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A briefing on data quality in the NHS



Health

National briefing

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1 | Summary

- 1 The importance of data for NHS bodies and the patients and public they serve has never been higher. Good quality information underpins the delivery of effective patient care. Lord Darzi's *Next Stage Review* (Ref. 1) signalled a shift of emphasis within the NHS towards measuring and publishing quality outcome indicators. These will give more information to patients to enable them to better choose the service that best suits them. They will also increase accountability through the development of quality accounts and ultimately link to payment mechanisms through Commissioning for Quality and Innovation (CQUIN). The majority of hospital funding is already dependent on accurate activity and costing data under Payment by Results (PbR). World Class Commissioning and the development of practice based commissioning rely on good data being available. And regulators are placing increasing importance on information and data in their assessment and screening processes. Quality cannot be effective as the organising principle of the NHS without good data to underpin it.
- 2 Recent work has shown that the quality of data in the NHS is often not what it needs to be to meet the demands now being placed upon it. The Commission's PbR data quality assurance programme showed that the error rate in a key data set for NHS activity varied from 0.3 per cent to 52 per cent. The recent move towards a more refined tariff for PbR through the introduction of healthcare resource group (HRG) 4 has highlighted

further questions about the reliability of data, although it is based on more clinically appropriate definitions of the activity undertaken by the service. The *Health Informatics Review* (Ref. 2), published in July 2008, highlighted the need to improve the quality of data in order to deliver the goals set by the *Next Stage Review*. This was confirmed at a roundtable discussion by representatives of many of the relevant national bodies as well as some trust and primary care trust (PCT) managers hosted by the Commission in November 2008.
- 3 Data quality is not a new issue for the NHS. The Audit Commission undertook several reviews of data quality within the NHS between 2001 and 2004 (Ref. 3, Ref. 4, Ref. 5), covering activity, waiting list and reference cost information. Its work over that period, before responsibility for reviewing data quality was passed to the Healthcare Commission, was summarised in the 2004 report *Information and Data Quality in the NHS: Key Messages from Three Years of Independent Review* (Ref. 5). It concluded that NHS data quality had improved since earlier reviews in the mid 1990s, but there were a number of recurring issues that needed to be addressed if data quality was to be improved to the extent required for its future use:

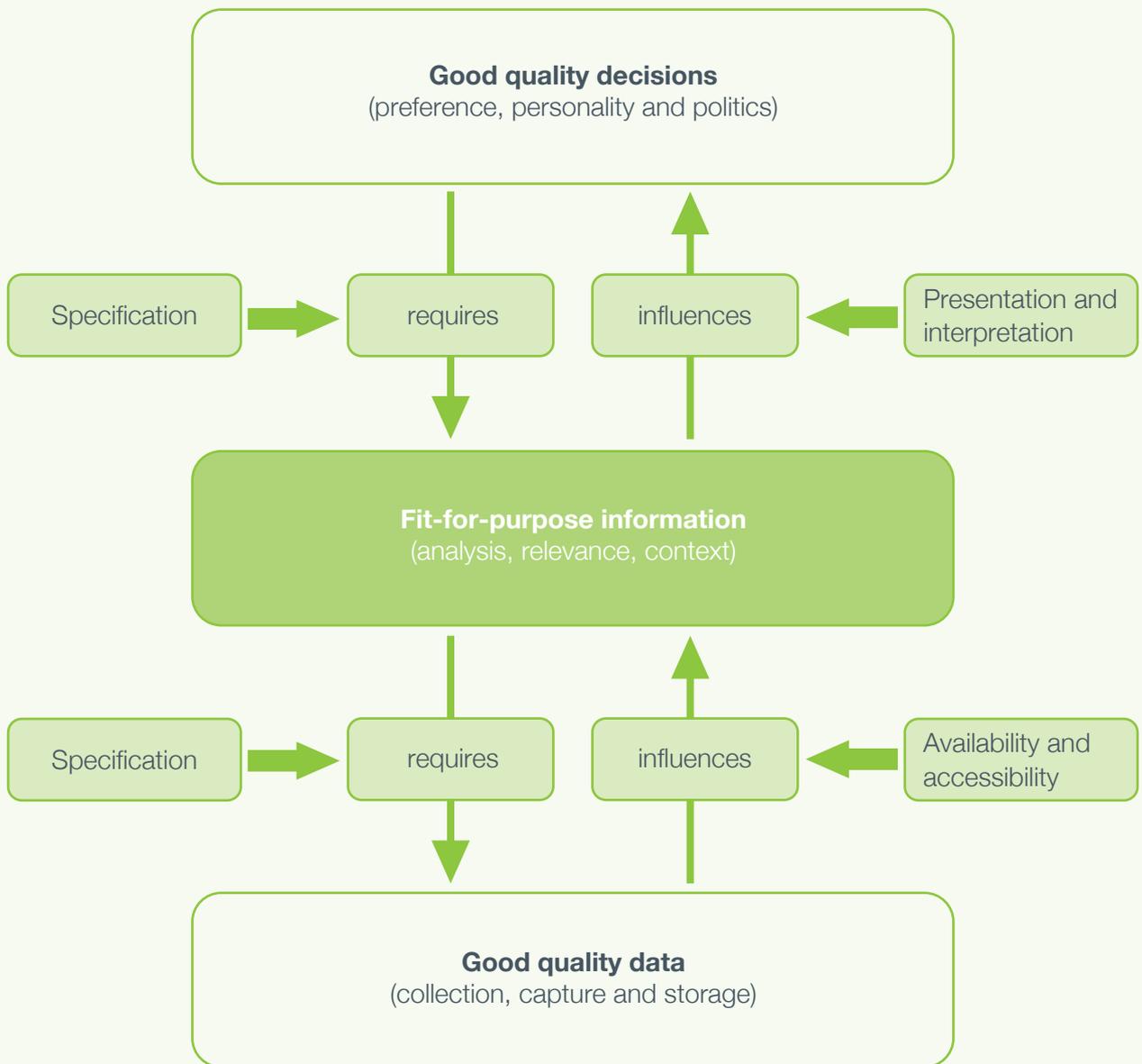
 - Waiting list and reference cost data at a national level were reliable for then current purposes but different interpretations of guidance and definitions caused inconsistencies locally.

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- Trusts and PCTs could improve data quality by making more and better use of patient based information, promoting and reporting data to board members, training and developing staff and keeping systems up to date.
 - Key organisations, such as the Department of Health (DH), the then NHS Information Authority and regulators did not have a clear and coordinated approach to reviewing and improving data quality.
 - A culture of good data quality was not embedded into organisations and required strong corporate leadership and engagement of frontline clinical staff.
- 4** We have recently reviewed how boards assure themselves of the quality of their data, assessed the findings of current data quality programmes and discussed the position with experts in a roundtable event. All of the issues we raised in 2004 are still largely relevant today. Progress over the last five years in addressing these areas is limited. Successful implementation of clinical outcome measures and the movement towards a more granular tariff currency for PbR could be undermined by poor data quality.
- 5** We propose five steps to improve data quality in the NHS:
- **Clear leadership** from the DH, senior managers, clinicians and regulators and also from the National Quality Board which should reinforce the need for reliable data when examining quality metrics and the quality and effectiveness of patient care.
 - **Greater clinical engagement**, helped by the development of quality metrics, the introduction of payment for quality schemes and the move to HRG 4, facilitated by improvements in the quality of medical records and ensuring data is increasingly derived directly from the operational care record.
 - **A stronger interest from boards** in every organisation which should assure themselves of the quality of data they are using and providing. Prime responsibility for the quality of data rests with the organisation producing it. Although there is some good practice, the approach of many organisations is weak. This briefing sets out five tests which all organisations and boards should use to assess themselves.
 - **External monitoring and review**, which are important components of any programme. Such reviews should build on existing programmes such as the PbR assurance framework which we intend will embrace payments under the CQUIN initiative. If quality accounts are to have the same status as financial accounts, and if the public are to have confidence in the data that they contain, the quality of that data should be subject to external, as well as internal, validation and assurance.
 - **More support** for organisations such as that planned under the NHS Information Centre's (NHS IC) new data quality programme.
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2 | Background

- 6 Data quality is a generic term which is often used with little explanation of what it means and what it covers. In the NHS, data quality is often referred to in the context of activity and performance information, such as data included in mandated Commissioning Data Sets (CDS) or in relation to reported data on targets such as access and waiting time information and hospital acquired infection rates. However, the quality of all data used by NHS bodies is important. Workforce, public health, commissioning, financial and, increasingly, quality outcome data should be validated and assured to ensure decisions made on all aspects of the organisation are supported by robust and accurate data.
- 7 Figure 1, taken from the Commission's discussion paper *In the Know* (Ref. 6), demonstrates how good data quality underpins the need for fit-for-purpose information to facilitate effective decision making.
- 8 The quality of financial data is generally higher than other data because underlying data is collected according to professional accounting rules and is subject to strong internal controls and a formal audit regime. The quality of non-financial data is often more variable. Producing data that is fit for purpose should be an integral part of an organisation's operational, performance management and governance arrangements.

Figure 1
Stages in producing and using information



Source: Audit Commission

Background

- 9** In 2007, the Audit Commission published a report *Improving Information to Support Decision Making: Standards for Better Data Quality* (Ref. 7) which outlined six dimensions of data quality. These are set out in Table 1.
- 10** The paper also introduced a set of standards to define the management arrangements which public bodies should adopt to drive improvement in the quality of their data (Appendix 1). They cover the:
- governance of data quality;
 - policies and procedures in place for data recording and reporting;
 - systems and processes in place to secure data quality;
 - knowledge, skills and capacity of staff to achieve data quality objectives; and
 - arrangements and controls in place for the use of data.
- 11** Following on from this work and our findings from the PbR data assurance framework, we have recently undertaken some further research and reviews to ascertain the level of evidence and assurance about the quality of underlying data specifically within the NHS. Our work involved:
- desk based research of current data quality programmes and initiatives;
 - reviews of board papers, trust documents and visits to 15 trusts as part of our wider board assurance review; and
 - discussions at a data quality roundtable event hosted by the Commission on 5 November 2008 (see Appendix 2).

Table 1
Descriptors of the six dimensions

Dimension	Description
Accuracy	Data should be sufficiently accurate for its intended purposes, representing clearly and in sufficient detail the interaction provided at the point of activity. Data should be captured only once, although it may have multiple uses. Accuracy is most likely to be secured if data is captured as close to the point of activity as possible. Reported information that is based on accurate data provides a fair picture of performance and should enable decision making at all levels. The need for accuracy must be balanced with the importance of the uses of the data, and the costs and efforts of collection. For example, it may be appropriate to accept some degree of inaccuracy where timeliness is important. Where compromises have to be made on accuracy, the resulting limitations of the data should be clear to its users.
Validity	Data should be recorded and used in compliance with relevant requirements, including correct application of any rules or definitions. This will ensure consistency between periods and with similar organisations. Where proxy data is used for an absence of actual data, organisations must consider how well this data is able to satisfy the intended purpose.
Reliability	Data should reflect stable and consistent data collection processes across collection points and over time, whether using manual or computer based systems or a combination. Managers and stakeholders should be confident that progress toward performance targets reflects real changes rather than variations in data collection approaches or methods.
Timeliness	Data should be captured as quickly as possible after the event or activity and must be available for the intended use within a reasonable time period. Data must be available quickly and frequently enough to support information needs and to influence the appropriate level of service or management decisions.
Relevance	Data captured should be relevant to the purposes for which it is used. This entails periodic review of requirements to reflect changing needs. It may be necessary to capture data at the point of activity which is relevant only for other purposes, rather than current intervention. Quality assurance and feedback processes are intended to ensure the quality of such data.
Completeness	Data requirements should be clearly specified based on the information needs of the organisation and data collection processes matched to those requirements. Monitoring missing, incomplete, or invalid records can provide an indication of data quality and can also point to problems in the recording of certain data items.

Source: Audit Commission

3 | Assurances of data quality

Responsibility for data quality

12 Ultimate responsibility for the quality of data rests with the organisation producing it. Such responsibility should not be confused with the role of the DH, other central data and information organisations, such as the NHS IC and NHS Connecting for Health (NHS CfH), regulators, such as the Healthcare Commission, the Audit Commission and Monitor, and others, such as commissioners and strategic health authorities (SHAs).

13 These organisations have a number of programmes and initiatives related to data quality. Appendix 3 summarises some of them. Previous work by the Audit Commission outlined the need for a more coordinated approach to developing and reviewing data quality. This was also emphasised within the *Health Informatics Review* (Ref. 2). The NHS IC is currently developing a programme to coordinate and provide some direction to the data quality work undertaken by these organisations. This programme is still at an early stage but is planned to:

- raise awareness of the impact of data quality, including direct support and education to frontline staff;
- assist data suppliers to improve data quality by developing and providing tools, guidance and comparative benchmarking of data quality; and

- establish a data quality grading scheme, through developing a data accreditation service and data quality indicators.

14 However, many of the current programmes do not cover a number of the dimensions of data quality outlined earlier. The dimensions of reliability, relevance and, in particular, accuracy are virtually wholly reliant on internal assurance processes and self-review. There are very limited external or independent reviews of the accuracy of data, with the exception of the PbR data assurance framework audits which specifically test the accuracy of some key data relating to clinical coding and outpatient work. This is a significant gap.

Assessments of assurance arrangements and accuracy of data

15 The Information Governance Toolkit (IGT), which is managed by NHS CfH, asks trusts to self-assess their attainment level (levels 0-3, with 0 meaning no or limited action and level 3 demonstrating full compliance) over 63 key controls which are grouped into six key headings:

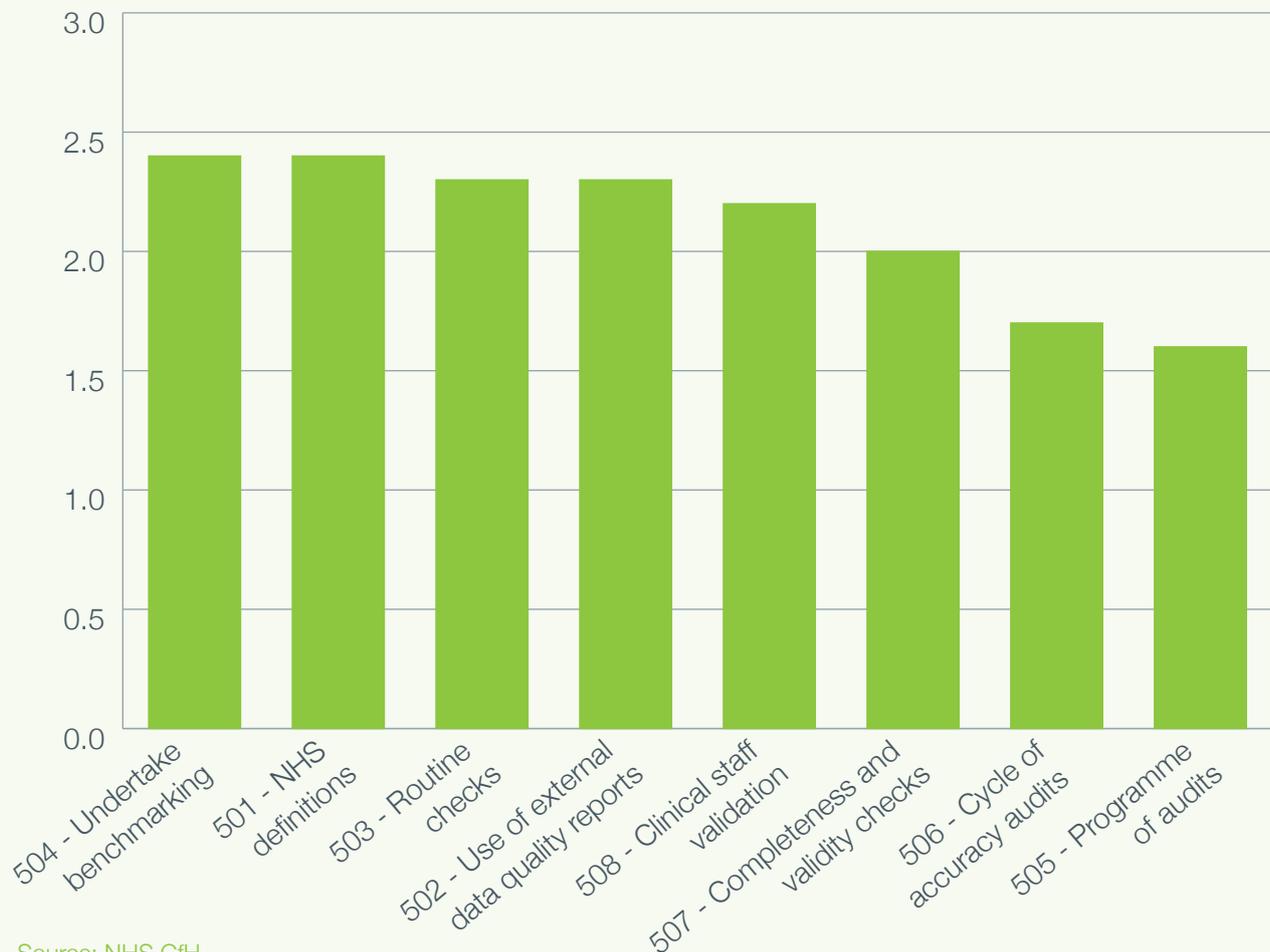
- information governance management;
- confidentiality and data protection assurance;
- information security assurance;
- clinical information assurance;
- secondary uses assurance; and
- corporate information assurance.

16 Under the heading of secondary uses assurances there are eight controls which specifically relate to data quality. Analysis of the 2007/08 IGT attainment level showed that most trusts rated themselves at attainment level 2 or above on these assurances (Figure 2).

17 However, attainment levels for the assurances relating to audits and reviews of data accuracy (505 and 506), were lower averaging at just over 1.5, in other words, not meeting an acceptable level of minimum compliance. This suggests that many trusts recognise the need to improve auditing and review processes of their data.

Figure 2

Average trust IGT attainment levels for selected secondary uses assurances relating to data quality



Source: NHS CfI

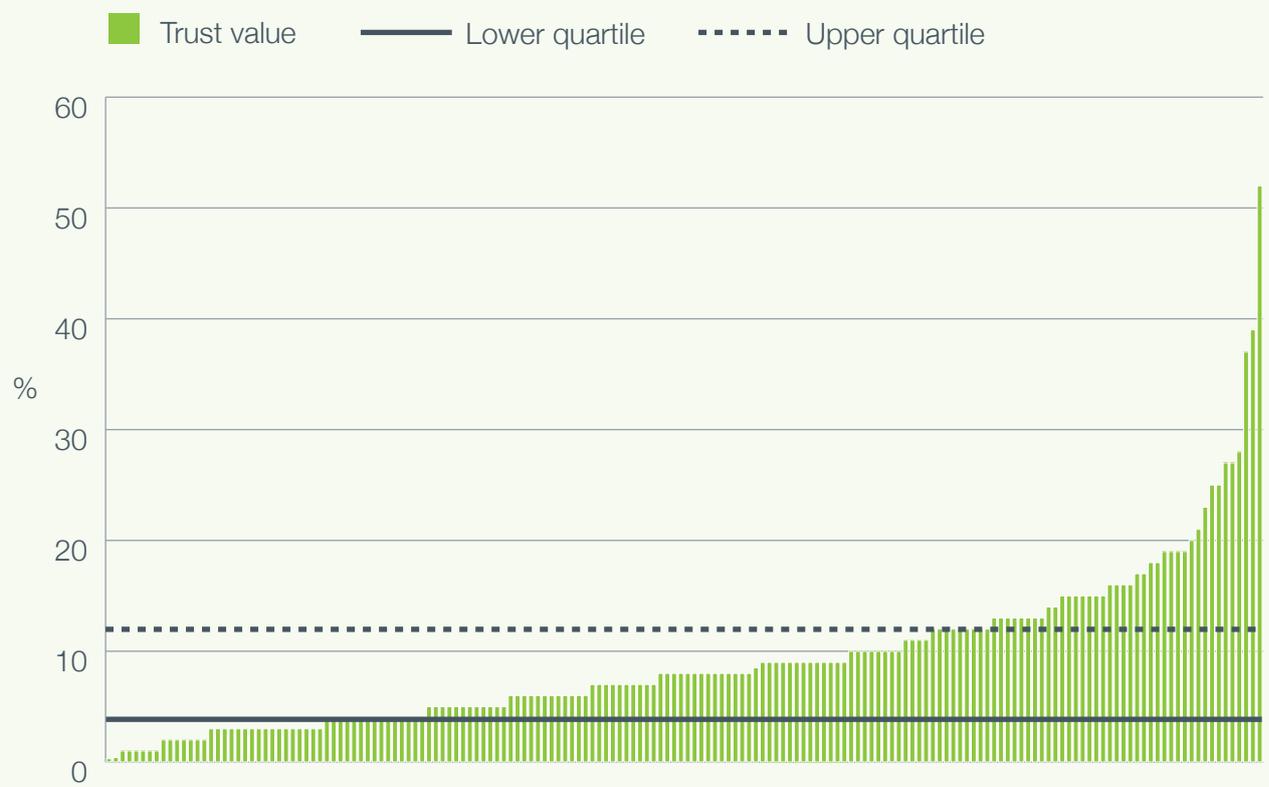
Assurances of data quality

- 18** As part of the PbR data assurance framework, the Audit Commission manages an audit programme which reviews the accuracy of clinical coding at all acute NHS trusts in England. The published results for 2007/08 (Ref. 8) identified that errors in clinical coding affected the proper identification of the HRG to which patients were assigned; a key data source for payment, activity planning and commissioning. An average HRG error rate of 9.4 per cent was identified, with a range across trusts of 0.3 per cent to 52 per cent (Figure 3).
- 19** Several factors affected the accuracy of the data but the main ones were:
- the quality of source documentation and records;
 - training and development of key staff, in this case clinical coders;
 - clinician involvement and validation; and
 - a lack of clarity or guidance on specific areas and data definitions.
- 20** In summary, the self-assessed IGT suggests that the majority of trusts consider their assurance arrangements to be mostly adequate except in relation to data accuracy audits and reviews. The findings from the PbR assurance work show that performance on accuracy varies greatly from excellent to wholly unacceptable. They demonstrate that data quality needs to be improved and that greater emphasis needs to be placed on accuracy and validation checks through internal assurance arrangements and audit.

Reviews of trust assurance processes

- 21** As part of a wider study into board assurance, we reviewed assurance processes for data quality at 15 NHS trusts. The study involved desk based reviews of board reports and key documents and interviews at different levels across the organisations. This was supplemented by more detailed work at three of the trusts visited.
- 22** Our overall conclusions from these reviews can be grouped into three key areas:
- profile, prominence and understanding of data quality at board level;
 - integration and embedding data quality into organisational practice; and
 - assurance and review programmes.

Figure 3
Percentage of HRGs derived incorrectly 2007/08



Source: Audit Commission

Assurances of data quality

Profile, prominence and understanding of data quality at board level

- 23** Our reviews found that there was often little evidence of board level discussion or challenge of data quality. Boards usually assume that data quality is sufficient without challenging or having evidence to prove that this is the case. Where trusts had identified the quality of data as a risk, its prominence at board level and subsequent discussions increased. In response to known problems with data quality, Leeds Partnerships NHS Foundation Trust now undertakes regular information gap and data quality assessments across all key service data and information and reports these assessments and action plan monitoring to the board (Case study 1).
- 24** Data quality was often not recognised by boards as core to their overall business, even though it clearly underpins

financial and clinical activity across the organisation. We found few mentions to data quality within corporate objectives. Financial information will often receive significant scrutiny and review, and boards can obtain adequate assurance through internal and external audit but this is not the case for other data, despite their increasing importance. Also, the preparation of financial information is based on generally accepted standards and practice that have developed over a long time and the finance profession invests significant sums annually in maintaining the framework of standards.

- 25** Although many of the trusts visited had allocated responsibility for data quality to a board level director (most commonly the director of finance), in practice responsibility for assuring data quality tends to be delegated to information managers and other specialists. It is rare for a board level director to have direct knowledge and experience of

Case study 1

Managing improvements in data quality at Leeds Partnerships NHS Foundation Trust

At Leeds Partnership NHS Foundation Trust, key service data is reviewed and assessed for each of the four clinical directorates of adult, specialist, older people and learning disabilities services. Each data item is assessed as good, adequate or unacceptable and then priority rated to focus improvements. Individual action plans are developed for each service.

Assessments, priority ratings and progress on action plans are reported to an information management and technology committee which subsequently reports the overall data quality position to both the board and the risk and assurance committee. This ensures that all directors are aware of the current quality of the data for each of its key services.

data quality issues as there is currently no clear career development path for information managers and specialists to progress to board level. As a consequence, many trusts may not have the knowledge and expertise at a senior level to challenge effectively on data quality. We generally found little evidence of data quality being effectively challenged and reviewed within organisations, either at board level or below. Where we did, this was the exception rather than the rule.

- 26** From these findings, it is clear that the profile and importance of data quality needs to be raised with boards being made more aware of the issue so that assurance processes can be improved. Responsibilities for ensuring the quality of reported information and the data that underpin it should be more clearly outlined. Governance and accountability arrangements need to be clarified so that any issues identified through monitoring and assurance processes are considered by the board if needed.

Integration and embedding data quality into organisational practice

- 27** In many of the trusts visited, responsibility for managing data quality largely rested with performance and information staff. Some trusts had specifically set up data quality teams and have data quality managers. There was however limited evidence of integrating and embedding data quality into wider organisational practice. Given its importance, data quality needs to be an organisational responsibility and considered to be part of everyone's role, rather than simply that of information specialists. Providing good quality data on, for example, clinical activity and patient safety is an issue for all staff, just as providing good quality data is a responsibility of all budgetholders.

Assurances of data quality

28 Trusts should use performance management systems to allocate responsibilities and promote the importance of data quality. Staff should have objectives that are linked to wider organisational objectives, policies and guidance on data quality. Cambridge University Hospitals NHS Foundation Trust has implemented a process whereby all job descriptions contain a general competency on data quality and explicitly relate to established policies and procedures (Case study 2). This ensures that data quality is a core element in staff appraisals and embedded into organisational performance management processes.

29 Key to embedding data quality into organisational practice is ensuring that frontline staff, clinicians and data entry staff are engaged and understand the implications of poor data. Some trusts hold regular reviews and meetings with

clinicians and data entry staff, such as ward and clinic clerks, to highlight and discuss data collection and entry issues, particularly focusing on the implications of incorrect recording.

30 Evidence from our clinical coding audit programme indicated that involving and engaging clinicians results in more accurate data. Clinician support is key to integrating and embedding data quality within organisational practice. We found that implementing clinician validation and developing information and data that meets the requirements and needs of clinicians can act as a driver to improve engagement within trusts. This should be a key by-product of the drive to improve quality in the NHS, started by Lord Darzi's *Next Stage Review* (Ref. 1).

Case study 2

Integrating data quality at Cambridge University Hospitals NHS Foundation Trust

Cambridge University Hospitals NHS Foundation Trust has implemented a process whereby all job descriptions contain general responsibilities in respect of information governance which include basic competence in data quality and refer explicitly to established policies. Those roles that have more specific data quality responsibilities contain further detail.

The corporate induction programme, mandatory for all staff, includes a session on data quality. Staff appraisals reinforce this through the knowledge and skills framework which includes data quality elements for some staff. In addition, there is regular staff training and easy access for staff through the trust intranet to a wide variety of supporting documentation.

The Data Quality Team actively seek out new ward, outpatient and waiting list clerks for induction training as well as running regular training sessions with each group. For managers, the Trust's Addenbrooke's Business Practice: Your MBA in a Day training programme includes an element on data quality.

Assurance and review programmes

31 We encountered varying degrees of data quality assurance and review processes at trusts. Some trusts had implemented a number of good practice arrangements including:

- establishing data quality teams and executives (although with differing levels of resources);
- producing and reviewing exception reports of completeness and validity of data around patient administration systems;
- developing policies, standards and guidance; and
- using benchmarking and other tools to identify potential data quality issues.

32 Where such practices had been implemented, accuracy of data measured by the coding audits which we performed was generally better than at others who did not have these arrangements.

33 However, we found limited evidence of formally planned audit or review programmes to verify the accuracy of data reported. This is consistent with the analysis of assessments against IGT requirements (Figure 2). Some trusts used internal auditors and external consultants to undertake specific reviews but these tended to be ad hoc and concentrated on underpinning arrangements rather than testing the accuracy of specific data sets. Cambridge University Hospitals NHS Foundation Trust was notable in undertaking regular ‘deep dive’ audits to investigate accuracy issues raised by monitoring (Case study 3).

Case study 3

Data quality reviews at Cambridge University Hospitals NHS Trust

The Data Quality Team at Cambridge University Hospitals NHS Trust not only carries out routine data quality checks but also performs regular ‘deep dives’ into the data or undertakes project based investigations to identify or explore further systemic issues that may have arisen through more routine checks. Once completed, a report is produced containing actions and recommendations which are followed up.

In addition, all new service proposals must include a section outlining the data requirements. The Data Quality Team have the opportunity to vet these proposals and ask for changes to be made, as well as being involved in the planning of the new service at an early stage.

Assurances of data quality

- 34** Moreover, any assurance and review processes tend to focus on core patient administration systems. There is very limited review of other information systems and feeder systems, such as A&E, theatre and clinic systems. Reviews of general administration systems, such as HR systems, which will generate important workforce information are very rare.
- 35** Data produced from these other feeder and administrative systems could provide important information for the production of quality measures and more patient based information, such as patient level costing. Monitoring and assurance processes need to incorporate review programmes for all such systems.

4 | Conclusions and way forward

36 Since the Commission's last review of NHS data quality in 2004, the emphasis on data within the NHS has increased and is set to increase further but efforts to improve its quality have not kept pace. There have been some improvements. For example, the development of service line reporting and patient level costing has encouraged clinician engagement and PbR has incentivised both providers and commissioners to improve data quality.

37 However, a number of recurring themes previously identified are still relevant today. There still needs to be a more coordinated and joined-up approach to reviewing and supporting the development of data quality by key stakeholders and regulators. This has been recognised and there are plans to address this through the NHS IC's data quality programme, but this is still in the early stages of development. Data quality programmes do not regularly encompass all of the elements of data quality. Currently there are very few reviews of the accuracy of data.

38 Ultimately, responsibility for data quality rests directly with the organisation itself and developing effective local processes to provide assurance over its own data quality. However, there is still a lack of prominence and importance attached to data quality at board level, it is not integrated and embedded into organisational practice, clinician engagement and involvement is still not widespread enough and trusts often do not have formal systematic programmes to review the accuracy of their data.

Improving data quality in the NHS

39 In the light of our work and the discussions we have had with other stakeholders, we consider that steps need to be taken in the following five areas in order to address the issues raised:

- leadership;
- clinical engagement;
- board assurance;
- external monitoring and review; and
- support.

Leadership

40 The NHS often criticises the quality of its own data. Clinicians have often been willing to criticise the quality of health episode statistics (HES). Management have often been critical of the secondary uses service (SUS) data and also about the reliability of reference cost information, particularly when it forms the basis of tariff payments. But the production of the data is entirely within the control of these groups. This division will only be resolved if there is a clear and sustained commitment from NHS leaders – the DH, senior managers and clinicians and regulators – that improvement needs to be made and the necessary actions are put in place.

41 The introduction of HRG 4 as the basis for tariff payments, the development of quality metrics and quality accounts, and the move towards payment for quality schemes present an ideal opportunity

Conclusions and way forward

to focus on key data sets that are central to managers and clinicians and fundamental to the operation of the NHS. Increased publication of quality metrics geared to the needs of patients and the public should act as a further incentive so that there is complete confidence in the information provided.

- 42** The National Quality Board might itself take a lead when examining quality metrics and the quality of the service to reinforce the need for reliable data on which to base its work. Many of the key stakeholders will be represented on it. If, as proposed, published quality accounts and the quality metrics associated with them are to stand alongside financial accounts as key components of governance and accountability for NHS bodies, they should be subject to the same rigour in their preparation in order that the public and professionals can have confidence in them.

Clinical engagement

- 43** Clinical engagement and ownership is fundamental to high quality data. A consistent message from the Commission's PbR data assurance coding audits was that no or limited clinician involvement with coding, or in the validation and verification of coding, results in higher error rates. The most common issue which affected the accuracy of clinical coding was the quality of source documentation from which the coding data was abstracted.
- This included clinical coders working from discharge summaries rather than full case notes, illegible or poorly structured case notes, lack of access to additional information systems by coders and insufficient information included on electronic patient records. Some of these problems are primarily for management to resolve. But some are for clinicians. The developments mentioned above provide a major opportunity to get clinicians more fully engaged.
- 44** Further steps can also be taken. The Royal College of Physicians (RCP) publication on the relevance of HES activity data to clinicians (Ref. 9) could be updated and expanded to encompass a specialty-by-specialty clinically based guide to coding. The Audit Commission is already working with the Health Informatics Unit at the RCP on a research project which aims to test whether the adoption of the RCP's clinical records standards (Ref. 10, Ref. 11) can make a measurable difference to the quality of clinical coding. The results of this research will be published in the summer of 2009. Wider implementation, supported by an audit programme, of the RCP clinical record standards could provide a major step forward in addressing the quality of records.

45 In the long term, the quality and structure of medical records should be improved as the NHS moves towards electronic based systems. Closer integration of data processes should ensure that data is increasingly derived from the operational clinical records ensuring greater clinician engagement and understanding. The inadequacies of many current patient administration systems contribute to poor data quality and do not facilitate clinician engagement.

46 The better use of existing data, such as NHS CfH's clinical dashboards and NHS IC's clinical team summary reports, and service line reporting provide incentives to improve engagement with individual clinicians and clinical teams. This should be supported by integrating the use and validation of data into consultant appraisal and clinical audit processes.

Board assurance

47 Boards should take a greater lead in improving and assuring themselves about the quality of the data they receive and that their organisations publish. There are significant differences in the approaches taken by individual organisations. Cambridge University Hospitals NHS Foundation Trust has a thorough approach to data quality that is led from the top. They had an HRG error rate in the PbR data assurance coding audits of 0.3 per cent – an outstanding result.

48 Our reviews found that many trusts had elements of assurance processes for data quality but very few were

comprehensive. We have identified a number of areas which, if adopted, could provide a useful platform for developing assurances over data quality at board and wider organisation level. The Commission's standards for better data quality outlined in Appendix 1 sets out a framework that boards and senior management can use to assure and improve data quality.

49 The findings from our current work indicate that there are five tests which all boards should use to assess themselves:

- developing policies and guidance on data quality and assurance processes to promote consistency and improve awareness;
- defining and allocating responsibilities for data quality at board, committee and managerial level so that governance and accountability arrangements are clear;
- reviewing the knowledge and expertise of the board membership to ensure that boards have the necessary skills to understand and challenge more effectively on data quality issues;
- where appropriate, incorporating into board reports disclosure of assurance processes for reported data and highlight any data quality implications, as is commonly done for legal and financial considerations; and
- promoting the wider use, publication and benchmarking of data at board level to further incentivise accuracy.

Conclusions and way forward

- 50** Wider accountability and responsibilities for data quality also need to be embedded across organisations by:
- integrating data quality into performance management processes of key staff, including frontline staff, clinicians, and any data entry staff;
 - building data quality into training and induction programmes so there is a wider understanding of its importance; and
 - encouraging the wider circulation and reporting of data, including benchmarking, to create a greater understanding of its use and impact.

- 51** NHS organisations need to develop more systematic and formalised review programmes for their data which include:
- developing monitoring programmes for all key information systems;
 - defining standards for the collection and recording of key data which are regularly reviewed and assessed;
 - ensuring reviews encompass all of the six dimensions of data quality;
 - assessing and addressing common areas which cause issues with the accuracy of data, such as the quality of clinical records and the training and development of data entry staff;

- implementing more detailed and systematic checks of accuracy back to records, informed by issues identified from monitoring reports and random reviews of data to provide wider assurance;
- commissioning of independent reviews by internal auditors; and
- reviewing the impact and addressing findings from local and national external reviews.

External monitoring and review

- 52** External monitoring and review are important components of any programme to improve data quality. They provide independent evidence for both the public and boards and stimulate improvement. This has been demonstrated through the Commission's own work on waiting times in the NHS and in other services such as the police. Such reviews should, if possible, be made part of existing programmes in order to operate most efficiently.

53 The PbR data assurance programme covers some of the key data. It is being extended as PbR itself is extended to cover outpatient and accident and emergency data. The programme is also relevant to the payment for quality schemes that are being developed. We are piloting an assurance programme with NHS North West as part of their innovative Advancing Quality Programme which will make payments based on comparative performance between organisations against the reliable delivery of specific quality metrics in five clinical areas:

- community-acquired pneumonia;
- acute myocardial infarction;
- hip and knee replacement;
- coronary artery bypass graft; and
- heart failure.

54 Based on this work, we intend that the PbR assurance framework will embrace payments under the CQUIN initiative that is being rolled out nationally as part of the implementation of the *Next Stage Review* (Ref. 1). We are also discussing with the DH how the programme could be extended to reference costs which are used to determine the tariff in order to improve the quality of submissions and so help to overcome some of the difficulties encountered with the move to HRG 4.

55 The programme may also be relevant to quality metrics and quality accounts where the data primarily rely on accurate clinical coding and SUS data. The *Next Stage Review* (Ref. 1) noted that ‘providers working for or on behalf of the NHS publish Quality Accounts from April 2010 – just as they publish financial accounts’. Financial accounts are subject to detailed board assurance processes internally as well as rigorous external audit to ensure that the figures are not materially misstated and present a true and fair picture of the organisation’s financial performance and position.

Conclusions and way forward

56 If quality accounts are to have the same status as financial accounts and if patients and the public are to have confidence in the data that they contain, the quality of the data should be subject to internal and external review. We do not consider that this should be on the same scale as that for financial accounts. But we do consider that boards should put in place the kind of assurance programme outlined above and declare in their quality accounts that they have done so. Its effectiveness should be subject to an external audit that includes an assessment of the accuracy of the data. It could include, for example, a requirement to set out error rates found in the clinical coding reviews and the findings from the audit of other data.

57 There are three other external sources that could help organisations improve their data quality.

- Firstly, the NHS IC's publications following reviews of data submitted by organisations, such as the SUS data quality dashboard, CDS data quality reports and NHS Comparators.
- Secondly, commissioners can play a much stronger role in scrutinising the information provided to them by trusts. Many PCTs have strengthened their scrutiny of the data submitted under PbR where there are direct financial consequences. This could be helpfully extended to other areas, particularly as the emphasis shifts to quality.

- Thirdly, regulators also have an important role in improving data quality in the NHS. Standards used for regulation and registration should include a requirement to ensure the quality of data and to submit accurate information. The current Standards for Better Health omit this, concentrating on the appropriate handling of medical records instead. Use and submission of poor quality data should have direct regulatory consequences.

Support

58 The NHS IC's new data quality programme can play a key role in heightening awareness, improving the coordination of initiatives and standards, and, importantly, providing support and training to organisations.

59 The programme also includes proposals to provide a data quality grading scheme which may facilitate the development of more robust organisational based assurance processes. The aims and objectives of the programme are laudable and potentially will provide much needed support and direction for the NHS. However, if it is to succeed where other initiatives have failed, it needs to be recognised as a sustainable and rolling programme, have high level support and engagement from stakeholders and the NHS and be appropriately resourced to deliver its aims and have the desired impact of improving data quality in the NHS.

Appendix 1

Standards for better data quality

These standards are intended for use by public bodies to support improvement in data quality. The standards define a framework of management arrangements that bodies can put in place, on a voluntary basis, to secure the quality of the data they use to manage and report on their activities. The standards distil the principles and practices identified in existing guidance, advice and good practice.

The standards are intended to be used flexibly and proportionately to promote better data quality, recognising local risks and circumstances, rather than as a rigid set of requirements or as a checklist. This means the standards intentionally provide high-level descriptions, recognising that the detail of their implementation is a matter for local judgement. Alternative approaches to achieving these aims may also be appropriate, where they achieve the outcome of securing reliable data to support informed decision making.

1 Governance and leadership

The body has put in place a corporate framework for management and accountability of data quality, with a commitment to secure a culture of data quality throughout the organisation.

Key components:

1.1 There is clear corporate leadership of data quality by those charged with governance.

- 1.2** A senior individual at top management level (for example a member of the senior management team) has overall strategic responsibility for data quality, and this responsibility is not delegated.
- 1.3** The corporate objectives for data quality are clearly defined (although this may not necessitate a discrete document for data quality), and have been agreed at top management level.
- 1.4** The data quality objectives are linked to business objectives, cover all the body's activities, and have an associated delivery plan.
- 1.5** The commitment to data quality is communicated clearly, reinforcing the message that all staff have a responsibility for data quality.
- 1.6** Accountability for data quality is clearly defined and is considered where relevant as part of the performance appraisal system.
- 1.7** There is a framework in place to monitor and review data quality, with robust scrutiny by those charged with governance. The programme is proportionate to risk.
- 1.8** Data quality is embedded in risk management arrangements, with regular assessment of the risks associated with unreliable or inaccurate data.
- 1.9** Where applicable, the body has taken action to address the results of previous internal and external reviews of data quality.

Appendix 1

1.10 Where there is joint working, there is an agreement covering data quality with partners (for example, in the form of a data sharing protocol, statement, or service level agreement).

2 Policies

The body has put in place appropriate policies or procedures to secure the quality of the data it records and uses for reporting.

Key components:

- 2.1** There is comprehensive guidance for staff on data quality, translating the corporate commitment into practice. This may take the form of a policy, set of policies, or operational procedures, covering data collection, recording, analysis and reporting. The guidance has been implemented in all business areas.
- 2.2** Policies and procedures meet the requirements of any relevant national standards, rules, definitions or guidance, for example the Data Protection Act, as well as defining local practices and monitoring arrangements.
- 2.3** Policies and procedures are reviewed periodically and updated when needed. The body is proactive in informing staff of any policy or procedure updates on a timely basis.
- 2.4** All relevant staff have access to policies, guidance and support on data quality, and on the collection, recording, analysis, and reporting of data. Where possible this is supported by information systems.

2.5 Policies, procedures and guidelines are applied consistently. Mechanisms are in place to check compliance in practice, and the results are reported to top management. Corrective action is taken where necessary.

3 Systems and processes

The body has put in place systems and processes which secure the quality of data as part of the normal business activity of the body.

Key components:

- 3.1** There are systems and processes in place for the collection, recording, analysis and reporting of data which are focused on securing data which are accurate, valid, reliable, timely, relevant and complete.
- 3.2** Systems and processes work according to the principle of right first time, rather than employing extensive data correction, cleansing or manipulation processes to produce the information required.
- 3.3** Arrangements for collecting, recording, compiling and reporting data are integrated into the business planning and management processes of the body, supporting the day-to-day work of staff.
- 3.4** Information systems have built-in controls to minimise the scope for human error or manipulation and prevent erroneous data entry, missing data, or unauthorised data changes. Controls are reviewed at least annually to ensure they are working effectively.

3.5 Corporate security and recovery arrangements are in place. The body regularly tests its business critical systems to ensure that processes are secure, and results are reported to top management.

4 People and skills

The body has put in place arrangements to ensure that staff have the knowledge, competencies and capacity for their roles in relation to data quality.

Key components:

- 4.1** Roles and responsibilities in relation to data quality are clearly defined and documented, and incorporated where appropriate into job descriptions.
- 4.2** Data quality standards are set, and staff are assessed against these.
- 4.3** The body has put in place and trained the necessary staff, ensuring they have the capacity and skills for the effective collection, recording, analysis and reporting of data.
- 4.4** There is a programme of training for data quality, tailored to needs. This includes regular updates for staff to ensure that changes in data quality procedures are disseminated and acted on.
- 4.5** There are corporate arrangements in place to ensure that training provision is periodically evaluated and adapted to respond to changing needs.

5 Data use and reporting

The body has put in place arrangements that are focused on ensuring that data supporting reported information are actively used in the decision making process, and are subject to a system of internal control and validation.

Key components:

- 5.1** Internal and external reporting requirements have been critically assessed. Data provision is reviewed regularly to ensure it is aligned to these needs.
- 5.2** Data used for reporting to those charged with governance are also used for day-to-day management of the body's business. As a minimum, reported data, and the way they are used, are fed back to those who create them to reinforce understanding of their wider role and importance.
- 5.3** Data are used appropriately to support the levels of reporting and decision making needed (for example, forecasting achievement, monitoring service delivery and outcomes, and identifying corrective actions). There is evidence that management action is taken to address service delivery issues identified by reporting.
- 5.4** Data which are used for external reporting are subject to rigorous verification, and to senior management approval.
- 5.5** All data returns are prepared and submitted on a timely basis, and are supported by a clear and complete audit trail.

Appendix 2

Data quality in the NHS roundtable event November 2008

The Audit Commission's work under the PbR assurance framework and further research undertaken as part of its review of NHS and foundation trust board assurance processes had raised a number of issues relating to data quality which, if not addressed, could hinder the development of a quality focused NHS. As a consequence, the Commission hosted a roundtable discussion on improving data quality in the NHS on 5 November 2008 in central London with senior representatives from the NHS, information and regulatory stakeholders to discuss the issues in more detail and suggest how they could be addressed.

Attendees included Bob Alexander, the Director of NHS Finance from the Department of Health, Stephen Hay, Chief Operating Officer of Monitor, Brian Derry, Executive Director of Information Services for the Information Centre for Health and Social Care, Mike Foster, Deputy Chief Executive of University College London Hospitals NHS Foundation Trust and Professor John Williams, Director of Health Informatics at the Royal College of Physicians. The meeting was chaired by the Commission's Managing Director for Health, Andy McKeon.

The Audit Commission's Head of PbR Assurance, Peter Saunders, outlined to the group the Commission's findings from its work on the PbR assurance framework and the wider review of NHS and foundation trust board assurance processes. It concluded that the importance of data quality had never been higher but raised questions as to whether the current state of data quality within the NHS was fit for its future purpose, particularly for the development of quality

outcome measures and the production of quality accounts. The review of board assurance processes suggested that data quality had little or no prominence at board level and there was a lack of understanding of the need for assurance programmes and processes for data quality. But was this a fair reflection of the current position?

The majority felt it was. There was a need to understand and educate the service about data quality and what data it covered. Often data is now referred to in the context of PbR but it is much more than that. It covers key performance information, such as waiting times, but also increasingly it has more significance for quality of service measurement and monitoring. From a clinical perspective, there was definitely a problem. The purpose of current health data is not clear. It seems to be more about targets than clinical practice or care. Poor clinical engagement is a consequence of low usage by clinical teams.

There is some evidence to suggest that some organisations do manage data quality effectively and recognise its importance, using internal audit to review processes. It was recognised that there were areas of the NHS that were managing this effectively but generally there was a need for wider improvements.

Having recognised that there is a problem, the discussion then went on to focus on what could be done to improve the position. There was agreement that involving and engaging clinicians was a key building block in improving data quality. The development of quality measures and accounts and the move to HRG 4 provided an opportunity to bring finance, business managers and clinicians together to address systemic problems. But it was felt that any improvements had to be two way – top down leadership from the DH and boards and harnessing the enthusiasm to improve and get this right from the bottom up. There is a need to take a more strategic approach on this whole area and the DH should feel confident in being more directive in this area.

While quality accounts and HRG 4 presented opportunities to develop wider engagement on data quality, they also presented risks if they are not addressed. It was widely agreed that organisations needed to improve their own assurance processes and involve internal audit in challenging and reviewing these processes and specific data sets if needed. This pointed to wider issues about the use of internal audit and the need to improve guidance to boards on commissioning and effective use of internal audit. The need

for some form of accreditation of data was discussed. Wales has had a data quality accreditation programme for several years and proposed the need for a kite mark for data. Organisations need to be clear about information requirements of policies before they are implemented.

SHAs and commissioners also have a role to play in driving improvements by more effectively challenging provider organisations about their data quality and the assurance processes they have. It was agreed that PCTs need to pool resources to provide a more focused and appropriate challenge to data quality. PCTs needed more assurance support.

The importance of external review and regulation was stressed. It was agreed that regulation played an important role in contributing to improvements. There needed to be direction and clarity of responsibilities in regulating data quality. This was felt to be particularly important for the development of quality accounts. Quality accounts needed to have comparable assurance to financial accounts because they could also be inaccurate and/or manipulated. There was a need for ‘carrots and sticks’ to be built into the system. There needed to be consequences for poor data quality built into performance management processes and data quality standards should form part of a ‘licence to participate’ in providing services.

Appendix 2

Andy McKeon closed the discussion by summarising the key points of discussion and agreement:

- There was a clearly a need for more leadership and messages from the top to address data quality.
- A top-down approach would not achieve change on its own and needed to be supported from the bottom up as well.
- The development of HRG 4 and quality accounts can also be seen as opportunities to bring together finance, clinical and business managers to improve data quality.
- These developments also offer an opportunity to review the source and use of data within the NHS.
- There is a desire to increase transparency in the publication of data and information which may have a positive effect on data quality.
- Current information and guidance on the development of quality metrics contains little on data quality.
- There are problems across the NHS which need to be addressed, although there is good practice as well.
- There is no indication that boards will solve these problems themselves.
- There is a need for some form of accreditation and assurance process over data quality.

Attendees		
Name	Position	Organisation
Andy McKeon (Chair)	Managing Director, Health	Audit Commission
Bob Alexander	Director of NHS Finance	Department of Health
Arun Bhopal	Statistician, Clinical Quality and Strategy Analytical Team	Department of Health
Frances Carey	Head of Indicators and Measurement	Healthcare Commission
Brian Derry	Executive Director of Information Services	The Information Centre for Health and Social Care
Simon Dixon	Deputy Director of Finance	King's College Hospital NHS Foundation Trust
Ray Franklin	Director of Health Informatics	Guy's and St Thomas' NHS Foundation Trust
Mike Foster	Deputy Chief Executive	University College London Hospitals NHS Foundation Trust
Dr Sarah Garner	Associate Director for Research and Development	National Institute for Clinical Excellence
Graham Harries	Chief Executive Officer	CHKS Ltd
Stephen Hay	Chief Operating Officer	Monitor
Graham Head	Director of IT	West Middlesex University Hospitals NHS Trust
Ian Moston	Director of Finance	The Christie NHS Foundation Trust
James Peskett	Health Policy Manager	Audit Commission
Peter Saunders	Head of PbR Assurance	Audit Commission
Roger Taylor	Director of Product Strategy and Design	Dr Foster
Prof John Williams	Director of Health Informatics Unit	Royal College of Physicians

Appendix 3

Data quality programmes and initiatives

NHS IC	NHS CfH	Audit Commission	Healthcare Commission	Local NHS
<ul style="list-style-type: none"> SUS data quality dashboard HRG 4 Workforce analysis Consultant activity logs NHS comparators PRIMIS IS data quality reports *New* data quality programme 	<ul style="list-style-type: none"> IGT Classifications and coding Data dictionary SUS submissions 	<ul style="list-style-type: none"> PbR assurance framework Board assurance study 	<ul style="list-style-type: none"> Information screening as part of core standard declaration reviews Inspections and reviews 	<ul style="list-style-type: none"> Trust review and assurance processes Commissioner challenge and review SHA programmes

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