pavilion health

National Audit of Admitted Patient Information in Irish Acute Hospitals

National Level Report

September 2016

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ACKNOWLEDGEMENT

Pavilion Health would like to acknowledge the people who have worked on Hospital Inpatient Enquiry (HIPE) over its many years in existence, both at hospital, regional & national level, while often under resourced, unrecognised and unacknowledged. This includes support for HIPE Clinical Coders and other stakeholders with regard to HIPE data, training development and delivery for coders and data users. The HIPE database in its current form has proven a robust platform for future quality initiatives outlined in this report and has made this project possible.

Pavilion Health also wishes to acknowledge the assistance of the Healthcare Pricing Office (HPO) of the Health Service Executive (HSE) Project Management Team, Project Implementation and hospital staff including coding teams, Clinicians and managers for their time and input into the processes to produce this report.

The Healthcare Pricing Office (HPO) HCAT© tool was used to collect the auditor's codes for further analysis in the medical record based coding audit.

For further information on Pavilion Health and its partners in this project; Chris Aisbett, Human Capital Alliance; Steve Gillett, University of Wollongong; and Jennie Shepheard (see **APPENDIX 1 Company Profile).**

As a postscript, Pavilion Health acknowledges the tremendous support and mentoring provided by Chris Aisbett who sadly passed away in May 2016. To the end he provided advice to ensure the success of his friends and colleagues who are still involved in the Irish health system.

GLOSSARY AND ABBREVIATIONS

ABF	Activity Based Funding (*for healthcare)*
ACHI – 6th Edition	The Australian Classification of Health Interventions, 6th Edition, 1 July 2008
ACS	Australian Coding Standards for ICD-10-AM and ACHI, 6th Edition, NCCH 1 July 2008
ADRG	Adjacent DRG (*DRG at the three-character level e.g. I10)*
AR-DRG	Australian Refined Diagnosis Related Group
CEO	Chief Executive Officer
CSA	Coding Service Assessment
DRG	Diagnosis Related Group
ESRI	Economic and Social Research Institute *(of Ireland)*
HADx	Hospital Acquired Diagnoses
HCAT©	HIPE Coding Audit Toolkit©
HIPE	Hospital Inpatient Enquiry
HPO*	Healthcare Pricing Office (*of the HSE, Ireland)*
HRID	Health Research and Information Division (*of the ESRI)*
HSE	Health Service Executive *(of Ireland)*
ICD-10-AM 6th Edition	The International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification, 6th Edition, 1 July 2008
ICS	Irish Coding Standards, 6th Edition, V6.0, HPO, January 2014
ICT	Information and communications technology
MDC	Major Diagnostic Category
NCCH	National Centre for Classification in Health. University of Sydney
NSW	New South Wales
PICQ®	Performance Indicators for Coding Quality (*A proprietary tool)*
WTE	Whole Time Equivalent
WU	Weighted Units

*From 1st January 2014 The National Casemix Programme and the Health Research and Information Division (HRID) at the ESRI became the HPO.

EXECUTIVE SUMMARY

The purpose of this project is to assess the validity of the data underpinning the Republic of Ireland's Health Service Executive (HSE) Activity Based Funding (ABF) model.

ABF represents a major change in the way Irish hospitals are funded. ABF means that hospitals are paid for the quantity of care they deliver to patients, thereby enabling the hospitals to see clearly the link between the work they do and the funding they receive for this work.

The inpatient and day case data that underpin ABF include the disease and procedure (clinical) codes collected by the Hospital Inpatient Enquiry (HIPE) system. In 2015 the HSE engaged Pavilion Health Australia Pty Ltd., by competitive tender, to undertake a review of the quality of HIPE data, to assess whether the quality of the data is sufficient to support the introduction of ABF.

The scale and methods employed in this project were carried out for the first time in Ireland and internationally. Six methods were employed to examine this complex area from different perspectives with the aim of providing a robust review of the quality of the data.

The core purposes of this project covered the following three areas:

- assess the validity of data underpinning the HSE ABF funding model
- validate a range of data reported to the HPO (Healthcare Pricing Office) of the HSE by acute hospitals
- identify best practice to improve coding quality management

The review demonstrated that the quality of the current HIPE coded data, and the processes and systems underpinning those data, are sufficiently sound to provide a platform for ABF in acute hospitals in the Republic of Ireland.

While the overall quality of the HIPE data is sufficient to move forward, there is a need to develop and resource a national data quality improvement agenda that reduces variations in coding practice between the hospitals. Detailed recommendations are contained in the body of the report but can be categorised into the following key areas:

- Clinician engagement with the HIPE Clinical Coding teams and the ABF process
- improvements in the structure and content of the medical record
- ensuring the HIPE Clinical Coding teams have the right structure and size in line with identified best practice
- the use of audit processes and quality tools
- training of key stakeholders including Clinical Coders

Draft hospital level reports were produced for all ABF hospitals and were further refined based on feedback from an extensive series of on-site face-to-face presentations and discussions with 32[1] hospitals in February and March 2016. Hospitals prepared their individual action plans based on the draft report and the feedback sessions. This important process ensured strong engagement from the hospitals and key stakeholders and an alignment with national recommendations.

[1] 38 ABF hospital reports were produced with 32 workshops conducted

The methods employed are detailed in the body of the report but are summarised in the following table.

Table 1: Overview of the methods used in the project

Method	Focus of analysis	Brief description
Adjacent DRG (ADRG) Benchmark Comparison	DRGs (*DRG at the three-character level e.g. I10)* that have a complexity split	measures the average complexity of discharges grouped to an ADRG and compares this average to the average for a group of peer hospitals, outputs those which are statistically different
PICQ® analysis	clinical codes (ICD-10-AM/ACHI/ACS 6th Edition)	PICQ® is a set of indicators or coding rules which identify records with inconsistencies in code combinations, sequencing, presence or absence of codes or lack of specificity
Medical Record Based Coding Audit	clinical codes (ICD-10-AM/ACHI/ACS 6th Edition)	re-abstraction and recoding of medical records
Coding Service Assessment: • literature review • Best Practice Workshop	service policies and procedures: • published work on best practice in coding service delivery • experience and opinions of stakeholders	• literature review using electronic and hand search • workshop with stakeholders from the hospital network • Interviews using a structured interview schedule
training and development infrastructure, and external auditing assessment	training and auditing policies and procedures	• interviews with HPO staff • results of medical record based audit and auditor's comments • HIPE Clinical Coder's comments
on-line survey of HIPE Clinical Coders	Clinical Coders' opinions and experiences	questionnaire

Detailed results and recommendations are found in the body of the report but are summarised in the following table.

Table 2: Summary results and recommendations

Project objective	Results	Summary recommendation
assess the validity of data underpinning the HSE ABF funding model	• quality of the HIPE data, are sufficiently sound to provide a platform for the introduction of ABF, however there is a large variation in coding practice between the hospitals	• hospitals implement quality improvement plans • HPO provide leadership by putting in place enabling infrastructure
validate a range of data reported to the HPO of the HSE by acute hospitals	• HIPE data lacks specificity in comparison to international benchmarks; lack of specificity may lead to under reporting of clinical complexity and this may have a material impact on the accurate allocation of ABF funding • compliance to national medical records standards is poor • national medical record standard is not conducive to coding and follow up auditing	• improve compliance to medical records standards by the hospitals • seek national standards review of the structure of the medical record to meet clinical as well as classification needs • Clinician engagement with the clinical coding teams and the ABF process to improve the quality of the medical record • give Clinical Coders opportunity to review DRG and value post code assignment
support data quality improvement in admitted patient data reporting including the identification of best practice clinical coding pathways	• best practice exists in some key elements of people and processes in a number of hospitals across the HIPE system • critical training and development infrastructure is very competent but under resourced • the use of audit processes and tools is under utilised	• HPO to provide an objective tool to estimate workforce needs • hospitals increase use of data quality tools • implement standard HPO audit process calibrated with hospital audits • resource future training and auditing resources to support data quality improvement at HPO and hospitals

1. INTRODUCTION AND PROJECT AIMS

In 2015 the HSE engaged Pavilion Health Australia Pty Ltd., by competitive tender to undertake an audit of the quality of the HIPE system, to assess if HIPE is sufficient to underpin the move to ABF, with a strong emphasis on coding processes in the acute Irish hospital setting. This study was completed in May 2016.

Pavilion Health is a specialist technology and services business focusing on the quality and integrity of clinical coded data particularly as it pertains to ABF in the public and private health sectors operating under ICD-10-AM/ACHI classification systems. PICQ® (Performance Indicators for Coding Quality) is a proprietary tool used by countries using the Australian modified classification systems as a way to objectively measure and compare the quality of clinically coded data against national coding standards and coding conventions, as well as for the relative specificity of the clinical coded data.

The Republic of Ireland's HIPE system is the national system for recording information relating to inpatient and day case attendances at acute public hospitals in Ireland. HIPE collects demographic, clinical and administrative data on discharges from, and deaths in, acute public hospitals nationally. Data are abstracted from medical records and coded by trained Clinical Coders before the codes are entered into the HIPE system. Clinical Coders use ICD-10-AM/ACHI/ACS (International Classification of Diseases 10th Revision Australian/Australian Classification of Health Interventions, Australian Coding Standards) 6th (2009 – 2014) & 8th Edition (from 2015) and related Irish Coding Standards to code the extracted data into HIPE. After coding, the cases are grouped to Diagnosis Related Groups (DRGs), a categorisation of clinically similar cases expected to consume similar levels of resources. ADRGs are split by complexity level with a maximum of four splits possible per ADRG. Weighted Units (WU) are assigned to cases based on the DRG and the length of stay.

The purpose of this project was to assess the validity of the data underpinning the Health Service Executive ABF model through a quality review of a full year (2014) of Irish HIPE coded patient data.

The purpose of the individual hospital reports and the action plans drawn up by the hospitals as a result are to improve data quality across the board and to accelerate a convergence of all hospitals towards high quality coded data.

2. RECOMMENDATIONS

2.1. A Guide – how to improve coding quality management

The following figure is an overview of recommendations on how to improve the quality of coded data.

Figure 1: Overview of a step-wise guide to improved quality of coded data

2.2. Detailed recommendations

Recommendation 1:

- HPO to facilitate sharing of best practice that currently exist within the current hospital network

Recommendation 2:

- increase Coding Service Managers profile as a key member of the hospital management team
- establish Coding Advisory Committee to support and develop system wide quality improvement initiatives and report back to local hospital management team

Recommendation 3:

HPO capacity be increased through recruiting:

- auditors to support a national audit programme
- trainers, recruited from the HIPE Clinical Coding workforce, and located initially in the HPO Dublin office but over time perhaps moving to a more regional model

Recommendation 4:

DRG assignment:

- education and awareness for HIPE management and Clinical Coders
- HIPE Clinical Coder access after coding an episode, including WU

Recommendation 5:

- develop an independent tool for better estimating the Clinical Coder workforce needs at a hospital level

Recommendation 6:

- increase the use of quality tools; all HIPE Clinical Coders should use quality tools and correct the errors identified in a timely manner (within 1 week of coding)

Recommendation 7:

Medical records:

- ensure compliance with the current national medical records standard
- seek national standards review of the structure of the medical record to meet clinical as well as classification needs

Recommendation 8:

Increase medical clinician involvement:

- establish committee with membership from HIPE Clinical Coders and Clinicians; regular scheduled meetings, key objective of this committee would be to improve the quality of the discharge summary and address quality improvement objectives
- development and distribution of aids (e.g. an email template for queries) and the introduction and monitoring of query protocols

Recommendation 9:

- implement a standard HPO audit process calibrated with internal audits at hospitals

Recommendation 10:

In hospitals where Clinical Coder staffing is greater than 5 Whole Time Equivalent (WTE), a workforce structure and common job specification be designed as follows:

- Trainee Coder
- Competent Coder
- Senior Coder (internal auditor / on the job trainer / mentor)
- Manager
- Quality Control Manager working on system wide quality initiatives

Recommendation 11:

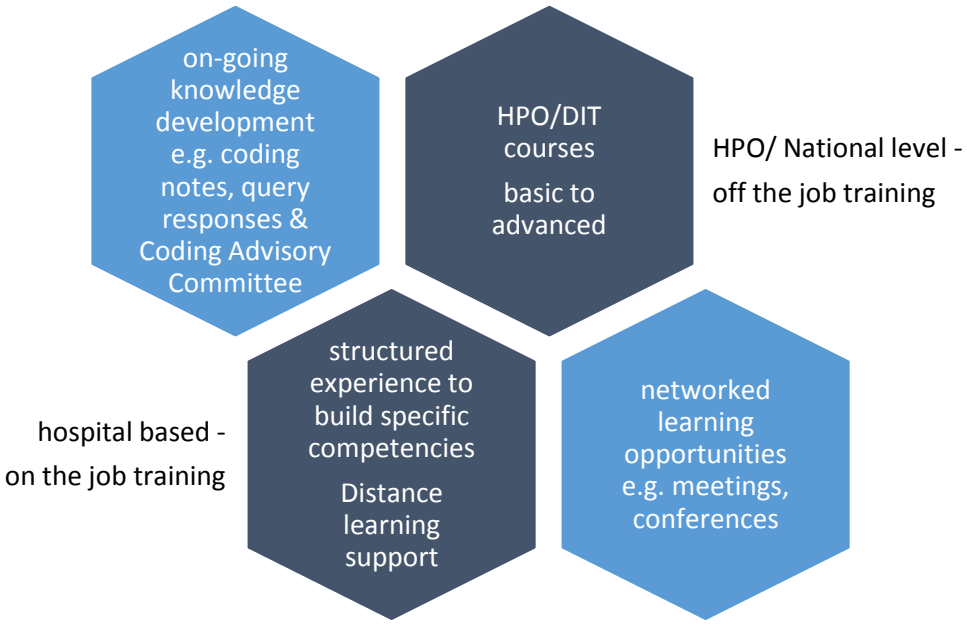
- develop a national standard for HIPE Clinical Coder remuneration based on skill level

Recommendation 12:

HPO to develop:

- training plans for the existing HPO trainers and auditors
- course to train Senior Coders in how to structure on-the-job training
- monitored online training so Clinical Coders can undertake more of their training independently
- a Clinician focused online education programme on clinical documentation improvement
- a course in auditing
- the existing HPO Clinical Coder entry courses to include competencies for beginning Clinical Coders in topics common across the hospitals, such as privacy and confidentiality policies
- and review the existing training content for the complex coding identified in the project; Diabetes, Critical Care and Mechanical Ventilation, Chronic Kidney Disease, Neoplasms, the Australian and Irish coding standards, and invasive and non-invasive ventilation
- build an online database of coded anonymous medical records with questions about the correct codes, the answers and explanations of why those are the correct codes; database should be available to Clinical Coders for independent learning, and hospitals for on-the-job training, as well as for use in HPO courses
- support and encourage the further development of the Dublin Institute of Technology

Figure 2: Overview of proposed Republic of Ireland Clinical Coder training system



3. METHODS

3.1. Overview of the methods

The approach used was a mix of several quantitative and qualitative methods. These methods reflect the two levels of data collection, namely the hospital level and the HPO/National level.

The methods deliberately examine this complex area from different perspectives to provide a robust review of the quality of the data underpinning Irish HIPE coded patient data.

Each of the methods addresses different aspects of the core objectives of the project, namely to assess the quality of the ICD-10-AM/ACHI and AR-DRG data, the management of the coding services and the Clinical Coder training. Taken together, the mixed methods approach addresses the objectives of the project directly.

The analysis using all 6 methods was used to develop 38 hospital level reports. The results were discussed in detail with the key stakeholders. At the workshops these results were overlayed with an understanding of local clinical practice.

3.2. Hospital level; data collection and analysis

The desktop analysis included 56 hospitals that contribute data to the HIPE, and 38 of these are funded under ABF. Detailed analysis and hospital level reporting was only conducted on the 38 hospitals funded under ABF.

3.2.1. ADRG Benchmark comparison

ADRG Benchmark Comparison Methodology

The analysis was developed by Pavilion Health[2] in collaboration with the HPO. Early drafts of the methodology were peer reviewed by the National Casemix and Classification Centre (Australia) of the University of Wollongong.

1. Within Ireland comparison: ADRG benchmarking measured the average complexity of discharges by ADRG at each hospital and compared this to the average for a group of peer hospitals
2. International comparison: each Irish hospital complexity per ADRG was compared to the New South Wales (NSW) average complexity. Individual hospital results were summed to enable a comparison between all 38 ABF hospitals and NSW as a whole

ADRGs Examined

This analysis is based on the AR-DRG system, which groups patients into clinically meaningful areas with similar resource consumption and costs and uses the diagnosis and procedure codes.

The comparison focused on ADRGs that have a complexity split, that is, those where the capture or not of additional diagnoses has the potential to impact on the measure of complexity assigned to individual cases.

2 method was devised by Stephen Gillette a member of the Pavilion Health team

Only ADRGs where the averages were statistically significantly different were output. ADRGs that had a very small number of cases nationally (fewer than 10) were excluded, as were ADRGs where the target hospital had more than 50% of all discharges.

Determining hospital peers

In order to determine the most appropriate peer groups for comparison purposes, a 'neighbourhood score' was calculated between all possible pairings of hospitals. The score was calculated by first stratifying the activity in each hospital by specialty, patient type (daycase, sameday or overnight), admission type (Emergency or Elective) and complex or non-complex activity (defined as Pre-MDC or not). Next the proportion of the hospitals' activity falling into each stratum cell was calculated and compared with each of the other hospitals. From these comparisons the neighbourhood score was derived by calculating the difference in proportion of cases falling into each cell for each pair of hospitals and summing across all cells. This yielded a score with values ranging from 0 (indicating a complete match in activity) to 2 (indicating completely different activity).

Of the 56 hospitals included in the sample, the majority were assigned to peer groups based on the 10 hospitals with the smallest neighbourhood score. However, an adjustment was made to ensure specialty hospitals and small hospitals were compared appropriately.

> *'This method of selecting individualised peer groups makes practical sense, and should result in comparable groups of hospitals. The review of the groupings by the HSE, with only minor changes also serves to further validate the method.' (University of Wollongong 2015).*

Calculation of average complexity

For both the Irish data and the New South Wales (NSW) data, each discharge was grouped using the AR-DRG Grouper V6.0. An inlier weighted unit (WU) and an overall WU was allocated to each discharge based on the DRG assigned and the length of stay using the same set of relative values.

Within Ireland, for each hospital (the 'target hospital'), for each ADRG and patient type (daycase, sameday or overnight) combination an average WU and an average inlier WU was calculated. If the average WU was higher than the average inlier WU, then the average inlier WU was used for further comparison to minimise the length of stay effect on the complexity measure.

Comparison of average complexity (*CMI difference*)

Within Ireland

Averages per target hospital were compared to the peer group average and the difference was calculated (the *CMI difference* = hospital average minus group average). Only those that were significantly different ($p<0.05$) were examined further.

Where the *CMI difference* was positive (the average at the hospital is greater than at the peer group) it is labelled as 'above average'. Where the CMI difference is negative (the average at the hospital is less than at the peer group) it is labelled as 'below average'.

The CMI difference was calculated at the ADRG level and therefore it is appropriate to sum across ADRGs within an MDC or hospital to get an MDC or hospital estimate.

Because these summed CMI differences contain values for multiple ADRGs, a range of *CMI differences* may present. The results are presented as 'above average', 'below average' and net.

International Comparison

As a result of an agreement with NSW Health to benchmark data, each target ABF hospital was also compared with activity data from NSW[3]. The NSW data were treated as one hospital. Thus, this part of the analysis is somewhat limited and further work should be carried out to benchmark Irish hospital peers with their peers in Australia to facilitate a more accurate comparison. However, on a national level the comparison gives an indication of comparative coding practices.

(Please see **APPENDIX 2 ADRG Benchmarking** for more detail)

3.2.2. PICQ® analysis

PICQ® is a proprietary software tool designed to examine admitted patient morbidity data coded using ICD-10-AM (International Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification) and ACHI (The Australian Classification of Health Interventions) 6th edition.

PICQ® examined a patient record and analysed diagnosis and procedure codes. While not all codes used will affect the allocation of an AR-DRG, the codes are used for patient care research and planning. Like the ADRG benchmark comparison, PICQ® does not in itself provide a definitive measure of data quality, rather an indicator.

PICQ® (see **APPENDIX 3 PICQ® Indicator definition**)

- stands for Performance Indicators for Coding Quality
- is an auditing tool which identifies records in data sets that may be incorrectly coded
- measures coding accuracy by using a set of indicators
- is used for benchmarking across health services, hospitals and HIPE Clinical Coders
- is an internal quality management system to support:
  - the continuous review of coding quality, and
  - review of amended coded data quality

The PICQ® indicators identify records in admitted patient morbidity datasets with inconsistencies in code combinations, sequencing, presence or absence of codes or lack of specificity. The Indicators were adjusted with consideration of the Irish Coding Standards (ICS). PICQ® was used to review Irish HIPE coded patient data for 2014 activity (provided as an anonymised dataset for this purpose) which was coded using ICD-10-AM/ACHI/ACS 6th Edition.

PICQ® total quality ratio

Numerator records are those where the indicator identifies problem records; these records are selected from the denominator records. Denominator records are the cases in the dataset under analysis in which the numerator records (problem records) could occur.

When the PICQ® programme processes indicators against a dataset (such as coded patient morbidity data in all sites in the HPO dataset for 2014), the results are expressed as a quality ratio of numerator to denominator. This ratio is presented as a percentage.

The higher the figure the more times a PICQ® indicator has been triggered.

[3] NSW data were also coded in the 6th edition classification and regrouped using the same grouper version (6) used in Ireland

Analyses conducted

Total Quality Ratio

This analysis was a comparison by hospital, of the total number of times PICQ® indicators triggered over the total number of times the indicator could have triggered expressed as a percentage. The ratio measures relative data quality between hospitals as measured by PICQ®. The major driver of this ratio is usually the number of times the relative indicators are triggered. The ratio is used to assess overall quality of coded data rather than identify individual problem records.

Data Specificity

PICQ® relative indicators measure how often 'other' or 'unspecified' codes are used to describe a clinical event. While the use of 'other' or 'unspecified' codes are valid, the overuse of these codes may indicate where a hospital data set lacks specificity. In some cases, this will result in a DRG that has a lower WU than it would have if more specific codes were used. Specificity of coding is, of course, dependent upon specificity of clinical documentation in medical records as well as the abstraction skills and capacity of the HIPE coding team.

Compliance to standards (PICQ® performance measurements – quality ratio of Fatal, Warning 1)

Fatal and W1[4] quality ratios for hospitals are a measure of records that are incorrectly coded in relation to the standards. Not all of these errors will affect the allocation of a DRG, but are important in terms of data quality and inter-rater reliability.

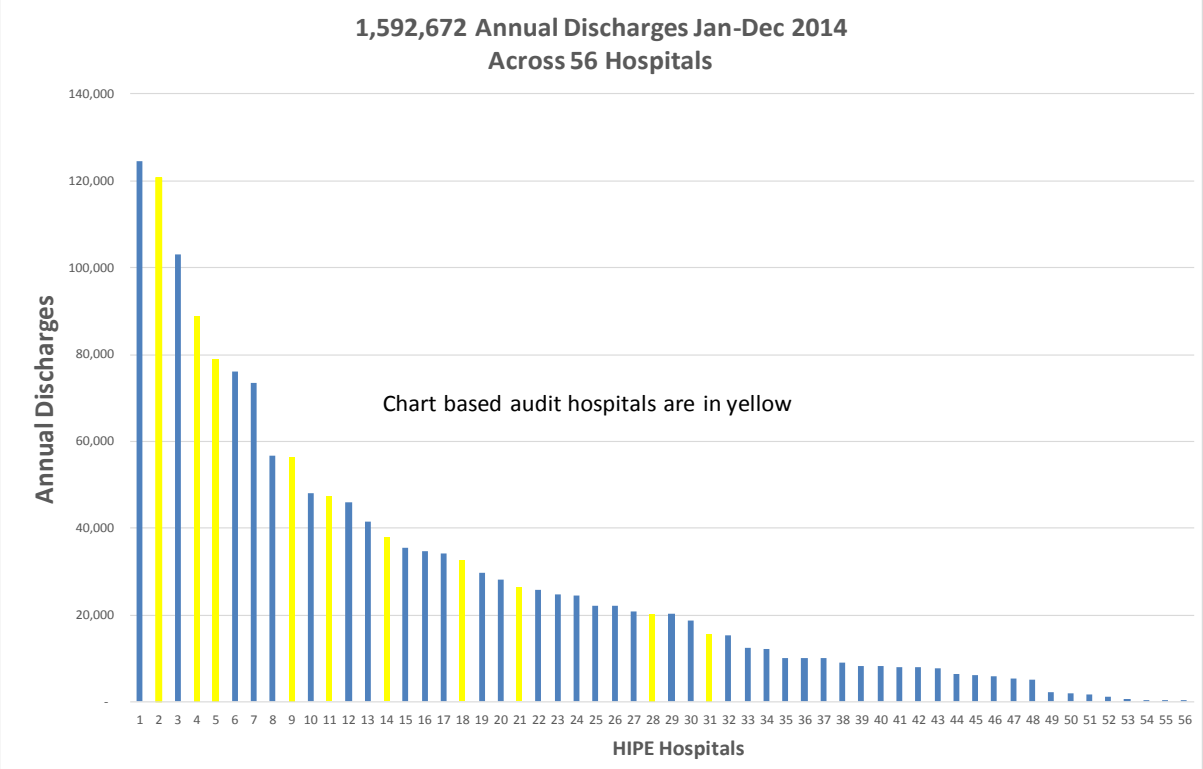
[4] 1 in 100 records will be correct

3.2.3. Medical record based coding audit

A medical record based coding audit (see **APPENDIX 4 Medical record based audit method**) was conducted in addition to the desktop audit methods, where a representative sample was drawn and recoded by an independent auditor to determine if there was a difference between the original codes and the codes abstracted by the auditor. The auditor's codes were regrouped and any difference in DRG and WU was noted. These sample results were then extrapolated across the most recent 6 months of data to obtain an estimate of the total WU effect of coding practice.

The following figure displays the total number of sitess in the HIPE data set by annual discharges. The hospitals coloured yellow were selected for the medical record based audit.

Figure 3: Annual discharges all HIPE sites



A representative sample of 10 hospitals was selected from the 38 ABF funded hospitals, stratified by group and hospital size. Within each hospital, a random sample of 150 records was selected.

Representative Sample of hospital discharges

Medical records were sampled in accordance with the casemix[5] of the hospital.

The method for selecting a record from a hospital was random but the probability that a particular record would be selected was biased towards more complex records[6]. The samples were analysed

[5] casemix refers to the type or mix of patients treated by a hospital

[6] sampling and analysis methods were developed by Chris Aisbett and have been used by Pavilion Health on a number of large scale medical records based audits; refer to **APPENDIX 4 Medical record based audit method**

using a method that corrects for this deliberate bias. In total 1,421[7] medical records were re-coded in the medical record based audit.

Audit process

A review of the audit methodology and the use of the HCAT© tool was conducted with the HPO and the Australian audit teams. HCAT© discrepancy reason categories were modified to facilitate comparison with Victorian audit discrepancy codes where possible. This process was conducted to ensure any learnings from previous Victorian audits were incorporated into the audit methodology.

The representative sample drawn was then loaded by the HPO into the HCAT© tool which was used to collect all the audit data.

The auditor reviewed the record for coding without reference to the original codes. The auditor regrouped the record and categorised the mismatched codes according to the HCAT© modified Discrepancy Reason Codes.

DRG mismatches were discussed at the hospital between the auditor and the local Coding Manager. Any disputed mismatches were referred to a HPO Gold Standard Arbiter (Coding Manager, HPO). On completion of each audit the results were agreed and signed off by the hospital.

Four experienced auditors from Australia conducted the audit over a period of 3 months. Extensive preparation of medical records was conducted by the hospitals in preparation for the auditors.

Analysis

Audited data were exported from the HCAT© to Pavilion Health for further analysis.

The statistics produced were a rate of DRG change and the number of errors per record for each sample hospital adjusted for the biased sample. These statistics were then used to estimate a DRG change rate.

The changed DRG and coding error rate for each hospital provided useful information at the hospital level and was extrapolated from each hospitals' annual discharges. The WU were then used to calculate the cost implications of the DRG changes by showing the estimated impact of the changes in coding for the casemix complexity over the six months reviewed.

A regression model based on casemix complexity and DRG cluster (Aisbett 2014) analysis was devised to provide hospital level estimates of change rates and case weight effects and to allow checking of peer level deviations from expected values of these measures.

The data from the results of the 10 medical record based coding audits was then used to calculate an estimated DRG change rate and cost implications that were then extrapolated across all ABF hospitals annual discharges for the 6 months ending December 2014.

[7] Not all sample medical records were located for audit at the hospital, resulting in a lower number of records being audited than the targeted 150 per hospital

3.2.4. Coding Service Assessment

The starting point for the Coding Service Assessment (CSA) was an agreement between Pavilion Health personnel and local stakeholders of what constituted coding service best practice. A review of literature was conducted to locate evidence of what constitutes best practice clinical coding service structure and organisation. The literature review revealed some sources of best practice in coding services but the deficiencies in the literature meant that a consultation process was needed to build an understanding of best practice from Irish experience through a workshop of a group of stakeholders. The consultation process was a Best Practice. A report from the workshop was circulated to all attendees soon after the event (Refer **APPENDIX 5 Best Practice Workshop**). Results of the workshop were used to construct a management audit tool.

As a result of the Best Practice Workshop a picture of a best practice service was constructed around a set of themes that focus on people, process and tools with a particular emphasis on the following areas:

- the type and level of hospital management
- work allocation and supervision processes
- number of staff and their training
- compliance with timeliness protocols
- productivity and current backlog
- quality control measures including internal audits

The elements of good practice from the above themes were employed to construct a management audit tool (see **APPENDIX 6 Coding Service Assessment**) which was used in the assessment of selected clinical coding services. The tool consisted of a questionnaire administered through face to face meetings that were completed in consultation with Clinical Coding Service Managers.

Twelve hospitals were selected for the Coding Service Assessment based on the following criteria:

- funded by ABF
- spread geographically

The scoring of the Coding Service Assessment is based mostly on the qualitative data collected through the interviews, supported where possible by results from the 2015 HIPE Survey undertaken by the HPO. Scoring was somewhat subjective but in each category scored, the presence or absence of key characteristics was noted in order to inform the score.

The initial scores for all hospitals were undertaken by the same Pavilion Health team member, so as to avoid inter-rater inconsistencies. These scores were checked by a third party and queried where appropriate based on the interview notes.

3.2.5. Hospital Reports

Individual draft hospital level reports were produced for all ABF hospitals. These draft reports were sent to the hospitals for review in early February 2016. Follow up workshops were conducted with each hospital, Pavilion Health and representatives from the HPO in late February 2016. The workshops were conducted to:

- expand on the methods used in the analysis
- obtain hospital comments on the draft reports
- provide a framework to review and support the hospitals to develop action plans to improve data quality

The hospitals specific results from each element were cross referenced and discussed so that hospital specific action plans could be developed and implemented to improve data quality.

Hospitals provided action plans back to the HPO and these were incorporated with any amendments into final hospital reports, with the insights on the analysis incorporated into the results section of this report.

3.3. HPO / National level analysis

3.3.1. Training and development infrastructure, and external auditing assessment

From 1st January 2014 the National Casemix Programme and the Health Research and Information Division at the Economic and Social Research Institute (ESRI) became the Healthcare Pricing Office (HPO). HPO roles include, pricing, costing, analysis, data support, education, IT support, coding advice as well as overall responsibility for the quality and integrity of the HIPE system and the implementation of ABF.

Discussions were held principally with HPO staff members who have responsibility of the HIPE system regarding the current training and their views on the training needs under ABF. Training was also discussed during the Workshop on Best Practice held on 16th June 2015.

Two existing sources were used in addition to these consultations. A survey of Coding Managers and the HPO Trainer's record of those HIPE Clinical Coders who completed training in any of the courses offered by HPO.

Further sources of data for the assessment of the training infrastructure were the responses and comments that HIPE Clinical Coders made during the on-line survey of HIPE Clinical

HPO staff members were interviewed regarding the current auditing conducted by HPO. The starting point for assessing the needs for external auditors was the HSE Implementation Plan 2015-2017. The plan included estimates of the numbers of auditors that will be needed under ABF. These estimates were compared to the experience of jurisdictions in Australia where external auditing has been in place for several years.

The medical record based coding audit described previously was also a source of data on auditing needs. The time taken by the auditors to complete the audit was instructive along with their comments on the ease of conducting of the audit. These comments included the availability of the required medical record for auditing, the location of the information needed for coding in the record and the use of the auditing tool HCAT©.

3.3.2. Online survey of HIPE Clinical Coders

The main purpose of the online survey of HIPE Clinical Coders was to establish their training needs. The questions for the online survey were developed following the initial round of Coding Service Assessments and discussed with staff from HPO. The initial survey questions were developed to gain an understanding of the background, experience, working hours, and pay levels of HIPE Clinical Coders. A series of questions were based on the competencies for entry level Clinical Coders developed in Victoria, Australia (Hill et al 2013), altered to suit the Irish context, and supplemented by additional competencies for more experienced Clinical Coders. The closing questions were designed to gain input on the further training needs of Clinical Coders in the more complex clinical and coding areas. The survey also asked about the HIPE Clinical Coder's work motivations and intentions in filling manager, trainer and auditor roles.

The survey began on 29th September, 2015 and was closed on 30th October, 2015.

A total of 224 HIPE Clinical Coders responded to the survey.

4. RESULTS

4.1. Conclusion

The overall conclusion from the analysis and hospital feedback is that HIPE data are sufficient to underpin Activity Based Funding, with the net WU variation between audited data and international comparisons being less than 2 % of total activity. However, ABF hospitals in general are under representing true clinical complexity and there is a need to reduce the inter hospital variation. Improvements in the structure and quality of the medical record are critical to improve the quality of current clinical coding and to facilitate efficient future audits.

4.2. Hospital level analysis

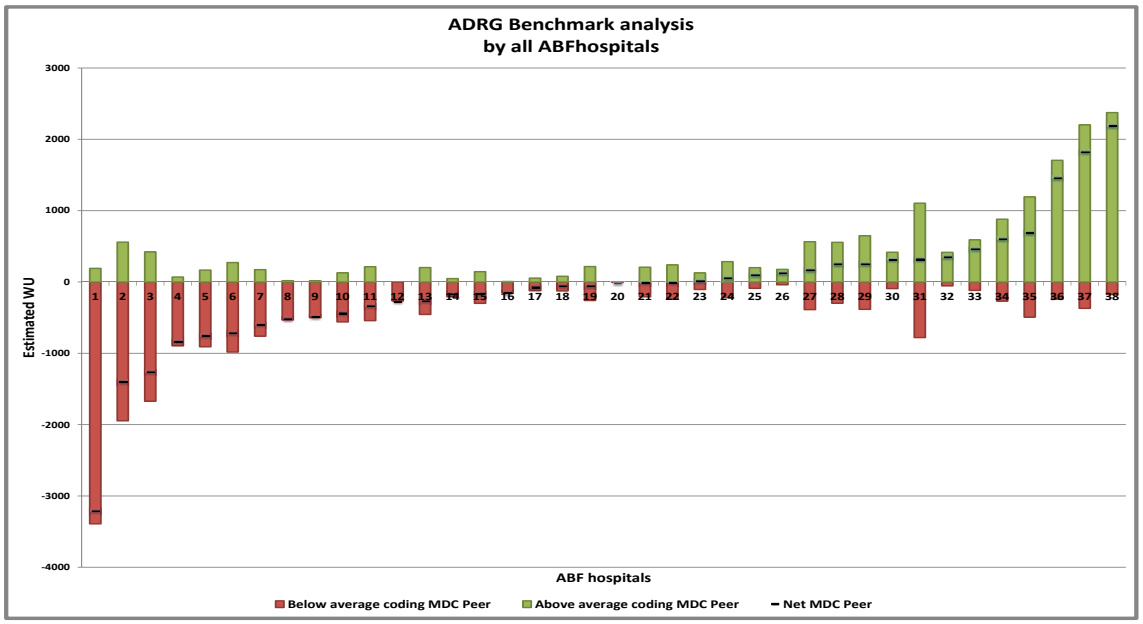
4.2.1. ADRG benchmark comparison

An initial international analysis was conducted comparing total NSW data with each ABF hospital. The results of the comparison at hospital level were summed to produce a comparison between all Irish ABF hospitals and NSW.

The analysis identified[8] that Irish data appeared to be under representing clinical complexity by an estimated 9,310 WU. This represents less than 2% of the total Irish WU activity.

In the figure below the results for the 38 ABF hospitals are summarised. Each hospital's results are displayed including below average, above average and net position of their coding activity in relation to their peers.

Figure 4: ADRG benchmark analysis by all ABF hospitals



The key message from this figure is the large variation (5,399 WU) between hospitals that have the largest below average coding compared to those that have the largest above average coding.

The ADRG Benchmarking provides an indication of where the average complexity at a hospital differs from comparable peers and attempts to quantify this difference. This analysis cannot (and does not

[8] assuming no material differences between the clinical complexities of NSW data and all Republic of Ireland ABF hospital data

attempt to) distinguish between real differences in clinical complexity and differences due to different coding practice, however it does provide a starting point for further investigation.

The MDCs with the largest coding variation [9] in average WU were:

- Respiratory system
- Musculoskeletal system and connective tissue
- Digestive system
- Circulatory system
- Nervous system

The ADRGs with the largest variation[10] in average WU were:

- A06 Tracheostomy
- E62 Respiratory Infections/Inflammations
- E75 Other Respiratory System Diagnosis
- R61 Lymphoma and Non-Acute Leukaemia
- R60 Acute Leukaemia
- B70 Stroke
- I08 Other Hip and Femur Procedures
- I03 Hip Replacement

While some variation in the capture of complexity can be explained by the differences in clinical complexity, it is likely that the major contributing factors across the ABF hospitals are inter-rater differences between HIPE Clinical Coders, coding process, and the variation in the quality of the clinical documentation. This was further supported by a review of the results at the hospital workshops where feedback was sought on the initial analysis.

[9] above and below average results ordered from largest variation

[10] above and below average results ordered from largest variation

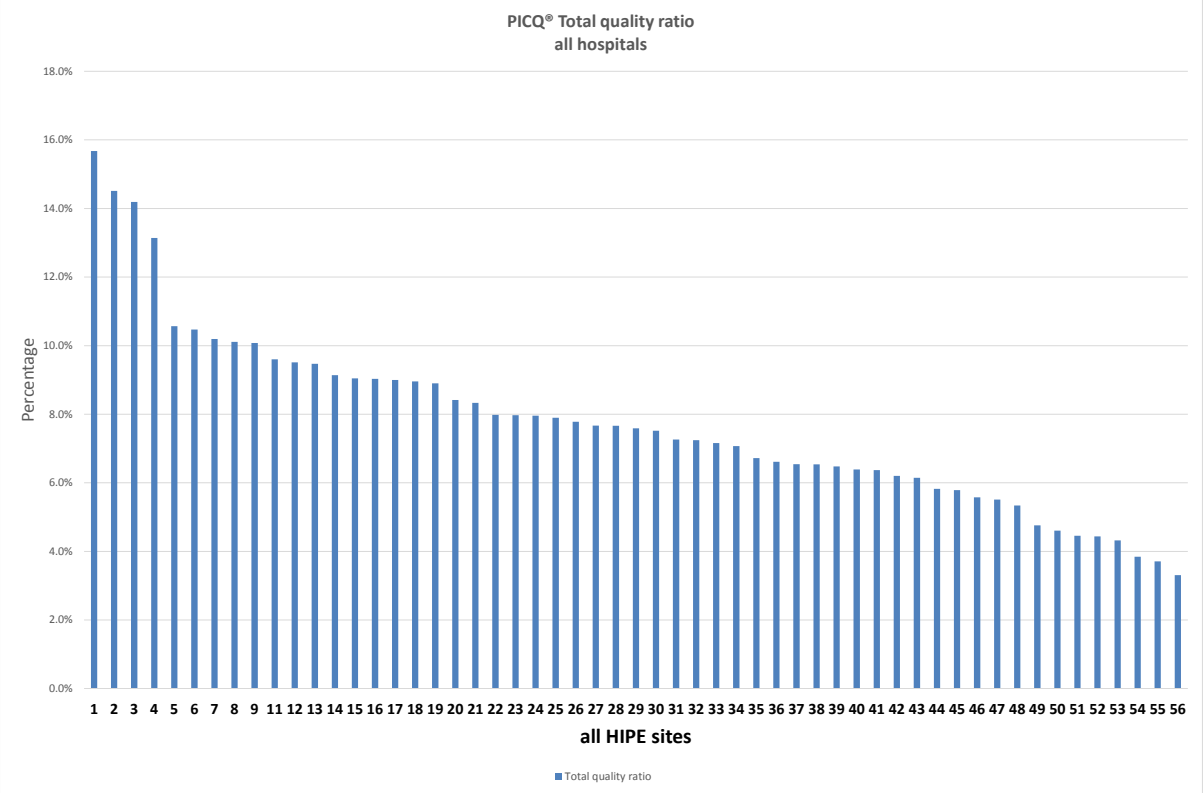
4.2.2. PICQ®

PICQ® total quality ratio

PICQ® processes indicators against a dataset (in this case coded patient morbidity data in the HIPE dataset for 2014), and the results are expressed as a quality ratio of numerator to denominator. This total quality ratio is presented as a percentage.

The figure below shows that there is a wide range of PICQ® quality ratios across all hospitals in the Republic of Ireland. The higher the figure the more times a PICQ® indicator has been triggered. The lower the % the better the performance. Not all indicators that have been triggered are considered incorrect; rather the ratio is a relative measure of data quality.

Figure 5: PICQ® Total Quality Ratio



PICQ® Data specificity

PICQ® relative indicators measure how often 'other' or 'unspecified' codes are used to describe a clinical event. While the use of 'other' or 'unspecified' codes are valid, the overuse of these codes may indicate where a hospital data set lacks specificity. In some cases, this will result in a DRG that has a lower WU than it would have if more specific codes were used. Specificity of coding is dependent upon specificity of clinical documentation in medical records.

The two ICD-10-AM chapters listed in the table below represent the largest two areas where Irish coding practice is less specific on average compared with data from Victoria[11].

Table 3: Data specificity principal diagnosis benchmarks

PICQ® Indicator Description	All HIPE site ratio	Victorian ratio
Use of 'unspecified' diagnosis codes in Chapter 10 Diseases of the Respiratory system as the principal diagnosis	63%	54%
Use of 'unspecified' diagnosis codes in Chapter 11 Diseases of the Digestive system as the principal diagnosis	31%	24%

It is important to note that coding additional diagnoses as 'unspecified' had a greater potential to impact on the WU using AR-DRG version 6 than coding 'unspecified' as a principal diagnosis. However, with the introduction of AR-DRG version 8 the principal diagnosis will also be used to calculate a complexity split. There is a convention that 'unspecified' codes tend not to be recognised as complications in determining the Complications and Comorbidity of a DRG split.

The use of 'unspecified' codes is valid and may be a result of poor documentation, measuring the relative use of these codes provides an indicator of data specificity and its potential impact on under reporting clinical complexity.

The following table shows the quality ratios for the use of 'unspecified' as an additional diagnosis in comparison to a Victorian benchmark.

The three ICD-10 AM disease chapters below represent the largest areas in terms of the number of times a PICQ® indicator was triggered and volume of separations.

[11] Victoria was chosen to benchmark data because Victoria is considered to have the highest quality of clinically coded data; Australia was chosen because of the same classification and grouper in use as in Ireland

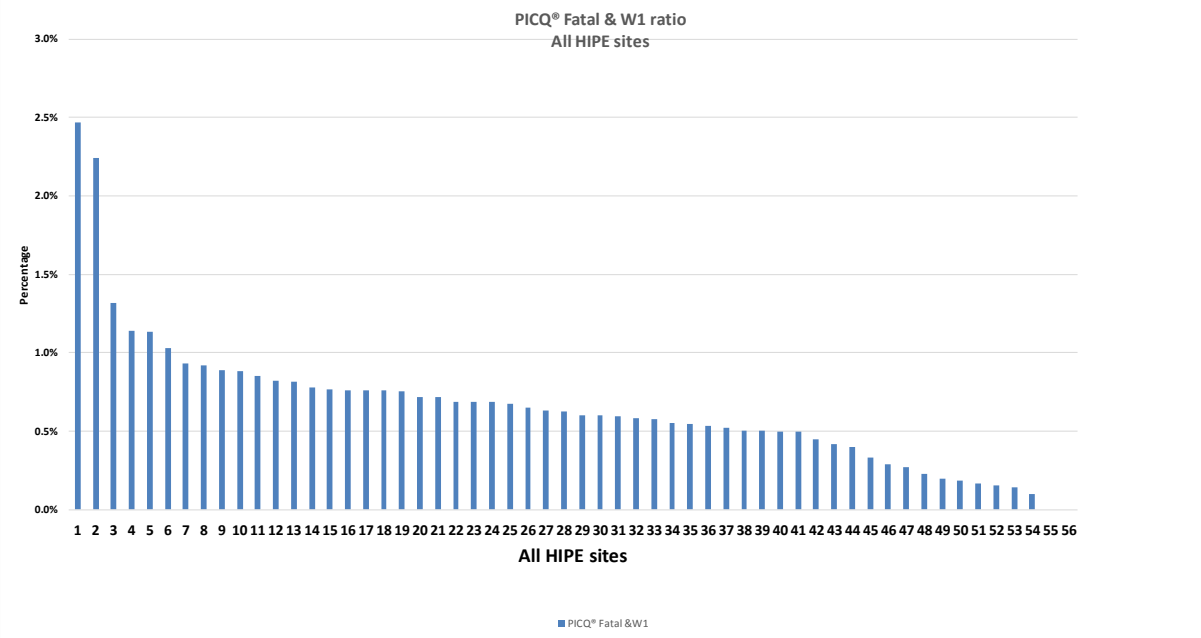
Table 4: Data specificity additional diagnosis benchmarks

PICQ® Indicator Description	All HIPE site ratio	Victorian[12] ratio
Use of 'unspecified' diagnosis codes in chapter 2 Neoplasms as an additional diagnosis	23%	17%
Use of 'unspecified' diagnosis codes in chapter 10 Diseases of the respiratory system as an additional diagnosis	66%	52%
Use of 'unspecified' diagnosis codes in chapter 11 Diseases of the digestive system as an additional diagnosis	34%	26%

PICQ® compliance to standards

The following figure shows the Fatal, W1 quality ratios for all sites that contributed to the HIPE. In Australia the correction of Fatal and W1 indicators are used as KPIs for hospital coding performance. High ratios may indicate a lack of compliance to national coding standards. Compliance to standards increases inter-rater reliability between Clinical Coders and hospitals and reduces variation in coding outcomes.

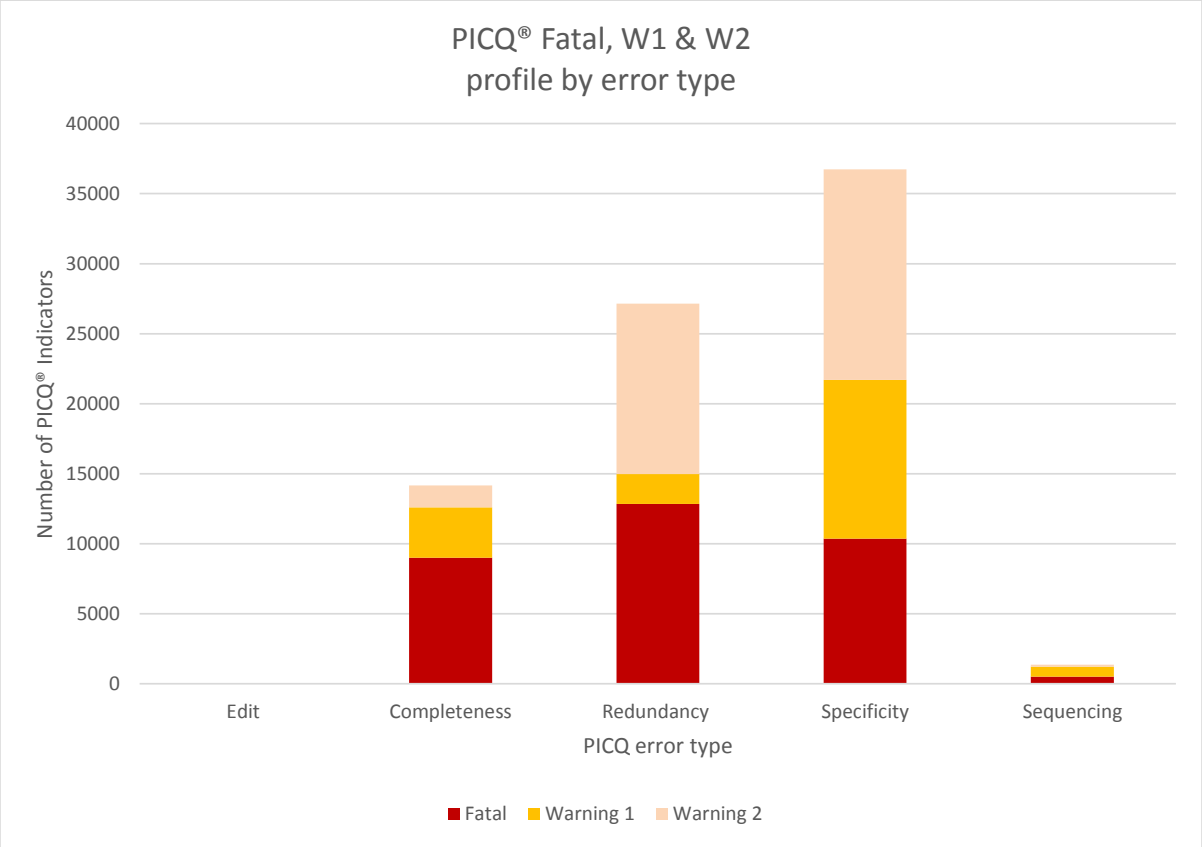
Figure 6: PICQ® Fatal & W1 Quality ratio for all HIPE sites



[12] in all cases Victoria had the best quality ratio for these chapters

The following figure shows the PICQ® errors by type.

Figure 7: PICQ® profile by error type



Lack of specificity is the largest error type for PICQ® Fatal, W1 and W2 indicators. It was pleasing to note that the PICQ® error indicators that highlights errors in data edits did not trigger. This indicates that the HIPE edits embedded in the HIPE Portal data entry system are effective.

The following table identifies the indicators that have triggered most often by the total number of trigger events. In absolute terms the percentage of errors is relatively small (see PICQ® Fatal & W1 Quality ratio on previous page). The records where these indicators have triggered have a high probability (greater than 99%) of being incorrect according to the coding standards.

Table 5: PICQ® Fatal and W1 errors

Indicator Number	Rationale	Degree	Numerator	Denominator	Ratio
101586	Dependence on kidney dialysis code with a dialysis procedure code	F	9,159	10,438	87.7%
101938	Diabetes mellitus code and a kidney failure or impairment code	W1	3,859	27,328	14.1%
102090	Alcohol related conditions without alcohol use code	F	2,253	3,886	58.0%
102060	Hypertension in chronic kidney disease stage 5	F	2,141	3,134	68.3%
102126	Pulmonary oedema code	W1	1,373	2,658	51.7%
102101	Pneumonia with acute exacerbation, specified or unspecified COPD	F	1,226	19,193	6.4%
102161	Pancytopenia unspecified	W1	937	52,057	1.8%
102057	Neuraxial block in labour and delivery procedure	F	930	15,303	6.1%

4.2.3. Medical record based coding audit

Auditor findings

The following are the main auditors' findings:

- The national standard for organising the medical record is not conducive to either auditing or coding. The records are not separated into admissions, but have dividers behind which the notes of all admissions are filed, some chronologically and some in reverse chronological order. The main problem for auditing is that paperwork for the admission selected for auditing may be found anywhere within the record and buried behind new paperwork for subsequent admissions not selected for auditing.
- The lack of consistent and orderly organisation of the medical records at a number of hospitals had a significant impact on the ability to code from the medical records. Areas of concern included:
  - large amounts of loose sheets (either in pockets) or loose in the medical record
  - inconsistent filing with forms not always in the appropriate place
  - very bulky records that were difficult to handle
  - missing notes
- as a result of the poor quality of the medical record only Clinical Coders with very strong abstraction skills and the time were able to find the appropriate codes

The medical record based coding audit supported by the hospital workshops, found the quality of the medical records fell far short of 'best data' in the opinion of the auditors and were sometimes inaccessible. In particular discharge summaries were lacking or of poor quality in many of the audited hospitals.

In the majority of audited hospitals, the HIPE Clinical Coders do not routinely utilise nursing notes for abstraction of conditions.

In a number of hospitals, no supporting documentation was viewed by the auditor in support of the codes that were used because the documentation was not stored in the medical record. The codes that were used in these cases were Z codes which resulted in the allocation of the DRG Z64 (Other Factors Influencing Health Status).

A number of the audit sample medical records were not audited because the hospitals could not locate the records. For example, medical records were stored in offsite storage and or were in a multi-volume record and the volume required for audit could not be found.

Analysis

Based on the medical record based audits it is estimated that there is a 9.5 % DRG[13] change rate across all ABF hospitals. This resulted in an estimated net change of 4,378 additional WUs for the six-month period ending December 2014[14]. This represented a WU change of net 1.42%. An analysis of the absolute percentage WU change[15] between under and over coding resulted in a 7%[16] WU range.

[13] The DRG change from the original coder to the auditor in records where no supporting documentation was viewed by the auditor, was high in a number of hospitals. After including these records the national DRG change rate increases from 9.5% to 12.9%

[14] last 6-month period was chosen because it represented the most recently coded data and finalised data available at the time of the audit

[15] measure of variation between under and over coding

Details of the records reviewed in the medical record based audits are set out in the following table.

Table 6: Medical record based audit summary results

Number of records requested for audit	1488
Number of records reviewed	1421
Number of records with mismatched DRG	204
Number of disputed records referred to gold arbiter	8
Number of medical records not available to auditor	67

The table following provides detailed audit results by hospital. The table includes the corrected[17] DRG change, an estimated value of the average change per record, an estimated outcome for all records and a percentage value change for the six-month period. The estimated DRG change rate for the hospitals was used to calculate a DRG change rate across all 38 ABF hospitals.

Table 7: Audit results by hospital

HOSPITAL	DRG change	WU change per record	WU of all Records [18]	WU change as a percentage
Hospital 1	11.3%	+0.014	+192	+3.57
Hospital 2	8.8%	-0.006	-116	-1.17
Hospital 3	13.4%	-0.021	-267	-4.27
Hospital 4	14.7%	-0.020	-460	-3.91
Hospital 5	7.1%	-0.015	-504	-2.80
Hospital 6	8.6%	-0.009	-89	-2.49
Hospital 7	33.7%	+0.009	+183	+2.08
Hospital 8	9.8%	-0.001	-30	-0.17
Hospital 9	6.1%	-0.004	-25	-0.53
Hospital 10	15.7%	+0.003	+156	+0.68
All 38 ABF hospitals	9.5%	-0.007	-4378	-1.42

A negative figure in the table above means the original HIPE Clinical Coder is under representing clinical complexity as compared to the agreed auditor codes. From this table we can say that the DRG change rate for all ABF hospitals is 9.5%, this represents 1.42% of total WU under the auditor's codes which would be an additional 4,378 WU additional funding for the 6 months ending December 2014.

[16] 21,627 WU

[17] after correcting for over sampling of complex records

[18] six months ending December 2014

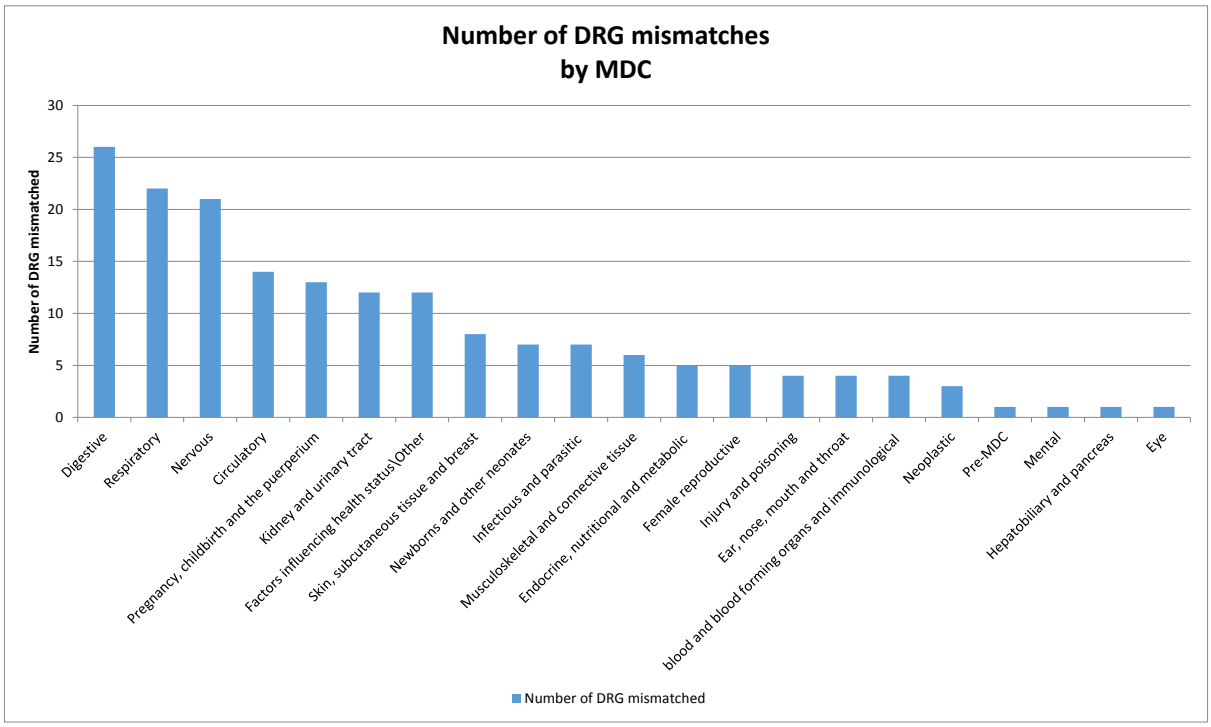
While the DRG change rate is an important benchmark figure the WU change as a percentage of total activity provides an important measure of the impact of current coding practice on WU. An acceptable net range is plus or minus 2%. An estimate for all 38 ABF hospitals was -1.42% which falls within the acceptable range.

The estimated WU change per record provides the ability to compare results without the effect of the size of the hospital. For example, hospital 3 had the highest change rate per record, 4.27%.

Hospital 8 had a DRG change rate of 9.8% but no statistically different WU change, which means that the clinical complexity is being accurately represented in the HIPE data for that hospital.

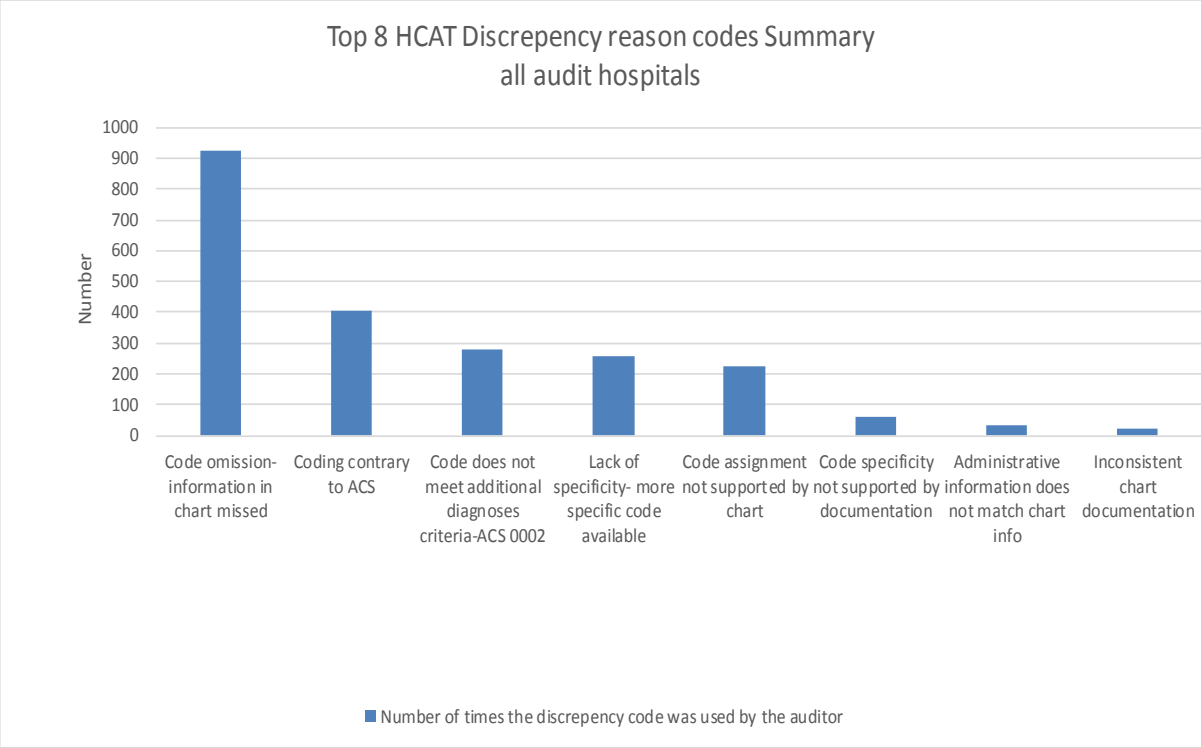
The following figure displays records with a DRG mismatch by body system. While the number of mismatches will be affected by the case load of Irish hospitals, it represents the best areas of focus for improving coding.

Figure 8: DRG mismatches by MDC



The following figure shows the most frequent reasons[19] why there was a mismatch between the auditor and original HIPE Clinical Coder.

Figure 9: HCAT© major discrepancy reason codes



This graph shows that main reason for a mismatch was the Auditor was able to find additional codes in the medical record that the original HIPE Clinical Coder was unable to locate. There could be a number of reasons for this outcome including:

- auditors had more time to search for the relevant information in the medical records and
- the HIPE Clinical Coders with high level of abstraction skills were able to locate the information in the medical record i.e. they knew what they were looking for and understood the clinical pathway

[19] assigned at code level.

4.2.4. Summary

The following table displays the MDCs where there appears to be the greatest variation in results as measured by both ADRG benchmark and medical record based audit.

Table 8: MDCs with the greatest variation

MDC	ADRG benchmark	medical record based coding audit
Digestive system	**X**	**X**
Respiratory system	**X**	**X**
Neoplastic disorders	**X**	
Pregnancy, childbirth and the puerperium		**X**
Skin, subcutaneous tissue and breast	**X**	**X**
Circulatory system	**X**	**X**
Nervous system	**X**	**X**
Musculoskeletal system and connective tissue	**X**	**X**

According to the PICQ® analysis**,** Irish coded data lacks specificity in most body systems (ICD-10-AM Disease chapters) as compared to international benchmarks and is the largest area of opportunity for improvement in the quality of the coded data.

The ICD-10-AM Disease chapters with the greatest opportunity in terms of size to improve specificity are:

- Digestive system
- Respiratory system
- Neoplasms
- Pregnancy, Childbirth and the Puerperium.

Clinical coding that contravenes the coding standards needs to be corrected in a timely manner by the original HIPE Clinical Coder.

According to the medical record based coding audit**,** the estimate of a national DRG change rate of 9.5 % (12.9 % if you include records that were not able to be located but were marked as a DRG mismatch) is a good platform for the implementation ABF, best practice is 4% in Victoria, Australia where ABF has been used for many years.

The national estimated value change from the medical record based audit is net 1.4 % which compares to the international benchmark of less than 1%. However, the net figure hides a large variation of under and over coding. The absolute measure of variation is 7%.

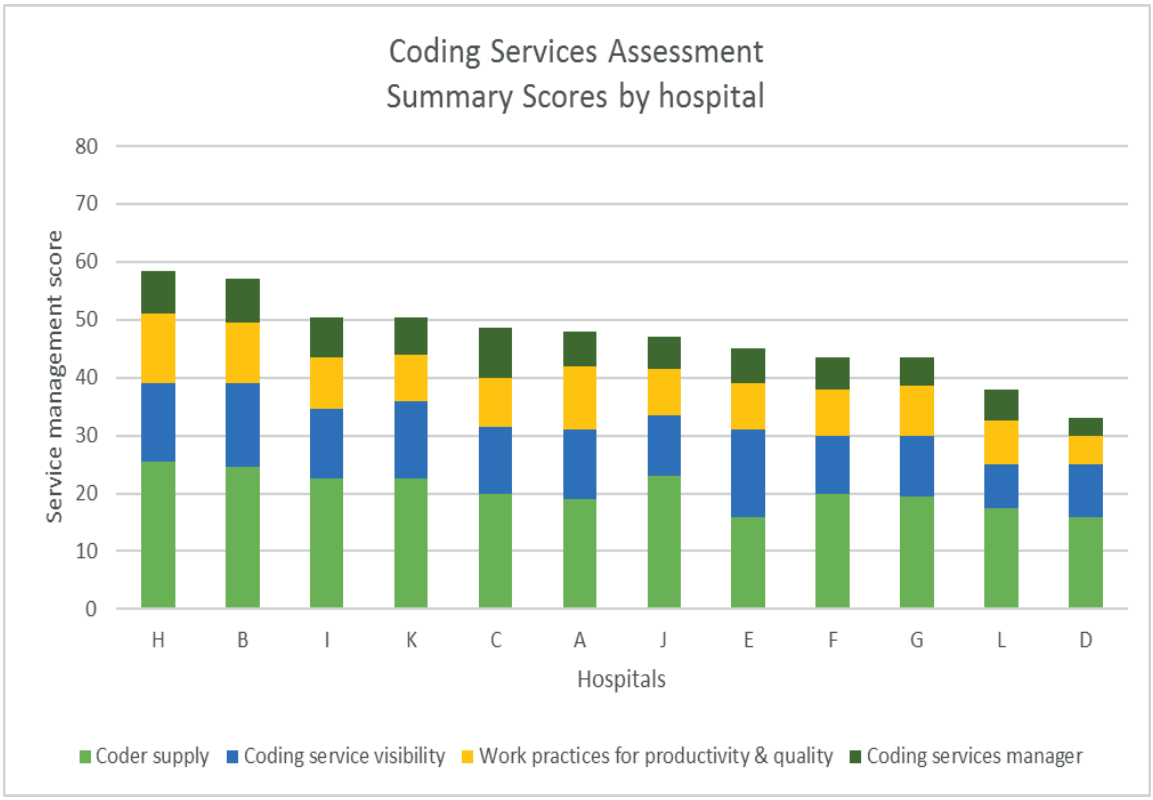
4.2.5. Coding Service Assessment

The elements of best practice (listed in **Appendix 4 Coding Services Assessment**) were included in the Coding Service Assessment (CSA). The results of the structured interviews are set out below using both the scores of the interviewer and observations based on the interviewer's notes of key characteristics observed. The scoring was subjective, but in each category scored, the presence or absence of key characteristics was noted in order to inform the score.

Overall results

Overall, the CSA found significant variation in the capacity of the hospitals to satisfy the best practice elements. The total scores (out of 80) for each of the 12 hospitals are shown in the figure below. On a percentage basis, scores ranged from a low of 41.3% of best practice to 73.1%. Notably, even the best of the hospitals have significant room for improvement.

Figure 10: Coding services assessment summary scores by hospital



Aspects of coding service management most influential on data quality outcomes

Based on consideration of the CSA data and feedback from hospitals, the elements of coding services that most critically affect best practice and the production of higher quality data are as follows:

- degree to which Service Managers have time available for strategic effort, and the extent to which they devote that time to quality coding considerations
- use of quality checking resources, such as the Checker© and HCAT©, that have been provided to all services but are generally poorly utilised
- extent to which a coding service workforce structure has evolved that allows some division of labour within the service to take operational supervision duties from the manager and allows resources to be allocated to auditing data quality
- systematic way of calculating Clinical Coder workforce numbers that takes account of casemix and seeks to find a balance between coding speed and quality
- degree to which the coding service, the Coding Service Manager, and HIPE Clinical Coders themselves are visible to Clinicians; highly correlated with this is the level of direct Clinical Coder contact with Clinicians
- level of attention to the way content is included and organised in the medical record, with high levels of attention facilitating easier access and making the process of abstracting the data needed for coding more productive, complete and better record tracking

4.2.6. Hospital reports

The workshops that were held with 32 ABF hospitals were a key piece of the overall project, drawing all the strands of the hospital level analysis together. Hospitals have completed detailed action plans and there is evidence from feedback from certain sites that they are in the process of implementing these action plans.

The key improvement areas summarised from the hospital action plans can be categorised into the following themes in order of importance:

- improve compliance to current medical records standards
- Clinician engagement with the clinical coding teams and the ABF process to improve the quality of the medical record
- ensuring the HIPE Clinical Coding teams have the right structure and size in line with identified best practice
- the use of audit processes and quality tools
- training of key stakeholders including HIPE Clinical Coders

4.3. HPO / National level analysis

The results of the national infrastructure analysis draw together the results from several methods that relate to national rather than hospital level issues. These national issues mainly relate to the coding workforce and its training. The results of the online survey are an important focus because the main purpose of the survey was to give HIPE Clinical Coders an opportunity to voice their training needs. The survey results are supplemented by other data such as the CSA, interviews with HPO staff members, and comments by the medical record auditors where relevant.

Description of the coding workforce

Several questions were included in the online survey to assist the understanding of the background, experience, working hours, and pay levels of HIPE Clinical Coders.

The prominent backgrounds before becoming a HIPE Clinical Coder were:

- administration (71%)
- clinical practice is less common (only 15%)

The HIPE Clinical Coder workforce is very experienced, with just over 70% coding for more than 5 years and nearly half having coded for over 10 years. Comparable data from Australia (Australian Institute of Health and Welfare (2010)), identified 65% of the coding workforce with greater than 5 years' experience. Indicative that this degree of experience is not unusual, given the workforce is maturing after an initial growth in numbers 15-20 years ago.

Coding workforce motivators and aspirations

HIPE Clinical Coders were asked in the survey to nominate up to three aspects of coding that they found most satisfying. Two of the highest nominated factors revolve around the speed / quality tension:

- meeting deadlines / targets
- enjoy coding correctly

HIPE Clinical Coders were also asked about the least satisfying aspects of coding at their hospital:

- poor medical record keeping, 'can't find information for coding'
- illegible writing
- lack of appreciation/recognition
- lack of support/interest from management/other workers

HIPE Clinical Coders were asked about their ambitions for the future in terms of a role they could be occupying:

- happy with their current lot
- could not see any opportunity arising

Current formal training options in the Republic of Ireland

Training delivered by HPO

- Clinical Coder training is offered by HPO through a schedule of courses that run throughout the year. The training is conducted in face-to-face mode[20]. Since 2010 HIPE Clinical Coders have attended many HPO organised and conducted courses, with a total of 4,420 attendances.[21] These attendances include those from all 56 Irish hospitals that support the HIPE system, not just the 38 ABF hospitals.
- The change in 2015 from 6th to the 8th edition of ICD-10-AM has placed a high demand for coding training in the requirements of the new edition. During 2015, 87 courses were delivered with 1572 attendees. This level of activity is somewhat atypical but will be required each time the Edition is changed. Other reasons for increased number of training courses and attendees are ongoing developments in HIPE Clinical Coder training such as additional training sessions run as part of the Certificate in Clinical Coding (discussed below) along with virtual training facilities being used to deliver short and more frequent training courses.
- trainers would like to offer a module to train the on-the-job coding mentors
- The coding team at HPO function as problem solvers for the hospitals by answering enquiries about complex coding problems. Currently, there is no clinical support for the HPO coding team in this function or the design of courses for complex coding areas such as diabetes coding.

DIT Professional Development Certificate in Clinical Coding

- Twelve HIPE Clinical Coders completed the DIT Certificate in 2014 and 32 were enrolled in 2015. The selection criteria for prospective students were negotiated with DIT and students are enrolled with DIT.

Training experience of the coding workforce

- HIPE Clinical Coders surveyed had completed some training in coding in a course outside of their own hospital in the last five years. The most common course completed:
  - Refresher course
  - HIPE Introductory course
  - other HPO provided courses
- 30% of Grade[22] IV, Grade V and Grade VI HIPE Clinical Coders had completed one or more of the courses Coding Skills I to IV in the last five years
- respondents to the survey show that the DIT Certificate Course was attended almost equally by HIPE Clinical Coders in Grade IV (12.9%) and Grade V (10%)

On the job training experience

It is generally agreed that the bulk of HIPE Clinical Coders' learning occurs on-the-job. Managers interviewed for the CSA displayed a remarkably similar approach to structuring on-the-job training for novice HIPE Clinical Coders, which inevitably included:

[20] supplemented by some WEBEX seminars

[21] HPO Coder Training Database

[22] grading system utilised in the HSE for defining administrative support roles

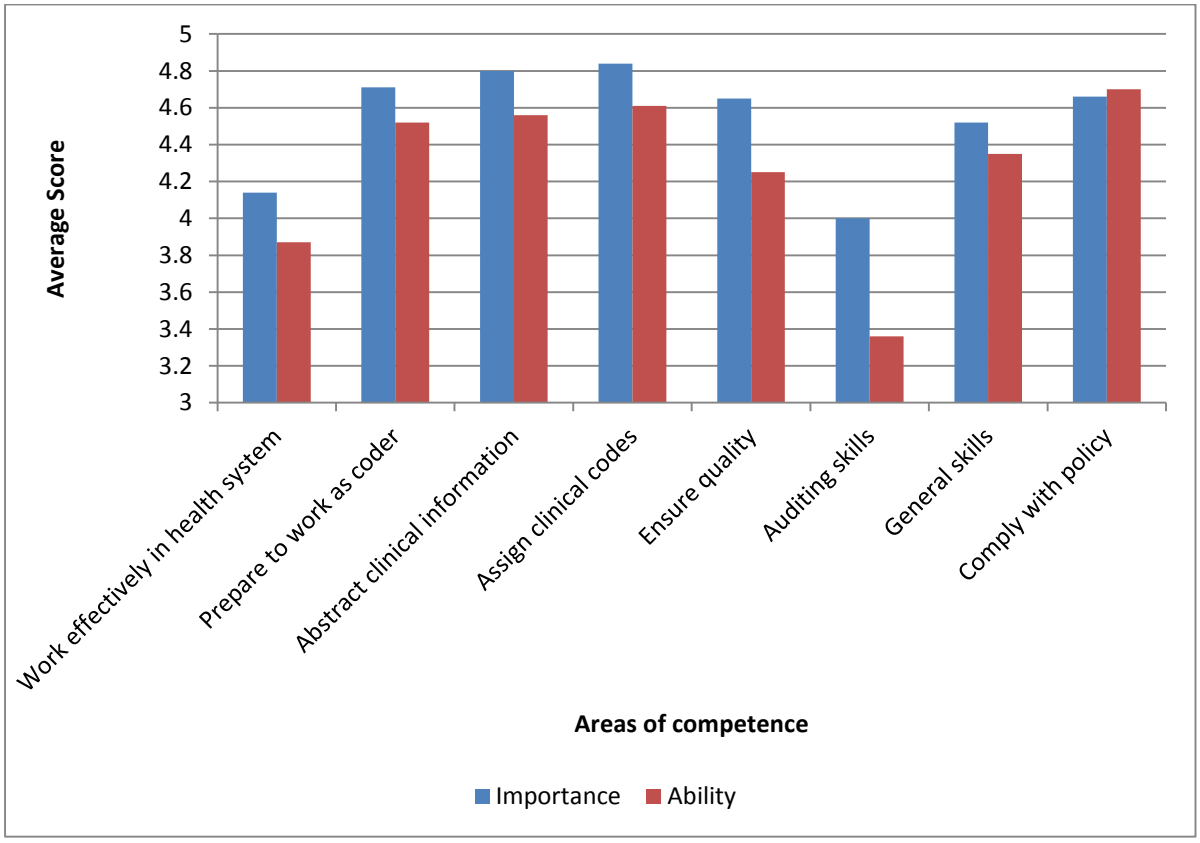
- allocation of the trainee to a buddy relationship with an experienced Clinical Coder, where they would largely observe
- commence coding practice on low complexity episodes of care, especially day procedure cases

Nearly half of the survey respondents (48.9%) expressed an interest in coding at other hospitals within their region / group as a way of increasing coding experience and developing more coding competence.

Competencies needed by the current workforce

The needs of the Irish coding workforce for competency development are summarised in the figure below. The most obvious needs are in the areas of auditing skills and in ensuring quality of coded data. The conflict between speed and quality which affects almost all areas of product and service delivery is also evident in the endeavour of coding clinical services.

Figure 11: Summary of needs of coding workforce, average score of importance by area of competence



Source: On-line Survey, 2015

The survey HIPE Clinical Coders identified the clinical areas where they need more training. The top five areas of content identified were:

- Diabetes
- Heart and Vascular diseases including Stroke
- Critical Care and Mechanical Ventilation
- Trauma/Emergency medicine
- Neoplasms

Survey respondents were also asked to identify the areas of coding rules and conventions in coding complex cases where they would like to undertake additional training. The most frequently cited areas were:

- Diabetes
- Critical Care and Mechanical Ventilation
- Chronic Kidney Disease
- Neoplasms
- Australian and Irish coding standards.

These priority nominated areas reflect the same clinical areas above.

A third perspective on HIPE Clinical Coder training needs was obtained through the observations of the auditors who undertook the medical record based audit. Specific findings and recommendations were set out in the hospital reports, but the more common training needs identified in the recommendations across all the audited hospitals are summarised in the points that follow:

- abstraction guidelines so HIPE Clinical Coders are trained to use the entire medical record for coding
- Australian and Irish coding standards
- how to liaise with Clinicians to clarify documentation in relation to individual patient episodes
- designing and using a documentation query form
- distinguishing between invasive and non-invasive ventilation
- scores from anaesthetic reports
- AR-DRGs and how the coding impacts on funding for hospitals

APPENDIX 1 – COMPANY PROFILE / ACKNOWLEDGEMENTS

Company profile

Pavilion Health is a specialist technology and services business focusing on the quality and integrity of clinical coded data particularly as it pertains to casemix or ABF in the public and private health sectors. Since 2010, Pavilion Health has established a company in Republic of Ireland as a future support base for products and services in the Irish and European markets, and has conducted a number of projects with Irish private health insurance companies.

Pavilion Health is an Australian owned company (established in 2007) located in Sydney, NSW. The Sydney office supports the development, deployment and maintenance of our installations throughout Australasia. A wholly owned subsidiary located in Republic of Ireland supports the deployment and maintenance of our installations throughout Europe.

Pavilion Health team acknowledgements

Pavilion Health was assisted through its sub-contractor partners. This included ADRG Grouper developer, Laeta Pty Ltd. Pavilion Health have incorporated the Laeta DRG grouper into a number of their current and future product offerings and are well respected internationally. A key resource for this report, Steve Gillett (SSAKG Consulting) was primarily involved in the ADRG analysis.

Human Capital Alliance (HCA) who worked closely with Professor Beth Reid (Pavilion Health) brought expertise in planning and developing the health information workforce assessment, having developed effective and efficient training programmes for Clinical Coders. HCA was assisted by a broadly recognised health information workforce supervisor and training expert, Jennie Shepheard, whose prominence in the casemix history in Australia, workforce issues and audit methodology in Australia makes her a leader world-wide. As well, the University of Wollongong, developers of the 8th Edition of ICD-10-AM/ACHI/ACS, and the Australian Refined Diagnosis Related Group (AR-DRG) classification, Version 7.0 and a world acknowledged authority on coding quality, provided invaluable peer review capacity.

APPENDIX 2 – ADRG BENCHMARKING

Casemix Neighbours (hospital peers)

The casemix neighbours of a hospital are those hospitals that are most similar in terms of patients treated. As we can classify patients in different ways it is possible to define casemix neighbours in different ways. Typically, we describe acute inpatients using DRGs, however, in this case, we are concerned about the numbers and types of diagnosis and procedures reported by hospitals so we describe patients using ADRGs.

In some applications we could use MDC or specialty. However, this approach fails to quantify complexity differences often associated with role delineation. For example, at the specialty level a person with chest pain admitted to a regional hospital for observation would be counted as equal to a person receiving a heart transplant in a teaching hospital. The failure of specialty or MDC to capture complexity differences means that observed differences in coding between hospitals could relate to differences in the types of patients treated rather than coding differences. Therefore, Specialty or MDC are inappropriate to use in this application.

Casemix Neighbour score

We determine a hospital's (the target hospital) casemix neighbours by calculating a neighbour's score (NS) for all other hospitals by comparing the percentage of cases of patients allocated to different strata (ADRGs in this case) in the target and the other hospital and then adding the absolute value of those difference across all strata i.e.

$$\mathrm{NS} = \sum_{ADRG=1}^{n} absolute\left(Percentage\ Cases\ Target_{ADRG} - Percentage\ Cases\ Hospital_{ADRG}\right)$$

This calculation gives a score of between 0 and 2 where 0 means that the hospital has exactly the same mix of strata (ADRGs) as the target hospital and 2 means that they treat no ADRGs in common.

A hospital's casemix neighbours are then defined as those hospitals with the lowest neighbourhood scores.

Other restrictions on Casemix Neighbours

It is also possible to then use other information to drop unlikely comparison hospitals from the list. In this application we place size restrictions on casemix neighbours. Any hospital that had fewer than half of the annual separations of the target hospital or more than twice the annual separations of the target was excluded from the list of potential casemix neighbours.

In Ireland different exclusion criterion were supplemented based upon existing knowledge.

The local knowledge implications were in two areas; maternity and orthopaedics, hospitals that have maternity/orthopaedic units were each included in each other's peer group. This meant that for a couple of hospitals they were compared to 12 instead of 10 hospitals.

38 ABF hospitals were reviewed, so while the non-ABF hospitals were sometimes included in peer groups, these were not reported on these as the target hospital.

Selection of Casemix Neighbour lists for each hospital

Casemix neighbours were calculated for all institutions with more than 200 separations in the data set. Under the exclusion rules above, this means that no institutions reporting fewer than 100 separations in the data set were used as casemix neighbours. It is unlikely that the ADRG profile for very small hospitals would be stable over time.

In general, 10 hospitals were selected as casemix neighbours for comparing ICD-10-AM code frequencies. In a small number of cases fewer than 10 hospitals met the size requirements. In these cases, a reduced number of hospitals were used for comparative purposes.

In a number of cases ABF sites had a number of non ABF peers.

Casemix Neighbours as opposed to Peer Groups

Hospital comparisons are made in most systems by comparing a hospital's result against:

- the overall (National) results
- against a hospital peer group; under peer grouping each hospital is allocated to a category and hospitals are compared against hospitals in the same group

Peer groups are often determined:

- based upon hospital size
- major specialties
- teaching status

However, there is often considerable variation between hospitals within a peer group and debate around the appropriateness of allocations often occurs, especially with those close to peer boundaries.

Casemix neighbours overcomes the boundary issues by selecting hospitals that are closest to each individual target hospital based upon their neighbourhood score. Further, the score is precisely defined, unlike many peer group allocations. It also provides an indication of the extent of the similarity (scores under about 0.6 are reasonably good matches and scores significantly greater than 1.0 are generally poor matches).

Measuring the effect of coding on WU

In order to get an idea of the potential magnitude of coding effects we use an approach assuming that all differences observed in average WU allocations within a specific group of patients result from coding differences. In practice we know that this is not true, but we assume that the closer we are able to match a hospital to similar hospitals the more valid the assumption becomes.

In order to help ensure that we are making valid comparisons between hospitals with similar roles (and therefore case complexities we have compared each hospitals WU against up to 10 of its closest casemix neighbours. The choice of 'ten' is a pragmatic one, with fewer than ten hospitals often providing small numbers in the peer hospitals (especially for fairly small hospitals). Using more than ten hospitals may include hospitals where the neighbourhood score gets too high.

Estimating the Coding effect

The estimated Target hospital WU effect of coding when compared to other hospitals for the ADRG is given by:

Target Coding effect = Number Separations in Target ADRG x (Average WU Target ADRG - Average WU Comparison Hospitals ADRG)

However, this can be expressed for each record as

$$Average\ WU\ Target\ ADRG\ = \frac{\left(\sum_{j=1}^{nunber\ Separations\ in\ target} Actual\ WU\right)}{Number\ Separations\ in\ Target\ ADRG}$$

But as terms cancel out

Target Coding effect = $\sum_{j=1}^{nunber\ Separations\ in\ target} Actual\ WU$

- *Number Separations in Target ADRG x Average WU Comparison Hospitals ADRG*

This means that for any group of patients the estimated coding effect is calculated by adding the WU average of the comparison hospital for each patient and subtracting the resulting sum from the actual WU for the group of patients.

This calculation can be done on each record in the target hospital, and as each record has a single effect, can be added across patients.

APPENDIX 3 – PICQ® INDICATOR DEFINITION

PICQ® is a software tool containing a predetermined set of indicators or coding rules which identify records in admitted patient morbidity datasets that may be incorrectly coded.

There are four indicator degrees:

- F, Fatal Indicator – any record found by such an indicator has been coded incorrectly by definition
- W1, Warning Indicator, 1% threshold – records found by a warning indicator indicates that individual codes or combinations of codes or data items are likely to be incorrect
- W2, Warning Indicator, other – records found by a warning indicator indicates that individual codes or combinations of codes or data items are likely to be incorrect (although the record is possibly correct) and
- R, Relative Indicator – records found by such an indicator are counted and expressed as a ratio of a larger (usually) group of episodes. These indicators would generally be used to assess the overall quality of coded data rather than identify individual problem records.

Each indicator is categorised according to the type of problem the indicator seeks to identify. The indicator types are:

- edit problem – codes or code combinations that should have been prevented by basic editing, such as the use of edits incorporated in ICD-10-AM reference (or library) files
- completeness problem – codes are missing
- redundancy problem – unnecessary codes are present
- specificity problem – codes lack specificity or the incorrect code has been selected and
- sequencing problem – codes are incorrectly sequenced

When an indicator examines a record, it analyses diagnosis and procedure codes:

- in combination with other codes
- in combination with the Australian National Health Data Dictionary (NHDD) data items
- in a sequence
- for their presence or absence and
- for their specificity

Denominator records are the cases in the dataset under analysis in which the numerator records (problem records) could occur. Numerator records are those that triggered an indicator. When the PICQ® program processes indicators against a dataset the results are expressed as a ratio of numerator to denominator.

PICQ® indicators specific to 6th Edition were adjusted in accordance with ICS.

APPENDIX 4 – MEDICAL RECORD BASED AUDIT METHOD

Sampling

Representative Sample

The process used ADRG V6.0 and the WU for the defining of complexity of each coded record and for estimating changes in income due to DRG change.

The standard methodology took all hospital discharges collected at a hospital level for the HIPE 12-month period ending Dec 2014. Certain types of discharges were then removed including:

- uncomplicated deliveries (birth episodes)
- day case
  - dialysis
  - radiotherapy
  - chemotherapy
  - UV dermatology therapy and
  - Rehabilitation

A sample of approximately 150 medical records was drawn from each hospital in the grouped discharges data with base WU appended. If a hospital record was selected before the hospital's sample quota was filled, it could be selected in the next draw. This is called sampling with replacement and could result in duplicate records. To avoid confusion these duplicate records were removed from the sample sets. In the analysis phase these audited duplicate records were added back in to balance the sample.

The methodology for selecting a record from a hospital was random but the probability that a particular record will be selected on a single draw was proportional to the square root of the base WU of its ADRG V6. This is a form of weighted sampling deliberately biased to drawing the more complex case-type records where miscoding is likely to have a bigger effect and to be more likely due to added coding complexity. The samples were analysed using a method that corrects for this deliberate bias.

The computing process followed was first to take a random sample of the numbers between zero and the sum of the square root of the base WU on each in the hospital. The sample was then ordered from smallest to largest value. The records in the hospital were ordered from those with the smallest square root of the base WU (sample weight) to those with the largest weights.

The selection of records was conducted by comparing (in ascending order) each element of the order random sample with the running total (R say) of the sample weights of the records up to (and including) the record currently being considered for selection. The current record was chosen if it was the first record where the current ordered sample value was smaller than R. The process continued until the largest sample value was smaller than R. This process changed the uniform random sample of values to a weighted random sample of the hospital's records. This process corresponded to a well-known mathematical transformation of uniform random variables to other distributions.

Two weighted random samples are produced this way, primary Sample A list and the reserve Sample B list. The audit sampling tool also consisted of programming to ensure that each of the two samples consisted of two different records. These samples were then ordered in case weight order. This was to ensure that if a record is missing from the original sample a suitable replacement could be found.

Analysis

The data from the audit produced a rate of DRG change and the number of errors per record for each sample hospital adjusted for the biased sample. These data were then used to estimate a DRG change rate and compared with the results for the 38 hospitals in the DRG benchmarking study.

The changed DRG and coding error rate for each hospital provided useful information at the hospital level and was extrapolated from each hospital's annual discharges. The case weights were then used to calculate the cost implications of the DRG changes/errors by showing the impact of the changes in coding for the casemix complexity over the six months reviewed.

A regression model based on casemix complexity and/or DRG cluster and/or peer group was devised to provide hospital level estimates of change rates and case weight effects and to allow checking of peer level deviations from expected values of these measures.

Audit Process

1. Audit Tool

To ensure a smooth data collection process the HPO HCAT© tool was used to collect the data as per:

- audit sample data preloaded on HPO laptops
- auditors returned laptops to the HPO for data consolidation after each hospital audit

a) Modified HCAT© categories

The existing HCAT© tool was used with modified HCAT© categories.

HCAT© Discrepancy Reason Codes included:

01 Coding contrary to ACS
02 Code does not meet additional diagnosis criteria - ACS 0002
04 Code assignment not supported by medical record
05 Transcription error - wrong letter/number entered
06 Incomplete documentation at time of original coding
07 Lack of specificity - more specific code available
08 Code specificity not supported by documentation
09 Inconsistent medical record documentation
10 Local coding decisions
11 Coding method error e.g. dagger & asterisk/tabular
12 Code omission - information available in medical record missed
16 Administrative information does not match medical record info

2. Auditors

Four Australian auditors conducted the medical record based audit between 21st September and the second week of November. The auditors arrived in 2 phases with a one-week overlap to ensure consistency.
The HPO provided training for the auditors in use of the HCAT© tool and the Irish HIPE data collection system and guidelines.

3. Medical record Based Audit Procedures

a) Medical record preparation

The samples were chosen to represent the casemix of the hospital. Each of the sample medical records to be audited and their position on the primary Sample A list and the reserve Sample B list

was important. The samples were ordered in case weight order. This was to ensure that if a record is missing from Sample A, suitable replacement could be selected from Sample B.

Once the sample episodes were selected for review, two lists of approximately 150 records were sent to each hospital. The first list contained the primary records (Sample A) to be selected for review. The second list contained reserve records (Sample B) to supplement where primary-listed records were not available for review. It was not necessary for the hospital to pull all 300 records. The alternate list (Sample B) was only to be used when the record could not be found in the primary list (Sample A). For example, if the 20th record in Sample A was not found it was substituted with the 20th record from Sample B. It was important that if a record was not available in Sample A, exactly the same line number in Sample B was chosen. If both records in Sample A and the corresponding position in Sample B could not be found the sample of medical records audited was reduced (i.e. the medical record cannot be substituted by another record in sample B that is not on the same line number). At the end of some sample sets there were more records in the B sample set without corresponding A sample set records. In these cases, hospitals were asked to go straight to the B sample records.

Each hospital was given a minimum of two weeks to locate and prepare the records to be reviewed.

b) Medical record review

Each auditor would firstly review and code the record without reference to the original codes. The auditor would then review the original codes assigned and recode the record again referencing the existing codes. If the final code set differed from the original set the auditor regrouped the record and categorised the mismatched codes according to the Discrepancy Reason Codes listed in 1A.

Auditors reviewed mismatches with local coding staff and disputed records were referred to a Gold Standard arbiter for final decision.

c) Gold Standard arbiter process

Determination of the outcome of an audit dispute was made with respect to the issue under dispute. In some circumstances the second auditor may have assigned a code that neither the hospital Clinical Coder nor the first auditor assigned; similarly, the second auditor may not have assigned a code that was assigned by both the first auditor and the hospital. These situations may have resulted in a further change in the DRG, however the new DRG was not considered if it resulted from a second issue rather than in respect of the coding of the issue under dispute.

To make this clear the dispute resolution process is described formally as follows:

With respect to the coding issue under dispute:

- where the Gold Arbiter coding agrees with the auditor, the auditor DRG stands
- where the Gold Arbiter coding agrees with the hospital Clinical Coder, the hospital DRG stands
- where the Gold Arbiter coding results in a third option for the issue in dispute the dispute is resolved if the Gold Arbiter coding results in a:
  - DRG that matches the first auditor, the first auditor DRG stands
  - DRG that matches the hospital DRG, the hospital DRG stands and
  - third DRG, the hospital DRG stands (the benefit of the doubt goes to the hospital)

d) Medical record based audit results

At the conclusion of review of the sample medical records and the categorisation of the mismatched data, the auditor presented the local coding representative and the CEO (or nominated

representative) a HCAT© summary report identifying the number of records reviewed, the number of records with mismatched codes and the number of disputed records being referred to arbitration using the HCAT© summary reporting format. The sign off of these reports was critical so as not to have ongoing disputes or misunderstanding of audit results. In addition, this process created a sense of inclusion on the part of the local staff and therefore an increased willingness to participate and improve on future reviews. Attendance at the sign off meeting was decided on at hospital level with various levels of engagement in this aspect of the process by hospitals

e) Data consolidation

After completion of the medical record based audit the auditors' computers were returned to the HPO and the audit data backed up into a central directory. The audited codes were exported to a CSV file for further analysis of the case weight variation.

APPENDIX 5 – BEST PRACTICE WORKSOP

Background

The National Audit of Information in the Irish Acute Setting Project, in which the HPO and Pavilion Health are partners attempting to achieve improvement in the quality of HIPE data, commenced in May 2015. The core purposes of the project are to:

- assess the validity of data underpinning the health service ABF funding model
- validate a range of data reported to the HPO by acute hospitals
- support data quality improvement in admitted patient data reporting including the identification of best practice clinical coding service management and Clinical Coder skills and knowledge

One of the key activities of this project is to complete a study on the management of coding services in the ABF hospitals in line with best practice. A clear starting point for such a study is to define 'best practice', for which the convening of an 'expert group' discussion was considered an important step.

While the first intention for the workshop was that it be a meeting with a small number of experts who would assist in the development of the best practice document and a subsequent management audit tool, there was a lot of interest from the hospitals and it became clear that it would better serve the outcome of the project if all interested hospitals sent their representatives. A total of 57 people hence attended from hospitals all over Ireland and from a range of roles. These roles included Clinical Coders, HIPE Coordinators, Hospital Casemix Coordinators and Finance Managers.

The objectives of the workshop were to:

- engage HIPE data quality advocates in the current project
- develop a common understanding of the coding service management elements that impact upon data quality
- develop and validate topics for including in the management audit
- identify and share initiatives that individual managers might have already adopted

Literature Review

The literature review included an electronic search of published work, but there were few results which addressed directly the issue of best practice in coding services. The next step was a hand search of the journals which publish routinely on health information management issues. The country of origin was important because of the different clinical coding systems in use. A focus on the Republic of Ireland was needed but much of the material published in Irish clinical journals focused on the value (or not) of HIPE data and not on the quality of the coding service. The exceptions are works by Murphy (2010a, 2010b) and older papers by Bramley and Reid (2005a, 2005b). Papers published in Australia were particularly relevant. First, because the same clinical coding system is used; and second, the use of casemix for funding is relatively mature there. For example, funding of hospitals by casemix (now called ABF) has been operating in Victoria since 1993. The experiences of coding services in responding to the demands of ABF in Australia were most useful for the review.

Coding is discussed in many papers, and it was necessary to read these and discern if there were any lessons for best practice in each paper. The authors rarely made explicit the implications of the paper for best practice. One exception is the book by Schraffenberger and Kuehn (2011) which is aimed at the North American market. Few papers used a research approach to establish which

organisational practices contributed to fewer coding errors, the exception is Santos and colleagues (2008). Many papers are reports of natural experiments where the authors report on the success (or not) of changes to practices. Mostly, the accounts of best practice were found in accounts of how experiments or changes in practices have produced better coding results as measured by audits of coding and decreases in the percent of DRG changes, or improved Clinical Coder morale and job satisfaction.

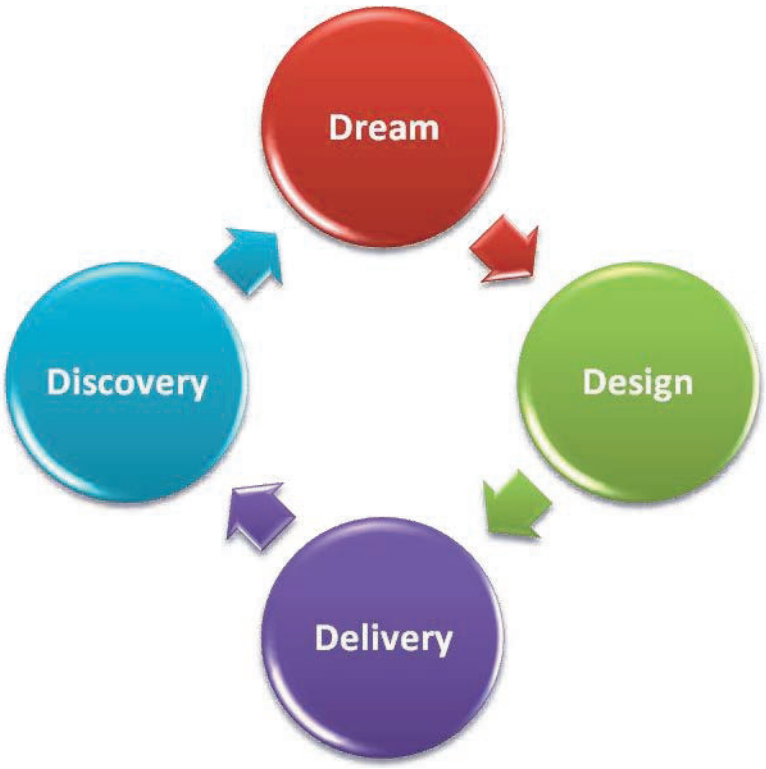
In summary, the review identified one book and around 38 papers which discussed issues related to improving the quality of coded data or the coding service, but the evidence to support the practices described tended to be anecdotal in nature rather than reports of well conducted research.

The themes found in the literature review were used in the Coding Service Assessment as described above and these themes are integrated into the results below of the Coding Service Assessment.

Workshop approach

The slides used to introduce the project and the workshop are attached as Appendix A. The Appreciative Inquiry (AI) method was used. The method of AI aspires to create change and growth from exploring the best in the past instead of finding the problems and then trying to solve them. Importantly, AI positively charges the process of organisational change thereby making it more feasible to take place. Teams that are able to apply the core principles of AI are typically able to enhance their interpersonal relationships and communication while building enthusiasm, ownership, commitment, and a sense of purpose.

The classic AI approach, as shown below, commences with the positive psychology of the 'Discovery' stage.



The intention of this workshop was only to go as far as the 'Dream' stage.

Discovery phase process & results

The morning was devoted to the Discovery phase of the AI approach. The participants were divided into five smaller groups for discussion and reporting to the plenary sessions. The groups were asked to consider the following question.

> *Describe a time in the last 6 months (or more if required) when you felt great about your role and when you or your team in the coding service (or ward, or hospital) felt you had really improved data quality. A time which was your best experience of coding service delivery, when you and your team felt you had really 'nailed' it? What made the experience great?*

The groups were asked to consolidate the stories about successes in the coding service into 4 or 5 main themes. The reporters for each small group summarised the stories and group discussion for their themes during the plenary session. The large group visited each small group and participants were free to read and re-visit the Post-it-note displays for each group as they wished. As expected, there were some common themes to the successes. The distribution of hospitals and different participant's roles across the groups facilitated the exchange of information during the 1-hour group discussion and there was much lively discussion of how successes were achieved. The AI Discovery phase is designed to elicit positive responses and this was evident in all groups with only a few lapses into negative suggestions. The overall impression from the plenary session before lunch was that there was much that had been achieved at the hospital level, that the tools available from HPO had been useful and there was much of which to be proud.

The following were common themes from the Discovery phase. Each theme is expanded by quotes from some of the stories recounted or summaries of the group discussion of these stories.

Engagement with the Clinicians is happening:

- eureka moment is happening with Clinicians (medical and nursing) seeking information from HIPE
- quarterly invitation to attend the medical clinician's monthly Journal Club breakfast
- Clinical Coder and HCC involvement in educating Clinicians about what they need to document in the medical record to support coding
- HIPE Clinical Coder participation in clinical studies
- validation of data with Clinicians

HIPE is the gold standard of information about the patients treated.

- "*We were able to answer a clinician's request in 15 minutes. A request he had been waiting for an answer to for more than 2 weeks from another part of the hospital*"
- trust and confidence in the HIPE data
- when HIPE and data from other systems were compared the HIPE data were found to be correct
- HIPE data being used more often

There has been improvement in the processes surrounding coding.

- "*Getting rid of the backlog was like winning Lotto."*
- mobile coding improved efficiency (quicker access to medical records) and clinical involvement
- a simple IT system allowed the capture of HIPE data without paper

- Clinical Coders attending the Multi-Disciplinary Team Meetings improved the communication flow

Clinical Coders are better recognised for their expertise.

- some Clinical Coders were upgraded to Grade 5
- Clinical Coders were moved from an inconvenient poor quality space to a better office adjacent to the medical record department
- raised profile – "*Quality data and improved patient care*"

ABF is driving the change to improving the profile of coding

Discovery phase process & results

After lunch the small groups met again to discuss the following question:

> *"If you woke up in 6 months and everything regarding HIPE data quality was how you wanted it to be – what has happened, what has changed? How would your team be working? What are a couple of things that you would change?"*

The following themes of the Dreaming phase emerged during the afternoon plenary session.

Career structure for Clinical Coders

- uniformity in the use of pay grades for Clinical Coders
- allocation of Clinical Coders to pay grades to reflect level of skill and capability
- grades that recognise Clinical Coder experience
- national level leadership in getting the grading system right
- progression and training support through roles from senior Clinical Coder to coding mentor, trainer, auditor, manager, information analyst, Hospital Group roles
- resurrect the HCC Working Group

Human Resources aspects of coding and HIPE data support/analysis workforce

- expectations of Clinical Coders linked to workload and supported by staffing numbers
- Clinical Coders to be valued and rewarded
- recruit the right people
- training takes a long time so succession planning is needed to fill positions when experienced Clinical Coders retire
- attention to Clinical Coder retention and morale

Improve the quality of documentation in the medical records

- timely detailed discharge summary/letter
- complete, accurate and clear medical record
- good communication with Clinicians
- consultants who take ownership of their data
- Senior Clinicians who lead by example
- scores noted on the anaesthetic sheet consistently

Better co-ordinate IT developments

- ensure Clinical Coder access to test results
- national fully operational IT systems
- integrated IT systems at the hospital level
- involve finance and Clinical Coders in new system development
- standard electronic discharge summary nationally
- move towards paperless system
- electronic tracking system for medical record location in all hospitals
- regular users group meetings
- develop Informatics expertise to oversee IT developments

Greater clinician engagement with ABF

- Clinician involvement in HIPE role
- Clinician involvement in audit
- identify clinician champions

Education and training

- increase the capacity of the DIT course for Clinical Coders
- DIT course advanced to higher level
- mentors for trainee Clinical Coders at the hospital level
- all Clinical Coders compete training
- increased understanding of costing/finance for Clinical Coders
- Clinicians trained in entire HIPE process
- HIPE module in medical clinician's university education
- nationally consistent education for Non-Consultant Hospital Doctors
- clear expectations of NCHDs input to the discharge summary
- training for medical Clinicians not educated in Ireland

Management of the coding service and related processes

- Senior level support for importance of Clinical Coders role
- HIPE office space is fit for purpose
- adequate resourcing of departments that HIPE depends on
- accuracy of PAS/IPMS addressed so HIPE and these systems use the same definitions
- National Data Dictionary so all data items are clearly defined for all uses
- coding process begins at admission
- HIPE function located within Finance

- If HIPE function is not located in Finance, then increase communication between HIPE department and finance
- develop expertise at the Hospital Group level
- no backlog
- Clinical Coders code not chase medical records
- Histology available on discharge if possible
- national HIPE data request form, coordinator
- Clinical Coding locum team

Conclusion

There was a summary of the main themes emerging from the Dreaming session at the conclusion of the afternoon plenary session. Lee Ridoutt and Beth Reid noted that a lot of useful material had been gathered during the day and thanked everyone for their contribution. The next steps in the project were outlined, along with plans to keep the hospitals informed starting with a report of the workshop.

APPENDIX 6 – CODING SERVICES ASSESSMENT BEST PRACTICE GUIDE

Coding services manager

Area of service management – Organisational management support • grading Level and salary commensurate with manager role – at least Grade 6 depending on hospital size and role • ideally a casemix as well as coding management role • management qualification or training courses • previous management experience • coding experience and • clear 'reports to' in hospital structure	Score /5
Coding service management style • at least 50% of time spent on strategic tasks • some coding to maintain coding skills if manager can code • able to respond to Clinical Coders queries or directs coding problems appropriately • regular communication with Clinical Coders and • competent at operational matters of staff supervision, reporting and 'firefighting'	/5
Services management sub total	**/ 10**

Clinical Coder supply

Clinical Coder capacity • numbers of Clinical Coders sufficient to cover workload without sacrificing quality to time constraints; • objective means of understanding workload and calculating required staffing; • Clinical Coders managed to match workload and; • no backlog	/5
Clinical Coder recruitment & development • recruitment is controlled by the coding manager; • can state clearly the qualities needed in recruits; • system for training new recruits; for example, using coding buddy, shadow coding to check beginner Clinical Coder's work • system for integrating on the job training with HPO courses; • no Clinical Coders currently employed without basic HPO training; • training and mentoring, includes orientation to the hospital and its casemix and specialities, and targets and tailors coding skills development to the hospital's mix of cases and; • mentors receive some training in mentoring	/5
Clinical Coder reward • the manager has influence over grading decisions; • rewards to assist in compliance with timeliness protocols and methods for avoiding and clearing backlogs and; • to the extent possible in current structure, individuals rewarded commensurate with competence and performance	/5
Work allocation & supervision • there is a system in place for work allocation that takes account of coding complexity • manager understands Clinical Coders' strengths and has method for evaluating the competence of Clinical Coders • the system matches Clinical Coders with appropriate clinical areas and coding difficulty measures and • a system for ensuring fair distribution of work among the Clinical Coders and early identification of under-performance	/5
Staff shortage strategies • a system is in place to deal with short and long term staff absences such as	/5

unexpected sick leave, absences for child rearing, etc.	
Career structure • a career structure is in place that allows motivated Clinical Coders to aspire to higher duties, responsibility and reward • system in place for guiding able Clinical Coders through different roles such as beginner, experienced, advanced, mentor, auditor • Clinical Coder organisational structure recognises enhanced competence and excellence in performance, and provides an incentive to 'step up'.	/5
Self-Rating of the morale of Clinical Coders in the hospital • manager has good understanding of morale and can explain score allocated and; • strategies in place to improve or sustain morale	/5
Clinical Coder supply sub total	**/ 35**

Work practices for productivity & quality

Availability and use of coding resources
• HPO provided tool are used properly including:
  • HIPE Portal edits
  • Checker
  • Reporter
  • HCAT©
  • QlikView
• system in place for solving complex coding problems
• other strategies for checking on coded data quality in place
	/5

Records administration resources • records are tracked properly and made available to Clinical Coders in a timely way • Clinical Coders are not chasing missed records as deadline for coding approaches • working and responsive IT infrastructure and support • Clinical Coders have ready access to all sections of the medical record including laboratory and imaging reports, ICU and Theatre • medical records are well organised and documented giving a full and accurate picture of what happened to the patient and supporting the detail needed for coding • Discharge summaries available prior to coding and complete. Detail in the summary includes necessary detail and is consistent with the rest of the record • manager has strategies in place and acts collaboratively with health record manager in solving any problems with medical records	/5
Clinical Coder interaction with clinical staff • [direct] communication between Clinical Coders and clinical staff is used to resolve queries on documentation in the medical records and coding problems • system is in place to facilitate clinical contribution to Clinical Coder understanding and training through discussion of changes in medical science and treatment • good rapport between Clinical Coders and Clinicians • manager is involved in educating medical Clinicians and junior doctors on ADRGs, ABF, documentation needed to support accurate coding and the fair financial return to the hospital for clinical work performed • manager involved in clinical team discussions	/5
Work practices sub total	**/ 15**

Coding service visibility

Clinician demand for data • reports from the HIPE Unit used frequently by Clinicians • nature of reports is not just compliance but demonstrates potential of HIPE data for multiple purposes • system in place to involve senior Clinical Coders in generating reports so their coding expertise is used and Clinical Coders understand how the data they code are used and are able to bear some of the report writing load with the Manager	/5
Clinical Coder visibility in wards • Clinical Coders are in contact with Clinicians and ward staff about records to be coded and issues of access to files • Coding commences on admission • Clinical Coders involved in clinical team activities at the department level as appropriate	/5
Coding service / service manager visibility • title for the coding manager role is appropriate for ABF importance and is a title favoured by HPO; • manager has a clear job description, which outlines a managerial role • manager reports to someone whose role makes sense under ABF and has appropriate influence over hospital decision making • manager supported well by immediate line manager • senior hospital management and Clinicians understand and supports ABF implementation	/5
Representation in in decision making structures • Manager is included on the ABF implementation committee attended by the most senior staff member of the hospital. This committee is active and effective • Manager is on the Medical Records Committee. Medical Record Committee is active and effective • Manager contributes to clinical department discussions	/5
Coding service visibility sub total	**/ 20**

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