Improving data quality in the NHS

Annual report on the PbR assurance programme

Health 2010
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What is the PbR assurance programme?
Since 2007, the Audit Commission has delivered an assurance programme for Payment by Results (PbR); the NHS tariff for paying acute hospitals. Our work comprises analysis, research, pilot reviews, benchmarking and an audit programme that has checked the accuracy of over £200 million of payments under PbR. The focus of our work is to improve the quality of data that underpins payment under PbR, but the data we review is also of wider importance to the NHS as it is used to plan and monitor healthcare provision. It also supports effective commissioning. This report summarises the findings from three years of our independent external clinical coding audit programme. It also outlines the findings from our outpatient reviews undertaken at all acute trusts.

What did we find?
The accuracy of clinical coding is improving year-on-year. At the start of the programme, average clinical coding errors at trusts were 16 per cent. This reduced to 11 per cent. We have identified approximately £9 million of financial errors because of this wrong data. When adjusted for changes in classifications, errors in Healthcare Resource Groups (HRGs) have also improved. The gap between the best and the worst trust has also narrowed.

Despite the improvements in clinical coding accuracy, the actual HRG error rate increased in 2009/10. This is because in 2009/10 most PbR tariffs moved to using a new and more complex set of HRGs (called HRG4). This new system is more sensitive to coding errors. The increase in errors is because of the change to HRG4 rather than poorer data quality.

In 2007/08 we highlighted that specialist trusts needed to improve the accuracy of their coding. Now their coding accuracy is at least as good as other trusts. We also continually highlighted the lack of national guidance on the coding of co-morbidities. This often caused errors and inconsistencies in clinical coding. Initial guidance on co-morbidities has now been published by NHS Connecting for Health (Ref. 1).
Normally, we do not extrapolate the error rates found at individual trusts because we encourage PCTs to either choose the areas to audit locally or target areas using our National Benchmarker. However, over the last three years we have carried out random sample audits on four specific specialties at all trusts that deliver them. The four specialties are: general medicine, trauma and orthopaedics, cardiology, and paediatrics. The random nature of the audit and the large sample enable us to extrapolate the findings. Through this extrapolation we estimate that £1 billion of the £21 billion expenditure (about 5 per cent) in these four specialties was paid on the wrong HRG between 2007/08 and 2009/10. However, nationally PCTs were not over- or undercharged for the work because the average net financial error rate is less than 0.5 per cent in the four specialties audited.

The HRG error rates continue to affect the accuracy of payments. In 2009/10, the average gross financial error rate is 4.6 per cent of the sample reviewed, approximately £2.7m. The average net financial error rate remains low (less than 1 per cent of the sample reviewed). Nationally, the under- and overpayments balance, suggesting there is no systemic upcoding. However, there has been a small shift towards net underpayments to trusts because of the move towards HRG4.

For the first time we are able to give a national view of the accuracy of outpatient data that affects payment under PbR. We found the average error rate resulting in incorrect prices being charged to PCTs to be 5.2 per cent. As a result of the errors PCTs paid an average of 1.4 per cent more (average net financial error) than expected for the work. Outpatient attendances attract a lower price for each attendance than most inpatient spells. However trusts deliver many outpatient attendances so it is important for the price for each attendance to be accurate.

We piloted audits of Accident and Emergency (A&E) data that trusts use to charge under PbR. This showed areas of excellent performance and some areas for improvement. Most data that affects payment is accurate, so payment errors are small. This is because the current national tariff for A&E activity has a relatively simple structure. We decided in the light of these findings that it was not necessary to conduct a full audit programme. However, we now include A&E data in our National Benchmarker to support improvement in local data quality.

Despite the overall improvement in clinical coding nationally, there is still significant variation between the best and the worst-performing trusts. HRG error rates range between 0 and 28 per cent. The clinical coding error rate range is similar. Trusts are implementing many of our recommendations and this is improving coding accuracy and strengthening the integrity of payment. However, we still believe some trusts can improve further. Our work in 2010/11 will therefore focus on the trusts that need to improve the most.
What can be done to improve?

There are common causes of errors in data. To further improve data accuracy, trusts and PCTs should ensure that:
- regular internal audits on clinical coding and the quality of outpatient data are carried out;
- clinical coders are well trained and follow national standards;
- clinicians are engaged in improving the accuracy of inpatient and outpatient data;
- policies and procedures for data quality and capture are up to date; and
- source documentation is of a good quality, accurate and readily accessible to those inputting data.

Many trusts had episodes that are unsafe to audit because clinical information is not available. Our auditors follow the NHS Connecting for Health audit methodology. This requires auditors to remove episodes that are unsafe to audit from the audit sample. In 2009/10, we excluded approximately £600,000 or 1.7 per cent of activity from our audits because the individual episodes were unsafe. These are in addition to the errors we currently report. Episodes that are unsafe to audit can result from poor-quality medical records which carry patient safety risks as well as financial risks.

We believe commissioners can also improve their contract management, and monitoring and understanding of provider activity. We will develop the assurance framework in 2010/11 to help commissioners identify the financial risks of provider data quality and improve the National Benchmarker to support commissioners further. We will also review commissioner’s contract management arrangements, including how PCTs involve and engage with GPs in their commissioning and contract arrangements.

Our work has highlighted problems in the consistency and interpretation of national guidance and definitions that affect data quality. We will work this year on specific data definition issues with the NHS and key partners to look at how these can be resolved.

An important part of the PbR tariff is the integrity of the costing information that determines tariffs. This also can be an important part of non-PbR contract negotiations between commissioners and trusts. In 2009/10, in partnership with the Department of Health (DH), we reviewed the use of reference costs across the NHS and tested the collection process at 16 trusts (Ref. 2). This showed the quality of submissions is variable. Basic checks to assure the quality of submitted data are often lacking. The quality of reference cost submissions needs to improve. The DH has agreed that the assurance framework will move into reviewing the accuracy of costing data in 2010.
Introduction

1. The PbR Data Assurance Framework helps improve data quality in the NHS. This report presents the key findings from the 2009/10 audits, the messages from three years of PbR inpatient audits, and supporting pilot work on reference cost submissions (Ref. 3) and Accident and Emergency (Ref. 4) data that drives payment.

2. For the first time, we are able to give a national picture of the accuracy of data in four specialties and describe what the impact of this is on payments across the whole of the NHS in England.

3. We publish summary results from all the audits on our website alongside comparative profiles for all PCTs, trusts and SHAs at: www.audit-commission.gov.uk/pbr Further analysis, briefings and case studies accompanying this report as well as access to our National Benchmark are also available on our website.
Key messages from inpatient audits

Healthcare Resource Groups (HRG) error rates

4. In 2009/10 the HRG version used for payment of most inpatient activity changed from HRGv3.5 to HRG4. The change to HRG4 is a major development in the casemix grouping methodology. It increases the number of groupings from 600 to more than 1,400 groups, enabling more detailed and specific description of patient treatment. In 2009/10, all inpatient clinical coding audits checked data that was grouped under HRG4.

5. The audits analyse the impact of coding errors on the derivation of the HRG and use PbR tariff rules to quantify the financial impact of coding errors identified.

6. Figure 1 shows the HRG4 error rate resulting from the audits we carried out in 2009/10. The average HRG4 error rate was 9.1 per cent.

7. Error rates varied across trusts from 0 to 28 per cent. When we compare this year’s error rates to last year’s error rates, there is a small increase in the average error rate of 1.1 per cent.

8. The change to HRG4 explains the increase in the average HRG error rate rather than poorer data quality. The error rate increased because HRG4 is more sensitive to errors in clinical coding accuracy, both through design and because HRG4 contains more than twice as many HRGs as HRGv3.5. If you group the data from the audits we carried out in 2007/08 and 2008/09 from HRGv3.5 to HRG4, you see a clear year-on-year improvement in the average error rates. Figure 2 shows that if HRG4 had been used in 2008/09, the result would be a 1.8 per cent improvement in the HRG error rate.
The example in Appendix 1 shows how under HRGv3.5, although the auditors disagreed with the trust coding, the HRG assignment and therefore the price remains the same. However, because of the greater granularity (or specificity) in HRG4 the same example would produce a different HRG to that of the trust’s, thus changing the payment.

Despite the overall improvements, over 25 per cent of trusts still have an HRG error rate of more than 12 per cent. Over the three years of the assurance framework, 20 per cent of trusts had an average HRG error rate of 10 per cent or higher. Focusing our work on those trusts that are the poorest performers will support improvement in data quality and payment accuracy.
Clinical coding accuracy

11 The accuracy of clinical coding is improving. When we started the audits in 2007/08, on average, 16.5 per cent of diagnosis and procedures were not accurately coded. In 2009/10, on average, 11.3 per cent of diagnosis and procedure coding was inaccurate. The error rate ranged from 1 to 30 per cent. Figure 3 shows that average procedure coding is six percentage points more accurate than in 2007/08 and average diagnosis coding is four percentage points more accurate than in 2007/08.
Ensuring that clinical coding is accurate goes beyond PbR. It is a key part of the data in the commissioning data set. The NHS uses this information to plan and monitor healthcare provision. It also supports effective commissioning. As the NHS places more focus on improving efficiency and outcomes, measurement of progress will be dependent on accurate clinical coding.

The accuracy of clinical coding varies not only between, but also within, trusts. Table 1 shows the five specialties with the worst clinical coding accuracy, averaged for the three years of our audits. Focusing internal audit, training and clinical engagement on specialties with high error rates will help trusts improve the most.¹

¹ We use the term ‘specialties’ throughout this report to help understanding, but we are always referring to treatment function as defined in the glossary.
Table 1: Five specialties with the worst average clinical coding accuracy 2007/08 – 2009/10

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Average percentage coding error 2007/08 – 2009/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident &amp; Emergency</td>
<td>21.0</td>
</tr>
<tr>
<td>Geriatric Medicine</td>
<td>19.7</td>
</tr>
<tr>
<td>Nephrology</td>
<td>19.6</td>
</tr>
<tr>
<td>Vascular Surgery</td>
<td>16.3</td>
</tr>
<tr>
<td>General Medicine</td>
<td>13.6</td>
</tr>
</tbody>
</table>

*Source: Audit Commission*

**Gross financial impact by trusts**

14 Since 2007/08 we have audited £200 million of inpatient activity covered by PbR, totalling 148,000 Finished Consultant Episodes (FCEs). Over the three years, 4.4 per cent or £9 million of the total cost of the activity paid for by PCTs was assigned to the wrong HRG. To produce this analysis we treated the monetary value of all errors identified as a positive value and added them together.

15 In 2009/10, we audited 48,000 episodes of care, equating to approximately £60 million of NHS expenditure. Nationally the average gross financial error rate was 4.6 per cent of the value of the sample reviewed, approximately £2.75 million. Figure 4 shows the gross financial error for the trusts we audited in this year as a percentage of the sample audited.

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*i* Specialties are only included if the number of FCEs audited is greater than or equal to 100. This analysis was calculated by finding the top ten specialties by HRG error across all three years, including where the specialty was audited more than once at the same trust. We then calculated the top five specialties by ranking the average coding error across the three years.

*ii* Accident and Emergency refers to patients admitted into hospital under the specialty or treatment function of Accident and Emergency. Section 4 of this report on the Accident and Emergency pilot relates to payments for people attending an Accident and Emergency department at a hospital, not those admitted into hospital.
Net financial impact

16 We calculate the net monetary value of the errors by adding together all the changes from the audits, both positive and negative, to give a net financial impact for each trust. A negative figure indicates that PCTs should have been charged less.

17 In the first two years of the assurance framework, the average net over- or undercharge nationally to PCTs was almost zero. This year PCTs have been slightly undercharged nationally. If trusts had coded everything accurately, PCTs would have paid more. However, because the average net error rate is still close to zero, (less than 1 per cent), this suggests there is no systemic upcoding.
18 Although the national position shows a small undercharge, Figure 5 shows there is significant variation locally. In more than 25 per cent of trusts audited, PCTs would have paid 2 to 8 per cent more on the sample audited if the trust had coded accurately.

Figure 5: **Net monetary value of errors as a proportion of the sample 2009/10**

Source: Audit Commission

### National themes

19 Over the three years of the PbR assurance framework, we focused an element of the clinical coding audits on four national theme specialties. Every trust had each national theme specialty audited at least once over the three years if they delivered that specialty. As the specialties reviewed were not targeted or selected locally, we are able extrapolate these results to give a national financial error rate for each of these specialties. The four specialties are general medicine, trauma and orthopaedics, cardiology, and paediatrics. We chose these four specialties following advice from our external advisory group consisting of key stakeholders and representatives from the NHS. Table 2 shows the total of the sample audited and the net and gross error rates.
General medicine has the highest gross financial error rate of 5.3 per cent. We audited £30 million of activity over three years and found that £2 million was wrong. If we sum the total activity that each trust delivered in the year we carried out the audit, over the three year period there was approximately £9 billion of general medicine activity. We estimate that with a financial error rate of 5.3 per cent, £480 million of this expenditure on general medicine was paid on the wrong HRG between 2007/08 and 2009/10. Table 2 shows this for each of the four specialties.

Over the three-year period, the total value of the activity carried out by trusts in the specialties we audited each year, was approximately £21 billion. We estimate that £1 billion (about 5 per cent) of the activity was paid out on the wrong HRG. Table 2 shows a summary of the audit results for the national themes over the three years of the audits.

Table 2: Total financial error extrapolated from national theme audit results

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Estimated number of FCEs audited</th>
<th>Clinical coding error rate (%)</th>
<th>HRG error rate (%)</th>
<th>Net financial error (%)</th>
<th>Gross error rate (%)</th>
<th>Total audited 07/08-09/10 (£m)</th>
<th>Total activity in specialty over 3 yrs 07/08-09/10 (£bn)</th>
<th>Estimated gross financial error over 3 yrs 07/08-09/10 (£m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Medicine</td>
<td>17,600</td>
<td>12.2</td>
<td>11.3</td>
<td>0.8</td>
<td>5.3</td>
<td>29.4</td>
<td>9</td>
<td>484.0</td>
</tr>
<tr>
<td>Trauma &amp; Orthopaedics</td>
<td>7,000</td>
<td>12.1</td>
<td>8.0</td>
<td>0.8</td>
<td>4.3</td>
<td>52.8</td>
<td>7.6</td>
<td>328.9</td>
</tr>
<tr>
<td>Cardiology</td>
<td>5,100</td>
<td>18.9</td>
<td>6.8</td>
<td>0.7</td>
<td>3.3</td>
<td>14.8</td>
<td>2.6</td>
<td>86.9</td>
</tr>
<tr>
<td>Paediatrics</td>
<td>14,700</td>
<td>15.7</td>
<td>9.6</td>
<td>1.1</td>
<td>5.0</td>
<td>12.1</td>
<td>1.9</td>
<td>97.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>109.1</td>
<td>21.1</td>
<td>996.8</td>
</tr>
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</table>

Source: Audit Commission

This analysis only includes specialties audited as a national theme. This means that the error rate for general medicine is different from the error rates reported in Table 1.
22 During the latter half of 2008/09 and 2009/10, we audited 25,000 outpatient appointments across all trusts to identify the accuracy of outpatient data that underpins prices for PbR.

23 The outpatient tariff is based on an attendance by a patient at an outpatient clinic. Outpatient clinics are assigned a specific treatment function code depending on what clinical function is undertaken in the clinic. For example, the treatment function code for general surgery is ‘100’. Under PbR different treatment functions attract different prices. A first attendance attracts a higher reimbursement rate than a follow-up attendance.

24 We look at the accuracy of the three sets of data that affect price. We check that:
- evidence confirms the patient attendance or non-attendance is correct;
- evidence confirms the attendance is recorded correctly as a first or follow-up; and
- the treatment function is recorded correctly.

25 An error in any one of the above will affect the price of the attendance charged to the PCT. Therefore, if one or more of these was wrong we counted that as an attendance error (Figure 6). The average attendance error was 5.2 per cent with a range of 0 to 45 per cent.

26 The best-performing 25 per cent of trusts have an attendance recording error rate of 0.7 per cent or less. However, the worst-performing 25 per cent of trusts have an attendance recording error rate of 7.3 per cent or more.

Causes of attendance errors

27 Most trusts accurately record whether a patient attends the outpatient clinic, with 37 per cent of trusts having no errors. But 25 per cent of trusts had between 3.1 and 40 per cent of the attendances incorrectly recorded.

28 Over 50 per cent of trusts made one or more errors in recording the attendance as a first or follow-up attendance. There is a significant price difference between a first attendance and a follow-up attendance.
Figure 6: **Percentage of outpatient attendances with one or more errors that affect price**

![Percentage of outpatient attendances with one or more errors that affect price](image_url)

- **Trust error rate**
- **Upper quartile 7.3%**
- **Lower quartile 0.7%**

*Source: Audit Commission*

29 Most trusts accurately recorded the treatment function. However, 25 per cent of trusts made errors. The treatment function error rate ranged from 0 to 18 per cent.

30 In 2009/10 local prices were agreed between commissioners and trusts for procedures performed in an outpatient setting. There was no national mandatory tariff for this activity. In 2010/11 there are mandatory tariffs for 49 outpatient procedure HRGs. All other outpatient procedure HRGs will be paid for as part of the relevant mandatory outpatient attendance tariffs. This requires trusts to accurately record the procedures carried out. In order to support trusts getting ready for the change in charging for procedures, we checked that, if trusts were recording procedures, evidence correctly showed that a procedure had been carried out, or that no procedure was undertaken.

31 In trusts that were recording procedures, we found that 17 per cent incorrectly recorded one or more procedures. Our findings show that a significant proportion of trusts need to improve their systems to make sure procedures are recorded accurately.
Outpatient gross and net financial impact

32 Outpatient attendances attract a lower price per attendance than most inpatient spells. However, trusts deliver a large number of outpatient attendances, so it is important that an accurate price for each attendance is charged to the PCT.

33 Figure 7 shows the gross monetary value of the errors at outpatient attendance level. To produce this analysis, we treated the monetary value of all errors identified as a positive value and added them together. We have presented this as a percentage of the sample. The average gross financial error rate was 4.4 per cent with a range of 0 to 50 per cent.

Figure 7: Gross monetary value of outpatient errors as a proportion of the sample 2008/09 - 2009/10

Source: Audit Commission

34 Figure 8 shows the net monetary value of the errors at outpatient attendance level. The net monetary value of the errors is calculated by adding together all the changes from the audits, both positive and negative, to give a net financial impact for each trust. A negative figure indicates that PCTs should have been charged less.
As a result of the errors PCTs paid an average of 1.4 per cent more than expected for the work.

### Arrangements for collecting accurate outpatient data

The processes for collecting data that determine outpatient PbR prices often vary between trusts and even between different specialties. This is different from inpatients, where the system of clinical coding is common across all trusts. It is therefore important to look at the arrangements that trusts have in place to support the collection of outpatient data, as well as looking at the accuracy of data. We looked at:

- accountability – whether there is clear accountability for data quality and the production of outpatient data;
- policies and procedures – whether there are effective policies and procedures to ensure that all outpatient activity is accurate and consistent;
- data entry – ensuring all outpatient data is captured completely, accurately and promptly at the trust; and
- IT systems – whether there is adequate functionality and controls for processing outpatient information.
Our auditors assessed whether these arrangements are below minimum standard, adequate, good or excellent.

Over 90 per cent of trusts have adequate or good arrangements in place (Figure 9). However 10 per cent of trusts had one or more areas that were weak. This means the arrangements they have in place to secure good data quality are below the minimum standards we expect. Only 2 per cent of trusts have excellent arrangements in one or more of the areas we looked at.
Messages from Accident and Emergency pilot and reference cost work

Accident and Emergency (A&E) pilot 2009

39 We carried out pilot audits on A&E data quality to decide whether we should extend the PbR data assurance framework to cover A&E activity. In January we published our findings on the pilot (Ref. 5). Under PbR, Accident and Emergency attendances are paid for based on the most resource-intensive investigation or treatment. The A&E pilot found:

- some areas of excellent performance, although most trusts need to improve;
- the most resource-intensive investigation or treatment codes were recorded accurately, so we found payment errors were very small because the current national tariff for A&E activity has a relatively simple structure;
- most trusts record more investigation and treatment codes to collect a more complete picture of what happened to the patient. This should better reflect what happened to the patient, but we found the accuracy of these additional codes to be quite poor at most of the sites reviewed; and
- commissioners are satisfied with the quality of A&E activity data available to them to support payment. However there are wider data quality implications because A&E data is used for purposes other than payment. It forms a core part of the information used for planning services, commissioning and patient care.

40 Because the findings from the reviews show that payment is generally accurate, we do not intend to undertake a wider general review of A&E data. We have included A&E data in our National Benchmarker to support improvement in local data quality.

Reference cost pilot 2009/10

41 During 2009/10, the Commission worked in partnership with the Department of Health (DH) to review the reference cost collection process. The review looked at how the NHS and other stakeholders used reference cost data and the quality of data submitted. We reported our findings to the DH, who have published a summary of them and our reports (Ref. 2).
The review showed that stakeholders and NHS organisations use reference costs extensively. Over 90 per cent of those responding from the NHS said they were making use of the reference cost data locally. In particular, PCTs often use reference cost data for local pricing and contracting of non-PbR activity. Dissatisfaction with the timetable for publication of data and guidance and with the clarity of guidance produced was highlighted.

Our review of the quality of reference cost submissions at 16 pilot sites found that data quality varied across the different categories. Inpatient data is fairly reliable but other areas, such as outpatient and non-admitted care data, were more problematic.

We found trust submission processes to be overwhelmingly finance-driven, with basic checks to assure the quality of submitted data often lacking. Consistency issues with pilot sites that had implemented Patient Level Information Costing Systems (PLICS) were also identified. This will have more impact on reference cost data as more trusts move towards patient level costing.

Our work also highlighted the need for improvements at a national level including:
- better and more timely guidance;
- improvements to the collection process so organisations are incentivised to submit data that is ‘right first time’; and
- more timely final publication and additional analysis of national data.

The quality of reference cost submissions needs improving. The data is widely used and critically underpins:
- the national tariff (there is no plan to move away from this at least in the medium term);
- programme budgeting data used for commissioning; and
- local prices and contracting for non-PbR activity; an area where our review suggested the data was variable in quality.

It has been agreed with the DH that the assurance framework will review the accuracy of costing data. This will start with reviews of 2009/10 reference cost submissions at all acute trusts. National analysis of reference cost data will highlight many data quality issues. As with the wider assurance framework, we will undertake comparative analysis to focus our reviews. Analytical tools used for the pilot audits have also been released by the DH to help trusts improve their data before submission.

The response rate from PCTs and trusts to the survey was 62 per cent. The response rate from acute and specialist trusts was 71 per cent.
The underlying issues are generally similar in both outpatients and inpatients. The main factors that affect the accuracy of data used to support PbR are as follows.

- **Inadequate policies and procedures** – Good quality, regularly updated policy and procedures support staff in knowing how, and what, data should be recorded. Failing to keep local policies and procedures up to date means that clinical coders and staff responsible for outpatient data are not using the most up-to-date information from NHS Connecting for Health.

- **No, or limited, clinical involvement** – Trusts with clinicians who engage with staff to improve the accuracy of data have lower error rates than those who do not. Clinicians have a key role to play in helping to improve the accuracy of clinical coding and outpatient data.

- **Coders not following national standards** – This is specific to inpatient clinical coding where there are many instances of coders not following the national standards for procedure and diagnosis coding. Instead they are assigning the wrong codes or not coding in sufficient depth. It is important to ensure that coders are well trained so that national standards are always followed.

- **Lack of, or inadequate, internal audit** – Regular assurance that good levels of accuracy are being achieved should be a key part of a trust’s quality assurance programme. Regular internal clinical coding audit is a requirement of the NHS Connecting for Health Information Governance toolkit. Over 40 per cent of trusts had no, or inadequate, internal audit or review arrangements in outpatients.

- **Poor source documentation** – There is a range of problems. These include using discharge summaries with inadequate information, and case notes that are in bad condition, or poorly structured, making it difficult to find out what happened to the patient.

In addition to reporting general issues on poor source documentation our auditors identify episodes that are unsafe to audit. Our auditors follow the NHS Connecting for Health audit methodology. This requires auditors to remove episodes that are unsafe to audit from the audit sample. An episode is unsafe to audit when the auditor is unable to audit the coded clinical data against the source documentation, for example when there is no clinical information regarding the episode in the source documentation to support the auditors code assignment. Figure 10 shows that over 50 per cent of trusts had at least one episode that was unsafe to audit. The range of episodes that were unsafe to audit was between 0 and 14 per cent of the audit sample.
Figure 10: **Percentage of inpatient audit sample unsafe to audit in 2009/10**

![Graph showing percentage of inpatient audit sample unsafe to audit in 2009/10.](image)

**Source:** Audit Commission

50 In 2009/10 we excluded approximately £600,000 (1.7 per cent) of activity from the inpatient audit because it was not safe to audit. We believe that these are errors and there is no evidence to support payment of this activity by PCTs. In 2010/11 we will include the episodes recorded as unsafe to audit in our findings on error rates and incorrect payments.

51 Unsafe to audit episodes may result from poor-quality medical records. These represent a clinical as well as a financial risk.
Improving data quality

Driving local improvement in data quality

The assurance framework is improving data quality both locally and nationally. Locally, PCTs and trusts have used the assurance framework to drive improvement. NHS Sefton uses both the audit programme and the PbR National Benchmarker within its contract management and monitoring of providers (Case study 1).

Case study 1

NHS Sefton

NHS Sefton has extensively used the PbR data assurance framework and the PbR National Benchmarker to help with the contract management of its three main providers.

The PCT actively engages with both the inpatient clinical coding and outpatient data audits undertaken under the assurance framework. It works closely with its providers to ensure issues identified from the audits are addressed, including actively monitoring the implementation of recommendations through regular contract meetings. The PCT believes that the audits have been beneficial in both providing assurance over the quality of clinical coding and outpatient data, and in identifying areas for further improvement.

The benchmarking tools delivered to PCTs by the Audit Commission have also been used extensively in Sefton to support the development of their contracts and strategic plans. The PCT uses the PbR National Benchmarker to identify areas where provision levels for the Sefton population are out of line when compared to expected levels for the population. The PCT triangulates this information with other comparative tools, such as NHS Comparators, and applies the information to support strategic planning and contract development.

This work has impacted in operational terms through the removal of approximately 1,000 outpatient attendances from the baseline 2010/11 activity plan with one of their provider trusts.
This decision was made following analysis of the ‘multiple same day outpatient attendance ratio’ delivered via the PbR Benchmarker. The PCT will not be funding these attendances over the expected rates in this financial year. The financial value of this work is estimated at approximately £100,000.

Specific impacts have included the development of cross-organisational workstreams to understand and address areas of concern identified through analysis available on the PbR Benchmarker. Significant work has been done locally, isolating specific growth areas (for example, outpatient follow-up attendances and 34 specific procedures where the health economy appears to over-intervene) which were subsequently fed into contract planning rounds and enabled the strengthening of contract monitoring and reporting. The PCT is now working with its providers and GP practices to set challenging activity thresholds in areas where clinical practice appears to vary from the norm.

*Source: NHS Sefton and Audit Commission*

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When we first reviewed clinical coding at Central Manchester University Hospitals NHS Foundation Trust there were high error rates. The audit identified the need for considerable improvement and provided a platform for the Trust to review its whole approach to clinical coding (Case study 2).

**Case study 2**

**Central Manchester University Hospitals NHS Foundation Trust**

In 2008/09 and 2009/10 the Trust increased the number of clinical coding personnel and established dedicated specialist divisional coding teams. This allowed the Trust to improve the management of the day-to-day coding requirement as well as create capacity to review the quality of coding. The Trust also reviewed its processes for collecting and recording information.

The Trust has invested in an off-site case notes warehouse. This has improved the storage of the case notes and helped the effort to eliminate multiple-volume case notes which supports efficient and accurate coding.
An internal audit programme of coding audits is completed each year. Some audits are assisted by clinicians, improving clinician engagement in coding.

The Trust is part of the NHS North West Advancing Quality programme. This has increased the importance and awareness of data quality throughout the Trust. Clinicians have become more interested in the quality and collection of data.

The improvement in HRG, procedure and diagnosis error rates is shown in Figure 11.

Source: Central Manchester University Hospitals NHS Foundation Trust and Audit Commission

Figure 11: Improvement over three years at Central Manchester University Hospitals NHS Foundation Trust

Source: Central Manchester University Hospitals NHS Foundation Trust and Audit Commission
Last year we highlighted that both trusts and PCTs could do more to ensure that recommendations from our audit reports are implemented. Figure 12 shows that most trusts have made progress in implementing outstanding recommendations from previous years’ audits.

Figure 12: Progress in implementing previous year’s recommendations

We still believe more can be done because only 13.7 per cent of all trusts audited this year had completed all their recommendations from the last two years. Figure 12 shows that about 75 per cent of trusts still have one recommendation outstanding from our first review carried out in 2007/08. These are more wide-ranging recommendations, such as improving the quality of documentation or clinician involvement, which cannot be resolved quickly. To address such recommendations, actions should be supported by high-level commitment and addressed corporately rather than individually.
56  PCTs and trusts should also ensure local reports generated from our work provide a key part of local assurance processes, including review by Audit Committees.

57  Some PCTs (see Case study 1) actively engage with the assurance process and are using the audits and the National Benchmarker to challenge and drive local improvements. However, this is not consistently the case. Commissioners should actively use the outcomes from the assurance framework in contract management arrangements. The framework provides assurance and tools to identify where local provider data may be wrong.

58  We believe many commissioners could improve their own arrangements and will therefore review this as part of our 2010/11 programme. We will also develop and provide more analysis to support commissioners through our National Benchmarker.

59  The focus of our work is to improve the quality of data that underpins payment under PbR. But the data we review is of wider use and importance to the NHS. Clinical coding in particular underpins many quality and outcome measures and can affect hospital standardised mortality rates.

60  The results from our audits and the tools we have developed support other areas. For example, the results of the clinical coding audits are reported in all providers’ quality accounts. The National Benchmarker and our audit work also contribute towards the assurance of NHS North West’s Advancing Quality Programme. Our work also provides evidence to support Information Governance Toolkit assessments. PCTs and trusts should use our work in areas other than PbR to maximise value and impact.

61  Further local case studies on how organisations have addressed issues raised by our work are available at www.audit-commission.gov.uk/pbrgoodpractice

Supporting national improvement

62  Over the last three years, we have consistently identified a number of national issues that need addressing to support local improvements in data quality. These are broadly:

- coding accuracy at trusts undertaking specialist activity;
- guidance on co-morbidities;
- improving the quality of source documentation; and
- training and development of clinical coders.

63  In 2007/08 we found that specialist trusts’ coding accuracy was worse than other trusts. Specialist trusts have delivered improvements in their coding accuracy and are now more accurate at coding than non-specialist trusts (Table 3).
Table 3: Combined diagnosis and procedure coding error rates over three years at specialist and non-specialist trusts

<table>
<thead>
<tr>
<th></th>
<th>2007/08 coding error rate (%)</th>
<th>2008/09 coding error rate (%)</th>
<th>2009/10 coding error rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist trusts</td>
<td>16.9</td>
<td>11.9</td>
<td>9.5</td>
</tr>
<tr>
<td>Non-specialist trusts</td>
<td>16.0</td>
<td>12.6</td>
<td>11.6</td>
</tr>
</tbody>
</table>

Source: Audit Commission

64 We have continually highlighted that the lack of national guidance on the coding of co-morbidities has led to inconsistencies and errors. As we have shown earlier, introducing the more coding-sensitive HRG4 tariffs in 2009/10 made the need for this guidance even more important.

65 In March 2010, NHS Connecting for Health issued initial guidance on coding of co-morbidities having been through an extensive clinically led consultation process. We believe this will start to improve the consistency of coding co-morbidities in some areas. However, this and any further guidance will need to be reviewed carefully from both a clinical and financial perspective to assess their impact.

66 Our coding auditors continue to raise concerns over the quality of medical records that they review. This is a significant issue in the management of the quality of care. We have worked closely with several organisations, notably the Royal College of Physicians and the Care Quality Commission, to identify levers to improve medical record keeping. However, much still remains to be done. It needs coordinated efforts by trusts, clinicians, Royal Colleges, regulators and the Department of Health, if the problems we have identified over the last few years are to be addressed.

67 Our work has improved the profile of the clinical coding profession and driven up coding audit standards. But training and development programmes for clinical coders remain an issue. Auditors often identify issues where coders have not followed national standards. The national NHS Classifications Service is working with a number of clinical coding training centres and clinical coding teams to develop regional clinical coding academies. They will be accredited by the NHS Classifications Service and will enhance the future training needs of those working in the field on a daily basis.
Feedback we receive from the NHS suggests the assurance framework is addressing some of the ‘technical’ data quality issues that exist. However, important issues remain around the consistency and interpretation of national guidance and definitions. Examples include broad issues, such as the approach to distinguishing between day case and outpatient attendances, and focused issues such as what information should be on the mother’s notes and what should go on the child’s, when recording maternity activity.

This is an area that needs to be addressed if more improvements in the accuracy and consistency of local payments are to be realised. The Audit Commission, with the Department of Health, NHS Connecting for Health and the NHS Information Centre for Health and Social Care, have therefore set up a project to review and suggest ways to address common data definitional and guidance issues identified by our work.
Changes to the framework

70 The focus of our work programme is changing. We will begin to implement these changes in 2010/11. We will move towards a more risk-based approach on areas we have reviewed over the last three years, and focus resources on trusts that need to improve the most. The programme will now also include independent providers.

71 We will also work more directly with commissioners. We will develop a commissioner-based framework to identify the financial risks of provider data quality. We will also review their PbR contract management arrangements, including how PCTs involve and engage with GPs in their commissioning and contract arrangements. We will also continue to develop the Commission’s award-winning PbR National Benchmarker.

72 Our work will move into reviewing the quality of costing information. We will deliver an audit programme of 2009/10 reference cost submissions. We will also work jointly with the Department of Health, the NHS Information Centre for Health and Social Care, and NHS Connecting for Health on a project to review data definitions.

73 We will also use our programme to look at the wider implications of data quality and PbR. In particular we will review:
- the implications of data quality in new tariff and payment areas (mental health, community services and readmissions);
- payment for quality schemes by continuing our partnership work with NHS North West in providing data assurance for the Advancing Quality Programme; and
- the impact of clinical coding on Hospital Standardised Mortality Rates.

74 More details on the programme can be found at www.audit-commission.gov.uk/pbr201011programme
### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Finished Consultant Episode (FCE)</strong></td>
<td>An FCE or episode of care is a completed period of care of a patient using an NHS hospital bed, under one consultant within one healthcare provider. If a patient is transferred from one consultant to another, even if this is within the same provider unit, the episode ends and another one begins.</td>
</tr>
<tr>
<td><strong>Healthcare Resource Group (HRGs)</strong></td>
<td>Healthcare Resource Groups (HRGs) are the casemix grouping methodology used to support PbR. The groups are organised by the body system and given clinical coherence by clustering diagnosis and procedure code combinations into groups which consume a similar level of resources. In 2009/10 the version used for payment of admitted patient care changed from HRGv3.5 to HRG4.</td>
</tr>
<tr>
<td><strong>Hospital spell</strong></td>
<td>A hospital spell is the period from the date of admission to the date of discharge. A hospital spell may consist of more than one FCE.</td>
</tr>
<tr>
<td><strong>Inpatient</strong></td>
<td>The technical term for activity when a patient is admitted to a hospital is admitted patient care.</td>
</tr>
<tr>
<td><strong>Outpatient attendance</strong></td>
<td>The outpatient tariff is based on attendance by treatment function in a consultant-responsible clinic, for which the patient has an appointment. The clinic does not have to take place in trust premises and clinics held off-site are included in the scope of PbR.</td>
</tr>
<tr>
<td><strong>Outpatient first/ follow up appointment</strong></td>
<td>A first attendance is the first or only attendance in respect of one referral. Follow-up attendances are those that follow first attendances as part of a series in respect of the one referral. The episode (or series) ends when the patient is not given a further appointment by the consultant or the patient has not attended for six months with no forthcoming appointment.</td>
</tr>
<tr>
<td><strong>Payment by Results (PbR)</strong></td>
<td>Payment by Results (PbR) was first introduced in the NHS in 2003/04 to improve the fairness and transparency of hospital payments, and to stimulate provider activity and efficiency. Rather than relying on locally negotiated contracts based on local prices and with a tenuous link to outputs, providers are paid for the number and type of patients treated, in accordance with national rules and a national tariff.</td>
</tr>
<tr>
<td><strong>Reference cost</strong></td>
<td>Reference cost is a cost collection exercise that produces data which informs the national tariff under Payment by Results. Reference costs are the average unit cost of an HRG or similar unit of healthcare activity, as reported as part of the reference costs annual mandatory collection from all NHS organisations in England. These have been published in the National Schedule of Reference Costs by admission type and service, since 1998.</td>
</tr>
<tr>
<td><strong>Treatment function and treatment function codes</strong></td>
<td>Treatment function is a division of clinical work based on main specialty, but incorporating approved sub-specialties and treatment interests used by lead care professionals including consultants. Treatment function codes are the codes assigned to individual treatment functions.</td>
</tr>
</tbody>
</table>
## Impact of HRG4 on inaccurate coding compared with HRGv3.5

During the clinical coding audit, each Finished Consultant Episode (FCE) is checked by a clinical coding auditor. If the auditor finds an error in the clinical coder's original coding this is corrected. The auditor adds the correct coding by identifying accurately what procedures and diagnoses were carried out. We then recalculate the correct HRG and correct price.

In this example the coder correctly coded the diagnoses. However the auditor has corrected the first procedure and the third procedure carried out. This is because they found evidence in the case notes that showed these are the correct procedures.

When the correct coding is grouped under HRGv3.5, the HRG (and price) remain the same – Spinal Cord Surgery (£4,211) as the original coding carried out by the trust. We would have identified this as a coding error but not an HRG error.

However under HRG4 the difference in coding results in a change in the HRG. The trusts coding produces the HRG – Major Pain Procedure costing £1,108. Because HRG4 is more complex and requires more detail to produce an accurate HRG, the correct auditor coding has a significant impact. The correct coding produces a new HRG – Complex Neurosurgical Pain Procedures and a new price of £6,290.

<table>
<thead>
<tr>
<th>Trust coding and price</th>
<th>Auditor coding and price</th>
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<tbody>
<tr>
<td>Diagnosis 1 R15X - Faecal incontinence</td>
<td>R15X - Faecal incontinence</td>
</tr>
<tr>
<td>Diagnosis 2 Z720 - Tobacco use</td>
<td>Z720 - Tobacco use</td>
</tr>
<tr>
<td>Procedure 1 A488 - Other specified operations on spinal cord</td>
<td>A483 - Insertion of neurostimulator adjacent to spinal cord</td>
</tr>
<tr>
<td>Procedure 2 Y705 - Temporary operations</td>
<td>Y705 - Temporary operations</td>
</tr>
<tr>
<td>Procedure 3</td>
<td>Z112 - Sacral nerve</td>
</tr>
<tr>
<td><strong>HRG / Price (HRGv3.5)</strong></td>
<td><strong>HRG / Price (HRG4)</strong></td>
</tr>
<tr>
<td>AB04Z - Major Pain Procedures (£1,108)</td>
<td>AB01Z - Complex Neurosurgical Pain Procedures (£6,290)</td>
</tr>
</tbody>
</table>

Source: Audit Commission
References


