

# Morbidity data quality initiatives in Ireland

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## 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.<sup>1</sup> 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 re-coding 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

<sup>1</sup> With the introduction of ICD-10-AM, the number of validation checks has increased to 93.

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 time-frame. 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 to the 'real world'. From their comments, it seems that the rationale for introducing a particular guideline is seldom explained to HCCs and coders. The relevance of the guideline can also be missed if no medical science background is given. HCCs rarely measure compliance with the guidelines at a local level. Most coders are unaware as to whether any of the edit checks in the HIPE computer system measure compliance with a guideline.

##### *Local coding practices*

Some facilities initiate their own coding practices. Certain diseases and procedures are coded specifically for

research, and requests for such come from consultants. Local coding practices may conflict with the ESRI's 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-

dated. An audit of a Dublin hospital in 2004 was based on 2002 data. This was the year that the Windows-based HIPE computer system was introduced and there were significant problems with interfaces to local PAS, which resulted in problems with the data. There were also problems with the time frames in resetting the cases (correcting and resubmitting to the Unit) where errors in the data were found.

One suggestion from an HCC is that the Unit develop a template<sup>2</sup> for audits, outlining the reason for the audit and describing the process and methodology to be applied. The template should be sent to hospitals before the planned audit so that coders could prepare themselves to assist the Unit's staff. Such a template could also be used in staff training at the local level, allowing coders to build skills in auditing. Another suggestion from an HCC is that clinicians be involved in some of the national audits, in the belief that it would not only raise the profile of local HIPE units and the national Unit, but also the level of awareness of clinicians about classification issues.

Few facilities conduct their own audits, the reason being that an HCC's workload leaves little time for implementing local data quality initiatives. Those who do manage to conduct audits tend to focus on DRG analysis. One innovative HCC uses an external company to conduct data quality checks in which information is analysed and benchmarked against the customer pool. It seems that no ad hoc checks are conducted by HCCs to see if coders comply with the Unit's coding guidelines.

### Coding queries

The topic of coding queries raised some passionate debate. Many HCCs and coders consider that the process has improved in recent years, with a quicker response to questions. The Unit's staff are always available and unreservedly offer their help. However, there remains a perception that the Unit is too removed from local issues and needs to be more familiar with the problems with charts. One HCC described the relationship between the Unit and coders as 'teacher/pupil, rather than coding colleagues'. Most HCCs and coders believe that the Unit tends to stifle debate, rather than encourage open discussion. The perception is that the Unit's approach does not recognise the local skill base or the opinions of consultants. Some acknowledge that the Unit is more receptive now than previously to questioning of decisions, although decisions are rarely changed.

HCCs and coders would like to engage the Unit's staff in more open discussion. They, and consultants if needed, would like to be included 'in the loop' before decisions are made. They would also like to see greater accountability on the part of the Unit, namely, that the responses to every coding query should be published by the Unit in *Coding Notes* (currently only selected queries are published), or on their website. Another suggestion from coders is to expand the content of the feedback, which generally relates only to the codes. Some coders stated that no background information is given on the research undertaken or the reasons why particular codes are the recommended

ones. 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

Coding staff and the local HIPE units generally have a low profile within hospitals. The perception is that other staff within the hospital, particularly clinicians, do not understand or appreciate their work. One pertinent example came from two hospitals where coders did not have online access to the pathology results and X-ray reports necessary to allocate the correct code. The HCCs have access to such reports and will work with hospital administrators to change this policy.

#### Productivity

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.

#### 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

<sup>2</sup> 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 specialty 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' knowl-

edge 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.<sup>3</sup> 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,<sup>4</sup> 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-

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

<sup>4</sup> 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).

bidity database at national, state and territory levels. A different body again develops and maintains the classification system used to code the data. The involvement of so many different national and state organisations leads to fragmentation, and indeed, our national bodies have no mandate and are too far removed from the process at a local level to have a major influence on data quality. Ireland, therefore, has a significant advantage over Australia in the level of control it can exert to achieve consistent and comparable data.

It is largely as a legacy of Federation that Australia's national morbidity data collection is structured the way it is. Only through collaboration and cooperation can we achieve the same level of control that Ireland enjoys. When the teamwork breaks down the costs can be significant. Stokes (2005) highlighted the problems that the private sector faces, principally with funding, when state coding guidelines are introduced that conflict with national coding guidelines. Ireland, too, has had instances where local coding practices conflict with national coding guidelines. Sometimes, local initiatives can demonstrate the usefulness of changes that may later achieve wider adoption. Just how much control is needed is therefore unclear.

Another parallel upon which we can draw relates to the coder workforce issues. Australia's coder workforce issues are similar to Ireland's. It would be fair to say that the Clinical Coders' Society of Australia has struggled to meet their objectives, despite the enormous efforts undertaken by a small group of hard working, dedicated, volunteer board members. The truth is that they, and the general membership, all have busy jobs and lives. It will be interesting to observe how the CCI evolves over the next few years and what changes they can effect for the coder workforce in Ireland.

## Conclusion

The Unit is committed to achieving best practice in the coding of morbidity data. In this paper, and our previous paper on coder training initiatives in Ireland (Bramley & Reid 2005), we identified opportunities where the Unit may build on the solid frameworks that have been established for its coder education programs and data quality initiatives. We recognised that key stakeholders outside the ESRI, particularly the DoHC, clinicians and HCCs, have a significant influence on data quality and that each stakeholder needs to understand the important part they play in promoting data quality. Many of our recommendations will require collaboration between key stakeholders if they are to be implemented effectively. Their implementation will also require significant resources. It is rewarding to know that the DoHC has agreed to 'indenting appropriate resources for the ESRI in 2005 to commence implementing the recommendations of the Bramley and Reid report' (Department of Health and Children 2004b: 90).

Health information is the 'backbone' of any health-care system. It shapes the way healthcare is planned, promoted, delivered, researched and funded. Information is 'strengthened' only when there is a quality management strategy in place to facilitate improved accuracy of the underlying data.

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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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