

UPDATING CLINICAL
CODING IN IRELAND:

OPTIONS AND
OPPORTUNITIES

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1. INTRODUCTION

The Hospital Inpatient Enquiry (HIPE) Scheme is a computer-based health information system designed to collect clinical and administrative data on discharges and deaths from acute public hospitals. HIPE was established in 1971 and is the principal source of national data on discharges from acute general hospitals in Ireland. HIPE collects data on hospital discharges and maintains a national database of morbidity data from acute general hospitals in Ireland. The data collected by the HIPE system can logically be grouped into demographic, clinical and administrative data. A detailed specification of all data collected, together with analysis for the period 1990-1999 is presented in the report on *Activity in Acute Public Hospitals 1990-1999* published by the HIPE & NPRS Unit (National Perinatal Reporting System) at The Economic and Social Research Institute (ESRI) in March 2002. For the purpose of this report, the clinical data collected by the HIPE are the focus of interest, and specifically the coding of these data within the HIPE system.

Prior to 2002, clinical data collected by the HIPE system consisted of one principal diagnosis and up to five (optional) secondary diagnoses and one principal procedure and up to three (optional) additional procedures where appropriate. Since January 2002, up to nine secondary diagnoses and up to nine additional procedures may be reported for each discharge. The approach to coding these data has changed five times since the inception of the system and the coding schemes used may be summarised as follows:

| | |
|----------------|---|
| 1969 - 1980 | ICD-8 for Diagnoses and OPCS ¹ Procedures classification |
| 1981 - 1989 | ICD-9 for Diagnoses and OPCS Procedures classification |
| 1990 - 1994 | ICD-9-CM (Oct 88 version) for both Diagnoses and Procedures |
| 1995 - 1998 | ICD-9-CM (Oct 94 version) for both Diagnoses and Procedures |
| 1999 - present | ICD-9-CM (Oct 98 version) for both Diagnoses and Procedures |

By 1990, the OPCS Procedures Classification which had been in use for coding procedures in the HIPE system was completely outdated. While a revised version was becoming available, the fact that the system required upgrading provided an opportunity to assess the other options available. The decision to introduce a significant change to the coding schemes in 1990 was based on a number of factors, including the following:

- The availability of an integrated coding scheme for diagnoses and procedures;
- The availability of regular updates for the coding schemes to ensure they kept pace with advances in clinical practice;
- Cross-national use which facilitated the use of the data for international comparisons;

¹ Office of Population Censuses and Surveys (OPCS) 1975, *Classification of Surgical Operations*, Second Edition, London.

- Software support and training programmes for the education of coders and quality checks on the data.

When assessing these options, the ICD-9-CM coding scheme was found to be the best fit to the factors listed above as being essential in the choice of a new coding scheme. While developed and maintained with the support of the US government, at that time this was the most widely used coding scheme within Western health systems which provided an integrated approach to coding diagnoses and procedures, was updated annually and for which software and training support was readily available. Since the ICD-9-CM system was introduced as the national standard for coding diagnoses and procedures in 1990, there have been two upgrades introduced nationally in 1995 and in 1999.

1.0 Updating Morbidity Coding within the HIPE

Ensuring that the coding schemes in use for morbidity data collected by discharge abstract systems are current, accurate and relevant is a challenge faced by all such systems internationally. This challenge is even more acute in a small country like Ireland, which has to depend on the availability of current coding schemes in the international context rather than address the task of developing such schemes locally. Apart from the scarcity of the required expertise to undertake the development of a national coding scheme, with close to a million discharges a year it is questionable if adequate data would be available to successfully develop an appropriately comprehensive coding scheme for diagnoses and/or procedures. In addition to the substantial resource costs of such an undertaking, the facility to compare data internationally would be lost and the capacity to update as often as required could not be guaranteed.

The importance of regular updating for coding schemes was highlighted at the meeting of Heads of WHO Collaborating Centres for the Classification of Diseases in Tokyo in October 1996 where The Nordic Centre emphasised the importance of this issue arising from “the perceived need to show the world medical community that a functional maintenance and updating system for the classification exists”.² Additional reasons for regular updates of morbidity coding schemes include the need to keep up with medical and surgical advances and ensure quality standards for the data are achieved. Improved specificity is also important as noted by a Canadian assessment of ICD-10 that “increased specificity in ICD-10 contributes to more relevant data for epidemiological research. Gains in the level of specificity also increase the sensitivity of the classification when making refinements in applications, such as grouping methods”.³ The improved specificity of ICD-10 is further supported by an Australian study which found that of a total of 13,600 codes reviewed in ICD-10, 50.8 per cent were more specific than the ICD-9-CM codes, 31.5 per cent were as specific, and only 11.5 per cent either were less specific or could not be compared.⁴

1.1 Clinical Coders

Clinical Coding is a specialised task performed in hospitals by trained personnel. Coders are generally drawn from administration and also to a lesser degree from the nursing staff of the hospital. In many hospitals their work is monitored by HIPE/Casemix Co-ordinators (HCCs) who are responsible for HIPE within the hospital. These workers need to develop and hone the special

² Source: Meeting Report - www.who.int/whois/icd10/report96.htm.

³ Source: “Medical Classification Systems in Canada: moving toward the year 2000.” André N Lalonde MHA and Elizabeth Taylor. Canadian Medical Association www.cma.ca/cmaj

⁴ Source: Options research paper on future long-term suitability of using ICD-9-CM in Australian hospitals. Canberra: National Coding Centre, 1994, p. 14.

skills involved in clinical coding. These skills develop over time and with experience.

All personnel responsible for coding HIPE data are trained by the HIPE & NPRS Unit at The Economic and Social Research Institute (ESRI) which also has responsibility for data collection, processing, quality and audit procedures. While not involved in clinical coding, hospital doctors have responsibility for ensuring that the required data are correctly, completely and clearly entered on the patient's chart. Ongoing training and support provided to clinical coders in Irish hospitals by the ESRI's HIPE & NPRS Unit is informed by guidelines circulated through the American Hospital Association (AHA) *Coding Clinic* journal, which is published every quarter. Basic, intermediate and advanced coding courses for ICD-9-CM are regularly organised. Specialised workshops on specific areas like obstetrics and neoplasm coding are also run on a regular basis. The HIPE & NPRS Unit issues national coding guidelines to be uniformly adhered to throughout the hospital system.

In order to maintain quality data and information, coding standards must be met and promoted for uniform application and use, and not violated to meet local or short-term requirements. In order for us to obtain, store, and utilise quality information, coding standards must be uniformly applied across hospitals and maintained to meet the national and international needs of healthcare delivery, research, policymaking, and the interpretation of healthcare data.

Monitoring and control of the quality of the data collection and coding procedures includes the incorporation of standardised edits within the software developed and supplied by the HIPE & NPRS Unit for data collection. Centralised review of data submitted by hospitals is also undertaken with the return of any queries to hospitals for correction and to prevent errors reoccurring. In addition, a quarterly bulletin *Coding Notes* is issued to all coders incorporating updates on coding guidelines, new developments in coding practice, addressing commonly raised queries and issuing new codes when appropriate. The HIPE & NPRS Unit in the ESRI supports the hospital coders and all those involved with HIPE. Within the hospital the HIPE/Casemix Co-ordinators have the role of supporting and monitoring the coder's work at the local level.

The coder represents part of a group, which Peter F. Drucker⁵ describes as knowledge workers who obtain information usually in a non-academic setting and become skilled in a particular field of expertise. Older knowledge workers tend to have less formal qualifications than younger knowledge workers. For the knowledge workers and the coder practical experience counts for a lot. But the key here is that knowledge workers each individually possess their own substantial personal reservoir of accumulated knowledge that they apply on a daily basis in their work. The knowledge worker must take responsibility for self-education and take responsibility for keeping up to date with changes and advancements in their area. In many countries, the practice of self-education and self-regulation is common among coders.

⁵ Drucker first used the term 'Knowledge Worker' *Landmarks of Tomorrow*, 1959, New Jersey: Transaction Publishers.

1.2 The Tenth Revision of the International Classification of Diseases, ICD-10

The history of statistical healthcare classification systems dates back to the eighteenth century. The *Bertillon Classification of Causes of Death* was developed in 1893. Subsequent revisions were titled the *International Classification of Causes of Death*. Until 1948, the classification was only used to classify causes of mortality. At that time, the sixth revision was published under the auspices of the WHO and the scope was extended to include morbidity data.⁶

The current purpose of the ICD is to promote international comparability in the collection, classification, processing, and presentation of health statistics, including both morbidity and mortality. In practice, the ICD has become the international standard diagnostic classification for all general epidemiological and many health management purposes. The purpose of ICD revisions is to stay abreast with medical advances in terms of disease nomenclature and aetiology. While the introduction of new classifications is costly and may cause some disruption in mortality and morbidity statistics, it is essential to stay abreast of advances in medical science and to ensure the international comparability of health statistics.

Work on the Tenth Revision of the ICD started in September 1983 with a meeting in Geneva. The programme of work was guided by regular meetings of Heads of WHO Collaborating Centres for Classification of Diseases. It represents the broadest scope of any ICD revision to date. It has over 2000 categories, which is almost 900 more than are in place in ICD-9. It was realised that the great expansion in the use of the ICD necessitated a thorough rethinking of its structure and an effort to devise a stable and flexible classification which should not require any fundamental revision for many years. Consequently, although the traditional ICD structure was retained, an alphanumeric coding scheme replaces the previous numeric one. This provides a larger coding frame and leaves room for future revision without disruption of the numbering system. The alphanumeric codes also distinguish ICD-10 from any previous ICD version.

ICD-10 was published by the World Health Organisation (WHO) in Geneva in 1992 and is a major update of the WHO's ICD 9 Classification of Diseases. Updating is now maintained by the WHO International Collaborating Centres through their Update and Maintenance Committee. The previous update from ICD-8 to ICD-9 retained most of the basic structure with the addition of some detail at the level of the four-digit subcategory and some optional five-digit subdivisions. The ninth revision introduced an optional alternative method of classifying diagnostic statement, including information about both an underlying general disease and a manifestation in a particular organ or site. This system became known as the dagger and asterisk system and is retained in the Tenth Revision.

The WHO promotes the development of adaptations that extend both the usefulness of the ICD and the comparability of health statistics and, therefore, has authorised the development of adaptations of ICD-10. The US has been developing its own adaptation of ICD since the seventh revision in the late 1950s. Before ICD-9 was introduced in the US, the National Centre for Health Statistics there developed an expanded version called ICD-9-CM (CM standing for 'Clinical Modification'). ICD-9-CM contained additional codes in the disease classification to provide more detail, and it included a procedure classification. Ireland adopted the US ICD-9-CM in 1990. Australia initially used ICD-9-CM but subsequently adapted it to an Australian version. The First Edition of the Australian Modification of ICD-10, called ICD-10-AM was published in 1998. All modifications to ICD-10 must conform to WHO conventions for the ICD.

⁶ Source: Sue Bowman, RHIA, CCS, Director, Coding Policy and Compliance, AHIMA "Testimony of the American Health Information Management Association" to the National Committee on Vital and Health Statistics on ICD-10-CM. May 29, 2002.

The tenth revision is copyrighted to WHO and no changes can be made to the classification without specific authorisation, and only then at fifth digit level. At the meeting of the WHO-FIC (World Health Organisations – Families of Classifications) meeting in Cologne in October 2003 there were presentations on the role of the Update Reference Committee and Development of ICD-11.⁷

1.2.1 ICD-10 CHANGES FROM ICD-9

ICD-10 is the first new diagnostic coding system since the widespread use of computers in healthcare. With the development of ICD-10, the title was amended to *International Statistical Classification of Diseases and Related Health Problems* in order to reflect the progressive extension and scope of the classification beyond diseases and injuries. ICD-10 differs from ICD-9 in several ways:

- The structure is alphanumeric,
- Some chapters have been restructured,
- Some diseases have been reclassified,
- New features have been added, and
- The classification's specificity and detail have been expanded.

ICD-10 is an expanded classification when compared with ICD-9 with almost twice the number of categories of ICD-9 as shown below in Table 1. ICD-10 changed chapters, categories, titles and regrouped conditions. The traditional ICD structure has been retained, but the alphanumeric coding scheme provides a larger coding frame and leaves room for future revision. New chapters were created for *Diseases of the eye and adnexa* (ICD-10 Chapter VII) and *Diseases of the ear and mastoid process* (ICD-10 Chapter VIII). Existing chapters have been expanded, for example *Certain conditions originating in the perinatal period* (ICD-10 Chapter XVI) has been expanded and increased from twenty 3-digit subcategories to 59 subcategories. *Congenital malformations, deformations and chromosomal abnormalities* (ICD-10 Chapter XVII) and *Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified* (ICD-10 Chapter XVIII) have been expanded by over 300 per cent at the 3-digit subcategory level.

The former supplementary classifications of *External causes of morbidity and mortality* and of *Factors influencing health status and contact with health services* now form part of the main classification (ICD-10 Chapters XX and XXI).

While recognising the importance of the production of ICD-10 by the WHO, the fact that an equivalent coding scheme of international standing has not been produced by the WHO for coding of procedures is problematic.

In the next section, the options available internationally for updating the coding schemes in use for diagnoses and procedures within the HIPE in Ireland are reviewed.

⁷ See <http://www.rivm.nl/who-fic> for all proceedings from this meeting.

Table 1: Comparison of ICD-10 and ICD-9 at the Level of 3-digit Category

| ICD-10 Chapter (and code ranges) | No. 3-digit Categories | No. 3-digit Categories | ICD-9 Chapter (and code ranges) |
|---|------------------------|------------------------|--|
| I Certain infectious and parasitic diseases ⁸ (A00-B99) | 171 | 120 | Infectious and parasitic diseases (001- 139) |
| II Neoplasms (C00-D48) | 136 | 92 | Neoplasms (140 – 239) |
| III Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50 –D89) | 34 | 10 | Diseases of the blood and blood-forming organs (280- 289) |
| IV Endocrine, nutritional and metabolic diseases (E00 – E90) | 73 | 37 | Endocrine, nutritional, and metabolic diseases and immunity disorders (240 – 279) |
| V Mental and behavioural disorders (F00 – F99) | 78 | 30 | Mental disorders (290- 319) |
| VI Diseases of the nervous system (G00 –G99) | 67 | 65 | Diseases of the nervous system and sense organs (320 – 389) |
| VII Diseases of the eye and adnexa (H00 – H59) | 47 | | |
| VIII Diseases of the ear and mastoid process (H60 – H95) | 24 | | |
| IX Diseases of the circulatory system (I00 – I99) | 77 | 58 | Diseases of the circulatory system (390 –459) |
| X Diseases of the respiratory system (J00 – J99) | 63 | 50 | Diseases of the respiratory system (460- 519) |
| XI Diseases of the digestive system (K00 – K93) | 71 | 48 | Diseases of the digestive system (520 – 579) |
| XII Diseases of the skin and subcutaneous tissue (L00 – L99) | 72 | 26 | Diseases of the skin and subcutaneous tissue (680 –709) |
| XIII Diseases of the musculoskeletal system and connective tissue (M00 – M99) | 79 | 30 | Diseases of the musculoskeletal system and connective tissue (710 – 739) |
| XIV Diseases of the genitourinary system (N00 – N99) | 82 | 47 | Diseases of the genitourinary system (580 – 629) |
| XV Pregnancy, childbirth and the puerperium (O00 – O99) | 75 | 46 | Complications of Pregnancy, childbirth and the puerperium (630 – 677) |
| XVI Certain conditions originating in the perinatal period (P00 –P96) | 59 | 20 | Certain conditions originating in the perinatal period (760 – 779) |
| XVII Congenital malformations, deformations and chromosomal abnormalities (Q00 – Q99) | 87 | 20 | Congenital Anomalies (740 – 759) |
| XVIII Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00 – R99) | 90 | 20 | Symptoms, signs and ill-defined conditions (780 – 799) |
| XIX Injury, poisoning and certain other consequences of external causes (S00 – T98) | 195 | 190 | Injuries and Poisoning (800 –999) |
| XX External causes of morbidity and mortality (V00 – Y98) | 372 | 192 | Supplementary Classification: External Causes of Injury and Poisoning (E800 – E999) |
| XXI Factors influencing health status and contact with health services (Z00 – Z99) | 84 | 77 | Supplementary Classification: Factors influencing health status and contact with health services (V01 – V82) |
| Total 3-digit categories | 2,036 | 1,178 | |

⁸ When a Chapter Title is different from ICD-9 it is presented in bold.

1.3 Review of Diagnostic and Procedure Coding Schemes in Use in Selected Countries Internationally

In reviewing the coding schemes in use internationally, a small number of key options are apparent. The current situation with regard to morbidity coding in the United States is reviewed here. While ICD-10 is becoming the standard for diagnostic coding outside of the US, many countries like France and the UK have been developing national coding schemes for procedures. A coding scheme which is only in use within one health system has the disadvantage of not facilitating international comparisons. This was considered an important factor in the choice of a coding scheme within the Irish system. A review of procedure coding schemes indicates that the main options for consideration are those developed by Australia, Canada and the Nordic countries. The coding schemes available from these systems will therefore also be considered here.

1.3.1 UNITED STATES

In the United States, coding is carried out by coders who can attain accreditation and who may belong to the Society for Clinical Coders (SCC) that is affiliated with the American Hospital Information Management Association (AHIMA). The American Hospital Association (AHA) issues official Coding Guidelines on a quarterly basis in their *Coding Clinic* journal. Clinical information is coded using the ICD-9-CM classification.⁹ ICD-9-CM was the first adapted and fully integrated coding scheme developed from the WHO ICD-9 disease classification over 20 years ago which incorporated a procedure classification since inception, it has been updated annually (with the exception of October 1999¹⁰).

With the publication of ICD-10 for diagnostic coding in the early 1990s, an assessment was undertaken to determine what would be required if a Clinical Modification (i.e. ICD-10-CM) was to be developed. In 1994 the National Centre for Health Statistics (NCHS) awarded a contract to the Centre for Health Policy Studies to evaluate whether ICD-10 was an improvement for morbidity coding over ICD-9-CM. They reported that a clinical modification of ICD-10 would be a significant improvement and would be worth implementing. Particular issues highlighted for consideration if such a modification was to be undertaken included:

- Removal of codes unique to mortality coding (e.g. decapitation).
- Removal of multiple codes (e.g. multiple injuries).
- Combination of the dagger and asterisk coding as implemented with ICD-9-CM.

After a subsequent review by the NCHS, the following changes were recommended if any development of ICD-10-CM was to proceed:

- The addition of sixth digits where appropriate.
- Laterality (left and right identified).
- Trimester information added into the Obstetrics chapter.
- Some combination codes added to the Injury chapter.
- Common fifth digits incorporated into the tabular with full code titles.
- Modification of the Diabetes Mellitus codes in conjunction with recommendations from the American Diabetes Association.
- Expansion of the superficial injury codes (e.g. Burns, abrasions etc.) up to 6 digits as appropriate.
- Expansion of open wound codes up to 6 digits as appropriate.
- Combination of codes with common symptoms (e.g. Atherosclerosis and Angina).

⁹ Current Version in use in the US is ICD-9-CM, October 2003.

¹⁰ A decision was taken not to update ICD-9-CM in 1999 due to possible Y2K problems in 2000.

- Movement of maxillary-facial anomalies from the Gastro-Intestinal chapter into the Musculoskeletal chapter.
- Deactivation of codes (e.g. procedure related diagnoses).
- Some complications codes moved back into the body system chapters.

Between December 1997 and February 1998 NCHS placed a draft version of an ICD-10-CM system on their web site and had an open comment period of 60 days. They received over 1,200 comments from about 20 organisations. The most common comment was that ICD-10-CM was an improvement over ICD-9-CM. It was removed off the web site to prevent vendors or others producing training materials on a classification which could subsequently change. In 1998 the implementation date of ICD-10-CM was hoped to be synchronous with the launch of an ICD-10 Procedure Classification System and NCHS were working towards a date of October 2001. While the development of a procedure classification scheme was commissioned by the Health Care Financing Administration (HCFA) in the mid-1990s, no decisions have been made to date on the adoption of the version developed as ICD-10-PCS.¹¹

While the momentum for the development of an ICD-10-CM system, including a procedure coding scheme, was considerable in the US through the mid to late 1990s, these developments now seem to have hit something of a hiatus. The current situation may be best summarised in a quote from the website of Channel Publishing (one of the main publishers of ICD-9-CM):

*Given all the relevant information and issues regarding ICD-10-CM and a possible implementation date, Channel Publishing believes that it can be no earlier than October 1, 2005, and quite probably 2006 or even beyond. First, CMS and NCHS must finalize and present ICD-10-CM to the NCHVS (HIPPA) committee. Then the NCHVS committee must discuss and evaluate all the relevant issues and, when ready, submit ICD-10-CM for adoption and implementation as a new coding standard through the Proposed, and Final, Rule process. In addition, the HIPPA process provides for a two-year implementation window after a Final Rule has been published in the Federal Register.*¹²

Channel have now withdrawn all their products related to ICD-10-CM and ICD-10-PCS until such time as there is “significant ICD-10-CM progress with an imminent (proposed rule) implementation discussion.”¹³

The only option, therefore, which the US has to offer currently regarding an update of morbidity coding is an upgrading of the ICD-9-CM scheme which continues to be undertaken annually. Any consideration of this option, however, would need to have regard to the cautionary comments regarding the current status of ICD-9-CM noted by Linda Kloss, Executive Vice President and CEO of the American Hospital Information Management Association (AHIMA) in a statement to the ICD-9-CM Co-ordination and Maintenance Committee in May 2001 on the subject of replacing the ICD-9-CM procedural coding scheme with the ICD-10-PCS. At that time, Kloss noted: ¹⁴

- The ICD-9-CM procedure coding system is obsolete and must be replaced.
- ICD-10-PCS represents a significant improvement over ICD-9-CM.
- As ICD-10-PCS requires a more extensive knowledge of anatomy and physiology than ICD-9-CM additional training in this area may be needed by some coders.

¹¹ Procedure Classification System (PCS).

¹² Source: <http://www.channelpublishing.com/> April 2004.

¹³ Source: <http://www.channelpublishing.com/> April 2004.

¹⁴ The full text is available at www.ahima.org.

- Because of its precision, ICD-10-PCS requires more complete and accurate medical record documentation.
- Responsibility for maintenance of coding systems and development of the associated rules and guidelines should be the domain of a single agency.
- Other countries, such as Australia, can be a model for the US in redesigning maintenance.
- The US is already at least a decade behind in implementing new ICD modifications and, like any system maintenance experience, catching up is more costly than staying current.

Sue Bowman presented a similar perspective a year later in testimony on ICD-10-CM by AHIMA to the National Committee on Vital Statistics on 29th May 2002:

*ICD-10-CM represents a significant improvement over both ICD-9-CM and ICD-10. It incorporates much greater specificity and clinical detail, which will result in major improvements in the quality and usefulness of the data.*¹⁵

These statements from the US suggest that agreement on a new companion procedure coding scheme for ICD-10 is not imminent and any finalisation or implementation of an ICD-10-CM classification is some time away. There is also agreement that the US Clinical Modification of ICD-10 will be an improvement on ICD-9-CM.

While updating to the current version of ICD-9-CM continues to be an option for Ireland, a number of deficiencies would have to be recognised in pursuing this choice. In particular, Ireland would be out of step with the many countries now using ICD-10 for coding diagnoses so the potential for continuing international collaboration may be threatened. Because the development of a replacement for ICD-9-CM was anticipated with the piloting of ICD-10-CM, it is widely perceived that the updates to the procedure coding within ICD-9-CM, in particular, (as noted by Kloss above) have not kept pace with developments internationally. On the plus side, if a decision was made to choose an upgrade of the ICD-9-CM coding scheme for use over the next 2-4 years, only minimal training would be required for coders, the books would be readily available, and DRG-type case-mix systems developed for use in the US could continue to be used without difficulty in Ireland.

1.3.2 THE NORDIC BLOCK: NORWAY, SWEDEN, DENMARK, FINLAND, ICELAND

The Nordic region consists of five states with an aggregate population of about 24 million. The objective of formal Nordic co-operation is the principle of a common good, based on a common Nordic identity with regard to some basic conditions and values, geography, climate language, welfare etc. While each country is distinctive, generally decentralisation prevails with local authorities able to raise funding through local taxation. Governments are close to the people with much local input. The county councils usually own the hospitals.

In the area of health statistics, there has been active co-operation between countries since the 1960s, mainly in the framework of the Nordic Medico-Statistical Committee (NOMESCO). The WHO Collaborating Centre for the Classification of Disease in the Nordic Centre was established in 1987 and is responsible for updating and maintenance of the classifications used. It is based in Uppsala, north of Stockholm. The existence of the Collaborating Centre gives the Nordic block a strong influence on the International scene.

¹⁵ Testimony of the American Health Information Management Association to the National Committee on Vital and Health Statistics on ICD-10-CM May 2002. See www.ncvhs.hhs.gov.

Since the fall of the Soviet Union, and due to the long tradition of links between the Nordic and Baltic countries, NOMESCO quickly established links with this group of countries. NOMESCO has put both Nordic and EU funding into the establishment of systems in the region. WHO and NOMESCO support this collaboration but resourcing is becoming a problem, as there is little or no financial input from the Baltic States which are increasingly availing of the coding expertise available in the Nordic area.

Historically, coding has been done by clinicians in the Nordic countries. Courses are increasingly being offered to medical secretaries both in Universities (as part of a degree course) and by private agencies although all codes must still be approved and signed off by the clinician for each case coded. As a result, the classifications, both diagnostic and procedural, are developed for use by clinicians with little annotation or guidelines.

ICD-10 Disease Coding in the Nordic Block

By 1999 all Nordic countries were using ICD-10 for morbidity statistics. The Nordic Centre for Classification of Diseases modifies ICD-10 annually at 5th digit level both at national levels and at the level of the Nordic Block for Collaboration. While there is a mapping available between the national coding schemes, it is important to note that each Nordic country may use a locally modified coding scheme based on ICD-10 for diagnostic coding. A separate coding scheme outside of ICD-10 is used for coding of drugs and adverse affects of drugs. Annual updates are posted on the web for clinicians to integrate into their coding. In addition to national versions, all Nordic countries also have national language versions of ICD-10 (though Iceland uses the English version).

The NOMESCO Classification of Surgical Procedures – NCSP

The WHO Collaborating Centre for the Classification of Disease in the Nordic Centre is responsible for updating and maintenance of the Nordic Medico-Statistical Committee (NOMESCO) Classification of Surgical Procedures (NCSP). The NCSP was developed from an initiative by surgeons from the five Nordic countries. There is no alphabetical section to the classification. This was deemed unnecessary as surgeons do the coding. For this reason also there are very few coding guidelines. X-rays are not coded using the NCSP. These are coded using a different Nordic classification. There is no coding of chemotherapy or blood tests.

NOMESCO published the first printed edition of the NOMESCO NCSP in 1996. Nationally modified versions of the procedure coding scheme have subsequently been developed. Denmark introduced a Danish version of NCSP (NCSP-D) in 1996, Finland and Sweden introduced national versions in 1997 (NCSP-F and NCSP-S respectively), whereas Iceland implemented the Nordic (English-language) version of NCSP (NCSP-E). Norway implemented a Norwegian version of NCSP (NCSP-N) in 1999, which means that all five Nordic countries are currently using nationally modified versions of NCSP.

A procedure for annual updating of NCSP has been established. The responsibility for updating the classification lies with the Nordic Centre for Classification of Diseases. The Centre maintains an electronic discussion group for the exchange of suggested changes (NCSP Forum). The reference group for Nordic classification makes recommendations of changes to the classification to the Board of the Centre, which takes the formal decisions regarding changes.

To date, the Nordic version of NCSP has been updated eight times. NCSP Version 1.8 is effective from January 1, 2004. The Nordic Collaborating Centre is currently developing the NCSP + which, with the addition of an extra digit in the centre of the code, addresses some limitations in the original NCSP. The

annual updates are posted on the web for surgeons to integrate into their coding.

NordDRG – The Nordic Grouper

HCFA version 12.0 was used as the model for the NordDRG system though it is maintained and produced independently by NOMESCO. The NordDRG was developed as the DRG tool related to ICD and NCSP codes. The Nordic Collaborating Centre for the Classification of Diseases also performs updates and maintenance of NordDRG. The annual updating of NordDRG which takes place in the Spring is closely linked to the updating of the primary classifications (ICD-10 and NCPS). Because of the national modifications to the diagnostic and procedure coding schemes, a mapping system must be integrated with NordDRG to ensure that the system works in all countries within the Nordic block. The Nordic classifications for diagnosis and procedure coding together with the Nordic Grouper are currently being adopted for use by the Baltic States.

To summarise the status of morbidity coding in the Nordic block, each country uses a nationally modified version of the WHO ICD-10 system for coding diagnoses and nationally modified versions of the NOMESCO developed NCSP for coding procedures. The NordDRG is used in all Nordic countries and integrates a mapping system to accommodate national versions of the diagnostic and procedure coding schemes. While the Nordic coding and classification systems have the advantages of being used in a number of countries, being available in English and regularly updated, any consideration of adopting these systems for use in Ireland would have to take account of a number of important factors. In particular, coding is done by clinicians and, as a result, there are few coding guidelines and there is no formal training or support. In addition, an alphabetical listing is not currently available for the NCSP. The fact that the diagnostic and procedure coding schemes are modified at national level, albeit within a common framework, means that there are actually five versions of each system and, while similar, they also differ according to the country in which they are used. This would mean that, while Ireland could choose to adopt the core ‘Nordic version’ of each coding scheme, it is more likely that it would be necessary to undertake an ‘Irish’ modification not unlike those undertaken within each of the Nordic countries. This would also necessitate local production of coding books and training materials. While the national modifications of these systems have the appeal of flexibility and localisation, the disadvantages include the difficulty in developing and supporting an ‘Irish’ modification of the coding systems where the availability of expertise in this area is very limited. In addition, the proliferation of national versions of these systems results in a loss of comparability and standardisation which is considered important within a small, national system like that prevailing in Ireland.

1.3.3 CANADA

Canada

Canada has a population of over 32 million and is divided into 10 provinces and 3 territories. The Canadian health care system is an interlocking set of provincial and territorial health insurance schemes. Each is universal and publicly funded. All the provincial schemes are linked through adherence to national standards set at the federal level. This structure results from the

constitutional assignment of jurisdiction over health care to the provincial level of government.¹⁶

The Discharge Abstract Database (DAD) is the national database for information related to hospital inpatient and day surgery events. About four million records are submitted to the DAD annually. Inpatient records submitted to the DAD represent 75 per cent of all inpatient discharges in Canada. Each record in the DAD captures a standard clinical, demographic and administrative data set on a patient-specific basis. It provides almost national coverage, excluding Quebec and part of Manitoba.

The National Hospital Morbidity Database (HMDB), like the DAD, provides a count of inpatient discharges from hospitals. The Canadian Institute for Health Information (CIHI) is responsible for the management of the National HMDB. Data are downloaded from the DAD for participating provinces. Data files for hospitals not submitted to the DAD are submitted annually to CIHI by the responsible government.

CIHI is an independent, pan-Canadian, not-for-profit organisation working to improve the health of Canadians and the health care system by providing quality, reliable and timely health information. CIHI was established jointly by federal and provincial/territorial Ministers of Health to co-ordinate the development and maintenance of a comprehensive and integrated approach to health information for Canada and to provide and co-ordinate the provision of accurate and timely data and information required for:

- establishing sound health policy;
- effectively managing the Canadian health system; and
- generating public awareness about factors affecting good health.¹⁷

The Canadian Institute for Health Information (CIHI) supports clinical coding and the Classifications in Canada. These Classifications are:

- **ICD-10-CA** – Enhanced Canadian version of the 10th revision of the International Statistical Classification of Diseases and Related Health Problems. ICD-10-CA replaces the ICD-9 and ICD-9-CM in Canada.
- **CCI** – Canadian Classification of Health Interventions, developed to accompany ICD-10-CA. CCI replaces the earlier Canadian Classification of Diagnostic, Therapeutic, and Surgical Procedures (CCP).¹⁸
- **ICF** – International Classification of Functioning, Disability and Health (formerly known as ICIDH).

CIHI prepares all training materials for training health records coders in acute care facilities across Canada in the application of ICD-10-CA and CCI and uses electronic infobases instead of books to search for codes. These materials are not available commercially.

Coding in Canada

Coding in Canada is carried out by over 1,200 health records personnel consisting of health records technicians, administrators and practitioners. There is no credential scheme for morbidity coders in Canada and training is provided by CIHI.

¹⁶ Source: “The Reform of Health Care Systems, A Review of Seventeen OECD Countries,” *Health Policy Studies* No. 5, Paris: OECD 1994.

¹⁷ Source: CIHI Website - www.cihi.ca

¹⁸ The Canadian Classification of Diagnostic, Therapeutic, and Surgical Procedures (CCP) was originally developed by *Statistics Canada* in 1978 to meet Canadian needs for a procedural classification to be used in conjunction with ICD-9.

The Canadian Enhancement of ICD-10¹⁹

Canada began a staggered implementation of ICD-10-CA/CCI in 2001. It is anticipated that all contributors to the national database will have adopted ICD-10-CA/CCI by April 2005²⁰ The purpose of this modification was to ensure the continued relevancy and usefulness of the WHO's ICD-10 classification in Canada. ICD-10-CA is described by CIHI as 'a truly Canadian version of the International Statistical Classification of Disease and Health Related problems 10th Revision.'²¹ The final Canadian modification of ICD-10 includes approximately 4,000 new codes. These codes are identified on the Classification's CD with a red maple leaf.

The Canadian Classification of Health Intervention (CCI)

The development of a new classification of health interventions to accompany ICD-10 began in Canada in 1996. It contains a comprehensive list of diagnostic and therapeutic interventions (approximately 17,060 codes) and includes a tabular listing, an alphabetical index, anatomical diagrams and appendices to provide further information about the code structure. CCI is the companion classification to the International Statistical Classification of Diseases and Health Related Problems, Tenth Revision, Canada (ICD-10-CA). The term 'intervention' is used instead of 'procedure' to reflect its expanded scope which addresses applications beyond traditional medical and surgical services. CCI has a totally alphanumeric structure with a code length of up to 10 characters.

Canadian Coding Standards

CIHI is committed to data quality and the consistent use of ICD-10-CA and CCI in the Discharge Abstract Database (DAD) and the National Ambulatory Care Reporting System (NACRS). One of the main goals of implementing ICD-10-CA and CCI (Canadian Classification of Interventions) in Canada was the introduction of a single set of national standards. The coding guidelines were updated for 2003 and renamed to become the Canadian Coding Standards for ICD-10-CA and CCI.

The ICD-10-CA/CCI National Coding Advisory Committee provides CIHI with advice on the development and ongoing enhancement of ICD-10-CA and CCI coding rules and guidelines. All provinces and territories (100 per cent agreement) must approve each individual standard before it is incorporated into the Canadian Coding Standards for ICD-10-CA and CCI. Membership includes one representative from each province and territory, (with the exception of Quebec) which is determined by the respective Provincial/Territorial Coding Quality Committee, where one exists, or by the Ministry of Health.

Classification Advisory Committee

The ICD-10-CA/CCI Classification Advisory Committee provides CIHI with advice on the maintenance and enhancement of ICD-10-CA and CCI. In doing so, the Classification Advisory Committee will ensure the continued relevance of the classifications to meet the needs of all health care providers. The Classification Advisory Committee, supported by CIHI staff, is currently

¹⁹ *Source:* The Canadian Enhancement of ICD-10, Final Report, June 2001, Canadian Institute for Health Information, Ottawa.

²⁰ *Source:* Impact of ICD-10-CA and CCI on Interim Grouping Methodologies in Canada, Caroline Heick CIHI *et al.*, Meeting of WHO Collaborating Centres for the Family of International Classifications, Cologne, Germany. October 2003.

²¹ *Source:* www.cihi.ca

composed of 12 members made up of respected health care professionals, including, but not restricted to, physicians with research, teaching and/or clinical responsibilities. The membership reflects a broad spectrum of specialties to encompass the continuum of the health care field. Membership also includes representation from Health Canada and Statistics Canada.

The National ICD-10-CA/CCI Electronic Products Users Group meets to share experiences and concerns relating to the use of ICD-10-CA and CCI electronic products; and to provide recommendations to CIHI for improved functionality of the ICD-10-CA and CCI electronic code books.

Relevance for HIPE

ICD-10-CA/CCI is a national classification system developed to identify Canadian health care practices. Currently CIHI is only allowed to use, reproduce and distribute ICD-10 in English and French within Canada.²² CIHI also has permission to amend the classification to meet Canadian needs within the guidelines established by WHO.

CIHI have not as yet set up a licensing agreement for ICD-10-CA to be used outside of Canada. To do this the requesting country would first have to have a license with the WHO for ICD-10. Once the license with WHO was established, then Canada could distribute their ICD-10-CA to an interested party. To date CIHI have not set up any licensing agreements for CCI outside of Canada.²³ Although the ICD-10-CA/CCI national classification system has the advantages of being available in English and regularly updated, the fact that it is currently not in use outside of Canada has implications for HIPE in terms of the requirement to ensure international comparability of coded morbidity data.

With the development of the single set of national standards, CIHI anticipates improved national and international comparability. CIHI has developed Quality Assurance Processes through the development of a Data Quality Framework.²⁴ While the ICD-10-CA/CCI is not available as an option for the updating of morbidity coding in Ireland, Canadian experience with developing National Coding Standards and Quality Assurance processes could be of use to HIPE in the drive to improve standards of data quality and quality assurance procedures.

1.3.4 AUSTRALIA

An Australian version of ICD-9-CM was produced in July 1995. This was superseded in July 1998 by the development of ICD-10-AM, the Australian Modification of ICD-10 incorporating a procedure classification developed by the Australians. The third edition of ICD-10-AM was introduced in July 2002. ICD-10-AM was developed by the National Centre for Classification in Health (NCCH) which is the centre of expertise for classification in all areas of health in Australia. The NCCH has offices in Brisbane and Sydney and is funded under The Australian Casemix Programme. During the development of ICD-10-AM, the NCCH was advised by members of the NCCH Coding Standards Advisory Committee and the Clinical Coding and Classification Groups (CCCGs), which consist of expert clinical coders and clinicians nominated by the Australian Casemix Clinical Committee (ACCC).

²² 'With the approval of Health Canada, CIHI applied for and received a license agreement for Canada. The license allows CIHI to use, reproduce and distribute ICD-10 in English and French within Canada. CIHI received permission to enhance the classification to meet Canadian needs within the requirements of the license.'

Source: The Canadian Enhancement of ICD-10, Final Report CIHI June 2001, Ottawa.

²³ Ref: Personal correspondence from CIHI.

²⁴ *Source:* Quality Assurance Processes, CIHI, August 2002 Ottawa, P1.

Morbidity Coding in Australia

Coding in Australia is carried out by coders who may attend courses organised by both the NCCH and the Health Information Management Association of Australia (HIMAA). There are about 1,000 clinical coders in the country. No formal accreditation currently exists though coding may be taken as part of a degree course in many Australian Universities. The NCCH co-ordinates the work of the Coding Educators Network (CEN) which is a pool of clinical coders and health information managers throughout Australia who assist with the development and presentation of coding education programmes. CEN members also become liaison points to coding education issues and ensure the continuing education of clinical coders and other health care professionals. The Clinical Coders' Society of Australia (CCSA) was formed in recent years to support coders in all aspects of their work.

The hospital activity data collected is from acute care facilities including Inpatient and Day Surgery Centres. About 5.5 million separations²⁵ are coded annually. Within the ICD-10-AM system there is a volume of coding guidelines for use with ICD-10-AM. Coding queries are dealt with by core expert groups in each territory and can be referred to NCCH. These questions and answers are widely circulated. With the introduction of ICD-10-AM, an implementation kit containing training materials was circulated. This included such facilities as *A Taste of Ten* booklets incorporating coding exercises for coders and a series of *Mastering Ten* booklets incorporating a more advanced introduction to coding with ICD-10-AM.

For updates to ICD-10-AM, a Coding Standards Advisory Committee represents all interested parties and meets and approves any recommendations coming through from the CCCGs. Updates are published in July every second year.

The NCCH has developed an auditing tool for hospitals. This is now produced as a propriety product called the PICQ® (Patient Indicators of Coding Quality). NCCH also produces ACBA® (Australian Coding Benchmark Audit). This is a coding audit method that involves re-coding a sample of hospital-admitted patient episodes and uniformly recording results. Hospital data are not returned to the NCCH so data quality checks must be carried out at hospital or state level.

The Australian Grouper²⁶

The Australian DRG grouper²⁷ was originally developed for use with ICD-9-CM (Australian version) and continues to be modified for use with ICD-10-AM.

The Australian DRG grouper was developed under the auspices of the [Clinical Casemix Committee of Australia \(CCCA\)](#). The CCCA was established in 1991 by the then Commonwealth Department of Health, Housing and Community Services to co-ordinate the clinical evaluation of inpatient classifications so that clinically relevant recommendations for the development of an Australian inpatient casemix classification could be identified.

The Australian DRG classification comprises:

- a description of body systems,
- a separation of medical and surgical procedures, and

²⁵ A separation is defined as a patient who is discharged, dies or is transferred within the hospital or to another hospital.

²⁶ <http://www.health.gov.au/casemix/andrg1.htm>

²⁷ A DRG Grouper is the term used to denote the software used to assign hospital discharges to a diagnosis related group.

- a description of a hierarchy of procedures, medical problems and other factors that differentiate processes of care.

ICD-10-AM and the Australian Grouper are currently in use in original or adapted form in many countries outside of Australia including New Zealand, Germany and a number of Asian countries. NCCH works closely with many countries both supporting those still using the Australian version of ICD-9-CM and those implementing ICD-10-AM. This centre also has an ongoing involvement with the WHO Update Reference Committee ensuring that any developments within the Australian system are consistent with international practice.

With regard to Ireland's current needs to update the coding systems in use, ICD-10-AM has a number of important advantages, including the fact that it is an integrated coding scheme for diagnoses and procedures; the coding scheme for diagnoses is compatible with WHO's ICD-10 and the systems are regularly evaluated and updated. The number of countries using ICD-10-AM continues to increase so international comparability with health systems similar to that prevailing in Ireland would be facilitated. Training in the use of the coding system is provided both by the NCCH and HIMAA. The code books are readily available in English and guidelines are published in Volume 5 of ICD-10-AM and also in *Coding Matters*, a journal published regularly by the NCCH. The coding systems are well maintained and continually reviewed and the support for coders is excellent both through the NCCH, the HIMMA and the CCSA. The Australian Grouper is available for case-mix classification of data coded in ICD-10-AM.

The potential drawbacks for Ireland in any consideration of the adoption of ICD-10-AM would seem to rest mainly with the procedure coding scheme. The fact that this was originally based on a benefits schedule has resulted in a framework which may be potentially challenging to understand and use when first introduced. While this coding scheme fulfils the requirements of a procedure coding system and is probably better supported than any equivalent available internationally, the demands on coders using this system would have to be carefully assessed before any final decision was reached on implementation.

1.4 Potential for Upgrading Morbidity Coding in Ireland

In reviewing the choices of coding schemes made by the country systems reviewed, it is apparent that in each case different challenges and goals have been addressed, including the development of local adaptations for ICD-10 and the creation of national coding schemes for procedures.

In the determination of the options for upgrading coding schemes for diagnoses and procedures in Ireland, the factors that have been considered important include the availability of an integrated coding scheme for diagnoses and procedures which is regularly updated, facilitates international comparability and provides for the availability of training and software support as required. While the systems used in all of the countries reviewed here go some way towards meeting these requirements, a number of key factors specific to each system needs to be taken into consideration before any final decision is reached.

In reviewing the system-specific factors, the Nordic block may first be considered. The fact that coding is done by clinicians in these countries means that the available guidelines are deficient which is a considerable drawback. The other critical factor mitigating against the adoption of these systems is the fact that for each country, a national adaptation is developed and in place. This would mean that if this approach was to be adopted in Ireland, an Irish adaptation would have to be developed, produced and supported on an ongoing basis and it is not evident that the resources are currently available within the HIPE system to support such an undertaking.

With regard to current US experience, it is regrettable that neither a procedure coding scheme or a version of ICD-10-CM has been finalised for national application within this system. The only option available to Ireland from the US currently, therefore, is to upgrade to the most recent version of ICD-9-CM. While this would have the advantage of being accessible to coders currently using this system, the disadvantages are that this is not compatible with ICD-10 and is not considered to have kept pace with current developments in coding internationally.

Canada has produced a national modification of ICD-10 along with the Canadian Classification of Health interventions. This system is not used outside of Canada.

The remaining option available for consideration therefore is the Australian developed ICD-10-AM system which constitutes an integrated coding scheme for diagnoses and procedures. Within the five volume set of manuals available, a comprehensive presentation of Australian coding guidelines is included in the fifth volume. There are regular updates and ongoing maintenance of this system with new publications produced with each update every two years. In addition to being used in Australia, New Zealand and a number of Asian countries, this system is also being adapted for use in Germany, the largest country within the EU. There is also an established train-the-trainer scheme in place and guidelines are discussed and reviewed regularly in *Coding Matters*, the newsletter of the NCCH. The availability of the Australian Grouper is an important factor in ensuring that a case-mix classification system compatible with the ICD-10-AM coding systems is available and supported on an ongoing basis.

Irrespective of the choice of coding scheme determined, there will be resource implications in terms both of the purchase of publications, software, training materials, and also in terms of the time required to undertake the required training courses. The good relations which have been developed between the ESRI's HIPE & NPRS Unit and organisations responsible for coding support in other countries including the International Federation of Health Records Organisations, The Nordic WHO Collaborating Centre in Sweden, AHIMA in the US and NCCH in Australia facilitates direct access to the most up-to-date information and training materials required for coding purposes. The contacts maintained with these and their associated groups such as the coders' societies through newsletters, journals, the Internet and e-mail discussion groups are also important in ensuring access to current developments in relevant areas. Ongoing support for these international collaborations is important to ensure the continued development of an excellent national data set of hospital activity within the HIPE system. The choice of a new coding scheme for diagnoses and procedures ultimately needs to be determined on the basis of which option best meets the needs of participating hospitals within the HIPE to ensure ongoing development of this system towards the objective of delivering the best available information on hospital activity.

Prior to finalising any decision on the coding scheme of choice for Ireland, further consideration of the approach to procedure coding, in particular, within the ICD-10-AM system was considered advisable. This classification is quite different to that prevailing within the ICD-9-CM system and would represent a very substantial change in practice for Irish coders. In assessing this scheme for implementation in Ireland, it was considered advisable to consult with coders and other relevant stakeholders and solicit their views on the ICD-10-AM system.

With agreement and support from the Department of Health and Children, it was therefore decided to proceed with a pilot study of ICD-10-AM to assess the issues which might arise with regard to implementation and training if this classification was to be recommended for use in Ireland. In proceeding with this study, it was considered particularly important to assess whether the ICD-

10-AM system would place additional demands on coders which might have implications for productivity and data quality. This Pilot Study therefore addressed a number of specific objectives, including the appropriateness of the ICD-10-AM classification to the Irish hospital setting and the acceptability of this classification for Clinical Coders in Irish hospitals. The specifics of the pilot study, together with the results, are presented in this report. A more indepth presentation on the ICD-10-AM classification will first be presented in the section that follows.

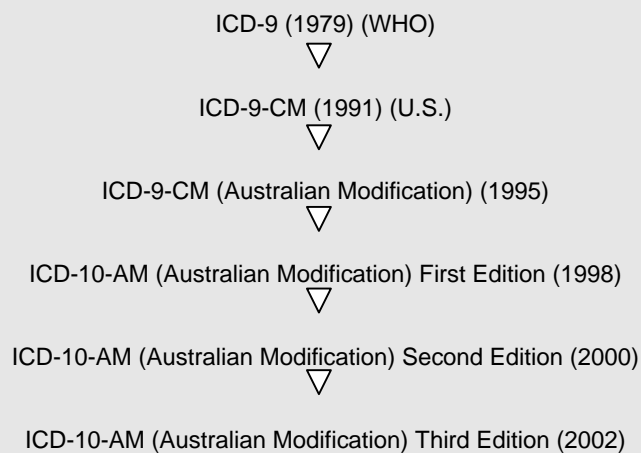
2. THE INTERNATIONAL STATISTICAL CLASSIFICATION OF DISEASES AND RELATED HEALTH PROBLEMS – TENTH REVISION – AUSTRALIAN THIRD EDITION

2.0 History and Development of ICD-10-AM

ICD-10-AM (THIRD EDITION)

Box 1

The Transition from ICD-9 to ICD-10-AM in Australia



Australian clinical coders began using ICD-9 when it was introduced in 1979. During the mid 1980s a number of State health authorities in Australia saw the advantages of converting to ICD-9-CM for coding hospital inpatient records. By 1991 all Australian States were using ICD-9-CM for coding hospital morbidity data.

On July 1 1995 the Australian version of ICD-9-CM, including the Australian Coding Standards for use with ICD-9-CM, was introduced across Australia. The second edition was introduced on 1 July 1996. These classifications were published by the National Coding Centre (NCC), the forerunner of the National Centre for Classification in Health (NCCCH).

The first edition of ICD-10-AM, the Australian Modification of the International Statistical Classification of Disease and Related Health Problems, 10th Revision was published by the NCCH in January 1998. The second edition was implemented from July 2000. The third edition was published in July 2002 and is the edition used in the HIPE & NPRS Unit's Pilot Study of ICD-10-AM. The fourth edition is available for implementation from July 2004.

2.1 ICD-10-AM – Description

ICD-10-AM is the Australian modification of the World Health Organisation (WHO) ICD-10 disease classification and is produced by the National Centre for Classification in Health (NCCH). WHO do not publish a procedure classification so the NCCH developed a procedures classification using the Australian Commonwealth Government's Medicare Benefits Schedule (MBS). The ICD-10-AM procedure classification was, therefore, previously referred to as MBS-Extended (MBS-E). On the publication of the third edition of ICD-10-AM in July 2002, the procedure classification became known as the Australian Classification of Health Interventions (ACHI). Volume 5 of ICD-10-AM contains the Australian Coding Standards (ACS). The NCCH is responsible for developing rules and guidelines on how to apply and interpret the ICD-10-AM disease and procedure classifications when coding. ICD-10-AM consists of 5 volumes:

Box 2

Volume 1 – Tabular List of Diseases
Volume 2 – Alphabetic Index of Diseases
Volume 3 – Tabular List of Procedures
Australian Classification of Health Interventions (ACHI)
Volume 4 – Alphabetic Index Procedure Index (ACHI)
Volume 5 – Australian Coding Standards (ACS)

2.2 Disease Classification of ICD-10-AM

The 'core' disease classification of ICD-10-AM is the three-character code which is the mandatory level of coding for international reporting to the World Health Organisation (WHO) for general international comparisons. This core set of codes has been expanded to four and five character codes so that important specific disease entities can be identified, while also maintaining the ability to present data in broad groups to enable useful and understandable information to be obtained. Table 2 presents the codes available in ICD-10-AM compared with the WHO – ICD-10 and the ICD-9-CM (October 1998) currently in use.

Table 2 illustrates the modifications of ICD-10 present in ICD-10-AM (3rd Edition) and also presents code totals by chapter for ICD-9-CM (October 1998). NCCH have added over 3,000 codes to the WHO ICD-10 classification to provide further specificity and additional information.

When modifying the existing ICD-10 disease classification to produce ICD-10-AM, the NCCH ensured:

- There was no change to the structure of ICD-10.
- The meanings of the three character and four character codes in ICD-10 were not changed.
- Any modifications were consistent with existing ICD-10 codes and conventions.
- The ability to compare ICD-10-AM data with ICD-10 data over time was not compromised.

Table 2: Number of Codes Available in ICD-10, ICD-10-AM (Third Edition) and ICD-9-CM to the Furthest Degree of Code Specificity Available

| ICD-10 Chapter | | ICD-10 Total Codes | ICD-10-AM ²⁸ Additional Codes | ICD-10-AM Total Codes | ICD-9-CM ²⁹ Total Codes | ICD-9CM Chapter | |
|----------------|---|-----------------------|---|--------------------------|---------------------------------------|-----------------|---|
| I | Certain infectious and parasitic diseases ³⁰ (A00 – B99) | 751 | +14 | 765 | 1,220 | I | Infectious and parasitic diseases (001 – 139) |
| II | Neoplasms (C00 – D48) | 692 | +98 | 790 | 806 | II | Neoplasms (140- 239) |
| III | Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50 – D89) | 164 | 0 | 164 | 73 | IV | Diseases of the blood and blood-forming organs (280 – 289) |
| IV | Endocrine, nutritional and metabolic diseases (E00 – E90) | 304 | +154 | 458 | 269 | III | Endocrine, nutritional, and metabolic diseases and Immunity disorders (240 – 279) |
| V | Mental and behavioural disorders (F00 – F99) | 396 | +41 | 437 | 469 | V | Mental Disorders (290 – 319) |
| VI | Diseases of the nervous system (G00 – G99) | 309 | +72 | 381 | 1,210 | VI | Diseases of the nervous system and sense organs (320 – 389) |
| VII | Diseases of the eye and adnexa (H00 – H59) | 260 | 0 | 260 | | | |
| VIII | Diseases of the ear and mastoid process (H60 – H95) | 112 | 0 | 112 | | | |
| IX | Diseases of the circulatory system (I00 – I99) | 381 | +15 | 396 | 392 | VII | Diseases of the circulatory system (390 - 459) |
| X | Diseases of the respiratory system (J00 – J99) | 229 | +4 | 233 | 204 | V111 | Diseases of the respiratory system (460 – 519) |
| XI | Diseases of the digestive system (K00 – K99) | 386 | +69 | 455 | 446 | IX | Diseases of the digestive system (520 – 579) |
| XII | Diseases of the skin and subcutaneous tissue (L00 – L99) | 336 | 4 | 340 | 160 | XII | Diseases of the skin and subcutaneous tissue (680 – 709) |
| XIII | Diseases of the musculoskeletal system and connective tissue (M00 – M99) | 3,363 | 0 | 3,363 | 868 | XIII | Diseases of the musculoskeletal system and connective tissue (710 – 739) |
| XIV | Diseases of the genitourinary system (N00 – N99) | 431 | +4 | 435 | 324 | X | Diseases of the genitourinary system (740 – 759) |
| XV | Pregnancy, childbirth and the puerperium (O00 – O99) | 381 | +47 | 428 | 1,018 ³¹ | XI | Complications of pregnancy, childbirth and the puerperium (630 – 677) |
| XVI | Certain conditions originating in the perinatal period (P00 – P 96) | 322 | +44 | 366 | 223 | XV | Certain conditions originating in the perinatal period (760 –779) |
| XVII | Congenital malformations, deformations and chromosomal abnormalities (Q00 – Q99) | 538 | +321 | 859 | 401 | XIV | Congenital Anomalies (740 –759) |
| XVIII | Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00 – R99) | 329 | +3 | 332 | 263 | XVI | Symptoms, signs and ill-defined conditions (780 – 799) |
| XIX | Injury, poisoning and certain other consequences of external causes (S00 – T98) | 1,105 | +679 | 1,784 | 2,498 | XVII | Injuries and Poisoning (800 – 999) |
| XX | External causes of morbidity and mortality (V00 – Y98) | 1,146 | +1,514 | 2,660 | 1,085 | Suppl | Classification of External Causes of Injury and Poisoning (E800- E999) |
| | Unused (WHO - ICD-10) U-codes issued for use by ICD-10-AM for Activity While Injured (U00 - U99) | | | 236 | | | |
| XXI | Factors influencing health status and contact with health services (Z00 – Z99) | 615 | +58 | 673 | 773 | Suppl | Classification of Factors influencing health status and contact with health services (V01- V82) |
| Total | | 12,550 | 3,141 | 15,927 | 12,702 | | |

²⁸ Third Edition.

²⁹ October 1998 Edition of ICD-9-CM with the addition of five codes for SIRS (995.9x) introduced pre update in January 2003.

³⁰ When a Chapter Title is different from ICD-9 it is presented in bold.

³¹ ICD-9-CM has a fifth digit to identify stage of obstetrical experience. ICD-10-AM uses a single additional code for this information as appropriate.

The major difference between ICD-10 and the disease classification in Volume 1 of ICD-10-AM is that in ICD-10-AM there are additional codes that are more specific than the original ICD-10 codes. Usually these have been created by adding fifth characters to some codes. There are also a small number of additional three and four character categories where the NCCH was not able to create a new code at the fifth character level. All Australian codes in Volume 1 (Disease tabular) of ICD-10-AM that do not exist in ICD-10 are annotated with the symbol ★.

Most of Volume 1 is taken up with the main disease classification composed of 21 chapters. The first character of the ICD-10-AM disease code is a letter, and each letter is associated with a particular chapter, except for the letter D, which spans both Chapter II, *Neoplasms*, and Chapter III, *Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism*, and the letter H, which is used in both Chapter VII, *Diseases of the eye and adnexa* and Chapter VIII, *Diseases of the ear and mastoid process*. Four chapters (Chapter I, II, XIX and XX) use more than one letter in the first position of their codes.

WHO intends the codes U00–U99 to be used for provisional assignment of new diseases of uncertain aetiology and for specific research purposes. U50–U73 are used in ICD-10-AM, Third Edition, to classify activity while injured.

2.3 Australian Classification of Health Interventions (ACHI), the Procedure Classification of ICD- 10-AM

The procedure classification of ICD-10-AM (ACHI) was developed by the NCCH and is based on the Commonwealth Medicare Benefits Schedule (MBS). The MBS is a fee schedule and has been structured according to specialty. The NCCH developed a new Australian clinical procedure classification based on the MBS. This procedure classification was called MBS-Extended (Volumes 3 and 4 of ICD-10-AM). With the third revision of ICD-10-AM, the procedure classification was renamed the Australian Classification of Health Interventions (ACHI). ACHI is the Australian national standard for procedure and intervention coding in Australian hospitals.

The main features of the classification are a seven-character code in the format xxxxx-xx. The first five characters represent the MBS item number and the last two characters were allocated for each new procedural concept derived from the MBS item description. The procedures are presented in the tabular in Block number order rather than in numerical order.

The first edition of ICD-10-AM introduced for morbidity coding in Australia in July 1998 provided a new procedure classification based on the Commonwealth Medicare Benefits Schedule (MBS). As ACHI is based on item numbers in the MBS and structured on an anatomical basis, the code numbers do not always appear in numerical order within the tabular list. In order to present the code numbers in a logical sequence within the classification, Blocks were introduced. Blocks are numbered sequentially in the tabular list to assist clinical coders in locating a specific code and have titles that relate specifically to the codes contained within the Block.

A Block number follows every procedure code in Volume 4 (Alphabetical Index to procedures). This Block number indicates where the seven-digit procedure code will be found in Volume 3 (Tabular Index to procedures). As all codes selected from the alphabetical indices are verified in the tabular, the Block number is essential for locating the code. The code assigned to the patient record is the seven-digit code and the Block number is not recorded. See Box 3 for example.

Box 3e.g. **Laparoscopic Appendicectomy****Step 1** – Select Procedure in the Alphabetical index (Volume 4)**Appendicectomy** (incidental) (open) 30571-00 [926]
laparoscopic 30572-00 [926]**Step 2** – Using the Appendicectomy Block number [926],
the procedure code is located in the Tabular listing
(Volume 3) and the code is verified.**926 Appendicectomy**

30572-00 Laparoscopic appendicectomy

30571-00 Appendicectomy
Incidental appendectomy**Step 3** – Assign code **30572-00** for **Laparoscopic Appendicectomy****2.4
The Australian
Coding
Standards –
Volume 5**

The Australian Coding Standards are designed to be used in conjunction with ICD-10-AM Volumes 1–4. The Australian Coding Standards (ACS) were written with the objective of providing sound coding conventions for the use of ICD-10-AM. The standards are arranged according to the ICD-10-AM chapter to which they relate. Each standard is uniquely identified by a four-digit number. These are arranged according to ICD-10-AM structure with the first 2 digits of the standard denoting the chapter to which they refer. ‘00-xx’ refers to general standards for both diagnoses and procedures. See Box 4 for example.

Box 4**0023****Laparoscopic/Arthroscopic/Endoscopic Surgery**

If a procedure is performed laparoscopically, arthroscopically or endoscopically, and there is no code provided which encompasses both the endoscopy and the procedure, then both procedures should be coded.³²

**2.5
ICD-10-AM
Third Edition**

The National Centre for Classification in Health’s core activity is creating and maintaining the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification* (ICD-10-AM) which is revised biennially.

In late 2001, work was completed on the ICD-10-AM Third Edition. Updates and refinements to the classification were as a result of official World Health Organisation (WHO) changes to ICD-10, public submissions and queries from clinicians, coders and other data users and review by NCCH staff.

ICD-10-AM Third Edition was produced directly from the NCCH ICD-10-AM database, as were the First and Second Editions. ICD-10-AM is available in both hardcopy (five-volume book set) and electronic (browser and ASCII list) formats. To date there have been three sets of errata issued for the Third

³² Extracted from NCCH ICD-10-AM, July 2002, General Standards for Procedures.

Edition.³³ These errata are not incorporated into books published following their release.

In response to user feedback about the electronic versions, NCCH commenced work in the second quarter of 2002 to create an enhanced electronic version of the books. This is the ICD-10-AM *eBook*. The *eBook*'s features include a notes field so the application can be personalised, published errata can be imported electronically and it has electronic links to the '10-AM Commandments' (a regular information update feature of the Centre's quarterly newsletter, *Coding Matters*) and Australian Coding Standards.

ICD-10-AM Third Edition was implemented by all Australian State and territory health services from 1 July 2002. An education programme to inform ICD-10-AM users about the Third Edition was developed. This includes a web based education programme.

2.5.1 CHANGES IN DISEASE CLASSIFICATION ICD-10-AM, THIRD EDITION (FROM PREVIOUS TWO EDITIONS)

A significant number of disease codes were expanded at fourth or fifth character level. For example:

- Codes at category P07 Disorders related to short gestation and low birth weight, not elsewhere classified, were expanded to further specify the weight ranges.
- Category F32 Depressive episode has a fifth character indicating whether the condition arose within the postnatal period.
- Category Z06 Infection with drug-resistant microorganism has fourth character breakdown to identify MRSA or VRE.
- The perinatal and congenital chapters (P and Q codes) were expanded to update the classification in line with the recently released British Paediatrics Association version of ICD-10.

Morphology

Morphology codes (not currently used in HIPE) were reviewed in light of the release of the International Classification of Diseases for Oncology, Third Edition (ICD-O-3).

External Causes

Codes within Chapter XX *External causes of morbidity and mortality* were expanded to improve the reporting on cause of injuries. This revision was performed primarily in response to a public submission received from the National Injury Surveillance Unit. Many of the changes were made with direct reference to the International Classification of External Causes of Injury (ICECI).

Areas expanded included:

- X85 – Y09 *Assault* now requires a fifth digit to identify the relationship of the perpetrator to the victim.
- V90 – V94 *Water transport accidents* codes now require a fifth digit to identify the type of Watercraft.
- W02 *Fall involving ice-skates, skis, roller skateboards* now requires a fifth digit to identify the equipment involved (i.e. snow ski, water ski, snowboard etc).
- Category Y93 *Activity* was deleted and a much expanded section, U50 – U73 *Activity*, was created. The majority of the new codes are contained within the section U50 – U72 *While engaged in sports and leisure*. Many sporting activities previously bundled under Y93.08 *While engaged in sports, other* now have specific codes, e.g.

³³ June 2002, September 2002 and March 2003.

- U61.32 *Karate*
- U56.1 *Jogging and running*

2.5.2 CHANGES IN PROCEDURE CLASSIFICATION ICD-10-AM, THIRD EDITION (FROM PREVIOUS TWO EDITIONS)

In ICD-10-AM Third Edition, the procedure classification (Volumes 3 and 4) was renamed the Australian Classification of Health Interventions (ACHI). Modifications based on changes to the Medicare Benefits Schedule (MBS) from November 1999, May 2000, November 2000 and May 2001 were included.

The first edition of ACHI (previously known as MBS-Extended) was closely aligned with MBS, both in the numbering system and terminology. The MBS utilises diagnostic information to describe many item numbers and this feature was maintained in MBS-Extended. However, in ICD-10-AM Third Edition, a number of diagnostic statements were deleted from code titles, in line with the principle that a procedure classification should describe only the procedure performed.

The anaesthetic codes were reviewed, and were designed to provide a more concise and user-friendly code structure. The patient's American Society of Anesthesiologists (ASA) Physical Status Classification was included in the new code structure as the last two characters of the anaesthetic code.

2.5.3 CHANGES IN AUSTRALIAN CODING STANDARDS IN ICD-10-AM, THIRD EDITION (FROM TWO PREVIOUS EDITIONS)

There were 14 new Standards and a further 68 Standards were amended. Many of these changes reflected advice previously published in *Coding Matters*. A further 18 Standards have been deleted as a result of new codes, index improvements or amalgamation with other Standards.

Australian Coding Standard 0002 *Additional diagnoses* contains additional guidelines to further clarify the application of this standard. The specific criteria for defining an additional diagnosis were not altered.

Australian Coding Standard 0020 *Multiple/bilateral procedures* was revised with increased emphasis on coding procedures as often as they are performed.

Australian Coding Standard 0401 *Diabetes mellitus and impaired glucose regulation* has been renamed and expanded to reflect the changes previously outlined in *Coding Matters*.³⁴

2.6 NCCH and *Coding Matters*

Coding Matters is the quarterly newsletter of the National Centre for Classification in Health NCCH (Sydney). It is circulated by e-mail in pdf format. All back issues are available for downloading from the NCCH website.³⁵ The '10-AM Commandments' within each issue of *Coding Matters* provide advice regarding coding. Any changes in practice are expected to be implemented by coders once they have been published in *Coding Matters*.

2.7 Conclusion

Given the review of internationally used classification systems presented in Section 1, it was decided that the ICD-10-AM system was a lead contender for adoption in the Irish system as it fulfilled all of the objectives considered essential to the system of choice, i.e. incorporating an integrated system for coding diagnoses and procedures, is updated regularly, used internationally and

³⁴ *Coding Matters*, Vol. 8 No.1 p., 13, June.

³⁵ www.fhs.usyd.edu.au/ncch

support materials for training purposes are available. Following the more substantive assessment of the ICD-10-AM system presented in this section, it was considered important to undertake a pilot test of this system within the Irish HIPE system prior to proposing any final recommendation regarding the appropriateness, or otherwise, of this classification system for adoption at the national level in Ireland. With the support of the Department of Health and Children a pilot study of ICD-10-AM was undertaken in six Irish hospitals. The methodology of this study, together with the findings, are presented in the remaining sections of this report.

3. PILOT STUDY OF ICD-10-AM: METHODOLOGY

3.0 Introduction

The assessment of the feasibility of implementing the ICD-10-AM (Third Edition) classification system for the coding of morbidity data reported for acute hospital discharges in Ireland was the essential goal proposed for the pilot study of ICD-10-AM. This study aimed to provide a comparison between the application of the ICD-9-CM and the ICD-10-AM clinical classification systems and to compile information to assist in the assessment of the wider impact of a classification change to ICD-10-AM in Ireland.

Experienced coders who, in turn, train coders and monitor the quality of coding in the HIPE system comprised the HIPE team for this study. For the development and conduct of the project, the team also drew upon resources available within the HIPE & NPRS Unit at the ESRI, the Department of Health and Children, the Health Information Management Association of Australia (HIMAA) and the National Centre for Classification of Health (NCCH) in Australia.³⁶

The ICD-10-AM Pilot Study was conducted in three phases over a 6-month period as follows:

Phase 1: September - November 2002

The HIPE Pilot Study team was established to formalise a Pilot Study framework. The Pilot Study team was responsible for implementing, documenting and reporting all outcomes to relevant stakeholders within the given time frame.

The HIPE Pilot Study team acquired the resources and were trained in coding with the ICD-10-AM classification system.

Several hospitals volunteered interest and committed experienced HIPE coders to the ICD-10-AM Pilot Study following the announcement of the study in the HIPE & NPRS Unit quarterly publication *Coding Notes* (September 2002).

Phase 2: November 2002 – January 2003

Phase 2 involved the HIPE Pilot Study team training clinical coders in coding with ICD-10-AM at the participating Pilot Study hospital sites. The hospital-based exercise, essentially a dual coding exercise using ICD-9-CM and ICD-10-AM, was conducted in this phase. Continual reporting of Pilot Study activities through regular meetings, coding of Pilot Study sample data and gathering Pilot site feedback was also undertaken.

Phase 3: February - March 2003

This phase involved the compilation of Pilot Study sample data, data entry of coded cases in both ICD-9-CM and ICD-10-AM, comparative analysis and reporting activities.

³⁶ NCCH is responsible for publishing, updating and supporting the International Classification of Diseases, Tenth Revision Australian Modification (ICD-10-AM) as well as developing health classification theory and coding systems.

3.1 Pilot Study Site Selection

Sites were chosen to represent a distribution of clinical activity, geographic location and the experience of the clinical coding staff. The clinical coders of the selected Pilot Study sites were all fully trained and experienced.

Six hospitals took part in the Pilot Study including three from the Dublin area and three from regional areas. A total of 11 clinical coders participated. A letter was sent from the HIPE & NPRS Unit to each hospital coder confirming their involvement in the Pilot Study and a proposed date to commence their training. Upon receiving each coder's response, a training schedule was devised appropriate to the specialty of the hospital.

The Pilot Study hospitals, their specialties and the number of coders per hospital are outlined in Table 3.

Table 3: The distribution of hospitals and coders who took part in the Pilot Study of ICD-10-AM

| Hospital Name | Specialty | Coders in Pilot Study |
|--|---|-----------------------|
| Beaumont Hospital, Dublin | <i>General</i> - Acute Medical/Surgical <i>Specialties</i> - Neurosurgery/Neurology; Renal Medicine and Transplantation; ENT / Cochlear implantation and Gastroenterology. | 2 |
| Our Lady's Hospital for Sick Children, Crumlin, Dublin | <i>General</i> - Acute Medical/Surgical (Paediatrics) <i>Specialties</i> - Burns; Genetics; Neonatology | 1 |
| National Maternity Hospital, Holles Street, Dublin | <i>Specialties</i> - Obstetrics; Gynaecology; Neonatology | 1 |
| University College Hospital, Galway | <i>General</i> - Medical/Surgical <i>Specialties</i> - Regional specialties of Urology, Ophthalmology and ENT. Higher specialties include Cardiology, Cardio-Thoracic Surgery, Dermatology, Endocrinology, Gastroenterology, Neurology, Plastic Surgery, Respiratory Medicine and Vascular Surgery. | 3 |
| Merlin Park Hospital, Galway | Regional specialty of Orthopaedics Other specialties are Nephrology, Rheumatology, Respiratory Medicine and Geriatric Medicine | 1 |
| Cork University Hospital | <i>General</i> - Acute Medical/Surgical <i>Specialties</i> - The hospital has more than twenty specialties including Neuro-Science, Cardiology, Cardiothoracic Surgery, Infectious Diseases, Ophthalmology, Nephrology, Plastic Surgery, Orthopaedics, Rheumatology, Paediatrics, Respiratory Medicine, Geriatric Medicine, General Surgery and Anaesthetics | 3 |

3.2 Resources

Resources, consisting mainly of books, training and support materials considered necessary to effectively conduct the Pilot Study, were acquired as needed throughout the duration of the project.

Coding Books and ICD-10-AM Browser

The HIPE Pilot Study team and pilot site coders used both the ICD-9-CM and ICD-10-AM (3rd Edition) clinical classification systems to code exercises and inpatient cases. The HIPE Pilot Study team used their own copies of ICD-9-CM and four copies of the ICD-10-AM, 5-volume set were purchased from NCCH in Australia.

In addition to the books, a searchable CD-ROM version of all the volumes of ICD-10-AM was enclosed with the 5-volume sets. These were used in conjunction with the hard copy volumes (and in place of them where the number of participants in training sessions exceeded the number of ICD-10-AM sets available).

HIMAA Workbook 'Introduction to Coding with ICD-10-AM, Third Edition'

This workbook, produced and published by the Health Information Management Association of Australia (HIMAA), consists of 26 units. Each unit contains explanatory material, examples and exercises related to the different chapters contained within ICD-10-AM Third Edition. It is used throughout Australia offering clinical coding and health information management courses. This book provided the basis for the Pilot Study team training.

Coding Matters

The quarterly published newsletter of the NCCH was used regularly throughout the Pilot Study. *Coding Matters* is the medium for informing coders and managers about relevant coding education matters as they arise. It also provides clinical update articles and selected coding queries.

NCCH Query Database

An MS Access database of selected queries and responses submitted to NCCH by clinical coders and health information managers is available for download from the NCCH website. New queries and the responses are added to the website on a quarterly basis.

Australian Dictionary of Clinical Abbreviations, Acronyms and Symbols

The HIMAA *Australian Dictionary of Clinical Abbreviations, Acronyms and Symbols* was also available.

3.3 Training and Education

Training activities were focused on two groups, the HIPE Pilot Study team and the hospital coding staff for each Pilot Study site. An intensive training schedule was devised focusing on educating both the HIPE Pilot Study team and hospital coders in using the ICD-10-AM classification system. The HIPE Pilot Study team's training was carried out in Phase 1 and the hospital coders' training in Phase 2.

HIPE Pilot Study Team

The HIPE Pilot Study team for six months included a colleague from Australia who had experience working with ICD-10-AM in Australia and New Zealand. This colleague facilitated the training of the HIPE group in ICD-10-AM. The HIPE Pilot Study team participated in two workshops facilitated by the Australian colleague. These workshops were designed to provide the team with an overview of ICD-10-AM and a solid foundation for further training activities. Workshops covered the major differences between ICD-9-CM and

ICD-10-AM; the theory of coding diagnoses and procedures in ICD-10-AM; use of the Australian Coding Standards; ICD-10-AM coding conventions; navigation of the ICD-10-AM books and practical application of ICD-10-AM principles through coding exercises. Resources related to using ICD-10-AM such as *Coding Matters* (NCCH) were also provided.

In addition, a self-education programme was undertaken using the HIMAA workbook *Introduction to coding with ICD-10-AM Third Edition*. Following on from the workshops and throughout Phase 1 the HIPE Pilot Study team reviewed individual units and completed related coursework on a weekly basis to further build upon their knowledge of the fundamental concepts of coding using ICD-10-AM Third Edition.

In conjunction with the in-house training activities, two visits to Beaumont Hospital, a Pilot Study site, were organised to provide the Pilot Study team with exposure to coding in ICD-10-AM in a hospital environment using randomly selected medical records. This exercise was intended to provide the team with hands on, practical experience prior to commencing Phase 2 of the study where the team would themselves be training coders in the use of the classification system.

Pilot Study Hospital Coders

A basic introductory course to ICD-10-AM was presented to each hospital coder participating in the Pilot Study over a 3-day period. Prior to the coding course the HIMAA workbook was sent out to each coder with a request that they read the first five units. These units cover the introduction to coding diagnoses and procedures. The objective was to provide the coders with exposure to ICD-10-AM prior to the course and build upon this foundation during the course. However, as most coders did not read these units in advance of the course due to work commitments, it was also necessary to cover these units in the training course.

The course was carried out at each coder's workplace, (except for one hospital where the coders came to the HIPE & NPRS Unit). It was not possible to train all the coders together due to coder unavailability, geographical constraints and the number of ICD-10-AM sets available (four). The presentation of the course at the coders' respective workplaces did assist in reducing the impact of their participation in the study on their coexisting workloads. This also enabled training courses to be adapted to specific hospitals' needs.

The time frame of the project and the workloads of participating coders resulted in a three-day course being most appropriate for the purposes of the Pilot Study. The hospital coders were presented with an overview of the minor and major differences between ICD-9-CM and ICD-10-AM; the theory of coding diagnoses and procedures in ICD-10-AM; use of the Australian Coding Standards; ICD-10-AM coding conventions; navigation of the ICD-10-AM books and practical application of ICD-10-AM through coding of medical records. The basic course was further adapted to suit coders who worked in specialty areas (e.g. obstetrics, paediatrics).

Time constraints limited the amount of material that could be covered so similar material to that contained in the training workshops undertaken by the HIPE Pilot Study team was presented but in a more compressed format.

Components of the basic course were adapted to focus on the coders' specialty areas (such as obstetrics and paediatrics). This was to provide the coder with all the information they required to effectively code in these areas throughout the dual coding exercise. The HIMAA workbook was also used in conjunction with the basic course to supply further clarification of ICD-10-AM coding principles.

The majority of the training was carried out by the team member with prior experience of ICD-10-AM. This trainer had no experience of ICD-9-CM. The

3.4 Data Collection Tools

final training course was given solely by a member of the HIPE Pilot Study team. Knowledge of ICD-9-CM proved beneficial in the training of ICD-10-AM as comparisons and references could be made between the two classifications.

To support the objectives of the study, data were collected by a range of methods at all stages of the study.

Training Sessions

Throughout the Pilot Study team's training activities each member noted their observations on differences, possible impediments and/or opportunities they deemed significant to the overall assessment of ICD-10-AM. This information was considered important for the development of the hospital coders' training programme.

During the hospital coders' training activities, the HIPE trainer noted comments made verbally by the coder(s) throughout the exercise. This complemented the data collected via the purpose designed questionnaire completed by the coders at the end of their ICD-10-AM training programme. Information gathered at each training session was used to refine subsequent training sessions.

3.4.1 HOSPITAL CODING – DUAL CODING STUDY

The key data collection activity of the ICD-10-AM Pilot Study was the hospital-based coding exercise. A dual coding study whereby a sample of inpatient records would be coded in ICD-9-CM and ICD-10-AM was the preferred approach to undertaking the evaluation of the ICD-10-AM classification. This was co-ordinated by the HIPE Unit Pilot Study team.

Where possible, the hospital coding exercise was commenced in the week immediately following each coder's completion of their introductory course.³⁷ Each hospital coder was provided with a set of ICD-10-AM books and data forms on which to record the ICD-10-AM codes. A HIPE Unit Pilot Study team member was also in attendance at the Pilot site to support the coder for the duration of the exercise.

The length of time coding ranged from 2 days to 1 week depending on workloads and availability of coders. For example, two coders in one hospital alternated across 4 days, thus coding for two days each.

Cases were randomly selected and the hospital coder coded each case in ICD-10-AM, while the supervising HIPE Unit staff member verified the ICD-10-AM coding and coded the same cases in ICD-9-CM.

The administrative data variables collected for each case included:

- Hospital name
- Hospital number
- Medical record number
- Date of Birth
- Admission date
- Discharge date
- Sex
- Admission Type
- Admission Source
- Discharge Code
- Coder Name
- Date Coded

³⁷ One coder had a delay between their training and participation in the dual coding study due to annual leave arrangements.

- Time taken to code case

The clinical data collected for each case included:

- Principal diagnosis
- Additional diagnoses
- External Cause Codes³⁸
- Procedures (up to ten as appropriate)

Up to nine additional diagnoses including the 3 additional external cause codes where appropriate.

Each case's ICD-9-CM and ICD-10-AM codes were recorded on a double-sided dataset form³⁹ and collected for data entry. The data collection form was modified for each pilot site to provide ICD-10-AM coding prompts and coding tips related to their coding speciality. A comments field was also included for free text.

As with the coders' training sessions, the HIPE supervisor noted all comments made verbally by the coder(s) that were deemed important to the evaluation of ICD-10-AM throughout the dual coding. These comments were separated into the categories of documentation issues, classification issues and general coding queries.

The ICD-10-AM codes were then entered onto an MS Access database (ICD-10-AM) and the ICD-9-CM codes into a parallel W-HIPE system stored on a HIPE unit laptop. The data from each were then linked and reviewed.

3.4.2 FEEDBACK - QUESTIONNAIRES

To evaluate the Pilot Study activities undertaken a series of forms and questionnaires were developed to collect information and feedback from the participants.

*Training Evaluation Questionnaire*⁴⁰

This was designed to capture each individual Pilot Study hospital coder's overall impression on the training provided at the 3-day introductory ICD-10-AM course. Each participating coder completed this form at the end of their 3-day training course.

Pilot Study Data Collection Form

The data collection form was designed to collect the administrative and clinical coding data; in addition, a comment field was included so that the coder could make case-specific comments. Comments could include coding queries and likes or dislikes of the classification. This form was double sided to allow for recording of ICD-10-AM on one side and ICD-9-CM on the other (Appendix 2). Different coloured forms were used for each site.

*Classification Evaluation Questionnaire*⁴¹

This was designed to capture the individual Pilot Study hospital coder's impression of the ICD-10-AM classification system, in comparison to the ICD-9-CM classification system. This was completed by each participating coder at the end of their hospital coding exercise.

Feedback Day

Further feedback was also obtained soon after completion of the hospital-based dual coding study. This was via a group focus day where all the

³⁸ See Data Collection for a breakdown of these codes.

³⁹ See Appendix 2.

⁴⁰ See Appendix 2.

⁴¹ See Appendix 2.

3.5 Information Technology

participating coders were brought together to share their overall impressions of their role as coders, the Pilot Study and training and the ICD-10-AM classification system. Eight of the eleven coders attended this day, along with the three ESRI Pilot Study coding team. The day was divided into a discussion on the role of a clinical coder and also a discussion on the Pilot Study Coding exercise and impressions of ICD-10-AM.

Microsoft (MS) Word was the software used to document all workings of the Pilot Study. Folders related to the key areas were set up on the HIPE Unit network and all related documents sorted and stored in these.

The ICD-9-CM and ICD-10-AM information was initially recorded separately on paper forms. These forms were entered into two separate systems, one for the ICD-9-CM and the other for ICD-10-AM. Once the information was entered into both systems it was merged into a complete dataset for the hospitals.

The ICD-9-CM information was entered using the Windows HIPE data entry system and validated by the built-in quality checks. A new program was written to store the ICD-10-AM data. This program stored some basic chart identification data and the diagnosis and procedure information for each case. The program also stored comments by the coders, the time taken to code the chart and the Australian Coding Standard if it was used. Both the ICD-9-CM and the ICD-10-AM systems are written in Visual basic and used Microsoft Access databases as storage. During the data entry phase of the project, the information entered was continuously monitored to ensure that it was being recorded correctly and completely.

After the merging of the data had taken place it was possible to establish if any cases were either missing or if the MRN and/or discharge dates had been keyed incorrectly. Identified problems were corrected and the merging was re-run. It is important to note that a one-to-one relationship was expected between the ICD-9-CM and ICD-10-AM data and the final merged table achieved this.

Once the data were merged, it was processed and reformatted as follows.

- Letters in diagnosis codes converted to uppercase.
- Codes formatted to appear correctly in analysis reports.
- Principal Diagnosis in ICD-9-CM and ICD-10-AM recoded into broad chapter groups.

Finally, a series of reports were created for the data analysis section of the Pilot Report. These reports were created using a combination of queries in Access on the merged table and pivot tables in Excel. A listing of parallel cases was also created using the mail merge facility in Word and an Access query. The next section presents reports on the data collection and analysis phases of the Pilot Study.

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4. PILOT STUDY OF ICD-10-AM: DATA COLLECTION AND ANALYSIS

4.0 Introduction

There were a number of different data sets collected throughout the Pilot Study. In this section the data collected are presented and analysed. The data collected are those reported on the data collection form in both ICD-10-AM and ICD-9-CM together with the information returned in the training and classification evaluation questionnaires and the coder feedback day. Each data set will be discussed in this section. The data sets may be summarised as follows:

1. The **ICD-10-AM and ICD-9-CM coded discharges** collected during the coding exercise. The double-sided forms (Appendix 2) used to collect these data also contained a **comment** box which collected views on a case by case basis as appropriate.
2. The information collected from the **Training Evaluation Questionnaire** (Appendix 2) completed by each coder at the end of the coding exercises.
3. The information collected from the **Classification Evaluation Questionnaire** (Appendix 2) completed by coders at the end of their coding exercises.
4. Comments collected during the **Coder Feedback day** held at the ESRI.

4.1 Coded Data

The data collected and coded for the Pilot Study are summarised in Table 4. The hospitals and coders are numbered to preserve anonymity. A total of 474 Charts were coded by the eleven coders in six hospitals using ICD-10-AM. These charts were verified and recoded using ICD-9-CM by HIPE coding staff. During this coding exercise any coding queries or problems with extraction or coding were discussed at the time. The quality and accuracy of the data extracted and coded in both classifications was checked in the hospital. Hospital charts were used as the source document for all of the coding, according to the recommended practice within HIPE.

The five volumes of ICD-10-AM were used to code the charts and the single volume *Educational Annotation of ICD-9-CM* (Channel Publishing, Nevada, October 1998), in current use within the HIPE system, was the source for the ICD-9-CM codes. Additional resources available were those in common use, including a medical dictionary, M.I.M.s (*Monthly Index of Medical Specialties*), HIPE coder's training folder and copies of the HIPE & NPRS Unit's quarterly coding newsletter *Coding Notes*. In addition, the HIMAA (Hospital Information Management Association of Australia) *Introduction to*

Coding with ICD-10-AM, Third Edition as used during the initial training phase was also available. Some copies of the NCCH quarterly newsletter *Coding Matters* were available, together with copies of the HIMAA *Australian Dictionary of Clinical Abbreviations, Acronyms and Symbols*. In addition, ICD-10-AM was available on CD-Rom.

The charts were selected at random from those available in the coding offices. Initially, uncomplicated charts were selected to enable coders gain confidence with coding using ICD-10-AM. As the exercise progressed, more complex and challenging charts were selected. Table 4 below gives a breakdown of the charts coded by each of the eleven participating coders in each of the six hospitals. The focus of this Pilot Study was on the Classification and the ability of the coders to work with it. It was not intended to monitor any increase in 'coding speed'. The coders did, however, give feedback through the questionnaires completed on the issue of 'coding speed' at the end of the exercise and also during the feedback day and these findings will be presented later in this chapter.

Table 4: ICD-10-AM Pilot Study Cases Coded in ICD-10-AM by Each Coder

| | | | | | |
|---|--------------|--------------|--------------|--------------|--------------|
| Hospital 1 – Specialised Hospital | | | | | |
| No. of charts coded by Coder 1 | | Day 1 | Day 2 | Day 3 | Day 4 |
| | | 6 | 10 | 9 | 9 |
| Total | | | | | 34 |
| Hospital 2 – General Hospital | | | | | |
| No. of charts coded by Coder 2 | | Day 1 | Day 2 | Day 3 | Day 4 |
| | | 14 | | 15 | |
| No. of charts coded by Coder 3 | | | 19 | | 11 |
| Total | | | | | 59 |
| Hospital 3 – Specialised Hospital | | | | | |
| No. of charts coded by Coder 4 | | Day 1 | Day 2 | Day 3 | |
| | | 24 | 27 | 36 | |
| Total | | | | 87 | |
| Hospital 4 – General Hospital | | | | | |
| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
| No. of charts coded by Coder 5 | 9 | 7 | 8 | 15 | 15 |
| No. of charts coded by Coder 6 | 8 | 8 | 12 | 14 | 12 |
| No. of charts coded by Coder 7 | 2 | 4 | 5 | 5 | Off |
| Daily Total | 19 | 19 | 25 | 34 | 27 |
| Total | | | | | 124 |
| Hospital 5 – General Hospital | | | | | |
| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
| No. of charts coded by Coder 8 | 15 | 9 | 17 | 15 | 4 |
| No. of charts coded by Coder 9 | 9 | 11 | 9 | 16 | 4 |
| No. of charts coded by Coder 10 | 11 | Off | 8 | 12 | Off |
| Daily Total | 35 | 20 | 34 | 43 | 8 |
| Total | | | | | 140 |
| Hospital 5 – Specialised Hospital | | | | | |
| | Day 1 | Day 2 | | | |
| No. of charts coded by Coder 11 | 16 | 6 | | | |
| Total | | | | | 22 |
| Hospital 6 – Specialised Hospital | | | | | |
| | Day 1 | | | | |
| No. of charts coded by Coder 10 | 8 | | | | |
| Total | | | | | 8 |
| Total charts coded for all hospitals | | | | | 474 |

4.2 Extraction of Diagnoses

HIPE currently collects up to ten diagnoses and ten procedures per discharge as appropriate. There are some differences in guidelines for selection of diagnoses and procedures between the two classifications. There are also changes in the way certain conditions are coded e.g.

- An open fracture in ICD-10-AM is coded to a fracture with an additional special code for wound with open fracture code. In ICD-9-

CM there are separate codes for ‘closed’ and ‘open’ fracture. No code is assigned for a wound associated with open fracture.

- The structure of codes and the guidelines related to coding of Diabetes Mellitus are changed from those in ICD-9-CM.

4.2.1 PRINCIPAL DIAGNOSIS

The definition of the principal diagnosis in ICD-10-AM and ICD-9-CM are the same, though worded slightly differently:

ICD-9-CM: The principal diagnosis is that condition established after study to be chiefly responsible for occasioning admission to the hospital for care.⁴²

ICD-10-AM: The principal diagnosis is the diagnosis established after study to be chiefly responsible for occasioning the patient’s episode of care in hospital (or attendance at the health care facility).⁴³

4.2.2 ADDITIONAL DIAGNOSES

The definition for collecting additional diagnoses within ICD-10-AM and ICD-9-CM differ and this had to be taken account of during extraction and coding of data using the different classifications.

As a generalisation, ‘other’ or ‘secondary’ diagnoses reported in ICD-9-CM are conditions that affect patient management and/or consume hospital resources. These secondary or ‘other’ diagnoses can be interpreted as additional conditions that affect patient care in terms of requiring: clinical evaluation, therapeutic treatment, diagnostic procedures, extended length of stay or increased nursing care and/or monitoring.

NCCH define the secondary diagnosis as “a condition or complaint either coexisting with the principal diagnosis or arising during the episode of care or attendance at a health care facility.”⁴⁴ NCCH has tightened the definition of additional diagnoses since July 1999 to try to limit coding of conditions to only those that affect patient management in a significant way. Within this context, additional diagnoses are interpreted as conditions that affect patient management in terms of requiring therapeutic treatment, diagnostic procedures and increased nursing care and/or monitoring. One or more of these factors will generally result in an extended length of hospital stay. In contrast to the ICD-9-CM definition of an additional diagnosis, a condition should not be routinely coded just because a patient is on ongoing medication for treatment of this condition. However, if the medication is altered or adjusted during the episode of care, the condition should be coded. There is also a guideline with regard to multiple coding which states “There are situations where multiple codes may need to be assigned to reflect the various components of a disease. Each individual component (i.e. code) may not necessarily meet the definition of ACS (Australian Coding Standard) 0002 *Additional diagnoses*, yet the detail is required to ensure that the entire medical concept is captured by the codes.”⁴⁵

The average number of diagnosis codes per discharge reported across the 474 cases coded in ICD-9-CM in the Pilot Study was 2.65 codes compared to 2.78 codes in ICD-10-AM. The average number of secondary diagnoses codes per case was 1.65 in ICD-9-CM compared to 1.78 in ICD-10-AM. Although

⁴² Source: American Hospital Association, Official Coding Guidelines, *Coding Clinic 2nd Quarter*, 1990, pp. 3-4.

⁴³ Extracted from NCCH ICD-10-AM, July 2002, Australian Coding Standard 0001.

⁴⁴ Extracted from NCCH ICD-10-AM, July 2002, Australian Coding Standard 0002.

⁴⁵ Extracted from NCCH ICD-10-AM, July 2002, Australian Coding Standard 0027.

there are stricter controls on the use of additional diagnoses in ICD-10-AM, there are additional diagnoses collected through the Australian classification that are not in ICD-9-CM. These extra codes account for the slightly higher numbers of secondary diagnoses reported in ICD-10-AM. These codes are summarised in Table 5 below.

Table 5: New Diagnosis Codes Collected in ICD-10-AM and not in ICD-9-CM in the Pilot Study

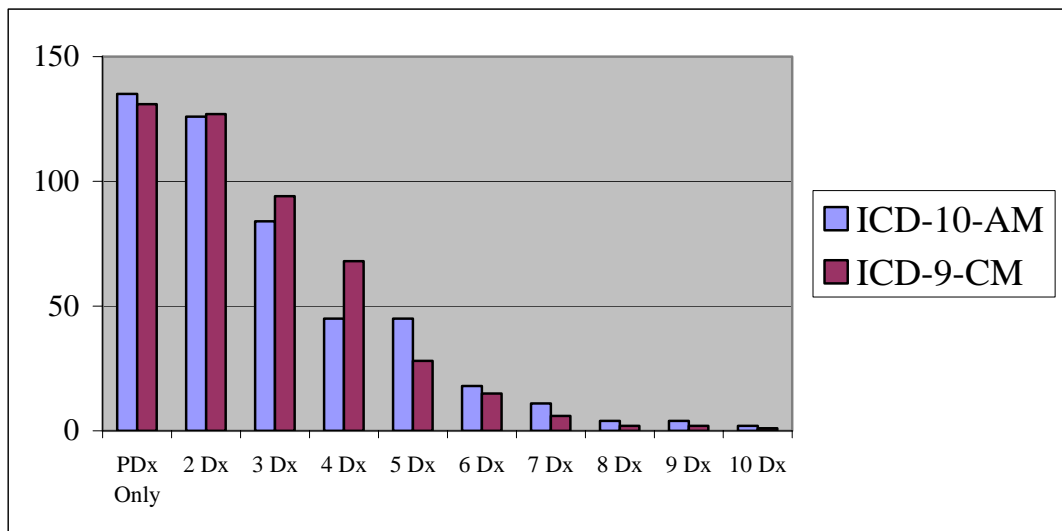
| ICD-10-AM Codes | Condition | Number |
|-----------------|--|-----------|
| O09 | Duration of pregnancy | 11 |
| U50 – U73 | Activity codes (U50 – U73) | 47 |
| Z38 | Liveborn infants according to place of birth | 24 |
| Total | | 82 |

The number of diagnoses collected for each classification are shown in Table 6 and illustrated in Figure 1.

Table 6: Distribution of Diagnoses by Discharge Included in the Pilot Study

| Number of Diagnoses | ICD-10-AM | % | ICD-9-CM | % |
|--------------------------|------------|------------|------------|------------|
| Principal Diagnosis Only | 135 | 28.5 | 131 | 27.6 |
| 2 Diagnoses | 126 | 26.6 | 127 | 26.8 |
| 3 Diagnoses | 84 | 17.7 | 94 | 19.8 |
| 4 Diagnoses | 45 | 9.5 | 68 | 14.4 |
| 5 Diagnoses | 45 | 9.5 | 28 | 5.9 |
| 6 Diagnoses | 18 | 3.8 | 15 | 3.2 |
| 7 Diagnoses | 11 | 2.3 | 6 | 1.3 |
| 8 Diagnoses | 4 | 0.8 | 2 | 0.4 |
| 9 Diagnoses | 4 | 0.8 | 2 | 0.4 |
| 10 Diagnoses | 2 | 0.4 | 1 | 0.2 |
| Total | 474 | 100 | 474 | 100 |

Figure 1: Distribution of Diagnoses by Discharge Included in the Pilot Study



4.2.3 COMPARISON OF SPECIFICITY IN DIAGNOSES CODES IN ICD-9-CM AND ICD-10-AM

ICD classifications must be capable of capturing information about diseases and procedures encountered in hospital medical records. The classification used must be capable of aggregating this information into meaningful groups. ICD classifications accomplish this through the use of residual codes. These

are the *other specified* and *unspecified* categories, that allow the classification to ‘catch-all’. Residual codes enable all medical information to be collected even if a specific code is not available. The convention of the final digit of ‘8’ representing *Other specified* or *Not elsewhere classified (NEC)* is used in most categories in ICD-9-CM and ICD-10-AM. A final digit of ‘9’ in a code generally represents unspecified or Not Otherwise Specified (NOS).

Australian Coding Standard 0013 *Other and Unspecified codes* gives guidance in the use of these codes. It states that these “residual codes should not be used to ‘dump’ diagnoses which do not appear to be categorised.”⁴⁶ This standard instructs the coder that when a clinician uses terminology which cannot be found in ICD-10-AM, clarification for alternative terms available in ICD-10-AM must be sought.

Overuse of these codes can arise due to poor documentation. The HIPE data entry software challenges the use of these codes in an effort to reduce their use and promote the most specific information available. A WHO study (Kerry Innes *et al.*, 2002) carried out two studies on the ‘Specificity in ICD-10-AM’⁴⁷ and found the most robust identification of ICD-10-AM residual codes was achieved by word recognition of *other* and/or *unspecified* words in the code titles attributed to codes within ICD-10-AM Third Edition codes in the data set. Identification was not reliant on the inclusion of .8 or .9 appearing in the code itself. By selecting the codes with NEC, ‘Other’, NOS and ‘unspecified’ the following tables have been generated to compare use of specific codes between the two classifications in the Pilot Study both as principal diagnosis and as secondary diagnoses.

Table 7 shows that 24.5 per cent (n=116) of the ICD-10-AM codes assigned in the Pilot Study were unspecified compared to 28.0 per cent (n=133) of ICD-9-CM codes. There are more specific codes used as a principal diagnosis in ICD-10-AM with 61.8 per cent (n=293) reported compared to 55.1 per cent (n=261) in ICD-9-CM.

Table 7: Specificity of Principal Diagnosis in Pilot Study

| Description | ICD-10-AM | | ICD-9-CM | |
|---|-----------|------|----------|------|
| | Codes | % | Codes | % |
| Codes identified as ‘Other’/NEC | 65 | 13.7 | 80 | 16.9 |
| Codes identified as ‘Unspecified’ | 116 | 24.5 | 133 | 28.0 |
| Total Specified Codes identified | 293 | 61.8 | 261 | 55.1 |
| Total Number of Principal Diagnosis Codes | 474 | 100 | 474 | 100 |

ICD-10-AM Total excludes external cause codes (beginning with U, V, W, X and Y).

ICD-9-CM Total excludes external cause codes (beginning with E).

Table 8 shows that of all diagnoses assigned in ICD-10-AM, 16.3 per cent (n=215) were unspecified codes compared with 20.5 per cent (n=261) in ICD-9-CM.

⁴⁶ Extracted from NCCH ICD-10-AM, July 2002, General Standards for Diseases.

⁴⁷ *Specificity in ICD-10-AM* Kerry Innes, Patricia Saad, Vladimir Stevanovic and Donna Truran presented at a Meeting of Heads of WHO Collaborating Centres for The Classification Of Diseases, 14-19 October 2002, Brisbane, Queensland, Australia.

Table 8: Specificity of All Diagnoses in Pilot Study

| Description | ICD-10-AM | | ICD-9-CM | |
|---|-----------|------|----------|------|
| | Codes | % | Codes | % |
| Codes identified as 'Other'/NEC and 'Unspecified'/NOS | 174 | 13.2 | 162 | 12.9 |
| Codes identified as 'Unspecified'/NOS | 215 | 16.3 | 261 | 20.8 |
| Total Specified Codes identified | 928 | 70.5 | 832 | 66.3 |
| Total Number of Diagnosis Codes | 1,317 | 100 | 1,255 | 100 |

ICD-10-AM Total excludes external cause codes (beginning with U, V, W, X and Y).

ICD-9-CM Total excludes external cause codes (beginning with E).

4.2.4 OBSTETRICS CODING

Obstetrics data accounted for 10.4 per cent (91,112 discharges in MDC 14⁴⁸) of data reported to HIPE in 2001. This is a specialised area of coding with guidelines specific to this field. Two of the coders who took part in the Pilot Study specialise in obstetric coding.

In ICD-10-AM there have been changes made both to the structure of the codes and to the guidelines associated with obstetrics. The obstetric codes in ICD-10-AM are all contained within Chapter 15 *Pregnancy, Childbirth and the Puerperium* (O00–O99). This corresponds with Chapter 11 *Complications of Pregnancy, Childbirth and the Puerperium* (630 – 677) in ICD-9-CM. The major changes in coding of obstetrics are:

- There are no fifth digits for identifying stage of the pregnancy (e.g. antepartum or postpartum) in ICD-10-AM as used in ICD-9-CM.
- Additional codes are assigned for duration of pregnancy with early delivery and pregnancy with abortive outcome in ICD-10-AM.
- In ICD-10-AM sequencing of antepartum and delivery codes depends on length of stay.
- In ICD-10-AM a specific set of anaesthetic codes is collected for any procedures associated with an obstetrics condition.

Table 9 shows the number of obstetric diagnoses codes collected in the Pilot Study in the two classifications.

Table 9: Obstetric Diagnoses Codes in the Pilot Study

| | ICD-10-AM | ICD-9-CM |
|----------------------------------|-----------|----------|
| Obstetric Diagnosis Codes | | |
| Principal Obstetric Diagnosis | 63 | 63 |
| All Obstetric Diagnoses | 97 | 84 |

DURATION OF PREGNANCY

In ICD-9-CM a fifth digit is assigned to all the codes relating to early pregnancy, complication of pregnancy, delivery and the puerperal period (ICD-9-CM code range 640 – 676) within Chapter 11, *Complications of Pregnancy, Childbirth and the Puerperium*. This fifth digit indicates if the condition is antepartum, associated with a delivery or is postpartum.

In ICD-10-AM this information is not collected but additional codes from the Category O09 *Duration of pregnancy* are assigned for duration of pregnancy with early delivery and pregnancy with abortive outcome. A code from O09 will be assigned as an additional diagnosis in all cases of:

⁴⁸ MDC 14 = Major Diagnostic Category Number 14, Pregnancy, Childbirth & The Puerperium.

- Abortion (O00–O08) (Pregnancy with abortive outcome).
- Threatened abortion (O20.0).
- Premature rupture of membranes (O42) (Before 37 completed weeks of gestation).
- Threatened premature labour (O47.0) (False labour before 37 completed weeks of gestation).
- Early onset of labour (O60) (Preterm delivery).

Table 10 gives a breakdown on these ‘Duration of pregnancy’ codes as assigned during the Pilot Study.

Table 10: Duration of Pregnancy with Early Delivery and Pregnancy with Abortive Outcome in the Pilot Study

| ICD-10-AM Code | Duration of pregnancy | Number |
|----------------|---|-----------|
| O09.1 | Duration of pregnancy 5-13 completed weeks | 8 |
| O09.2 | Duration of pregnancy 14-19 completed weeks | 1 |
| O09.4 | Duration of pregnancy 26-33 completed weeks | 1 |
| O09.5 | Duration of pregnancy 34-36 completed weeks | 1 |
| Total | | 11 |

Procedure Coding

Table 11 gives the total number of obstetrics procedures codes recorded in the Pilot Study. As with all procedures coded in ICD-10-AM, an anaesthetic code is recorded to indicate the type of anaesthetic used. A total of 27 anaesthetic codes associated with obstetric procedures were recorded in the Pilot Study and can account for the higher number of obstetric procedure codes collected in ICD-10-AM.

Table 11: Numbers of Procedure Codes in the Pilot Study

| Obstetric Procedures | ICD-10-AM | ICD-9-CM |
|-------------------------------|-----------|----------|
| Principal Obstetric Procedure | 48 | 48 |
| All Obstetric Procedures | 111 | 91 |

The anaesthetic codes used with obstetric procedures are contained in Block 1333, *Analgesia and Anaesthesia during labour and caesarian section*.⁴⁹ These anaesthetic codes as recorded in the Pilot Study are in Table 12.

Table 13 breaks down the principal procedure codes collected in ICD-10-AM and ICD-9-CM for obstetric cases in the Pilot Study. There are separate codes in ICD-10-AM for Emergency lower segment caesarean section (16520-03) and Elective lower segment caesarean section (16520-02). In ICD-9-CM there is no breakdown between Emergency and Elective caesarean section.

⁴⁹ The definitions of the ASA scores for these procedures are detailed in Box 5.

Table 12: ICD-10-AM Codes Assigned for Analgesia and Anaesthesia during Labour and Caesarian Section [Block 1333] in the Pilot Study

| ICD-10-AM code | Description | Number Coded |
|----------------|---|--------------|
| 92506-19 | Neuraxial block during labour, ASA 19 | 1 |
| 92506-99 | Neuraxial block during labour, ASA 99 | 13 |
| 92506-99 | Neuraxial block during labour, ASA 99 | 6 |
| 92506-99 | Neuraxial block during labour, ASA 99 | 1 |
| 92507-10 | Neuraxial block during labour and caesarean section, ASA 10 | 1 |
| 92507-19 | Neuraxial block during labour and caesarean section, ASA 19 | 2 |
| 92507-90 | Neuraxial block during labour and caesarean section, ASA 90 | 1 |
| 92507-99 | Neuraxial block during labour and caesarean section, ASA 99 | 1 |
| 92507-99 | Neuraxial block during labour and caesarean section, ASA 99 | 1 |
| Total | | 27 |

Table 13: Obstetrics Principal Procedures in the Pilot Study

| ICD-10-AM | | | ICD-9-CM | | |
|---------------|--|-----------|----------|---|-----------|
| Code | Principal Procedure | Number | Code | Principal Procedure | Number |
| 90481-00 | Suture of 1st or 2nd degree tear of perineum | 9 | 74.1 | Low Cervical Caesarean Section | 13 |
| 90466-01 | Surgical augmentation of labour | 9 | 75.69 | Repair current obstetric laceration NEC | 9 |
| 16520-03 | Emergency lower segment caesarean section | 9 | 73.09 | Artificial Rupture of membranes (AROM), NEC | 9 |
| 90472-00 | Episiotomy | 8 | 73.6 | Episiotomy | 8 |
| 90465-05 | Medical and surgical induction of labour | 4 | 73.4 | Medical induction labour | 4 |
| 16520-02 | Elective lower segment caesarean section | 4 | 73.01 | Induction labour by AROM | 4 |
| 90465-01 | Medical induction of labour, prostaglandin | 2 | 72.1 | Low forceps with episiotomy | 1 |
| 92506-99 | Neuraxial block during labour, ASA 99 | 1 | | | |
| 90468-00 | Low forceps delivery | 1 | | | |
| 90466-02 | Medical and surgical augmentation of labour | 1 | | | |
| Totals | | 48 | | | 48 |

ICD-10-AM has six codes available in Block 1334 *Medical or surgical induction of labour*. ICD-9-CM has three codes available in Chapter 13, *Obstetrical Procedures* (Code range 72-75) to code medical or surgical induction of labour.

DILATION AND CURETTAGE (D&C)

Dilation and curettage (D&C) is a procedure in which the lining of the uterus (endometrium) is scraped away. It is a common procedure with almost 13,500 D&Cs reported to HIPE for 2002. It is used to obtain tissue for microscopic evaluation to rule out cancer. D&C may also be used to diagnose and treat heavy menstrual bleeding, and to diagnose endometrial polyps and uterine fibroids. A D&C can be used as a treatment as well, to remove pregnancy tissue after a miscarriage, incomplete abortion, or childbirth. In ICD-9-CM there are three codes for D&C:

- 69.01 Dilation and curettage for termination of pregnancy.
- 69.02 Dilation and curettage following delivery or abortion.
- 69.09 Other dilation and curettage including diagnostic D&C.

Code 69.01 is never used in Ireland and the HIPE software checks its use.

In ICD-10-AM there are five codes for D&C in two separate blocks. D&C is classified separately for Gynaecological procedures in Block 1265, *Curettage of uterus*. This Block contains two codes for Curettage of the non-gravid⁵⁰ uterus, *Diagnostic dilation and curettage of uterus* (35640-00) and *Curettage of uterus without dilation* (35640-01). Obstetric procedures are contained in Block 1267, *Evacuation of gravid uterus*. Block 1267 contains three codes for curettage of the gravid uterus.

The first code listed is 35643-00 *Dilation and curettage following abortion or for termination of pregnancy*. This code identifies both the D&C following abortion and that for termination of pregnancy. In ICD-9-CM these codes are separate. The other codes provided in Block 1267 are *Suction curettage of uterus* (35643-01) and *Dilation and evacuation of uterus [D&E]* (35643-02). Table 14 gives a breakdown of the use of the D&C codes collected in the Pilot Study. Three of the five codes available in ICD-10-AM were used in the Pilot Study.

Table 14: Coding of Dilation and Curettage (D&C) in the Pilot Study

| ICD-10-AM Code | Procedure | No. Coded | ICD-9-CM Code | Procedure | No. Coded |
|----------------|---|-----------|---------------|---|-----------|
| 35640-00 | Dilation and curettage of uterus [D&C] | 5 | 69.02 | D&C POST Delivery or abortion (miscarriage) | 9 |
| 35643-00 | Dilation and curettage [D&C] following abortion or for termination of pregnancy | 3 | 69.09 | D&C NEC | 5 |
| 35643-01 | Suction curettage of gravid uterus | 6 | | | |
| Total | | 14 | | | 14 |

The procedure codes for D&C record important activity in HIPE. ICD-10-AM provides five codes to identify different D&C procedures and ICD-9-CM provides three codes. The combination of the D&C following abortion and that for termination of pregnancy is a change in the classification of this procedure.

4.2.5 CLASSIFICATION OF FACTORS INFLUENCING HEALTH STATUS AND CONTACT WITH HEALTH SERVICES – THE V AND Z CODES

The V-Codes section in ICD-9-CM is a special supplementary classification of factors influencing health status and contact with health services (V01-V82). The V-Code chapter is presented as a supplementary classification after the main ICD-9-CM classification. In ICD-10-AM Z codes (Z00–Z99) are the final chapter within the main disease classification and are for coding persons with potential health hazards related to family and personal history and certain conditions influencing health status and contact with Health Services. These ‘V’ and ‘Z’ codes are necessary for coding situations:

1. When a person with a known disease or injury, whether it is current or resolving, encounters the health care system for a specific treatment of that disease or injury e.g. chemotherapy for malignancy V58.1 (ICD-9-CM) and Z51.1 (ICD-10-AM).
2. When some circumstance or problem is present which influences the person’s health status but is not in itself a current illness or injury.

⁵⁰ Gravid = pregnant.

Factors can be recorded that may have an impact on the person receiving care for some current illness or injury classifiable in the rest of the disease classification e.g. Personal history of malignancy.

3. When a person who is not currently sick encounters the health services for some specific purpose, such as to act as a donor of an organ or tissue, to receive prophylactic vaccination, or to discuss a problem which is in itself not a disease or injury

These codes may be used as principal or secondary diagnoses codes depending on the circumstances of the admission and the guidelines governing the use of the V (ICD-9-CM) or Z (ICD-10-AM) code in question. Table 15 shows the Z and V codes used as principal diagnoses in the Pilot Study.

A total of 219 Z codes were recorded in all positions in the Pilot Study, accounting for 53 different Z codes from ICD-10-AM. A total of 158 V-codes covering 49 different V codes were recorded in ICD-9-CM. Tobacco use is recorded differently in ICD-10-AM and this accounts for an additional 42 codes assigned as Z-codes. The coding of tobacco use is discussed in more detail in the next section.

Table 15: Z and V Codes used as Principal Diagnoses in the Pilot Study

| ICD-10-AM | Description | Code Count | ICD-9-CM | Description | Code Count |
|--------------|---|------------|----------|---------------------------------------|------------|
| Z60.4 | Social exclusion and rejection | 2 | V67.0 | Surgery follow-up | 4 |
| Z08.0 | Follow-up examination after surgery for malignant neoplasm | 2 | V60.8 | Housing/economic circumstances NEC | 2 |
| Z47.0 | Follow-up care involving removal of fracture plate and other internal fixation device | 1 | V71.8 | Observation for suspect condition NEC | 1 |
| Z46.6 | Fitting and adjustment of urinary device | 1 | V54.0 | Removal internal fixation device | 1 |
| Z43.1 | Attention to gastrostomy | 1 | V53.6 | Fitting urinary devices | 1 |
| Z41.2 | Routine and ritual circumcision | 1 | V50.2 | Routine circumcision | 1 |
| Z30.0 | General counselling and advice on contraception | 1 | V25.1 | Insertion of IUD | 1 |
| Z09.8 | Follow-up examination after other treatment for other conditions | 1 | | | |
| Z03.8 | Observation for other suspected diseases and conditions | 1 | | | |
| Total | | 11 | | | 11 |

4.2.6 CODING OF TOBACCO USE

In ICD-9-CM smoking is assigned to code 305.1 *Tobacco use disorder*, a code from Chapter 5 of ICD-9-CM (*Mental disorders* 290-319). Any history of tobacco use on a chart is coded to V15.82 *history of tobacco use*.

In ICD-10-AM a distinction is made between current use and hazardous use of tobacco. ACS 0503 *Drug, Alcohol and Tobacco use disorders* provides guidance on code assignment related to tobacco. Z86.43 *Personal History of Tobacco use disorder* is assigned to indicate that a patient has smoked tobacco in the past but excluding the last month. Z72.0 *Tobacco use, current* is assigned if the documentation indicates that the patient has smoked tobacco (any amount) within the last month. Code F17.1 *Harmful use of tobacco* is assigned if the clinician has clearly documented a relationship between a particular condition and smoking. ICD-10-AM code F17.2 *Tobacco dependence syndrome* is assigned when the patient is diagnosed as having 'Tobacco dependence syndrome'. Table 16 shows the codes used to identify tobacco use both past and present as recorded in the Pilot Study.

Table 16: Coding of Tobacco Use in the Pilot Study

| ICD10-AM Code | Tobacco use | Code Count | ICD-9CM Code | Tobacco Use | Code Count |
|---------------|---|------------|--------------|------------------------|------------|
| Z72.0 | Tobacco use, current | 42 | 305.1 | Tobacco use disorder | 48 |
| Z86.43 | Personal history of tobacco use disorder | 23 | V15.82 | History of tobacco use | 23 |
| F17.2 | Mental and behavioural disorders due to use of tobacco, dependence syndrome | 6 | | | |
| Total | | 71 | | | 71 |

4.2.7 EXTERNAL CAUSE CODES

In ICD-9-CM external cause codes are included in cases where there has been an accident, injury or poisoning. This 'E' Code identifies the type of accident and the intent i.e. accidental, deliberate or assault. In addition to this E code another E code from the E849.x range is mandatory to identify the place of occurrence of the accident or poisoning.

Place of Occurrence Codes

Each time an injury or poisoning is recorded a place of occurrence code is added. In ICD-9-CM these codes all fall within the four digit E849.x providing 10 codes to identify location of an injury or poisoning. In ICD-10-AM these codes fall into the 5-digit Y92 category giving 52 codes to identify place of occurrence. The Place of Occurrence codes assigned in the Pilot Study are shown in Table 17.

Table 17: Coding of Place of Occurrence in the Pilot Study

| ICD-10-AM Code | ICD-10-AM – Y92 | | ICD-9-CM Code | E849 – ICD-9-CM | |
|----------------|--|-------------|---------------|---------------------------------|-------------|
| | Location | Cases Coded | | Location | Cases Coded |
| Y92.09 | Other and unspecified place in home | 20 | E849.0 | Home accidents | 19 |
| Y92.9 | Unspecified place of occurrence | 8 | E849.9 | Accident in place NOS | 10 |
| Y92.40 | Street and highway, roadway | 6 | E849.5 | Accident on street/highway | 10 |
| Y92.21 | School | 3 | E849.6 | Accident in public building | 6 |
| Y92.88 | Other specified place of occurrence | 2 | E849.3 | Accident on industrial premises | 3 |
| Y92.69 | Unspecified industrial and construction area | 2 | E849.8 | Accident in place NEC | 1 |
| Y92.48 | Other specified public highway, street or road | 2 | E849.4 | Accident in recreation area | 1 |
| Y92.41 | Street and highway, sidewalk | 2 | E849.1 | Farm Accidents | 1 |
| Y92.7 | Farm | 1 | | | |
| Y92.62 | Industrial and construction area, factory and plant | 1 | | | |
| Y92.50 | Trade and service area, shop and store | 1 | | | |
| Y92.49 | Unspecified public highway, street or road | 1 | | | |
| Y92.29 | Other specified institution and public administrative area | 1 | | | |
| Y92.22 | Health service area | 1 | | | |
| Total | | 51 | | | 51 |

Of the 51 cases where these codes were assigned in ICD-10-AM, 14 different Y92 codes were assigned representing 27 per cent of the codes available. In ICD-9-CM 7 of the codes available were used representing 70 per cent of the total number of codes. While there are many more codes available in ICD-10-AM, the place of occurrence codes remain clustered in a small number of codes. Home accidents are the most common place of occurrence in both classifications representing 39 per cent of all locations identified.

Unspecified place of occurrence is the next highest set of codes collected in both classifications with 15.7 per cent ($n = 8$) in ICD-10-AM and 19.7 per cent ($n=10$) in ICD-9-CM. These unspecified codes are used due to lack of information in the charts.

In ICD-10-AM there are three external cause codes to be collected on each case where there is accident, injury or poisoning. As with ICD-9-CM, there are codes provided for the type of accident and the place of occurrence. In addition to these two codes, it is mandatory to include a code from the *Activity while injured* code range (U50–U73) to identify the activity while injured as discussed below.

Activity While Injured

During development of ICD-10-AM Third Edition, it was found that there was strong user demand for extension of this list. Technical factors would have prevented any extension of the list of sports under the approach used to include ‘activity’ codes in the Second Edition (that is, as a fourth and fifth digit expansion of Y93). NCCCH decided to move the activity classification to the unused range of ICD-10 codes commencing with the letter ‘U’. The list of ‘types of sport’ included there is based on that in the International Classification of External Causes of Injury (ICECI) version 1.0. That, in turn, was based on one that forms part of the Australian Sports Injury Data Dictionary.

Within the Activity code range (U50–U71), 206 (93.2 per cent) of the 221 codes available are commonly recognised as sports, though they may also be identified as leisure. U72 *Leisure activity, not elsewhere classified* (1 code) is provided to enable coding of other leisure activities not identified as sport. The range *Other activity* (U73) contains 14 codes (6.3 per cent) and includes codes for working for income according to industry type. Other activities classified within this last U73 code include other types of work (U73.1) and activities such as resting, sleeping or eating (U73.2).

Table 18 breaks down the Activity codes collected in the Pilot Study. From the data collected, 74.4 per cent ($n=35$) fall into the unspecified or other specified activity code range. 94 per cent ($n = 44$) are in the U73 range. One code falls into the category U50 – U71 (Sports) range.

Table 18: Activity Codes (U50 – U73) Collected in the Pilot Study

| ICD10-AM Code | Activity | Cases Coded | % |
|---------------|---|-------------|------------|
| U73.9 | Unspecified activity | 19 | 40.4 |
| U73.8 | Other specified activity | 16 | 34.0 |
| U73.09 | While working for income, unspecified | 3 | 6.38 |
| U73.00 | Agriculture, forestry and fishing | 2 | 4.25 |
| U72 | Leisure activity, not elsewhere classified | 2 | 4.25 |
| U73.2 | While resting, sleeping, eating or engaging in other vital activities | 1 | 2.1 |
| U73.1 | While engaged in other types of work | 1 | 2.1 |
| U73.05 | Transport and storage | 1 | 2.1 |
| U73.04 | Wholesale and retail trade | 1 | 2.1 |
| U50.09 | Football, unspecified | 1 | 2.1 |
| Total | | 47 | 100 |

4.3 Coding of Procedures

In ICD-9-CM there is no restriction on the assignment of procedure codes, with capacity to code up to ten as appropriate. The principal procedure is one that is performed for definitive treatment (rather than one performed for diagnostic or exploratory purposes). If two or more procedures appear to meet this definition, the one most related to the principal diagnosis is designated as the principal procedure. If both are related to the principal diagnosis, the most resource-intensive or complex procedure is usually designated as the principal

procedure. When more than one code is needed to fully identify the principal procedure, any ICD-9-CM directions for sequencing are followed.

In ICD-10-AM the order of codes is the same as described above for ICD-9-CM with therapeutic procedures taking precedence and those related to the principal diagnosis taking precedence over others. Diagnostic procedures are sequenced after these.

The ACHI Procedures classification in ICD-10-AM provides more codes than are available in ICD-9-CM as presented in Table 19 below.

Table 19: Comparison of ICD-10-AM & ICD-9-CM Tabular Lists of Procedures within Chapter by Number of Codes and Percentage Change

| ICD-10-AM Chapter | | Number of ICD-10-AM Codes | ICD-9-CM Chapter | | Number of ICD-9-CM Codes | % Change in ICD-10-AM |
|------------------------------|---|---------------------------|------------------|---|--------------------------|-----------------------|
| I | Procedures on Nervous System | 337 | 1. | Operations on the Nervous System (01-05) | 130 | +159.2 |
| II | Procedures on Endocrine System | 52 | 2. | Operations on the Endocrine System (06-07) | 69 | -24.6 |
| III | Procedures on Eye and Adnexa | 303 | 3. | Operations on the Eye (08-16) | 282 | +7.4 |
| IV | Procedures on Ear and Mastoid Process | 92 | 4. | Operations on the Ear (18-20) | 59 | +55.9 |
| V | Procedures on Nose, Mouth and Pharynx | 167 | 5. | Operations on the Nose, Mouth, And Pharynx (21-29) | 178 | +125.3 |
| VI | Dental Services | 234 | | | | |
| VII | Procedures on Respiratory System | 151 | 6. | Operations on the Respiratory System (30-34) | 117 | +29.0 |
| VIII | Procedures on Cardiovascular System | 704 | 7. | Operations on the Cardiovascular System (35-39) | 248 | +183.9 |
| IX | Procedures on Blood and Blood-Forming Organs | 45 | 8. | Operations on the Hemic And Lymphatic System (40-41) | 49 | -8.2 |
| X | Procedures on Digestive System | 513 | 9. | Operations on the Digestive System (42-54) | 435 | +17.9 |
| XI | Procedures on Urinary System | 272 | 10. | Operations on the Urinary System (55-59) | 157 | +73.2 |
| XII | Procedures on Male Genital Organs | 150 | 11. | Operations on the Male Genital Organs (60-64) | 102 | +47.0 |
| XIII | Gynaecological Procedures | 209 | 12. | Operations on the Female Genital Organs (65-71) | 180 | +16.1 |
| XIV | Obstetric Procedures | 102 | 13. | Obstetrical Procedures (72-75) | 63 | +61.9 |
| XV | Procedures on Musculoskeletal System | 987 | 14. | Operations on the Musculoskeletal System (76-84) | 623 | +58.4 |
| XVI | Dermatological and Plastic Procedures | 467 | 15. | Operations on the Integumentary System (86) | 48 | +872.9 |
| XVII | Procedures on Breast | 49 | 15. | Operation on the breast (85) | 46 | +6.5 |
| XVIII | Chemotherapeutic and Radiation Oncology Procedures | 75 | 16. | Miscellaneous diagnostic and therapeutic procedures (87-99) | | |
| XIX | Non-invasive, Cognitive and Interventions, not elsewhere classified | 644 | | | | |
| XX | Imaging Services | 373 | | | 772 | +141.5 |
| Total number of codes | | 5,926 | | | 3,558 | +67.4 |

There is a 67.4 per cent increase in the procedure codes available in ICD-10-AM. The biggest increase is in the chapter for Dermatological and Plastic procedures where there is an increase of almost 873 per cent, from 48 codes in

ICD-9-CM to 467 codes in ICD-10-AM. A common procedure from this section collected in HIPE is Excision of skin lesion. In ICD-9-CM this is collected using codes 86.3 (*Excision of lesion of skin*) and 86.4 (*Radical excision of skin lesion*). Table 20 gives a breakdown of the ICD-9-CM and ICD-10-AM codes collected for Excision of skin lesion collected in the Pilot Study.

Table 20: Procedure Codes Collected for Excision of Skin Lesion in the Pilot Study

| ICD-10-AM CODE | Procedure | No | ICD-9-CM CODE | Procedure | No |
|-------------------|---|-----------|------------------|---|-----------|
| 31235-00 | Excision of lesion of skin and subcutaneous tissue of other site of head | 5 | 86.3 | Other local excision or destruction of skin | 14 |
| 31205-00 | Excision of lesion of skin and subcutaneous tissue of other site | 5 | 86.4 | Radical excision skin lesion | 1 |
| 31235-03 | Excision of lesion of skin and subcutaneous tissue of leg | 3 | | | |
| 30099-00 | Excision of sinus of skin and subcutaneous tissue | 1 | | | |
| 31245-03 | Extensive excision of skin and subcutaneous tissue for sycosis, from face or neck | 1 | | | |
| Total | | 15 | | | 15 |

4.3.1 DISTRIBUTION OF PROCEDURE CODES COLLECTED IN THE PILOT STUDY

Table 21 shows the average number of procedure codes assigned, when a procedure was performed in cases coded in the Pilot Study. In ICD-9-CM 84.8 per cent ($n = 402$) of cases had at least one procedure code assigned with 82.5 per cent ($n = 391$) of cases in ICD-10-AM having at least one procedure code.

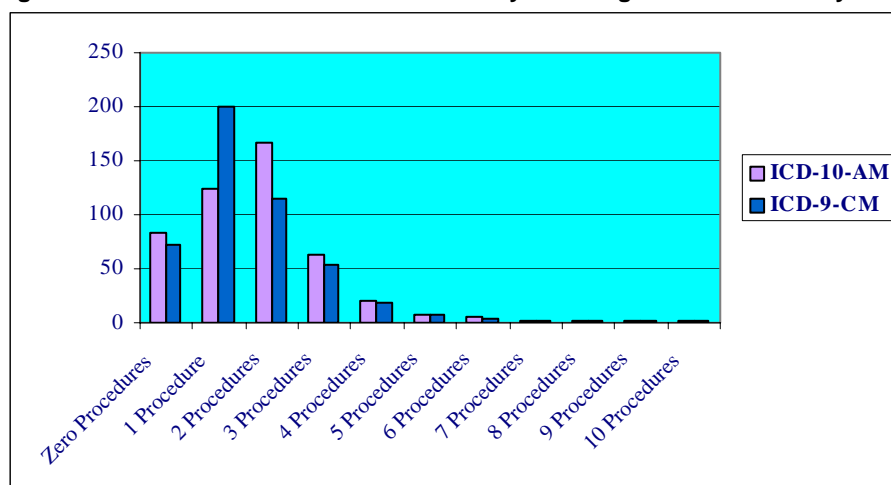
Table 21: Average Number of Procedure Codes Assigned, when a Procedure was Performed in the Pilot Study

| | ICD-10-AM | ICD-9-CM |
|---|------------|------------|
| Average Number of Procedures per case | 2.15 | 1.89 |
| Average Number of Secondary Procedures per case | 1.15 | 0.90 |
| Total Number of cases that have a Procedure | 391 | 402 |
| Total number of cases | 474 | 474 |

Table 22 shows the distribution of procedures codes assigned in the Pilot Study and Figure 2 illustrates this table.

Table 22: Distribution of Procedures Coded by Discharge in the Pilot Study

| Number of Procedures Coded | ICD-10-AM | % | ICD-9-CM | % |
|----------------------------|------------|------------|------------|------------|
| Zero Procedures | 83 | 17.5 | 72 | 15.2 |
| 1 Procedure | 124 | 26.2 | 200 | 42.2 |
| 2 Procedures | 166 | 35.0 | 115 | 24.3 |
| 3 Procedures | 63 | 13.3 | 53 | 11.2 |
| 4 Procedures | 20 | 4.2 | 18 | 3.8 |
| 5 Procedures | 8 | 1.7 | 7 | 1.5 |
| 6 Procedures | 5 | 1.1 | 4 | 0.8 |
| 7 Procedures | 1 | 0.2 | 1 | 0.2 |
| 8 Procedures | 1 | 0.2 | 1 | 0.2 |
| 9 Procedures | 1 | 0.2 | 2 | 0.4 |
| 10 Procedures | 2 | 0.4 | 1 | 0.2 |
| Total | 474 | 100 | 474 | 100 |

Figure 2: Distribution of Procedures Coded by Discharge in the Pilot Study

4.3.2 AUSTRALIAN CODING STANDARD 0042 *PROCEDURES NORMALLY NOT CODED*

As noted in the previous sections, ICD-10-AM differs significantly from ICD-9-CM in the collection of procedures. Australian Coding Standard *0042 Procedures normally not coded* lists procedures not coded because they are usually routine in nature, performed for most patients and/or can occur multiple times

Table 23: Procedure Codes Recorded in ICD-9-CM in Pilot Study that would not normally be collected in ICD-10-AM according to ACS 0042 *Procedures not Normally Coded*

| ICD-9-CM Code | Procedure | Code Count |
|---------------|------------------------------------|------------|
| 99.21 | Injection antibiotic | 38 |
| 87.44 | Routine chest X-ray | 26 |
| 88.71 | Diagnostic ultrasound - head/neck | 9 |
| 88.72 | Diagnostic ultrasound-heart | 7 |
| 89.52 | Electrocardiogram | 7 |
| 99.29 | Inject/infuse NEC | 6 |
| 88.75 | Diagnostic ultrasound-urinary | 6 |
| 89.14 | Electroencephalogram | 5 |
| 89.54 | ECG monitoring | 4 |
| 87.17 | Skull X-ray NEC | 3 |
| 88.73 | Diagnostic ultrasound - thorax NEC | 2 |
| 88.74 | Diagnostic ultrasound - digest | 2 |
| 88.28 | Skeletal X-ray-ankle & foot | 2 |
| 88.23 | Skeletal X-ray-wrist & hand | 2 |
| 93.57 | Application other wound dressing | 2 |
| 88.79 | Diagnostic ultrasound NEC | 1 |
| 88.76 | Diagnostic ultrasound - abd | 1 |
| 88.77 | Diagnostic ultrasound-vascular | 1 |
| 87.03 | Routine chest X-ray | 1 |
| 87.09 | Head soft tissue X-ray NEC | 1 |
| 87.16 | Facial bone X-ray NEC | 1 |
| 87.22 | Cervical spine X-ray NEC | 1 |
| 81.92 | Injection into joint | 1 |
| 87.29 | Spinal X-ray NEC | 1 |
| 87.79 | Urinary system X-ray NEC | 1 |
| 88.24 | Skeletal X-ray-up limb NOS | 1 |
| 88.26 | Skeletal X-ray-pelv/hip NEC | 1 |
| 88.31 | Skeletal series X-ray | 1 |
| 88.22 | Skeletal X-ray-elbow/forearm | 1 |
| Total | | 135 |

during an episode.⁵¹ The reason given for omitting these codes is that the resources used to perform these procedures are often reflected in the diagnosis or in an associated procedure. For example: X-ray and application of plaster is expected with a diagnosis of Colles' fracture; intravenous antibiotics are expected with a diagnosis of septicaemia.

Table 23 presents a breakdown of the 135 procedure codes collected in ICD-9-CM in the Pilot Study that would not normally be collected in ICD-10-AM.

4.3.3 ANAESTHETICS

Anaesthetics are coded in ICD-10-AM. This is additional information not coded using ICD-9-CM. Australian Coding Standard 0031 *Anaesthesia* provides instruction on the coding of anaesthesia. General Anaesthetic (92514.xx) is coded as appropriate. *Sedation* (92515-XX) may be assigned where the anaesthetic is administered as per general anaesthesia (i.e. intravenous or inhalational or both). *Local anaesthesia* (92513-XX) is assigned for administration of local anaesthetic (either injection or topical) when the anaesthetic documentation supports its assignment. *Neuraxial block* (92508-XX) is assigned for epidural, spinal or caudal (or any combination) anaesthesia, and includes both injection and infusion. Oral Sedation is not coded. There are also special obstetric anaesthetic codes assigned as appropriate.

These anaesthetic codes require a two-character extension, which represents the patient's ASA (American Society of Anaesthesiologists) score. The first character of the two-character extension of the procedure code is the ASA score representing the patient's status at the time of the procedure. The second character of the extension represents whether a modifier of 'E' is recorded on the anaesthetic form in addition to the ASA score. 'E' signifies a procedure that is being performed as an emergency and may be associated with a suboptimal opportunity for risk modification. The modifier 'E' is represented by the digit '0'. *ACS 0031 Anaesthesia* states that this information must be documented on the anaesthetic form before assigning these codes. Where there is no documentation of ASA score or the emergency modifier is not indicated, filler digits of '9' will be assigned. This classification is shown in Box 5.

Box 5

American Society of Anaesthesiologists (ASA) Physical Status Classification

First Character

| ASA Class | Description |
|-----------|--|
| 1 | A normal healthy patient |
| 2 | A patient with mild systemic disease |
| 3 | Patient with severe systemic disease that limits activity |
| 4 | Patient with a severe systemic disease that is a constant threat to life |
| 5 | A moribund patient who is not expected to survive longer than 24 hours without surgical intervention |
| 6 | A declared brain-dead patient whose organs are being removed for donor purposes |
| 9 | No documentation of ASA score |

Second Character

| Emergency modifier | Character | Description |
|--------------------|-----------|---|
| E | 0 | procedure being performed as an emergency |
| | 9 | non-emergency or not known ⁵² |

⁵¹ Extracted from NCCH ICD-10-AM, July 2002, Australian Coding Standard 0042.

⁵² Extracted from NCCH ICD-10-AM, July 2002, Procedures.

Table 24 indicates the ASA score recorded with the appropriate codes in blocks [1333] *Analgesia and anaesthesia during labour and caesarean section*, [1909] *Conduction anaesthesia* and [1910] *Cerebral anaesthesia*. The first character of the two-character extension of the procedure code is the ASA score representing the patient's status at the time of the procedure. The second character of the extension represents whether a modifier of 'E' is recorded on the anaesthetic form in addition to the ASA score. 'E' signifies a procedure that is being performed as an emergency. The modifier 'E' is represented by the digit '0'. ACS 0031 states that this information must be documented on the anaesthetic form before assigning these codes. Where there is no documentation of ASA score or the emergency modifier is not indicated, filler digits of '9' will be assigned.

This table shows that information about the patient's specific ASA score is available on 40.5 per cent (n=85) of charts. These charts indicated an ASA of 1 - 4. The remaining 59.5 per cent (n=125) had no information recorded on the ASA score with the assignment of the '9' (no documentation of ASA score) in the sixth position. All operations sheets reviewed during the Pilot Study had a section for the ASA to be recorded by the Anaesthesiologist. Emergency surgery was indicated on 8.6 per cent (n=18) of procedures performed. The remaining 91.4 per cent (n=192) had no indication of emergency on the anaesthetic sheet. This indicates the procedures were either non-emergency or it was unknown. Of the comments collected on a case by case basis, eight refer to lack of documentation for ASA with twenty comments specifically on the issue of coding anaesthetics.

Table 24: ASA Scores Assigned to the 210 Anaesthesia Codes in the Pilot Study

| ASA Score | ASA Class | Description | Emergency modifier | Description | Total coded | % |
|--------------|-----------|--|--------------------|---|-------------|------------|
| 92507-10 | 1 | A normal healthy patient | E | procedure being performed as an emergency | 1 | 0.5 |
| 92514-10 | | | | | 9 | 4.3 |
| | | | | | | |
| 92506-19 | | | None | non-emergency or not known | 1 | 0.5 |
| 92507-19 | | | | | 2 | 0.9 |
| 92514-19 | | | | | 31 | 14.8 |
| 92514-20 | 2 | A patient with mild systemic disease | E | procedure being performed as an emergency | 1 | 0.5 |
| | | | | | | |
| | | | | | | |
| 92513-29 | | | None | non-emergency or not known | 1 | 0.5 |
| 92514-29 | | | | | 26 | 12.4 |
| | | | | | | |
| 92514-30 | 3 | Patient with severe systemic disease that limits activity | E | procedure being performed as an emergency | 2 | 0.9 |
| | | | | | | |
| | | | | | | |
| 92513-39 | | | None | non-emergency or not known | 2 | 0.9 |
| 92514-39 | | | | | 8 | 3.8 |
| | | | | | | |
| 92514-49 | 4 | Patient with a severe systemic disease that is a constant threat to life | None | non-emergency or not known | 1 | 0.5 |
| | | | | | | |
| | | | | | | |
| 92507-90 | 9 | No documentation of ASA score | E | procedure being performed as an emergency | 1 | 0.5 |
| 92514-90 | | | | | 4 | 1.9 |
| | | | | | | |
| 92514-99 | | | None | non-emergency or not known | 64 | 30.6 |
| 92515-99 | | | | | 17 | 8.1 |
| 92506-99 | | | | | 20 | 9.6 |
| 92507-99 | | | | | 2 | 0.9 |
| 92508-99 | | | | | 1 | 0.5 |
| 91513-99 | | | | | 15 | 7.2 |
| 91512-99 | | | | | 1 | 0.5 |
| Total | | | | | 210 | 100 |

4.3.4 ALLIED HEALTH INTERVENTIONS

Codes are available in ICD-10-AM Third Edition to identify ‘Allied Health Interventions’. The concept underlying these interventions is that they are considered ‘provider neutral’, that is, the same code will be assigned for a specific intervention regardless of which health professional performs the intervention. The interventions of 13 allied health professions are represented in ICD-10-AM:

- Dietetics
- Social Work
- Occupational Therapy
- Physiotherapy
- Podiatry
- Speech Pathology
- Pastoral Care
- Audiology
- Orthoptics
- Prosthetics & Orthotics
- Pharmacy
- Psychology
- Music therapy

Block 1916 *Generalised Allied Health Interventions* contains the general allied health intervention codes. A code from Block 1916 will only be assigned once for an episode of care, regardless of the number of specific interventions performed by the relevant professional. Table 25 shows the Allied Health Interventions collected in the Pilot Study. In ICD-9-CM there are procedure codes for physiotherapy (93.9x) and occupational therapy (93.8x). Consultations with Dietitians are captured in ICD-9-CM as diagnoses using V-codes from the supplementary classification (V65.3 Dietary surveillance and counselling). V-codes can also be used to indicate difficult social circumstances where a social worker would be involved in a case (Persons encountering health services in other circumstances (V60-V68)).

Table 25: Allied Health Interventions Coded in the Pilot Study

| ICD-10-AM | Allied Health Intervention | Cases Coded |
|--------------|----------------------------|-------------|
| 95550-03 | Physiotherapy | 24 |
| 95550-02 | Occupational therapy | 6 |
| 95550-00 | Dietetics | 6 |
| 95550-01 | Social work | 5 |
| 95550-05 | Speech pathology | 2 |
| 95550-10 | Psychology | 1 |
| Total | | 44 |

4.4 Comments on Data Collection

The comments collected on the forms were entered by coders at the time of coding individual discharges and are useful in assessing specifics of the coding scheme. The comments collected across the different hospitals were both positive and negative with regard to the classification. Coders familiar with coding a specialty were specific about codes they liked or disliked within ICD-10-AM. e.g.

- Nephrology coder in Hospital 2 ‘Better codes for renal disease’.
- Ophthalmology coder in Hospital 5 ‘Good set of codes for laser treatment’.
- Oncology coder in Hospital 5 ‘I like the code section on tomography – a lot more choice’.

Difficulties encountered in coding were also highlighted in the comments box. One coder stated she had ‘Difficulty assessing codes for the secondary diagnoses’. Chart documentation was highlighted as a problem on 19 forms e.g. ‘Chart very vague, no real diagnosis’.

4.5 Questionnaires

As part of the ICD-10-AM Pilot Study, each coder was asked to complete two questionnaires: the first upon completion of the training course (Pilot Training Questionnaire), and the second on completion of the supervised coding period (Pilot Evaluation Questionnaire). The data collected by these questionnaires are summarised here.

4.5.1 ICD-10-AM PILOT TRAINING QUESTIONNAIRE

The questionnaire was divided into 3 sections:

1. Coder Details.
2. Training Experience.
3. ICD-10-AM Training Course.

1. Coder Details

This section contained information on the participating coders and hospitals, and the venue and dates of the training course.

2. Training Experience

The coding experience of the participants ranged from 1 year 9 months to 12 years and all participants regularly coded specialties including anaesthetics, cardiac, neonatal, endocrinology, ENT, geriatrics, gynaecology, haem-oncology, medical, neurology, neoplasms, ophthalmics, orthopaedics, plastics, renal, surgical and urology.

3. ICD-10-AM Training Course

This section collated information on the coders' assessments of the course and their own ability to use the new coding scheme.

Eight out of eleven coders (72.7 per cent) felt that an adequate amount of time was given to the Pilot Coding Training Course, while the remaining 3 coders (27.3 per cent) would have preferred a longer time period. At the end of the training course, 9 participants (81.8 per cent) were confident that they could use ICD-10-AM for coding charts in their own hospital; however, 81.8 per cent also felt that there were areas where further explanation/training would be desirable. These areas included, diabetes, external causes, burns, neoplasms, plastics, injuries and ophthalmics.

Responses to the course level and course speed indicates a high level of satisfaction. Table 26 shows that the course content was regarded as *Excellent* by 36.4 per cent and *Good* by 63.6 per cent. The Instructor's Presentation was rated as *Excellent* by 63.6 per cent and *Good* by 36.4 per cent. Material and Handouts etc. were rated as *Excellent* by 54.5 per cent, *Good* by 36.4 per cent and *Satisfactory* by 9.1 per cent. Overall Course Organisation was also viewed by 72.7 per cent of participants as *Excellent* and *Good* by 27.3 per cent.

Table 26: Participants' Ratings of Training Course Content, Materials and Organisation

| Score | Course Content | | | | Instructor's Presentation | | | | Materials/Handouts etc. | | | | Course Organisation | | | |
|-------|----------------|--------|--------------|-------|---------------------------|--------|--------------|-------|-------------------------|--------|--------------|-------|---------------------|--------|--------------|-------|
| | Excellent | Good | Satisfactory | Poor | Excellent | Good | Satisfactory | Poor | Excellent | Good | Satisfactory | Poor | Excellent | Good | Satisfactory | Poor |
| No. | 4 | 7 | 0 | 0 | 7 | 4 | 0 | 0 | 6 | 4 | 1 | 0 | 8 | 3 | 0 | 0 |
| % | (36.4) | (63.6) | (0.0) | (0.0) | (63.6) | (36.4) | (0.0) | (0.0) | (54.5) | (36.4) | (9.1) | (0.0) | (72.7) | (27.3) | (0.0) | (0.0) |

Participants were asked to comment on aspects of the training course which were of most interest to them and a variety of responses were expressed. In general, the expanded range of available diagnoses and procedure codes were remarked upon as a significant improvement, especially in the areas of paediatrics, gynaecology and obstetrics, while the inclusion of a “Standards”⁵³ book was a welcome and reassuring addition.

Finally, participants were asked for their suggestions on how to improve any aspect of the course. The main response was a request for more time to be allocated to training.

4.5.2 PILOT EVALUATION QUESTIONNAIRE

The second questionnaire was completed at the end of the supervised coding period. This questionnaire had five main sections:

- Coder Details.
- Coding Experience.
- General Coding Questions.
- ICD-10-AM Coding Experience.
- Conclusions.

Coder Details

This section was similar to the first section of the ICD-10-AM Training Questionnaire. It contained information on the course participants, associated hospitals, and the venue and dates of the training course.

Coding Experience

Coders were asked about their experiences of various coding classification schemes. Two coders (18.2 per cent) reported using one coding classification scheme (1999-present), 7 (63.6 per cent) had coded with two different editions of the ICD-9-CM classification schemes (1999-present and 1995-1998) and 2 coders (18.2 per cent) had coded with three different editions of the ICD-9-CM classification scheme (1999-present, 1995-1998 and 1990-1994).

Among the 11 participating coders, the average number of years spent working in a hospital was 12.8 and ranged from 5-25 years. Excluding one coder who only spent approximately 2 hours coding per week, the average number of hours spent coding was 32.8 hours per week.

When asked about the frequency with which each coder used the ICD-9-CM Tabular list, 72.7 per cent reported using it *Always* and the remaining 27.3 per cent reported *Sometimes*. All participants confirmed that they knew certain ICD-9-CM codes off by heart. A total of 72.7 per cent of participants responded that they spent approximately 10-40 per cent of their time coding from memory, while 27.3 per cent claimed that this approach accounted for 50-90 per cent of their time coding. More than 90 per cent of participants kept a notebook which contained frequently used codes. Two coders used their notebooks as a reference for guidelines.

Coders were asked to comment on the greatest challenge encountered when coding with ICD-9-CM. The main response was the lack of specific codes for new diagnoses and procedures within specialty areas. The current presentation of notes in charts was another difficulty regularly encountered. In particular,

⁵³ Australian Coding Standards, Volume 5 of ICD-10-AM, National Centre for Classification in Health, Australia.

relevant information may be difficult to discern, discharge letters are often not included with the file, and histology reports need to be ‘chased down’ in order to obtain the required information.

When asked if coding times in ICD-10-AM were adversely affected, 10 coders responded. The majority of coders (7) believed that the time taken to code using ICD-10-AM was longer compared to using ICD-9-CM. This was mainly due to unfamiliarity with the new coding classification. One coder regarded her coding time as unchanged and two were *Unsure* as they found it too early to comment. One reason given for longer time taken to code was attributed to the increased details which needed to be checked. Approximately 91 per cent of coders felt that their ability to navigate the ICD-10-AM coding books improved as the course progressed. One coder did not feel that any improvement was achieved, however, no reason was given to clarify this answer. The majority of participants (81.8 per cent) also found that their coding speed improved over the course of the study. This was chiefly attributed to practice and increased familiarity. Almost 64 per cent of participants felt that *other features of the study* adversely affected their coding speed during the Pilot Study. These included the lack of specific information contained in the charts and the legibility of charts, the physical space available to work on (i.e. desk size compared to the number of coding books) and the number of books in particular were found to be cumbersome.

Several areas of the ICD-10-AM coding classification were identified as significant improvements; these included the availability of more codes for diagnoses and procedures, especially in the specialties of paediatrics, gestation/pregnancy and anaesthetics. Other areas of improvement included the layout, legibility and print of the ICD-10-AM books, and the existence of Block Numbers and a Standards book. The availability of a CD version of the coding books was also regarded favourably.

The main disadvantage with the ICD-10-AM classification scheme was the number of individual books (i.e. five volumes); too many books was regarded as cumbersome and it was suggested that the amalgamation of the Tabular and Alphabetic index would be welcomed. Another drawback was the extra details required relating to operations, anaesthetic, labour and neonatal care. Collection of such details was regarded as difficult because sufficient information is generally not currently available on charts.

The final section of this second questionnaire examined the preferences between ICD-9-CM and ICD-10-AM. Participants were asked to compare the two classifications under several areas: (a) Coding Books – Quality, Print, Size of text and Durability and (b) Coding Classifications – Diagnoses, Procedures, Guidelines and Overall. The results are summarised in Tables 27 and 28.

Table 27: Coding Books – Preference Based on Quality, Print, Size of Text and Durability

| | ICD-9-CM (%) | ICD-10AM (%) | No Preference (%) | Like Neither (%) | Total |
|--------------|--------------|--------------|-------------------|------------------|----------|
| Quality | 0 (0) | 6 (54.5) | 4 (36.4) | 1 (9.1) | 11 (100) |
| Print | 1 (9.1) | 9 (81.8) | 1 (9.1) | 0 (0) | 11 (100) |
| Size of text | 5 (45.5) | 3 (27.3) | 3 (27.3) | 0 (0) | 11 (100) |
| Durability | 2 (18.2) | 4 (36.4) | 4 (36.4) | 1 (9.1) | 11 (100) |

Approximately 55 per cent of participants preferred the quality of the ICD-10-AM books, 36.4 per cent had *No Preference* and 9.1 per cent reported that they *Liked Neither*. By far, the majority of participating coders (81.8 per cent) preferred the size of text in the ICD-10-AM books, however, the print size in the ICD-9-CM books was preferred by 45.5 per cent with 27 per cent expressing *No Preference* and 27.3 per cent who *Liked Neither*. Preferences regarding the durability of the coding books were mixed: 36.4 per cent chose

the ICD-10-AM books, 36.4 per cent expressed *No Preference*, while 18.2 per cent chose the ICD-9-CM books and 9.1 per cent *Liked Neither*.

Table 28: Expressed Preferences for Coding Classification Schemes

| | ICD-9-CM (%) | ICD-10AM (%) | No Preference (%) | Like Neither (%) | Total |
|------------|-----------------|-----------------|-------------------------|---------------------|----------|
| Diagnoses | 3 (27.3) | 7 (36.6) | 1 (9.1) | 0 (0) | 11 (100) |
| Procedures | 0 (0) | 10 (100) | 0 (0) | 0 (0) | 10 (100) |
| Guidelines | 0 (0) | 10 (90.9) | 0 (0) | 1 (9.1) | 11 (100) |
| Overall | 1 (11.1) | 7 (77.8) | 1 (11.1) | 0 (0) | 9 (100) |

With regard to the classification schemes, 36.6 per cent of the participants preferred the new ICD-10-AM Diagnoses Codes. Of the participants who responded, all regarded the ICD-10-AM procedure codes as preferable. Guidelines in ICD-10-AM were favourably received by 90.9 per cent of participants, and 77.8 per cent expressed an overall preference for ICD-10-AM.

4.6 Coder Feedback Day

On the coder feedback day, eight of the eleven Pilot Study coders attended the ESRI to discuss the Pilot Study and their views on coding both in ICD-9-CM and ICD-10-AM. This day was very informative as the coders were all experienced and they had many views on the challenges of being a coder within the framework of the classification system they use and also as a coder within the hospital system.

Part of the day was spent discussing the current situation of coders, coding in ICD-9-CM and the general view of coding. The issue of reporting in charts was discussed at length. Lack of specificity in codes in ICD-9-CM was raised, together with the problems arising when the terminology used by doctors in the charts does not match what is in the coding books.

In the course of discussions on the Pilot Study and ICD-10-AM, there was consensus that the Australian Coding Standards (ACS -Volume 5) are useful, though there was some difference of opinion over the practicality of using five books. The lack of medical annotation⁵⁴ in the books was seen as a drawback and all felt that more medical terminology would be required to code in ICD-10-AM. The ACS would make up for some of the lack of information in the main classifications volumes. The coders acknowledged that the basic skills of coding, extraction from charts and selection of codes using The Four Basic Steps to Quality Coding⁵⁵ shown below in Box 6 would remain unchanged irrespective of the coding scheme chosen for use within the HIPE system.

There were concerns expressed over the speed of coding that would be expected, though all coders considered that their coding speed improved the more charts they coded during the Pilot Study.

⁵⁴ Medical annotations are provided in the *Educational Annotation of the ICD-9-CM Single Volume Coding Book* (Channel Publishing, Nevada) which is currently used by coders in Irish hospitals and considered to be very helpful.

⁵⁵ HIPE Unit, ESRI, Basic Coding Manual.

Box 6**The Four Basic Steps to Quality Coding**

1. Analysis of Medical Terminology
2. Location of **Main terms** in The Alphabetical Index.
3. Assignment of a *tentative* code using the Alphabetical Index.
4. Checking the code against the Tabular List to verify that it is the correct code for the described disorder according to the classification.

**4.7
Conclusion**

A large amount of information has been collected and analysed in this Pilot Study. This chapter has presented much of these data. The analyses show that ICD-10-AM present more codes and to a more specific level than is currently available in ICD-9-CM as used in Ireland. While the coders in general liked the Australian classification, the coding issues arising for any classification including documentation, coder education, adherence to guidelines and coding quality present challenges within the current system that will need to be met regardless of the final choice of a new coding scheme or when it is introduced.

5. CONCLUSIONS AND RECOMMENDATIONS

5.0 Conclusions

The review of alternative schemes for coding data on diagnoses and procedures undertaken for this report was prompted by the fact that the ICD-9-CM scheme dating from October 1998 has been in use in Ireland since 1999 and is now considered to require updating. While the adoption of the WHO's ICD-10 coding scheme for diagnoses would seem an obvious choice, the challenge presenting is the sourcing of a companion coding scheme for procedures, given that one was not developed by WHO as part of the ICD-10 system. To address this problem, a review of the options presented by developments internationally was undertaken to determine what alternatives could feasibly be considered for adoption within the Irish system. In making this determination, these alternatives were assessed with reference to a set of criteria considered essential in the selection of the coding schemes of choice for use in Ireland. These criteria include the following:

- The availability of an integrated coding scheme for diagnoses and procedures;
- The availability of regular updates for the coding schemes to ensure they kept pace with advances in clinical practice;
- Cross-national use which facilitated the use of the data for international comparisons;
- Software support and training programmes for the education of coders and quality checks on the data.

In Section 1 of this report, coding schemes in use in the United States, Canada, Europe and Australia were assessed with respect to these factors. The findings of this review indicated that ICD-10-AM, the coding scheme developed in Australia, was the best fit when considered against these criteria. Prior to finalising a recommendation that ICD-10-AM be adopted for use in Ireland, it was, however, considered important to undertake a pilot study to determine how this system might operate in Irish hospitals and, in particular, the views of coders using this system within HIPE. In subsequent sections of this report, the development and implementation of this pilot study are outlined, the data collected specified and the findings of the data analyses presented. The conclusions and recommendations emerging from this study will be summarised here. Given the importance of the functions carried out by coders in HIPE, a number of important issues that emerged in the course of this study with regard to the work of coders will first be addressed. While the ICD-10-AM system has been described in detail in the course of this report, some factors of specific relevance to implementation in the Irish context will then be explored in the context of finalising the overall conclusions and recommendations.

5.1 Quality Issues Arising with Clinical Coding

There are currently about 150 coders working in Ireland, including part-time and full-time staff with varying levels of experience. These coders are responsible for coding and inputting the data for over 900,000 records submitted to the HIPE system annually. A full-time coder may code between seven and eight thousand records per year depending on such factors as experience, support, specialties and chart documentation. They are usually supported in their work at hospital level by the HIPE/Casemix co-ordinator (HCC). The HIPE & NPRS Unit at the ESRI provides training and support to all coders, HCCs and other personnel involved in coding in Ireland.

For any classification to be effective, coders must be able to use it correctly, efficiently and with adherence to the appropriate guidelines. A key question in the adoption of a new classification is the ability and willingness of clinical coders to adopt the classification and use coding guidelines both directly related to the new classification and those guidelines in place for best practice in coding.

The ICD-10-AM Coding Classification scheme was positively received by all participants in the Pilot Study for HIPE. In general, it was regarded as an improvement on the current ICD-9-CM coding classification, especially with the availability of new codes and the inclusion of a volume on coding standards. The five volume format of the ICD-10-AM system was, however, regarded as inconvenient. The procedures classification in ICD-10-AM, in particular, was also found to demand a greater knowledge of medical terminology.

An important finding emerging from the Pilot Study, which was to some extent peripheral to the core aims of the study but nevertheless important, relates to current adherence to coding guidelines. During the training and the in-hospital coding experience undertaken for the Pilot Study, it became evident that current standard coding guidelines issued to Irish coders are not always implemented as required. During discussions between hospital and ESRI coders on current coding guidelines and availability of codes in the current ICD-9-CM classification, a lack of insight by some of the coders on the issue of quality became apparent. In the course of the Coder Feedback Day these issues were also addressed. Coders feel the pressure currently exerted by their hospitals is concerned with quantity and meeting reporting deadlines. Timely and accurate data are essential for HIPE data and neither should be compromised for the other. Reporting deadlines cannot be used as an excuse for poor data.

Coding guidelines are issued regularly at HIPE coding courses, through the data entry system edit checks, through queries returned to coders for correction and through the HIPE quarterly coding newsletter *Coding Notes*. Coders also contact the HIPE Unit for clarification of problem issues and on specific cases. Non-adherence to national coding guidelines is a serious problem which could lead to quality deficiencies in coding and data reporting. Irrespective of the approach adopted to upgrading morbidity coding, initiatives will be required to ensure that all coders comply with national guidelines in pursuit of best practice in coding morbidity data for the HIPE.

The coders involved in the Pilot Study agreed they need to continually renew their coding skills through attendance at HIPE coding courses and by keeping abreast of new developments through *Coding Notes*. Coders need to take more responsibility for their continuing education and responsibility for data quality needs to be emphasised. Hospitals need to take more responsibility for quality control requirements which would be expected to be supported by the HIPE/Casemix Co-ordinators who monitor and supervise coders' work.

Although the coders all welcomed the *Volume of Australian Coding Standards*, the current level of compliance to current coding guidelines would indicate a need to emphasise this quality focused aspect of coding in any training undertaken for the new coding scheme. The majority of coders suggested that, with practice, a coding time comparable to that currently prevailing could be

5.2 Updating Clinical Coding and Classification within HIPE

achieved within 2-12 months. One coder believed that she had already achieved a comparable coding speed, and another coder was unable to speculate on such a time frame.

Training, experience and commitment are required to achieve best practice in morbidity coding. Clinical coders will be well placed to achieve the goal of reporting timely, accurate and high quality data where there is a commitment and support for this important and skilful task. Irrespective of the coding schemes used, ongoing training is required for coders to gain insight into the issues arising in achieving high standards of quality coding.

The HIPE & NPRS Unit at the ESRI is committed to the implementation of an updated scheme for coding clinical data in the pursuit of the collection of best quality data within these data systems. Following a review of the classification options available internationally, it was decided to proceed with a Pilot Study of The International Statistical Classification Of Diseases And Related Health Problems – Tenth Revision – Australian Third Edition (ICD-10-AM (Third Edition)). This system met the criteria required of a comprehensive, supported, updateable, internationally compatible and integrated disease and procedure classification. In undertaking this Pilot Study, the objectives were first, to test ICD-10-AM within an Irish hospital setting and, second, to measure the readiness of clinical coders working in hospitals to adapt to and use this system to provide optimum quality data.

When compared with the ICD-9-CM currently in use in Ireland, the ICD-10-AM classification is shown to be more specific and provides more codes for both diagnoses and procedures with greater specificity. The classification is presented in a five volume set and also as an electronic browser. There are no medical annotations provided within the disease and procedures volumes.⁵⁶ In Australia, the Coding Standards regulate how data are collected. While the same definition of the principal diagnosis is used in Ireland and Australia, there are differences in other areas. NCCH has tightened the definition of additional diagnoses to limit coding of conditions to only those that affect patient management in a significant way, for example where a chronic condition may be present but not treated during the stay in hospital. This may result in important information currently collected being lost. Australian Coding Standard 0042 recommends the omission of many routine procedures such as x-rays, change of dressings and some intravenous drug therapies when coding with ICD-10-AM. The Australian classification does, however, require extra information to be collected in other areas for example ‘Activity while injured’ and an anaesthetic code for each procedure performed as appropriate. These guidelines could be adapted for an Irish setting to prevent loss of information or collection of non-specific information which may be of limited use.

Since publication, three sets of errata have been issued for ICD-10-AM Third Edition. These are not incorporated into the hard copy five volume set of books subsequently printed. It is the responsibility of the coder to update their books as necessary. These errata can, however, be incorporated into the electronic browser which can be updated via the web.

An additional issue that will need to be addressed with any initiative concerning the implementation of ICD-10-AM in Ireland concerns the

⁵⁶ Medical annotations are provided in the *Educational Annotation of the ICD-9-CM Single Volume Coding Book* (Channel Publishing, Nevada) which is currently used by coders in Irish hospitals and considered to be very helpful.

collection of information from patient charts. This relates specifically to such information as ASA score, documentation of local anaesthetics and the completion of operation forms. Doctors would therefore need to be consulted as to the feasibility of providing such information on a routine basis in the chart. With the expansion of codes available in ICD-10-AM, particularly in the procedure classification, clinicians will need to be made aware of the level of detail required to optimise the classification.

5.3 Conclusions and Recommendations

Following the review of coding schemes for clinical data in use internationally, the ICD-10-AM system was found to comply with all of the factors considered important in the choice of an updated scheme for use within HIPE. The findings of the Pilot Study of ICD-10-AM also found that this coding scheme could be used successfully by coders in Irish hospitals and was found to be acceptable to these coders.

While recognising the importance of proceeding to the implementation of an updated coding scheme for coding clinical data in HIPE, the challenges posed by such an initiative must also be recognised and addressed in planning for this development. In particular, the implications for the work of coders, clinicians, the ESRI's HIPE & NPRS Unit and all involved in the collection and use of activity data from the acute hospital sector will need to be addressed. The following factors, amongst others, will need to be taken into account with the advancement of this initiative.

5.3.1 TRAINING AND SOFTWARE DEVELOPMENT

As well as providing training sessions in the use of any new coding schemes and the issuing of coding books, additional training will be required in the form of regional workshops, and through *Coding Notes*. With the introduction of a new coding scheme there will be a period of dual coding, when coders will code using both ICD-9-CM and ICD-10-AM, and this will impact on training of coders at all levels and on coding at hospital level. Reporting deadlines will be affected as coders will take some time to learn to code with the new system at their current pace.

It would be expected that with the introduction of ICD-10-AM, coders would be supplied with, and trained, in the use of the electronic browser as well as the coding books. This would address a number of difficulties previously noted, including the fact that coders found the management of five volumes cumbersome and notified errata are only updated on the electronic browsers via the web. The training programme will also have to address the fact that coders will need to have a better facility with the use of medical terminology as necessitated with the use of ICD-10-AM.

The HIPE data entry and reporting software will have to be adapted to accept the new coding scheme. As coders will for some time be using both the old and new coding schemes, the software will have to be amended to accept both as appropriate to the period of the hospital stay. Edits, quality checks and validation will all have to be reviewed to accommodate the new coding and casemix classification schemes when they proceed to implementation. Dissemination of updated software and training materials can proceed through expanded use of the web as well as through other relevant avenues.

5.3.2 QUALITY

The commitment of coders and HCCs to support data quality initiatives will need to be reinforced. In particular, the need for renewed efforts to ensure compliance with national coding guidelines by all clinical coders has been highlighted. The volume on guidelines that is currently part of the ICD-10-AM system will need to be reviewed to ensure relevance to the Irish context. Irrespective of the coding scheme adopted for use within HIPE in the future,

compliance with national coding standards is a requirement if quality standards are to be supported and improved.

As previously noted, improved documentation will also need to be addressed if the full potential of the ICD-10-AM system is to be exploited. Greater clinician involvement in this process will be required if this objective is to be achieved. Towards this end, it is recommended that a comprehensive consultation process involving the professionals most directly affected by this issue be undertaken. In particular, it is recommended that a National Clinical Committee (NCC) be established to provide advice and support for the achievement of comprehensiveness in reporting and best practice in coding morbidity data within the HIPE system.⁵⁷

Irrespective of the choice of morbidity coding scheme for the HIPE system, a range of interventions will be required to achieve best practice in the standards of coding morbidity data. Given the findings of this study regarding problems with compliance with national coding guidelines, a review of coder education within the HIPE system is also recommended with a view to ensuring that (i) coders are being equipped with the tools, facilities and skills required and (ii) that adequate measures are in place to ensure compliance with national coding guidelines and standards. Commitment to putting in place the findings of this review as a matter of priority will be important to ensure that appropriate training for best practice in clinical coding is provided within HIPE.

High standards of data quality can only be achieved if all stakeholders within the HIPE system recognise their responsibilities in this regard. This will require comprehensive, complete and accurate information being recorded on the hospital chart by clinicians, appropriate facilities and procedures being in place in hospitals to ensure that HIPE coders have access to the data required as soon as possible after patient discharge and that coders comply with best practice guidelines in coding and returning data to HIPE.

⁵⁷ It is further recommended that the responsibilities of this committee would also extend to the National Perinatal Reporting Scheme.

APPENDIX 1

Implementation of ICD-10 by WHO Member States (Proposed)

IMPLEMENTATION OF ICD-10 BY WHO MEMBER STATES (PROPOSED)*

ICD-10 was first used for the coding of national mortality data in 1994. *The World Health Statistics Annual, 1996*, published in early 1998, contains ICD-10 data for the first time. The following country-years are included:

Croatia 1995
Czech Republic 1994, 1995, 1996
Denmark 1994, 1995
Malta 1995
Qatar 1995
Republic of Korea
Slovakia
Thailand

The following table shows the latest information available to WHO regarding the actual and planned dates for the implementation of ICD-10 by WHO Member States for the coding of national mortality and morbidity statistics.

Actual and Proposed Implementation Dates of ICD-10

| Country | Mortality | Morbidity |
|--------------------|-------------|-----------|
| Australia | 1998 | July 1998 |
| Austria | 1998 | .. |
| Belgium | 1998 | .. |
| Brazil | 1996 | 1998 |
| Canada | 1998 | 1999 |
| China | 2000+ | 2000+ |
| Colombia | 1996 | .. |
| Costa Rica | 1996 | .. |
| Czech Republic | 1994 | .. |
| Denmark | 1994 | 1994 |
| Estonia | 1997 | 1997 |
| Finland | 1996 | 1996 |
| France | 1998 | 1997 |
| Germany | 1998 | 2000 |
| Iceland | 1996 | 1997 |
| Ireland | 1998 | .. |
| Jamaica | 1995 | .. |
| Japan | 1995 | 1996 |
| Kuwait | 1995 | 1996 |
| Italy | 1998 | .. |
| Latvia | 1996 | 1998 |
| Lithuania | 1997 | 1998 |
| Macedonia | 1996 | .. |
| Malta | 1995 | .. |
| Netherlands | 1996 | 1998-2000 |
| New Zealand | 1998 | July 1998 |
| Norway | 1996 | 1998 |
| Poland | 1997 | .. |
| Portugal | before 2000 | .. |
| Qatar | 1995 | .. |
| Romania | 1994 | .. |
| Slovakia | 1994 | .. |
| Suriname | 1996 | .. |
| Sweden | 1997 | 1997 |
| Thailand | 1994 | 1994 |
| United Kingdom | | |
| -England and Wales | 1999 | 1995 |
| -Scotland | 1998 | 1996 |
| -Northern Ireland | 1998 | 1996 |
| United States | 1999 | 2000 |
| Venezuela | 1996 | 1997 |

.. information not available.

Last update: 07 December 1999.

* Source: <http://who.int/whosis/icd10/implemen.htm>

APPENDIX 2

DATA COLLECTION TOOLS

CODING FORM
(DOUBLE-SIDED)

| | | | | | | | |
|---|---|--|----------------------|--|-----------------|-------------------|------------------------|
| HOSPITAL NAME: | | | | | HNO: | | |
| MRN | AdmDate | DisDate | Date of Birth | Sex | Adm type | Adm source | Dis-charge code |
| | / / | / / | /.... / ... | <input type="checkbox"/> M <input type="checkbox"/> F (please tick) | | | |
| ICD-10-AM | | | | | | | |
| Type | Code | Description | | | | | |
| PDX | | 1 | | | | | |
| | | 2 | | | | | |
| | | 3 | | | | | |
| | | 4 | | | | | |
| | | 5 | | | | | |
| | | 6 | | | | | |
| | | 7 | | | | | |
| | | 8 | | | | | |
| | | 9 | | | | | |
| | | 10 | | | | | |
| Ops | | 1 | | | | | |
| | | 2 | | | | | |
| | | 3 | | | | | |
| | | 4 | | | | | |
| | | 5 | | | | | |
| | | 6 | | | | | |
| | | 7 | | | | | |
| | | 8 | | | | | |
| | | 9 | | | | | |
| | | 10 | | | | | |
| HELP? | 1. ALWAYS REFER TO YOUR STANDARDS (VOL. 5) – These will nearly always clarify your queries. 2. READ your includes / excludes notes at the beginning of code titles / category blocks 3. ASK for assistance – we are here to help | | | | | | |
| Tips: Injuries | 4 codes required per injury (excl: adverse effects – see below- Injuries; burns; poisonings; procedural complications 1. Inj: S00-T98 2. ECC: V01-Y98 3. POO: Y92.- 4. Act: U50-U73 | | | | | | |
| & Poisons | 3 codes req'd per 'Adverse effect' 1. Manifestation: from any chptr 2. ECC: Y40-Y59 3. POO: Y92.- | | | | | | |
| Time taken: ____ mins Coded by: _____ Date Coded: / / | | | | | | | |
| Comments may incl: eg. what you like/dislike about section of classification; coding queries e.g. had difficulty coding a certain disease or procedure (provide details where you can); couldn't code procedure due to lack of documentation etc.... | | Comments: (please attach any extra comments where room doesn't allow you to fully document things) | | | | | |

| | | | | | | | |
|--|----------------|--------------------|----------------------|------------|-----------------------------------|-------------------|------------------------|
| HOSPITAL NAME: | | | | | HNO: | | |
| MRN | AdmDate | DisDate | Date of Birth | Sex | Adm type | Adm source | Dis-Charge code |
| <div style="display: flex; justify-content: space-between;"> / / / / /..... / <div style="text-align: right;"> <input type="checkbox"/> M <input type="checkbox"/> F (please tick) </div> </div> | | | | | | | |
| ICD-9-CM | | | | | | | |
| Type | Code | Description | | | | | |
| PDX | | 1 | | | | | |
| | | 2 | | | | | |
| | | 3 | | | | | |
| | | 4 | | | | | |
| | | 5 | | | | | |
| | | 6 | | | | | |
| | | 7 | | | | | |
| | | 8 | | | | | |
| | | 9 | | | | | |
| | | 10 | | | | | |
| Ops | | 1 | | | | | |
| | | 2 | | | | | |
| | | 3 | | | | | |
| | | 4 | | | | | |
| | | 5 | | | | | |
| | | 6 | | | | | |
| | | 7 | | | | | |
| | | 8 | | | | | |
| | | 9 | | | | | |
| | | 10 | | | | | |
| Time taken: __ : __ mins | | | | | | | |
| Coded by: _____ | | | | | Date Coded: / / | | |
| | | Comments: | | | | | |

TRAINING QUESTIONNAIRE

| CODER DETAILS | | | | |
|---|------------------------------------|---|---------------------------------------|---------------------------------------|
| Name: | | Hospital: | | |
| Location of Training: (eg. Hospital name, ESRI) | | Date held: ___ / ___ / ___ | | |
| TRAINING EXPERIENCE: (Please outline your previous ICD-9-CM training experience) | | | | |
| Date started coding: ___ / ___ / ___ | | | | |
| HIPE Courses Attended (please tick ✓ and provide year/s completed) | | <input type="checkbox"/> Basic | Year completed: _____ | |
| | | <input type="checkbox"/> Intermediate | Year completed: _____ | |
| HIPE Workshops Attended (*Please list all workshops attended) | | Workshop Type: _____ _____ _____ _____ | | |
| Do you code any specialties? (please tick ✓) | | <input type="checkbox"/> Yes | <input type="checkbox"/> No | |
| If Yes, please list specialty types: | | Specialty: _____ Type: _____ _____ | | |
| ICD-10-AM TRAINING COURSE | | | | |
| Trainer's Name: | | | | |
| Did you feel you had enough time? (please tick ✓) <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | |
| Do you feel confident using ICD-10-AM for coding charts in your hospital now? (please tick ✓) <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | |
| Are there any areas you would like further explanation / training on? (please tick ✓) (e.g. additional diagnoses, external causes) <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | |
| If Yes please specify: (e.g. additional diagnoses, external causes) _____ _____ | | | | |
| Was the Course Level: | | <input type="checkbox"/> Too simple | <input type="checkbox"/> Just right | <input type="checkbox"/> Too advanced |
| Course Speed: | | <input type="checkbox"/> Too slow | <input type="checkbox"/> Just right | <input type="checkbox"/> Too fast |
| How do you rate each of the following areas: (please tick ✓) | | | | |
| Course Content: | <input type="checkbox"/> Excellent | <input type="checkbox"/> Good | <input type="checkbox"/> Satisfactory | <input type="checkbox"/> Poor |
| Instructor's Presentation: | <input type="checkbox"/> Excellent | <input type="checkbox"/> Good | <input type="checkbox"/> Satisfactory | <input type="checkbox"/> Poor |
| Material/Handouts etc: | <input type="checkbox"/> Excellent | <input type="checkbox"/> Good | <input type="checkbox"/> Satisfactory | <input type="checkbox"/> Poor |
| Course Organisation: | <input type="checkbox"/> Excellent | <input type="checkbox"/> Good | <input type="checkbox"/> Satisfactory | <input type="checkbox"/> Poor |
| What particular aspects of the training content were of most interest to you? _____ _____ _____ | | | | |
| Do you have any comments and/or suggestions on how to improve any aspect of this course? _____ _____ _____ | | | | |

Please Return to:
The Quality Department
HIPE Unit
Economic & Social Research Unit
 by: Fax: (01) 668 9984 or /
 Email: deirdre.murphy@esri.ie
deirdre.mcdonagh@esri.ie

CLASSIFICATION EVALUATION QUESTIONNAIRE

ICD-10-AM PILOT PROJECT
HIPE – HOSPITAL IN-PATIENT ENQUIRY
ESRI – ECONOMIC AND SOCIAL RESEARCH INSTITUTE

Thank you for your valued participation in this Pilot Coding project. We greatly appreciate the time and skills to test out ICD-10-AM with us. By completing the following questionnaire we will have valuable feedback to further assess the feasibility of ICD-10-AM as a possible coding scheme for use by HIPE in the future.

A. Coder Details

| |
|-------------------------------------|
| Name: |
| Hospital: |
| Dates of Training: |
| Dates Coding: |
| ESRI Staff at this coding exercise: |
| |
| |

B. Coding Experience

Years of coding experience: _____

Which classifications in HIPE have you coded with: please tick all relevant.

- | | |
|------------------|--|
| • 1969 - 1980 | ICD-8 & OPCS Procedures classification |
| • 1981 - 1989 | ICD-9 & OPCS Procedures classification |
| • 1990 - 1994 | ICD-9-CM (Oct 88) |
| • 1995 - 1998 | ICD-9-CM (Oct 94) |
| • 1999 - present | ICD-9-CM (Oct 98) |

How long have you worked at this hospital:

How many hours per week do you code?

General Coding Questions

When you code using ICD-9-CM do you use the tabular? (please tick)

- | | |
|-----------|--------------------------|
| Always | <input type="checkbox"/> |
| Sometimes | <input type="checkbox"/> |
| Never | <input type="checkbox"/> |

Please comment:

Do you know some ICD-9-CM codes "off by heart"? (please tick)

- | | |
|-----|--------------------------|
| Yes | <input type="checkbox"/> |
| No | <input type="checkbox"/> |

How often do you code from memory? (please tick)

10%-40% of the time ☐

50%-90% of the time ☐

Never ☐

Please provide further information:

Do you use your own coding notes? Yes ☐ No

Please specify: (Notebook, specialty cards etc)

What is the greatest challenge for you coding using ICD-9-CM?

C. Coding Exercise

What was your level of participation in the study? (please tick)

2 weeks ☐

1 week ☐

Other (please specify) _____

ICD-10-AM

Do you think your coding times were adversely affected? (please tick)

Yes ☐

No ☐

Unsure ☐

Please comment:

Do you think your ability to utilise the books improved as the study progressed? (please tick)

Yes ☐

No ☐

Unsure ☐

Please comment:

Do you think your ICD-10-AM coding speed improved over the course of the study? Yes ☐ No ☐

If so why?

Were there any other features of the study which might have affected your speed during the pilot coding study? For example legibility of abstracts, physical space etc. Yes ☐ No ☐

Please comment:

Will changes be necessary in the information provided in the charts for coding in ICD-10-AM? (e.g. ASA scores) Yes ☐ No ☐

Please comment:

Do you have any indication of how long it might take to attain a similar coding time using ICD-10-AM as you are used to with ICD-9-CM? (e.g.: days, weeks etc.)

Please comment:

If you do not think you can attain the same time, what level do you think you can obtain? (For example, one third less cases per day, half the cases per day).

Please comment:

What features of ICD-10-AM do you see as **improvements**:

What features of ICD-10-AM do you see as **not** useful *or unworkable*?

D: Conclusion:

Which do you prefer?

| | ICD-9-CM | ICD-10-AM | No preference | Like Neither |
|---------------------|----------|-----------|---------------|--------------|
| Coding Books | | | | |
| Quality | | | | |
| Print | | | | |
| Size | | | | |
| Durability | | | | |
| | | | | |
| Diagnoses | | | | |
| Procedures | | | | |
| Guidelines | | | | |
| Overall | | | | |

Was the training you received adequate for this initial coding exercise?

Yes ☐ No ☐

General comments:

Many thanks.

If you have any further questions regarding ICD-10-AM please do not hesitate to contact us.

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