

# PostScript

## LETTERS TO THE EDITOR

### Hospital success rate: a multidimensional indicator of prognosis

There is worldwide interest in using routinely collected statistics to construct indicators to measure the outcome of hospital care. Typically, interest in any particular condition tends to focus on the review of comparative performance as assessed by individual measures such as mortality, emergency re-admission, or excessive lengths of stay. There is thus a set of indicators to review.

Consideration should also be given to the development of multidimensional outcome indicators, derivable from routinely collected data, that summarise the outcomes of a hospital admission and can be used to provide prognostic information. With the universal implementation of the NHS number in England, it will be possible to link data about hospital admissions for each individual with their subsequent admissions and with mortality data. National indicators based on linked data are now starting to be published.<sup>1</sup> Using linked data, "success" can be considered in various ways and, as an illustration, in this study it has been defined at 90 days after admission as being alive, being out of hospital, and not having been re-admitted after discharge. We have calculated success rates for two conditions—stroke and fractured femur—highlighted as key priorities in the national strategic framework for older people.<sup>2</sup>

Routine data linked in the former Oxford health region were used (population 2.5 million) for the period 1 January 1994 to 31 March 1999. The denominators were emergency admissions for people aged 65 years and over with a principal diagnosis of stroke (ICD-9 431–434, and 436; ICD-10 I61–I64) or fractured neck of femur (ICD-9 820, 821.0 and 821.1; and ICD-10 S72.0, S72.1, S72.2 and S72.9). An admission was defined as a continuous stay in hospital, regardless of any change in consultant or hospital. Thus,

If you have a burning desire to respond to a paper published in *QSHC*, why not make use of our "rapid response" option?

Log on to our web site ([www.quality-healthcare.com](http://www.quality-healthcare.com)), find the paper that interests you, and send your response via email by clicking on the "eLetters" option in the box at the top right hand corner.

Providing it isn't libellous or obscene, it will be posted within seven days. You can retrieve it by clicking on "read eLetters" on our homepage.

The editors will decide as before whether to also publish it in a future paper issue.

**Table 1** Outcome at 90 days following admission for stroke and fractured neck of femur: number and percentage of patients in each outcome category

Outcome	Stroke		Fractured neck of femur	
	No	%	No	%
Dead	6840	46.3	2234	20.4
Emergency re-admission	716	4.9	764	7.0
Elective re-admission	268	1.8	209	1.9
Still in hospital	1173	7.9	591	5.4
"Success"	5784	39.1	7162	65.3
Total admissions	14781	100.0	10960	100.0

admissions linked by a transfer were counted as a continuous stay. For each condition a second admission for the same condition within 90 days of the first was counted as a re-admission rather than a new fracture or stroke. The status of the patients was measured within 90 days of admission and classified as (a) dead, (b) re-admitted, (c) still in hospital with no break in inpatient care, or (d) none of these. If a patient had both a re-admission and died, only the death was included in the results. If a patient was re-admitted more than once, he/she was counted once as a person re-admitted. The results presented in table 1 show that, at 90 days, the hospital success rate was 39 per 100 patients with stroke and 65 per 100 patients with fractured neck of femur.

We suggest that work might be undertaken in each clinical specialty to derive dimensions of outcomes from linked routine data. Key issues include the choice of conditions to be considered, the choice and definition of adverse events following care for the conditions (for example, whether to restrict analysis of re-admissions to those for certain types of complication); and time frames (for example, 30 or 90 days). If the indicator is to be used for making comparisons, consideration will have to be given to weighting the adverse events to reflect their relative importance. Whether weighted or not, we suggest that the components of the indicator are presented alongside the multidimensional measure.

Once the definition of "success" has been agreed for a given condition, it will be necessary to evaluate its usefulness in informing doctors and patients about the prognosis. However, any "success" indicator derived from routine statistics will be only a partial measure of outcome and will need to be supplemented by other clinician-assessed or patient-assessed measures.

**A Mason, M J Goldacre, H McGuinness**  
Unit of Health-Care Epidemiology, Department of Public Health, University of Oxford, Oxford OX3 7LF, UK

Correspondence to: Dr M J Goldacre, Unit of Health-Care Epidemiology, Department of Public Health, University of Oxford, Oxford OX3 7LF, UK; michael.goldacre@dphpc.ox.ac.uk

Alastair Mason and Henry McGuinness are funded by the Department of Health as part of its funding of the National Centre for Health Outcomes Development. The views expressed in this letter are those of

the authors and not necessarily those of the Department of Health. The Unit of Health-Care Epidemiology is funded by the South East Regional Office of the NHS Executive.

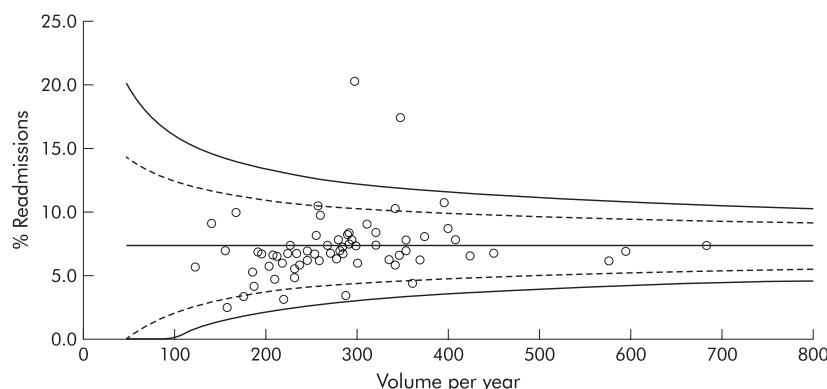
### References

- 1 Lakhani A, Olearnik H, eds. *Compendium of clinical and health indicators*. London: Department of Health, 2001.
- 2 Department of Health. *National service framework for older people*. London: Department of Health, 2001.

### Funnel plots for institutional comparison

Mohammed and colleagues<sup>1,2</sup> have suggested the use of Shewhart control charts as a means of presenting performance indicator results without spurious ranking into "league tables". They choose to plot the observed number of events against the volume of cases on a square root scale; unfortunately this choice appears unintuitive, obscures the observed event rates, and leads to rather approximate control limits. A small adjustment—plotting the event rates against the volume of cases—leads to the "funnel plot" which is widely used in meta-analysis to check for publication bias<sup>3</sup> and has also been used to compare mortality rates in paediatric cardiac surgery.<sup>4</sup> An example is shown in fig 1 for emergency re-admission rates following treatment for a stroke in large acute or multi-service hospitals in England and Wales in 2000–1; exact 95% and 99.9% binomial control limits (essentially corresponding to 2 and 3 standard deviations) around the overall event rate of 7.4% are superimposed to indicate possible thresholds for "alert" and "alarm".<sup>5</sup> Two centres stand out as having clearly divergent performance while the remainder essentially display expected variability. There is some suggestion that smaller centres have lower event rates but, after removing the divergent centres, a logistic regression shows a non-significant relationship.

Funnel plots discourage inappropriate ranking while providing a strong visual indication of "divergent" performance or "special cause" variation. Advantages over the specific suggestion of Mohammed and colleagues include the display of the observed event rates, an informal check of the relationship between event rate and volume of cases, an emphasis on the increased variability expected from smaller



**Figure 1** “Funnel plot” of emergency re-admission rates following treatment for a stroke in large acute or multi-service hospitals in England and Wales in 2000–1.

centres, intuitive choice of axes and hence easy plotting, and exact binomial control limits obtainable from the most popular spreadsheet package. I suggest that funnel plots could provide a useful adjunct to any performance monitoring system.

#### D Spiegelhalter

Senior Scientist, MRC Biostatistics Unit, Institute of Public Health, University Forvie Site, Robinson Way, Cambridge CB2 2SR, UK; david.spiegelhalter@mrc-bsu.cam.ac.uk

#### References

- 1 **Mohammed MA**, Cheng KK, Rouse A, *et al.* Bristol, Shipman, and clinical governance: Shewhart’s forgotten lessons. *Lancet* 2001;**357**:463–7.
- 2 **Adab P**, Rouse A, Mohammed MA, *et al.* Performance league tables: the NHS deserves better. *BMJ* 2002;**324**:95–8.
- 3 **Egger M**, Davey Smith G, Schneider M, *et al.* Bias in meta-analysis detected by a simple, graphical test. *BMJ* 1997;**315**:629–34.
- 4 **Stark J**, Gallivan S, Lovegrove J, *et al.* Mortality rates after surgery for congenital heart defects in children and surgeons’ performance. *Lancet* 2000;**355**:1004–7.
- 5 **NHS Executive**. *Acute trusts NHS performance indicators: clinical effectiveness and outcomes*. London: Department of Health, 2002. <http://www.doh.gov.uk/nhsperformanceindicators/2002/trust.html> (accessed 17 June 2002).

### Cleveland Health Quality Choice was a failure, not a martyr

We read with interest the article entitled “Too good to last: did Cleveland Health Quality Choice leave a legacy and lessons to be learned?” published recently in *QSHC*.<sup>1</sup> Perhaps relevant in this regard is our study of the claim, repeated by Neuhauser and Harper, that the Cleveland Health Quality Choice (CHQC) project may have improved mortality rates in Cleveland at a faster rate than they were improving elsewhere.<sup>2</sup> Using OHA data we found that not to be the case. The rate of improvement in inpatient mortality in Cleveland was the same as that in the rest of the state and would therefore have to be attributed to other factors.<sup>3</sup>

CHQC’s bright promise unfortunately went largely unfulfilled as it never got much beyond mortality and length of stay, neither of which is a very good surrogate for quality. Although CHQC’s risk adjustment may have been the best available, it was only marginally better than simpler, far less expensive methods. That was just one of the many problems

with this project, which seemed incapable of improvement almost from the moment it began releasing reports.

In their article Neuhauser and Harper allude to the Cleveland Clinic’s intent to focus the money previously being spent on CHQC to improve quality in its system of hospitals. We have been doing that on a disease-by-disease basis through the Cleveland Clinic Health System’s Quality Institute, actually spending about the same amount as on CHQC. This program measures well proven indicators of quality care, producing demonstrable, credible, timely results that lead to productive actions. The Joint Commission recognized this activity with the 2001 Codman Award.

Although we certainly agree that CHQC was a pioneering project, we disagree that anyone ever used the data for its original purpose—to influence the medical marketplace. We were able to find no evidence that this ever occurred. The “business model” as it applies to health care did not work in Cleveland, nor has it worked in other areas such as Pennsylvania and New York where report cards have been published. The production of academic articles was never the purpose, and research grants rather than operational money should support such activities.

We are aware of another 5 year ongoing study in Dayton, where a collaboration of business and hospital leadership has led to substantial improvement in both outcomes and processes of care. The Dayton project has been successful because its goal is to improve health care in the community, not to reward or punish providers based on their outcomes.

We doubt that the loaded word “martyrdom” accurately describes the fate of this failed program. We need, either as communities or as individual institutions, to move on to new approaches as we learn from the failures of the past.

#### J D Clough

Director of Health Affairs, Cleveland Clinic, Cleveland, Ohio, USA

#### D Engler

Vice President, Data Services, Ohio Hospital Association, Columbus, Ohio, USA

#### P E Canuto

Executive Editor, Cleveland Clinic Journal of Medicine, Cleveland Clinic

Correspondence to: Dr J D Clough, Director of Health Affairs, Cleveland Clinic/W14, 9500 Euclid Ave, Cleveland, Ohio 44195; cloughj@ccf.org

#### References

- 1 **Neuhauser D**, Harper DL. Too good to last: did Cleveland Health Quality Choice leave a legacy and lessons to be learned? *Qual Saf Health Care* 2002;**11**:202–3.
- 2 **Rosenthal GE**, Quinn L, Harper DL. Declines in hospital mortality associated with a regional initiative to measure hospital performance. *Am J Med Qual* 1997;**12**:103–12.
- 3 **Clough JD**, Engler D, Snow R, *et al.* Lack of relationship between the Cleveland Health Quality Choice project and decreased inpatient mortality in Cleveland. *Am J Med Qual* 2002;**17**:47–55.

## BOOK REVIEWS

### Review of *e Clinical Governance: A Guide for Primary Care*

Louise Simpson, Paul Robinson, eds. Abingdon, Oxon: Radcliffe Medical Press, 2002. £19.95. 128 pp. ISBN 1 85775 595 2.

Unlike elephants, clinical governance is easy to describe in theory but hard to know if you have a splendid example in front of you. This book, which introduces the reader to the field of health informatics, helps this process of turning clinical governance from rhetoric to reality. Health informatics is more than just using a computer in a clinic or surgery. It is, the editors tell us, a “scientific approach to information, which includes how we think, how data become information and knowledge, how we communicate in clinical practice, how we represent data, information and knowledge in computers, how we learn, how computers can support clinical practice”. It is this staggeringly wide definition that provides the clue to the book’s strength and weakness. It scopes the field of health informatics competently, urging the reader and all healthcare professionals to record clinical data more accurately, use it more fruitfully, and reflect on it as part of continuing personal and professional development. The book deals with the practical aspects of this challenge adequately. The authors advocate using Prodigy, unsurprisingly, as a number of the contributors have helped develop that programme. They explain the use and availability of Prodigy well, and signpost the reader to a host of useful websites for clinical guidelines, protocols, and other evidence based centres and groups. And they explain clearly the contribution of Read codes, and the value of the PRIMIS and MIQUEST programmes in organising and retrieving clinical data. But the book has taken on this huge brief—outlined in its definition—and doesn’t deal with the theory underpinning health informatics robustly. The authors never really nail the connection between clinical governance and health informatics, and provide somewhat bland sections on risk management and the theory of knowledge. They do stray occasionally into the odd platitude, and stand accused, like many others, of misusing the word “paradigm”. But this is essentially an introductory guide, a practical book to help people navigate through a tricky and increasingly important field, as shown by the final section which is full of practical advice on education. Readers who seek that level of information won’t be disappointed.

#### K Sweeney

Research and Development Support Unit, University of Exeter, UK; k.g.sweeney@exeter.ac.uk

## Principles for Best Practice in Clinical Audit

National Institute for Clinical Excellence. Abingdon, Oxon: Radcliffe Medical Press, 2002. £29.95 (£19.95 for NHS staff). 208 pp. ISBN 1 85775 976 1

After over a decade of investment in clinical audit in the NHS, it might seem a little late for the National Institute for Clinical Excellence (NICE) to be publishing a book on how to do it. In the foreword by NICE there is a clue to the reason why. It says, rather charitably, that audit has a “mixed record”, and then goes on, less charitably, to list its flaws and shortcomings. A litany of problems is recited—including poor project design, inadequate data, bad project management, lack of commitment, poor change management, patchy follow up, and inadequate support. With such a track record, the continuing policy commitment to clinical audit looks like a triumph of hope over experience, or an admission that no realistic alternatives to persisting with clinical audit exist. The obvious question is why should this be so? Why has clinical audit often failed to deliver meaningful improvement, and what can be done about it?

The book does a good job of pulling together useful resources and information on clinical audit from all sorts of places, and it provides a great primer on clinical audit. It shows very clearly that good clinical audit is not rocket science; indeed, that perhaps it is too simple for some clever people’s liking. A series of chapters take the reader through the stages of the clinical audit cycle, from preparation to making and sustaining change. But three quarters of the book is dedicated to a series of appendices which provide a diversity of materials from a guide to online resources to a summary of the recommendations from the Bristol Inquiry. It is very extensively referenced and has lists of further reading. Overall, as a general resource, it should be useful to anyone working in clinical audit or clinical governance and to many clinical professionals.

However, the book does not really answer the obvious question posed earlier—why has clinical audit often failed to deliver meaningful improvement and what can be done about it? The book makes audit sound simple, which makes it all the harder to understand why it is so often ineffective. The truth is that we know how to do clinical audit well, and have known it for several years. Only in the early days of the 1990s was there much uncertainty about why clinical audit worked in some places or cases, but failed miserably in others. We know how to do it, and yet we still get it wrong. The continuing failure of clinical audit in many NHS organisations is not a failure of knowledge, which this book might help to address. It is primarily a failure of leadership and organisational culture, something which this book cannot really help to solve.

**K M J Walshe**

University of Manchester, Manchester M13 9PL, UK; kieran.walshe@man.ac.uk

## Action Evaluation of Health Programmes and Changes: A Handbook for a User-Focused Approach

John Øvretveit. Abingdon, Oxon: Radcliffe Medical Press, 2002. £27.50. 246 pp + vi. ISBN 1 85775 925 7.

Evaluation has never been higher on the agenda. Policies and programmes in health care change faster than ever, yet the methodological demands of rigorous evaluations lead to them becoming more complex, time consuming, and often distant from everyday service experience. Too often, by the time evaluation information becomes available, things have moved on and the information lacks saliency. What distinguishes this text is both its plurality of approaches and its focus on the end users of evaluation information. In this sense, the book concentrates on what it terms “action evaluation”—evaluations

designed to inform, in realistic time scales, policy, managerial and practice questions.

The text is in three parts. First, Øvretveit discusses the overall design requirements for evaluations of policies and programme changes, then he introduces the tools needed to develop evaluations, before finally exploring some of the specific issues that arise in evaluation implementation—for example, data gathering or ethics. The book fills an obvious need by offering a very practical step by step guide at each stage. Each section is highly structured, with good use being made of tables and figures. A bulleted summary rounds off each chapter, enabling quick review of the material covered. The book is completed by a handy glossary of terms complete with definitions.

This is an undoubtedly practical book, and Øvretveit does a good job in positioning his action evaluation approach compared with pure research or more standard evaluation methods. Being relentlessly pragmatic, however, the book is rather light in two inter-related areas—qualitative methods receive fairly scant attention and there is almost no mention of how theory can help develop more meaningful evaluations of wider applicability. This is disappointing when the complexity of healthcare policies and programmes, and the ways in which they interact with the social context of their delivery, provides great scope for theory driven approaches. Work such as that described in *Realistic Evaluation* by Pawson and Tilley (Sage, 1997) provides a nice counterpoint to this text. Nonetheless, for would-be evaluators, Øvretveit’s book provides clear and practicable guidance on evaluation, highlighting both the potential and the pitfalls.

**H Davies**

Professor of Health Care Policy & Management, University of St Andrews, St Andrews, Fife KY16 9AL, UK; hd@st-and.ac.uk