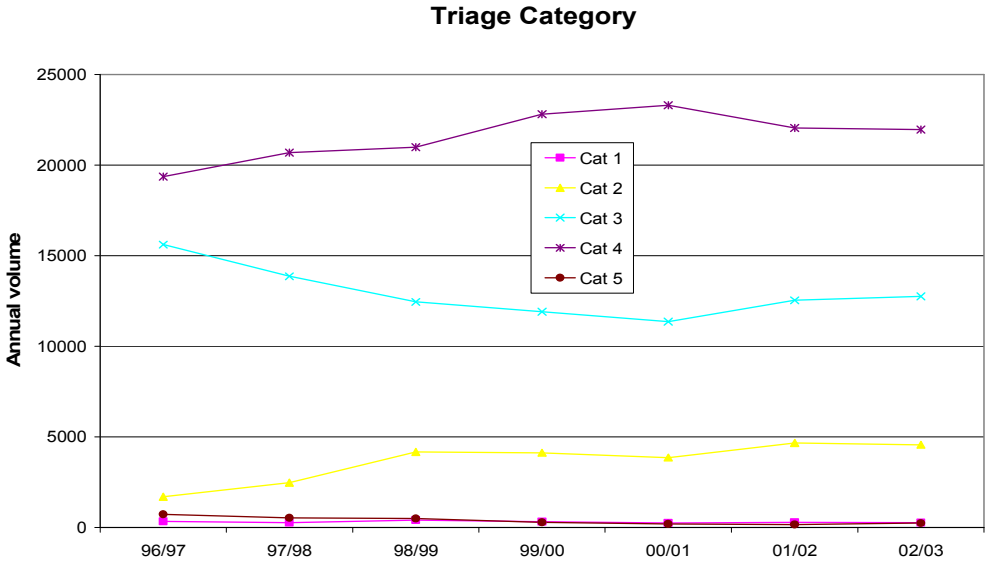
- Growth in total attendance between 1996/97 and 2002/03 was less than 1% per annum
  - Growth appears to be constant over all Triage categories
  - Triage category does not appear to yield a relevant measure of workload
- Analysis of outcome yields useful categories
  - 23% of patients are admitted to hospital
  - 22% of patients are suitable for GP triage
  - 12% of patients are re-directed to other hospital clinics
  - 4% of patients leave – presumably due to a long wait
- Pattern of arrivals varies by day of the week – there will be a direct impact on staff resource scheduling
  - Arrivals on a Monday peak earlier in the day with a further peak between 7 and 8 p.m.
  - Arrivals on a Sunday peak between 11 a.m. and 1 p.m.

Annual Growth

Total attendance for the 7 years 1996/97 to 2002/03 is given in the following chart. Average growth is 375 extra patients each year. This corresponds to less than 1% p.a. growth. In hindsight it now appears that the pattern in attendances, including the high attendance in year 4 (1999/00) is also reflected in national data[1] and that the period of time over which this data was collected represented a period of relatively low growth in the national as well as this local data.



Growth in demand, per se, during this time period cannot be a major source of pressure on A&E services although the mix between the different categories has changed slightly.



The 'Triage Category' chart shows the annual totals broken down by the assessed

[1] Jones R (2010) Forecasting emergency department attendances. British Journal of Healthcare management 16(10): 495-496.

medical severity of the patient. Category 1 is life threatening, etc. The shift over time may have more to do with slight alteration in the allocation of patients into each category rather than to fundamental change. In this respect the greatest shift occurred prior to 1998/99.

Outcome of Attendance

The outcome of a patient attendance appears to give a better view of potential resource issues. Table 1 shows outcome by various categories.

Table 1: Trends in outcome of attendance

Outcome	96/97	97/98	98/99	99/00	00/01	01/02	02/03	% of Total
No review	12734	12816	11943	11862	12232	12785	15099	33%
Admission	8759	8726	8916	9413	9014	9428	8777	23%
A&E Clinic	1852	1547	1498	1585	1997	1608	1051	4%
Other hospital	191	222	309	259	217	281	308	1%
DID	105	83	83	85	86	82	109	0%
Plastic dressing	208	141	164	137	192	128	89	0%
Discharged at triage			22	272	251	84	27	0%
Refused treatment	13	15	18	11	10	13	17	0%
Sub-total	**23862**	**23550**	**22953**	**23624**	**23999**	**24409**	**25477**	**62%**
Did not wait	772	1366	1501	1491	1224	1600	1342	3%
Left without treatment			72	134	75	84	87	0%
Self Discharge	43	82	76	80	121	150	188	0%
Sub-total (leave)	**815**	**1448**	**1649**	**1705**	**1420**	**1834**	**1617**	**4%**
Fracture Clinic	1823	1908	2013	2156	2044	2318	2202	5%
Other clinic	1279	1451	1680	1881	2049	2245	2166	5%
Eye A&E	575	529	672	591	490	523	492	1%
ENT Clinic	403	311	254	317	321	299	266	1%
Sub-total (redirected)	**4080**	**4199**	**4619**	**4945**	**4904**	**5385**	**5126**	**12%**
GP review	7600	7162	8002	7773	7373	7192	6677	19%
Practice Nurse	1190	1275	998	1070	1044	711	689	3%
Healthcare Professional	198	185	264	315	233	179	199	1%
Sub-total (GP triage)	**8988**	**8622**	**9264**	**9158**	**8650**	**8082**	**7565**	**22%**
Grand Total	**37745**	**37819**	**38485**	**39432**	**38973**	**39710**	**39785**	**100%**

The key points from this table are the number of patients (4%) who leave without treatment – presumably due to an unacceptable wait and the high proportion of patients for whom GP triage in A&E would be an option (22%). Note that in the 4th year (1999/00), when national and local attendances were high, the proportion of admitted patients was also high.

For further information regarding the trends in emergency admissions and possible relationships with emergency department attandences refer to:

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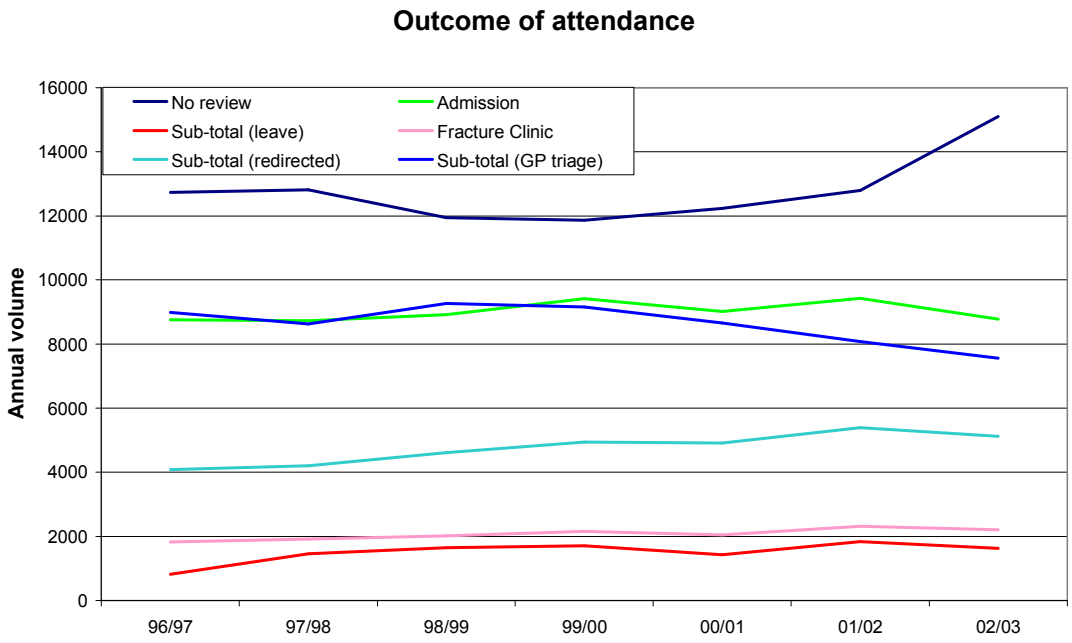
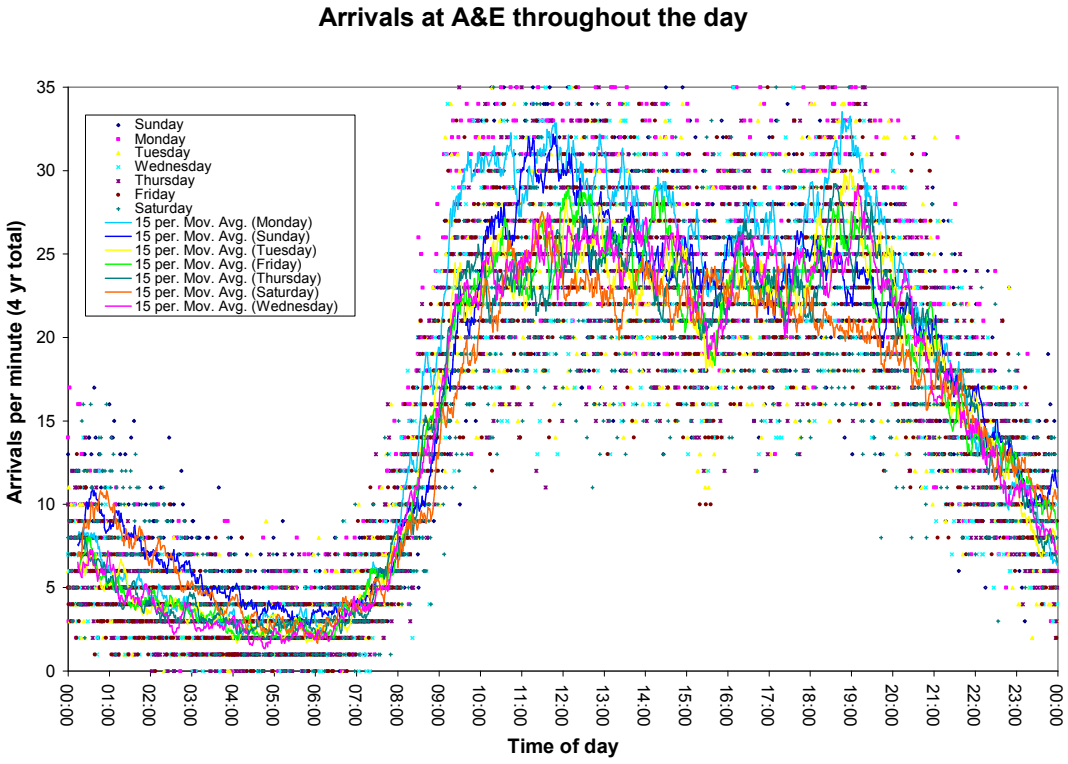
The next chart attempts to summarise the trends in some of these categories.



Patterns of Arrival

The resource implications around the patterns of arrival are reasonably obvious, however, little work has previously been done to characterise these patterns.

The following chart gives the detailed analysis of arrivals by day of the week over a 4 year period.



The arrivals in this chart can be turned into equivalent arrivals per hour by multiplying by 0.29, hence, for this emergency department highest average arrivals per hour are around 9.5 per hour on a Monday at 7 p.m.

A consideration of this chart suggests that extra resources should be available for Mondays and that an 8 a.m. start may help to prevent the formation of a queue since demand dramatically increases between 8 a.m. and 9 a.m. such that maximum rate of arrivals is occurring by 9 a.m. Additional short-term will also be required around 6 p.m. to 8 p.m. to cope with the peak later in the day – which is a week day rather than weekend phenomena.

Conclusions

During a period when the growth in A&E attendances was relatively low background changes in categories and outcomes of patients were still evident.

This relatively stable base for attendances also allowed accurate assessment of the weekday patterns in arrivals which are specific to this site and its socio-economic catchment area.