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Challenges in Coding and Classification

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In this issue of the Journal, matters relating to coder training, data quality, terminologies, accuracy and audit are explored. Certification is also important for the clinical coder workforce. The HIMAA coder education program is currently addressing this issue, and that of ongoing education required to maintain certification currency.

In their first article, Bramley and Reid discuss coder training initiatives which have undergone evaluation in Ireland, and the opportunities which arise for improvements in these initiatives. Their findings show that we need to look beyond our own organisation and the daily task of assigning codes to the morbidity information in the medical records, and consider what represents best practice and how can we achieve it. Often our clinical coders are under a great deal of pressure to achieve daily targets; these are essential to the achievement of funding associated with the coding process. There are, however, other issues related to the coding process which all clinical coders should consider and actively pursue.

Training and education of clinical coders across all education providers must be standardised so that all trainees receive equitable education and are equipped with the confidence and skills sufficient for them to be able to undertake accurate, productive and high-quality coding. In a second article, Bramley and Reid present their evaluation findings on the data quality initiatives in Ireland. They report that many coding services managers actively encourage their coding staff to interact with clinicians in order to break down the barriers to clinical terminology used in the patient record, which is often abbreviated to indistinguishable shorthand.

McKenzie and Wood, and Reid, Allen and McIntosh address such issues as terminology and coding inaccuracy in their articles. It is only through rigorous scrutiny and quality audits that we are able to achieve the high standard of assigning codes required to attract the correct DRG weights and funding associated with the process. Many coding audits have revealed under-assignment of codes, which affects the outcome of the funding regimen, which in turn financially disadvantages the organisation. Shortfalls in coding quality can be overcome by continuous education and data monitoring in the medical records.

Not only is the issue of data quality important to the clinical coder, but we must also remain alert to the ever changing environment of the health sector and associated terminologies linked with coding practice. It is also important to keep abreast of the changing electronic health record environment, technologies used to assist in the allocation of codes, and the reality of meeting targets in order to maintain funding for the organisation. As clinical coders, in our daily work we are faced with many challenges of coding and classification, and it is important that we maintain a high standard of practice through continuing education, audit and research. Our craft is highly skilled and technical, and through our clinical knowledge, we are best able to serve our organisations by maintaining currency of knowledge and expertise.

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Challenges in coding and classification: what’s new?

Rosemary Roberts AM

The process of coding and classifying is all about turning health data into health information. The electronic era presents a major challenge, as well as an opportunity, for the personnel and organisations involved to improve coding and classification systems. Our ability to represent concepts and terms electronically is changing dramatically the way in which the clinical record is created and held, how the data is disseminated, how the coding process works, and how classifications are built and maintained. It is impacting on the working lives and education of clinical coders and Health Information Managers, not to mention clinicians and health managers.

However, articles in this issue remind us that good quality clinical documentation is still the most important prerequisite for accurate and precise coding. Paramount amongst the incentives for good patient record keeping practices is the use of the data for patient care. Communicating information to other clinicians and to the patients themselves is fundamental to the rationale for a scientifically sound clinical record. The advent of electronic health record systems means that exchange of health information can be more timely and efficient, and the information itself legible and comprehensive. This development also opens up possibilities of extracting clinical terms from patient health records electronically, either for ‘terming’ or for ‘coding’.

The transition from hard copy to electronic health records is one of the current challenges in coding and classification. A related challenge is the move to electronic products for the coding process. Coders must be in a position to understand how to access electronic patient records, to use electronic books and encoders to apply codes, and to source electronic information to support their knowledge of disease processes and treatments.

Incentives to improve the quality of documentation can only come about by demonstrating the usefulness of the information held in and gleaned from the patient record. First and foremost amongst these users is the clinician, and the partnership between clinicians and clinical coders must be robust and familiar if coders can correctly interpret diseases, symptoms and signs, and treatments undertaken. Extracting the data and codifying that data for research, monitoring utilisation, reporting to state and national health authorities, and quality assurance are the traditional reasons d’être of clinical coding and classification. In the last decade we must add to this the use of coded data to underpin casemix classifications, which in turn are related to clinical costs and affect hospital budgets. This adds another dimension to the need for accurate clinical coding and documentation, and puts particular pressure on clinical coders and managers to ensure that coding is accurate.

Australia is fortunate in having its own National Centre for Classification in Health (NCCH) to produce Australian health classifications and to provide a forum for maintaining and updating each classification in accordance with changes in clinical knowledge. The challenge here is to ensure that new advances and understanding are reflected in the classifications in a timely and clinically relevant way, without ‘knee jerk’ reactions to ephemeral fads or jargon. The NCCH approach to evidence-based change to the classifications is outlined in the paper by McKenzie and Wood, who explore the ramifications of a request to express severity and patterns of asthma in ICD-10-AM. While this is of paramount importance clinically, it also relates to classifying casemix to reflect groups that are not only clinically homogeneous but also bring together cases that require similar financial resources. Severity becomes a critical issue here, but the clinical definition of ‘mild’, ‘moderate’ and ‘severe’ must be extremely precise to ensure consistent terming and reliable data extraction. This minefield of gaining agreed definitions reinforces the importance of high level collaboration between clinical organisations such as learned colleges and societies and the NCCH, as well as the nuts and bolts question of whether the agreed terms can be found in patient records.

Although Australia has the capacity to update its own classifications, local currency must be achieved in the context of compliance with international standards, not only for morbidity coding, but also to enable consistency of coding of diseases for morbidity reporting with that of coding causes of death. This country is not alone in confronting the challenges of applying clinical terminologies in electronic health records while maintaining the advances made in classifying and coding clinical information using a clinical coder workforce.

There has been some concern that the introduction of clinical terminologies will replace health classifications. Mappings have been done between ICD-9-CM and SNOMED CT in the United States and between ICD-10 and SNOMED CT in the United Kingdom. In this issue, Kemp, Walker and Scott describe the process of mapping between Australian term sets and SNOMED CT, and the hazards of using theoretical maps when the relationship between a terminology and classification is dependent on the personal or clinical context of care. I believe that one of our greatest challenges is to graft the advances made in terminology development and mapping to the solid foundation we have internationally with health classifications such as ICD-10 and ICD-10-AM. Terminologies can inform classification development, particularly with regard to the detailed axes of a disease such as asthma outlined by McKenzie and Wood. Terminologies must coexist with classifications, not replace them, and clinical coders will learn the benefits of applying and supplementing maps with their knowledge of evidence and standards for application of particular codes. Such standards may relate to whether a combined or precoordinated
code is used for a set of diseases or procedures, or whether each aspect or axis of that disease or procedure receives a separate code using a post-coordinated approach (see Kemp, Walker and Scott).

Another challenge is in enlarging the scope of settings in which terming, coding and classification take place. Most attention to date has been given to classification in acute in-patient settings. The use of electronic patient records will create the tension needed to extend the transmission and retrieval of data in a standardised format to ambulatory and other care types. Already, term sets are being developed in Australia for emergency departments and community health. Such term sets must be familiar and fit for purpose in those environments, but at the same time they must relate to the patient who moves between health professionals, settings and levels of the health system. In services such as ambulatory care, rehabilitation, palliative and nursing home type care, patient function is as important as disease description and often affects patient perception of severity. Use of WHO reference classifications such as the International Classification of Functioning, Disability and Health (ICF), in tandem with the ICD, will help us to extend the boundaries of what we are able to describe in code, so that a fuller picture of patient characteristics and treatments can emerge.

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Asthma terminology and classification in hospital records

Kirsten McKenzie and Sue Wood

Abstract

Asthma is a national health priority area in Australia, and there is significant interest in capturing relevant detail about hospitalisations as a result of asthma. A public submission received by the National Centre for Classification in Health from a large teaching hospital in Victoria suggested that current classification terminology in ICD-10-AM did not adequately reflect the terms recorded in clinical inpatient records, and that patterns and severity of asthma better reflected current clinical terminology in Australian hospitals. The purpose of this study was to determine the validity of the public submission and inform future changes to ICD-10-AM. A representative sample of over 3000 asthma records across Australia and New Zealand were extracted, and the asthma terminology documented and codes assigned were recorded and analysed. The study concluded that there was little support for either pattern terminology or the current classification terminology; however, severity of asthma was commonly used in asthma documentation.

Keywords: Asthma; classification; terminology; International Classification of Diseases

Asthma is a national health priority area in Australia, and there is significant interest in capturing relevant detail about hospitalisations as a result of asthma. The prevalence of asthma in Australia is high by international comparisons, with 14% to 16% of children and 10% to 12% of adults reporting asthma as a current problem (Australian Centre for Asthma Monitoring 2003; Australian Centre for Asthma Monitoring 2004). Since 1996, hospitalisation rates for children have reduced, whilst the rate for people aged 15 years and over has remained unchanged (Australian Institute of Health and Welfare 2002). In 2000/01, 0.8% of all hospital separations were for people with a principal diagnosis of asthma, with over half of all separations for asthma occurring in the 1–14-years age group (Australian Centre for Asthma Monitoring 2003). According to the Australian Centre for Asthma Monitoring, the average length of hospital stay for asthma has reduced over the same time period. It has also been reported that asthma mortality rates have steadily declined from 1994 (Dobbin et al. 2004).

Frequency and severity of asthma symptoms vary from mild episodic asthma to chronic severe asthma (Australian Institute of Health and Welfare 2002). Generally, asthma is clinically classified as either intermittent or persistent, and measurement of airway hyper-responsiveness is often used to determine asthma severity in persistent asthma (Robertson 2002; Woolcock et al. 2001). Clinical assessment of asthma severity (mild, moderate or severe) helps to determine individual patient treatment (National Asthma Council Australia 2002). Patterns of asthma are significant in terms of determining the need for preventive therapy and in determining the outcome of childhood asthma. The National Asthma Council (2002) defines patterns of asthma in childhood as:

**Infrequent episodic asthma:** isolated episodes of asthma; lasts from 1–2 days up to 1–2 weeks; usually triggered by an upper respiratory tract infection (URTI) or an environmental allergen; has a wide range of severity, although mostly mild; accounts for up to 60% of childhood hospital admissions for asthma.

**Frequent episodic asthma:** shorter interval between episodes; lasts less than 6–8 weeks; minimal symptoms, such as exercise-induced wheeze in the interval period.

**Persistent asthma:** patients may exhibit acute episodes like the categories above, but also show symptoms on most days in the interval period; wide range of severity.

Historically, the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* (ICD-10) (World Health Organization 1994) has described asthma with terms such as intrinsic (non-allergic) and extrinsic (allergic), and these terms from the parent classification are included in the Australian modification, *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*, Australian Modification (ICD-10-AM) (National Centre for Classification in Health 2004). Australian clinical coders utilise the *Australian Coding Standards (ACS)* for the *ICD-10-AM* (Volume 5) to guide them in making sound decisions pertaining to the coding of asthma (National Centre for Classification in Health 2004). The ACS guidelines for asthma state that J45 should be assigned for diagnoses such as ‘asthma’, ‘severe asthma’, ‘acute asthma’ or other terminological variations not included in J46. J46 should be assigned only if asthma is documented as ‘acute severe’ or ‘refractory’. Asthma terminology in other classification modifications of ICD-10 varies. For example, the Canadian classification (ICD-10-CA) uses the same codes as ICD-10-AM but includes a fifth character to indicate with or without status asthmaticus (Canadian Institute for Health Information 2003). In contrast, the June 2003 pre-release draft of the *American classification (ICD-10-CM)* contains codes for intermittent and persistent asthma (National Center for Health Statistics 2003). ICD-10-CM also captures asthma severity and includes a fifth character to identify ‘uncomplicated’, ‘with acute exacerbation’ and ‘with status asthmaticus’.

A public submission received by the National Centre for Classification in Health (NCCH) from a large Victorian teaching hospital asserts that the management of asthma in an inpatient setting is determined by the
pattern of asthma rather than the terms included in ICD-10-AM at present.\textsuperscript{1} It was further suggested that ICD-10-AM codes should also reflect asthma severity. In terms of the Australian Refined Diagnosis Related Group (AR-DRG) allocation, coding for severity of asthma is currently insignificant. A principal diagnosis of J45.0 (Predominantly allergic asthma), J45.1 (Non-allergic asthma), J45.8 (Mixed asthma), J45.9 (Asthma, unspecified) or J46 (Status asthmaticus) would place a patient in AR-DRG E69 Bronchitis and Asthma. This AR-DRG is further broken down according to age and/or the presence of complication or co-morbidity codes, as follows:

- E69A Bronchitis and Asthma Age > 49 W CC
- E69B Bronchitis and Asthma Age > 49 or W CC
- E69C Bronchitis and Asthma Age < 50 W/O CC

Diagnostic inaccuracies and changes to coding classifications may affect trends in asthma reporting. Misclassification of asthma in the elderly can occur due to clinical confusion between asthma and chronic obstructive pulmonary disease, and the presence of other medical conditions (Australian Centre for Asthma Monitoring 2005; Dobbin et al. 2004). Osborne, Vollmer and Buist (1992) reported that incorrect clinical assessment and incomplete or insufficient record documentation impacts on the diagnostic accuracy of asthma. Furthermore, coding of asthma in Australian hospitals may be affected by ICD revisions, variations in coding practice, and clinical misdiagnosis (Australian Centre for Asthma Monitoring 2005). However, an American study reported by Krueger, Armstrong and Langley (2001) which addressed asthma coding errors, reported an 85.4% level of agreement between diagnoses documented in clinical records and diagnostic codes.

This study was undertaken to review the asthma terminology suggested in the public submission to establish if it existed in clinical records, which would inform changes to asthma codes for ICD-10-AM. The research questions addressed were:

- Are patterns of asthma (infrequent, frequent, episodic, chronic, persistent) used widely and regularly documented in hospital records?
- Can patterns of asthma be applied to both children and adults?
- How regularly is asthma documented as mild, moderate or severe?
- Are other asthma terms used widely in hospital records?
- Does the current asthma classification reflect the terminology present in hospital records?

Method

Data Collection

Representatives from the NCCH’s Coding Standards Advisory Committee (CSAC) from all Australian states and territories were involved in the facilitation of access to data for this study. These representatives presented the study proposal to the state and territory health authorities to gain approval for state and territory participation in the study.

Using 2001-2002 Australian hospital morbidity data from the Australian Institute of Health and Welfare, numbers of records per state, age group, and public or private hospital were ascertained to be reflective of the general distribution of asthma separations within each of these categories and sample size guidelines were provided to the CSAC representatives. The aim of these guidelines was to ensure the sample selected was a representative coverage of asthma coding and clinical terminology used across Australia.

The CSAC representatives approached suitable hospitals within their state, ensuring the sample of hospitals included a range of rural and metropolitan centres, children’s and general hospitals, and in small, medium and large hospitals. CSAC representatives were directed to request a sample of recent asthma records, ensuring adequate numbers of each of the asthma codes in the range J45 to J46.

Health Information Managers at the hospital level then extracted hospital records with a principal diagnosis in the desired range. HIMs were advised to record the clinical terms used to describe asthma in each of the documents present in the hospital records using a standard data collection form. Data were entered into a database and analysed using SPSS Version 13.0.

Results

Sample Characteristics

The final sample of Australian records obtained was 2711, representing 101% of the original Australian sample requested, and approximately 6.3% of the asthma separations across Australia using 2001/02 data (Australian Centre for Asthma Monitoring, 2003) (total N=48 812). New Zealand supplied an additional 360 records, representing 78.3% of the original New Zealand sample requested, and 4.3% of the asthma separations across New Zealand using 2003 data supplied by the New Zealand Health Information Service (total N=8359).

\begin{table}
\centering
\begin{tabular}{|c|c|c|c|}
\hline
\textbf{State} & \textbf{n} & \textbf{\% Total Asthma} & \textbf{Total Asthma} \\
\hline
ACT & 110 & 3.58 & 1.15 \\
NSW & 961 & 31.29 & 34.99 \\
NT & 97 & 3.16 & 1.00 \\
Qld & 419 & 13.64 & 17.88 \\
SA & 336 & 10.94 & 11.33 \\
Tas & 120 & 3.91 & 1.28 \\
Vic & 411 & 13.38 & 22.29 \\
WA & 257 & 8.37 & 10.18 \\
NZ & 360 & 11.72 & \textbf{100.00} \\
\hline
\end{tabular}
\caption{Sample size by state and age group}
\end{table}

Table 1: Sample size by state and age group

Table 1 shows the sample size by state and by age group. Both sets of information provide number of cases, percentage of total, and the percentage distribution of asthma cases nationally in each category. Approximately 60% of records were extracted from regional hospitals and the remaining 40% extracted from rural hospitals. Almost 13% of records were extracted from designated children’s hospitals and 87% extracted from general hospitals.

Table 2 shows a detailed breakdown of the percentage distribution of ICD-10-AM codes by state, hospital location, hospital type, and age group. The use of J46 varies by state from a minimum of 6% in New Zealand to a maximum of 22% in NSW. Queensland had a considerably lower percentage of J45.9 cases (61%) compared with an average of 84% for all other states. Queensland, however, had a much higher percentage of codes in the range J45.0-J45.8 than all other states.

There was also considerable variation in utilisation of codes between children’s hospitals and general hospitals with 40% of the asthma codes in children’s hospitals being J46 compared with just 13% of the codes in general hospitals (correspondingly, only 53% of the asthma codes in children’s hospitals were J45.9 compared to 84% of the codes in general hospitals).

Are patterns of asthma used widely and regularly documented in hospital records?

Table 3 presents the number and percentage of cases using pattern terminology of infrequent, frequent, episodic, chronic, and persistent in any documentation source. Only 10% of cases had one or more of these pattern terms present in any documentation source.

These pattern terms were examined by state, hospital location, hospital type, and age group with some significant variations in term usage identified (See Figure 1). While 17% of cases in Victoria had some pattern terminology documented in the hospital re-
cords, less than 5% of cases in NT, WA and NZ reported patterns in the hospital records.

**Figure 1: Patterns of asthma terminology by state/territory**

No significant differences were identified for pattern terminology by hospital location, although significant variations were identified by hospital type and age group. Pattern terminology was present in 21% of hospital records from children's hospitals, but just 9% of hospital records from general hospitals. Pattern terminology by age group varied depending on hospital type, with 28% of records for 5 to 15 years olds in children's hospitals documenting patterns, compared with just 12% of records in general hospitals.

**How regularly is asthma documented as mild, moderate or severe?**

Table 3 also presents the number and percentage of cases using severity terminology of mild, moderate, or severe. Almost 40% of records contained documentation of severity levels, with 'severe' being the most common severity level reported. However, of those cases with severity levels documented, 34.8% of cases had multiple severity levels documented in the hospital records, with moderate/severe being the most common multiple severity level recorded (representing over 70% of cases with multiple severity levels reported and 25% of all severity cases overall) (See Table 4).

**Table 4: Severity levels reported in hospital records**

<table>
<thead>
<tr>
<th>Severity level</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>128</td>
<td>10.45</td>
</tr>
<tr>
<td>Mild/Moderate</td>
<td>79</td>
<td>6.45</td>
</tr>
<tr>
<td>Mild/Severe</td>
<td>13</td>
<td>1.06</td>
</tr>
<tr>
<td>Mild/Moderate/Severe</td>
<td>27</td>
<td>2.20</td>
</tr>
<tr>
<td>Moderate</td>
<td>275</td>
<td>22.45</td>
</tr>
<tr>
<td>Moderate/Severe</td>
<td>308</td>
<td>25.14</td>
</tr>
<tr>
<td>Severe</td>
<td>395</td>
<td>32.24</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1225</td>
<td>100.00</td>
</tr>
</tbody>
</table>

These severity terms were examined by state, hospital location, hospital type, and age group with some significant variations in severity term usage identified (See Figure 2). While over 50% of cases in the ACT included severity terminology, only 25% of cases in Tasmania included severity terminology in the hospital records.

**Figure 2: Severity of asthma terminology by state/territory**

Significant variations were also evident by locality, with 43% of regional hospitals documenting severity levels compared with 36% of rural hospitals. Similarly, records from children's hospitals had severity levels documented in half of the cases, compared with 38% of the records from general hospitals. Severity levels were most widely reported in records for children aged between 5 and 15 (52%) compared with 38% of records for children aged under 5 years and 35% of records for people aged over 15 years.

**Are there other asthma terms used widely in hospital records?**

Data were explored to identify other common terminologies present in hospital records for asthma admissions. There were four main categories of common asthma terms in hospital records, which included the following:

- **Exacerbation terms**: worsening, exacerbation, increasing
- **Viral terms**: respiratory tract infection (RTI), pneumonia, bronchitis/bronchiolitis, viral, infection, respiratory syncytial virus (RSV)
- **Symptom terms**: shortness of breath, breathing difficulties, wheeze, respiratory distress, cough, tight, recession, retraction, tachypnoea
- **Asthma history terms**: asthmatic, known, history, first

Table 5 presents the number and percentage of cases using other common asthma terminology.

**Table 5: Presence of other common terminology in any documentation source**

<table>
<thead>
<tr>
<th>Terminology</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exacerbation terms</td>
<td>2051</td>
<td>66.80</td>
</tr>
<tr>
<td>Viral terms</td>
<td>1562</td>
<td>50.90</td>
</tr>
<tr>
<td>Symptom terms</td>
<td>1009</td>
<td>32.90</td>
</tr>
<tr>
<td>Asthma history terms</td>
<td>791</td>
<td>25.80</td>
</tr>
</tbody>
</table>
Less than 5% of cases had no terminology beyond the terms ‘asthma’ or ‘asthma, unspecified’. Tasmania had the highest proportion of cases with no descriptive terminology, with 12.5% of cases, followed by NZ with 8.1% of cases and the ACT with 6.4% of cases. All other states had 5% or fewer cases with no descriptive terminology. There were no significant differences for cases with no descriptive terminology by hospital locality, hospital type or age group. While 95% of cases with no descriptive terminology were coded to ‘J45.9 Asthma, unspecified’, five cases were allocated to J46 and two cases were coded to J45.0.

**Does the current asthma classification reflect the terminology present in hospital records?**

Table 6 presents the number of cases using any of the terminology required for current ICD-10-AM asthma classification. Two additional terms are included in this list for comparison, being ‘Severe Acute’ and ‘status’ (without asthmaticus specified), as these terms were identified in the documentation.

<table>
<thead>
<tr>
<th>Term</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergic</td>
<td>43</td>
<td>1.40</td>
</tr>
<tr>
<td>Infective</td>
<td>489</td>
<td>15.92</td>
</tr>
<tr>
<td>Acute Severe</td>
<td>176</td>
<td>5.73</td>
</tr>
<tr>
<td>Status Asthmaticus</td>
<td>85</td>
<td>2.77</td>
</tr>
<tr>
<td>Severe Acute</td>
<td>58</td>
<td>1.89</td>
</tr>
<tr>
<td>Status (alone)</td>
<td>7</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Table 7 reports the number and percentage of cases that have any documentation in any source to support the assignment of J46 using both strict and broader interpretations of the Australian Coding Standards (ACS). Broader interpretations of the ACS reflect queries received by NCCH in relation to asthma classifications. The NCCH compiles a database of these queries and responses which can be viewed on the NCCH website at: http://www3.fhs.usyd.edu.au/ncchwww/site/4.3.htm. A summary of the various interpretations of the ACS pertaining to asthma are as follows:

- **J46** – presence of any of the terms ‘acute severe’, ‘status asthmaticus’, OR ‘refractory’.
- **J46 term variants** – presence of any of the terms from J46 OR ‘severe acute’ OR ‘status’ (as ‘severe acute’ indexed in ICD-10-AM and some evidence of abbreviation of status asthmaticus in sample).
- **J46 acute and severe** – presence of any of the terms from J46 OR ‘acute’ and ‘severe’ (NCCH query database no. 2068 suggests some confusion as to whether acute and severe need to be present or whether acute or severe is sufficient for coding J46 based on ICD-10-AM index (National Centre of Classification in Health 2005).
- **J46 acute or severe** – presence of any of the terms from J46 OR ‘acute’ OR ‘severe’ (NCCH Query database no. 2068).

Table 7: Presence of documentation in any source to support the assignment of J46

<table>
<thead>
<tr>
<th>J46 Documentation</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. J46</td>
<td>242</td>
<td>7.88</td>
</tr>
<tr>
<td>2. J46 Term Variants</td>
<td>285</td>
<td>9.28</td>
</tr>
<tr>
<td>3. J46 Acute and Severe</td>
<td>498</td>
<td>16.22</td>
</tr>
<tr>
<td>4. J46 Acute or Severe</td>
<td>1532</td>
<td>49.89</td>
</tr>
<tr>
<td>5. J46 Exacerbation</td>
<td>1074</td>
<td>34.97</td>
</tr>
</tbody>
</table>

Less than 8% of cases had the terms ‘acute severe’, ‘status asthmaticus’ and/or ‘refractory’ documented in the hospital records, which are required to assign the code ‘J46 status asthmaticus’ according to the Australian Coding Standards. However, the J46 code was assigned in approximately 16% of cases in the sample.

Figure 3 provides a detailed breakdown of the percentage distribution of ICD-10-AM codes for those cases with documentation supporting the use of J46 compared with those cases without documentation supporting J46 using the five ACS interpretations listed previously. In almost 60% of cases that were coded to J46, there was insufficient documentation to support the use of the code (using the strict ACS guidelines). This figure decreased to 51% of cases without supporting documentation when accepting term variants such as ‘severe acute’ or ‘status’. While over 80% of J46 coded cases had supporting documentation when using the broad criteria of interpretation no.4, there is also a corresponding increase in the number of J45 coded cases that should be J46 (44% of cases using interpretation no.4 compared to just 1% of J45 coded cases using the strict interpretation of ACS). Including acute exacerbation (interpretation no.5) appears to provide an appropriate balance, with 73% of J46 cases having supporting documentation and only 27% of J45 coded cases having J46 documentation included in the records.

Further examination of the J46 coded cases was conducted by state, hospital location, hospital type, and age group, with J46 coded cases being categorised as either having supportive documentation or no supportive documentation (using interpretation 2 from the previous step). Figure 4 shows the percentage of J46 coded and supported cases by J46 coded and not supported cases, by state. Significant variations were present with a minimum of only 31% of NSW J46 coded cases being supported with documentation to a maximum of 89% of SA J46 coded cases being supported with documentation. Furthermore, while 55% of J46 coded cases in rural hospitals were supported with documentation, only 36% of J46 coded cases in rural hospitals were supported with documentation. There was no significant difference in the distribution of supported/not supported J46 coded cases by hospital type or age group.
Discussion

With asthma being a national health priority area, there has been considerable interest in capturing relevant detail about hospitalisations as a result of asthma. On account of a public submission received by the NCCH recommending changes to the asthma classification, this study examined the terminology used in a representative sample of hospital records with a principal diagnosis of asthma to assess (a) whether patterns of asthma are used widely and regularly documented in hospital records, (b) whether asthma severity is regularly documented, (c) other common asthma terms in hospital records, and (d) whether the terminology supports the current classification.

There appears to be little support for the introduction of pattern terminology into the asthma classification with only 10% of cases having asthma patterns documented in the hospital records. Pattern terminology varied significantly by state, with Victoria using pattern terminology the most of all states (17% of cases). Patterns were also documented at varying rates by hospital type and age group with 5 to 15 year olds in children’s hospitals having the highest rate of pattern documentation (28%).

Severity levels were commonly documented in hospital records with almost 40% of records having some documentation pertaining to severity. However, this varied significantly by state, locality, hospital type and age group. Furthermore, over one-third of cases had multiple severity levels documented in the hospital records. Therefore, any changes to asthma classification would need to consider these findings.

The research identified other common terms present in the hospital records for asthma cases, with four main categories of asthma terms found including: exacerbation terms, viral terms, symptom terms, and asthma history terms. All of these categories appeared in considerable proportions through the sample, and may warrant further attention in any considerations for changes to the asthma classification.

Finally, the study provided evidence that the asthma terminology in ICD-10-AM is outdated and not used clinically. Documentation to support the use of J46 was present in less than 10% of cases, and only 40% of cases assigned J46 had supporting documentation using the current classification terminology. There has been considerable confusion as to the interpretation of the ACS and NCCH query responses in relation to the acceptance of ‘exacerbation’ for the assignment of J46. Expanding the current terminology to include ‘acute and exacerbation’ increased the percentage of cases with supporting documentation to over 70% of cases.

There were significant differences between states in relation to the presence of documentation to support J46 code assignment. While some of these could be explained by the widening of the terminology to include ‘exacerbation’, significant variation still remains between states and warrants further attention.

Conclusion

In summary, this study found little support for the introduction of pattern terminology but considerable support for the utilisation of severity level terminology in asthma classifications. Furthermore, this research found little supporting documentation to justify the current asthma classification terminology, suggesting that changes to future editions of ICD-10-AM in relation to asthma classification will need to be considered. In order to advance the changes to ICD-10-AM, the NCCH will be circulating study results more widely amongst key stakeholders in the asthma field (e.g. Australian Centre for Asthma Monitoring and Australian Institute of Health and Welfare) so that experts in asthma research and clinical care can assist in deciding the next steps in relation to the classification and clinical documentation of asthma.

Acknowledgements

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Kirsten McKenzie is a Research Fellow at the Brisbane office of the National Centre for Classification in Health, where she has worked since the start of 2001. She has completed an Honours degree and a PhD in Psychology. She is involved in research on the quality of morbidity and mortality coding. She was recently awarded a three-year Australian Research Council grant to examine the quality of national injury-related hospital morbidity data. Some examples of her previous research include a survey of the Australian Clinical Coder workforce, examining the effects of classification change on long-term mortality trends, the impact of the change from ICD-9 to ICD-10 on mortality statistics, and the international comparability of the World Health Organization’s mortality databases.

Sue Wood is a Health Information Manager with a postgraduate qualification in statistics who has worked for the National Centre for Classification in Health since December 2001. Initially, Sue was seconded to the Victorian Institute of Forensic Medicine where she was responsible for auditing the data quality of the national coronial database and educating staff in coronial jurisdictions in the application of the International Classification of External Causes of Injury (ICECI). Sue relocated from Melbourne to Sydney in 2004, and conducts regular analyses of national morbidity data to check for compliance with the Australian Coding Standards and coding conventions, and reviews coding practice within and between states and territories. The analyses assist with decisions to make ICD-10-AM code changes and help to target coder education.
Investigation of leukaemia and lymphoma AR-DRGs at a Sydney teaching hospital

Beth Reid, Corinne Allen and Jean McIntosh

Abstract

Using non-blinded methodology, this study checked the coding of acute leukaemia, non-acute leukaemia and lymphoma episodes assigned to the AR-DRGs R60 A, B, C and R61 A, B during the fiscal year 2000–2001 at a Sydney teaching hospital. The purpose was to investigate whether the assignment of fewer episodes of these diseases to the highest complexity AR-DRGs during that year compared to 1999–2000 was due to miscoding, or due to a true decrease in episodes. A check of all 242 episodes revealed a degree of miscoding (mainly under-coding) of complications and comorbidities that had caused a 15% DRG error rate; nevertheless, there was a true decrease in the highest complexity episodes. The error in DRG assignment may have caused some financial disadvantage to the hospital.

Key words: Coding; leukaemia; lymphoma; AR-DRGs

Introduction

The Australian Refined Diagnosis Related Groups (AR-DRGs) is a classification system that categorises acute in-patient episodes in New South Wales hospitals. Each AR-DRG represents a class of patients with similar clinical conditions requiring similar hospital resources. Variables such as an additional diagnosis if it qualifies as a complication and/or comorbidity (CC), are used for AR-DRG assignment. CCs can cause considerably higher resource consumption (Australian Refined Diagnosis Related Groups Version 4.1 Definitions Manual 1998: 3), and although clinically they may vary widely, their impact on resource use is similar (Zhang et al. 1997). A severity weight, the Complication and Comorbidity Level (CCL), is given to all additional diagnoses. CCL values in medical episodes range from 0 (the additional diagnosis is not a CC) through 1 (minor CC), 2 (moderate CC), to 3 (severe CC) (Commonwealth Department of Health and Aged Care 1998:7). The Patient Clinical Complexity Level (PCCL) has been developed to measure the cumulative effect of CCs in an episode. The PCCL value, which indicates the overall severity of an episode, is based on combinations of CCL values, and ranges (both for medical and surgical episodes) from 0 (no CC effect) to 4 (catastrophic CC effect) (Commonwealth Department of Health and Aged Care 1998:7). At a teaching hospital in metropolitan Sydney, Australia, statistics showed that when the time period 1 July 2000 – 30 June, 2001 was compared to 1 July 1999 – 30 June 2000, assignment of episodes to the high complexity AR-DRGs R60A (acute leukaemia with catastrophic CC effect) and R61A (lymphoma or non-acute leukaemia with catastrophic CC effect) was down by 56% and 33% respectively. Despite the drop in the highest complexity episodes, clinical staff in the hospital’s Haematology Department had the impression (though only anecdotal) that the clinical complexity of their workload relating to leukaemia and lymphoma was not lower in 2000–2001 than in 1999–2000. Clearly, factors such as staff changes may have accounted for this impression, and the Haematology Department had taken that into account. On the assumption that the haematological workload was related to episode complexity, and that there really was no decrease in highest complexity episodes, it was possible that the decreased assignment of episodes to the highest complexity (that is, highest cost weighted) AR-DRGs was due to miscoding, in terms of neglecting to code additional diagnoses which happened to be complications or comorbidities; this could have caused episodes to be incorrectly assigned to less complex (lower weighted) AR-DRGs.

The first aim of this study was to investigate the accuracy of the coding of CCs within episodes assigned to the AR-DRGs R60 A, B, C, and R61 A and B during the fiscal year 2000–2001. R60B and R60C are the AR-DRGs to which episodes of acute leukaemia are assigned where the CC effect is severe but not catastrophic (R60B), and less than severe (R60C). Episodes of lymphoma or non-acute leukaemia where the CC effect is severe but not catastrophic are assigned to the AR-DRG R61B.

The second aim of the study was to compare the years 1999–2000 and 2000–2001 as regards the number and complexity of R60 and R61 episodes. The coding for 1999–2000 was not checked because of time constraints as the research had to be completed within an Honours year.

The third aim of the study was to check for the presence of internal coherence of R60 and R61 in 2000–2001. Internal coherence would be seen to be present if there was indication of a positive correlation between the clinical complexity or severity of the episode (as represented by A, B, C), the average length of stay in hospital (LOS) per episode, and the average number of additional diagnosis codes per episode. The number of additional diagnoses was used as a proxy for severity because this is similar to the ‘unexplained severity index’ used previously to adjust funding in South Australia (Moss 2002). LOS is increased by the presence of a CC (Eagar & Hindle 1994) and thus LOS together with codes per episode should reflect severity; this combination can therefore be used as a quasi measure. Absence of internal coherence would suggest there had been miscoding involving some form of systemic bias.

Definitive testing of whether there was any allocation of inadequate PCCL values to episodes was beyond the scope of this study. This was because the algorithm used to determine the PCCL was too complex to replicate manually.
The clinical profiles for each AR-DRG for the years 1999–2000 and 2000–2001 are described to provide background on the patients and shed light on possible differences found. These profiles include: number and demographic features of patients admitted; number of episodes and mean LOS; type and frequency of the principal diagnoses within the AR-DRGs. Type and frequency of additional diagnoses associated with 2000–2001 episodes are also presented.

Methods
At a major teaching hospital in metropolitan Sydney during June and July 2003, all episodes assigned to the AR-DRGs R60 A, B, C (n=175), and R61 A and B (n=67) during the fiscal year 1 July 2000 to 30 June 2001 were investigated for miscoding of additional diagnoses. The original codes assigned to each episode were checked by a second coder against relevant diagnoses. The original codes assigned to each episode, which included discharge summary, progress notes, correspondence were checked by a second coder against relevant diagnoses. This check revealed whether all justified additional diagnoses (i.e. those present during the episode) had been coded, and whether an additional diagnosis had been coded unjustifiably, that is, coded as being present when it was not. In cases where investigation revealed that an additional diagnosis originally omitted should have been included, note was made of where in the medical record of evidence to support the inclusion. Where the second coder disagreed with the original codes, the coding was arbitrated by a gold-standard coder who adjudicated on the correct codes and ensured that any changed codes met the Australian Coding Standards criteria for additional diagnoses. If an additional diagnosis code was included or deleted, the episode was re-classified using AR-DRG Version 4.1, the same grouper as was used for the original coding. The possible reasons for any coding discrepancies were not addressed because this was not a re-coding study. A blind re-coding study was not done because of time constraints.

The Australian Coding Standard 0002 provides guidance for coders on which conditions should be coded as additional diagnoses. The definition used during 1999–2000 differed slightly from that used for the 2000–2001 period (National Centre for Disease Classification 2000) by removing ‘clinical evaluation’ from the criteria used to justify the coding of an additional diagnosis. This change, however, had no impact on final codes approved by the gold standard coder for 2000–2001 because no code had been justified on the basis of clinical evaluation alone. Hence the difference in this coding standard had no impact on the results.

A structured form was used to record the data for each episode, which included: patient’s age and gender; LOS; discharge status; diagnoses codes — both what they were originally and after the check was made; location in medical record of evidence to support any code additions; and AR-DRG assignment — both original and after checking.

The internal coherence of the AR-DRG classification of the checked 2000–2001 R60 and R61 episodes was investigated, and for this it was necessary to re-determine episode complexity (severity). In place of the PCCL value (the original PCCL value having not been checked), a proxy for severity was used which was the mean LOS plus the mean number of additional diagnosis codes per episode.

Statistical analysis
All data collected were entered into a Microsoft Access database, from which descriptive statistics were generated.

Standard chi-squared ($\chi^2$) tests with degrees of freedom (df) were used to test the significance of difference between (a) the distributions of the 2000–2001 R60 and R61 episodes before and after checking for miscoding, (b) the distributions of the 1999–2000 episodes and the checked 2000–2001 episodes, and (c) remission status of the principal diagnosis in 1999–2000 versus 2000–2001.

The normal approximation to the binomial distribution (Colton 1974) was used to test whether there was a significant difference between 1999–2000 and 2000–2001 with regard to: (a) the numbers of episodes assigned to the individual R60 and R61 AR-DRGs, and (b) the numbers of patients admitted for episodes assigned to the individual AR-DRGs.

The two-sample t test (with df) was used to estimate the significance of difference between the 1999–2000 and 2000–2001 episodes with regard to LOS and age of patients. Comparisons were made by individual AR-DRG.

The alpha level of significance for all statistical testing was 0.05.

The purpose of the statistical testing was to quantify the extent of any differences found.

Results
Testing for coding accuracy

<table>
<thead>
<tr>
<th>Table 1: Distribution of 2000–2001 episodes within the AR-DRGs R60 (A, B, C) and R61 (A, B) before and after coding check</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR-DRG</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>R60A</td>
</tr>
<tr>
<td>R60B</td>
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<tr>
<td>R60C</td>
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<tr>
<td>Total</td>
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<tr>
<td>R61A</td>
</tr>
<tr>
<td>R61B</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Table 1 shows the number, before and after checking, of episodes assigned to the individual AR-DRGs R60A, B and C, and R61 A and B from 1 July 2000 to 30 June 2001. It is seen that the check did not cause any change to the total number of episodes assigned to the R60 AR-DRGs but did bring about a change in their distribution amongst A, B, and C. Checking resulted in there being three (11%) more R60A episodes, six
(14.6%) fewer R60B episodes, and three (2.8%) more R60C episodes than originally shown. This change in distribution was not statistically significant ($\chi^2 (2df) = 0.67, P = 0.7$).

It is also seen that checking resulted in no change to the total number of episodes assigned to the R61 AR-DRGs (A + B), but R61A episodes increased by nine (64.3%) and R61B episodes decreased by nine (17%). This change in distribution approached statistical significance ($\chi^2 (1df) = 3.02, 0.05 < P < 0.1$).

Checking also increased the total number of 2000–2001 highest complexity episodes (R60A + R61A) by 29% (from 41 to 53) and decreased the second highest complexity episodes (R60B + R61B) by 16% (from 94 to 79). Checking the records revealed that 205 (85%) of all 242 2000–2001 R60 and R61 episodes under study had originally been coded correctly with regard to A, B and C classification (84% of R60, and 87% of R61). Of the remaining 37 (15%) episodes that had originally been assigned an incorrect DRG, the checking process resulted in 24 (65%) being allocated to a higher weighted DRG. A total of 50 codes for additional diagnoses that were CCs needed to be added to, and 15 to be deleted from, 2000-2001 episodes; this shows that more than three times as many CC codes were omitted from episodes erroneously as were added to them unjustifiably.

### Frequency of R60 and R61 episodes in 1999–2000 and 2000–2001

Table 2 shows the numbers of R60 A, B and C and R61 A, B episodes in 1999–2000 and in 2000–2001 (after checking). The total number of R60 episodes was 20% higher in 2000–2001 than in 1999–2000 (175 as against 145); however, this increase was not statistically significant at $P=0.05$. It is seen that in 2000–2001 compared to 1999–2000, there were over five times as many R60C episodes ($P<0.05$), less than half the number of R60A episodes ($P<0.05$), and just over half the number of R60B episodes ($P<0.05$). In 1999–2000, R60A and R60B episodes were approximately three times more frequent than R60C episodes, whereas in 2000–2001 the reverse was true. The difference between the 1999–2000 and 2000–2001 distributions of the R60 A, B and C episodes was highly significant ($\chi^2 (2df) = 75.9, P < 0.001$). With regard to AR-DRG R61, the total number of episodes (A+B) was nearly one third (29%) fewer in 2000-2001 than in 1999–2000 (67 as against 95) ($P<0.05$); there were 15% fewer A episodes ($P>0.05$) and 35% fewer B episodes ($P<0.05$). However, the 1999–2000 and 2000–2001 distributions of R61 A and B episodes were similar ($\chi^2 (1df) = 0.64, P > 0.4$).

There were 48% fewer R60 A+B episodes and 29% fewer R61 A+B episodes in 2000–2001 than in 1999–2000. However, the total number of R60 and R61 episodes for the two years was similar (240 and 242).

Table 3 shows for 1999–2000 and 2000–2001 the numbers of patients admitted per complexity level of episodes, the mean number of episodes per patient, mean LOS per episode, mean age and the male-to-female ratio. With regard to the number of patients, the only significant difference between the two years was that fewer patients were hospitalised with R61B episodes in 2000–2001 than in 1999–2000 ($P<0.05$). It is recognised that during one or

<table>
<thead>
<tr>
<th>AR-DRG</th>
<th>No. of Patients</th>
<th>Episodes per patient</th>
<th>Average LOS in days (SD)</th>
<th>Average age in years (SD)</th>
<th>M: F ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>R60A</td>
<td>1999-2000</td>
<td>24</td>
<td>2.5</td>
<td>15.1 (16.7)</td>
<td>50 (16.0)</td>
</tr>
<tr>
<td></td>
<td>2000-2001</td>
<td>20</td>
<td>1.5</td>
<td>18.1 (13.6)</td>
<td>53 (13.3)</td>
</tr>
<tr>
<td>R60B</td>
<td>1999-2000</td>
<td>19</td>
<td>3.3</td>
<td>4.1 (6.6)</td>
<td>54 (17.9)</td>
</tr>
<tr>
<td></td>
<td>2000-2001</td>
<td>11</td>
<td>3.2</td>
<td>2.8 (5.9)</td>
<td>53 (8.4)</td>
</tr>
<tr>
<td>R60C</td>
<td>1999-2000</td>
<td>8</td>
<td>2.5</td>
<td>3.2 (3.3)</td>
<td>56 (12.8)</td>
</tr>
<tr>
<td></td>
<td>2000-2001</td>
<td>11</td>
<td>10</td>
<td>1.6 (91.9)</td>
<td>58 (10.4)</td>
</tr>
<tr>
<td>R61A</td>
<td>1999-2000</td>
<td>21</td>
<td>1.3</td>
<td>12.9 (9.2)</td>
<td>56 (19.3)</td>
</tr>
<tr>
<td></td>
<td>2000-2001</td>
<td>21</td>
<td>1.1</td>
<td>17.6 (11.5)</td>
<td>62 (14.4)</td>
</tr>
<tr>
<td>R61B</td>
<td>1999-2000</td>
<td>48</td>
<td>1.4</td>
<td>6.6 (7.5)</td>
<td>60 (15.2)</td>
</tr>
<tr>
<td></td>
<td>2000-2001</td>
<td>27</td>
<td>1.6</td>
<td>4.1 (4.1)</td>
<td>57 (10.7)</td>
</tr>
</tbody>
</table>
both years, the same patient could be hospitalised for different complexity levels of illness (A, B, C). The mean number, within DRGs, of episodes per patient was similar for the two years except for R60C where it was four times higher in 2000–2001 than in 1999–2000. It is seen that over each of the two years the average LOS for episodes decreased in accordance with the decrease in clinical complexity level. The mean LOS for R61B episodes was significantly shorter in 2000–2001 than in 1999–2000 (t value = -2.75 (110df), P<0.01) while within the other AR-DRGs it was similar for the two years (all P values >0.05). Patients’ mean age was similar across AR-DRGs for each of the two years and there were no significant age differences between 1999–2000 and 2000–2001 episodes (all P values >0.05). The male-to-female ratio varied widely across the AR-DRGs over the two years but with no directional tendencies.

In 2000–2001, there were, on average, respectively, 13 and 14 additional diagnosis codes per R60A and R61A episode, five and seven codes per R60B and 61B episode, and four per R60C episode.

For 2000–2001, there was indication of a positive correlation between episode complexity level (A, B, C), mean LOS per episode, and mean number of codes per episode. This demonstrates internal coherence of the AR-DRG classification system for that year.

Principal diagnosis and CCs

Table 4 shows there were some differences between 1999–2000 and 2000–2001 in the mix of principal diagnoses. It is seen that that among acute leukaemia (R60) episodes, the most frequent principal diagnosis both in 1999–2000 and 2000–2001 was myeloid leukaemia. However, among R61 episodes the most frequent principal diagnosis was non-Hodgkin’s lymphoma in 1999–2000 and multiple myeloma in 2000–2001.

Acute leukaemia, across all types, was in remission in 1.4% of 1999–2000 episodes compared to 19.4% of 2000–2001 episodes ($\chi^2 = 11.07\ (1df)$, $P<0.001$). A new coding standard ACS 0245 (NCCH 2000) introduced in the 2000–2001 period may account for the increased coding of remission status. Over the two years, acute leukaemia was in remission in 5% of R60A episodes, 13% of R60B episodes and 8% of R60C episodes. This demonstrates that remission status in acute leukaemia was not associated with CC effect (catastrophic, severe, less than severe).

There were no R61 episodes in either 1999–2000 or 2000–2001 where multiple myeloma or non-acute leukaemia was in remission. It was not known whether there were any episodes where lymphoma was in remission; this is because within the AR-DRG R61 there are no separate principal diagnosis codes to allow differentiation between a lymphoma in remission and a lymphoma without mention of remission. (For the acute leukaemias, non-acute leukaemias, and multiple myeloma there are separate diagnosis codes to allow this differentiation).

The number of R60 plus R61 episodes where the principal disease was reported to be in remission was significantly higher in 2000–2001 than in 1999–2000 (23 as against four) ($\chi^2 = 14.00\ (1df)$, $P<0.001$). However, the number of episodes where disease was not reported to be in remission was only 7% lower in 2000–2001 (n=219) than in 1999–2000 (n=236). Also, despite there being proportionately more acute leukaemia episodes in remission in 2000–2001 than in 1999–2000, the increase in acute leukaemia episodes in 2000–2001 (175, as against 145 in 1999–2000) resulted in there being more episodes in 2000–2001 than 1999–2000 where acute leukaemia was not in remission (152 versus 141).

The three most frequent additional diagnoses that were CCs among the 2000–2001 R60 episodes were agranulocytosis, other transplanted organ and tissue status, and anaemia in neoplastic disease (in respectively, 21%, 19%, and 7% of episodes). These three additional diagnoses were present in, respectively, 50%, 10%, and 30% of A episodes, and 60%, 37%, and 9% of B episodes. Of these CCs, only other transplanted organ and tissue status was present in C episodes (15.5%).

The three most frequent additional diagnoses among 2000–2001 R61 episodes were anaemia in neoplastic disease, atrial fibrillation and flutter, and agranulocytosis (in, respectively, 18%, 13%, and 12% of episodes). These additional diagnoses were present in, respectively, 26%, 17%, and 30% of A episodes and 14%, 9%, and 2% of B episodes.

In the original coding, agranulocytosis, other transplanted organ and tissue status, and anaemia in neoplastic disease had been missed in, respectively, 20%, 6%, and 21% of the episodes in which they were present.

Discussion

The results of this study serve to confirm that at the hospital under study there were, in reality, markedly fewer inpatient episodes within the higher complexity R60 and R61 AR-DRGs in the year 2000–2001 compared to 1999–2000. Miscoding, which caused a 15% DRG error rate, was seen to have little impact on the difference between the two years in this regard. Nevertheless, because under-coding of CCs was more frequent than over-coding, the 2000–2001 resource consumption for the study diseases would have appeared somewhat lower than it actually was, which may have resulted in some financial disadvantage to the hospital. Coding audits in Victorian public hospitals (MacIntyre et al. 1997) and in seven Western Australian hospitals (Stevens, Unwin & Codde 1998), and a recoding study across three Sydney teaching hospitals (Donoghue 1992) revealed that on average, respectively, 13.6%, 13.3%, and 9.25% of DRGs had been incorrectly assigned. In two of the surveys (Stevens et al. 1998; Donoghue 1992) incorrect coding would have caused financial loss to most of the hospitals under study. The DRG error rate found by Donoghue (1992) — less than two-thirds that found in our study — was claimed by that author to be too high in view of the financial implications. However it is likely that the rate of error in DRG assignment found in our study is not representative of that across all of the study hospital’s records; the present study focused on particular diseases and it has been
shown that the DRG error rate can vary widely by diagnosis group (Donoghue 1992) and may increase with increasing complexity of the case (MacIntyre et al. 1997). It is noted that when Donoghue (1992) investigated different diagnosis groups she found a DRG error rate of 27% for ‘lymphoma or leukaemia age 18-69 without CCs’; this was three times higher than the error rate overall for Donoghue’s study, and nearly twice that found in our study for leukaemia and lymphoma both with and without CCs. However, as implied by Donoghue (1992), having access to the original codes when checking the records, as was the case in our study, can bias towards finding a lower number of discrepancies. The probability of such bias in the present study serves as a limitation because it renders uncertain whether the true rate of incorrect DRG assignment was found; the true rate could, in fact, have been much higher than 15%. In our study, random rather than systematic miscoding of additional diagnoses is indicated in view of the finding of internal coherence of the DRG classification, and of unjustified additional diagnosis additions as well as omissions. (There had been no hint of deliberate false over-coding). The reason why there were fewer higher complexity episodes in 2000–2001 is not readily explained; the brief time frame and limited area of study (one hospital only) prevent any inferences concerning trends over time in respect of the occurrence or severity of complications associated with these diseases, or the presence of comorbidities.

In respect of the perception of the Haematology Department staff that despite statistical evidence of fewer complex episodes in 2000–2001 their clinical workload for the diseases under study was not lower than during the previous year, there are two possible contributing factors. Firstly, for both 1999–2000 and 2000–2001, the total number of inpatient episodes was virtually identical; and secondly, the total number of episodes where disease was not reported to be in remission was similar for the two years, being only slightly lower in 2000–2001. Another circumstance of possible relevance haematologically was that the mix of principal diagnoses within the DRGs differed between the two years, especially with regard to multiple myeloma and non-Hodgkins lymphoma. It may be that haematology work tended to be generated by the principal diagnosis rather than by the CCs; and that some diseases within the DRGs under study generated more work than others; if so, such could explain the impression that there was no true decrease in the haematology workload during the second year, because in fact there was none. There is a large difference between the cost weights for these AR-DRGs, but it should be borne in mind that workload and cost weights are different concepts.

Our finding that most admissions for acute leukaemia were for acute myeloid leukaemia is in line with previous reports that this is the most common form of acute leukaemia in adults (Redaelli et al. 2004). The frequency of the additional diagnoses agranulocytosis and anaemia in neoplastic disease is also understandable given that toxicity to bone marrow cells due to chemotherapy can result in agranulocytosis (Guest & Utrecht 2001; Karp, Merz & Charache 1991), and anaemia is strongly associated with haematological malignancies (Beguin 1998).

In conclusion, the findings of this study suggest that in major hospitals miscoding continues to occur to an important degree. If, as found in this and previous studies, the bulk of coding errors are in the area of under-coding, financial disadvantage to hospitals might be considerable. It is apparent that measures to improve coding accuracy such as continuing education and training for coders need to continue at an enhanced level. In order to ascertain whether the marked differences in leukaemia and lymphoma AR-DRG distribution found over 2 years in the present study were due to the beginning of a trend or just to an aberration or random fluctuation, the frequency distributions of the AR-DRGs would need to be examined over at least a 5-year-period. Trends over time in these AR-DRGs could also be studied at a state (NSW) level using cancer registry data.

| Table 4: Principal diagnosis among R60 and R61 episodes in 1999–2000 and 2000–2001 |
|---------------------------------|-----------------|-----------------|
| **Principal diagnosis**         | **1999–2000**    | **2000–2001**    |
| R60 episodes                    | (% of all episodes) | (% of all episodes) |
| Acute Leukaemia                | 59.3            | 57.7            |
| Non-acute leukaemia (prolymphocytic, chronic lymphocytic, chronic myeloid, mast cell, adult T-cell, plasma cell) | 31.6 | 22.4 |
| Other lymphoma (B-cell, Burkitt’s) | 10.5 | 14.9 |
| Hodgkins lymphoma (lymphocytic depletion, unspecified) | 4.2 | 4.5 |
| Multiple myeloma               | 23.2            | 35.8            |
| Non-Hodgkins lymphoma (diffuse — large cell, lymphoblastic, unspecified; follicular — small cleaved cell, mixed small cleaved and large cell, large cell; other types; unspecified type) | 42.5 | 29.1 |

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<th><strong>R61 episodes</strong></th>
<th><strong>1999–2000</strong> ( % of all episodes)</th>
<th>**2000–2001 ( % of all episodes)</th>
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<td>Multiple myeloma</td>
<td>23.2</td>
<td>35.8</td>
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<tr>
<td>Non-Hodgkins lymphoma (diffuse — large cell, lymphoblastic, unspecified; follicular — small cleaved cell, mixed small cleaved and large cell, large cell; other types; unspecified type)</td>
<td>8.4</td>
<td>10.5</td>
</tr>
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Clinical coder training initiatives in Ireland

Michelle Bramley and Beth Reid

Abstract
The Hospital In-Patient Enquiry and National Perinatal Reporting System (HIPE & NPRS) Unit of the Economic and Social Research Institute (ESRI) in Ireland requested a review of its coder training programs and data quality initiatives, primarily because of the decision to implement a major change in Ireland’s morbidity classification in January 2005. In August 2004, a formative evaluation using qualitative methods was conducted to assess the Unit’s programs and initiatives. A number of opportunities for building on the solid frameworks the Unit has implemented were identified. In this paper, we focus on the Unit’s coder training programs. The Unit’s data quality initiatives will be discussed in a subsequent paper (Bramley & Reid 2005).

Key words: Best practice analysis; clinical coders; coder training programs; health information management

Introduction
The Hospital In-Patient Enquiry and National Perinatal Reporting System (HIPE & NPRS) Unit (hereafter called the Unit) of the Economic and Social Research Institute (ESRI) in Ireland, manages the national morbidity data collected from acute care hospitals in Ireland. The Unit is committed to achieving best practice in the coding of morbidity data (Murphy et al. 2004) and has implemented training programs for hospital staff who abstract, code and report the data (clinical coders). The Unit also promotes data quality through a number of in-house/in-hospital data quality initiatives that aim to minimise sources of error.

In August 2004, the Unit requested a review of its coder training programs and data quality initiatives because of the decision to implement a major change in the morbidity classification in January 2005, and the expanding applications for HIPE data. The classification currently used is the ICD-9-CM, 1 October 1998 version (Commission on Professional and Hospital Activities 1998), an American product that is a clinical modification of the World Health Organization’s International Classification of Diseases, Ninth Revision. The ICD-9-CM is outdated and no longer reflects current clinical practice, especially in respect of surgical procedures. The Unit’s assessment of the best options for updating the classification system led to the decision to implement the ICD-10-AM Fourth Edition (Murphy et al. 2004; National Centre for Classification in Health 2004). There are many significant structural and content differences between the ICD-9-CM and the ICD-10-AM (Roberts 1999). Implementing a new national classification system is not a trivial exercise (Innes, Peasley and Roberts 2000; Roberts et al. 1999). A review of the Unit’s existing training programs and data quality audit procedures was therefore necessary to determine if any structural or fundamental changes were necessary.

This review is timely and necessary for more reasons than one. A recent pilot study conducted by the Unit to assess the feasibility of implementing the ICD-10-AM found that some areas within the morbidity data collection system needed improving. These areas included clinical documentation, clinical coder education, adherence to coding guidelines and coding quality (accuracy) (Murphy et al. 2004). Updating the morbidity classification system is essential in order to reflect current clinical practice. However, this move alone will not eliminate the problems mentioned above. Clinical coder education is integral to the quality of data within the national morbidity data collection, and the Unit acknowledges this in their quest for best practice.

In this paper, we report on our review, and include an overview of the Unit in order to place the work in context. The focus of our results is on the Unit’s coder training programs. The Unit’s data quality initiatives will be discussed in the following paper (Bramley & Reid 2005).

Background
An overview of the HIPE Unit
Ireland’s national morbidity data collection system — the HIPE Scheme — has been managed by the Unit since 1990, through a contractual arrangement with the Department of Health and Children (DoHC). The Unit is contracted to oversee the ‘collection, coding, input, quality, processing and reporting’ of morbidity data from acute care hospitals (Economic and Social Research Institute 2002). In 1998, the Unit’s mandate was broadened to include the development, implementation and maintenance of the HIPE computer system (Economic and Social Research Institute 2002) and provision of technical support and training to all users of the system. The system is designed to collect and report clinical, demographic and administrative data on deaths and discharges and is used by all hospitals participating in the HIPE data collection (Economic and Social Research Institute 2002, p.17). Three departments within the Unit support the HIPE data collection system; the Coding/Data Quality Department, the Information Technology Department, and the HIPE Data Management Department.

The HIPE Scheme
The HIPE Scheme is the national morbidity database containing clinical, demographic and administrative data relating to hospital in-patients. Each individual record represents an episode of in-patient or day-patient care, and therefore the database reflects hospital activity, rather than incidence or prevalence of disease (Economic and Social Research Institute...
2002). Data are collected from all 60 participating hospitals (all public acute hospitals and some private acute hospitals in Ireland) and represent almost 96% of all in-patient discharges in Ireland (Economic and Social Research Institute 2002). Approximately one million records are submitted to the Unit each year.

Clinical coders, and in some instances, HIPE/Casemix Coordinators (HCCs), in hospitals abstract relevant information from each patient’s chart (or clinical record) and translate the information into coded data. In the clinical data subset, up to 10 diagnoses and 10 procedure codes can be collected. The data are entered into the HIPE computer system and submitted to the Unit each month. The HIPE instruction manual provides guidance to all users of the system and includes definitions of each data element within the HIPE Scheme and guidelines in relation to abstracting.

One key source for information within the chart is the HIPE summary sheet. Clinical consultants are responsible for completing this sheet, which contains a summary of the conditions that occasioned the admission and affected the patient during the episode of care, and the treatment provided for those conditions. However, coders are required to review the entire chart when abstracting relevant information, primarily because there may be additional information available within the chart that can assist with accurate code assignment. Coders are also required to follow HIPE data collection guidelines, classification conventions, and national coding guidelines, which are published in Coding Notes, the Unit’s newsletter distributed quarterly to all HCCs and coders (and also to clinicians and administrators, on request).

The HIPE computer system

The HIPE computer system is the data entry and reporting software used by all hospitals participating in the HIPE scheme. Coders enter data on each episode of care for all in-patients and day-patients discharged from acute hospitals (Economic and Social Research Institute 2002).

Edits and validation checks are automated and are performed on individual data fields as data are entered into the system. There are inbuilt combination checks between two or more data fields and final cross comparisons between all data fields when data entry for the episode of care has been completed (but before the record is stored). Messages are displayed to prompt or guide the user in correcting the errors. Fields are also colour coded; for example, ‘red’ indicates a field with an error. Flags are inbuilt to reject certain codes or code combinations. They also allow users to confirm, endorse, or provide a textual explanation for their choice of codes. Two special flags — audit and report flags — are automatically triggered when users select certain codes. Queries are marked in logs, and the logs can be viewed and accessed centrally by the Unit for analysis.

Automated edits, validations and data quality checking lists (reporter checks) enable hospitals to correct errors at the source and conduct local data quality improvement activities. Additional quality checks at the national level are performed on the data submitted to the Unit each month. Reports are sent to HCCs and coders for analysis and correction if any problems are found. Edits and reports are built on the collective advice of all departments within the Unit, the users and the DoHC. All user requests are evaluated (at HIPE unit level and in some cases by the DoHC), and adopted only if applicable nationally.

Scope and timeframe of the review

The aim of the review was to evaluate the Unit’s coder education programs and data quality initiatives to determine if: (a) coders are being equipped with tools, facilities and skills required to produce quality morbidity data, and (b) adequate measures are in place to facilitate compliance with national coding guidelines and standards (Murphy et al. 2004).

The objectives were to:

- conduct an evaluation of the Unit’s:
  - coder training programs and monitoring procedures
  - existing coding guidelines and compliance with same
  - policies and procedures at a national level concerned with auditing and improving quality assurance of coded records
- determine which coder training programs are performed at a local level (in hospitals)
- determine if the policies and procedures concerned with auditing and improving quality assurance of coded records, in place at a local level, align with national policies and procedures
- describe the strengths and weaknesses of the Unit’s coder training programs and data quality audit procedures from the point of view of key stakeholders (HCCs), clinical coders and the Casemix Unit of the DoHC
- identify any coder workforce issues that may impact on the production of quality data.

We performed the review as a consultancy, in two phases. The investigative phase was conducted in Ireland over 2 weeks in July 2004 and involved site visits to HIPE units at seven hospitals; three hospitals in Dublin and four in various counties across Ireland. The reporting phase was conducted in Australia in August 2004.

Methods

A formative evaluation approach was adopted for the review. Formative evaluations assess the value of a current program or initiative, with the objective to improve the program or initiative (Scriven 1991). The focus is therefore on process and implementation. Two qualitative methods, content analysis and focus group sessions and interviews, were used with this approach to (a) gain insight into the work of the Unit and key stakeholder perceptions, and (b) source rich, interpre-

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1 HCCs manage the operations and staff of the local HIPE Units within hospitals. They may also be responsible for the collection, analysis and reporting of casemix data.

2 From January 2005, 20 diagnoses and 20 procedure codes will be collected.
tative data (Liamputtong and Ezzy 2005) on which a reasonable assessment of the Unit’s training programs and data quality initiatives could be based.

The Unit identified the key stakeholders for the interviews and focus group sessions as: the Casemix Unit of the DoHC, HCCs, and clinical coders. The Unit also approached a number of hospitals across Ireland to participate in the review. The seven chosen were selected primarily for regional representation and in consideration of the time frame of the review.

Structured questionnaires were built from a review of the relevant literature and our knowledge and experience in this area, in line with the study objectives. The questionnaires provided a consistent base to the interviews and focus group sessions; they also provided the framework for the evaluation, analysis, and reporting of data. Different questionnaires were built for each stakeholder group and the staff of the Unit.

Detailed data were collected from documents relating to the Unit’s data quality initiatives and coder training curriculum (policies, procedures, strategic plans, minutes from meetings, data quality framework, quality audit activities, coding guidelines, newsletters, training manuals and exercises, assessments, statistics, evaluations, software implementation and training manuals, reports, publications, outcome measurements etc.). In-depth interviews were conducted with the staff of the Unit to collect objective data to support the content analysis.

Results

We present first a description of the Unit’s coder training programs, gleaned from content analysis and from staff interviews designed to collect objective data to support the content analysis. We then document key stakeholder perceptions, obtained from the focus group sessions.

The Unit’s coder training programs

Background to the Unit’s coder training programs

The Unit regularly conducts coder training workshops aimed at three different skill levels — basic, intermediate, and experienced (refresher and continuing education). Ad hoc coder training workshops are also designed on demand. Workshops are conducted at various times throughout the year at the ESRI in Dublin and at various locations throughout Ireland, with timing and location dependent on demand. All members of staff from the Coding/Data Quality Department of the Unit are involved in the workshops.

Content for all workshops is derived from requests from HCCs and coders, feedback from the evaluations of previous workshops, or feedback from data quality audit activities conducted at local and national levels. All workshops are advertised in Coding Notes and on the Unit’s website to enable wide participation. Though some workshops are designed for and conducted in a specific region, they are open to coders in other regions who are willing to travel to participate. Several ICD-10-AM training workshops were conducted prior to implementation on 1 January 2005. Post-implementation workshops were held in March and April 2005 and more are planned for later in 2005.

Coding exercises are completed after each session in the workshop to reinforce learning and clarify understanding. Discussion sessions are also held to give participants a chance to discuss various coding issues and experiences that have arisen on the job.

Conferences and seminars are two other forms of educational initiatives organised by the Unit. An inaugural conference for clinical coders and HCCs was held in August 2002, and a seminar for HCCs, Managing Coding Services, was held in October 2003.

Registration process for training programs

The Unit monitors all requests for training programs. Registration forms are sent to all participants. The form also collects data about the participant’s current level of coding experience. Each participant’s details are updated in the Unit’s documentation log for training programs. When new coders are booked for basic training sessions their details are recorded in two systems: the documentation log for training programs, and the registration database of all HIPE computer system users.

This tracking process provides a valuable snapshot of the national coder workforce, its years of experience, and its level of training. It also ensures that coders are not repeating training programs unnecessarily or inappropriately. The documentation log for training programs is maintained and cross-referenced with the registration database. No HCC or coder is ever deleted from the registration database. Those no longer in the coding workforce are differentiated from those still in the workforce by using shaded text in the database.

Basic coder training workshops

Basic coder training workshops are conducted every 6-8 weeks, depending on demand.

Every registrant receives a set of line-coding exercises to complete before they attend the workshop and answers are provided at the workshop. Each participant also receives a training folder at the beginning of the workshop, with reference material covering the topics to be taught. The folder becomes their reference tool and coders are advised to update it regularly with the material received from future workshops and on-the-job training. Course material covers a brief introduction to the coding role and the context within which coders function, data quality activities, and confidentiality and privacy aspects. Medical terminology reference material covers common medical terms, medical abbreviations, alternative terms for surgical procedures, eponyms, anatomical prefixes and surgical suffixes. Coding reference material covers classification and coding conventions, coding guidelines, and the conditions and surgical procedures that coders will frequently encounter on the job. A sample chart (clinical record) is included in the training material. Each form within the chart is explained and its significance to the abstraction process discussed. Coders are also taught how to use the HIPE computer system.

One month after attending the basic training course, participants receive a special edition of Coding Notes that reiterates the main issues taught in the basic training session. This is accompanied by a confi-
courses. required. their work environment to discuss coding issues, when monitored indirectly through quality initiatives under-feedback. The outcomes of training programs are content of all training programs is informed by the educational activity. The evaluations are analysed and the feedback is reinforced.

Intermediate coder training workshops

Intermediate coder training workshops are conducted over 2 days, when there is sufficient demand, and generally 4 months after the basic coding workshop. The content of the intermediate workshop consolidates coding training and experience to date. Coding reference material covered in the basic training course is reviewed and coding conventions and guidelines reinforced.

Experienced coder training workshops and continuing education

The Unit conducts a range of continuing education sessions for experienced coders. Regional coding workshops cover certain specialty areas (e.g. diabetes, injuries, obstetrics, neoplasms, cardiovascular, general surgery). Specialist nurses may be involved in the delivery of content to explain the clinical relevance of the classification logic. Refresher courses cover the basics — coding conventions, coding guidelines and compliance, and data quality initiatives — at local and national levels.

Participants must have completed an intermediate training course to be eligible to attend these workshops. The Unit recommends that experienced coders attend at least one workshop or refresher course each year.

Other ad hoc continuing education initiatives

Medical terminology workshops are conducted on request. The Unit also conducts in-hospital educational sessions, at a hospital’s request or when the Unit deems it necessary after a data quality review. A log of every hospital visit is kept and formal feedback is provided to hospitals following a visit.

Coding Notes publishes, on an ad hoc basis, terminology notes, crosswords that test terminology skills, and coding advice that relates medical science to coding logic.

Monitoring procedures — coder training

All coders who attend the basic training sessions can request an in-hospital follow-up visit by the staff of the Unit to check their work and discuss coding issues with them. This generally occurs before the coder undertakes the intermediate training session.

Evaluations are performed at the end of every educational activity. The evaluations are analysed and the content of all training programs is informed by the feedback. The outcomes of training programs are monitored indirectly through quality initiatives undertaken by the Unit. Ongoing audits identify patterns or trends in incorrectly coded data. The source can be identified and remedial action taken.

Key stakeholder perceptions

This section summarises the key stakeholders’ opinions, obtained from interviews and focus group sessions, and outlines their suggestions for improvement. We acknowledge that points of view expressed by individuals who participated in the study are not necessarily representative of HCCs, clinical coders and Casemix Unit staff as a whole, and cannot therefore be generalised as such.

Clinical coders’ and HCCs’ perceptions on coder training programs

National training initiatives

National initiatives in coder training are generally well received. Most HCCs and coders appreciated the Unit’s efforts because training initiatives are virtually non-existent at a local level. Coders also enjoy networking and discussing issues with colleagues. The material they receive in the sessions is useful and is often accessed as a primary reference source. They also value the opportunity to suggest content for future training initiatives.

Coders appreciate the Unit’s efforts in conducting regional training activities. Coders in regional areas dislike having to travel to Dublin for training, mainly because of time constraints.

On the downside, coders are dissatisfied with the charts used in the basic training sessions. They think the charts are ‘sanitised’, that is, they are too simple and short, and too easy to read to be a true reflection of the real world. A low level of medical terminology knowledge is also a barrier to their learning. They believe the content of the intermediate sessions is repetitive (same as the basic training). They criticised the content of the experienced sessions, believing it is not updated from year to year and is not always relevant to their work. Some coders also believe the Unit tends to overlook their suggestions for content. For example, no educational sessions are conducted for ophthalmology, the neurosciences, vascular and renal systems in spite of requests. Some coders consider the regional workshops, some of which run for only 2 to 3 hours, are too short. Coders also raised concern about inconsistent advice given in workshops (e.g. coding of suicide). The perception is that it is difficult to receive written clarification from the Unit.

The areas in which new coders would like more training are medical terminology, anatomy and physiology, and medical science. Experienced coders requested more training in casemix and certain aspects of information management, for example, audit, data quality and the reporting functions of the HIPE software (how to analyse reports and determine what each report is designed to show).

HCCs mentioned that they would like training in casemix. Surprisingly, not one HCC interviewed has received any formal casemix education. Some have no background in classification theory or practical coding. They learn their skills on the job. Many have a back-

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3 A staff member from the Unit will visit a new coder in their work environment to discuss coding issues, when required.
ground in nursing; in fact, a nursing background is an essential requirement for HCC positions in certain regions.

The DoHC conducts casemix education sessions on request. The coders who have attended them, however, have not found them useful because they could not understand many of the concepts discussed. Their preference is for basic, introductory casemix education, delivered by the Unit. The Unit is perceived as having a better understanding than the DoHC of the relationship between coding and casemix.

Coders also suggested inclusion of more clinicians as instructors in the experienced coder training initiatives to discuss certain disease processes or new surgical techniques. Coders enjoy the training sessions delivered by nurses.

Local training initiatives

Hospital HIPE units have a mentor (‘coding buddy’) program for new coders (Groom 2003) that aligns with the Unit’s basic training workshops. New coders are teamed with an experienced coder and their work is guided, audited and assessed by their mentors.

Workload is distributed in two ways; either by specialty (and coders tend to change specialties regularly), or by medical record numbers (giving coders exposure to a range of specialties). Both methods facilitate ‘upskilling’ and succession planning. Not every coder changes specialties on a regular basis. In some facilities, coders can choose to specialise in one area only and some prefer this approach.

Hospitals provide very few training initiatives for coders. Some do offer personal computer training and anatomy/medical terminology courses. A few keen coders have sought external training in medical terminology and anatomy and physiology and have been supported by their hospitals; distance education or online education was their only option, because there are few formal (certified) training courses on offer in Ireland, apart from those undertaken in a clinical or health sciences university degree. Many coders stated they were not in a position to undertake formal university training, and would prefer to upgrade their knowledge through distance or online learning.

HCCs conduct very few continuing education initiatives for coders, relying on the Unit to deliver these. HCCs explained that they have a significant workload, leaving little time for implementing local data quality initiatives and coder training programs for their staff. Coders also have limited access to clinicians or clinical education sessions in hospitals.

Assessment of skill levels following training

Coders have no way of judging their skill levels. No examinations or tests of a coder’s ability are conducted following the Unit’s training programs. Some HCCs believe the training programs for coders should be academically linked and accredited. This was seen as particularly important for teaching hospitals. HCCs and coders also saw value in an accreditation process that determines skill levels and is linked to coder competencies, career paths and salary gradings.

The Casemix Unit of the DoHC and their perceptions

The proportion of funding to hospitals based on casemix will soon rise to fifty per cent, and so the quality of the underlying ICD data is of primary concern to the Casemix Unit. Trends emerging in the latest analysis of data indicate problems with the application of coding conventions and the definition of principal diagnosis (Curley 2003). There is a demonstrated lack of knowledge of the training material issued in the training courses, and there is evidence that local coding practices conflict with national coding guidelines (Curley 2003). Plainly, the Casemix Unit is keen to see the Unit implementing effective coder training programs.

Casemix and coding are intrinsically linked by a classification system, and understandably, there are many issues relating to casemix and coding that need to be resolved. The Casemix Unit would like to see the establishment of a national clinical advisory panel with appropriate representation from all stakeholders.

Discussion and recommendations

The Unit has established a solid framework for training a professional coder workforce. It orientates new coders to the work of the Unit. It delivers education where and when it is required, particularly to those who reside outside the major cities, and the training initiatives are generally well received. Education sessions are designed on a needs basis, which is driven by feedback from all stakeholders. There is an excellent registration and monitoring process, which provides a snapshot of the coder workforce, years of training and level of experience (basic, intermediate or experienced). There are two key areas where this framework could be improved: (a) by including assessment of the skill level of coders, and (b) by basing the Unit’s curriculum on competencies.

Introducing a competency-based curriculum and assessment model will strengthen the Unit’s coder training framework. It will provide coders with credible evidence of their skill levels, particularly if the Unit seeks recognition as an accredited training body and the Unit’s certificates of attainment are recognised in the workplace as an entry requirement. Clinical coder competencies must be developed before this can be achieved. We would like to see Clinical Coding Ireland (CCI) carry out this work; however, they are a fledgling organisation and may not yet have the capacity to deliver on this substantial recommendation. Therefore, we have recommended that an appropriate body, such as the National Qualifications Authority of Ireland, undertake this work in consultation with CCI, the Unit and HCCs.

We recommended that the Unit broaden and deepen the content and structure of the training sessions over a longer time frame to avoid repetition, build on skills learnt, and cover topics such as medical terminology, anatomy and physiology, classification theory, information management, and casemix. With the introduction of a competency-based curriculum, it will also be necessary to broaden the source material.
and vary the coding exercises, both practical and theoretical, in order to match skill level.

Of primary concern to the staff members of the Coding/Quality Department of the Unit was their need for casemix education, and we have suggested they undertake formal education in this area before conducting any casemix training sessions for coders.

We recommended the involvement of more clinicians in the coder training programs because this strategy benefits all stakeholders. Clinical updates on medical science and surgical techniques are fascinating and relevant and coders appreciate them (Carol 2004; McKenzie and Walker 2003). Clinicians could also be involved in discussing with coders their research and any issues they found with the coded data. Indeed, all other users of the data could present to HCCs and coders at conferences or training sessions — the feedback is invaluable. Involving clinicians may also serve to close the quality loop. Clinicians contribute significantly to documentation in charts. Accurate, timely documentation influences the quality of the coded data.

Developing a national training strategy will enable Ireland to grow and nurture its own workforce of health information management professionals. We proposed the establishment of a national steering committee, under the auspices of the DoHC, to develop a strategy. The committee's role should be to explore a variety of educational opportunities for both coders and HCCs, with flexible modes of delivery, in response to local demand.

We made clear one very important point, that the Unit should maintain control over the development and delivery of all coder training education. Although we have recommended a variety of training options, we believe that the Unit should maintain control for they provide excellent professional support to coders and HCCs. We believe this is achievable through the Unit working in collaboration with accredited educational facilities and the Unit seeking recognition as an accredited training body.

The Unit collects valuable statistics about the coder workforce and these statistics are vital to workforce planning (McKenzie and Walker 2003). Our final recommendations were that the Unit should build on the existing collection by developing indicators of coder skill levels and retention/turover rates of coding staff in hospitals, and should publish coder workforce statistics in the ESRI's annual report of hospital activity.

Conclusion

The Unit is committed to achieving best practice in the coding of morbidity data. Health information is the 'backbone' of any healthcare system. It shapes the way healthcare is planned, promoted, delivered, researched and funded. Clinical coder education is integral to the quality of data within the national morbidity data collection and the Unit acknowledges this in their quest for best practice. In this paper, we identified opportunities where the Unit may build on the solid framework that has been established for coder education.

The opportunities that we saw while undertaking this review were not only beneficial to Ireland, but perhaps Australia as well. We see opportunities for Australian organisations that specialise in coder education programs to expand into global markets. Australian organisations offer a very different range of coder training options. Four universities offer a degree in Health Information Management, one of which offers the course by distance education (Postle et al. 2003). The distance education arm of Technical and Further Education NSW (TAFE) offers a course in medical terminology, and clinical classification is an optional extension to this course (Open Training and Education Network 2003). The Health Information Management Association of Australia (HIMAA) offers clinical coder training via distance education at introductory, intermediate and advanced levels (Dimitropoulos 2005). Business opportunities may exist for organisations specialising in distance education to tailor their products to the Irish market and work collaboratively with the ESRI to deliver coder education programs. Online technologies are proving to be a real boon to distance education. Introductory level programs could be offered as interactive web-based programs with sophisticated online advice that explains clearly to new coders which particular codes are correct, and the inappropriateness of other codes.

We also see opportunities for Australian Health Information Managers and clinical coders to work overseas. The ESRI is seeking applications from qualified and experienced coders to work in the areas of data quality review and audit, and training coders to use ICD-10-AM.

For more information on opportunities to work in Ireland, visit the ESRI website: <http://www.esri.ie>.

References


Reviewed Articles


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Morbidity data quality initiatives in Ireland

Michelle Bramley and Beth Reid

Abstract
In 2004, the Hospital In-Patient Enquiry and National Perinatal Reporting System (HIPE & NPRS) Unit of the Economic and Social Research Institute in Ireland requested a review of its coder training programs and data quality initiatives, primarily because of the decision to implement a major change in the morbidity classification in January 2005. In August 2004, the authors conducted a formative evaluation using qualitative methods to assess the Unit’s programs. A number of opportunities for building on the solid framework the Unit has implemented were identified. The preceding paper focused on the Unit’s coder training programs (Bramley & Reid 2005). In this paper, the Unit’s data quality initiatives are examined.

Key words: Best practice analysis; clinical coders; data quality; health information management

Introduction
The Hospital In-Patient Enquiry and National Perinatal Reporting System (HIPE & NPRS) Unit (hereafter called the Unit) of the Economic and Social Research Institute (ESRI) in Ireland requested a review of its coder training programs and data quality initiatives in August 2004. This was primarily because of the decision to implement a major change in the morbidity classification in January 2005. In our previous paper (Bramley & Reid 2005) we provided a background to the review and the HIPE data collection process, and documented the results, key findings and recommendations for the Unit’s coder training programs. In this paper, we focus on the results, key findings and recommendations for the Unit’s data quality initiatives.

Results
We present first a description of the Unit’s data quality initiatives, obtained from content analysis and from staff interviews designed to collect objective data to support the content analysis. We then document key stakeholder perceptions, obtained from the focus group sessions.

The Unit’s data quality initiatives

Data quality checks
The primary focus of the Unit’s work is data quality. In addition to roughly 36,000 edits built into the HIPE computer system, 80 validation checks on ICD-9-CM diagnosis and procedure coding (selector checks) are routinely performed on national data.1 The analysis covers a range of coding conventions and guidelines. Some DRG (diagnosis related groups) analysis is performed on areas where the underlying problem may be related to coding, rather than to grouping. After the selector checks are run, the Unit produces query reports for hospitals to verify and correct. The Unit routinely checks the quality of administrative and demographic data (reporter checks) and analyses compliance with the guidelines published in Coding Notes and the HIPE instruction manual.

Data quality audits
Requests for data quality audits originate with hospitals (HIPE/Casemix Coordinators [HCCs], coders, finance managers, hospital managers), the Department of Health and Children (DoHC), clinicians, researchers, and staff of the Unit. Hospital audits are conducted by Unit staff, generally in conjunction with coding staff, at the hospital. Audit methodology varies with the purpose of the audit and generally involves either a recoding or a comparison methodology. In some cases, variance in DRG assignment is assessed to measure impact on funding. In-house auditing software has been developed by the Unit in order to simplify the extraction of data from the national file, to simplify the analysis, and to standardise the format of reports.

Data quality surveys
The Unit conducts routine data quality surveys and publishes results in Coding Notes. A recent HCC survey (HIPE & NPRS Unit 2003) determined the perceived main reasons why coding is not always accurate, complete or timely. These are: profile of the HIPE Unit within the hospital, illegible chart entries, incomplete charts, non-identification of principal and additional diagnoses, and limited supply of qualified coding staff.

Coding guidelines
Coding guidelines for ICD-9-CM are developed in-house and adapted from the American Hospital Association Coding Clinic journal published in the USA. In-house development is driven by need, primarily from quality activities conducted by the Unit. Some guidelines are developed as a result of coding queries. Guidelines are published in the Unit’s quarterly newsletter Coding Notes, and reinforced in all training activities. Coders are encouraged to provide feedback on the guidelines; for example, how relevant they are to their workplace and how they translate in application. Compliance is measured directly through audits and indirectly through the number of coding queries relating to a guideline.

Coding queries
Coders are able to seek expert guidance on coding problems from the Unit. Requests can be lodged via a standardised form (available in the HIPE instruction manual).
manual or from the Unit’s website), email or telephone. Queries are distributed evenly among members of staff and answers are generated from weekly discussions.

Monitoring procedures — data quality
Every data quality initiative (data quality checks, data quality audits and coding queries) undertaken by the Unit is logged in a database. Hospitals receive formal, standardised feedback (summary sheets) on the outcomes of all data quality checks. Query reports, sent to hospitals for verification and correction, are monitored and investigated if not returned within the set timeframe. Detailed reports are produced following a hospital-based audit which outline strategies for improving coding practices at the local level. Follow-up visits are also recommended. The responses can be less formal for coding queries and vary according to the way the query was received; for example, a telephone request for advice generates a telephone response. The less formal approach generates a quicker turnaround time. The results of the Unit’s data quality initiatives are used productively in coder education and training programs. Collectively, they are used to develop coding guidelines and the content of training workshops. Some hospital audits lead to further coder training, which is generally conducted in the hospital by the staff of the Unit. Selector checks on data become edits in the HIPE computer system, wherever possible and if warranted. Coding Notes publishes responses to some coding queries.

Key stakeholder perceptions
This section summarises the stakeholders’ opinions, obtained from interviews and focus groups, and outlines their suggestions for improvement. We acknowledge that points of view expressed by the individuals involved in the study are not necessarily representative of those of HCCs, clinical coders and Casemix Unit staff as a whole, and cannot be generalised as such.

Clinical coders’ and HCCs’ perceptions on data quality initiatives
National coding guidelines
HIPE/Casemix coordinators (HCCs) and coders have no input into guideline development at the national level. Some coders do not know whether the guidelines are mandatory and some admit to not reading them. A few believe the guidelines have little relevance at a local level. HCCs and coders perceive the national data quality guidelines, and clinical need is stated as the overriding justification for this.

HIPE computer system and information technology (IT) support
There is unqualified support from HCCs and coders for the HIPE computer system. The system is user friendly and the technology support delivered by the staff in the Unit’s Information Technology Department is described as ‘second to none’. The inbuilt edits and checks are usually logical but a few coders felt that some of the edits were not relevant. The validation checks are said to assist in reducing data entry (transcription) errors. The reporting functions are perceived as very useful.

Real problems are perceived to lie with the IT infrastructure within hospitals. Most PAS (Patient Administration Systems) are more than 15 years old and computer equipment is outdated. Local IT support staff are said to be reluctant to assist in solving problems with interfaces to HIPE software because they believe the responsibility for this lies with the Unit. HCCs and coders often feel, when they seek help in solving problems, they are caught up in a dispute between their local IT support and the Unit’s IT support. External suppliers are responsible for the maintenance of many of the local systems, therefore any requests for major changes take time to program, build, test, and implement. The time factor in this process, however, is not always taken into account; for instance, a notification to change the system for January 2004 was received by HCCs and coders in October 2003, which was only 3 months before the planned implementation. Such a time frame is not sufficient for most hospitals. Moreover, some hospitals plan to introduce new PAS and consequently, no maintenance is conducted on the old system in the interim. Frustratingly, in such cases, any information required has to be collected manually.

Regarding changes to software, HCCs and coders believe there should be better coordination and cooperation between the Unit, the DoHC and hospitals. They say there is limited mutual discussion about why new fields are required. One suggestion is that a consultative group be established to discuss and ratify all proposed changes to the system. This group should analyse the impact and the feasibility of introducing a change, and there should also be a more realistic time frame during which to implement changes.

Data quality checks/audits
HCCs and coders perceive the national data quality checks and audits as being necessary. Most participants also believe the feedback is useful, providing an indication of a coder’s skill level and identifying areas where further education is required. Most checks and audits are considered to be valid, but some are perceived as not relevant at a local level. HCCs and coders feel free to advise the Unit about audits and edits, but none have yet done so. Some HCCs believe that national audits could be more timely. They feel greater consideration should also be given to the period au-
Coders would appreciate knowing the reasoning or logic behind a decision.

An HCC’s educational background directly affects coders and indirectly affects the Unit. Some coders remarked about the challenges they face when their HCC has no background in coding, and they do not have a more experienced coder to help them code difficult cases. Most of their queries therefore need to be referred to the Unit. Some hospitals have set up informal coding advice networks where coders can seek advice from their peers via email.

Coder workforce issues
Profile of coding staff
Coders generally monitor their own workloads. Most are aware of their productivity levels and regularly access this information from the HIPE computer system. Many do this in relation to data reporting timelines and any identified problems are discussed at meetings. There are very few incentive schemes at a local level for meeting productivity targets or data reporting timelines, even though coding deadlines are linked to financial rewards. There is a limited pool of funding for hospitals, and distribution of funds is partly based on activity (casemix). If a facility’s data are not incorporated into the DoHC’s casemix model on time, a loss of funding may result.

Productivity
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Clinical coder salaries, recruitment, competencies and career paths
Coders are unhappy with their salary structure. They believe there is no recognition of their specialised skills, most coders being graded as Grade 3 clerical workers. Some regions offer Grade 4 because some HCCs and hospital managers have worked to achieve greater recognition for their coding staff. There is no recognition of seniority or experience. A coder with 8 years’ experience receives the same grading as a new coder with 4 months experience. There is no incentive to undertake continuing education because it makes no difference to pay scales.

HCCs mentioned that there is no ‘locum’ coder workforce from which to recruit people when assistance is needed to reduce a backlog or to cover for holidays or sick leave. Existing staff are working progressively harder to keep up with the workload. Some HCCs stated that the availability of qualified coders for employment is an ongoing issue, though some hospitals do not have the problem of high turnover of staff. Coders at these facilities did mention, though, that they stay on purely because the work environment is pleasant. Most are regularly looking for jobs with

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2 Similar to the standard templates created by the DoHC for hospital costing audits.
higher salaries and better opportunities for promotion, and are prepared to leave the coding profession if need be.

Competencies have not been developed for coders, and their grading is not linked to any job-specific skills or performance measures. In short, there is no career pathway for coders, not even towards an HCC role. Coders complained that there is no recognition of their information management skills. Other healthcare positions with a recognised information management role currently require a clinical background, such as nursing. Incidentally, these positions have higher gradings.

Coders desire a career pathway, therefore they would like gradings that reflect their knowledge and skills. They see coder accreditation as one way of achieving this.

Clinical Coding Ireland

Clinical Coding Ireland (CCI) is the society established in March 2004 to raise the profile of clinical coders in Ireland. The society will work towards establishing a coder accreditation program, a standard grading structure, and a communication network at a regional and national level. The aim is to work with the Unit and the DoHC to establish and promote good practice. CCI received €5,000 from the DoHC for establishment costs, and the Unit provided them with administrative support until the official launch of the society.

Coders are very positive about CCI; many have joined the society at their own expense. They see CCI as their ‘champion’ and a catalyst to better salaries and working conditions. Coders are keen to volunteer to help with the society’s workload, however, many may flag under the pressure of too much voluntary work for CCI. Most hospitals do not support coders who belong to CCI, for example, by providing them with time off to conduct CCI activities. Their work for CCI must be undertaken in their own time.

HCCs have mixed feelings about CCI. Very few have joined, believing that membership should be representative of only those who code. Although all HCCs support CCI and its aims, they believe that considerable resources are required to achieve these aims. So much is expected of this fledgling society. All HCCs and coders believe it is in the best interests of the Unit and the DoHC to provide financial resources to assist in the continued development of this valuable society.

Access to resources

Coders’ ready access to the Internet and online coding resources varies greatly between facilities, but most coders have access to the Intranet and email. Most have ready access to medical dictionaries and anatomical texts, but not to clinical journals.

Clinician/coder relationships

Clinician/coder relationships vary greatly between facilities. Generally, coders have little contact with clinicians. Few facilities mentioned good working relationships where coders regularly discuss coding issues with their specialist medical teams. It is perceived that few clinicians recognise the importance of the local or national HIPE units’ work and it seems that the level of recognition aligns with clinicians’ knowledge of casemix. The more they know about casemix, the better their understanding of the dependence of casemix on coding and classification issues.

HCCs and coders believe there should be education provided to clinicians at a national level specifically about documentation, and also about the HIPE data collection and casemix. Some HCCs are working locally to improve the Unit’s profile. Efforts in this area include providing information about the local HIPE unit’s work in clinical orientation programs, publishing information about HIPE and the move to ICD-10-AM in hospital or regional newsletters, developing new coding guidelines for ICD-10-AM with clinicians, and preparing a guide to good clinical documentation.

Quality documentation and form design

The quality of documentation in charts varies greatly between facilities. HCCs and coders agreed that the quality is often not good enough to support the coding function. They have limited input into designing forms for charts. Some facilities have established committees, but with little or no input from HCCs or coders.

Moving to ICD-10-AM

All coders and HCCs are very positive about the move to ICD-10-AM and are keen to be educated about the new classification before implementation. Most coders were unaware of the ICD-10-AM education workshops planned by the Unit, in spite of this having been advertised in Coding Notes.

Discussion

The Unit has established a solid framework to support its data quality initiatives. All departments within the Unit conduct data quality initiatives. The Unit works collaboratively with external users of the data. The results of joint research proposals or data quality studies are presented at conferences and published on the Unit’s website. This is an important communication strategy for increasing awareness of the work of the local and national HIPE units. Stronger working relationships among key stakeholders are built and the profile of coders is raised. The more the data are used by all stakeholders, the greater the understanding of the strengths and limitations of the system, and thus the greater potential to influence data quality (Canadian Institute for Health Information 2003a; Driscoll, Henley & Harrison 2003; Eager & Innes 1992).

The ‘ace’ in the Unit’s pack of data quality initiatives is the HIPE computer system. There are many benefits in having a single computer system for the HIPE data collection, the primary benefit being control. We heard many complaints from HCCs and coders about local PAS in hospitals and the variable support from local IT staff. Their issues clearly demonstrate why it is so valuable to have one system, developed and maintained by one body. Control is the major factor in the quest for quality data. The Unit has control in respect of the HIPE computer system.

We saw a number of opportunities for building on the Unit’s data quality framework, and, importantly, for the Unit to share the workload.
Developing a data quality strategy, in collaboration with key stakeholders, will focus the Unit’s work on the priority areas for promoting data quality. It will introduce academic robustness, justification and overarching support to the Unit’s data quality framework. Part of this work will include developing performance indicators, establishing acceptable error rates and setting benchmarks. Developing a standard template for recoding or comparison audits, with standardised error and reason categories, will enhance understanding of the audit process at a local level and may encourage more audit activity at that level.

We were concerned about the lack of awareness of the national coding guidelines, and that in two hospitals there exist local practices that conflict with national guidelines. Distinguishing coding guidelines clearly from all other news items published in the Unit’s newsletter, Coding Notes, may increase awareness of the guidelines. The consistent use of a ‘rationale’ section will also be useful to explain to all stakeholders the reasons for the introduction of a guideline. We see HCCs as being important in bringing about change in compliance with guidelines, and recommend they work collaboratively with the Unit, both to reinforce the importance of the guidelines and to measure compliance at the local level.

We recommended that the Unit consider the implications of publishing the answers to all queries, either in Coding Notes or on their website. We suggested they seek guidance on their best options from Australia, Canada and the United States. Knowledge of the background to a coding query decision helps coders understand the logic of the decision. We believed the problems with communication and collaboration and transparency among key stakeholders could explain why some local coding practices conflict with national guidelines. These problems could be solved with the establishment of a national advisory committee to the Unit, with representation from CCI, HCCs, and the DoHC. Establishing such a committee will promote an ethos of collaboration and establish a pathway for regular communication between stakeholders. In our view, it will promote transparency and a better understanding of the work of the Unit. It will also foster ongoing learning and upskilling in the HCC and coder workforce. We recommended the establishment of a clinical support network for similar reasons. The network will also provide the Unit with valuable assistance in developing and presenting material for coder training programs, writing coding guidelines and responding to coding queries. Noller’s project is one good example of what can be achieved with collaboration. Through multidisciplinary analysis of in-patient complication rates, nurses and medical practitioners became aware of coding and data reporting requirements. They worked with coders to establish definitions of complications for certain surgical cases, which in turn led to more accurate coding and the establishment of benchmarks. The result was enhanced data quality and an improvement in clinical outcomes (Noller 2000).

The HIPE computer system is a valuable tool and could be enhanced by enabling diagnoses to be classified by type upon data entry. Such a move will also align with Ireland’s National Health Information Strategy (see our last recommendation below). Applications for morbidity data are expanding and data are now being used to assess the quality of hospital care (Jackson et al. 2003). A hindrance to this analysis is the inability of most information systems to distinguish between the different types of diagnoses classified. Although the principal diagnosis is distinguished, additional or secondary diagnoses are grouped together, and it is difficult to determine which particular additional diagnoses had the most impact on a patient during the episode of care. The Canadians have improved their morbidity information system by introducing diagnosis typing (Canadian Institute for Health Information 2002; 2003b). All diagnoses data submitted to the Institute’s Discharge Abstract Database are classified by type. Two states in Australia also classify diagnoses by type (Jackson et al. 2003).

We would like to see the ESRI play a major role in Ireland’s National Health Information Strategy (NHIS), for they are key stakeholders. Evaluating the ESRI’s role in this strategy was outside the scope of this review; however, we considered the ESRI to be a key stakeholder and therefore we have incorporated this recommendation. The NHIS is in its infancy. It aims to build the frameworks required to facilitate the optimal development and utilisation of health information (Department of Health and Children 2004a). One of the Strategy’s terms of reference is to ‘consider gaps in data and look at requirements for the development and use of performance indicators and outcome measures for monitoring and evaluating health and the effectiveness of health services’ (p.103). The Unit should work with the NHIS or the Health Information and Quality Authority, in order to identify priority areas and establish national performance indicators of health status and health outcomes. Insight could be drawn from similar work in Australia (Australian Institute of Health and Welfare 2003), Canada (Canadian Institute for Health Information 2002) and the United States (Watt et al. 2003).

Finally, we have encouraged the Unit to extend their publication activities and publish responses to all coding queries, data quality performance indicators, and results of data quality audits.

Considerations for Australia

While undertaking this review, we drew on parallels between Ireland and Australia. In Ireland, a single body is responsible for the national morbidity database — the computer system that collects and reports the data — and the classification system used to code the data. In Australia, many different organisations build and maintain the information systems that collect and report the data, and different bodies manage the mor-

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3 Diagnosis types are pre-admit comorbidity, post-admit comorbidity, secondary diagnosis (optional coding), morphology codes, external cause codes.

4 It is planned to establish a Health Information and Quality Authority in Ireland. The Authority will be responsible for introducing a national health information standards framework, developing common sets of indicators, and establishing a system of quality assurance of information services provided to the public (Department of Health and Children 2004b).
Acknowledgements

Our recommendations were shaped from the information gathered within and outside the ESRI. Many individuals advised us and we wish to thank them for the important contribution they made. The staff of the HIPE & NPRS Unit deserve special mention. They willingly gave up their time, energy and resources to assist us in this review. We would also like to thank Miriam Wiley, Deirdre Murphy and Jean McIntosh for their suggestions for improvements to these papers. Lastly, we would like to dedicate this paper to the memory of the late Anne Clifton. It was a pleasure and privilege to work with someone with such passion and dedication for her family, her work, her colleagues and her organisation. Vale, Anne.

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Coding of thoughts, words and things

Madonna Kemp, Sue Walker and Peter Scott

Abstract

This short paper highlights some new work being performed at the National Centre for Classification in Health (NCCH), relating newly created term sets developed for specific purposes to existing reference terminologies and classifications such as SNOMED CT and ICD-10-AM. It describes some of the inherent difficulties experienced by the NCCH team in interpreting terms in the term set and therefore in locating equivalent concepts in reference terminologies and classifications, in the absence of a context with which to associate each term. Also examined is the effect that a person's background and past experience has on their understanding and interpretation of clinical terms and how this results in inconsistent 'world views'.

Key Words: Clinical terminology; coding; meaning; SNOMED CT

Introduction

"There's glory for you!" "I don't know what you mean by 'glory'," Alice said. Humpty Dumpty smiled contemptuously. "Of course you don't — till I tell you. I mean, 'there is a nice knock-down argument for you'!" "But 'glory' doesn't mean 'a nice knock-down argument'," Alice objected. "When I use a word," Humpty Dumpty said, in rather a scornful tone, "it means just what I choose it to mean — neither more nor less." 2

All very philosophical one might admit, but in the context of a term, and in this case a clinical term, what do words mean, especially when all you have are the words? We attach meaning to words based on our own perceptions, in the context of our view of the world in which we live, or (in this case) where we work. This may also mean that those views may differ from each other even though we share a common 'world'. Health Information Managers (HIMs) and clinical coders are faced with difficulties associated with coding terms every day. Usually the greatest obstacles are those that are created through inadequate documentation, or the terms used by the clinician may need to be interpreted beyond the face value of the term. The medical record provides meaning to terms, through the context or perspective in which the term sits. One may wonder what a clinician means when she or he writes 'COLD'. The Health Information Manager or clinical coder is trained to search the medical record and it is this medical record, specifically where that term sits within the record, that provides the HIM or coder with context and therefore meaning. Without the context given to this term through the place in which it sits within the record, this term could mean a number of things. Did the clinician mean 'cold' as in common cold, or 'cold' as in ambient temperature, or 'COLD' being Chronic Obstructive Lung Disease, or 'Cold' meaning socially isolated? The word by itself has no definitive meaning.

This article will highlight some of the difficulties which arose when a number of NCCCH staff embarked on an exercise in assigning Systematised Nomenclature of Medicine Clinical Terms (SNOMED CT) concept identifiers or IDs (codes) to terms in a newly developed term set.

The example provided earlier, regarding the meaning of the term 'COLD', is an illustration of some of the difficulties faced when attempting to match a code, in this case a concept ID from SNOMED CT, to a word or term used in clinical practice. We, as individuals, apply our own interpretation of what that word means based on our perceptions of what the thing is. There are three factors involved when any statement is made or interpreted:

- mental process
- the symbol
- a referent (something which is thought of) (Ogden & Richards 1972).

The NCCH has been working on terminology development for small, specific uses. The processes involved in this development work include the testing of maps between terms and other existing terminologies or classifications such as SNOMED CT or ICD-10-AM. NCCH staff, for research purposes, assign SNOMED CT concept IDs to terms contained within these newly developed term sets. The process involves discussion between members of the work group, with regard to the difficult or ambiguous terms. In addition, through a qualitative method, concept IDs are checked and rechecked for concordance between individuals assigning the maps. It is this process that has highlighted some instances of the differing views held by the individuals involved as to what the clinical terms mean. It was found overall that concordance between individuals was initially not very high, but this improved with time. This agreement was found to be higher between those staff who had immediate face-to-face contact with each other, facilitating open discussion regarding perceptions of the meaning of individual terms.

The process also included assigning a rating scale for the maps. This scale rated how well it was thought the term was represented by the SNOMED CT concept. This scale used a rating of 1 to 5, these being:

- lexical and conceptual equivalence between the source term and that chosen in SNOMED CT
- equivalence of meaning (between our source concepts and SNOMED CT), and concepts are considered synonymous
- the SNOMED CT term is more specific than the source term

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1 ‘Thoughts, words and things’ is the title of chapter one of Ogden and Richards’ book The meaning of meaning — a study of the influence of language upon thought, and of the science of symbolism.
2 From Through the looking glass by Lewis Carroll.
• the source term is more specific than the SNOMED CT term
• there is no match.

The differences came about when comparing the ratings assigned by individuals and this is where the differing 'world views' were highlighted.

In the world of terminologies, terms within those terminologies derive meaning by the place in which they sit within the hierarchy, and the relationships they may have with other terms within that terminology. For example in SNOMED CT, choledolithiasis is described as:

- disorder of a digestive organ
- disorder of biliary tract
- biliary calculus

Its meaning is derived in part from where it sits within the hierarchy. Other difficulties experienced by the team occurred when faced with terms that had two or more meanings within the SNOMED CT hierarchy. For example raised blood pressure is described as:

- abnormal blood pressure finding
- finding of increased blood pressure
- elevated blood pressure reading without diagnosis of hypertension

Or:

- disorder of an artery
- hypertensive disorder

Each of these has a different concept ID and are indeed different concepts. One relates to a finding — an occasion of high blood pressure (BP) — the other refers to an ongoing medical condition. Without knowing more about the context in which raised blood pressure is used, it is difficult to know which meaning is correct or relevant.

SNOMED CT is a reference terminology, therefore each concept has a different concept ID. A reference terminology is defined by Standards Australia in draft standard DR 04114 as being:

... a terminology designed to uniquely represent concepts. It does this by listing the concepts and specifying their structure, relationships and, if present, their systematic and formal definitions. It normally contains a unique identifier, a rubric, and may contain reference to alternate terms to the preferred term (which may be conceptualised as an interface term (interface terminology) and it may contain maps or pointers to aggregate terminology) (Standards Australia 2004: 30).

If there was a medical record to which to refer, it would become clearer as to which concept ID should be assigned to the words raised blood pressure. When there is no other context, one automatically assumes meaning based on prior thought or knowledge. A similar example is that found with the term or concept of rash. This term is represented in two ways within SNOMED CT. It is a body structure concept and therefore a morphologically abnormal cutaneous eruption or it is also a clinical finding of the skin which is a disorder of the skin, skin lesion.

Adding to the difficulties when trying to decide on a concept ID which reflects a term, is the fact that more than one could be considered correct. Someone in the group may decide to post-coordinate and represent the concept of laparoscopic total abdominal hysterectomy and bilateral salpingo-oophorectomy by using the following concept IDs:

<table>
<thead>
<tr>
<th>Concept ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>116144002</td>
<td>BSO - Total abdominal hysterectomy</td>
</tr>
<tr>
<td>180627003</td>
<td>Laparoscopic approach</td>
</tr>
</tbody>
</table>

Others may choose to represent it as shown below:

<table>
<thead>
<tr>
<th>Concept ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>414575003</td>
<td>Laparoscopic total abdominal hysterectomy and bilateral salpingo-oophorectomy</td>
</tr>
</tbody>
</table>

Or:

<table>
<thead>
<tr>
<th>Concept ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>180627003</td>
<td>Laparoscopic approach</td>
</tr>
<tr>
<td>116143008</td>
<td>Total abdominal hysterectomy</td>
</tr>
<tr>
<td>29827000</td>
<td>Bilateral salpingo-oophorectomy</td>
</tr>
</tbody>
</table>

These differences also come about because of the different perspectives from which each person looks at a term. Those of us from a health information management background may find it difficult to remove ourselves from 'coder brain' thoughts, whereas members of the group who have a nursing background tend to see the terms from a nursing perspective, while the clinician amongst us sees them from a doctor’s or clinical perspective. An example of this may be used in the case of a rash. The nurse may have a particular perspective of what a rash is, which may be an allergic reaction, therefore deciding that the term means one thing. The clinician such as a general practitioner may see a 'rash' from the point of view of a 'finding', that is, they see a patient who has a rash — an eruption of the skin. A dermatologist may see a rash as an indication of an underlying disease, or a pathologist may see it as the morphological abnormality of a body structure. Differing perspectives are gained through what we know.

Conclusion

In this ever-changing world and with the advancement and diversification of the role of HIMs, it is hoped that this article has highlighted some of the difficulties associated with coding, albeit somewhat outside the usual experience of coding with ICD.

Lessons learnt from this exercise and how these can be used to minimise error were:

• try not to divorce terms from their contexts when interpreting meaning
• try not to slavishly code all terms if some are ambiguous
• run concordance tests and refine internal processes
• check with clinicians if unsure
• develop quality assurance measures at the time of clinical documentation.

It is important to recognise that language, and therefore meaning, is idiosyncratic. We take for granted that because we share a common language, we also share similar views with regard to words, thoughts and things.
In simple but loose words we only know for certain what is said when we know why it is said ... (Ogden & Richards 1972).

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Challenges in coding and classification

Nadia Kolednik

I have worked within the health industry for the past 25 years, 22 of which have been spent as a clinical coder. Throughout this time I have worked in various public and private hospitals in New South Wales, the Australian Capital Territory, the Northern Territory, and now in Western Australia. Over these years, I have, like many others, experienced and seen many changes not only within the coding industry, but also within the health industry as a whole. Along with this variety, I have had the opportunity to work in a large teaching hospital for approximately 5 years where there was wide-range implementation of Casemix, and where I gained further expertise in my profession.

As a newcomer to Western Australia, writing this article has provided an opportunity to look at the ‘challenges in coding and classification’ from a different perspective from simply that of the challenges faced by a clinical coder when embarking upon a new position in a different state or territory.

We moved from country Northern Territory to Perth, Western Australia in mid-January 2005. After settling in to our new house and becoming moderately familiar with our surrounds, the time came for me to look for work. Believe me, this was not an easy task. I can say the UBD Perth Street Directory has become our ‘bible’. After doing some research, I was referred to a contact who could tell me which hospitals and locations had suitable positions available. There was one particular hospital that ‘grabbed my attention’, but the distance from my home seemed too far to be practicable. One afternoon, however, I went for a drive to test the distance for myself. It was 48 km — a 50 to 60 minute drive, depending on the traffic. There was a big decision to make; could I work full-time and handle the travelling and, most important of all, the traffic? For city folk the drive may seem trivial but when one has lived for the past 20 months in a small town that has only one set of traffic lights, city traffic can be frightening.

After contacting the hospital and going through an informal interview, I have been temporarily employed on a six-month full-time contract with the South Metropolitan Area Health Service. What a challenge the past 10 weeks have been! I can certainly say it has not been easy; everything about this position is very different from my previous experience. In addition, when the hospital’s one and only clinical coder took maternity leave I was left ‘holding the reins’. The following is a list of some of the areas in which I have encountered challenges.

Administrative challenges

- The start and end of the pay period is different from that of my previous employer.
- Staff are expected to pay for their own criminal background search out of their first pay.
- There was a different superannuation scheme which had to be amalgamated with my existing schemes.

Coding issues

Challenges in this area included:
- becoming familiar with the WA Coding Query Database
- becoming familiar with the Department of Health Technical Bulletins
- teaching and validating a new clinical coder
- learning and remembering codes that I have not coded in many years, for example, tonsillectomy and vasectomy (the nice and easy ones for a change!)
- locating and abstracting information (e.g. on smoking) from forms
- becoming familiar with the names and specialties of the doctors, getting to know them, and interpreting their handwriting and idiosyncratic abbreviations
- coding Admission and Wait List Forms
- coding Outpatient Same Day Unit episodes
- discovering how to chase up outstanding histopathology results
- locating active files within other Departments, e.g., rehabilitation and mental health
- finding out when to complete a Cancer Notification Form and where to send it
- coding an episode without Discharge Summary and then rechecking when completed
- not having the Grouper at the local level
- prioritising coding, e.g., any episode with a blue card has first priority
- learning how to chase up any outstanding episodes and files.

Computer applications

This involved:
- learning and understanding a new computer application in general, e.g., for coding, reports, maintenance requests and sick leave that is not user friendly with respect to coding data input
- learning the Pathology computer application to view outstanding results before chasing them up
- learning the Department of Health application to run off Edit Reports
- learning the Outpatient Same Day Unit computer application.

Terminal digit filing system

- The colours are all different, e.g., 00-09 is silver/grey, 10-19 is brown, 20-29 is red. This has really thrown my mind in a twist, but I am slowly coming to terms with it. I have been told that it is different once again at other hospitals throughout WA.
- Year label stickers are different.
- Client Medical Record Number is different.
Compilation of end-of-month statistics

This entails:

- running off edit reports, correcting errors and reporting those that cannot be corrected at hospital level to the Department of Health via email (I am still trying to establish a routine to deal with this issue)
- inputting daily coding output levels that are broken down to three levels, coded within 14 days, coded within 30 days, coded post-30 days, on a weekly basis and reporting totals at end of the month
- collecting and running off end-of-month statistics and inputting this information on a total summary sheet and forwarding this to management.

Conclusion

Yes, my days are busy and challenging — there is always something new to learn. I am using many skills that I have not been able to utilise for many years. Overall, we all have the Australian Coding Standards to follow, but each Area Health Service in their state or territory also has their own coding databases with which a coder needs to become familiar. I have found each state and territory to be unique and not just in the coding aspect, but in everything else that comes with job.

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Eight methods for improving coding quality and efficiency

Carolyn Haggarty and Jacqueline Ives

The data abstracted and coded by clinical coders provides the information that is used to assist in the planning and funding of health care services at local, state and national levels. How do coding managers go about improving the quality of coding, while at the same time maintaining and improving coding efficiency? The authors identify eight great ways to improve coding quality and productivity.

1. Motivation
Clinical coding could at times be considered a somewhat tedious and repetitive task, depending upon the complexity of the casemix. Perhaps one of the most challenging issues that coding managers therefore need to address is how to keep their coding staff highly motivated. Strategies for motivating coders can be based broadly on monetary and non-monetary rewards.

Monetary rewards are fairly self-explanatory, as they involve financial incentives to increase performance; for example, employers may offer clinical coders a bonus based on increased productivity and accuracy. Such initiatives require careful monitoring and must form part of the departmental budget. However, while private sector employers may be able to offer bonus incentives, government employers do not have this capacity.

Non-monetary rewards relate to issues of self-worth. Anecdotally, clinical coders do sometimes feel undervalued for the activities that they perform. It is important for coding managers to recognise when their staff are performing well and to provide non-monetary ‘rewards’, such as regular morning teas and lunches, to acknowledge work-related milestones (coding) and personal events (e.g. birthdays) as a means of showing the appreciation by management for work well done. Our advice is for managers to be creative; for example, one health service we know of encouraged the department to go as a team to the movies. Activities such as this provide clinical coders with some well deserved time away from their desks, and promote team building.

2. Setting boundaries
Clinical coders need to be aware of the work requirements that are specified in their employment contracts. Typically, these might include daily productivity levels and expected accuracy rates. Coding managers need to monitor coding statistics and accuracy rates as part of the overall performance management activities for the unit. Visual references, incorporating graphs or tables, are a reminder to clinical coders of both their achievements and their goals; the coders can work towards achieving these goals and monitor their progress against colleagues in the Unit (or Department or region).

3. Division of work
We recommend that medical records awaiting coding be sorted into specialty groups, for example renal, cardiology, urology. The complexity level for each group, ranging from simple to complex, then needs to be assigned by the coding manager. It is at this stage that specialties can be assigned to the coders by the coding manager, who needs to keep in mind both the level of experience of the individual coders and the complexity of the cases to be coded. This allows the coders to take ownership of their specialty areas and to further develop their knowledge in these areas. It also allows the coding manager to assess the performance of their coders relatively easily, and to set up training and education plans for them.

4. Training and education
Coder training and education should form an integral part of the coding manager’s overall management strategy. It is essential that clinical coders keep up to date with new procedures and changes in the health industry. Both internal and external education resources need to be identified and harnessed by the coding manager. Many larger facilities have existing education sessions set in place for clinicians, such as grand rounds, nursing in-service programs and postgraduate training. Attendance by clinical coders at these meetings can prove invaluable to their training and development. Clinical coders themselves also need to identify areas of particular interest or concern in relation to their work-related training and development, and lobby for their manager to set up education sessions on these topics. The coding managers should also encourage their coders to attend or participate in peer reviews, internal and external coding meetings, and relevant education sessions.

5. Communication
The promotion of communication between coders and clinicians encourages mutual cooperation and understanding. We recommend two methods. Firstly, the Coding Query Letter allows clinical coders to clarify, in consultation with the relevant clinician, any ambiguous, unclear or illegible information without having to leave the department. Secondly, where regular clinical audits are established and conducted with clinical consultants and their teams, the clinical coders have the opportunity to identify and set aside difficult cases that need to be discussed directly with the clinicians. In our experience, this method has been shown to be particularly effective for complex queries relating to new procedures. During these meetings, coders have the opportunity to explain the implications of incorrect or missing information within the documentation and the impact these may have on diagnosis-related group (DRG) allocation and subsequent funding. Such inter-
actions promote learning and build a rapport between the parties.

6. Quality management tools
Coding managers are required to utilise, on a regular basis, quality management or quality enhancement tools, including Performance Indicators for Coding Quality (PICQ) produced by the National Centre for Classification in Health. The Australian Institute of Health and Welfare (AIHW) edits (which are both demographic and coding), and hospital and state-specific edits are also used to ensure the validity of their data.

Auditing is an additional tool that coding managers can employ, especially targeted auditing of records by internal or external clinical coding auditors. The use of coding and DRG grouping software packages (one of which, for example, is 3M’s Codefinder™) can assist with the correct code assignment and analysis of data including the review of DRGs and length of stay. Coding managers can also use alternative methods for improving quality such as developing databases to monitor daily operations (for instance, the tracking of queries between the clinician and the coding unit).

7. Ward-based coding
It has been our observation that partial or total decentralisation of coding services has been undertaken by some coding departments and resisted by others. Again, in our experience, ward-based coding has been shown to increase discussion between coders, clinicians, nurses, and allied health and clerical staff and to provide a valuable source of information to the coders. Coding is facilitated as the clinical coders have ready access to medical records on discharge, thus reducing unnecessary delays in the coding process. Clinical coders who work in this setting become a part of the wider healthcare team and, subsequently, are recognised for their specialised knowledge and contribution to the wider health outcomes.

8. Workstations
Coding managers should consider as a priority the provision of a comfortable workstation and pleasant environment for their clinical coders; this is especially important considering the sedentary nature of coding work and the number of hours a coder is required to be at their desk. Ideally, clinical coders should be situated in a quiet environment where there are few interruptions. Regular review and assessment of the coding work area by the Occupational Health and Safety representative will ensure that the appropriate equipment is available and utilised correctly. This, in turn, will identify any work-related coding hazards.

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With my business case written and approval achieved, I was off to Geelong for the HIMAA Conference!

Driving down to Geelong for the Coding Seminar I was looking forward to a few days of catching up with old friends, staying in a funky hotel (hope it’s got Foxtel!), taking my new car for a spin, and going out on the town to some of the local haunts. Now I must admit those aims were pretty much achieved, but the best thing about this conference was that I came away on the Friday evening tired yet feeling invigorated about both my career and the profession in which I work.

The quality of the Health Information Management presentations at this conference was generally very good, and the trade exhibition was relevant and well presented. The theme of the conference was ‘change’, and this characteristic of the profession was certainly borne out by many of the speakers. Think about it for a minute. Every single day you go to work and every day you don’t there is change happening. During the time we were at Geelong, changes were occurring at our work places and we weren’t even there – amazing! We all need to actively participate in ensuring that the Health Information Management profession is at the forefront of changes that are continuing to occur in health.

What does that mean? It means that we do not accept the status quo. It means selling ourselves as intelligent individuals who aren’t just cellar dwellers. It means telling everyone proudly we are Health Information Managers. Wine isn’t the only good thing that comes out of the basement! Put your fingerprint on the institution in which you work and leave a legacy for those to come! ‘Invent’ change: be dynamic, lead it, implement it, and act on it.

This conference showed me that there are many HIMs throughout the land involved with many exciting and innovative developments. Often, these developments are taking place in environments outside the traditional sphere of innovation. These HIMs are changing the paradigm in such a way that others, like myself, are inspired to resist the temptation to sit back and rest on our perceived laurels.

Professional jealousy is a phrase that is a good one to remember. If you see others being involved in the many exciting projects occurring around Australia then it is up to you as an individual to catch up and better your ‘rivals’. And even more importantly, put a paper in at the next conference and tell us about it so the circle of knowledge continues.

It behoves all of us as a professional group to ensure the continuation of HIMAA conferences as stand-alone entities by making certain our particular institutions are represented adequately at future conferences. It is even more important that we reclaim our professional ground by maintaining a large and active membership, and this can only be achieved by rejoining the Association every year and encouraging others to do the same.

Although this conference and this article are probably examples of preaching to the converted when it comes to professional issues, the most inspiring aspect of the conference was the fact that there is still passion about our profession and where it is heading. Let’s hope this conference is the first step in a long journey.

The next HIMAA conference will be held in Wellington, New Zealand, probably in November 2006. Start writing your business cases now to attend next year, and better still, start thinking about what you are going to present as a conference paper!

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The National Centre for Classification in Health (NCCH) Conference was conducted in Perth, 16–18 March 2005. The two-day conference was preceded by an optional ICD-10-AM Fourth Edition post-implementation workshop. Both activities achieved capacity attendance, and feedback from participants through the evaluation forms was overwhelmingly positive. Evaluations were received from 97 (39.4%) participants.

Attendance

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<tr>
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<tr>
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Participants’ feedback

Program

Outstanding presentations from many participants included:

- Dr Fiona Wood and Anne Roberts’ clinical update *Burns – the Bali experience*. Dr Wood is Director of the Royal Perth Hospital’s Burns Unit and 2005 Australian of the Year. Anne Roberts is Clinical Coding Coordinator at Royal Perth Hospital.

- Dr Didier Palmer’s keynote address *Bali – the first 72 hours*. Dr Palmer is Director of Royal Darwin Hospital’s Emergency Department, which was a major treatment and receiving centre for people injured in the Bali bombing.

- Professor Aleksandar Janca’s opening keynote address *Classification is a way of seeing life*. Professor Janca is Head, Mental Health Epidemiology Unit and Professor, School of Psychiatry and Clinical Neurosciences, University of Western Australia; a consultant psychiatrist; and Director, WHO Collaborating Centre in Perth.

Feedback indicated a strong preference for clinical update presentations. A good indicator that participants met their attendance aims is that a ‘yes’ response was recorded from 74 (76.2%) respondents when asked if their expectations were met.

Workshop and breakfast discussion meeting

Strong registration demand meant that the number of workshop places was increased to 90. The workshop will be repeated in all Australian states and territories between August and November 2005.

The vigorous response to the call for papers meant that the proposed coding additional diagnosis plenary session was redeveloped as a breakfast meeting before the workshop. It was judged beneficial, although feedback indicated that some participants expected finite outcomes to be presented.

Location

Perth was deemed to be an appropriate and desirable location by participants, despite the cost, time and travel arrangements needed by many to attend.

Social program

NCCH conference registration includes attendance at social events for all full registrants which are highly valued for their networking opportunities. There was enthusiastic endorsement of both social events: a welcome reception at the Burswood Resort; and the conference dinner, at the King’s Park Function Centre. Judging from comments, the dinner bus journey provided a bonding experience, helped by the warm welcome from the Perth locals.

Next NCCH conference

A decision has yet to be made about the next conference’s location and timing. All Australian states and territories have now been locations for NCCH conferences.

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Day One sessions (from the Clinical Coder’s perspective)

The first speaker at the conference was Professor Aleksander Janca, who is a consultant psychiatrist and Head of the University of Western Australia’s Mental Health Epidemiology Unit. He spoke about the basic principles of ICD-10 from a World Health Organization point of view, as he is also a Director of the WHO Collaborating Centre in Perth. He talked about mental health issues in Australian Aboriginal people today and the application of ICD-10 in a culturally appropriate way.

This led on to a discussion titled ‘How coded data are used’, in which Dr Tim Threlfall, the Director and Registrar of the WA Cancer Registry, related how the Registry uses the data they receive to compile statistics, support research projects and answer the varied questions that are put to them.

The next speaker, Elizabeth Sullivan from the Australian Institute of Health and Welfare National Perinatal Statistics Unit, Randwick, NSW, spoke about all the data that is collected when a child is born, as well as maternal characteristics that are collected from coding and also from the midwives’ national perinatal data collection system. Comparisons are then made between the two systems. She also spoke about congenital anomalies and the lack of specificity in ICD-10 for some of these conditions, and the need to develop maps between these diagnosis codes and procedures.

The Director of the Research Centre for Injury Studies in South Australia, Professor James Harrison, discussed injuries surveillance and the use of external causes, the quality of data, various groups places and time trends. Improved data result in a better understanding of this area and facilitate the development of concepts and methods. He spoke about useful new categories such as sports activity, the pressure for hospital beds, improved diagnostic techniques and the transferring of patients from one hospital to another, and how this results in the creation of two medical records.

Session 2 started with a presentation by Dr Fiona Wood who recounted her ‘Bali Experience’, referring to her unique treatment methods used for burns victims of the Bali bombing. This was especially interesting for those involved in coding of the graft procedures she used, and provided a valuable opportunity for us to gain a clearer picture of her work. A number of graphic pictures of burns and various grafts were shown, and it was particularly interesting from a coding perspective to be able to see the differences in methods. Dr Wood is the founder of the ‘spray on skin’ method of cell culture, by means of which she has achieved improved outcomes and has managed to shorten the culture time from 21 days to 5 days. She has increased the survival rate of burns patients, speeded up recovery time and greatly improved skin repair, thus lessening the development of scar tissue.

Robyn Bicanin and Lesley Holmes

Anne Roberts, the Clinical Coding Coordinator of Royal Perth Hospital, built upon Dr Woods’ talk by showing us a coded record of one of the Bali victims. As well as burns, the other most common injuries sustained by the victims included perforated ear drums, shrapnel wounds, loss of limbs, injuries to bone, blood vessels and soft tissues. Also of importance were infection by ‘bugs’ that are unfamiliar to WA, organ failure, and dehydration. She also touched on the fact that the coders at RPH who handled these cases were offered counselling due to the horrific nature of the information they had to read through.

The after-lunch session focused on developments in electronic hospital records and data linkage, and was presented by Dr Frida Cheok, Manager of the Clinical Information Project in Adelaide. This provided an interesting insight into what the future will bring to health information. Dr Cheok explained the function of NEHTA (National e-Health Transition Authority) as ensuring the availability of the right information at the right time for the right patient. State governments and departments are working together to establish this organisation as a company for which funding will be available for 3 years. They aim to adopt specifications for a national shared electronic health record. Agreed standards are essential to improve the quality, usefulness and availability of health information.

Following this presentation, John Bass, who is a Senior Research Fellow from the Centre for Health Informatics, Curtin University, discussed the Western Australian Data Linkage Unit. The role of this Unit involves the extraction of data for approved projects from the Master Link File, which includes information from the Births and Deaths Registry, Hospital Separations, Mental Health Registry, Cancer Registry, Midwives Registry, Electoral Roll, Silverchain, St John’s, Aged Care, Medicare, Emergency Departments, the Alcohol and Drug Authority and Private Health Insurance.

Jenny Hargreaves, from Hospital and Mental Health Services in Canberra, explained Data Linkage and the National Hospital Morbidity Database. This includes data from all states and territories, all public and private hospitals, and all demographic data.

A Swedish infectious diseases physician, Dr Olaf Steinum, discussed the coding of complications and the easy identification of complication specificity by multiple coding such as using an ‘s’ code (trauma) with a ‘t’ code (complication code) for an easier way of identifying post-procedural complications.

Interesting presentations were given by Jill Burgoyne, who outlined a Coding Improvement Project and identified many coding issues, while Leanne Stokes discussed coding in private hospitals and associated grouping conflicts and data inconsistency.

Mary McKay, a clinical coder from the Northern Territory, provided an insight into the challenges faced by coding in rural Indigenous populations; for example, coding ‘Machado Joseph Disease’, a degenerative dis-
ease that is only found in Arnhem Land populations. Also mentioned was the use of certain ‘z’ codes to capture tribal ‘payback’ injuries, which of course would not be seen elsewhere in the country.

Day One of the conference closed with Jennie Shepheard outlining a career development in clinical coding auditing.

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Conference Reports

Ninth National Centre for Classification in Health Conference. 16–18 March 2005. Perth, Western Australia
Jennifer Vardy and Cerys Leach

Coding Workshop, 16 March 2005 (from the Clinical Coder’s perspective)

On Wednesday, 16 March 2005 we attended the Coding Workshop as part of the ‘Coding Rules’ Conference. The conference opened on an informal note with the breakfast session, making everyone feel at ease.

Breakfast session and discussion: how many diagnoses should you code?

At this session a case scenario was discussed, with comments from each of the 10 tables on how they would code the episode of care. The interpretation of what Additional Diagnoses to code was considerably varied (ranging from coding one diagnosis to six or seven), which was a reflection of the different backgrounds and knowledge of the coders present.

Points of discussion included:

• Should the coding of an episode reflect the whole picture of the admission; that is, to be able to translate the codes back into what actually happened in the episode, or are the users of this data only wanting specific information?
• The importance of reviewing the whole record.
• The definition of ‘treatment’, ‘management’ of a patient not only being treatment with medication or surgery, but including ‘decision making’ and ‘clinical evaluation’.
• The ‘Clinical Coders’ Creed’.
• Talks of overhauling the current ACS 0002 Additional Diagnoses, and devising and implementing a new ACS for Additional Diagnoses. Interpretation of the current standard is not consistent between states, hospitals and even coders, creating many discrepancies in coding.

Workshop

After breakfast we attended the workshop conducted by Megan Cumerlato and Julie Rust, during which several cases were reviewed and discussed. Many items were covered during this workshop, including: double coding, code also, post-procedural codes, blood salvage, epidurals, breastfeeding and attachment difficulties, ‘s’ and ‘t’ codes in pregnancy, coding of laterality, activity codes for traffic accidents, ulcers, STEMI/NSTEMI, and diabetes.

We found the workshop to be informative and well presented with many important points being raised by the participants. The use of ‘double coding’ was of particular interest. It was also interesting to hear the different opinions and coding practices of coders from other states and private hospitals. Attendance at the workshop gave coders the opportunity to see the issues and problems other coders may have. The workshop created discussion and brought to light areas that could be improved in the Coding Standards and Indexing for ease of use for clinical coders.

Discussion at these workshops clarifies issues, provides useful tips and encourages more uniformity in coding practice over a greater area, also creating an understanding that there will always be some variation in coder interpretation without detracting from the purpose of coding.

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