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Nosocomial Infections

Risk management standards in NHS hospitals and the frequency of hospital-acquired infections

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Hospital-acquired infections such as MRSA and clostridium difficile have increased markedly in the NHS over the last fifteen years, leading to the introduction of a mandatory surveillance system in England in 2001 (Health Protection Agency, 2006), vapour treatments in some hospitals, the specific employment of a hygiene company by the NHS and several ward closures. A total of 55,634 cases of *C. difficile* in patients aged 65 years or over in England was reported to the Health Protection Agency in 2006, an increase of 7% from the previous year. The Office for National Statistics has reported that the number of times *C. difficile* was mentioned on death certificates in England and Wales increased from 975 in 1999 to 3,807 in 2005. The comparable figure for MRSA in 2005 was 1,629. These developments, along with well-documented compensation payouts to a number of MRSA sufferers, additional treatment costs of approximately £1bn per year (National Audit Office, 2000) and reputation costs to the NHS itself make hospital-acquired infections a high profile and important focus for the patient safety debate in the NHS.

Financial Incentives

In principle, one important mechanism for encouraging patient safety is through the provision of financial incentives to hospitals. The main body responsible for administering schemes allowing NHS trusts in England to pool the costs of liabilities to patients is the NHS Litigation Authority (NHSLA), a Special Health Authority established in November 1995. The NHSLA is responsible for administering the Clinical Negligence Scheme for Trusts (CNST), a voluntary scheme to which all English NHS Trusts and PCTs currently belong, and covers clinical incidents occurring on or after the date when the Trust joined the scheme. Contributions are based on the number of staff employed in different risk categories by each Trust member. The scheme also gives a role to the risk management processes that members have in place when determining contributions. Assessments are based on seven "core" standards. Trusts at level 1 are normally assessed against the CNST Standards once every two years and those at levels 2 and 3 at least once in any three year period, although trusts may request an earlier assessment if they wish to move up a level. Trusts which are assessed as complying with the standards will be entitled to a discount from their scheme contribution for the following two financial years. The discounts on CNST contributions are 10% (level 1 compliance), 20% (level 2 compliance) and 30% (level 3 compliance). The discount earned by members is applied to contributions in the financial year following a successful assessment and is valid for 2 years (unless, of course, the assessed level of compliance changes).

Efficiency Studies

A recent example illustrates the potential importance of these incentives. In October 2007, the Healthcare Commission, the health "watchdog" for England, published a report which attributed the deaths of 90 patients at hospitals in the Maidstone and Tunbridge Wells NHS Trust in Kent to outbreaks of *Clostridium difficile* between April 2004 and September 2006. *C. Difficile* is a bacterial infection of the gut which causes severe diarrhoea and can be fatal in vulnerable patients such as the elderly. The report linked these deaths to significant failings in infection control at the Trust. In particular, the Commission's investigation identified inadequate measures to manage and prevent infection, poor staff training, staff shortages, and very high occupancy rates. The report noted that the clinical CNST had criticised the Trust in January 2006 for failing to have an infection control programme for the year ahead. The Trust had previously declared itself compliant on the set of standards that relate to infection control in the core standards laid down by the Department of Health.

In a recent study, funded by the Economic and Social Research Council, we sought to assess the extent to which the discounts offered to hospitals for reaching higher risk management standards have incentivised hospitals to improve their safety procedures, and the extent to which this has effected a reduction in the incidence of hospital-acquired infections. We are able to control for various observable measures of hospital risk type, including hospital throughput, bed utilisation, and casemix. To our knowledge this is the first study to examine the link between risk management standards and patient safety.

Data Collected

Data on MRSA infection rates were extracted from the Health Protection Agency Communicable Disease Surveillance Centre. These cover the period from April 2001 (when mandatory surveillance began) to September 2005. Data were available for each NHS Trust by number of MRSA bacteraemia reports and MRSA rates per 1,000 bed days. Clearly, there are considerable differences across hospitals in the number of infections each year, which will be influenced by hospital throughput and casemix, as well as the extent to which the reported MRSA infections originated in the community rather than the hospital. Nevertheless, they may also be a function of the infection control measures introduced in these hospitals, which in turn may be given a higher priority in hospitals with good risk management procedures in place.

It is evident that the trend over time has been for an overall progressive improvement in the assessed standard of risk management procedures, although considerable variations between hospitals have existed, and remain throughout the period of observation. These differences in compliance with the NHSLA's standards presumably reflect the priority given by hospital management to the benefits of risk management (including the discount on contributions) relative to the investment costs involved. We also obtained annual data for each hospital from the Hospital Episodes Statistics on activity levels (measured by the total number of bed days), bed utilisation rates (i.e. bed days relative to bed

capacity), and casemix variables (i.e. the proportion of bed days allocated to the main treatment specialities). In our statistical analysis we used these variables as controls for the risk type of individual hospitals – that is, their exposure to risk of infection.

Findings

We found that improved CNST risk management standards (i.e. the attainment of levels 2 or 3) are associated with reductions in the region of 11%-20% in the MRSA infection rate, after controlling for the effect of observed variations in hospital activity levels, their casemix, and their bed utilisation rates (how “busy” a hospital is).

Ultimately, whether hospital care levels respond to the financial incentives explicitly incorporated into risk pooling contributions is an empirical matter, and we believe that the data available from the NHSLA has opened up a unique opportunity for research on this topic. A combination of financial autonomy at hospital level and risk management assessments in the years from 2001 to 2004 means that data exist on the extent to which hospitals responded differently to these incentives by implementing improved risk management procedures. Because of the progressive implementation and assessment of standards by the NHSLA, it has been possible to construct a panel of data in which the variations in these standards across hospitals and over time can be captured and related to the measurements in reported MRSA infections. The results reported in this paper are indeed consistent with the implementation of improved risk management procedures having a positive effect on patient safety (i.e. a reduction in the number of infections for given throughput and casemix). Moreover, our subsidiary results indicate that inter-hospital variation in throughput, casemix and capacity utilisation can help explain the incidence of MRSA infections, and consequently that there is a degree of predictability to the geographical distribution of these events.

Conclusions

Our results may have useful implications for policy makers. At a time when MRSA infection rates appear difficult to control, the results indicate that financial incentives could be given an important role in this area. Such insights are relevant to the wider evaluation of alternative mechanisms for compensating medical injuries as well as those directed at improving specific aspects of patient safety. It is perhaps unsurprising in the light of our findings that the risk management standard attained by the Maidstone and Tunbridge Wells NHS Trust was category 1 - the lowest available level. Managerial failings were identified by the Healthcare Commission as contributory factors in that outbreak. A way of providing financial incentives which signal areas where risk management can be improved is surely a positive contribution to the range of measures which have been debated in the wake of this event.



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