

# Trends in emergency admissions in England 2004–2009: is greater efficiency breeding inefficiency?

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Approximately 35 per cent of all admissions in the NHS in England are classified as emergency admissions, costing approximately £11 billion a year. Emergency admissions are costly and frequently preventable but every year more patients are being admitted in this way. This briefing paper examines the rise in emergency hospital admissions in England from 2004/05 to 2008/09 and tries to identify the possible explanations.

## Key points

- The number of emergency admissions in England rose by 11.8 per cent over the five-year period 2004/05 to 2008/09 – a total of approximately 1.35 million extra admissions.
- Older people are more likely to have an emergency admission. However, at most, 40 per cent of the increased number of emergency admissions can be explained by the effects of population aging.
- The rise in emergency admissions is not associated with any one particular type of illness or age group and levels of self-reported ill health do not appear to be rising.
- The increases have been associated with a large rise in short-stay admissions – indicating less severe cases are being admitted to hospital, suggesting that the clinical threshold for acute admissions has been lowered. The number of admissions that end with the death of a patient has also reduced.
- Central policy initiatives – such as the accident and emergency (A&E) four-hour maximum waiting time target, the introduction of Payment by Results (PbR) and NHS foundation trusts – do not seem to have had an effect upon accelerating the rate of emergency admissions in England. However, for some individual trusts an association with the A&E target is apparent.
- While the number of attendances at major (type 1) A&E units – the main source of emergency admissions to hospital – grew by 1.2 per cent over the five years, the proportion admitted from these A&E units as emergencies grew by 14.3 per cent – equivalent to 449,078 additional admissions in 2008/09.
- Within England there is significant variation between NHS trusts – in some, emergency admissions declined by up to a third, while in others they almost doubled.
- There is also a significant variation between primary care trusts (PCTs). Although admission rates are known to be higher in more deprived areas, there is no clear link between deprivation and the rise in emergency admissions.

## Introduction

Admitting a patient to hospital as an emergency case is costly and frequently preventable, yet the number of emergency admissions to hospital has been rising for some time (Campbell and others, 2002; Hobbs, 1995; Patel, 1971; Robinson, 2010). There has also been a rise in the use of other healthcare services such as attendance in A&E departments and consultations in general practice (see Figure 1). Interestingly, this does not correspond with self-reported health status, which has remained broadly static since the mid-1990s (Information Centre, 2009b).

Many reasons for the rise in emergency admissions have been proposed, for example:

- increased illness and frailty linked to an aging population (Blatchford and Capewell, 1997; Gillam, 2010)
- increased public expectations leading to more self-referral to NHS care (Hobbs, 1995)
- the effects of incentives in the NHS such as central targets and new ways of paying hospitals (Farrar and others, 2009; Information Centre, 2009a)
- changes in clinical decision-making and more 'defensive' medicine (Blatchford and Capewell, 1997)
- increased ability to detect and treat illness (Hobbs, 1995)
- changes in data collection and recording (Morgan and others, 1999)
- changes in care outside hospital such as general practice (Coast and others, 1995; Kendall, 2009; Silby and others, 2007; West, 2010) and social care.

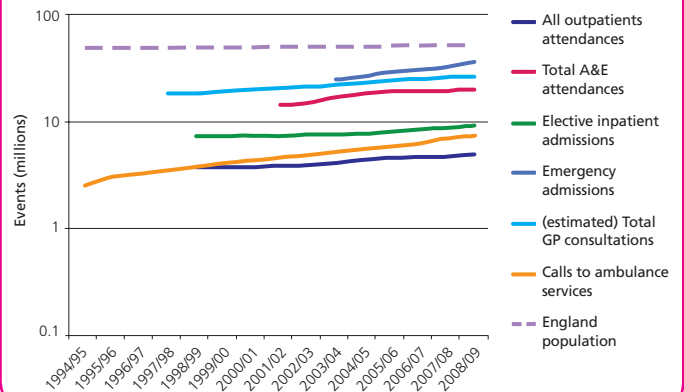
Of all the areas of care the NHS offers, an emergency admission to hospital is one of the most costly, with a total cost of around £11 billion a year. If the NHS is to generate the efficiency savings required by 2014, there is an urgent need, especially in today's economic climate, to examine all areas of expenditure that may be avoidable (Nicholson, 2009). Yet despite the known rise in emergency admissions, and the huge costs they generate, to date there has been insufficient systematic analysis of what lies behind the rise across England.

This briefing report attempts a comprehensive analysis using Hospital Episode Statistics (HES) (Information Centre, 2009c) over a five-year period from April 2004 to March 2009 and covering all hospitals in England.

Some admissions (such as in mental health, those for which no diagnosis was recorded or those occurring in merged NHS trusts) were excluded as appropriate to each analysis. This briefing summarises the results; the methods and fuller findings are described in more detail in a further report (Blunt and others, 2010).

**Figure 1: Trends in demand for NHS care**

(Note: the vertical scale is shown logarithmically to aid comparison between measures of different orders.)

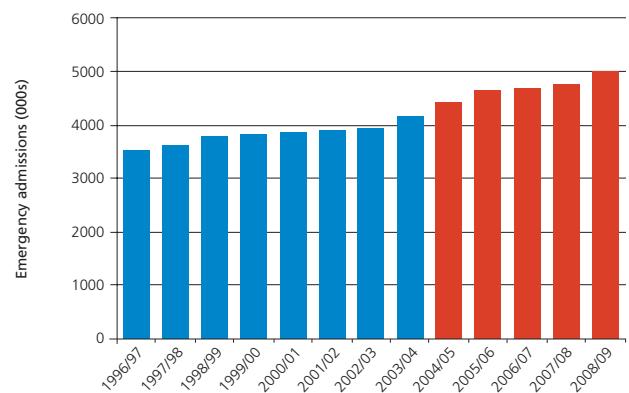


## Analysis

### How quickly are emergency admission rates rising?

Emergency admissions rose from 4.4 million in 2004/05 to 5 million in 2008/09, an increase of 11.8 per cent – a total of over 1.35 million additional admissions over the five-year period. Figure 2 shows the steady rise since the mid-1990s. The increase accelerated in the five-year period and appeared to be slightly steeper

**Figure 2: Number of emergency admissions in England 1996–2009, with period investigated marked in red**



between 2003/04 and 2005/06, although this is not statistically significant.

The increase is not unique to England. Robinson (2010) noted that emergency admissions in Wales and Northern Ireland also rose between 2005/06 and 2008/09, but at a lower rate than England. Between 1986 and 1995 Kendrick (1996) and Blatchford (1997) observed average annual increases in emergency admissions for Scotland of around the same level that is currently attracting attention in England. However, more recent data (ISD Scotland, 2009) show Scotland's increase since 1999 has been only half that of England's (15 per cent and 31 per cent, respectively).

The estimated cost to NHS commissioners of these extra admissions in the financial year 2008/09 was equivalent to approximately £330 million (compared to 2004/05 activity, costed at 2008/09 payment levels). However, the actual additional cost is likely to be higher because this analysis does not include locally negotiated payments for emergency care not covered by the national tariff, or additional payments for periods of augmented care.

### Is the increase due to admission of the same patients?

Some people have more than one hospital admission a year – in fact the average number of emergency admissions is around 1.4 per person. Therefore, is the rise in admissions the result of the same people being admitted more frequently or is the rise because of new cases emerging? Through linking data in individual patients (anonymously) over time, the analysis shows that the growth in admissions is mostly due to new single cases rather than individuals being admitted more often each year.

The number of emergency readmissions of patients within 28 days of hospital discharge has been rising steadily since 2002 (NCHOD, 2009). In 2007/08 emergency readmissions represented 11.5 per cent of all emergency admissions, an increase from 10.7 per cent in 2004/05.

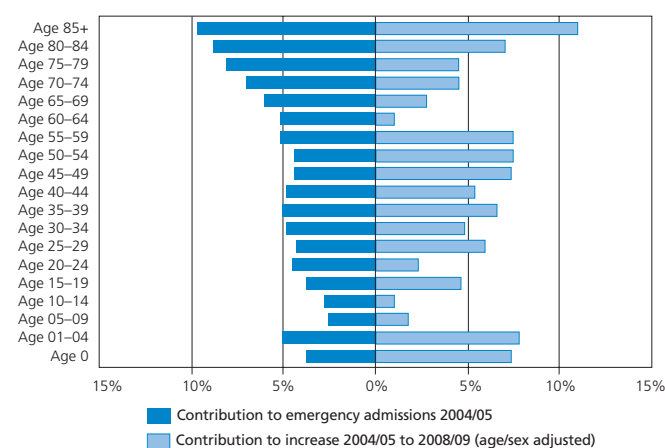
### Is the increase simply the result of an aging population?

Older people tend to have more emergency admissions and there are increasing numbers of older people in the population. This may account for the observed increase, so the effects of differences in the age profile over the five years were tested. The changes in the age structure of the population accounted for approximately 40 per cent of the increase in admissions.

People over 85 were nearly 10 times more likely to have an emergency admission than someone in their 20s, 30s or 40s. However, when looking at change over the past few years, the growth in admission rates for those aged 85 and above did not increase disproportionately compared with other age bands (8 per cent growth versus the population average of 7.1 per cent). The greatest proportionate increases in admission rates to 2008/09 are seen in the under-ones (13.8 per cent) and 45 to 49 and 50 to 54 age groups (both 11.9 per cent).

If the rates of emergency admission in 2004/05 were applied to the 2008/09 population, a 4.7 per cent increase in emergency admissions would be expected in 2008/09, relative to 2004/05. This compares with the observed 11.8 per cent increase and implies that changes in demography alone could account for approximately 40 per cent of the rise in emergency admissions. Figure 3 shows the proportion of the emergency admissions in 2004/05 by age band of patient admitted (columns on the left), and the contribution to the overall increase in admissions over the five years to 2008/09 beyond the expected amount (columns on the right). The contribution to the overall increase is variable between age bands and does not appear to be significantly related to the overall proportion of admissions by age band in 2004/05. The increase in the number of emergency admissions lasting less than one day is broadly uniform across all age bands.

**Figure 3: Contribution to the number of emergency admissions in 2004/05, and increase between 2004/05 and 2008/09 by age band**



**Is the increase associated with certain diagnostic groups?**

The overall increase in emergency admissions since 2004/05 was not due to admissions for any particular diagnosis or broad illness type. The most common diagnostic groups tend to be non-specific descriptions of health problems, or very common problems in older people, but the increase was not concentrated in any limited set of diagnostic groups. The top ten diagnostic groups, ranked by contribution to the increase, accounted for 30 per cent of total emergency admissions in 2004/05, and 62 per cent of the increase between 2004/05 and 2008/09. Interestingly, this pattern is not reflected in admissions lasting less than one day – the increase in these appears evenly spread across most diagnostic and treatment groups.

Primary diagnoses that indicate an external cause of injury or poisoning rose by 21 per cent over the five years, although this represents a modest increase as a proportion of all emergency admissions (16.3 per cent in 2004/05 against 17.3 per cent in 2008/09).

**Has the case fatality rate changed?**

The proportion of emergency admissions in which the patient died in hospital appears to have reduced slightly over the five years. In 2008/09, 203,790 people died during their hospital stay following an emergency admission, compared with 225,209 in 2004/05. Taking into account changes in the age, sex and diagnosis of people admitted to hospital in 2004/05, it would be expected that 256,712 people would die during an emergency admission in 2008/09 rather than the observed 203,790.

The falling mortality in hospital represents a 9.5 per cent decrease against 2004/05 numbers, even though admissions have risen by 11.8 per cent. The proportion of short-stay emergency admissions that end with death is much lower than the longer-stay equivalent (2.1 per cent versus 7.1 per cent in 2004/05), but both fall at similar rates (reduced to 1.7 per cent and 6.9 per cent, respectively, in 2008/09). The fall in absolute numbers of deaths could mean that hospital care is now more effective at preventing death or end-of-life care services are supporting more people to die at home.

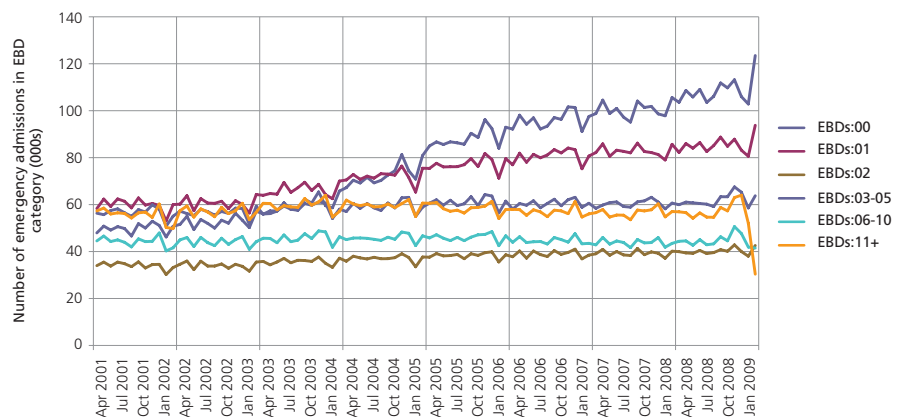
However, the large fall in the proportion of patients dying following an emergency admission is also likely to mean that the additional admissions tend to include patients with less severe conditions.

**Is the pattern of length of stay changing?**

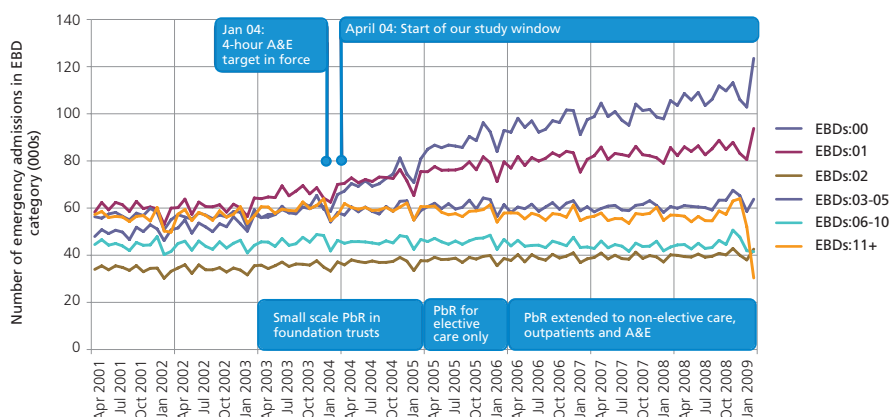
Figure 4 shows the large increase in the number of people who are admitted to hospital as an emergency and stay for less than one day, or for one day. The increase in zero bed-day and one bed-day admissions ('short-stay' admissions) accounted for an extra 592,724 spells (continuous stays) in 2008/09 compared with 2004/05 – about the same as the observed overall increase in emergency admissions in England between those two years. The numbers of admissions for patients staying longer in hospital have either remained constant or fallen. A short length of stay in hospital implies patients with less severe conditions are being admitted. Analysis of earlier years (back to 2001) suggests that the rise in these short-stay admissions began in 2003/04, although the number of patients specifically staying less than 24 hours may have been rising for longer.

Emergency admissions with patients staying less than one day in hospital (so-called zero bed-day admissions) accounted for 20.7 per cent of all emergency admissions in 2004/05, and had risen to 27.2 per cent by 2008/09.

**Figure 4: Number of emergency admissions categorised by emergency bed-days (EBDs) used in spell, excluding spells in mental health and undefined Healthcare Resource Groups (HRGs) 2001–2009**



**Figure 5: Number of emergency admissions categorised by EBDs used in spell, excluding spells in mental health and undefined HRGs, annotated with dates of key reforms**



them quickly afterwards. In 2006/07 there were adjustments to the tariff to reduce the amount hospitals are paid for less costly short-stay admissions.

Figure 5 shows the trend in short-stay admissions relative to the introduction of PbR. While the increase in short-stay admissions tallies with the introduction of PbR, the increase had occurred for at least two years before PbR was extended to cover emergency admissions.

### Targets for maximum wait in A&E

The four-hour A&E target set by the Department of Health in 2000 required 98 per cent of patients attending A&E departments to be

seen, treated, admitted or discharged in under four hours by 2004. It has been suggested that trusts might have admitted patients for ‘observation’ when close to breaching the four-hour waiting target (Information Centre, 2009a), resulting in the patient being admitted for less than one day (effectively a few hours) and discharged as soon as they could be assessed properly and treated.

Figure 6 tracks the parallel changes in the number of four-hour target breaches and short-stay emergency admissions in England from 2002/03 onwards. It shows the actual number of attendees waiting more than four hours (breaches) or admitted as a zero bed-day stay, as well as the percentage of people attending A&E seen within four hours (target achievement).

It can be seen that the growth in the number of zero bed-day emergency admissions has been steady, and this trend was not altered by the introduction of the four-hour target. There was a dramatic fall in breaches between 2004 and 2005, and from then on the level of breaches remains more or less consistent. After 2005, the number of combined events grows steadily with the increase in zero bed-day admissions, which indicates that there is no evidence of substitution between breaches and zero bed-day admissions at national level.

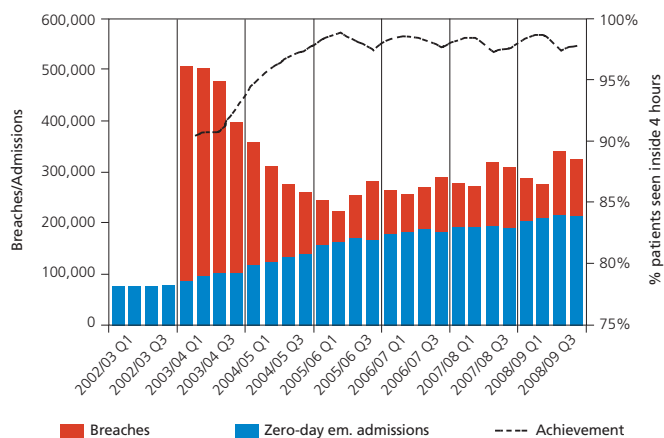
However, some trusts show a different pattern. Figure 7 shows the same analysis but for a single trust with an admission pattern that could suggest a link between breaches and the rise in short-stay admissions. The trust’s performance on the four-hour target had

## Have key reforms resulted in rising short-stay admissions?

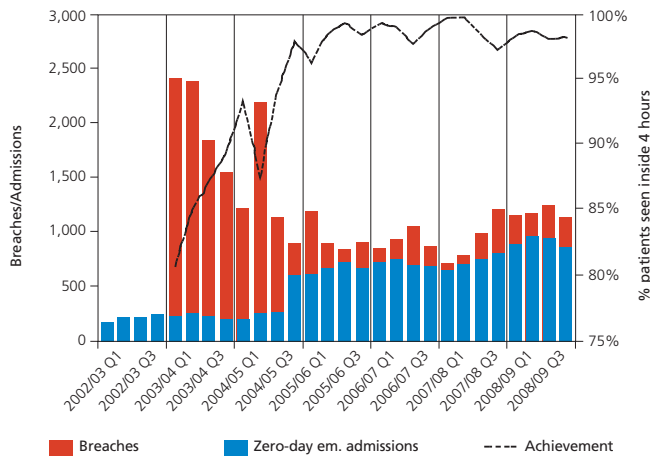
### Payment by Results

In 2003, the way that hospitals were paid for admitting patients began to change. Hospitals used to be paid on a ‘block’ contract basis – receiving a fixed sum every year for a volume of admissions that was normally specified, often regardless of how many admissions took place. From 2005/06, all hospitals were paid on a fixed price per admission basis, known as Payment by Results (PbR), where the price was nationally set as a ‘tariff’. This was phased in over three years and gave clearer financial incentives to hospitals to admit patients, and discharge

**Figure 6: Trade-off analysis between four-hour target breaches and short-stay emergency admissions in England (all A&E types), 2002–2009**  
(Note: this assumes that all admissions happen before patient has breached the four-hour target waiting time.)



**Figure 7: Trade-off analysis between four-hour target breaches and short-stay emergency admissions in a particular trust, 2002–2009**



been improving steadily without a parallel increase in short-stay admissions between the first quarter (Q1) of 2003/04 and the third quarter (Q3) of 2004/05. When the target was eventually achieved (Q4 in 2004/05) it coincided with a sharp increase in zero bed-day emergency admissions. While the number of breaches had reduced in the previous six quarters, from this point there is an apparent substitution between zero bed-day admissions and breaches, where the number of combined events is relatively steady but the number of breaches falls away drastically. There could be many explanations for this behaviour and there are several other trusts that display similar patterns.

It appears therefore that though some trusts do show patterns that indicate a link between admissions and targets, this is not apparent at a national level and so does not seem an adequate explanation of national increases in emergency admissions observed.

**The introduction of foundation trusts**

Foundation trusts are hospitals that have more autonomy in how they manage their affairs compared to other trusts. The number of foundation trusts increased markedly in the five-year period, so that just under half of all acute trusts in England had foundation status. In our sample of 150 hospitals, 60 achieved

foundation status by 31 March 2009 (see page 7 for more information).

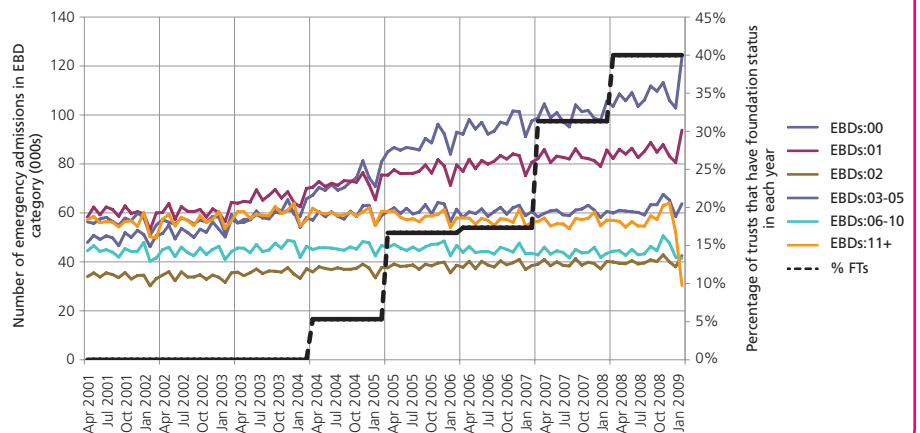
Figure 8 illustrates the proportion of NHS trusts that were foundation trusts over the period under study. Those trusts that eventually became foundation trusts show similar increases in emergency admissions when compared with other NHS trusts from 2004/05 to 2008/09. However, further analysis shows there are no obvious differences between foundation trusts and non-foundation trusts in the propensity to admit people for less than a day. Zero bed-day admissions start at 20.3 per cent of all emergency admissions (non-foundation trusts) and 20.5 per cent (foundation trusts) then rise to 28.6 per cent and 28.3 per cent, respectively. These results suggest that emergency admission patterns are not linked to foundation status.

**Is the increase linked to more A&E visits?**

Patients admitted via A&E departments are only a small subset of the total number who attend A&E. Looking at the Department of Health’s *Quarterly Monitoring of Accident and Emergency* data (Department of Health, 2010), there has been a steady rise in A&E attendances since 2001/02, and the increase in the five-year period is around 10 per cent. However, the majority of these additional attendances are at minor A&E centres (types 2 and 3) such as minor injury units and walk-in centres. Attendances at major (type 1) A&E units, the main source of emergency admissions to hospital, have grown by only 1.2 per cent since 2004/05.

Though the numbers attending major A&E departments were relatively stable over the five years, the proportion

**Figure 8: Number of emergency admissions categorised by EBDs used in spell, excluding spells in mental health and undefined HRGs, and the proportion of NHS acute trusts which became foundation trusts, 2001–2009**



of attendances that resulted in an emergency admission rose from 21 per cent to 24 per cent – equivalent to 449,078 additional admissions in 2008/09, a 14.3 per cent increase. A similar analysis of all A&E attendances (types 1, 2 and 3) reveals a 20 per cent increase in admissions with a 10 per cent increase in attendance. The attendance-to-admission conversion rate grew from 15 per cent to 17 per cent in the five-year period.

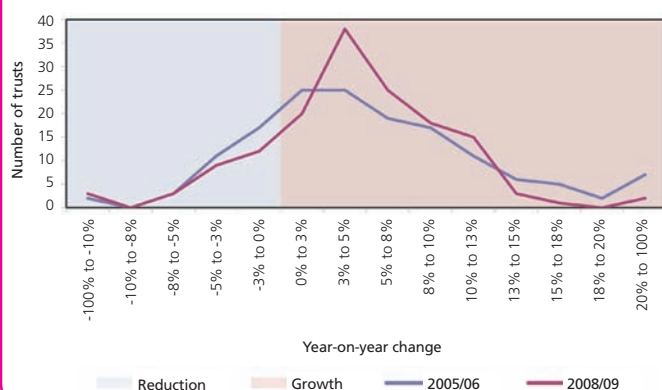
### Are there differences between hospitals?

The pattern of emergency admissions for each hospital (NHS trusts and NHS foundation trusts) in England was investigated to see whether the national trends outlined above were common to all NHS trusts. Since the overwhelming majority of emergency admissions are to general acute trusts, data for these trusts only were examined.

The analysis was complicated because of mergers and reconfigurations of emergency services over the five-year period under study. In some cases NHS trusts were excluded where the reconfigurations were especially complex. This left a group of 150 acute trusts that have existed throughout all five years under study. These 150 hospitals received 94.8 per cent of all emergency admissions in England, and they underwent a 14 per cent rise in emergency admissions since 2004/05.

Across all these hospitals the median year-on-year increase in emergency admissions, over all years, was 2.7 per cent and there was little variation between the majority (80 per cent) of these trusts (see Figure 9). However, as shown in the figure, each year some trusts appear to show extreme changes. It is likely some of these changes are due to the impact of service reconfigurations within the trust or changes in recording

**Figure 9: Distribution of changes in numbers of emergency admissions year-on-year for 150 trusts in first and final years**



of information on admissions (such as the introduction of a new computer system or changes of local definitions).

Thus, over the study period, emergency admissions have reduced in some trusts (up to one-third), and in other trusts have increased far more than the average national figure of 11 per cent (up to nearly 100 per cent). Similarly, there was considerable variation between trusts in the proportion of emergency admissions that lasted one day or less and their increase over time. It will be very important to examine these outliers in further detail to understand if there are useful lessons for other trusts.

### Are there differences between PCT areas?

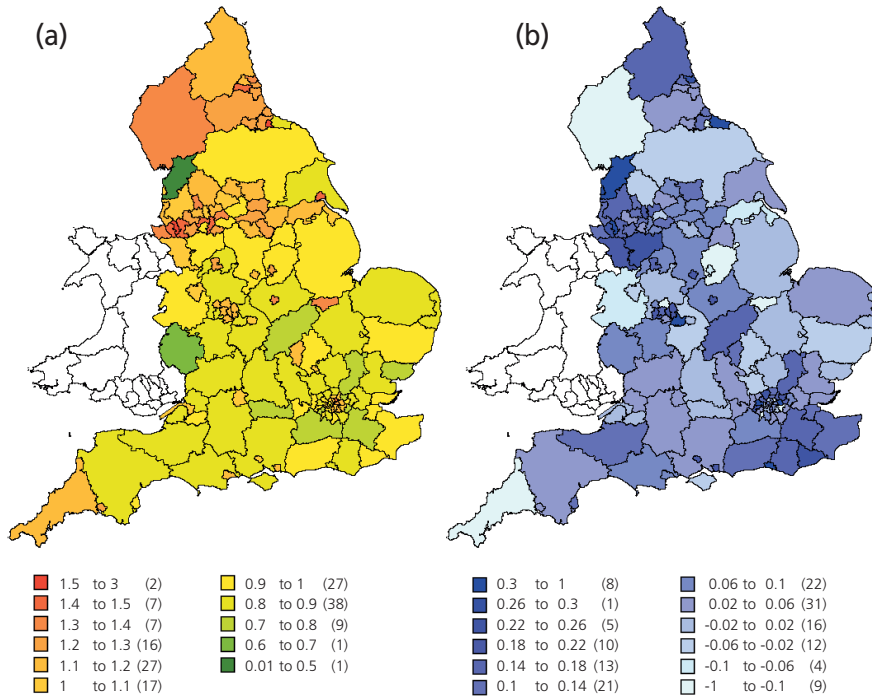
Further to the analysis above of NHS trusts, variations in the pattern of emergency admissions by PCT area were examined. The research team used the 152 PCTs that existed in England at the end of 2008/09, each covering an approximate average population of 300,000. The team used indirect standardisation (adjusting for the age and sex differences in the population) to calculate the expected level of emergency admissions based on 2004/05 admission rates. Comparing this to the observed number of emergency admissions gives a standardised admission ratio (SAR) that can be used to compare across PCT areas. A SAR value above 1 indicates that the number of admissions observed is greater than that expected.

Figure 10 (a) overleaf shows the SAR in 2004/05 on the left and the change in SAR by 2009 on the right. Across all PCTs the SAR values range from about 0.5 (about half the expected value) to over 2 (twice the expected value). Figure 10 (a) shows that in 2004/5 there were higher SARs in urban areas, and particularly in the North West and North East.

Figure 10 (b) shows the change in SAR values over the five years. The areas with the highest increases are largely around London and other conurbations in the Midlands, North West and North East. But other areas bucked this trend; for example Cumbria in the North West had a higher than average baseline admission rate in 2004/5 but the increase to 2008/09 was lower than average. In contrast an area along the southeast coast had a lower than average SAR 2004/5 yet the increase to 2008/09 was relatively large.

Though there is a known strong positive correlation between rates of emergency admission and socioeconomic deprivation, there is no clear link to the change in emergency admissions from 2004/05 to 2008/09.

Figure 10: (a) Age and sex standardised emergency admission ratio in 2004/05 (green, lowest, to red, highest); (b) absolute increase by 2008/09 (blue, dark = highest, light = lowest)



the financial incentives on hospitals to admit patients; policies to promote – and advances in clinical practice that allow – faster discharge from hospital, which increases the availability of beds; inadequate health and social care outside hospital; and the adequacy of clinical decisions to admit patients. Together these factors can create a cycle of rising admissions, where more discharges have meant more admissions and, paradoxically, greater efficiency (shorter stays in hospital for each admitted patient) has probably led to more ‘inefficiency’ (a greater number of avoidable emergency admissions).

Of all the possible supply-side factors contributing to the increase, we suggest that the most significant is that advances in medical care and management have reduced the length of stay that patients have in hospitals, which in turn has freed up more available beds and allows doctors to admit more patients. This cycle is reinforced when services across hospital, primary, community and social care providers are fragmented,

## Conclusions

The trend of rising emergency admissions in England has been observed over at least three decades. The analysis presented here shows that the number of emergency admissions across England has increased by approximately 11.8 per cent over the five-year period – equivalent to around 1.35 million extra admissions in total. This rise accelerated in particular between 2003/04 and 2005/06. Over the same five-year period the number of short-stay admissions (patients admitted for one day or less) increased by a similar number. The rise in emergency admissions is occurring in patients across all age groups, and across a range of diagnoses. The short length of stay of the extra cases suggests that less severe cases are being admitted, implying that the threshold for emergency hospital admission lowered in the five-year period. Lower mortality in admitted patients also suggests the same.

The potential reasons for the rise can be roughly divided into ‘demand’ factors (such as England’s aging population) and ‘supply’ factors. Supply factors include:

which can lead to miscommunication delays in care and avoidable ill health and costs. Though recent policies, such as PbR and the four-hour maximum waiting time target in A&E, may have exacerbated some of the problems, their impact is likely to be marginal relative to the long-standing underlying trend.

Given the financial squeeze on the NHS, it is critical that future reforms should focus on how to reduce hospital care where it is preventable and avoidable. There are many different service innovations aimed at improving how demand factors are managed and some can have short-term local impacts. However, putting in place better out-of-hospital care and reducing the number of hospital beds is unlikely to be enough – there needs to be more fundamental reshaping and incentives in the health system towards robustly managed coordinated care.

Below we offer some recommendations for policy-makers, regulators and healthcare practitioners.



**Policy-makers should:**

- Continue to scrutinise and reform the system for reimbursing hospitals and general practices for care so that avoidable admissions are discouraged. This could mean the encouragement of risk-adjusted capitated payments to primary and hospital providers for each patient per year, with financial risk borne by the provider and savings from averted emergency admissions to be shared between both types of provider.
- Understand more fully the contribution of inadequate out-of-hospital care to the rise in admissions and what can be done to improve it. In particular pilot attempts to improve links between hospital care and out-of-hospital care providers (primary care, community services and social care) that promote more coordinated care.
- Craft financial incentives, or allow the local NHS to craft them, which encourage providers to keep people well so that admission is avoided and at the same time discourage admission to hospital unless absolutely necessary.
- Ensure that the definitions, data recording and reimbursement in this area adequately reflect emerging models of urgent care provision.

**Regulators should:**

- Develop ways of assessing the quality of care across different providers.
- Consider using avoidable emergency admissions as an undesirable outcome measure to indicate adequacy of coordinated care across providers.

**Local clinicians (including GPs as commissioners) and managers should:**

- Review how clinical decisions to admit patients to hospital are made and improve them, for example through greater use of primary care physicians in A&E and/or greater use of consultants to decide on admission, or not.
- Ensure that shorter stays for admitted patients, which free up beds available for care, are translated into reducing the number of hospital beds, rather than further lowering the threshold for hospital admission.
- Develop higher-quality out-of-hospital care for patients to reduce the need for emergency admissions, and in doing so create: more coordinated care between hospital and out-of-hospital settings, for

example through clearer direction for patients to the most appropriate urgent care service; easier lines of communication between admitting clinicians; better management of care pathways between hospitals and general practices; shared information and peer reviews between providers on the use, cost and outcomes of care for individual patients.

- Work with patients to identify how they could be better supported to reduce the risk of ill health and admission. Identify the patients at high risk of future admission, using risk-stratification techniques (Billings and others, 2006) to target personalised support.
- Learn from NHS trusts where emergency admissions have declined, as well as from those where admissions have been far higher than the national average.

Without such change, future rises in emergency admissions – with all the avoidable human and financial cost they represent – are guaranteed.

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### *Trends in Emergency Admissions report*

The full report *Trends in Emergency Admissions in England 2004–2009* by Ian Blunt, Martin Bardsley and Jennifer Dixon is being published online in July 2010 at [www.nuffieldtrust.org.uk/publications](http://www.nuffieldtrust.org.uk/publications).

## The Nuffield Trust

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Key current work themes include:

- new forms of care provision
- commissioning
- efficiency
- national and international comparisons
- competition policy.

This briefing forms part of our efficiency work theme. A major programme of Trust work in this area, New Frontiers in NHS Efficiency, is currently underway.

For more information on our work programme and to sign up to receive our regular e-newsletter, visit [www.nuffieldtrust.org.uk](http://www.nuffieldtrust.org.uk)

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FOR RESEARCH AND POLICY  
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