

Under-reporting of diabetes in hospital admissions data

In this section, a panel of multidisciplinary team members give their opinions on a recently published paper. In this issue, we focus on the issue of hospital admissions among people with diabetes and the recording of this condition in inpatient records.



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The analysis provided by Anwar et al (2011; summarised alongside) illustrates the difficulties faced when trying to design systems of care and monitor their value (Porter and Teisberg, 2006). No clinician would accept a level of accuracy in blood tests as poor as that described in this article for the recording of diabetes in hospital admissions. Coding was documented in less than two thirds of those who were known to have diabetes. Imagine if a third of biochemistry results had no potassium level recorded; there would be professional uproar. Yet, we are trying to make critical decisions about healthcare systems based on such poor information.

A proper understanding of the link between conditions and resource utilisation along pathways of care is vital if we are to make wise investments in healthcare systems. A few years ago, working with Simon Swift, NHS Lincolnshire explored, in depth, the care pathway for diabetes, seeking to understand where we were, where we wanted to be (based on the best possible evidence) and how we could invest to get there (McShane and Swift, 2009). This work was dependent on using data from multiple sources. It is evident that if the actual recorded use of hospital beds is 10% but insight into the under-recording of diabetes means that the actual use is likely to be 15% then such modelling is rendered “imperfect”!

The NHS faces an unprecedented financial challenge. Complete information is vital if we are to adapt, while maintaining quality in health care in the face of low growth coupled with the significant inflation that all healthcare systems face. As Muir Gray puts it “we need to manage knowledge as carefully as money”. To do so requires that

clinicians and managers understand and value the importance of recording data as accurately as possible. It will never be 100% accurate, but in order to plan and design systems of health care we need the data to be “good enough”. This article by Anwar et al elegantly illustrates that we are not there – yet.

So what could get us there? Creating incentives, penalties and feedback are three steps in the right direction. The introduction of the Quality and Outcomes Framework has incentivised the development of a comprehensive database for many conditions. Mining this can help us to better understand what works and what doesn't work (Dusheiko et al, 2011). Linking

quality data collection into contracts (which traditionally have just been about activity and money) creates financial penalties for providers who fail to comply. Most importantly, we need to create feedback that makes people realise the value of good quality data collection to their specialty, their organisation and, most importantly, their patients. We need to demonstrate how it helps us to design, implement and monitor the impact of better care. We need to

embed “Plan, Do, Study, Act” (NHS Institute for Innovation and Improvement, 2008), if we are going to achieve the ambition, which I believe to be common to everyone working in health care, of continuous quality improvement.

Dusheiko M, Gravelle, Martin S et al (2011) *Does Better Disease Management in Primary Care Reduce Hospital Costs?* Centre for Health Economics, York. Available at: <http://bit.ly/o0z2e0> (accessed 28.01.11)

McShane M, Swift S (2009) *Clinical Economic Modeling in Lincolnshire*. NHS Lincolnshire, Lincoln. Available at: <http://bit.ly/vh0iKz> (accessed 27.10.11)

NHS Institute for Innovation and Improvement (2008) *Quality and Service Improvement Tools: Plan, Do, Study, Act (PDSA)*. NHS Institute for Innovation and Improvement, London. Available at: <http://bit.ly/frZdgK> (accessed 27.10.11)

Porter ME, Teisberg EO (2006) *Redefining Health Care: Creating Value-based Competition on Results*. Harvard Business Press, Boston, MA

“A proper understanding of the link between conditions and resource utilisation along pathways of care is vital if we are to make wise investments in healthcare systems.”

Assessment of the under-reporting of diabetes in hospital admission data: a study from the Scottish Diabetes Research Network Epidemiology Group

Anwar H, Fischbacher CM, Leese GP et al (2011) *Diabet Med* [Epub ahead of print]

DIABETIC MEDICINE

Hospital data underestimates the number of admissions of people with diabetes

1 The authors stress that good-quality data are required to plan and evaluate diabetes services, and so undertook this study to assess the completeness of recording of diabetes in hospital admissions using recent national data from Scotland.

2 Hospital inpatient admissions between 2000 and 2007 were assessed; data were derived from linkage of the Scottish Care Information – Diabetes Collaboration (SCI-DC, a comprehensive, centralised, online database) and hospital admissions to analyse the completeness of coding for diabetes.

3 The authors report that there were 78 559 hospital inpatient admissions during 2007 among people who had already appeared on the

diabetes registry; of this group only 59.3% diabetes mentioned as either a primary or secondary diagnosis on admission. Conversely, the diabetes register had a record of greater than 99% of those whose hospital admissions recorded a diagnosis of diabetes included.

4 Variability between National Health Service Boards was wide, with the completeness of diabetes recording ranging from 44–82%; in large general hospitals the range was greater still, ranging from 34–89%.

5 Completeness of recording of diabetes as a comorbidity varied by primary diagnosis for hospital admission; 70% of admissions with coronary heart disease mentioned coexisting diabetes, while only 41% of admissions with cancer as the primary diagnosis mentioned coexisting diabetes.

6 Improvements in the recording of diabetes over time were noted by the authors, with accident and emergency departments increasing the completeness of recording of diabetes from below 40% to 65% between 2000 and 2007.

7 The authors concluded that there is wide variation in the completeness of recording of diabetes in hospital admission data in Scotland, but this variability take a number of forms.

8 Hospital data alone considerably underestimate the number of admissions and bed days, but also overestimated the length of stay for people with diabetes.

9 Linkage of data from a diabetes register to hospital admissions data provides a more accurate source for measuring hospital admissions among people diagnosed with diabetes than hospital admissions data alone.



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The Scottish Care Information – Diabetes Collaboration (SCI-DC) dataset is populated by daily downloads from over 99% of general practices and all adult diabetes clinics in Scotland. Anwar et al (2011; summarised alongside) present evidence showing that linkage of SCI-DC with hospital admissions data can provide a more accurate measure of hospital admissions in people with diabetes than using hospital admissions data alone. In 2007, only 59.3% of hospital admissions for people registered on SCI-DC mention

diabetes, whereas 99.4% of inpatients noted to have diabetes on their hospital admissions were included in SCI-DC (Anwar et al, 2011).

The completeness of coding of diabetes on hospital admissions varied between clinical specialties, for example only 28.3% of people with diabetes had diabetes recorded on their admission to clinical oncology, compared with 66.7% with diabetes admitted to cardiology. This may reflect the opinions of medical staff completing clinical notes as to whether to include diabetes depending on the perceived relevance of diabetes to the admission, or simply the limited time of clinical staff for the completion of administration. Regardless of the underlying cause, this variability in completeness of coding of diabetes for hospital admissions data limits the conclusions that can be drawn from this dataset alone, and likely underestimates the burden of diabetes on secondary care.

Current Scottish Health Improvement, Efficiency, Access and Treatment (HEAT) targets aim to reduce the rate of hospital admissions and bed days in people with diabetes. Reliable data on hospital admissions of people with diabetes are needed to inform decisions about the development of new and existing services and to evaluate the impact of these services on hospital admissions. Anwar

et al demonstrate that methodologies using coded discharge letters are not an accurate and reliable measure of diabetes admissions and linking the SCI-DC and hospital admissions data is considerably more accurate. Using this linked dataset, Govan et al (2011a) have shown that people with type 1 diabetes (T1D) and an HbA_{1c} level of 7.7–8.7% (61–72 mmol/mol) have fewer hospital admissions than those with an HbA_{1c} level either side of this range. In addition, people with T1D and an HbA_{1c} level >10.8% (>95 mmol/mol) are at the highest risk of hospital admission. These results, derived from a robust linked dataset, could be used to inform the design of services targeted at reducing hospital admissions in people with T1D, and the evaluation of their impact in relation to HEAT targets.

Reliable data on hospital admissions for people with diabetes are also needed to inform evaluations of costs of admissions and evaluations of cost-effectiveness of interventions. This is especially pertinent given the current economic climate. Govan et al (2011b) have also used the linked dataset to show that 12% of all Scottish inpatient expenditure was spent on inpatients with diabetes, who account for 4.3% of the general population. This baseline data could be used to investigate whether development of new or existing services is able to reduce the cost of admission of people with diabetes.

Political policy, health service design and clinical practice decisions should ideally be based on robust data. Anwar et al have shown that linking SCI-DC data with hospital admissions data is more accurate at identifying people with diabetes who are admitted to hospital compared with using coded hospital discharge data alone, and using this linked dataset can provide reliable answers on which to direct service delivery and clinical practice.

Govan L, Wu O, Briggs A et al (2011a) Achieved levels of HbA_{1c} and likelihood of hospital admission in people with type 1 diabetes in the Scottish population: a study from the Scottish Diabetes Research Network Epidemiology Group. *Diabetes Care* **34**: 1992–7

Govan L, Wu O, Briggs A et al (2011b) Inpatient costs for people with type 1 and type 2 diabetes in Scotland: a study from the Scottish Diabetes Research Network Epidemiology Group. *Diabetologia* **54**: 2000–8