

## **Reports by John Yates on the use of HES data to identify potential failures in surgical performance**

### **Background**

John Yates has many years of experience in using routine data to monitor health service activity and performance and it is characteristic of him that he promptly made steps to investigate data relevant to Bristol. His background is in hospital administration and his analytical approach is much less sophisticated than that commissioned by the Inquiry.

The importance of his work is that he has given much thought to the question of how to use routine data, much of which is relatively crude and of variable quality, to monitor the health service in a way which could identify potential problems at an early stage. The questions of interpreting hospital mortality rates and improving data collection are of long standing and received considerable attention in the nineteenth century from, for example, Florence Nightingale and Henry Burdett.

It is difficult to review formally these papers by John Yates, so what follows are comments on key points in the light of the approach he developed in the 1980s. This has now fallen into disfavour, wrongly in my view.

### **Examining variation in death rates: - a job for the scientist not the journalist**

This extract from a longer report starts by outlining concerns about data in clinical systems. These include their accuracy and completeness, the fact that few deaths occur so mortality rates are based on small numbers and the lack of linkage to records about people who die outside the hospitals being investigated, either voluntarily or involuntarily. The last of these problems can, of course be tackled by linking hospital and death data. He also spells out the need to adjust for casemix and allow for differences in resources, which can affect the performance of staff.

The paper continues with a brief description of an analysis of HES data for 128 general surgical and urological teams for one region in 1989/90 and focuses on the wide differences observed in mortality rates. These were analysed by operation, diagnosis and consultant firm and the results were published in appendices which were not included in the version of the paper sent to me. It appears from the text that they were not adjusted for age or case mix and most were based on small numbers of deaths.

Of the 4082 deaths included, 60 per cent took place on surgical wards during an episode which did not include an operation and most of these had a diagnosis which included a malignancy. Death rates were higher in emergency than in elective admissions. A group of teams undertaking a certain type of vascular surgery had a particularly wide range of death rates.

The discussion acknowledges the limitations of the approach and of drawing conclusions based on the small numbers of deaths in only one year's data for one region. It goes on to point out that these arguments will be deployed to justify

continuing to ignore the data and makes the case for an independent inspectorate to examine data from all NHS and private hospitals. These analyses would be conducted blinded to the identity of the hospitals and teams and would relate mortality to other data about the hospitals and units concerned. It argues that this approach would be more constructive than simply publishing league tables of named units in the press.

### **Early identification of poor performance failure and major performance failure**

This paper describes briefly the rationale behind John Yates' work in building up databases of routinely collected data to investigate poor performance and performance failure in NHS institutions. It starts with a brief review of catastrophe theory and a discussion of the extent to which it can be applied to the NHS. I do not know enough about catastrophe theory to comment on how well this was done, but I think this use of a wider approach to investigate problems in the NHS data is potentially valuable.

The next section is an equally brief overview of the work of John Yates and his team and others who followed the same approach. The most important point is that they used as wide a range of indicators as they could gather together. This showed that institutions whose performance was in question tended to have extreme values for other indicators, for example staffing or resources. For monitoring it suggests that 'What we should be looking for is a consistency of performance within individual indicators over a period of time, consistent patterns of behaviour in groups of indicators and sudden changes in the values of key indicators following previous consistency.'

Finally, John Yates proposes, following press reports about Bristol, that HES data should be used to investigate variations between units in mortality associated with paediatric cardiac surgery. The only cause for comment is the length of time which elapsed before this actually took place.

### **Analysis of HES data for cardio-thoracic work**

This is a one page outline setting out plans for analyses. There is little to comment on here, except that there was no detailed age breakdown among younger children.

### **A case study exploring an early identification of performance failure in an acute hospital**

This paper reports John Yates' own analysis of HES data about cardiac surgery from 1990/91 to 1994/95. It appears that unit codes but not the identity of the units was provided. This was a considerable disadvantage over this time period, at the beginning of the internal market, when hospitals were being reconfigured from directly managed units into trusts and being given different organisation codes as a consequence.

The analysis compared mortality rates associated with relevant operations and also ranked them. In doing so, it identified one unit with exceptionally high mortality, which could be identified as Bristol and one other unit with a relatively high mortality

rate. The general approach was similar to that subsequently commissioned by the Inquiry and reached much the same conclusion, despite a much lower level of statistical sophistication and rigour. In the discussion, it suggests comparison of HES data with data from other sources, which is of course what the Inquiry subsequently commissioned.

## **General comments**

These papers do not do justice to John Yates' many years of experience in developing systems to monitor NHS performance and factors with which it may be associated. As a result, readers who are unaware of his work might be tempted to dismiss them. From a purely statistical point of view, the analyses commissioned for the Inquiry are an advance on his work, but there are many other areas where he has experience and insights to offer. It might have been better to commission an overview rather than reproduce this rather disjointed set of papers. The important points he has to make are:

**1. The need to use a wide range of indicators.**

John Yates has shown that it is counterproductive to publish indicators of poor 'performance' in isolation from other indicators which can set poor 'performance' in context and be useful in investigating the problems behind it. The systems of health service indicators developed in the 1980s along the lines pioneered by John Yates took this approach. The current approach, on the other hand is to use small numbers of 'high level' indicators, and consider them as a proxy for many other factors about which data are not collated or examined. This will not enable the development of sensitive monitoring systems. Instead, as John Yates suggests, we need systems which can monitor NHS activities in detail both cross-sectionally and over time.

**2. Publishing anonymised or named data.**

Anonymity was necessary in the 1980s but is unacceptable now. A 'middle way', where data are compared anonymously and fed back to trusts and health authorities for comment before being made public would allow them to identify differences and possible factors behind them. They may result from differences in data collection rather than performance. Using a wide range of indicators can show whether a unit is divergent on one or on many of them.

**3. The need to take a wider view of factors associated with 'poor performance'.**

This is not simply a matter of adjusting for social factors and 'case mix', but taking a wider review of how major adverse incidents can arise. Simply focussing on the competence of individual clinicians is not sufficient. For example, a review of 'catastrophe theory' and the insights it can offer would seem to be useful, if the Inquiry has not already commissioned one.

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March 28 2000