

EARLY IDENTIFICATION OF POOR PERFORMANCE AND MAJOR PERFORMANCE FAILURE

Introduction

Most large organisations are subject to occurrences of poor performance and occasionally there are examples of major performance failure. Ideally, monitoring mechanisms are established which attempt to minimise the risk of failure by providing some form of warning system. Whilst such systems can never be foolproof, they are seen as an alternative to waiting for 'accidents to happen' by providing a mechanism which helps the organisation to concentrate on a small number of areas where the risk of performance failure appears greatest.

This paper describes part of the rationale behind an attempt to formalise a research programme which scans routine data sources in order to try and identify poor performance and anticipate major performance failure. The aim is to give early identification of situations where clinical intervention might be inappropriate, insufficient, dangerous or inefficient.

Performance failures in the NHS

From time to time the NHS suffers from performance failures that cannot simply be considered as caused by occasional and unavoidable human error. Some of these might rightly be called disasters but others simply appear as a cluster of significant errors. Disasters include the spate of major mental hospital enquiries from 1965-1985^{1,2}, hospital fires causing significant damage and loss of life³ and major outbreaks of food poisoning⁴ and Legionnaires disease⁵. Clustering of errors include hospitals whose levels of efficiency and equity have necessitated police investigations⁶, locations where large groups of patients have been waiting excessive periods for admission^{7,8}, hospitals subject to external enquiry because of high death rates⁹ and the possible links between low volume (or occasional) surgeons and high complications and high death rates¹⁰.

- Catastrophic failures

Bignell et al¹¹ suggests that whilst accidents happen, disasters are carefully planned. Where sudden violent disasters, such as aeroplane¹² and train crashes¹³, and mining disasters occur¹¹, subsequent study shows that there were a large number of failures in and around the organisation, many of which had been known about for some considerable period of time.

Turner¹⁴ says the 'ideal typical' disaster has some or most of 19 typical features. These include a complex, ill-defined and prolonged task which gives rise to a variety of information difficulties and a system which includes a large and complex site to which employees of a number of organisations have access and to which the public is also admitted. From the complex web of "ideal-typical" features, Bignell et al¹¹ have described seven causal features and these are:

- 1 a rigidity of institutional beliefs;
- 2 tendency to be distracted to 'decoy problems';
- 3 an organisational exclusivity that disregards non-members;
- 4 information difficulties;
- 5 the involvement of strangers;
- 6 failure to comply with existing regulations;
- 7 minimising or under-estimating emergent dangers.

They argue there is no single cause of failure, but if one cause had to be selected it would be failure in information. It is not that information is not available, but that it exists in a state of 'variable disjunction' (information held at different levels, in different places, in different time scales and in an unco-ordinated fashion) and even sometimes there is information overload.

Are these theories relevant to the NHS?

In 1979 when I first started work in this area I felt that a weakness in the catastrophe theory was the apparently large element of hindsight judgement and the absence of accurate prediction. After every major disaster it is usually possible to find that some form of warning was offered by someone inside or outside the organisation, and yet that warning was ignored. The reason for ignoring warnings is that organisations have

so many warnings and criticisms that it is difficult to distinguish between those it can safely ignore and those which it should take more seriously. The theory at that time lacked some quantification or measurement of risk and I therefore attempted to set that work alongside the more statistical 'catastrophe' theory of Zeeman¹⁵ and the mixed scanning approach adopted by Etzioni¹⁶, which suggests a useful form of exception reporting.

A comparison between the theory of catastrophic failures and the situation in mental hospitals subject to major enquiries showed striking similarities in the elements of performance failure. This led to the development and testing of the hypothesis which suggested that performance failure in mental hospitals were not a random event, but was more likely to occur in hospitals that were large in size, badly staffed and with a high proportion of long stay patients. The results of that research showed that a high proportion of mental hospital disasters could have been identified and predicted.

The result was the development of an inter-hospital comparison database which spanned 25 years and showed that whilst any hospital could have poor standards of care, there were groups of hospitals which were much more prone to performance failure. The retrospective analysis showed that each year a group of hospitals could be identified as having 'high risk' performance failure characteristics. From 1980, annually updated information was then made available on a request only basis to hospitals and monitoring agencies as a type of warning system. Managers of every large mental illness and mental handicap hospital in England requested information.

It is not possible to be exactly sure of the impact, if any, of providing such warnings. The inter-hospital comparison data was widely, but not universally, used. The failure of the Department of Health and one regional health authority to use the system was heavily criticised by the judicial enquiry into the food poisonings at Stanley Royd Hospital⁴. Since that date there have been no major external enquiries into standards of care in large mental illness or handicap hospitals, but that may well be due to many factors other than the production of a comparative database to aid monitoring. All the hospitals have reduced in size (a large number of patients was one of the risk factors), many have closed and, in any case, the monitoring database closed down in 1987 with the disappearance of SBH112, a routine return from which many of the indicators were derived, and consequently the Department of Health ceased to gather data about individual mental institutions.

- Identifying disaster in the acute sector

Given the cohesive nature of performance shown by organisations that have catastrophes, is it possible that the major performance failures occurring in acute hospitals might also be detected by scanning routine data? It could be that on occasions, one or two simple indicators will be seen to be associated with performance failure. Extremely poor values in terms of patient/nurse ratio are frequent associated with mental hospital enquiries, and there was evidence of high admission rates in child and adolescent psychiatry in the Tees districts following the Butler-Schloss enquiry¹⁷. (Data was not available for the period prior to the enquiry.)

Individual indicators must, however, be treated with some scepticism, because they describe a natural variation which could itself alter from year to year and also because extreme values in indicators are quite often associated with data error. 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 on key indicators following previous consistency. It was interesting to note, for example, that during the time of serious allegations about fraud and misconduct in general surgery at Merthyr the performance of the District could be seen to be extreme in the number of variables. It had a very high waiting list per population and per consultant, with a very high proportion of patients waiting over a year for treatment. Length of stay was extremely high as was turnover interval, and yet the District had one of the highest levels of bed provision per population to be found in Britain. The level of day case activity was extremely low, clinic sizes were very small and yet re-attendance rates very high. Our experience in examining some of England's worst waiting lists did not show a neat consistent pattern in which every district involved had the same pattern of problems, but in most cases we could identify various typical sets of problems.

We have not been privy to any detailed information about the problems surrounding paediatric cardiac surgery in Bristol and have merely seen press reports on the subject. If the evidence presented in these reports is correct, it would appear that it took some time for NHS staff to convince health authorities of the need for some form of investigation. The differences in death rates reported appear significant, and yet this information ought to be readily identifiable from HES data. Data systems produced by IACC now readily identify death rates for individual surgical teams, either for all

patients or any selection of diagnostic or operative groups of patients. This work has already demonstrated some surprisingly consistent patterns, with certain surgical teams having high death rates year after year which do not seem to be accounted for by case mix variation. To date the medical profession and health service managers have been reluctant to use a database which is acknowledged to have imperfections, but the confidential examination of this data seems to be an eminently reasonable professional activity to be undertaken in the NHS. There is no need to publish the names of surgeons or hospitals, but we should, at least, examine the data to see if it merits further investigation.

Proposal

I would like to propose that we examine the HES data for cardiac surgery for the whole of the country for a period of five or more years. Initially, this work should be done blind with no access to the identity of surgeons or hospitals. The analysis of the data would then try and identify patterns of activity which appear to be either inappropriate, insufficient, dangerous or inefficient. If such patterns emerge, we would then discuss the findings with an expert panel. After that the identity of the units and teams involved could be made known in order to see whether the unusual patterns of activity in Bristol were, indeed, identified and to what extent the data analysis matches the information system set up by the cardiac surgeons themselves¹⁸.

This project could be conducted quickly (within six months) and, if successful, would lead on to:

- a extension into other specialties;
- b linking the data to abstracts of good practice.

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-References

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