ABSTRACT – Hospital episode statistics contain clinical data. They are used for many purposes, including monitoring activity in the NHS and the allocation of funds. More recently they have been applied to monitoring performance, and it is intended that they will inform consultant appraisal and revalidation.

The validity of hospital episode statistics was questioned by Kö rner in 1982. Recent publications have shown that problems persist in England and Wales, and that the quality of the data is inadequate for the task. The lack of involvement of clinicians in the process of data collection and validation is no longer acceptable. To rectify the situation there should be a change of process and culture, supported by education and investment. NHS data definitions of terms such as ‘spells’, ‘episodes’ and ‘diagnoses’ need to be reviewed. The development of separate data processes to monitor national service frameworks is regrettable.

KEY WORDS: clinicians, hospital episode statistics, data validity

Statistics on activity in all NHS hospitals are used for many purposes including: negotiation of funds for the NHS, allocation of resources, monitoring of variations in activity and identification of trends in healthcare. Recently, they have been used to produce performance and clinical indicators. They could also be used for clinical audit and health-technology assessment via randomised trials. In the future, they may also be used to inform consultant appraisal and underpin the new consultant contract.

Hospital episode statistics (HES) are just one of many central returns from NHS hospitals (most are financial). Clinical information on diagnosis and procedures is captured for inpatients and day cases, but not for outpatient attendances. The clinical data are identified and coded from medical records, following the discharge of a patient from an inpatient or day-case episode. The process is distinct from the separate data collection required for confidential enquiries and specialty-based audits and for monitoring national service frameworks.

The quality of data routinely collected for central returns for management purposes was questioned in 1982 by Kö rner, who noted that ‘the inaccuracy, lack of timeliness and certain inherent defects form the core of criticism levelled against NHS information’. Problems with validity have been acknowledged by the Department of Health and the Welsh Office (now the National Assembly for Wales), who found inexplicable variations in clinical indicators between Wales, England and Scotland, which, it was presumed, ‘were due to coding or technical errors’.

Validity of HES

We have reviewed papers assessing the validity of data held in HES for England and Wales since 1990. They show that the ability of HES to capture all in-patient and day-case episodes is doubtful (Table 1). A recent study found that hospital episode statistics in Wales (held on the patient episode database for Wales (PEDW)) failed to identify 17%, 29% and 53% of patients admitted to hospital in the course of three randomised controlled trials.

Even if patient episodes are captured, the clinical data recorded may be inaccurate. A retrospective audit in two hospitals, comparing diagnosis codes assigned by local staff with those assigned by members of an external coding team who did not know the locally assigned codes, found exact agreement for the main diagnosis in 43% and 60% of cases, and approximate agreement in 55% and 72% of cases, respectively, in the two hospitals.

Operations and procedure data are equally suspect (Table 2). Examination of procedure data for 1999–2000 on the HES website reveals that for approximately 6 million operations, the number of general anaesthetics that were included was 61,833.

It is clear, therefore, that HES remain unable to support the purposes for which they were originally designed, let alone new purposes related to quality appraisal and revalidation. The unjustified criticism of the Chesterfield and North Derbyshire Royal Hospital NHS Trust by the Commission for Health Improvement is an example of the damage that can be done.
What can be done?

The process of collecting clinical data for central returns is summarised in Table 3. Accurate coding depends on clear medical documentation of diagnoses and procedures, as highlighted by the Audit Commission. Clinicians must also validate the coded data. Discussion of data validity in *HES – the book* makes no mention of the need for clinicians to be involved. There is no routine process of feedback to clinicians of either individual patient or aggregate data at a local level. The involvement of clinicians in data collection will improve accuracy, but they need to work closely with coders. The accuracy of coding by trained coders, when presented clearly with the term to code, is high, suggesting that most problems lie with the identification of the correct diagnoses and procedures in the notes. To rectify this, the quality of documentation in medical notes must be given a high priority in undergraduate and postgraduate curricula. Transfer of the responsibility for, and ownership of, collection and validation of routine clinical data from management to clinicians in hospitals would mean a change in culture as well as education. It would also need resources – but there is already a considerable investment in the coding infrastructure in hospitals, which might be more effectively deployed by providing support to a clinically managed process. The likelihood that HES data will underpin the new consultant contract and appraisal may create interest from clinicians in this change.

In the meantime, NHS data definitions need revision and clarification. For example, the definition used to describe an episode is open to misinterpretation. A hospital provider spell is 'the total continuous stay of a patient, using a bed on the ward, during which medical care is the responsibility of one or more consultants, or the patient is...

### Table 1. Completeness of hospital episode statistics (HES) for patient episodes.

<table>
<thead>
<tr>
<th>Comparator</th>
<th>Year</th>
<th>Completeness of HES (%)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer registrations</td>
<td>1991–4</td>
<td>66%</td>
<td>Thames Cancer Registry. Some patients may not have been admitted to hospital.</td>
</tr>
<tr>
<td>Public Health Common Dataset</td>
<td>1993–5</td>
<td>83%</td>
<td>Patients admitted with hip fracture in Wessex region (range 44%–99% in individual districts).</td>
</tr>
<tr>
<td>NHS private patient unit data</td>
<td>1995/6</td>
<td>84%</td>
<td>Data from 53 hospitals in England. More day cases than inpatients were missing.</td>
</tr>
<tr>
<td>Randomised controlled trial database:</td>
<td>1995–7</td>
<td>83%</td>
<td>All patients were admitted as day cases to one hospital in South Wales.</td>
</tr>
<tr>
<td>investigation of sleep apnoea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>surgery for incontinence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Randomised controlled trial database:</td>
<td>1995–8</td>
<td>47%</td>
<td>One hospital in South Wales participated.</td>
</tr>
<tr>
<td>total knee replacement</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2. Completeness of procedure data in hospital episode statistics.

<table>
<thead>
<tr>
<th>Comparator</th>
<th>Year</th>
<th>Patients with procedure correctly identified (%)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Histopathology department records</td>
<td>1990</td>
<td>10%</td>
<td>Pleural biopsies in Wales.</td>
</tr>
<tr>
<td>Haematology department records</td>
<td>1990</td>
<td>12%</td>
<td>Marrow aspirations in Wales.</td>
</tr>
<tr>
<td>External coding team</td>
<td>1991–3</td>
<td>58%, 76% 70%, 83%</td>
<td>Exact agreement required (two hospitals in NW Thames). Approximate agreement required (two hospitals in NW Thames).</td>
</tr>
<tr>
<td>Gastrointestinal endoscopy unit records</td>
<td>1992</td>
<td>67%</td>
<td>All Wales.</td>
</tr>
<tr>
<td>Local audit data</td>
<td>1989/90</td>
<td>45%</td>
<td>Varicose vein operations in the Oxford region.</td>
</tr>
<tr>
<td>Prospectively collected data</td>
<td>1994/5</td>
<td>69% (range: 36%–87%)</td>
<td>Vascular procedures in five regions in England and Wales.</td>
</tr>
<tr>
<td>Prospective data collection</td>
<td>1990–5</td>
<td>80%</td>
<td>Vascular surgery in the Oxford region.</td>
</tr>
</tbody>
</table>
receiving care under one or more nursing episodes, or midwife episodes in a ward. The hospital provider spell starts when a consultant, nurse or midwife assumes responsibility for care following the decision to admit the patient. Furthermore, ‘A bed includes any device that may be used to permit a patient to lie down when the need to do so is a consequence of the patient’s condition, rather than the need for active intervention such as examination, diagnostic investigation, manipulation/treatment or transport’. This definition causes immediate confusion when applied to a procedure such as an endoscopy, which could be classified as a day-case, and thus collected in HES data, or as an outpatient procedure, in which case it would be omitted. It is no wonder that endoscopic data held on PEDW indicate recurring under-reporting of nearly 10,000 procedures per annum in Wales19, translating to 170,000 procedures per annum for the whole of England and Wales.

While the total continuous stay in hospital is a ‘spell’, the period of care when a patient is under a consultant is termed a ‘consultant episode’35. The use of the ‘finished consultant episode’ as the primary episode currency has been questioned36,37, and has dubious relevance in a health service where roles are rapidly changing and team working is becoming the norm. The concept of the episode of care now needs to cross conventional organisational and time boundaries38. This would provide a more complete picture of both individual care and outcomes, leading to better views on quality, as well as better-informed case management, service development and policy decisions.

The definition of ‘primary diagnosis’ is also likely to contribute to poor validity. HES – the book describes ‘primary diagnosis’ as ‘the main condition treated or investigated during the episode of health care’38. ‘Main condition’ is not defined, and there are six further diagnosis fields for a ‘subsidiary’, and up to five ‘secondary’ diagnoses, again not defined, to be used to record ‘other diseases, conditions or complications’. The rate of recording of secondary diagnoses in England is about 10% of that in the USA, with serious implications for any comparison of outcomes between hospitals or professionals39.

It is also of concern that, while there is considerable investment in the process of collecting central returns, additional and parallel data-collection processes exist or are being created in support of confidential enquiries9 and national service frameworks10,11. A fundamental review of all data-collection processes is required in order to integrate them into a single process linked to the implementation of electronic patient records40. A current consultation on NHS performance indicators41 fails to seize this opportunity or to acknowledge the crucial role of clinicians in ensuring data quality. Improvements in the validity of HES might help to gain the trust of clinicians, and might also enable the wider use of the data for purposes such as audit6 and health-technology assessment by randomised controlled trials, with potential cost savings to the research budget9. Many of these issues were identified in the Bristol inquiry report, Learning from Bristol42. Action now needs to be taken.

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1 Central data collections from the NHS. NHS Executive Health Service Circular 1998/054.
11 Department of Health. Coronary heart disease information strategy.


PEDW data items. nww.wales.nhs.uk/whcsa/hmis/datadict22/pedw.dataitems.htm


