Factors that influence HIPE Data Quality from a Coder's Perspective

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Declaration

I declare that the work described in this dissertation except where otherwise stated is entirely my own work, and has not been subscribed as an exercise for a degree at this or any other university.

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Dolores Donegan

14th September 2005

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Summary

Quality patient data collection is essential for disease profiling activity audit, service planning and casemix adjusted budgets. Barriers to quality in coding include lack of documentation, illegible handwriting by clinicians, missing information, inability of coders to understand medical terminologies and the actual speed of coding.

The Hospital Inpatient Enquiry system is a national morbidity database containing clinical, demographic and administrative data relating to hospital inpatients. Each record represents an episode of inpatient or daycase care and there fore the database reflects hospital activity, rather than incidence or prevalence of disease.

There are over 120 clinical coders working in Ireland coding between seven and eight thousand charts per year. Their role is to abstract the relevant information from the patients chart and translate it into coded data.

The purpose of this research was to ascertain from the coder's perspective the factors that were influencing the quality of HIPE data. The questions explored identified coder experiences nationally in relation to their work practices. 71% of coders are involved in activities other than coding; Nearly two thirds of coders find that there are charts outstanding at reporting deadline periods which would indicate a need to employ more coders in Irish hospitals; A high percentage of junior coders are employed by the finance department this would indicate that coding is being lead by finance as appose to international literature that would support the belief that coding should be driven by information management; Contrary to previous research findings that non adherence to coding guidelines impacted most on the accuracy, completeness and timeliness of coding, this research has show that coders believe that incomplete discharge summaries impact greater; Finally almost a quarter of coders are finding the changeover to ICD-10-AM as being very difficult.

HIPE data quality is essential to promote value for money, quality of care, accountability and people centeredness within our healthcare service.

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Abbreviations

AHIMA.	Hospital Information Management Association
DOH&C	Department of Health and Children
SCC	Society for Clinical Coders
ESRI	Economic Social Research Institute
HIPE	Hospital In Patient Enquiry
HIS	Hospital Information System

NEHB	North Eastern Health Board
AHIMA	American Health Information Management Association
MRN	Medical Record Number
NPRS	National Perinatal Reporting System
CEN	Coding Educators Network
QA	Quality Assurance
PHIS	Paediatric Health Information Systems
NOMESCO	Nordic Medico Statistical Committee
CIHI	Canadian Institute for Health Information
ICD 9 – CM	International Classification of Diseases 9 – Clinical Modification
NCRI	National Cancer Registry in Ireland
CCI	Clinical Coding Ireland
SNOMED	Systematized Nomenclature of Medicine
CHCA	Child Health Corporation of America
HSE NE	Health Service Execute Northeast
PDA	Personal Digital Assistant

"***More accurate and available data have been shown to reduce costs, improve the quality of care, and increase patient satisfaction".***

Soule (2001)

1.1 Introduction:

Since the early 1980`s, there has been a drive to collect and analyze health systems data. The struggle for value for money in healthcare provision has pushed the need for accurate and clear clinical data. Estimating how much information technology could add to value for money in healthcare provision is difficult to quantify when considering the cost of applying it extensively. An Article in the Economist magazine of April 2005 cited a piece by Walker et al from the *Health Affairs American Journal* which stated that "a fully interoperable network of electronic health records would yield $77.8 billion a year in net benefit a 5% of Americas annual health spending". This includes savings from faster referrals between doctors, fewer delays in ordering tests and obtaining results, fewer errors in oral or handwritten reporting, fewer redundant tests and automatic ordering and refills of drugs. This doesn't include, what could be perhaps the biggest potential benefit, better statistics that would allow for faster recognition of disease outbreaks such as SARS and Asian Flu.

Love (2001) reinforced this when she stated that "experts assumed that variations in healthcare utilisation and outcomes can result in waste and preventable morbidity". This has led to a quest for uniform, comparable and valid healthcare data.

Not many years ago, coding was seen as a "back room" process that few knew of or cared about. Kloss (2002) found that "today's economic forces have brought coding into prominence, creating a great demand for skilled coders". Coding is defined by Brough (2003) as "designating descriptions of diseases, injuries and procedures into numerical designation". It involves the use of a health record as the source for determining code assignment.

All personnel responsible for the coding of acute hospital activity in Ireland are trained by the HIPE and NPRS unit at the Economic and Social Research Institute (ESRI), which also has responsibility for data collection, processing, quality and audit procedures. All relevant information relating to clinical inpatient activity in hospital (with over 5,000 discharges per year) is collected and stored on a national database known as the Hospital Inpatient Enquiry (HIPE) System.

The HIPE scheme is a national morbidity database containing clinical, demographic and administrative data relating to hospital inpatients. Each record represents an episode of in-patient and day patient care and therefore the database reflects hospital activity, rather than incidence or prevalence of disease. This information paints a picture of the patient, the reason for admission, conditions or complications of hospital stay and what treatments / procedures were provided.

Clinical coders in hospitals abstract relevant information from the patients` chart and translate into coded data. One key source for information is the HIPE Summary Sheet.

While not involved in clinical coding in Ireland, hospital doctors have a responsibility for ensuring that the required data are correctly and clearly entered on the patients` chart. Bramley (2004) states that ”consultants are responsible for completing this sheet which contains a summary of the conditions that occasioned the admission and affected the patient during the episode of care, and the treatment provided for those conditions”. The input of clinicians in providing clear and accurate clinical information about the patient’s hospital stay allows for the facilitation of the work of the clinical coders. Ongoing training and support is provided to clinical coders in Irish hospitals by the ESRI`s HIPE and NPRS unit.

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 time requirements. Murphy (2004) stated that “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”. The specific area of focus of my dissertation is to evaluate the factors that influence the quality of HIPE data.

A recent pilot study on coding in Ireland was conducted by Murphy (2004), using ICD 10 AM to code hospital inpatient data. It was found that the current standard coding guidelines issued to Irish coders are not always implemented as required. Murphy (2004) found that “Coders feel the pressure currently exerted by their hospitals is concerned with quantity and meeting report deadlines”. Therefore the question need to be asked, are

reporting deadlines influencing the quality of data collected? For any classification to be effective, coders must be able to use it correctly, efficiently and with adherence to appropriate guidelines. Murphy (2004) reiterates the belief that "non adherence to national coding guidelines is a serious problem which could lead to quality deficiencies in coding and data reporting".

Quality data on hospital activity is essential to facilitate international comparability in the collection, classification, processing and presentation of health statistics including both morbidity and mortality. In practice International Classification of Diseases (ICD) has become the international standard diagnostic classification for all general epidemiological and many health management purposes.

Quality patient data collection is essential for disease profiling, activity audit, service planning and casemix adjusted budgets. Fletcher (2004) found that "confidence in data is due in large to its quality". There are many factors leading to barriers in quality coding these include lack of documentation, illegible hand writing by clinicians, missing information (eg histology results), inability of coders to understand medical terminology and the actual speed of coding. As most HIPE data is retrospective data (i.e. at least three months old), this can have a negative impact on data users, as some would feel that the data is not up to date enough for meaningful use. The DOHC have recommended that by 2007 HIPE data should be coded within six weeks of an episode of care in an acute hospital.

A full time coder working in Ireland may code between seven and eight thousand records per year depending on such factors as experience, support, speciality and chart documentation. This dissertation will not only examine the factors which influence HIPE data from a coders perspective but also answer the question of the dissertation it will answer another burning question that is, is there a need to employ and educate more coders to work in the Irish health care system?

1.2 Aim of the study:

To ascertain the factors that influence HIPE Data Quality from a coder's perspective

1.3 Objectives:

- To promote quality data capture.
- To develop support networks for coders.
- To enhance patient outcomes by providing accurate records of care which may be used for research proposes.
- To ensure that Irish data is fully compatible with international healthcare activity comparisons.
- To open lines of communication with clinicians regarding clear and accurate documentation.
- To make international comparisons on the coding process in other countries
- To ensure that Irish coders understand the importance of adhering to coding guidelines.

1.4 Structure of the Report:

Chapter 1 provides a background from an Irish perspective. Chapter 2 examines and explains the current coding collection process in Ireland well and internationally. Chapter 3 explores the factor that influence HIPE data quality. Chapter 4 highlights the integration of IT systems within the Irish Healthcare system to the HIPE system. Chapter 5 details the methodology of the dissertation. Chapter 6 outlines the results of the primary research on coder's observation on the factors that influence HIPE data quality Chapter 7 synthesises this information into a discussion on the future direction in improving the quality and usefulness of HIPE data.

2.1 Review of the Literature:

Information is one of the most important resources that a hospital holds. Most clinical decisions about a patient's care are based on items of data that have been collected previously, both from the current admission (letters from referring GP, results of clinical investigations and reports prepared by other professionals) and from notes relating to previous episodes of care. An audit commission of information management and systems in the acute hospital in 1995 carried out in UK acute hospitals in 1995 found that "Good information, with its associated technology, is an essential component of the drive to improving patient care".

The main obstacle to getting better value out of information is that managers sometimes do not understand its value or potential. This perception will only change if benefits are seen to arise from information. In order to achieve this, information must be made more appropriate, timely, accurate and usable. Murphy et al (2004) stated that "timely and accurate data are essential for HIPE data and neither should be compromised for the other".

Information about patients is gathered in the first instance to support clinical decisions, but it has two further critical functions, to monitor and assure the quality of clinical performance, and to evaluate business performance that underpin contract management. Most of the information required for these functions can be derived from data collected during patient care encounters.

Monitoring clinical performance enables staff to ensure that patients receive the best possible care, that the care services are of a uniformly high quality and that outcomes of care are consistent with the best results from elsewhere. Dick and Steen (1991) “the patient record is the principal repository for information concerning a patient’s health record. It affects, in some way, virtually everyone associated with providing, receiving or reimbursing healthcare services”.

Evaluating business performance involves gathering the data required for billing and contract management, keeping a record of services provided and patients treated and tracking costs incurred in providing care to the relevant patients. It also involves calculating the aggregate costs of providing each service and identifying underutilised staff, equipment and facilities.

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. These workers need to develop and hone skills involved in clinical coding. These skills develop over time and with experience.

2.2 Clinical Coding Classification:

The history of statistical healthcare classification systems dates back to the nineteenth century. The Bertillon Classification of causes of death was developed in 1893. Until 1942, the classification was only used to classify causes of mortality. Bowman (2002), in her paper the testimony to the American Health Information Management Association (AHIMA) stated that "at that time, the sixth revision was published under the auspices of the WHO and the scope was extended to include morbidity data".

The current purpose of the International Classification of Diseases (ICD) is to promote international comparability in the collection, classification, processing and presentation of health statistics, including both morbidity and mortality. Murphy et al (2004) has found that "in practice, the ICD has become the international standard diagnostic classification for all general epidemiological and many health management purposes".

This statement is further demonstrated when reviewing the methods of clinical coding adopted by other countries. 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. However Murphy et al (2004) questions this practise when she states that "a coding scheme which is only in use within one health system has the disadvantage of not facilitating international comparisons". Therefore it is important to note, that Irish hospital changeover in January 2005 to use ICD 10 AM will facilitate further worldwide comparability of our national health status. A review of the clinical

coding practices in Europe, the United States of America, Canada and Australia is essential to clearly understand the process as it is used here in Ireland.

2.2.1 The United States of America:

In the United States, coding is carried out by coders who can attain accreditation and who belong to the Society for Clinical Coders (SCC), which 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. In the United Stated clinical information is coded using the ICD-9-CM classification. This was the same classification scheme used here in Ireland up until the beginning of January of this year.

Quality Assurance in the United States of America:

Data quality programs provide a rigorous means of routinely monitoring and improving the trustworthiness of the numbers which informs decisions. In the United States one method of quality assurance employed is that of the Child Health Corporation of America (CHCA), a business of 41 of the largest non-for-profit children's hospitals and healthcare systems in the US and Canada. The alliance represents more than 20,000 physicians, 98,000 employees, and $11 billion in revenue. Fletcher (2004) stated that the purpose of CHCA is "to provide its member organisations group purchasing and supply chain management, paediatric data management, performance improvement and patient safety initiatives".

The CHCA member hospitals pool clinical and financial data to form the Paediatric Health Information Systems (PHIS). The collaboration of data allows members to base their improvement efforts on more than just their own performance. PHIS data is warehoused by a third-party vendor, who load and process data submitted by the hospitals. The warehouse partner then applies 175 audits to each patient record. Submissions that do not meet the error thresholds are rejected. The hospital must correct the errors, resubmit the data, and meet the threshold before the data will be loaded into PHIS. Data is loaded and made available to hospitals quarterly. Fletcher (2004) found that "suspected quality issues are generally reported by data users, because most issues are identified when data are analyzed; for instance, when analysis reveals unexpected trends or significant variance between a single hospital and the rest of the members".

Successfully implementing a data quality program requires a mix of analytical and project management skills for those working on the process. Successful data quality management returns tremendous benefits. Fletcher (2004) has found that "since the CHCA hospitals began using PHIS, they have improved clinical outcomes, enhanced revenue, decreased utilisation of unnecessary procedures and drugs, and reduced variation in care".

PHIS data allows members to:

- Reduce variation and standardise care
- Improve care for high cost, high volume patient populations that need to be proactively managed.

- Reduce costs by comparing resource utilisation in pharmacy, lab, and imaging
- Improve managed care contracting
- Identify trends for clinical quality improvement initiatives and strategic planning
- Analyse high cost drugs
- Report as needed for hospital committees
- Review ICD-9 coding practices
- Enhance and improve medical record documentation
- Analyse physician practice
- Conduct research.

In the US, for over 75 years, the American Health Information Management Association (AHIMA) has been the professional forum to advance the quality of health information and coding is a vital part of that process. Kloss (2003) discusses four main coding leadership criteria. These are:

- ***Supporting the needs of current coders and their managers:*** AMIHA offers a full range of resources for coders and those who manage coding functions. These resources include e-learning, audio seminars, regional seminars, the National Convention, textbooks and practise publications and "Code Write", an electronic newsletter.

- ***Supporting advances in coding and classification systems and vocabulary:*** AHIMA is currently conducting a study of factors in implementing ICD- 10 –CM and is also co-chairing a panel to redesign evaluation and management criteria for outpatient services. AHIMA have also completed research on rules for the mapping from Systematized Nomenclature of Medicine SNOMED to ICD -9-CM

- ***Advocating for sound coding policy:*** AHIMA advocates replacing ICD-9 CM with ICD-10-CM. AHIMA is also working to convince payers to abandon practises that violate official coding guidelines and lead to inconsistent coding practice and unreliable healthcare data.

- ***Developing the highly skilled work force grounded in Health Information Management*****:** Due to a shortage of coders, training programs have proliferated but most do not meet AHIMA`s coder training criteria. AHIMA`s entry-level and advanced coders education and certification are the gold standards in the Industry. AHIMA has served as an official registry of credentialed individuals since the 1930`s and requires periodic assessment and reappraisal of continuing competency.

2.2.2 The Nordic Countries:

The Nordic region consist of five states with an aggregated 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 and welfare. While each county is distinctive, generally decentralisation prevails with local authorities able to raise funding through local taxation. The county councils usually own the hospitals.

In the area of health statistics, there has been active co-operation between countries since 1960`s, mainly in the framework of the Nordic Medico Statistical Committee (NOMESCO). The WHO "*Collaborating Centre for Classification of Diseases in the Nordic Centre"* was established in 1987 and is responsible for updating and maintenance of the classification 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. Links have been established between the Nordic countries and the Baltic States since the fall of the Soviet Union. Murphy et al(2004) highlights an emerging problem in that the "WHO and NOMESCO support collaboration but resources are becoming an issue 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".

The Coding Process in the Nordic Countries:

Historically, coding has been done by clinicians in the Nordic countries. However nowadays courses are increasingly been offered to medical secretaries both in universities (as part of degree course) and by private agencies, although all codes must be approved and signed off by the clinician for each case coded. Murphy et al (2004) states that "as a direct result of this, the classifications, both diagnostic and procedural, are developed for use by clinicians with little annotation or guidelines".

By 1999 all Nordic countries were using ICD 10 for morbidity statistics. Each country uses a nationally modified version of WHO ICD 10 system for coding diagnosis and nationally modified versions of the NOMESCO - developed National Classification of Surgical Procedures (NCSP) for coding procedures. *The Nordic Centre for Classification of Disease* modifies ICD-10 annually at 5^{th} digit levels. Murphy et al (2004) acknowledges the fact that "there is mapping available between the national coding schemes". It is important to note also 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 the coding of drugs and their adverse effects of drugs.

Methods used in Upgrading of ICD in the Nordic Countries:

Annual updates are posted on the web for clinicians to integrate into their coding methods. In addition to national versions, all Nordic countries also have national language versions of ICD 10.

2.2.3 Canada:

Canada has a population of over 32 million and is divided into ten provinces and three territories. The Canadian health care system is an interlocking set of provincial and territorial health insurance schemes. Each is universal and publicly funded.

Coding Process in Canada:

Coding in Canada is carried out by over 1,200 health record personnel consisting of health record technicians, administrators and practitioners. There is no credential scheme for coders in Canada and training is provided by the Canadian Institute for Health Information (CIHI).

Methods used in Upgrading of ICD in Canada:

The 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 (10 percent agreement) must approve each individual standard before it is incorporated into the Canadian Coding Standards for ICD-10-CA and CCI.

2.2.4 Australia:

Coding in Australia is carried out by coders who may attend courses organised by both National Center for Classifications in Health (NCCH) and the Health Information Management Association of Australia (HIMAA). There are about 1,000 clinical coders working in Australia. No formal accreditation currently exists through 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. The Clinical Coding Society of Australia (CCSA) was formed in recent years to support coders in all aspects of their work.

Methods used in Upgrading of ICD in Australia:

For updates to ICD-10-AM, a coding Standards Advisory Committee representing all interested parties and meets and approves any recommendations coming through from the Casemix Committee of Australia.

Quality Assurance in Australia:

The NCCH has developed an auditing tool for hospitals. This is now produced as a proprietary product called PICQ (Patient Indicator of Coding Quality). This is a coding audit method which involves re-coding a sample of hospital-admitted patient episodes and uniformly recording results. Hospital data is not returned to the NCCH, so data quality checks must be carried out at hospital or state levels.

2.2.5 Ireland:

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 in Ireland (Wiley and Murphy, 2003). HIPE collects data on hospital discharges and maintains a national database on morbidity data from participating hospitals.

The HIPE software was developed and is maintained by the ESRI. The decision to develop rather than buy-in was made because existing commercial products did not meet DOH&C requirements. The HIPE software suite was introduced in order to ensure the uniformity and validity of the data supplied by hospitals. The HIPE system performs validity checks on the data at source. Fletcher (2004) has found that "data quality programs provide a rigorous means of routinely monitoring and improving the trustworthiness of the numbers that inform your decisions". In addition it ensures data from all sources is submitted in a standard format, which is essential for compilation of the national HIPE database.

The HIPE data collection software is installed in the majority of participating hospitals. A small number submit data on paper for input by HIPE unit staff.

HIPE Data Collection Process:

HIPE collects the following data:

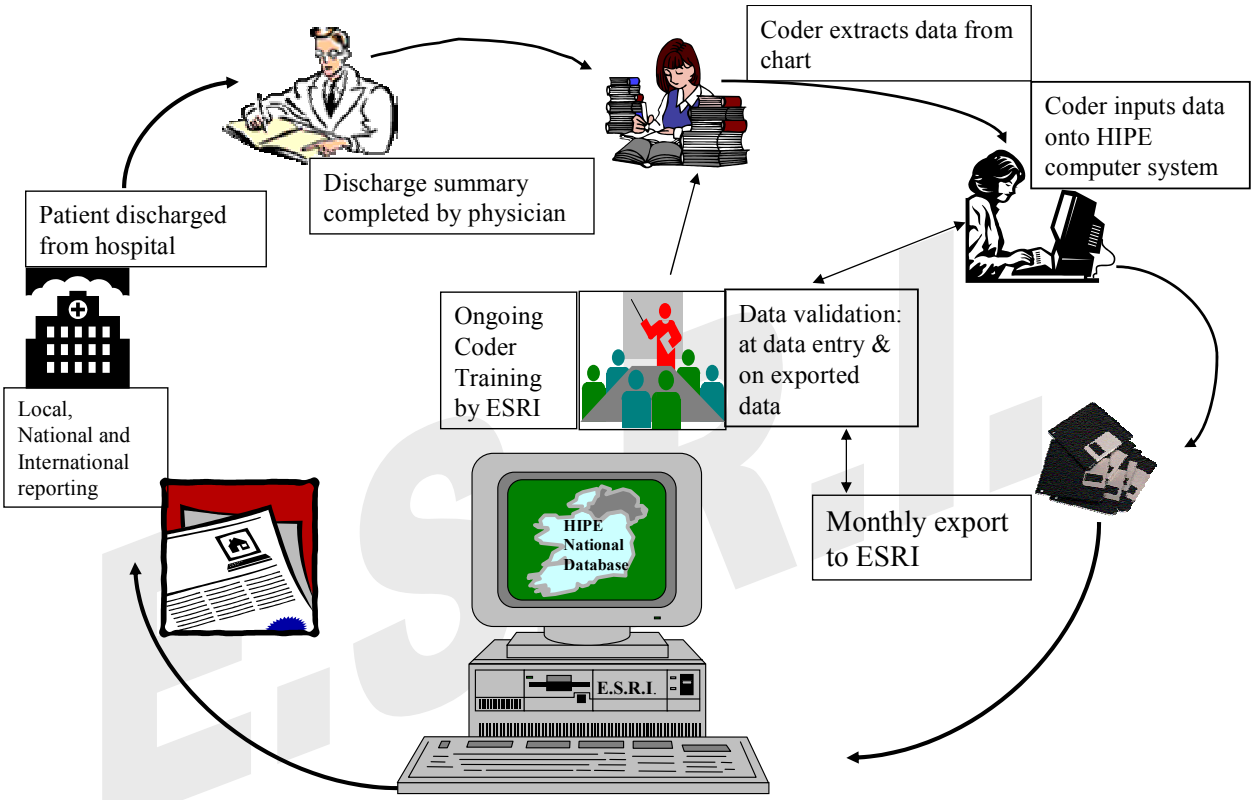
- **Demographic Information:** Date of birth, sex, marital status, area of residence by county or country

- **Clinical Information:** Principal diagnosis and up to 9 secondary diagnoses

  Principal procedure and up to 9 additional procedures

- **Administrative Information:** Name, Hospital Number, Medical Record Number, admission date, discharge date, operation dates, day case indicator, source of admission, discharge destination, public/private status, medical card status, admitting consultant.

This dataset is comparable to the information collected in other countries, thus allowing international comparisons to be made. (ESRI, DOH&C, 2002).



The HIPE Data Collection Process

Source: Deirdre Murphy, HIPE Unit, ESRI.

The administration data, hospital data and discharge status are downloaded electronically from the Hospital's Information System (HIS) to HIPE. All other patient information is obtained from the Discharge Summary Sheet and entered manually by the clinical coder. The data entry form used for input to HIPE is included in Appendix 1.

The data collected in the hospital is exported monthly to the HIPE and NPRS (National Perinatal Reporting System) unit of the ESRI. Data is downloaded to diskette and sent by courier to the ESRI. Some hospitals send data via email. In these cases, provision for secure transmission is made locally between the hospital and ESRI. The patient name is stripped from all records before export, in order to ensure patient confidentiality.

The files from each hospital are combined and added to the HIPE national database held by the ESRI. A copy of the database is submitted monthly to the DOH&C.

HIPE Data Quality Assurance Issues:

The HIPE software performs a number of checks to validate the data. This is in addition to checks carried out by the hospital systems. Each item entered is checked by itself and in comparison with others. The software checks the diagnosis and a procedure entered, and compares them to expected values for the age, sex and length of stay of the patient. Non-standard codes are queried and sent to the HIPE unit at ESRI for analysis. The software can automatically choose the correct version of ICD 9 CM and ICD 10 AM for the period relevant to the clinical data.

This system allows data to be validated at input stage in the hospitals and so errors can be corrected at source. Murphy (2004) highlighted this when she stated that "centralized review of data submitted by the hospitals is also undertaken with the return of any queries to the hospital for correction and to prevent errors reoccurring". This process guarantees the same validity checks are performed on data from all hospitals.

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.

Methods used in Upgrading of ICD in Ireland:

A decision was made in Ireland in 2002 to research and look at the possibility of changing over to the ICD 10 AM to code clinical data. It was felt at the time that ICD 10 AM is an expanded classification that would be more appropriate for use in the Irish setting. For example of ICD 9 CM text see appendix 2 and ICD 10 AM see appendix 3.

The main driving forces for the change over in Ireland to ICD 10 AM were:

- The structure is numerical
- Some chapters have been reconstructed
- Some diseases have been reclassified
- New features have been added
- The classification's specificity and details have been expanded

The use of ICD 10 AM in the Irish setting was perceived to result in a better coding classification system for the coding of procedures. This would in turn promote a more transparent clinical care pathway for comparison with other countries, which would promote enriched evidence- based decision making in the clinical care of patients.

3.1 Factors that Influence HIPE Data Quality:

There are many factors that are influencing the quality of HIPE data in Ireland these include:

3.1.1 Illegible Hand Writing By Clinicians

Many difficulties experienced by coders when coding are due to illegible writing by clinicians, the overuse of abbreviations and incomplete Discharge Summary Sheets. For example, the diagnosis of Peptic Ulcer Disease (*PUD*) can be difficult for a clinical coder to translate from a diagnosis of Peripheral Vascular Disease (*PVD)* if both are presented in the abbreviated format.

All new clinicians in their induction period are educated about clinical coding and their responsibility to write clearly and legibility on the discharge summary to promote accurate record of the patient's diagnosis during their episode of care. Mc Donald (1999) stated that education "programs for clinicians should be relatively short (ideally 30 – 45 minutes) and the subject matter must be directly related to the physician's practise".

In an article published in 2004 in the coding web site of JustCoding.com, a staff writer highlighted the problems this can cause "illegible documentation can have a direct negative impact on patient care resulting in improper medical treatment to the dispensing of the wrong medication". The author went on to state that illegibility in handwriting can lead to:

- Improper patient treatment
- Negligence on the part of the physician and the healthcare organisation
- Medical malpractice on the part of the physician and the healthcare organisation
- Dispensing of wrong medications
- The assumption that the service was not provided
- High error rates in documentation and coding audits
- Non payments for service provided
- Allegations of "under documentation" or "insufficient documentation"
- Claims of medically unnecessary services being provided
- Poor continuity of patient care
- An impact on quality of patient care overall

A workable strategy for physician education is challenging because of physician constraint on time, level of interest, and the need to structure the content of the education so it is viewed as useful by the physician participants. Mac Donald (1999) stated that "it is important in educating clinicians about coders needs by providing exhibits and examples of complete and accurate documentation and demonstrate specifics on problem areas that impact on coding". That can and does include the problem of illegible handwriting.

In direct response to the universal problem of clinician documentation a software company in the United States of America called HP3 Incorporated have developed a CDI

physician handbook. Their advertisement states that "The sections on JCAHO documentation guidelines and query/clarification information will be particularity useful to residents in developing good documentation habits early and ensure the hospital is accurately reimbursed for services provided".

3.1.2 Absence of Unique Patient Identifier:

Public and private organisations worldwide are navigating the transition from paper based to electronic health information management. People on the right side of the digital divide increasingly take for granted that they can go online to track their Fed-Ex packages, to trade shares, pay bills and access almost any other information- unless of course it involves their own health. That information crumpled, and yellowing, is spread among a number of hanging folders at all the various clinics you have ever attended have probably long forgotten about. Our most valuable information, our healthcare records are locked away from their owners, with no identification number to link it between centres.

In Canada, the government has turned to Canada Health Infoway (CHI), an independent, publicly funded organisation, to make the strategic investments in electronic health records (EHR) projects that can be replicated throughout the country. Dorrel (2004) has found that "Canada plans to have half the country using interoperable systems by 2010".

The fundamental component of an electronic health record is to store patient data on each episodes of care with a medical provider. This allows for the ability to identify admission patterns and disease profile and assist in the promotion of evidence-based practice.

However Canada, not unlike Ireland, is faced with a serious dilemma in relation to the introduction of an Electronic Health Record. Dorrel (2004) sums it up quite well when she states that "without the ability to uniquely and continuously identify patients and link their medical records from multiple systems and providers it is impossible to provide physicians, clinicians and researchers with an on demand complete health history for a given patient".

Currently, patients are identified within a healthcare organisation by a medical record number (MRN). Patients seen at multiple organisations receive multiple MRNs. These numbers provide unique identification only within specific facilities that issued the MRN. Wheatley (2004) in the US found that "to provide unique patient identification across multiple organisations, a reliable unique patient identifier is required".

The Canadian Institute for Health Information (CIHI) conducted research into the feasibility of a national unique identifier. While the research was specific to Canada, the issues raised are not unlike those experienced in Ireland at present:

- Multiple identifiers were assigned to a single patient
- A common identifier scheme was lacking
- Standards for matching patient data were lacking.

The absence of a unique identifier in the Irish healthcare system is obviously having a negative effect on the quality of HIPE data. The HIPE database represents a repository of high-quality population-based health records of great value for research. It contains data that may be used to carry out epidemiological, genetic and many other kinds of research

which could be of benefit to the nation as a whole. Such records are essential to progress in genetic medicine. This is an area of research that studies the genetic factors in disease and their interaction with environmental risk factors. This leads to the possibility of developing predictive models of the links between genes and the environment in causing disease, thus allowing preventive measures to be taken.

Unfortunately the use of the HIPE database for genetic research and other longitudinal studies is limited by the lack of an identifier that would allow linking of records for an individual patient. Research is needed to find ways of transforming the data to allow records belonging to a particular individual to be identified, while protecting patient confidentiality. Wheatley (2004) cited the report published in 1997 by the Department of Health and Human Services in the US in it five key categories of solution to the unique patient identifier were established these were:

- Unique identifiers based on the Social Security Numbers SSN
- Identifiers not based on the SSN
- Proposals that do not require universal unique identifiers
- Hybrid Proposals
- Cryptography methods that are not identifiers

One possibility is the provision of a link identifier by a trusted third party, who would generate and maintain the identifiers. The data recipient would have no means of linking this identifier to the actual patient's identity. This method is generally considered the most secure. Alternatively the identifier could be derived from other data in the record by use of a hashing algorithm. Dorrel (2004) states that "this expectation can only be

achieved through data linking that uses sophisticated algorithm software to accurately link all identifiers for a patient, regardless of the extent of data variation present". However, while the algorithm would not be revealed to the data recipient, there is still a danger that it could be reversed.

While patient confidentiality must be respected, a balance must be found between protecting confidentiality and facilitating research that would benefit the whole community. A commercial database to store the national HIPE data may make it easier to perform searches and facilitate use of data mining techniques to uncover new relationships between datasets. Care should be taken however not to get locked in to a proprietary data format.

Accurate and on demand-person identification is a critical component of any interoperable electronic health information infrastructure. No matter where an electronic health record system is implemented, it requires the ability to accurately identify patients. Dorrel (2004) reiterates the belief that "having accurate person identity data enables healthcare organizations to deliver high quality care, decreased medical errors, increase customer satisfaction and reduce healthcare costs".

3.1.3 Terminology and Classification issues:

The decision on how to classify an episode of care is usually made post-discharge. It involves examination of the record by a health information manager or clinical coder,

sometimes in conjunction with a clinician, and allocation of codes for diseases treated and procedures performed during the episode. These codes both record the concepts inbuilt in the care provided as well as interpret the ordering principles of the classification. Roberts et al (2004) found that "such ordering principles are designed for purposes such as statistical reporting".

Clinical coders are trained in the use of classifications, conventions and rules and in abstracting data from patient's records. The process is a manual one, with the coders using various resources to determine the correct code to describe the episode of care in a meaningful, predictable way. Entry to a class is via a clinical term, which is interpreted for that patient's episode of care by the application of rules. The index to ICD is structured according to disease process.

On the contrary, clinical terming can be performed by clinicians during the creation of the patient record. Choice of the term can inform treatment when the underlying concept is reused as a point of entry to clinical pathways and protocols, prescriptions and allergy information or to access the medical literature.

Classification and clinical terminologies have coexisted for decades. Both use clinical language, but they come from different domains. Classification derived from epidemiology and health information management, while terminologies come from health informatics. Roberts et al (2004) found that "the adoption of a terminologies

patient-centred system can require a significant cultural change from the statistical approach of classification".

In classification, codes convey meaning, and are predetermined categories based on the body system, aetiology, or phase to which codes are allocated. Roberts et al (2004) describes classifications as "essentially flat and contrived, with conditions usually coded in one place only and the labels adapted to coverall terms included in a rubric". Clinical Terminologies, on the other hand, have a much greater agility, are expressed in "Natural" language and are usually maintained electronically.

Terminologies are, in fact, meaningless but can have many dimensions by virtue of the parent-child relationships that constitute their structure. Terminologies aim to represent clinical knowledge through these relationships. Roberts et all (2004) has found that the "choice of term can inform treatments when the underlying concept is reused as a point of entry to clinical pathway and protocols, prescriptions and allergy information, or to access the medical literature". Because clinical terms and the concepts for which they may be synonyms may be uniquely identified by code, they can be transmitted electronically in a reasonable by unambiguous manner, forming part of messages derived and exchanged in a standard way within healthcare.

Computers rely on formal appeals to the reference terminology for their knowledge. Roberts et al (2004) found that "unlike people, computers do not implicitly understand links between the name of a concept and that to which the name refers in reality".

Classifications and terminologies each have merits. They are designed for similar but different purposes. The adoption of terminologies will both affect the development of electronic health records and be affected by the extent of the electronic health record use.

3.1.4 Deadlines Issues:

Complete and accurate diagnostic and procedural coded data is necessary for research, epidemiology, outcomes and statistical analysis, financial and strategic planning, reimbursement, evaluation of quality of care and communication to support patient's treatment. Coding deadline periods have been established by the ESRI in Ireland to promote more usable accurate data.

At present the coding deadlines are quarterly end of March for data up to the previous end of December, end of June for data up to the end of previous March, end of September for data up to the end of the previous June, and end of December for data up to previous September. In practice in Ireland coders most often code inpatient medical records within three to five days of discharge. This is due to the pressures exerted by other departments for the patient charts for processing patient's notes and the billing system.

When this pressure is strictly applied, coders may be in the position of relying on incomplete, conflicting, or inconsistent medical record documentation. Many time coders process charts without the availability of all the information required for example

histology reports and may have to go back to the case and input more information as this becomes available. Pressures from hospital management to process charts quickly and efficiently to facilitate other departments can have a detrimental impact on coding quality As Murphy (2004) states that "coders feel that the pressure currently exerted by their hospitals is concerned with quantity and meeting reporting deadlines".

Often because of these pressures there can be charts not coded completely at deadline periods which can have a detrimental effect on hospital budgets as well as clinical data. To support accurate and complete coding, organisations must enforce their own policies, rules and regulations for the timely processing of charts.

3.1.5 Missing Documentation and Incomplete Records Issues:

Ongoing planning and assessment rely heavily on the quality and accuracy of the documentation in the chart. In the US it has been found by Kostick (2002) that in addition to coding, "when missing patient coding information is identified, the coder is responsible for follow up with the physician or the responsible hospital department in order to request the missing coding information".

In practice it is found that the only dictated reports that may **not** be available immediately upon discharge are the discharge summary or an operative report or pathology report if the procedure was performed the day before discharge. Mac Donald (1999) says "these

documents should be available on the record or electronically no longer than 48 to 72 hours after discharge. All other documents, including the history and physical, consultations, emergency records and diagnostic results must be immediately available". Organisations should establish firm policies for their coders regarding the minimum documentation that must be present in order to code patient records.

Each organisation should also define a mechanism for each coder to communicate with physicians if necessary in order to obtain clarification on conflicting, incomplete, or ambiguous documentation. Zender (2003), in her interview the knowledgeable engineer Judy Sample found that "as we know, our physicians have their own unique ways of describing things….for example they could use "*Diabetes mellitus*", "*diabetes*", or just "*DM*". A uniformed standardised method of classifying a diagnosis and procedure should be established to assist in accurate coding.

The defined mechanism should be reviewed with administration and the clinicians to make sure that support is available and that the clinicians understand that coders will contact them when they need to. There must also be a clear agreement that clinicians are expected to respond to questions in a constructive and helpful way, and that requests for information cannot go unanswered. Mac Donald (1999) emphasises this important issue when she stated that "responses to coder's questions must be documented in the medical record".

One method employed in the United States to work on these difficulties is that of a quarterly review of medical records documentation. Mac Donald cites the Joint Commission standard IM.7.6, which states that "incomplete and delinquent medical record statistics must be reported at least quarterly as part of the medical record review function". The volume and types of medical record deficiencies and delinquencies are directly related to the organisation's ability to effectively implement an effective compliance strategy that supports accurate data collection, coding and billing practices.

Clark J (2002) in the US cited the Joint Commission on Standards "IM7.10-IM.7.10.1 require that "medical records to be reviewed on an ongoing basis for completeness and timeliness of information and action to be taken to improve the quality and timeliness of documentation that effects patient care". The intent section of the standards list 19 bulleted items that should be included in an ongoing record review. They are:

- Identification data
- Medical history
- Summary of patients psychosocial needs
- Physical examination
- Statement on the conclusions drawn from the admission history and physical
- Statement on the course of action planned
- Diagnostic and therapeutic orders
- Evidence of informed consent

- Clinical observations and results of therapy
- Progress notes
- Consultations
- Operative reports
- Reports of diagnostic and therapeutic procedures
- Transplants and Implants
- Final diagnosis
- Conclusions at termination of hospitalisation
- Discharge summaries
- Discharge instructions
- Results of autopsy

Clark (2002) recommends the review of clinical documentation regularly "an organisation might choose to review the 19 items at the beginning and mid point of each year and from these reviews determine the focus of ongoing record review and concentrate on resolving known documentation problems throughout the remainder of each year".

Mac Donald (1999) listed the potential benefits of such an implementation as:

- Improvement in timely documentation resulting from identifying and requesting missing reports and information.
- In-dept knowledge about patients and their plan of care and/or pathway.

- Ongoing review of orders, medications, and treatments in conjunction with the stated diagnosis.
- Increased opportunity to communicate with the physician to seek additional information where documentation is incomplete or ambiguous.
- Verification that the physician has entered clarifying documentation in the medical record as needed.
- Heightened visibility with the healthcare team and opportunity to ask questions about the patient, the plan of care, and treatment.
- Ability to complete and verify final coding on discharge for a majority of the cases.
- Provides an opportunity to lead the charge for documentation improvement.

The disadvantages of such a system of documentation review were highlighted by Mac Donald as:

- Lack of available and competent staff who have been properly trained in coding and documentation practices.
- Legacy systems which do not support concurrent methods
- Challenges in changing work practices and processes
- Poor acceptance by physicians.

It is clear from the above that the advantages of establishing such a system for auditing clinical documentation has far outweighs the disadvantages than that of having no system at all. This is further clarified in this statement by Mac Donald (1999) that "if your organisation affirms a policy allowing coding without the discharge summary, there must be a follow-up review mechanism in place to validate the accuracy of the codes originally submitted".

In the US, Fletcher (2004) found in her study that "upon conducting a coding practice review, the casemix for asthma patients was significantly lower at one hospital than for all other hospitals. An investigation revealed that physicians did not document with *status asthmaticus* resulting in an unspecific code assignment. The physicians were informed and began appropriately documenting more specific code assignments, and subsequently, a higher asthma patient casemix". Competent, clear and accurate documentation is the foundation for complete and accurate coding of all types of medical record.

3.1.6 Education and Training Issues:

A major reason for the increased analysis of medical records in recent years is that their use has moved beyond reimbursement into arenas of clinical outcomes, medical research, and hospital performance. Therefore data is being gathered to provide information on disease processes, which in turn makes codes more detailed. Pressure on coders has always been high but in recent years it has become even greater with the introduction of a wider variety of medical procedures and diagnosis. Carol (2005) found that "coders are

being asked to provide greater details on a wider variety of medical procedures and devices, with higher levels of accuracy and in close adherence to new guidelines and regulations in evolving electronic environment". In the case of medical technology, the introduction and adoption of new devices, procedures, and pharmaceuticals can easily outpace code updates, often challenging coders to document procedures that as yet lack codes.

How a procedure is carried out affects the reimbursement rate as well as the patient's length of stay. For example one clinician may remove a gall bladder using an open procedure whereas another clinician may use a laparoscope. Whether a normal stent or drug-eluting stent is used during an angioplasty will determine the assignment of coding and the reimbursement rate. As the same time that the rate of innovation increases, the demand for coding accuracy grows greater. Carol (2005) has found that "with stricter coding guidelines and compliance requirements mandated by government and other regulatory and accrediting agencies, medical coders are feeling more pressure than ever before to produce high-quality coded information".

The ESRI provides ongoing education and training for all coders working in Ireland in the HIPE system. The unit regularly conducts coder training workshops aimed at three different skill levels, basic, intermediate, and experienced. The workshops are conducted at various locations throughout Ireland, with timing and location dependant on demand. The basic training consists of three days for a beginner course followed up four months later by an advanced course comprising of two days. Each coder receives a training folder

at the beginning of the workshop, with reference material covering the topics to be taught. The folder becomes their reference tool and the coder is advised to update it regularly with the material received from future workshops and on the job training.

Much of coding experience is learned on the job from more experienced senior coders. Bramley (2004) described this type of training as "coding buddy". New coders are teamed with experienced coders and their work is guided, audited and assessed by their mentors. The ESRI also run specialist workshops for more experienced coders on specialised areas in coding, for example maternity, gynaecological and paediatric. These workshops are designed on demand and held at various times throughout the year in various locations. All workshops are advertised through the coding notes and coders can apply for inclusion on these programs.

Bramley et al (2004) found that coders generally enjoyed attending training sessions "coders enjoyed networking and discussing issues with colleagues". On the downside, Bramley et al (2004) found that "coders were dissatisfied with the charts used in the basic training sessions - they think they a too sanitised that is small and legible and not a true reflection of the real world". Bramley et al (2004) study also found that "a low level of medical terminology knowledge is a barrier to learning and they believed that the intermediate course delivered was repetitive same as the beginners course". However the view of the ESRI training unit is that "the content of the intermediate course is to consolidate coding training and experience so far".

Coders sometimes complain that because of coding deadline pressures that they do not have the time to attend workshops. Murphy et al 2004 found that "coders need to take more responsibility for their continuous education and responsibility data quality needs to be emphasised".

3.1.7 Non adherence to Coding Guidelines:

Health information managers and coding professionals have always played a vital role in advocating clear, complete, pertinent, and accurate documentation in the medical record. Guidelines have been established to assist in this process. However Murphy et al (2004) found that during the training and the in-hospital coding experience undertaken in the pilot study on the implementation of ICD- 10-AM in Ireland, "it became evident that current standard coding guidelines issued to Irish coders were not always implemented as required".

Murphy et al (2004) also went on to state that "a lack of insight by some coders on the issue of quality became apparent". Non adherence to national coding guidelines is a serious problem which could lead to quality deficiencies in coding and data reporting.

Coding guidelines are developed in-house and adapted from the USA. In-house development is driven by need, primarily from quality activities conducted by the unit and some guidelines are developed from coding queries sent to the ESRI. Guidelines are

published in *Coding notes* and reinforced in all training activities. Compliance is measured directly through audits and indirectly through the number of coding queries related to a guideline.

Interesting findings from Bramley et al (2004) found that "some coders do not know whether the guidelines are mandatory, some coders admit to not reading the guidelines, a few believe that they have little relevance to the real world".

3.1.8 Productivity Measurement

Davis (2003) stated that "as a non-renewable resource, time is precious". Many coders in Ireland have up to 29 days holidays a year. There is at present no cover for coders while on their annual leave. There is often a build-up of charts to be coded on their return referred to locally as a "backlog" of charts. This can result in coders working extra hours to cover the backlog, which can lead to an increase in annual leave entitlement in the form of Flexi days. This results in a spiralling effect on workload output with many HIPE departments experiencing a considerable amount of pressure at deadline periods.

In the US it has been found that there is a serious shortage of coders. Kloss (2002) cited the US Bureau of Labour Statistics (BLS) who projected the need for about 97,000 new Medical Record and Health Information Technicians through 2010 to fill new jobs and replace workers leaving the field. They stated that "the number of medical records and health Information Technicians…is expected to grow rapidly due to the need to maintain

records for an increasing number of tests, treatments, and procedures that will undergo increasing scrutiny by third-party payers, courts and consumers". This is evident here in Ireland also with the introduction of new fields of data capture.

Another effective productivity measurement highlighted by Kostick (2002) includes "running weekly coding reports that identify how many patient claims were coded by each coder on a daily basis". However, productivity measurement on individual coders is difficult to quantify given the variances in the types of charts to be coded. The time taken to code a complicated medical admission far outweighs that of the time taken to code a simple day case admission. This would further lead to querying of the decision of the DOHC to employ coders per number of admissions per hospital per year. At present it stands at one coder per 7,000 admissions per year. The specialty workload of hospitals is not considered in this calculation. Therefore coders who are employed in hospitals with a predominantly daycase workload may appear to be more productive with their time than those coders employed in more acute medical centers.

There are few incentive schemes at a local level for meeting productivity targets or data reporting timelines, even though coding deadlines are linked to financial rewards.

3.1.9 Inappropriate Computer Programming Routines or Software Logic

Ensuring accuracy of coded data is a shared responsibility between the health information management professional, clinicians, business services staff, and information systems integrity professional. Each health area is responsible for the integrating the HIPE system into the hospital administration system used in their facility. Brough et al (2003) found that "coding errors have multiple causes, some within the control of health information management process and others that occur outside the scope of health information management due to inadequacy of information integrity resulting from inappropriate computer programming routines or software logic".

The networking between HIPE and other hospital systems is complex due to the wide variation of systems in use in the Irish Healthcare system. Most PAS Patient Administration Systems are more than fifteen years old and computer equipment is outdated. Bramley et al (2004) found that "local IT support staff are reluctant to assist in solving problems with interfaces to HIPE software because they believe that the responsibility lies with the ESRI". To illustrate how the interface to HIPE is implemented, the Health Service Execute (HSE) Northeast (NE) system is described here.

HSE NE System

Administrative data required by HIPE is extracted from HIS, the Hospital Patient Information System. IT staff developed the interworking software, called the HIPE

Generation Programs. The logic for this software was worked out by manually calculating Private/Public and ITU days for an individual patient. A program was then written to output the required information by matching fields using a QTP program in Quiz (the reporting tool used in the HIS system). This program generates a sub file for each entity containing a list of discharges. An entity is an identifier unique to each location within the NEHB.

A command file runs the program and a job to run this command file is scheduled to run daily. The program checks the HIS records for patients discharged that day. For each patient discharged it calculates, from the HIS data, the length of stay, number of ITU and private/public bed-days, and also retrieves other relevant patient information for example name, MRN, Date of Birth. The data is stored in a HIPE file where it can be retrieved by the clinical coder. The program appends the data to the existing HIPE file, so that files generated at the weekend and during holidays are not lost. This gives the coder the flexibility to download the file at a time that is suitable for them. Once transferred to the coder's PC, the HIPE file is deleted from the disk and a new HIPE file is generated the next time the program is run. There is a backup program if files get deleted or lost.

The command file transfers the appropriate HIPE file from the disk to a folder on the coder's PC. The coder then runs the Windows-HIPE software, which allows for Data Entry and Reporting.

HSE NE HIPE Generation Program Versions

There are three versions of the HIPE Generation program on the HSE NE system:

The first program runs automatically every night to generate LIVE files for each Entity.

The second program is run manually on request for specified Entities and Discharge Dates in the event where a file may be lost or overwritten.

The third program is run manually to create a file with delimited fields so it can be exported to the excel format for analysis.

HIPE data Quality Assurance

There are two steps used in this process, firstly the **Bed Days Used** are checked and Secondly a **Select Discharge** comparison is carried out. The **Select Discharge** is a file on the HIS system that gives an account of discharges for a select date or date range.

The HIPE record contains three fields showing the breakdown of the Patient's stay in the Hospital: **ITU-Days, Private-Days** and **Public-Days**. A macro in excel runs a check on

the total of these three fields and compares it with the length of stay. The length of stay is calculated from the difference between **Patient Admission Date** and **Patient Discharge Date** fields. Appendix 4.

The **Select Discharge Program** on the HIS reports on the number of Discharges per Consultant for a particular Entity and Date Range. The **Select Discharge** report should agree with the number of discharges on the HIPE subfiles. The IT department checks this program regularly to ensure its integrity. An inability to download administration data from the HIS system would led to a major backlog in clinical coding. It would necessitate the coders to have to re enter in administration data on the patients.

The upgrade in Ireland to ICD-10-AM in January 2005 has necessitated changes to the prior program, as a number of new fields were required to capture data for the HIPE. This increase in data capture necessitated new software development, which can result in, as with any new system, a period of trouble shooting. That in itself has lead to slower coding times, which has led to backlogs in clinical coding. This has resulted in the spiral effect on workload output by clinical coders, which if not controlled could lead to a decrease in coding quality.

3.20 Data Protection Issues in relation to HIPE data:

The owner of the HIPE database is the DOH&C. The ESRI collects and processes the data on their behalf. Like all Data Controllers and Data Processors, the DOH&C and the

ESRI are bound by Irish and EU data protection legislation. See Appendix 5 for a summary of the Data Protection Rules.

Medical records are defined as sensitive personal data by the Data Protection (amendment) Bill 2002. Furthermore the information is collected for statistical purposes and may therefore be processed under subsection 2B (1) (b) (viii) of the Bill, which allows processing of data for statistical purposes.

The patient's name is stripped from the record before export to ESRI in order to protect confidentiality. This prevents casual identification. However the data is not completely anonymous and identification could still theoretically be possible from other data e.g. Date of Birth, Medical Record Number. Stripping this information from the data would render it useless for research purposes therefore a balance must be struck. Fields that could possibly identify an individual are not included in any information released by ESRI to third parties.

Bramley et al (2004) stated that "coders often feel as if as though they are caught in the middle of a battle between their local IT support and the ESRI`s IT support when they seek help in solving problems". External suppliers are responsible for the maintenance of many local systems, therefore any requests for major changes take time to program, build, test and implement. Moreover, some hospitals plan to introduce new PAS so in the interim, no maintenance is conducted on then old system. Bramley et al (2004) found that "the recent notification to change the system was received by coders in October, three

months in advance of the planned implementation date of January of the following year. Such a timeframe is not sufficient for most hospitals". This has obvious pressure effects on coders and their working relations with their local IT departments. This can lead to some data having to be collected manually which in turn can affect data quality. Bramley et al (2004) found that "Coders believe that there should be better co-ordination and co-operation between the ESRI, the DOHC and hospitals regarding changes to the software".

3.2.1 HIPE Data Safety and Security Issues:

In the US, work is on-going on the area of security regulations in the area of Electronic Heath Records. Rode (2003) states that "an organization not only address the confidentiality of electronic protected health information but also take steps to assess risks and protect the availability and integrity of the health records through the implementation of risk assessment, policies, procedures and training". This is further verified by Sullivan (2002) when she states that "privacy regulations focus on managing the permitted use, disclosure, or access to protected information".

To achieve ongoing confidentiality and security of the Electronic Heath Record
Rode (2003) recommends that each organization following these basic rules these too can be applied to HIPE data:

- Ensure the confidentiality, integrity, and availability of all electronic protected health information it creates, receives, maintains or transmits
- Protect against any reasonably anticipated threats or hazards to the security or integrity of such information
- Protect against any reasonably anticipated uses or disclosures of such information that are not permitted under the privacy rule
- Ensure compliance by the organization's work force.

The national HIPE database is stored and maintained by ESRI. They are responsible for the safety of the data. Version control is implemented manually. Each version of the database is archived for reference purposes and stored indefinitely. The database records are stored in text format. Commercial databases are not used. This renders the data reasonably future proof. Text is preferable to proprietary formats, since it is easier to migrate from one generation of technology to the next.

3.2.2 HIPE Data Access and Analysis:

HIPE includes a suite of reporting software that can be used by the hospitals locally to generate reports on the HIPE data that they have collected themselves.

In the ESRI, the national database for each year is analysed using SPSS, SAS, or the HIPE Reporting software.

HIPE Data is available nationally and locally as follows:

- Aggregate national statistics, without identification of hospital, patient or consultant are available directly from the HIPE Unit, ESRI.
- Hospitals may issue their own statistics for internal or external use.

Direct access to the database is not provided. Requests for information must be submitted to the ESRI, whose staff carry out the search and return the results to the requester. Aggregate datasets may be released for research purposes. Record-level data is released only with a limited number of fields. Anything which could potentially identify a patient e.g. date of birth is removed. Data which could identify a particular hospital is not released without authorization from hospital. Any data which could identify an individual patient, doctor or hospital must be kept confidential. Researchers must comply with the ESRI "Conditions of Use" for any data released to them see Appendix 6.

The Patient name is removed and no alternative identifier on the record is substituted. There is therefore no way of linking records from the same patient for the purpose of carrying out longitudinal studies. Longitudinal studies can be performed within hospitals, as the MRN is unique to each hospital. However longitudinal studies across the HIPE database are not possible, as there is no way of linking records belonging to the same individual across hospitals.

4.1 Integration of HIPE with other Systems

At its simplest, mapping is linking content from one minology or classification scheme to another. Mapping considers different purposes, levels of details, and coding guidelines of source target. The mapping process employs a standard method which the terminologies context or classification description principles are interpreted between systems. Brough (2003) found that "automated maps create efficiency by minimizing duplicative data entry and patient data integration across a wide variety of applications".

In the UK and the US disciplined mapping between specific terminologies and classification has taken place. In the UK, the National Health Service has mapped terms in Clinical Terms Version 3 to classes in ICD 10. These have evolved into mapping between Systematized Nomenclature of medicine Clinical Terms (SNOMED CT) and ICD-10 diseases. Likewise in the US, SNOMED International has mapped SNOMED CT to ICD-9-CM. Imel (2002) stated that "according to SNOMED International, the mapping structure provides a technical structure that will eventually support rule-based processing and thus facilitate cross mapping". In Australia, the National Centre for Classification in Health (NCCH) has undertaken work in the preliminary mappings between specific domains of SNOMED CT and ICD-10-AM. While such mapping allows an automated relationship between a term and a code, many still require human intervention where the context of the code is not straightforward. Roberts (2004) gave two examples these include "diabetes in a neonate in pregnancy and hypertension with renal disease".

However having a map does not necessarily eliminate coding or the need for expertise in code selection. The important role of the coder was reinforced by Brough (2002) when she stated that "even as coding processes become more automated, the project shows that coding professionals will be needed to review one-to-many or many-to one relationship in order to develop these rules for algorithmic translation". Maps are used to standardise linkages to a certain extent and therefore improve coding accuracy simply and efficiently through automated algorithms.

There is a special inbuilt reporting mechanism within the HIPE software specifically designed for the National Cancer Register of Ireland (NCRI). Its purpose is to flag all cancer cases diagnosed within each hospital in Ireland. This highlights any non-pathologically diagnosed patients. The National Cancer Registry has also designed software whereby all cancer cases are matched electronically from the HIPE database to the NCRI database. Approximately 12% (NCRI 2003) of all cases registered by The National Cancer Registry are downloaded from the HIPE database. This has increased from 5.8% in 1994. There is great scope for future development in the integration of these two systems.

5.1 Methodology:

5.1.1 Literary review:

The researcher has researched the HIPE coding process here in Ireland and across Europe, Canada, United States and Australia. The researcher has made analysis of the processes in relation to factors that influence data quality in Ireland and in the other countries. These factors included illegible handwriting, absence of unique identifier, terminology and classification issues, chart collection process, missing documentation, education and training issues. As well as these factors other issues include productivity measurement, inappropriate computer programming routines or software logic and non adherence to coding guidelines.

From this literary review the researcher has investigated the current practice of clinical coding in Ireland. The questions explored by the researcher have ascertained the factors that are influencing the quality of coding data from a coder's perspective. These questions have explore Irish coders coding experience, hours worked per week, non coding duties, departments employed by, amount of charts coded per quarter and the issue of outstanding charts at reporting deadlines. The researcher has identified recommendations that if implemented, could improve the quality of clinical coding in Ireland.

5.1.2 Questionnaire to Clinical Coders working across Ireland:

The researcher attended the national coding conference and distributed questionnaires to all clinical coders present to gain an insight from their perspective into the process of clinical coding in Ireland and their views on how it can be improved to ensure that coders adhere to the guidelines set down for coding of data. The researcher wanted to gain an insight into coder's opinions on the factors that were influencing the accuracy, completeness and timeliness of clinical coding. The researcher also wanted to inquire of the coders whether coding deadlines were influencing the quality of their work and finally the researcher wished to ascertain if there was a need to for more clinical coders to be employed in the Irish Healthcare system.

The broad areas of enquiry put to those working as clinical coders were years of coding experience, department reporting to, and the number on average of charts coded per day, the amount of charts outstanding at a reporting deadline time, and to identify issues that impact on the accuracy, completeness and timeliness of coding.

5.1.3 Pilot Questionnaire

In February a draft questionnaires were piloted to fifteen coders working across five different hospitals. The results of the pilot revealed a need to modify the questionnaire further to gain a clearer insight into coders` opinions. It also revealed for the researcher

two further issues that could result in corrections being sent to hospitals from the ESRI. See appendix 7

5.1.4 General Results of Piloted Questionnaires February 2005

Demographic Information of Piloted Coders:

Over 65% of those piloted had over 7 years coding experience. As shown in Table 1.1 Over half of these are working full time at 33 hours per week.

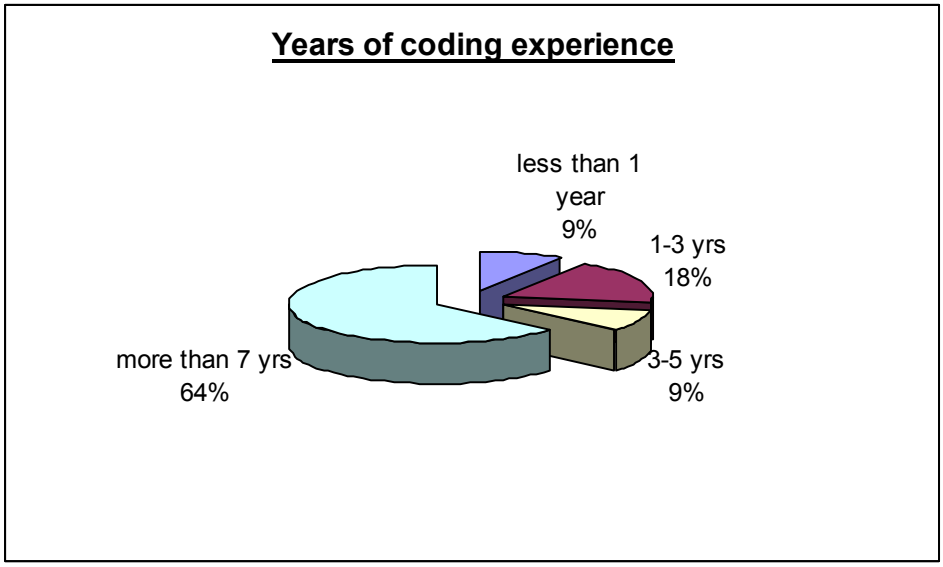


Table 1.1 shows the number of coding year's experience of those piloted.

All coders questioned in the pilot survey worked over 10 hours per week with the majority of them over 55% working full time on over 33 hours per week. See Table 1.2

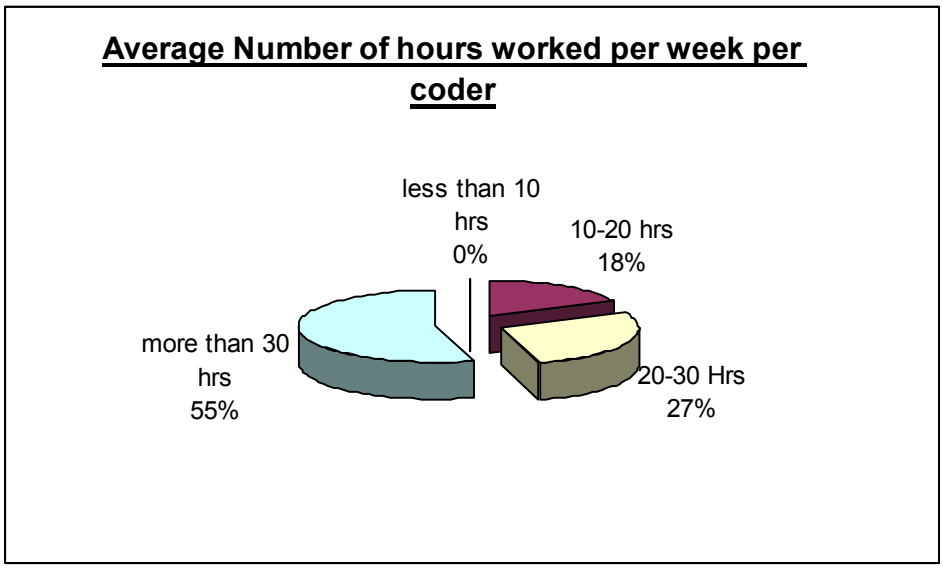


Table 1.2 shows the average number of hours worked per week per coder in pilot study

Department in which coders piloted are employed by:

Of the coders piloted two thirds were employed by the Medical Records Department and the remaining third by the Finance Department. The number of charts coded per quarter averaged between 3,000 – 9,000 charts per hospital.

67% of coders questioned in the pilot found that they were required to do other work other than coding with over half of these coders spending up to 10 hours per week at different tasks.

Factors that impact on the accuracy, completeness and timeliness of coding from the piloted coders perspective:

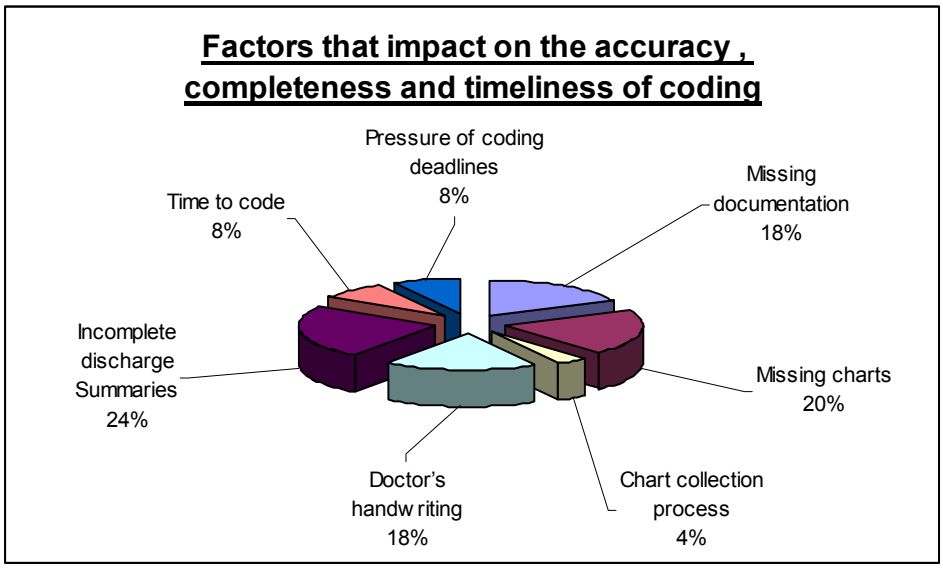


Table 1.3 shows the factors that impact on the accuracy, completeness and timeliness of coding from the piloted coders view point

The coders piloted were asked why, in their opinion, were the issues explored above causing such difficulty for them. These were some of the answers given:

"Trying to locate doctors to complete discharge summaries"

"Missing Charts"

"Charts being filed incorrectly"

"Trying to find the consultant to confirm Principal Diagnosis"

"Time consuming looking for charts"

"Time wasted trying to read handwriting"

"Time wasting trying to find documentation better spent to improve coding standards"

"Feeling of frustration around Doctors` handwriting"

"Inefficiency with getting charts"

***Correction received from the ESRI per quarter as expresses by the piloted group*:**

100% of those coders piloted stated that they receive correction from the ESRI per quarter. Of those 50% receive less than ten checks whereas only 10 % receive over twenty corrections per quarter. See table 1.4

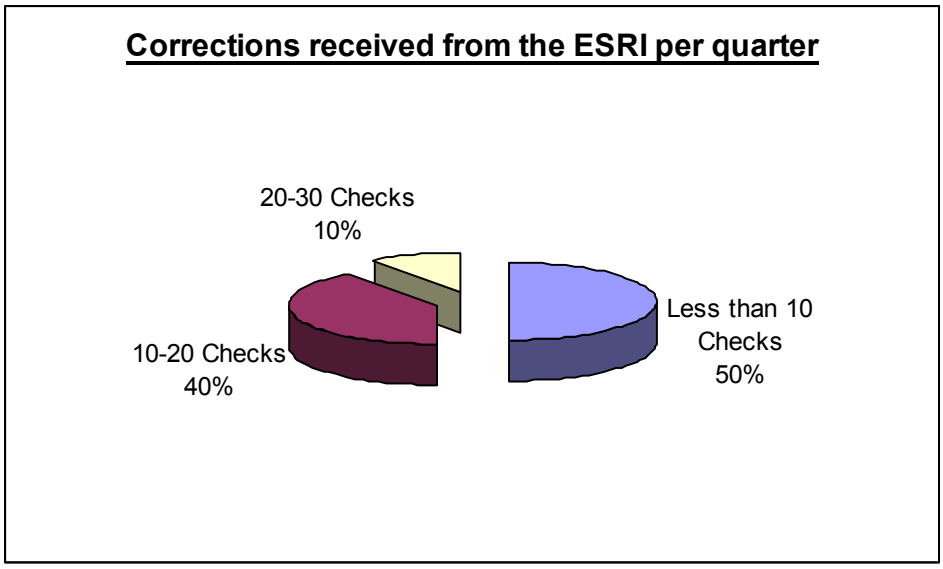


Table 1.4 shows numbers of corrections received per quarter by coders piloted

Reasons given for corrections by the piloted coders include:

- Poor documentation in 60% of piloted cases
- Changes in coding practice not communicated to coding staff in 20% of piloted cases
- Error in inputting data in 13% of piloted cases
- Error in choosing codes in 7% of piloted cases

The Changeover to ICD 10 AM

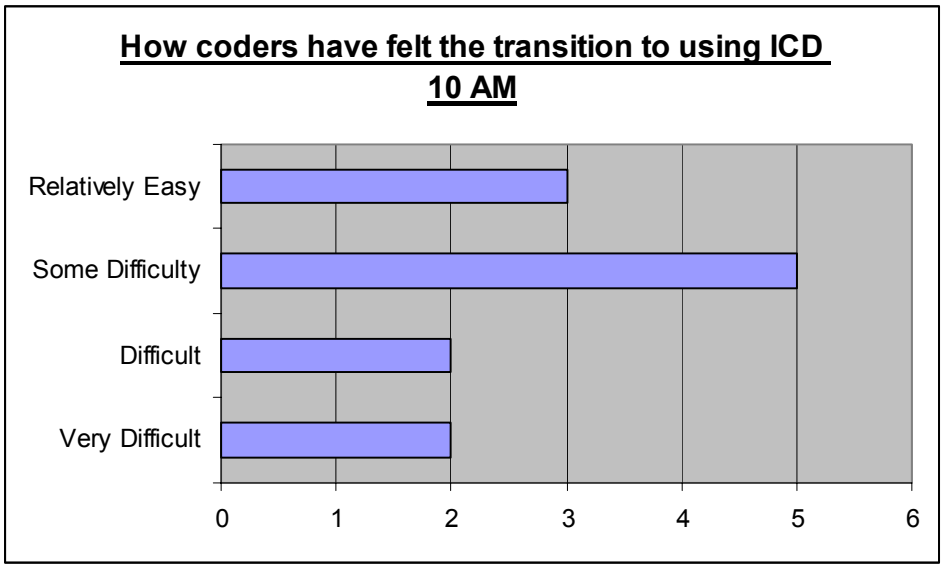


Table 1.5 shows the views of the coders piloted on the changeover to ICD 10 AM

Reasons given for difficulties as expressed by the coders piloted were:

- Difficulty with working two systems ICD 9 and ICD 10

6.1 Results of Primary Research:

The actual research was conducted in March in which fifty-five questionnaires were distributed to coders at their national clinical coder's conference. As coders are only coding using ICD 10 AM since January 2005 many of the questions explored in this questionnaire refer to coding pressures experience by coders using ICD-9-CM. See appendix 8. The return rate of completed questionnaires from coders was very high at forty-one. This represents a 75% return rate of questionnaires.

Years of coding experience:

Over 52% of coders surveyed had over 7 years coding experience. As shown in Table 2.1 Of these experienced coders over 80% are working full time at 33 hours per week.

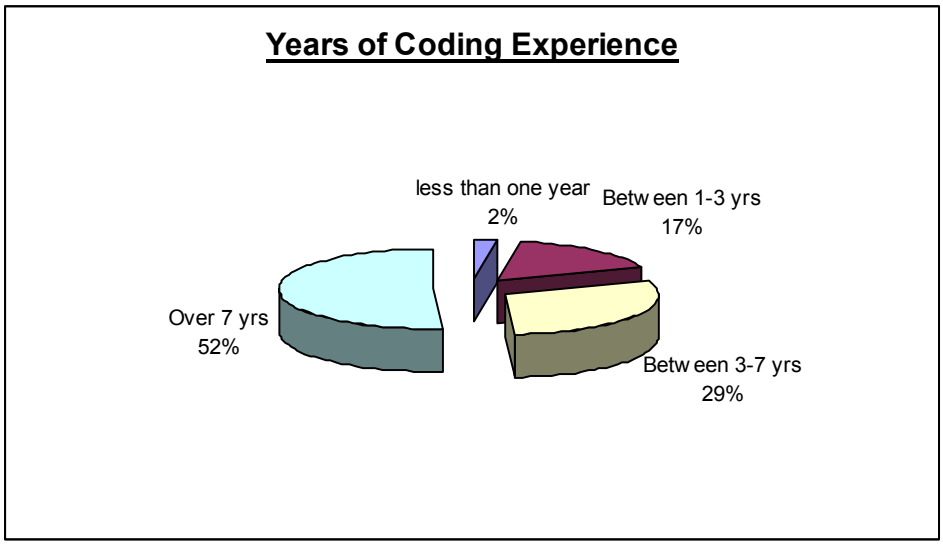


Table 2.1 shows the number of coding year's experience of those surveyed.

Hours Worked per Week:

All coders questioned in the survey worked over 10 hours per week with the majority of them over 81% working full time on over 33 hours per week. See Table 2.2

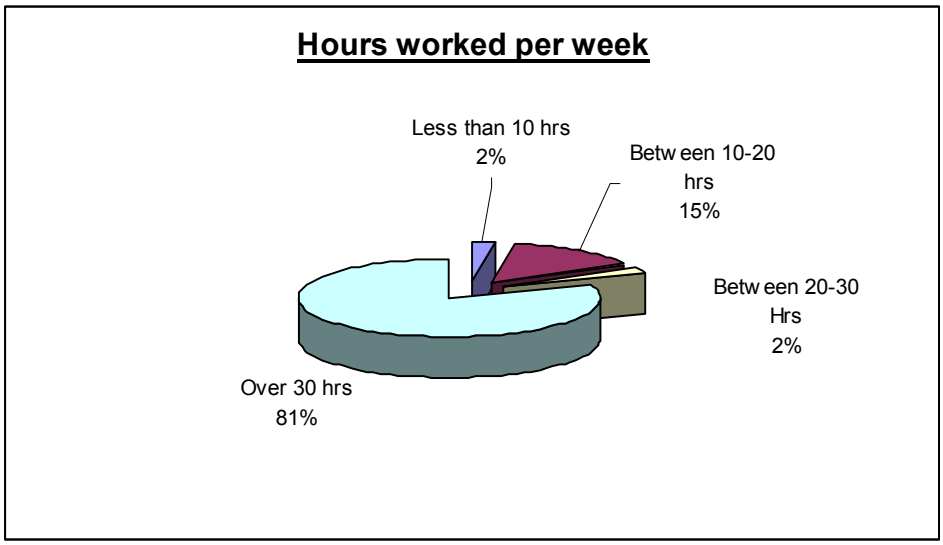


Table 2.2 shows the average number of hours worked per week per coder

Time Spent on other Tasks other than Coding:

71% of coders questioned in the survey found that they were required to do other work other than coding. Amazingly 14% of these coders are spending between ten and twenty hours per week at tasks other than coding. From the survey it was found that the coders who are spending over ten hours per week on tasks other than coding are senior coders with over seven years coding experience. The other tasks included locating missing charts, training junior coders and preparing reports for management and clinicians.

Surprisingly 50% of junior coders with less than three years coding experience are spending up to ten hours per week on trying to locate missing charts. While two thirds of coders surveyed with between three and seven years coding experience are spending up

to ten hours on other tasks other than coding. These tasks would mainly include locating missing charts.

These finding would indicate nationally a need to quantify and measure the chart collection process in all hospitals. A national standard method of processing charts to the coding department should be developed and implemented nationally to reduce the incidence of coding time being taken up trying to locate missing charts.

Time Spent per Week trying to Locate Missing Charts:

Four fifths of those surveyed stated that they spend up to ten hours of their working week trying to locate missing charts. Of the senior coders surveyed, 95% spent up to 10 hours per week trying to locate missing charts. Worryingly, one coder with less than three years coding experience admitted that they were spending up to half of their working week trying to locate missing charts.

Department in which Coders are employed by:

Of the coders piloted, two fifths were employed in the Administration Department and one quarter by the Finance Department. Others reported to the Medical Records Department and the Information Management Department.

In a more detailed break down of information provided it would appear that 50% of senior coders with over seven years coding experience reported to the administration department. 42% of coders with less than three years coding experience reported to the

finance department. Of the other coders surveyed with between three and seven years coding experience 45% reported to the administration department.

International research would indicate that clinical coders should actually be reporting to the Information Management Department of our hospitals. This research concludes that only 17% of those who answered the questionnaire did actually report to the Information management department. The high percentage of junior coders 33% with less than three years coding experience reporting to the finance department would indicate that clinical coding in our hospitals in Ireland is lead by the finance department.

It was interesting to learn that 10% of those surveyed were not aware of which department they reported to. See table 2.3.

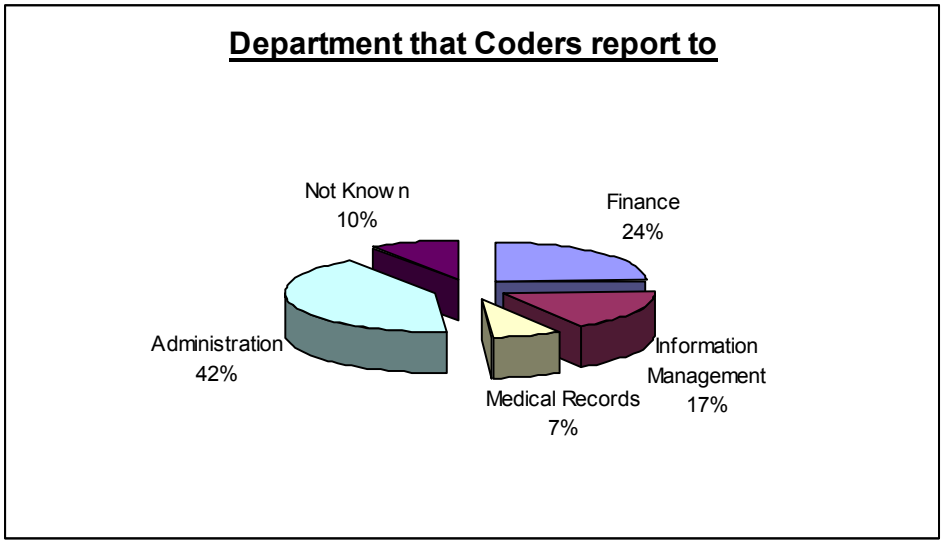


Table 2.3 shows Departments in which Coders report to

Of the coders that were unaware of which department they reported to, all had over three years experience in coding clinical data and one had over seven years experience. It could be argued that these coders must all work for the same hospital but the fact is that they actually are working in three different hospitals.

Coding Specialty:

Of the coders surveyed 56% stated that they coded a particular specialty. See table 2.4

The majority of coders code medical and surgical cases.

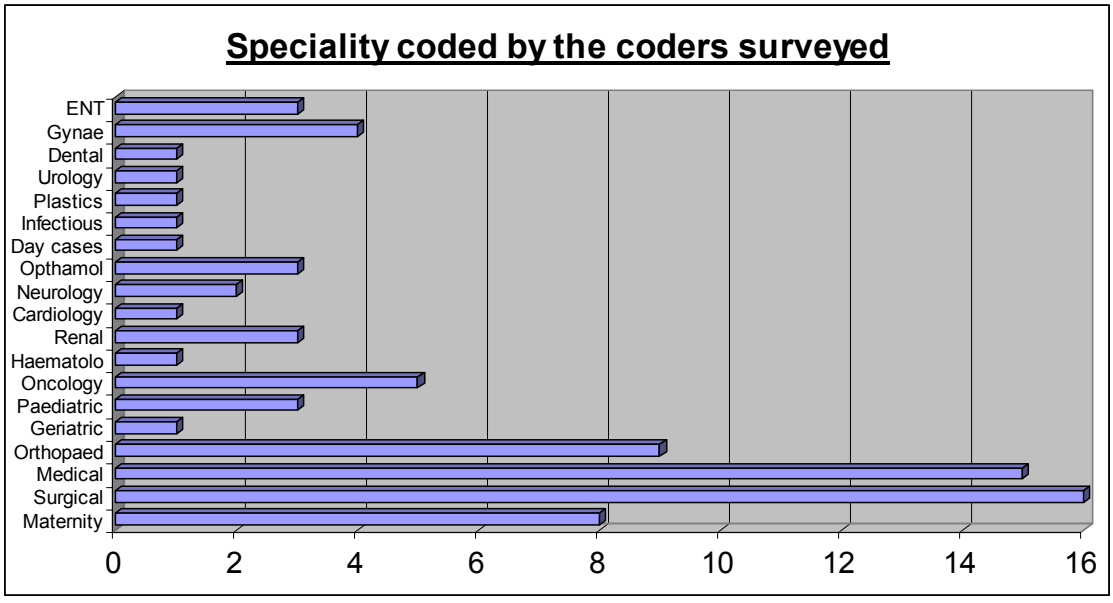


Table 2.4 shows specialty coded by coders

Charts outstanding at deadline periods:

62% of those surveyed stated that there were charts outstanding at deadline periods. Almost two thirds of these had over thirty charts waiting coding at deadline periods

See table 2.5

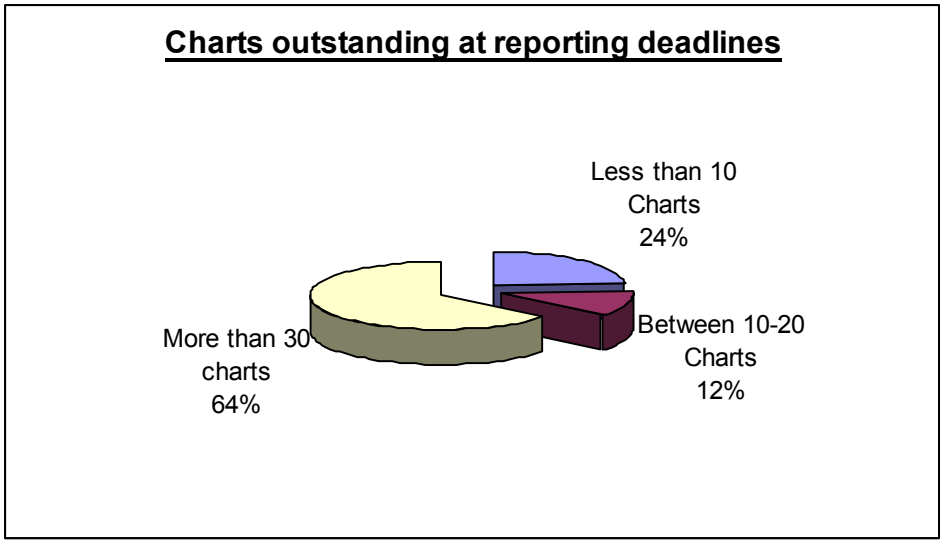


Table 2.5 shows the amount of charts as identified by coders as waiting coding at deadline periods

For senior coders with over seven years coding experience 57% found that they had charts outstanding at the quarterly deadline period. 60% of senior coders surveyed stated that they had over thirty charts waiting coding at the quarterly deadline period. Over half of coders with between three and seven years coding experience surveyed found this also to be the case.

Charts not coded at deadline periods obviously put a lot of extra pressure on coders from management in relation to the casemix adjusted budgets and from clinicians for their requirements for clinical audit. This trend has only worsened as a result of the

introduction of ICD-10-AM coding of clinical data in January 2005, as coders are only beginning to adjust to this new system.

The evidence from this research which highlights the fact that almost two thirds of those who completed this survey had over thirty charts outstanding at reporting deadline periods would indicate a need for more clinical coders working in Ireland.

***Factors that Impact on the Accuracy, Completeness and Timeliness of Coding*:**

Over 40% of those surveyed found that incomplete discharge summaries influenced most on the accuracy, completeness and timeliness on coding. This was followed in one fifth of cases by missing documentation and to a less degree at 17% by clinician's handwriting.

The factor that influenced senior coders the most was incomplete discharge summaries. More junior coders with less than three years coding experience found that incomplete discharge summaries as well as doctors handwriting influenced the accuracy, completeness and timeliness of coding. However coders with between three and seven years experience felt that missing documentation, missing charts and doctors handwriting all had an equal part to play in influencing the accuracy, completeness and timeliness of coding. See table 2.6

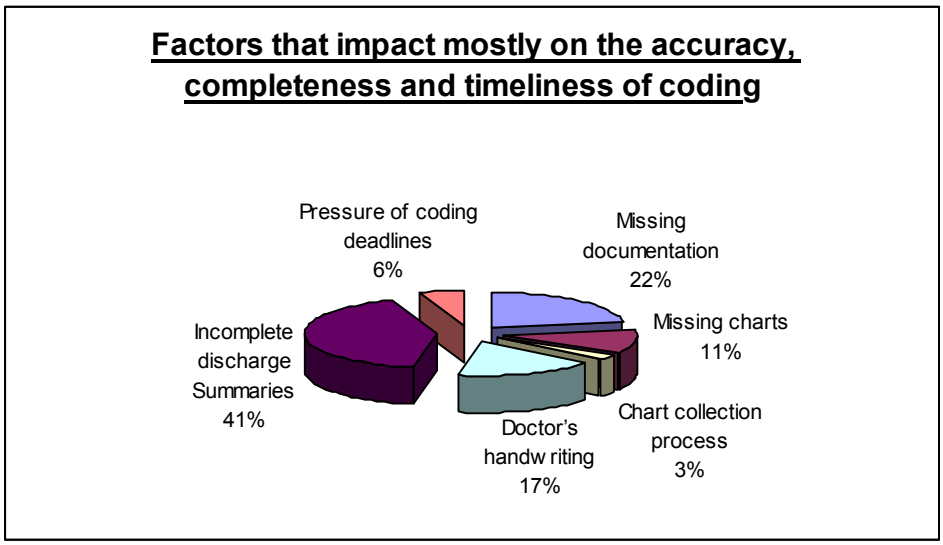


Table 2.6 shows the factors expressed by the coders surveyed that impacted most on the accuracy, completeness and timeliness of coding

In the majority of cases the major factors expressed by senior coders were "pressure of coding deadlines", "no cover for coders that are off sick or on holidays", and "time spent locating missing charts". Other factors expressed by senior coders included "absence of discharge summaries" and "missing information that results in coding that is not accurate" and to a lesser extent "rotation of doctors ever six months" and "unable to read doctors hand writing",

The most influencing factor as expressed by coders with between three and seven years experiences is "missing documentation". For more junior coders with less than three years coding experience found that "incomplete discharge summaries and the "inability to read doctors handwriting were the most influencing factors.

The number of charts coded per quarter:

The number of charts coded per hospital ranged on average from 2,000 – 12,500 charts per quarter**.** The DOH&C recommend that for every 8,000 charts processed per year per hospital there should be one coder. This would indicate that for some of the coders surveyed are processing up to fifty thousand charts per years in their hospitals and would have to have at least 7.5 coders employed in their hospital. Whereas other hospital processing only 8,000 charts per quarter would have only one coder employed.

A major difficulty expressed verbally by coders at the conference was the absence of holiday cover for coders. When a coder takes two weeks holiday charts are often bypassed from the coding department and on to other areas for processing like finance and consultants secretaries even back into the medical records filing system. The coder must then try to catch up with the non coded cases as well as cope with the new discharges daily. Many coders expressed anxiety when taking their annual leave entitlements.

Correction received from the ESRI per quarter:

100% of those coders piloted stated that they receive correction from the ESRI per quarter. Of those, over half receive less than 10 checks per quarter whereas almost one fifth receive over 20 corrections per quarter. See table 2.8. Checks are sent monthly from the ESRI to ensure data quality. It is normally the role of the HIPE Casemix Co-ordinator or

the senior coder to look up these cases and make corrections if necessary or to clarify correctly coded cases to the ESRI quality department.

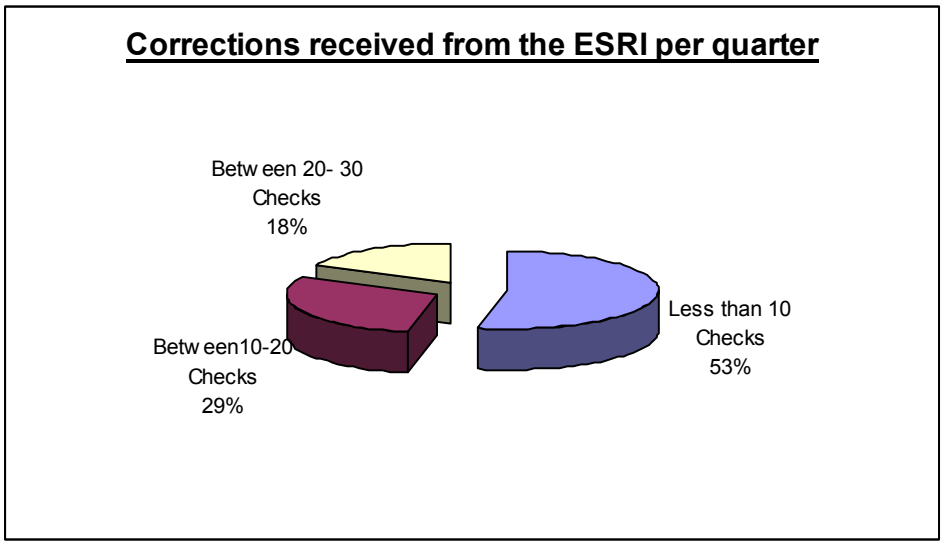


Table 2.8 shows corrections received from the ESRI per quarter

Reasons given for corrections include:

The factors that contribute to the corrections received from the ESRI as expressed by the coders surveyed highlighted in almost a quarter of cases missing documentation as the most major factor. It is followed closely in almost a fifth of cases by error in data inputting. See table 2.9

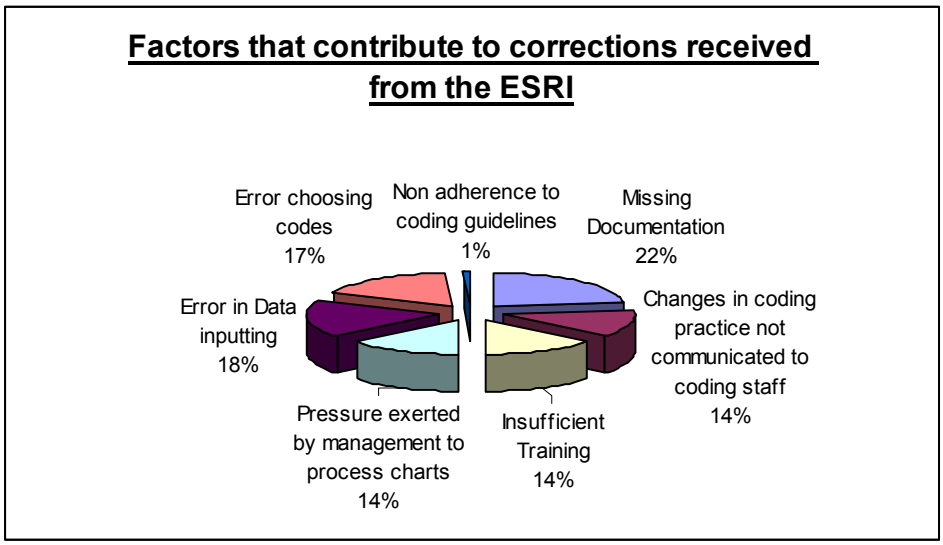


Table 2.9 shows the factors that contribute to the corrections received from the ESRI

For senior coders poor documentation scored the highest reason at over 76% of coders surveyed as the major factor for receiving corrections from the ESRI.

It is interesting to note that the non-adherence to coding guidelines was rated **least** an important factor for corrections received from the ESRI for the majority of coders.

The changeover to ICD -10-AM:

Almost a quarter of those surveyed are finding the change over to ICD-10- AM to be being very difficult, with two fifths of those surveyed finding some difficulty in the changeover. However one fifth of those surveyed are finding the change over relatively

easy. These are mainly more junior coders with between three and seven years experience. See table 3.0

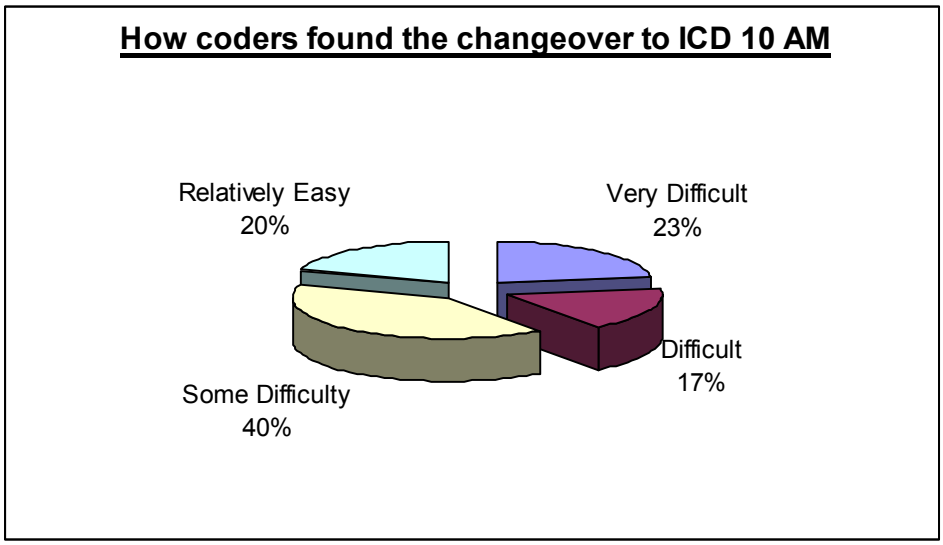


Table 3.0.shows how coders are finding the change over to ICD 10

Reasons given by coders for how they were finding the change over to ICD 10

In the case of senior coders with over seven years coding experience who were finding the change over very difficult the reasons given were:

- "Insufficient training prior to the changeover".
- "The coding using ICD-9 for so many years it's hard to change over to a completely new method of coding clinical data".
- "A lot to leave out and a lot of new codes".

For senior coders who were finding the change to ICD 10 AM coding difficult the reasons given were:

- “Slows up the coding process”.
- “Increase pressure on coders with coding deadlines”.
- “Changes take time to get used to”.
- “Insufficient training prior to the changeover”.

For senior coders who were finding some difficulty with the change to ICD 10 AM coding the reasons given were:

- “Codes are more detailed”.
- “Complete change from using manual books to using the E- book”.
- “Problems finding some codes”.
- “Have not moved o ICD 10 yet”.
- “A lot to leave out and a lot of new codes”.

For senior coders who were finding the change to ICD 10 AM coding relatively easy the reasons were not expressed.

For junior coders with less than three years experiences who were finding the change over to ICD 10 AM very difficult the reason given was “Difficult to know what to include and not to include”.

For junior coders with less than three years experience who were finding the change over to ICD 10 AM difficult the reasons given were “New codes” and “Checking for accuracy”.

For junior coders with less than three years experience who were finding some difficulty with the change over to ICD 10 AM the reasons given were:

- “Increased pressure of coding deadlines”.
- “Codes are more detailed”.
- “Documentation and time”.
- “Need now to read the whole chart to code correctly”.
- “New books are easy to read”.

For junior coders with less than three years experience who were finding the change over to ICD 10 AM relatively easy the reason given was “Same principles apply no great learning curve”.

For coders with between three and seven years coding experience who were finding some difficulty with the change over to ICD 10 AM the reasons given were “Just started using ICD 10”and “Local IT not ready to download administration data into HIPE system”.

For coders with between three and seven years coding experience who were finding some the change over to ICD 10 AM relatively easy the reason given was that the coder expressed the belief that the E book was very quick and easy to use.

6.2 Summary of the finding from the Primary Research:

- 71% of coders stated that they were required to do other work other than coding. Some senior coders are spending up to half of their working week on tasks other than coding. The other tasks included locating missing charts, training junior coders and preparing reports for management and clinicians.
- Four fifths of those surveyed stated that they spend up to ten hours of their working week trying to locate missing charts. One coder with less than three years coding experience admitted that they were spending up to half of their working week trying to locate missing charts.
- Of the coders piloted two fifths were employed in the administration department and one quarter by the finance department. Others reported to the Medical Records Department and the Information Management Department. It was interesting to learn that 10% of those surveyed were not aware of which department they reported to. A high percentage of junior coders are employed by the finance department this would indicate that coding is being lead by finance as appose to international literature that would support the belief that coding should be driven by information management.
- 62% of those surveyed stated that there were charts outstanding at deadline periods. Charts not coded at deadline periods obviously put a lot of extra pressure on coders from management in relation to the casemix adjusted budgets and from clinicians for their requirements for clinical audit. There is a need for more clinical coders working in Irish hospitals. This trend is only set to worsen with the

introduction of ICD-10-AM coding of clinical data as coders adjust to this process.

- Over 40% of those surveyed found that incomplete discharge summaries influenced most on the accuracy, completeness and timeliness on coding. This was followed in one fifth of cases by missing documentation and to a lesser degree at 17% by clinician's handwriting.
- 100% of those coders piloted stated that they receive correction from the ESRI per quarter. The factors that contribute to the corrections received from the ESRI as expressed by the coders surveyed highlighted in almost a quarter of cases missing documentation as the most major factor. It was followed closely in almost a fifth of cases by error in data inputting.
- Almost a quarter of those surveyed are finding the change over to ICD-10- AM very difficult, with two fifths of those surveyed finding some difficulty in the changeover. However one fifth of those surveyed are finding the change over relatively easy. These are mainly more junior coders with between three and seven years experience.

7.1 Conclusion:

In today's healthcare environment, coding professionals are enjoying a wealth of opportunity. There is a critical need for qualified coding professionals to classify, manage, and maintain clinical information in a form useful to the industry for analysis or healthcare transactions. Scichilone (2002) found that "due to the increased regulation in healthcare, heightened compliance risks, and progressively more complex reimbursement tied to code assignments, coding professionals have a greater array of choices within the profession than ever before".

Health Information Management is a field that offers ample personal and professional rewards and almost complete flexibility to craft a career that accommodates one's interests and desired work settings. Other positives identified by Rollins (2003) were "the ability to be involved in something that affects lives and improves care and plenty of recognition for a job well done".

Clinical documentation primarily created by clinicians is the cornerstone of accurate coding, supplemented by appropriate policies and procedures developed by organisations to meet patient care requirements. Brouch et al (2003) found that "coded data originated from the collaboration between clinicians and HIM professionals with clinical terminology, classification systems, nomenclature, data analysis, and compliance policy expertise". Therefore the need for collaboration and above all good communication between clinicians and coding staff is essential to promote the growth in information gathering and storage.

Some important areas that need to be considered in relation to the highlighting for clinicians the needs and the requirements of clinical coders to accurately code clinical episodes of care were described by Mac Donald (1999) as:

- Documentation describes the reason each medication was ordered
- Documentation explains the reason each test was ordered
- Documentation explains each abnormal test result
- Documentation explains the reason for each treatment provided
- Progress notes are updated to reflect the treatment plan
- Progress notes document the diagnosis (es) related to the treatment plan
- Progress notes document all procedures preformed
- A final progress note contains the final diagnosis
- Final diagnosis is specific and stated in complete, descriptive terms
- Final diagnosis statements include the etiology of the condition
- The content of the discharge summary is consistent with the rest of the record.

This basic information about the patient encounter can assist greatly the work of the clinical coder. This was further emphasized by the coders questioned for this study, who agreed that incomplete discharge summaries were by far the greatest factor that influenced the quality of HIPE Data.

Coding professionals and the organizations that employ them are accountable for data quality. Noller (1999) found that "the quality of data in many cases begins with quality coding". Brouch et al (2003) identified behaviours that are required by coding professionals and the organisations that employ them to promote data quality these are:

Adopt the best practises: Coding professionals should be aware the resources open to them for training and development. They should also be aware of their code of ethics and coding guidelines.

Use the entire heath record: Professional coders are urged to look beyond the discharge summary and use the entire clinical heath record "in order to assign and report the appropriate clinical codes for the standard transactions and codes sets required for external reporting and meeting internal abstracting requirements". It is clear from the findings of the survey conducted in this paper that clinical coders in Ireland are using the entire heath record to gain a clearer picture of the patient encounters, as "incomplete discharge summary" is highlighted by two out of five coders, as the factor that most impacts on the accuracy, completeness and timeliness of clinical coded data in Ireland.

Adherence to coding guidelines:

In the US, all official coding guidelines are published in the HIPAA standard transactions and code set regulations. Additional coding advice in the US is published in the quarterly publication *AHA Coding Clinic* for ICD-9-CM. In Ireland, coding guidelines are published by the ESRI and additional coding advice is transmitted through the ESRI

quarterly bulletin *Coding Notes.* Coders in Ireland are encouraged to strictly adhere to coding guidelines. Findings from the questionnaire conducted as part of this study would give the impression that coders working in the Irish setting are indeed adhering to coding guidelines.

Maintain a working relationship with clinicians: Clinical documentation for the most part created by clinicians is the basis of accurate coding. The maintenance of a good working relationship between coders and clinicians is essential to promote an accurate and complete data base. This can be achieved through ongoing communication and document improvement programs. In the induction program for new clinicians coming to work in Irish hospitals, the HIPE Casemix Co-ordinator sets down a clear educational awareness in relation to the functions of HIPE and Casemix. The HIPE Casemix Co-ordinator emphasises to the clinicians the importance of completed discharge summaries. In addition to this the HIPE Casemix Co-ordinator introduces the clinicians to the working of the HIPE database and its importance as a source tool for clinicians in research papers. The establishment of a good working relationship between clinicians and coders is essential in promoting an accurate and complete data set.

Report root causes of data quality concerns: It is important that all root causes of data quality concerns be referred to the appropriate consultants concerned. Brouch et al (2003) states that "problematic issues that arise from individual physicians or groups should be referred to medical staff leadership or the compliance office for investigation". In Ireland, a recent case such as this was discovered when it was found that a particular hospital had

an increase in the number of medical patients attending with *Respiratory Tract Infections*. On closer examination of the case notes it was found that quite a large amount of these patients had consolidation of the lungs on x-ray that would give rise to a more accurate diagnosis of *Pneumonia.* The medical consultant in charge of these particular patients was informed. A review of discharge summaries was completed and it was found that one particular junior doctor was recording episodes of *Pneumonia* as *Respiratory Tract Infection* in the patient's case notes and discharge summary. A discussion with the consultant changed this practice immediately. This proves that the reporting of root caused of data quality concerns can and does improve the quality of HIPE data.

Query when necessary: In the US, Prophet (2001) found that "best practices and coding guidelines suggest that when coding professionals encounter conflicting or ambiguous documentation in a source document the physician must be queried to confirm the appropriate code selection". The same holds true in Ireland, it is important when coding clinical information that the discharge summary matches that of the clinical record. A recent case in Ireland highlights this fact. A discharge summary of a surgical patient, a copy of which was sent out to the patients` GP, stated clearly that the patient had undergone an elective cholesectomy when in actual fact the patients' episode of care indicated that they had been admitted as an emergency case for an appendectomy. The querying of this discharge summary by the coder ensured that a proper discharge letter and information was set out to that patient GP and that a proper record of the actual encounter was recorded in the HIPE database.

Seek out innovative methods to capture pertinent information: Another significant behavior for coders as set out by Brouch et al (2003) is the need to "consistently seek out innovative methods to capture pertinent information required for clinical code assignment to minimize unnecessary clinical inquiries". This could be achieved here in Ireland through the mapping of other systems to the HIPE system, for example an electronic capture of procedures in theatre and endoscope unit could be linked to the HIPE System. Alternative methods of accessing information necessary for code assignment may prevent the need to wait for completion of the health records, such as electronic access to clinical reports. Procedures could be coded by clinicians using the ICD-10-AM and then downloaded to the HIPE system for storage. This would speed up the transfer of information and reduce coding errors.

Ensure that clinical code sets reported to outside agencies are fully supported by documentation: The health system is major news valuable area. It must be agreed that healthcare news assists in the selling of newspapers. On an almost daily basis we read interesting stories of insight into our healthcare system and of our government spending. Many of these reports are generated through the freedom of information mechanism. The majority of statistics used in these stories in relation to the acute hospital setting are generated from the HIPE system in the DOHC. It is important therefore that this information is correct and accurate. Brouch et al (2003) stated that it is important to "ensure that clinical code sets reported to outside agencies are fully supported by

documentation within the health record and clearly reflect in diagnostic statements and procedure reports provided by a physician".

Provide the clinician with the opportunity to review reporting diagnosis and procedures: The need of today's clinicians for information has expanded outside the clinician's office. Clinicians see an ever increasing number of well-educated patients who demand high-quality care and interaction. It is crucial therefore to be able to provide the clinician with the opportunity to review reports on their diagnosis and procedures. This promotes good communication between clinicians and coders and allows clinicians the opportunity to explore their caseload. This process also affords the clinicians a means of conducting a clinical audit of their practice and evaluation of the outcomes of procedures and interventions which in turn will promote evidence-based practice.

Create a document improvement program: The provision of educational awareness programs to clinicians, hospital management and nursing management staff promotes a clear understanding for all involved on the usefulness of HIPE data. Brouch et al (2003) recommends the "establishment of a documentation improvement program concerning the relationship of health record entries and health record management to data quality, information integrity, patient outcomes and the business success of the organization".

Conduct periodic audit of clinical coding: The audit of clinical data is essential to ensure its quality and integrity. Brouch et al (2003) found that "Pattern analysis of codes is a useful tool for prevention of compliance problems by identifying and correcting

clinical coding errors". In Ireland clinical data audit is normally conducted by the HIPE Casemix Co-ordinators whose role is to ensure the integrity and quality of HIPE data. Brouch e al (2003) also recommends a "periodic or ongoing review of encounter forms or other resource tools that involve clinical code assignment to ensure validity and appropriateness". This is significant for Ireland given the changes that are occurring in the new fields of data capture.

Complete appropriate continuous education: Complete appropriate continuous education of coders is crucial in the promotion of quality data capture. The ESRI provide training and education on coding of HIPE data. Complete appropriate continuous education and training enables coders to stay up-to-date with clinical advancements in diagnosis and treatment and coding guideline changes.

High standards of data quality can only be achieved if all stakeholders within the HIPE system recognize their responsibilities in this regard. This will necessitate complete and accurate information being recorded on the patient's chart by clinicians and appropriate chart collection processes being in place to ensure that HIPE coders have access to the data required to ensure accurate, complete and timely recording of each episode of care for all patients attending their hospital. Murphy et al (2004) stated that hospitals must "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".

7.2 Recommendations:

The healthcare and information technology industries are both in periods of dramatic change, driven by a multitude of pressures and presenting many opportunities. Experts tell us that technology has huge potential in the state sector. The latest European Commission survey puts Ireland fourth in "online sophistication" for accessibility to state services and functions on the web. While the web is currently the predominant method of providing physicians with access to clinical information, physician use of Personal Digital Assistant (PDA) technology continues to improve.

A central database of patient clinical information like HIPE data can be the foundation for centralizing the collection of patient- related clinical data for download and displays on PDA devices that are used by physicians during hospital rounds and for quick and easy on-call reference. Soule (2001) has found that "healthcare organizations view these devices as a way to increase clinician's satisfaction, while at the same time improving work flow". The health sector is undergoing serious redevelopment at the moment. Weckler (2005) suggests that "perhaps this is a good chance for the making the investment decisions to throw in some extra sophistication at a reasonable price".

The current complexity of healthcare information systems, with a different system in each major department from laboratory, to pharmacy, to outpatient physician's offices contributes to safety and quality problems by isolating and fragmenting critical patient information into departmental islands of automation. Soule (2001) has found that a central database of patient clinical information" like HIPE data "can help bridge this gap

and combined with an expert system "rules" technology, has been shown to be extremely effective in reducing adverse drug events, improve patient care quality and even reduce Medicare fraud and abuse risks". Soule (2001) goes on to state that "the cost savings from the reduction in adverse drug events alone is often enough to provide a return on investments in two years or less".

According to Barbell et al (2001) "medical errors are estimated to account for more than 7,000 deaths annually in the US and for an increased hospital cost of about $2billion per year. Improving computer systems would, of course, not eliminate all medical errors. But most researchers believe that they would reduce them dramatically. One study cited in *The Economist* magazine in April 2005 estimated that "Information Technology could prevent 2 million adverse drug interactions and 190,000 hospitalizations a year". Therefore the integration of all IT systems in the Irish healthcare system using ICD 10 AM to code clinical data could be a very important cost saving process that in time like that of the US would pay for itself.

HIPE data that combines the discharge data across different hospitals provides a national and regional benchmark information system that promotes the uniformity of hospital data systems. In the US Love (2001) has found that "data sharing and linkages, when authorised by state statues and guided by detailed data use agreements, provides powerful information for program management, policy development and population based assessment". For example, in the US Love (2001) cites "the crash Outcome Evaluating System funded by the National Highway Traffic Safety combines morbidity, mortality,

accident and utilisation data in 23 States to produce survival and injury information relating to vehicle safety".

The uses of the HIPE database are infinite given its uniqueness in that it is a database that covers all acute inpatient activity throughout Ireland. Coders must not be forgotten in this advancement and usage of data. Coder's educational and training needs should be met and a comprehensive accreditation program for coders in Ireland needs to be established. The Clinical Coders Ireland (CCI) the coder's society of Ireland hope to bridge this gap through strengthening its members to look for recognition from the DOHC for their contribution to healthcare information. Carol (2004) stresses the importance for coders to get accreditation when she states "the message to clinical coders is clear, stay current in your knowledge and skills, and if you aren't already credentialed, strongly consider becoming same".

Many of the coders questioned in this survey expressed difficulty with the change over to ICD-10-AM. Their clear difficulties should not be ignored but taken into consideration and acted upon. These difficulties includes insufficient training in using ICD-10-AM, a need for more coding workshops, and no ease on the deadline pressures to allow coders to adapt to the new system.

Another major factor influencing the quality of data capture as expressed by some of the coders surveyed was in the area in which the local IT network is not ready to download administrative data into the HIPE system. This is obviously affecting the work pattern of

coders to a great extent as with up to almost a quarter of the year was gone (at the time of this research) and still some of the hospitals surveyed were not coding using the new system. The author recommends that local IT employees be brought to the ESRI for training in the HIPE software and that advances and changes in the software be communicated directly to the IT personnel concerned. This would ensure that as a national clinical data base HIPE gets its rightful status in the area of priority for all acute hospitals in Ireland.

There is a need for further research into the changeover to ICD-10-AM and its effect on clinical coders to allow for international comparison of acute hospital activity. It is only a matter of time before the US changes to using ICD -10. Carol (2004) found that in the US "future coder education will focus most notably on the transition from ICD-9 to ICD-10". The new codes may also require a greater understanding of anatomy and physiology as well as the disease process and pharmacology. The US will be looking to Ireland for tools to make this transition as seamless as possible.

"***There is widespread agreement that Health Information Management will be an increasing important part of the healthcare system of the future".***

Wing (2003)

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Appendix 1

Discharge Summary Sheet

North Eastern Health Board / Bord Sláinte An Oir Thuaiscirt

DISCHARGE SUMMARY

Our Lady's Hospital, Navan ~ North Eastern Health Board

№ 011557

Chart No:_____ DOB:_____

Name:_____

Address:_____

CONSULTANT _____
Ward/Unit _____
Date Admitted _____
Date Discharged _____
Referral Source _____
Emergency/Elective _____
General Practitioner _____

Present complaint: _____

PRIMARY DIAGNOSIS	Office Use Only Code	Consultant
Secondary DX & Complication		
2		
3		
4		
5		
6		
PROCEDURES	**Code**	**Consultant**
1		
2		
3		
4		

CLINICAL INVESTIGATIONS / RESULTS / TREATMENT

Medication On Discharge	Dose	Frequency	Medication On Discharge	Dose	Frequency
1			6		
2			7		
3			8		
4			9		
5			10		

N.B. DRUG ALLERGIES

Follow Up:

GP Follow Up ☐ OPD Appointment ☐ Date ☐

Outcome: Home ☐ Long Stay ☐ Transfer to other Hospital ☐ Died ☐ Own Discharge ☐

Was Patient in ICU/CCU YES ☐ NO ☐

Blood Transfusion YES ☐ NO ☐ A further report will follow YES ☐ NO ☐

Signed _____ Date _____

Consultant/Registrar/SHO/Intern

White Copy - General Practitioners. Yellow Copy - Medical Case Notes. Pink Copy - Pharmacy

Appendix 2
Extract from ICD-9-CM

INDEX TO DISEASES

Inefficiency
kidney *(see also* Disease, renal) 593.9
thyroid (acquired) (gland) 244.9
Inelasticity, skin 782.8
Inequality, leg (acquired) (length) 736.81
congenital 755.30
Inertia
bladder 596.4
neurogeriic 596.54
with cauda equina syndrome 344.61
stomach 536.8
psychogenic 306.4
uterus, uterine 661.2
affecting fetus or newborn 763.7
primary 661. 0
secondary 661.1
vesical 596.4
neurogenic 596.54
with cauda equina 344.61
Infant - *see also* condition
held for adoption V68.89
newborn - *see* Newborn
syndrome of diabetic mother 775.0
"Infant Hercules" syndrome 255.2
Infantile - *see also* condition
genitalia, genitals 259.0
in pregnancy or childbirth NEC 654.4
affecting fetus or newborn 763.89
causing obstructed labor 660.2
affecting fetus or newborn 763.1
heart 746.9
kidney 753..3
lack of care 995..52
macula degeneration 362.75
melanodontia 521.0
os, uterus *(see also* Infantile, genitalia) 259.0
pelvis 738.6
with disproportion (fetopelvic) 653.1 affecting fetus or newborn 763.1
causing obstructed labor 660.1
affecting fetus or newborn 763.1
penis 259.0
testis 257.2
uterus *(see also* Infantile, genitalia) 259.0
vulva 752.49
Infantilism 259.9
with dwarfism (hypophyseal) 253.3
Brissaud's (infantile myxedema) 244.9
celiac 579.0
Herter's (nontropical sprue) 579.0
hypophyseal 253.3
hypo thalamic (with obesity) 253.8
idiopathic 259.9
intestinal 579.0
pancreatic 577.8
pituitary 253.3
renal 588.0
sexual (with obesity) 259.0
Infants, healthy liveborn - *see* Newborn
Infarct, infarction
adrenal (capsule) (gland) 255.4
amnion 658.8
anterior (with contiguous portion of intraventricular septum) NEC *(see also* Infarct, myocardium) 410.1
appendices epiploicae 557.0
bowel 557.0
brain (stem) 434.91
embolic *(see aLso* Embolism, brain) 434.11
healed or old, without residuals V12..59
iatrogenic 997.02
lacunar 434.91
postoperative 997.02
puerperal, postpartum, childbirth 674.0
thrombotic *(see also* Thrombosis, brain) 434.01
breast 611.8
Brewer's (kidney) 593.81
cardiac *(see aLso* Infarct, myocardium) 410.9
cerebellar *(see aLso* Infarct, brain) 434.91
embolic *(see also* Embolism, brain) 434.11
cerebral *(see also* Infarct, brain) 434.91
embolic *(see also* Embolism, brain) 434.11
chorion 658.8
colon (acute) (agnogenic) (embolic) (hemorrhagic) (nonocclusive) (nonthrombotic) (occlusive) (segmental) (thrombotic) (with gangrene) 557.0
coronary artery *(see also* Infarct, myocardium) 410.9
embolic *(see also* Embolism) 444.9
fallopian tube 620.8

Infarct, infarction - *continued*
gallbladder 575.8
heart *(see also* Infarct, myocardium) 410.9
hepatic 573.4
hypophysis (anterior lobe) 253.8
impending (myocardium) 411.1
intestine (acute) (agnogenic) (embolic) (hemorrhagic) (nonocclusive) (nonthrombotic) (occlusive) (thrombotic) (with gangrene) 557.0
kidney 593.81
liver 573.4
lung (embolic) (thrombotic) 415.19
with
abortion - *see* Abortion, by type, with, embolism
ectopic pregnancy *(see also* categories 633.0-633..9) 639.6
molar pregnancy *(see also* categories 630-632) 639.6
following
abortion 639.6
ectopic or molar pregnancy 639.6
iatrogenic 415.11 in pregnancy, childbirth, or
puerperium -*see* Embolism, obstetrical
postoperative 415.11
lymph node or vessel 457.8
medullary (brain) - *see* Infarct, brain
meibomian gland (eyelid) 374.85
mesentary, mesenteric (embolic) (thrombotic) (with gangrene) 557.0
midbrain - *see* Infarct, brain
myocardium, myocardial (acute or with a stated duration of 8 weeks or less) (with hypertension) 410.9

Note - use the following fifth-digit subc/assification with category 410:
0 episode unspecified
1 initial episode
2 subsequent episode without recurrence

with symptoms after 8 weeks from date of infarction 414.8
anterior (wall) (with contiguous portion of intraventricular septum) NEC 410.1
anteroapical (with contiguous portion of intraventricular septum) 410.1
anterolateral (wall) 410.0
anteroseptal (with contiguous portion of intraventricular septum) 410.1
apical-lateral 410.5
atrial 410.8
basal-lateral 410.5
chronic (with symptoms after 8 weeks from date of infarction) 414.8
diagnosed on ECG, but presenting no symptoms 412
diaphragmatic wall (with contiguous portion of intraventricular septum) 410.4
healed or old, cUITently presenting no symptoms 412
high lateral 410.5
impending 411.1
inferior (wall) (with contiguous portion of intraventricular septum) 410.4
inferolateral (wall) 410.2
inferoposterior wall 410..3
lateral wall 410..5
nontransmural 410.7
papillary muscle 410.8
past (diagnosed on ECG or other special investigation, but currently presenting no symptoms) 412
with symptoms NEC 414.8
posterior (strictly) (true) (wall) 410.6
posterobasal 410.6
posteroinferior 410..3
posterolateral 410..5
previous, currently presenting no symptoms 412
septal 410.8
specified site NEC 410.8
subendocardial 410.7
syphilitic 093.82
nontransmural 410.7
omentum 557.0
ovary 620.8
pancreas 577.8
papillary muscle *(see also* Infarct, myocardium) 410.8
parathyroid gland 252.8
pituitary (gland) 253.8

Appendix 3
Extract from ICD-10-AM

Infarct, infarction (of)

- cerebral - *continued*
- - due to - *continued*
- - - thrombosis
- - - - cerebral arteries 163.3
- - - - precerebral arteries 163.0
- - specified NEC 163.8
- colon K55.0
- coronary artery *(see also Infarct, myocardium)* 121.9
- embolic *(see also Embolism)* 174.9
- fallopian tube N83.8
- heart *(see also Infarct, myocardium)* 121.9
- hepatic K76.3
- hypophysis (anterior lobe) E23.6
- intestine (acute) (agnogenic) (haemorrhagic) (nonocclusive) K55.0
- kidney N28.0
- liver K76.3
- lung (embolic) (thrombotic) *(see also Embolism, pulmonary)* 126.9
-lymph node 189.8
- mesentery, mesenteric (embolic) (thrombotic) K55.0
- muscle (ischaemic) M62.2- - diabetic E 1-.69 - myocardium, myocardial (acute or with a stated duration of 4 weeks or less) 121.9
- - anterior (anteroapical) (anterolateral) (anteroseptal) (STEM I) (transmural) (wall) 121.0
- - chronic or with a stated duration of over 4 weeks 125.8
- - healed or old 125.2
- - inferior (diaphragmatic) (inferolateral) (inferoposterior) (STEMI) (transmural) (wall) 121.1
- - lateral (STEM I) (transmural) (wall) 121.2
- - non-ST elevation (NSTEMI) 121.4
- - nontransmural (NSTEMI) 121.4
- - NSTEMI 121.4
- - past (diagnosed on ECG or other special investigation) 125.2
- - posterior (STEMI) (transmural) (true) 121.2
- - postprocedural197.8
- - septal (STEM!) (transmural) 121.2
- - specified site (STEMI) (transmural) NEC 121.2
- - ST elevation (STEMI) NEC 121.3
- - STEMI NEC 121.3
- - - specified site - *see Infarct, myocardium by site*
- - subendocardial (acute) (nontransmural) (NSTEMI) 121.4
- - subsequent (recurrent) 122.9

Infarct, infarction (of) - *continued*

Appendix 4

HIPE input fields

HIPE FIELD	HIS FIELD	DESCRIPTION	
MRN	PAT-MED-REC-NO	Medical Record Number	
NAME	PAT-NAME-LAST + " " PAT-NAME-FI	Patient Name	
SDOB	PAT-DATE-BIRTH	Patient DOB	
SEX	PAT-SEX	Patient Sex	
MARR	PAT-MARITAL-STS	Marital Status	
RESID	AREA-CODE	Patients area of residence	
CONSULT	PAT-ADM-DR	Admitting Consultant	
SDADM	PAT-ADM-DATE	Date of Admission	
SOURCE	" "	Source of Admission	Blank
SDDIS	PAT-DATE-DSCH	Date of Discharge	
DISCODE	" "	Discharge Code	Blank
EP_NUM	PAT-ACCT-NBR	Episode Number	
TRANSFER_I	" "	Hospital transferred from	
EMERGEN_IN	" "	Emergency Transfer (in)	Blank
TRANSFER_O	DISPOSITION-CODE	Hospital Pat. transferred to	
EMERGEN_OU	" "	Emergency Transfer (out)	Blank
MED_CARD	PAT-FC-CODE	Medical Card Indicator	
SPECIAL	PAT-SERVICE	Consultant Specialty	
DAYCASE	PAT-TYPE	Patient Daycase	
D_CONSULT	PAT-ATTEND-DR	Discharge Consultant	
A_WARD	NURSE-STA	Ward Admitted To	optional
D_WARD	NURSE-STA	Ward Discharged From	optional
ITU_DAYS	CALCULATED	No. of Days in ITU	
MCN	USER FIELDS	GMS Number	
ADM_STATUS	" "	Public/Private Admission	
DIS_STATUS	FIN-CATEGORY	Public/Private Discharge	
INTERNAL	" "	Field for Internal Use	

HIPE FIELD	HIS FIELD	DESCRIPTION
ADMTYPE	PAT-ADM-CLASS	Type/Priority of Admission
ADMSOURCE	PAT-REF-SOURCE	Place prior to Admission
DISC_CODE	PAT-STAT-DSCH	Destination on Discharge
PRIV_DAYS	*CALCULATED*	No. of Days in Private/Semi
PUB_DAYS	*CALCULATED*	No. of Days in Public
WARDIND	PAT-TYPE	Dedicated Day Ward
EMADM	" "	Admission Mode of Patient
WLIST	PAT-REF-SOURCE	Waiting List Indicator
ADMWGT	" "	Admission weight - Patient
TRPDU	" "	Date – Pre-Discharge Unit

ITU_Days is calculated as the no. of days a Patient spends in an ITU/ICU ward.

PRIV_DAYS is calculated as the no. of days a Patient spends in a Private/Semi-Private ward.

PUB_DAYS is calculated as a total number of Patient length of stay minus (ITU_Days and Priv_Days)

Appendix 5
The Data Protection Rules

1. **Obtain** and process the information fairly

2. **Keep** it only for one or more specified and lawful purposes

3. **Use and disclose** it only in ways compatible with the purposes for which it was given to you initially

4. Keep it **safe and secure**
5. Keep it **accurate and up-to-date**
6. Ensure that it is **adequate, relevant and not excessive**
7. Retain it **no longer than is necessary** for the specified purpose or purposes

8. **Give a copy of his/her personal data** to any individual, on request.

Appendix 6

HIPE & NPRS Unit

CONDITIONS OF USE OF HOSPITAL IN-PATIENT ENQUIRY DATA

- The HIPE **tables/files/datasets** listed below are provided exclusively to facilitate research on **TOPIC** by **NAME**.
- These data should not be passed to any third parties.
- The HIPE & NPRS Unit is to be clearly acknowledged as the source of the data in any publication or presentation in which it is used.
- The HIPE & NPRS Unit is to be sent a copy of any paper based on HIPE data.
- Data are not to be presented in either written or oral form which could directly or indirectly identify an individual patient, doctor or health care institution.
- Tables should not be published where any individual data cells contain less than 5 cases.
- The responsibility for all interpretations of the data lies fully with the author of any publication or presentation of the data.

HIPE Datasets/Tables provided:

I agree to the above conditions

_____ Date:

Appendix 7

Clinical Coding Pilot Questionnaire

The purpose of this pilot questionnaire is to examine the factors that influence the quality of coding data in Ireland in 2004. I am enquiring as to your experiences and opinions -there are no right or wrong answers. Please complete the questionnaire and return to me in the envelope provided. The responses are **confidential.** You do not need give your name.

1. Years of coding experience							
< 1 year		1-3 yrs		3-7 yrs		> 7 years	

2. Number of hours worked per week							
< 10 hrs		10-20 hrs		20-30hrs		> 30 hrs	

3. Are you required to do other tasks apart from the coding of charts?			
Yes		No	

4. If you answered yes to the above question how many hours are taken up with other tasks on average per week?							
< 10hrs		10-20hrs		20-30hrs		> 30 hrs	

5. What department are you employed by?							
Finance		Information Management		Medical Records		Administration	

6. Do you code any particular specialty?		No		If yes, indicate specialty below
Maternity				
Surgical				
Medical				
Orthopedics				
Other please specify specialty				

7. How many charts per quarter are coded in your hospital?	

8. At deadline periods do you have charts outstanding to code?	Yes		No	

9. If you answered yes to the above question on average per quarter how many charts would be outstanding?							
< 10 charts		10-20 charts		20-30 charts		Over 30 charts	

10. How long do you spend per week on average trying to locate missing charts?	

11. What issues do you believe impact on the accuracy, completeness and timeliness of coding?					
Missing documentation		Doctor's handwriting		Pressure of coding deadlines	
Missing charts		Incomplete discharge Summaries			
Chart collection process		Time to code			

12. Why in your opinion is this issue causing the biggest difficulty for you?

13. Does your hospital receive QA checks from the ESRI?	Yes		No	

14. On average quarterly how many corrections does your hospital receive?							
< 10 checks		10-20 checks		20-30 checks		> 30 checks	

15. In your experience, what factor do you believe contributes to the amount of corrections required? (Please rank on a scale 1-6, 1 being the most relevant factor)			
Poor Documentation		Insufficient Training	
Changes in coding practice not communicated to coding staff		Pressure exerted by management to process charts	

16. How have found the transition to using ICD 10? (Please indicate one)			
Very Difficult		Relatively Easy	
Difficult		Easy	
Some Difficulty		No problems	

Thank you for taking the time to complete this questionnaire

Appendix 8

Clinical Coding Questionnaire

The purpose of this questionnaire is to examine the factors that influence the quality of coding data in Ireland in 2004. I am enquiring as to your experiences and opinions -there are no right or wrong answers.
Please complete the questionnaire and return to me in the envelope provided. The responses are **confidential.** You do not need give your name.

17. Years of coding experience							
< 1 year		1-3 yrs		3-7 yrs		> 7 years	

18. Number of hours worked per week							
< 10 hrs		10-20 hrs		20-30hrs		> 30 hrs	

19. Are you required to do other tasks apart from the coding of charts			
Yes		No	

20. If you answered yes to the above question how many hours are taken up with other tasks on average per week							
< 10hrs		10-20hrs		20-30hrs		> 30 hrs	

21. What department are you employed by?							
Finance		Information Management		Medical Records		Administration	

22. Do you code any particular specialty?		No		If yes, indicate specialty below
Maternity				
Surgical				
Medical				
Orthopedics				
Other please specify specialty				

23. How many charts per quarter are coded in your hospital?	

24. At deadline periods do you have charts outstanding to code?	Yes		No	

25. If you answered yes to the above question on average per quarter how many charts would be outstanding?							
< 10 charts		10-20 charts		20-30 charts		Over 30 charts	

26. How long do you spend per week on average trying to locate missing charts?							
< 10hrs		10-20hrs		20-30hrs		> 30 hrs	

27. In your experience please indicate the most relevant factor that you believe impacts on the accuracy, completeness and timeliness of coding? (Please rank on a scale 1-7, 1 being the most relevant factor)					
Missing documentation		Doctor's handwriting		Pressure of coding deadlines	
Missing charts		Incomplete discharge Summaries			
Chart collection process		Time to code			

28. Why in your opinion is this issue causing the biggest difficulty for you?

29. Does your hospital receive QA checks from the ESRI?	Yes		No	

30. On average quarterly how many corrections does your hospital receive?							
< 10 checks		10-20 checks		20-30 checks		> 30 checks	

31. In your experience, what factor do you believe contributes to the amount of corrections required? (Please rank on a scale 1-7, 1 being the most relevant factor)			
Missing Documentation		Insufficient Training	
Changes in coding practice not communicated to coding staff		Pressure exerted by management to process charts	
Error in inputting codes		Error in choosing codes	
Non adherence to coding guidelines			

32. How have found the transition to using ICD 10? (Please indicate one)			
Very Difficult		Relatively Easy	
Difficult		Easy	
Some Difficulty		No problems	

33. Please indicate reasons for your answer to question 16.

Thank you for taking the time to complete this questionnaire