NHS Trust Federation

in association with

King's Fund

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EXECUTIVE SUMMARY

1. Emergency medical admissions appear to have been growing over a long time period.

2. The rate of growth appears to have increased within the last two to three years, but this higher rate of increase has eased recently.

3. This increased growth appears to have been associated both with a rise in respiratory conditions and apparent changes in medical practice in relation to chest pain and heart conditions.

4. Variability in daily flow does not appear to have increased, but it may have done so in relation to the capacity to deal with it.

5. The methodology developed for this report can be used by any trust.

6. The analysis can and should be applied and extended at the local level.

ANALYSING CHANGES IN EMERGENCY MEDICAL ADMISSIONS

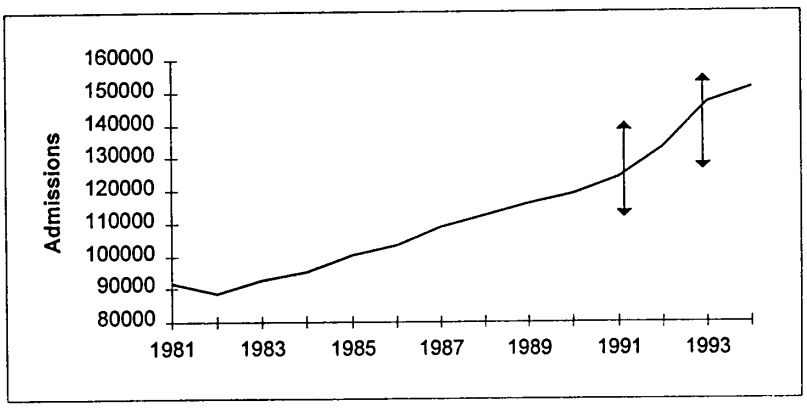
Introduction

Over the past two or three years, a rapid increase in the number of emergency medical admissions to acute hospitals has been widely reported and a number of studies in different parts of the country have been carried out aimed at explaining why these increases have occurred. In early 1995, the NHS Trust Federation and the King's Fund agreed to collaborate in a study of a small number of hospital trusts which had reported such increases. The findings of this work are the main subject of this report. We first present data for Scotland and a national sample survey in England, which set the context for the site studies.

Context

Because of changes to the way that hospital activity was recorded during the 1980s, there is no consistent data series for England as a whole covering that period up to the present. In Scotland, however, the basis of recording has remain more or less the same. Emergency admissions there rose steadily throughout the 1980s and the early 1990s, as Figure 1 shows. According to Kendrick, the gradual growth cannot be attributed solely to the changes in demography that were taking place during this period.

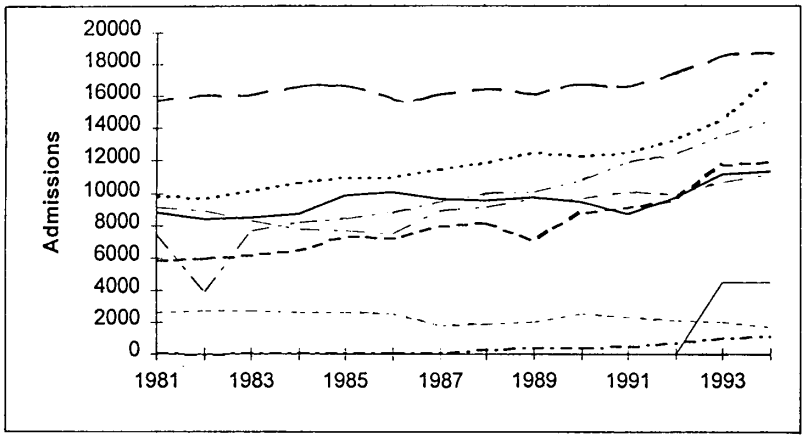
Figure 1: Emergency Medical Admissions, Scotland 1981-1994



Between 1991 and 1993, however, admissions increased at a much more rapid rate than hitherto, ie at about the same time that Trusts throughout the UK were reporting surges in demand. However, the Table also shows that not all hospitals experienced increases on a year on year basis.

The Trust survey carried out during early 1995 and covering the previous two years confirmed that when changes were measured on a year to year basis, the scale and even the direction of change varied widely between hospitals. About two-thirds of the trusts surveyed reported an increase in emergency finished consultant episodes and the remainder a decrease. This was a finding given further confirmation by results for nine Glasgow hospitals specifically during 1991-93 see figure 2.

Figure 2: Emergency Admissions, All Specialties, Glasgow Hospitals 1981-1994



Explaining Change

The data presented so far suggest that it is not only an increase in emergency admissions that has to be explained, but also:

- variations between trusts, and
- variations in the rate of growth of demand

Clearly, hospital trusts which have experienced growth in demand need to know the likelihood of rapid growth persisting, or of the possibility of rapid increases recurring. From a wider purchaser perspective, the issue is whether an increase in the emergency role reflects an appropriate or inappropriate use of hospital facilities, whether some needs could be better handled elsewhere or the need for some emergency care avoided entirely.

The answers to these questions depend largely on the factors underlying the change that have been observed. These may be categorised as follows:

Demand

- underlying epidemiology deriving either from long term factors such as might be associated with an ageing population, or short term factors such as weather conditions;

- change in GP referral behaviour which might reflect a number of factors including general pressure of work, better diagnosis or greater risk averseness and changes in medical practice, eg recognition of the value of anti-thrombolytics for suspected heart disease;

- changes in self-referral which might result from rising expectations and greater health consciousness.

Supply

- change in medical technology such as the availability of new tests or drugs;

- change in admission thresholds which may in turn reflect changes in hospital organisation or staffing.

These factors are, of course, not independent of each other; changes in referral may result from recognition of changes in medical technology or admission thresholds. Furthermore, the impact of these factors may depend on changes elsewhere in the hospital or in the availability of facilities outside it. Most hospitals have been rapidly increasing the proportion of surgery done on a day case basis and have reduced beds accordingly. In some areas, long-stay facilities to which patients might be transferred to rehabilitate have been retained; in others, they have largely disappeared, leaving the availability of continuing care places dependent on the willingness of social services to finance them.

Despite the large amount of work already carried out to explain changes in emergency admissions, the relative importance of these different factors has not been established. On the contrary, quite different explanations have been offered: some have concluded that increases are largely due to supply-side factors (Edwards), others to demand-side (Kendrick). Others have simply concluded that a large number of factors are at work. However, some possible explanations appear to have little value, eg demographic change or GP fundholding (the latter was confirmed during the course of preparing this report).

To understand the relative importance of these various factors, two main approaches are available. The first would be to estimate statistically a series of relationships across all hospital trusts, which would incorporate hypotheses arising from a range of demand- and supply-side explanations. The second is to analyse in detail what is happening at individual trust sites in order to establish important factors on a site-by-site basis.

The former approach is not feasible without a formidable data collection exercise. Much of the data required are not available on a routine basis. For example, no data are routinely collected on admission thresholds or on the reasons why GPs refer patients to hospital. Specially designed surveys would be necessary.

Partial approaches have been tried: for example using a sufficiently large sample of routinely available hospital data. Such attempts suffer from the very fact that they can only purport to be partial explanations. Moreover, it may be that there is no systematic explanation available across such a range of diverse trust sites.

However, consideration of detailed data at several trust sites may point to the existence of common explanations, or may suggest that the general approach is unlikely to be successful. The latter conclusion would save unwarranted data collection. It is worth bearing in mind also that understanding a particular trust's position and problems may be a legitimate aim in its own right, particularly to that trust. Accordingly, it is this approach that has been adopted in this report.

In the absence of comprehensive data and of a means of taking into account all the various possible factors at work simultaneously, the approach adopted for this report has been directed at describing in a systematic and consistent manner the changes that have taking place, using readily available data which all trusts have at their disposal. The analyses

presented here can, therefore, be easily carried out by any hospital trust. Hospital-based data alone cannot determine the relative importance of the different possible explanations set out above and, as we note in the conclusion, a number of other forms of study may be valuable. But some insights may be gained this way and some possibilities ruled out.

Measuring Change

There is no agreed way of describing the changes that have been taking place. Although usually changes are reported in terms of admissions, many of the figures quoted actually refer to finished consultant episodes, even though it is well known that the ratio between these and admissions can change. A method was developed which distinguishes between changes in the number of admissions, the number of consultant episodes and the number of patients. This allows changes in the relationships between these three measures to be taken into account.

There is no national dataset which allows comparisons to be made using all three measures between all acute trusts.

Data were, therefore, obtained from six acute hospital trusts, all outside London, which had reported a significant rise in emergency admissions: the specification of the data is at Annex 1. Four of these sites - A, B, C and D - have around 12,000 emergency admissions a year: sites E and F about 5,000. The data covers only 24 calendar months which we have divided into two years since some trusts were not confident of being able to provide consistent data over a longer period. These have been labelled Year 1 (December 1992 to November 1993) and Year 2 (December 1993 to November 1994).

Using the data provided, the following ratios were computed for each trust in both years:

Admission-to-Patient ratio - the average number of admissions per patient in any given year

Episode-to-Admission ratio - the average number of episodes per admission in any given year

Episode-to-Patient ratio - the average number of episodes per patient in any given year.

As the following tables show, the value of these ratios varied considerably from trust to trust eg the admissions per patient ranged from 1.2 (Trust F) to 1.35 (Trusts B, C and D) in Year 1. Moreover, the ratios changed by different amounts at different Trusts between the two years, eg episodes per admission at Trust C remained the same, the ratio for Trust A rose from 1.08 to 1.31 in the same period.

Table 1A: Annual Admission-to-Patient Ratio: Year 1 and Year 2

TRUST	Year 1	Year 2
A	1.25	1.26
B	1.35	1.36
C	1.35	1.35
D	1.35	1.31
E	1.20	1.20
F	1.24	1.24

Table 1B: Annual Episode-to-Admission Ratio: Year 1 and Year 2

TRUST	Year 1	Year 2
A	1.08	1.31
B	1.13	1.26
C	1.05	1.05
D	1.08	1.12
E	1.18	1.20
F	1.13	1.14

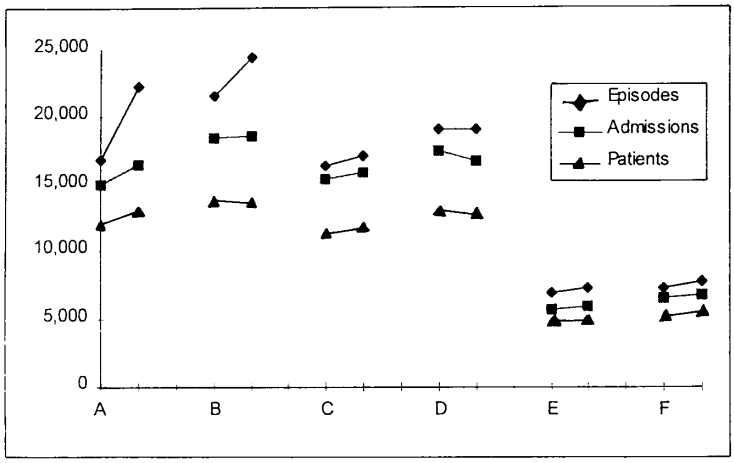
Table 1C: Annual Episode-to-Patient Ratio: Year 1 and Year 2

TRUST	Year 1	Year 2
A	1.35	1.65
B	1.52	1.72
C	1.42	1.42
D	1.46	1.47
E	1.42	1.44
F	1.39	1.41

The effect of these differences can be seen in Figure 3: the varying slopes of the lines reflects the changes in the relationship between the different measures.

For example, the increase in episodes per admission is shown strikingly by the difference in slope between the line showing number of admissions and the line showing number of episodes at both Trust A and Trust B.

Figure 3: Change in the number of patients, admission and episodes between Year 1 and Year 2 at six NHS Trusts



Scale of Year on Year Changes

The central finding of this stage of the analysis mirrored the national picture in that there was considerable variation between the sites in respect of each of the three measures: see Table 3 .

Table 2: Change from Year 1 to Year 2: number of patients, admissions and episodes

TRUST	Patients	Admissions	Episodes
	% change	% change	% change
A	9	9	32
B	-1	0	13
C	4	4	5
D	-1	-4	0
E	4	4	6
F	5	6	7

While five sites reported increases on a year on year basis, when change was measured by FCEs, only four did so when change was measured in terms of admissions or patients. The largest year on year change, in admissions and patients, was nine per cent in Trust A while one trust showed declines on both measures and another virtually no change.

Although Trust A experienced the highest change on all three measures, rankings of the other trusts are affected by the measures used. Trust B experienced the second highest increase in episodes, while recording a decline in the number of patients admitted and no change in the number of admissions. Trust D records a decline on both these measures but no change in the number of episode.

These differences arise because:

- the relationship between the various measures varies from trust to trust;
- the relationships themselves change at different rates in different trusts.

Although the scale and nature of the changes recorded varied between trusts, all perceived themselves as being under pressure. That perception might be attributed to:

- sudden large changes within the 12-month periods examined above;
- changes in the composition of the workload;
- changes in the extent of day-to-day variation.

We look at these in turn.

Within Year Change

All sites recorded a peak inflow towards the end of Year 1 and then further increases in the next quarter. All five sites included in this stage of the analysis recorded their highest quarterly flows in the period December 1993 to February 1994. In no site did the increase continue in both the following quarters, but five hospitals experienced another increase in the final quarter of Year 2, in two cases exceeding the peak level earlier in the year, and in three cases exceeding the level of the corresponding quarter. Moreover, in the case of Trusts A, E and F, the summer quarter, June to August of Year 2, exceeded the corresponding quarter in the previous year. This was not true of B and D which also failed to exceed their previous peak levels in the final quarter.

Table 3: Number of Admissions by Quarter

Trust	Year 1			↓	Year 2 ↓			
	Dec-Feb Q1	Mar-May Q2	Jun-Aug Q3	**Sep-Nov Q4**	**Dec-Feb Q5**	Mar-May Q6	Jun-Aug Q7	Sep-Nov Q8
A	3740	3802	3536	**3913**	**4137**	4075	4027	4169
B	4654	4618	4478	**4719**	**4929**	4659	4368	4551
D	4187	4435	4297	**4518**	**4621**	4208	3935	3969
E	1361	1450	1380	**1484**	**1606**	1426	1393	1490
F	1641	1667	1506	**1685**	**1722**	1663	1690	1788

Note: Trust C is excluded as a slightly different time period makes exact comparison impossible

Because of the short time period for which data is available, it is not possible to show whether or not the growth experienced between the third and fourth quarters of Year 1 was greater in absolute or proportionate terms than in previous years. However, it is clear from Table 4 that the difference in the corresponding quarters in the second year was much lower,

in no case exceeding 200 admissions. Thus, the difference between the quarters was dramatically reduced.

Table 4: Changes in Number of Admissions Between Quarters

	Year 1			Year2			
TRUST	change Q1-Q2	change Q2-Q3	change Q3-Q4	change Q4-Q5	change Q5-Q6	change Q6-Q7	change Q7-Q8
A	62	-266	377	224	-62	-48	142
B	-36	-140	241	210	-270	-291	183
D	248	-138	221	103	-413	-273	34
E	89	-70	104	122	-180	-33	97
F	26	-161	179	37	-59	27	98

Within Year Change by Diagnosis

The existence of seasonal pattern of inflow is typically attributed to changes in morbidity associated with the different weather conditions prevailing at different times of the year. We, therefore, consider next whether variation in overall inflow hides variations in diagnostic categories. The 20 diagnostic categories used here are based on ICD 9 codings: see full list in Annex 2.

To carry out the seasonal analysis, however, we first identified those diagnostic groups where the largest changes took place on a year to year basis using both admissions and episodes as a measure of change. This distinction is potentially important since changes in the numbers in each diagnostic group may reflect organisational change in the way emergencies are handled. This is looked at further below. Whether measured in terms of admissions or episodes, the largest growth is found in ill-defined or cardiac conditions with the exception of Trust C, where cardiac is in second place. Accordingly, we took these two categories as well as respiratory conditions in view of their likely relationship to weather conditions; the three categories account for about half of all admissions.

Table 5A: Diagnosis Groups with Largest Increases in Emergency Admission Episodes Between Year 1 and Year 2

TRUST	Highest growth	2nd highest	3rd highest	4th highest
A	Ill-defined	Musculoskeletal	Digestive	Infectious disease
B	Ill-defined	Digestive	Endocrine	Trauma
C	Resp/thoracic	Cardiac	Cerebro-vascular	Cancer
D	Cardiac	Mental	Trauma	Digestive
E	Ill-defined	Trauma	Cancer	Musculo-skeletal
F	Ill-defined	Musculoskeletal	Trauma	Skin

Table 5B: Diagnosis Groups with Largest Increases in Emergency Admission and Consultant Transfer Episodes between Year 1 and Year 2

TRUST	Highest growth	2nd highest	3rd highest	4th highest
A	Cardiac	Ill-defined	Resp/thoracic	Digestive
B	Ill-defined	Digestive	Trauma	Cardiac
C	Resp/thoracic	Cardiac	Cerebro-vascular	Cancer
D	Cardiac	Nervous	Mental	Trauma
E	Ill-defined	Cardiac	Trauma	Cancer
F	Ill-defined	Musculoskeletal	Trauma	Skin

Not surprisingly, admissions due to respiratory problems are higher in the winter months. However, those in the two other diagnostic groups are higher in the summer months, so to some degree the two sources of variation counter each other. We tested whether the changes observed within the two years could be accounted for by changes in the seasonal inflow of different kinds of patient.

Table 6: Admissions by Quarter and Main Diagnostic Group

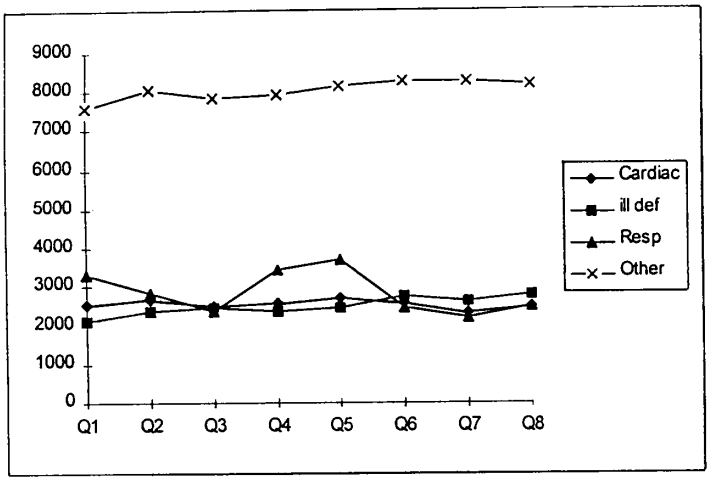
		Year 1				Year 2			
TRUST	Diagnosis Group	Dec-Feb Q1	Mar-May Q2	Jun-Aug Q3	**Sep-Nov Q4**	**Dec-Feb Q5**	Mar-May Q6	Jun-Aug Q7	Sep-Nov Q8
A	Cardiac	645	739	649	**676**	**678**	679	652	723
	Ill Def	634	593	596	**568**	**605**	688	642	648
	Resp	696	592	503	**745**	**826**	512	485	619
B	Cardiac	658	640	605	**610**	**659**	629	489	461
	Ill Def	664	840	792	**769**	**947**	951	1005	1032
	Resp	1086	906	819	**1138**	**1147**	730	658	755
D	Cardiac	574	613	641	**600**	**702**	631	578	626
	Ill Def	547	647	765	**719**	**535**	719	663	731
	Resp	970	858	681	**988**	**1056**	789	658	705
E	Cardiac	279	310	264	**298**	**306**	282	272	317
	Ill Def	133	157	173	**158**	**208**	199	166	168
	Resp	311	240	194	**294**	**364**	208	194	242
F	Cardiac	386	378	357	**404**	**373**	363	323	355
	Ill Def	150	150	140	**146**	**180**	190	172	219
	Resp	254	262	173	**268**	**300**	201	193	197

Note to Table: Trust C is excluded as a slightly different time period makes exact comparison impossible.

Table 6 shows that that inflows of all three conditions reached a peak level in the two quarters at the end of the first and beginning of the second year. But otherwise the pattern revealed is quite different. Respiratory conditions showed a large increase over these six months and then fell back. The two other diagnostic groups showed a steady rise, sustained over the

period as a whole, while all other categories changed very little, particularly during the second 12-month period. These variations are shown in Figure 4.

Figure 4: Emergency Medical Admissions: Changes by Main Diagnostic Group



The variation in respiratory conditions might be attributable to climatic conditions, but the changes in the other two categories do not appear to be explained in this way. One possibility is that changes in the two diagnostic groups are linked in that both reflect a greater tendency for GPs and patients to refer to hospital in the case of chest pains which might reflect a cardiac event. Such an increase might be due to the growing recognition that early administration of appropriate drugs can be effective in avoiding lasting damage. The growth in ill-defined conditions as well as confirmed cardiac conditions could reflect false alarms but nevertheless appropriate referrals.

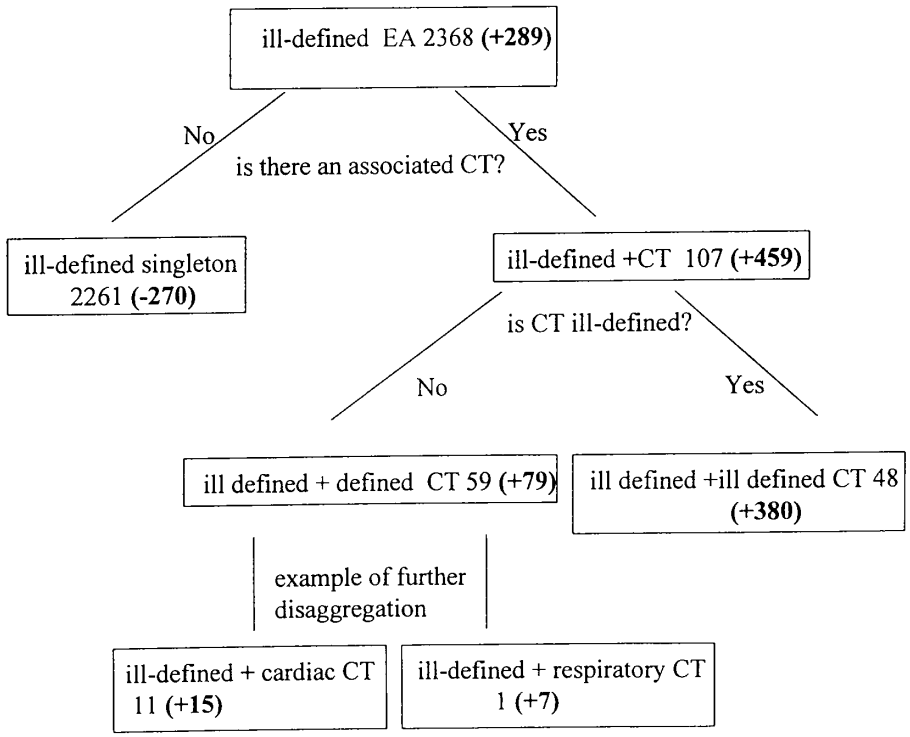
Analysis of the composition of the ill-defined category (see Table 7) shows that in the four trusts where there was growth in this category a sizeable proportion was attributed to chest pain. If there is a change in GP behaviour, there is no reason to believe it will happen at the same pace or that it is a once and for all effect. This may go some way to explaining why some Trusts who claimed increases in admissions prior to the period studied in this report no longer experience growth.

Table 7: Growth in Emergency Admissions with Ill-Defined Chest Codes, and Ill-Defined Group Total

TRUST	Ill defined chest	Ill defined total
A	196	192
B	477	870
C	-41	-100
D	70	-30
E	42	120
F	104	175

However, as Figure 5 shows, most ill-defined episodes of all kinds are what we have termed singletons, ie not part of a multi-episode stay. Only a small proportion of ill-defined episodes are linked to a subsequent diagnosis of a cardiac condition. They therefore appear to reflect a genuine change in the number of patients whose condition cannot be accurately diagnosed.

Figure 5: Analysis of Stays Beginning with Ill-Defined Episodes at Trust A



Note: the first number in each box shows Episodes for Year 1; the bold figure parenthesised shows change between Year 1 and Year 2.

Workload

Another measure of pressure is the load arising from emergency admissions relative to the capacity to deal with it. Numbers of available beds were not part of the data set collected so it was not possible to demonstrate whether or not capacity had been reduced over the study period. But it was possible to show how workload measured in terms of occupied bed days changed between the two twelve-month periods. Lengths of stay for emergency admissions have been falling. Consequently, workload as measured by occupied bed days has been falling even when admissions have been rising. Thus, in the case of Trusts B, C and D occupied bed days fell, and even in Trust A rose only slightly (see Table 8).

Table 8: Occupied Bed Days: All Episodes

TRUST	Year 1	Year 2	change	% change
A	138549	139030	481	0
B	177652	162885	-14767	-8
C	161095	158205	-2890	-2
D	129803	117974	-11829	-9
E	45324	54422	9098	20
F	72937	79642	6705	9

These trusts might nevertheless feel under pressure if, due to a switch to day case elective work, they had a lower level of reserve capacity to deal with variations in demand on a day to day basis. Before considering whether variability in the level of demand has grown, we look in more detail at the changes observed in one of the two trusts where occupied bed days increased.

In principle, an increase in occupied bed days such as that recorded at Trust F could be explained by an increase in lengths of stay as a whole, or by an increase in the age and diagnostic groups which tend to have higher than average lengths of stay, or an overall increase in the number of admissions, or some mixture of all these factors. In what follows, we show how the relative importance of these various factors can be measured in approximate terms.

The method involves taking, for each age group, each of the factors in turn and estimating their contribution to the overall change. In the final stage, the effects of differences in l engths of stay are accounted for. As Table 9 shows, change in diagnostic groups has a small but positive effect reflecting a small shift towards those conditions where length of stay is higher than average. The impact of growth in total numbers is substantial - 7.4 per cent - but the impact of change in the balance between the age groups is small and in the opposite direction. Changes in length of stay for each age/diagnostic group show a small upward effect which is entirely to be found in the older age groups.

Table 9 A Decomposition of the Change in Occupied Bed Days in Trust F, Year 1 to Year 2

OBDs	0-14	15-44	45-64	65-74	75-84	85+	Total	% change
A	188	3841	8607	14382	25877	20042	72937	
B	145	3638	8450	14535	26704	19983	73281	0.5
C	156	3898	9053	15572	28609	21409	78697	7.4
D	165	3918	9834	14465	28030	21790	78509	-0.2
E	117	3802	9447	15761	27129	23386	79642	1.4

Explanatory Note

A Year 1 Occupied Bed Days

B A + sharing activity in the diagnosis groups in the same proportions as Year 2 ie. reflects the effect of shifts in diagnosis

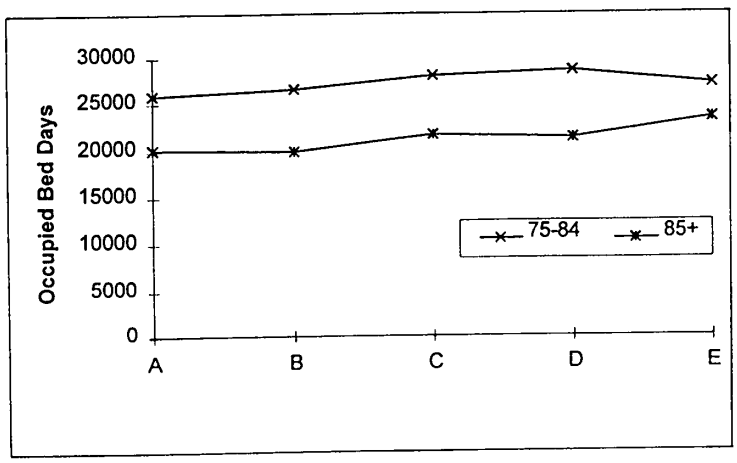
C B + Growth between Year 1 and Year 2 if shared out across age groups so that proportion of activity in each group is as Year 1 ie. the effect of growth in activity alone, with no effect of shifts between age groups

D B + Growth between Year 1 and Year 2 with no age standardisation as in C. ie. D minus C shows the effect of the shifts in activity between age groups

E Year 2 Occupied Bed Days. ie. shows the effect of changes in LOS over and above D.

Figure 6 reflects the data contained in Table 9 for the 75-84 and 85+ age groups. In both cases the number of occupied bed days has risen, but the contribution of the different factors is quite different. In some cases they act in the opposite direction.

Figure 6: A Graphical Decomposition of the Change in Occupied Bed Days in Trust F, Year 1 to Year 2



Note: for an explanation of A to E see explanatory note for table 9

The results shown here apply of course only to Trust F but the approach set out here could be applied by any Trust wishing to identify the relevant importance of factors behind a change in bed use.

Variability

It was noted earlier that changes in the variability of demand might give rise to pressure even within a constant total. For day to day management purposes, it is variation in daily inflow which is important. For the most part, hospitals are not able to control their inflow of emergency admissions and there is no way of forecasting them on a day by day basis. Variation as such need not give rise to difficulties if the range and pattern of variation is stable. However, if inflows are becoming more variable, then even within a falling total they may be more difficult to handle.

As Table 10 shows for Trust F, weekday flows are similar from one year to the next and the pattern of lower flows at the weekends is also maintained. These average figures however disguise the day to day variation. Using the standard deviation as a measure of variation round the mean, it appears that if anything the extent of variation fell between the two years.

Table 10: Daily Admission Flows: Means and Standard Deviations

TRUST F	Year 1		Year 2		Change in	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Monday	21.3	3.6	21.3	2.8	0.0	-0.8
Tuesday	19.0	3.1	22.0	3.2	2.9	0.2
Wednesday	19.6	3.9	19.8	3.4	0.2	-0.4
Thursday	20.7	3.9	19.5	2.8	-1.2	-1.1
Friday	21.1	3.4	20.8	3.3	-0.3	-0.1
Saturday	14.2	3.0	14.5	2.8	0.2	-0.3
Sunday	12.5	2.5	14.0	2.4	1.5	-0.1

Another way of measuring variability is to adopt a simple forecasting device - the moving average - calculated in this case over four weeks, and recording the number of daily inflows greatly above or below it. Figure 7 takes all admissions at Trust F for each Thursday in the two years and reveals the number of occasions where the actual inflow was more than one standard deviation away from the mean. The number of extreme events defined in this way, particularly the number outside the limit defined by the standard deviation actually fell from 15 to 12. This again suggests that variability has declined rather than increased which suggests that variability in itself has not been a source of increased pressure. However, it may be that variability had increased relative to the pool of beds available to deal with it.

Figure 7A: Daily Admissions in Year 1: An Example using Moving Averages and Outliers.

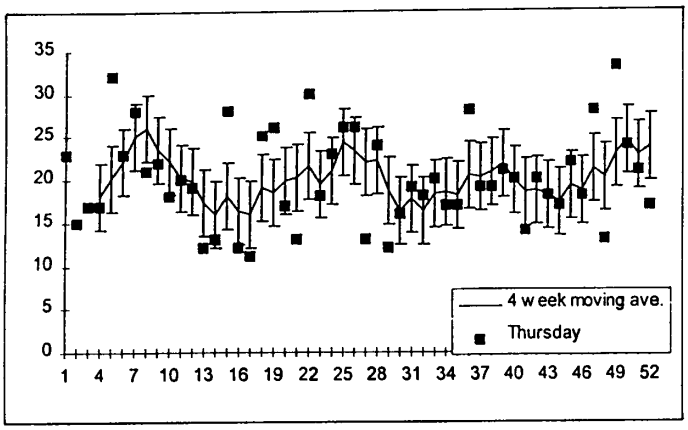
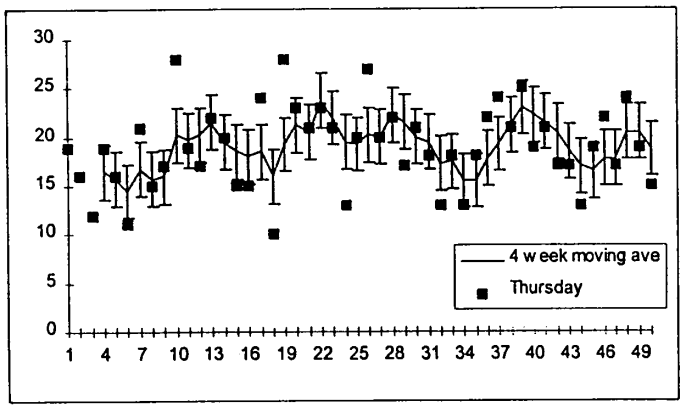


Figure 7B: Daily Admissions in Year 2: An Example using Moving Averages and Outliers.



Note: Moving average calculated over period of four weeks: the error bars show one standard deviation either side of the moving average.

Conclusions

Our conclusions fall into three categories: specific findings, general implications, and methodological considerations.

From the detailed analytic approach, applied here to six NHS trusts, several conclusions emerge relating to the nature of the problem of handling the ebbs and flows of an emergency workload. In particular, the study has shown:

- there have been increases in emergency admissions over the period from November 1993 to January 1994 at most sites;
- where there has been significant sharp changes in the level of admissions, respiratory admissions seem to have been a major factor;
- the ill-defined category has also played a major role where there has been significant change;
- some growth may be due to changes in medical practice in relation to heart conditions.

More generally the report has shown that:

- there is a need to describe with more precision the phenomena under consideration, given the confusion which can arise from comparisons of analyses based on different measures of activity, eg finished consultant episodes or admissions;
- nevertheless, considerable variation is revealed from site to site, both in terms of the nature of changes taking place and the impact on the demand for beds;
- in several cases there appears to have been an increase in the level of demand for emergency admission which could not have been predicted, given the current state of knowledge of the overall system within which emergency care is provided. This phenomenon may show itself often only within a particular temporal framework - for example, when admissions are looked at quarter-on-quarter, or day-on-day;
- however, evidence of a sustained sharp increase in the level of emergency admissions is sparse: this is true both of the data considered in detail here for six trusts and in the less detailed evidence which was referred to in the first part of this report.

Finally, this report confirms the need for a systematic analysis of the process of emergency admission throughout the UK if more universal claims are to be made. While the analysis confirms that changes in emergency admissions must be examined at the trust level in a detailed way, it is clear that a system-wide approach is required if anything other than a local understanding of the phenomenon is sought.

For example, the detailed trust data suggest that respiratory factors were a cause of increases in the fourth quarter of Year 1 in all of the trusts which were examined in detail. This finding

suggests there may be some common cause. However whether this is true for all Trusts would have to be examined in the context of a wider approach.

This would involve the collection of data covering all aspects of the demand and supply framework described above. Existing data sets would not allow so comprehensive an approach. Nevertheless much can be achieved within existing data sets. Three examples are suggested:

- further analysis of the variations in admission levels and the scope for use of simple forecasting techniques;
- analysis of admissions patterns by GPs, GP practices, and practice characteristics;
- analysis of changes in the source of admission by geographical catchment area - which could be linked to Census information.

Annexe 1: Specification for Emergency Admissions Data Set.

The following information is needed over a period of two years. For comparison with other data sets this period should be between 1st December 1992 and 30th November 1994. The following Fields are needed. Alongside is the Format that should be used if using Microsoft Access.

Field		Format
Patient Identification Number		Text
Specialty Code		Text
(groups required:		
Medicine	300-410 exc. 303	
Haematology	303	
Paediatrics	420-428	
Med for Elderly	430)	
Diagnosis Code		Text
(First **3** figures of diagnosis code)		
Age		Number
Sex		Text
Admissions Method		Text
(Consultant Transfers to be clearly marked as 'CT')		
FCE Type ie.Day Case/ In patient		Text
GP Code		Text
GP Practice Code		Text
GPFH Wave (1-4)		Number
ECR		Yes/No
Episode Start Date (Date, Month, Year)		Date/Time
Episode End Date (Date, Month, Year)		Date/Time
Spell Start Date (Date, Month, Year)		Date/Time
Spell End Date (Date, Month, Year)		Date/Time

If there is no CT code available for the admissions method field, then a supplementary field CT (Yes/No) is acceptable

The following calculated fields would be helpful, but are not essential.

Field	Format
Month no.	Number
MS Access calculation =	
(Year([Episode End Date])-1900)*100+Month([Episode End Date])	
LOS	Number
MS Access calculation =	
[Episode End Date]-[Episode Start Date]	

Annexe 2: Diagnostic Groups used

000-139	Infectious diseases	520-579	Digestive
140-239	Cancer	580-629	Urinary
240-279	Endocrine	630-676	Childbirth
280-289	Blood	680-709	Skin
290-319	Mental	710-739	Musculo-skeletal
320-389	Nervous	740-759	Congenital
390-428	Cardiac	760-779	Perinatal
430-439	Cerebrovascular	780-799	Ill-defined
440-459	Vascular	800-999	Trauma
460-519	Resp/Thoracic	V code	Other

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