

Accuracy of routinely collected clinical data on acute medical admissions to one hospital

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SUMMARY

Despite the rapid growth in routine computerized data collection within the National Health Service (NHS), and the increased use of such data for generating hospital statistics and doctor activity rates, few validation studies exist. During a study of 158 acute medical admissions, an examination of hospital data revealed numerous and systematic inaccuracies. If general practitioner (GP) performance statistics are to be reliably based on such sources, data validation, staff training, and protocols for data entry should form a routine part of NHS practice.

Keywords: data collection; computerized records, hospital admission.

Introduction

THERE has been a rapid growth in the routine collection of computerized data within the NHS, with the use of hospital datasets to produce regular reports on morbidity, mortality, and activity rates. This information is increasingly used to show comparisons between health providers and to provide information on resource allocations. Concerns are expressed over difficulties in retrieving and applying such data.¹ There is a need to standardize clinical coding² and formats for data interchange.³

The accuracy of NHS computer data is essential, particularly in the context of purchasing because, if diagnostic and demographic codings are inaccurate, purchasers may make reimbursements for non-supplied activities. Despite the importance of the subject, few data validation studies exist. In a major review of routine health databases,⁴ only three studies contained evidence on hospital data accuracy, and then only on surgical activity. The review determined that it was dangerous to draw conclusions from the currently inadequately tested NHS data.

Methods

Routinely collected registration and clinical data were validated in a study of acute admissions to one Birmingham teaching hospital. Data included the patient's name, age, address, registered GP, admission route, and diagnoses, entered by registration staff, and comprised 32 data entries per patient. Diagnoses were coded from discharge forms completed by clinicians, using ICD9 Classification⁵ for the main admission cause plus secondary problems.

Hospital data on 158 consecutive acute admissions occurring during a week in October 1992 were compared with information

from GP interviews and records. No validation was possible in 15 (9%) cases because three doctors refused to cooperate.

Results

Completeness and accuracy of the hospital database

The GP was untraceable for 10 (6%) of the patients because of inaccuracies in hospital data — in four cases no GP name was recorded. Of the 133 admissions that could be validated, the wrong GP was identified in 34 (26%) of the cases. Seventeen were wrongly allocated to one doctor — one patient was registered with another doctor in the same practice but the other 16 had no current or prior links. Numerous minor inaccuracies in hospital data existed, such as wrong spellings (especially patients' names and addresses) and false entries. Patients' addresses were unavailable for 33 (21%) of the total 158 patients.

Validation of hospital data on route of admission

Hospital data recorded 70 GP admissions (GP or deputy), but 10% were wrongly classified because six were self-referrals to the accident and emergency department and one followed a consultant domiciliary visit. The hospital recorded 63 cases as non-GP admissions, but 14 (22%) had actually been admitted by a GP (10 were wrongly recorded as self-admissions, three as outpatient admissions and one 'by other means'). Therefore, overall, 21 (16%) of the admissions that could be verified were misclassified in the hospital computer records for route of entry.

Validation of diagnostic data

Twenty-three (15%) of the 158 cases had discharge diagnoses listed under broad or vague diagnostic categories, rather than the specific diagnoses leading to admission. In four of the eight patients admitted with a diabetic history, the only diagnosis recorded was diabetes mellitus, rather than the complication (such as chest infection) or unassociated problem causing admission. Similarly, in eight of the nine patient entries listing 'acute but ill-defined cerebrovascular disease', this was the only diagnostic information. Some discharge diagnoses were unreliable, such as nine patients coded as pneumococcal pneumonia when no cultures had been taken. Overall, 32 (24%) of the validated admissions had diagnostic codes which were misleading or required clinical interpretation.

Discussion

There may be limitations to these findings, since they are based on data from only one hospital over one week of admissions. However, given the number of staff involved in routine data collection and the lack of formal training, which is characteristic of most hospitals, these results are quite likely to represent the norm.

In this study, considerable inaccuracies of routinely coded admission data were revealed. The main errors occurred in patient and GP names, routes of admission, and relevant diagnoses. Inaccuracies arose for a number of reasons; for example, a lack of formal procedures to ensure that patients confirm their registered doctor or GP data entered by default from existing

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files. Difficulties were even encountered with data validation because code numbers allocated to GPs varied between organizations (Department of Health GP codes weren't used). Furthermore, some doctors were repeat-listed by the hospital under different names (this was especially likely for Asian doctors).

Human error at data entry will also substantially contribute to the problem of inaccuracy. Diagnostic imprecision may occur because doctors (usually junior) completing discharge summaries may fail to adequately list patient problems or rank them correctly, or may incorrectly allocate inactive medical problems. Interpretation of these doctor-listed problems may be difficult for non-clinical data entry staff, transcription errors will occur, and a specific ICD code for the patient's problem might not exist (the main purpose of ICD is to record mortality and morbidity data⁶ rather than management). Little time is currently provided for training hospital staff in standardizing data collection; this is in contrast to the regular training and data validation imposed on practices in National Morbidity Surveys.⁷

These levels of inaccuracy and under-classification degrade the research and audit potential of hospital data and, if duplicated elsewhere, casts doubt on published GP activity rates (which quote wide variations in performance). Systematic methods understood by everyone directly entering data, with clear definitions of problem-ranking by agreed diagnostic criteria, are needed to accurately collect patient details. In addition, routine validation of data samples against other sources is necessary.

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