

Improving information to support decision making: standards for better quality data

A framework to support improvement in data quality in the public sector

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Introduction

- 1 Public services need reliable, accurate and timely information to manage services and account for performance. For example, service providers need good information to make judgements about the efficiency, effectiveness and responsiveness of their services. Commissioners need to make often complex decisions about their priorities and use of resources. Service users and members of the public more widely need accessible information to make informed decisions. Regulators and government departments must satisfy their responsibilities for making judgements about performance and governance.
- 2 A great deal of time and money is spent on the activities and systems involved in collecting and analysing the data that underlies performance information, yet there remains a lack of confidence in some of this data¹. As increasing reliance is placed on performance information in performance management and assessment regimes, the need to demonstrate that the underlying data is reliable has become more critical.
- 3 Good quality data is the essential ingredient for reliable performance and financial information. The data must be fit for purpose, representing in an accurate and timely manner the organisation's activity. At the same time, a balance must be achieved between the importance of the information requirement and the cost of collecting the supporting data with the necessary accuracy, detail and timeliness. To achieve this balance, public bodies need to determine their information priorities and put in place appropriate arrangements to secure the quality of their data.
- 4 The results of auditors' work on a variety of data quality topics – most recently in the police service, and previously in health, youth offending, and social care services – underline the fundamental importance of data quality in achieving robust and respected performance information frameworks. Successful bodies have recognised data quality as a corporate priority and have taken action to embed strong arrangements for managing the quality of the data they collect and use.
- 5 This paper introduces a set of standards (set out in **Appendix 1**) to define the arrangements public bodies can adopt to drive improvement in the quality of their data, building confidence in the data used by all bodies in partnership working.

¹ Auditors' local reports and national Commission publications have focused on aspects of data quality.

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Why is data quality important?

What data do we mean?

- 6 Public bodies are accountable for the public money they spend: they must manage competing claims on resources to meet the needs of the communities they serve, and plan for the future. The financial and performance information they use to account for their activities, both internally and externally, to their users, partners, commissioners, government departments and regulators, must be accurate, reliable and timely.
- 7 The quality of financial information is generally higher than that of performance information, because the 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 performance information can be more variable, because internal controls for the recording and preparation of the underlying data are often less developed. There is often also less ownership of performance information by those charged with governance.
- 8 Producing data that is fit for purpose should not be an end in itself, but an integral part of an organisation's operational, performance management, and governance arrangements. Organisations that put data quality at the heart of their performance management systems are most likely to be actively managing data in all aspects of their day-to-day business, in a way that is proportionate to the cost of collection, and turning the data into reliable information.

Responsibility for the quality of data

- 9 Ultimate responsibility for ensuring that data is fit for purpose can only rest with public bodies themselves. This responsibility should not be confused with the role of government departments in setting a policy framework, including defining national performance measures and issuing standards and guidelines, or the role of regulators in providing assurance and identifying improvements.
- 10 The risk in not identifying and addressing weaknesses in data quality, or the arrangements that underpin data collection and reporting activities, is that information may be misleading, decision making may be flawed, resources may be wasted, poor services may not be improved, and policy may be ill-founded. There is also a danger that good performance may not be recognised and rewarded.

- 11 There are many audiences for the data collected by public services. This in itself can cause problems with the reliability of reported information, because the need to aggregate and analyse raw data in a variety of ways to suit a variety of purposes (**Table 1**) may not be understood by all those involved in the data collection and reporting processes. Data collected for a specific local purpose may ultimately be used or reported in ways not envisaged, intended or understood by its originators.

Table 1
Stakeholders

Key stakeholders and their information needs.

Stakeholder	Information uses
Service users and the public	Exercising choice, understanding the service standards to expect and holding public bodies to account.
Staff in public sector organisations	Delivering services at the front line on a day-to-day basis; the starting point for data collection and use.
Managers in public sector organisations	Monitoring and managing service delivery and benchmarking performance against others.
Local councillors, trust non-executives	Decision making; monitoring strategic objectives, targets and use of resources; ensuring accountability.
Partners	Monitoring the achievement of partnership targets and the use of resources; ensuring accountability.
Commissioners	Identifying population need and determining priorities and services for meeting it; monitoring the achievement of contractual arrangements.
Central government	Developing policy; monitoring progress of new initiatives, and the achievement of national targets; publishing local performance information at national level; identifying poorly performing organisations and rewarding good performance with autonomy and resources.

Stakeholder	Information uses
Regulators	Monitoring performance and the use of resources of local bodies; publishing comparative performance information and national studies; planning work programmes proportionate to risk.

Source: Audit Commission

- 12 The introduction of successive performance measurement systems as the method by which public sector organisations account to resource providers and service users for their performance has increasingly emphasised the need for reliable, consistent and comparable performance information, based on complete and accurate data.
- 13 The weight attached to published performance indicators as the basis for reducing the burden of regulation and awarding freedoms and flexibilities has significantly increased the importance attached to performance information and the quality of the underlying data. To be confident they are focusing on the right things, regulators and government departments need to be assured that reported information reflects actual performance.

What makes good quality data?

- 14 There are six key characteristics that can be used to describe the quality of data (**Table 2**). These characteristics can help public bodies and their partners to assess the quality of their data and take action to address potential weaknesses.

Table 2

Dimensions of data quality

There are six key characteristics of good quality data.

Dimension	
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 once only, 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 informed decision making at all levels.

Dimension	
Accuracy continued	<p>The need for accuracy must be balanced with the importance of the uses for the data, and the costs and effort 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.</p>
Validity	<p>Data should be recorded and used in compliance with relevant requirements, including the correct application of any rules or definitions. This will ensure consistency between periods and with similar organisations.</p> <p>Where proxy data is used to compensate for an absence of actual data, organisations must consider how well this data is able to satisfy the intended purpose.</p>
Reliability	<p>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.</p>
Timeliness	<p>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.</p>
Relevance	<p>Data captured should be relevant to the purposes for which it is used. This entails periodic review of requirements to reflect changing needs.</p>

Dimension

Relevance continued	It may be necessary to capture data at the point of activity which is relevant only for other purposes, rather than for the current intervention. Quality assurance and feedback processes are needed 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 these 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

- 15 In practice these characteristics need to be balanced with the importance and intended use of the data concerned. In some cases data may be considered fit for purpose in spite of some known limitations: for example, some degree of accuracy may be sacrificed in order to produce data more quickly where this is a priority.
- 16 The standards set out in **Appendix 1** have been developed to underpin consistent application of these principles over the longer term and are in line with related guidance from the Office for National Statistics^I, Chartered Institute of Public Finance and Accountancy (CIPFA)^{II} and the Central Sponsor for Information Assurance^{III}.
- 17 The standards define a framework of management arrangements that will enable public bodies to assure themselves, partner organisations and other stakeholders that the quality of their data is reliable and sustainable over the longer term. Public bodies that adopt and implement the standards could be considered to have arrangements that are above the basic minimum necessary, demonstrating their commitment to securing data quality.

^I Office for National Statistics, *National Statistics Code of Practice: Protocol on Quality Management*, 2004.

^{II} CIPFA Statistical Information Service, Code of Conduct.

^{III} Central Sponsor for Information Assurance, Information Assurance Governance Framework, 2005.

- 18 While assurance about the quality of data can also be obtained by testing the data itself, the results of such data testing can provide only a snapshot of the quality of a small amount of data at a specified point in time. Testing all data to obtain this assurance is impractical and prohibitively costly, and less practicable as the move towards an outcomes-focused approach places increased reliance on survey data.
- 19 The standards therefore focus on the arrangements in place to manage the collection and reporting of the data, rather than the data itself. This should satisfy the needs for assurance about data quality of service providers themselves, as well as their stakeholders and regulators.

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How can organisations' management arrangements improve data quality?

- 20 The standards in **Appendix 1** define a framework of management arrangements that public bodies can implement to satisfy themselves and other stakeholders of the quality of the data supporting their performance information. They cover:
- the governance of data quality;
 - the policies and procedures in place for data recording and reporting;
 - the systems and processes in place to secure data quality;
 - the knowledge, skills and capacity of staff to achieve the data quality objectives; and
 - the arrangements and controls in place for the use of data.

Governance and accountability for data quality

- 21 If organisations are to achieve consistently high standards of data quality to underpin their performance information, clear leadership from the top of the organisation is essential, together with a comprehensive management and accountability framework focused on this objective.
- 22 The board or its equivalent should be clear about the strategic approach for data quality, setting out the priorities for the organisation. This strategic approach may be a free-standing document, or could form part of other strategic documents, for example the corporate plan. It should cover, as a minimum:
- the key data for the organisation to monitor its performance;
 - the relevance of data quality to business objectives; and
 - the corporate requirements and arrangements for data quality.

- 23 Some bodies continue to view data quality and information management as information technology (IT) issues, with responsibility for driving the strategy resting with the IT department. Successful bodies have recognised the need for leadership at the top of their organisations to reinforce the importance of, and responsibility for, data quality.
- 24 A mechanism for regular monitoring of data quality is needed, enabling those charged with governance to challenge the integrity of data throughout the year, not just at year-end. This may be covered by the internal audit plan, and should include regular formal reporting on the accuracy of data supporting key performance measures. These arrangements should provide assurance on the quality of the data supporting key measures, as well as the effectiveness of the arrangements in place.
- 25 As well as focusing on internal aspects of data quality, quality assurance processes are likely to involve analysis of comparative data. For example, the data published by CIPFA for local government, which is provided on a voluntary basis by local authorities, can be a valuable tool in the day-to-day activities involved.

Policies and procedures

- 26 To ensure that data is recorded accurately and in accordance with prescribed definitions, the organisation's approach to recording and reporting data should be specified in a set of up-to-date policies and procedures, setting out clearly the local and national requirements to be applied. Lack of clarity on policy and procedures, and poor access to the necessary guidance on their interpretation, can lead to inconsistent or inappropriate practice. This will undermine the integrity of data and consequently the integrity of the reported information for which it is the source.
- 27 However, reliance on the existence of written policies is insufficient to ensure their adoption in practice: the scope and impact of policies and other corporate requirements must be communicated widely. Periodic reinforcement of these messages, focusing on the value placed on data quality, is needed to embed and secure consistent compliance with policies and procedures.
- 28 Mechanisms to monitor the application of corporate policies and procedures should include regular review of operational practice and formal reporting of the results. Key data should also be subject to departmental checks and management review before being reported to top management.

Systems and processes

- 29 Data requirements should ideally be tightly defined around the organisation's service and people needs. Arrangements for collecting and recording the data, and reporting it as performance information, should be integrated as far as possible into the wider business planning and management processes.
- 30 Data should be collected and reported along the principle of 'getting it right first time', involving clear and simple actions and only limited, if any, manual intervention. The aim should be to avoid waste in the form of time and money spent on duplicated recording, cleansing data, interfacing between different information systems, matching and consolidating data from multiple databases and developing or maintaining multiple, often outdated, systems. This helps to reduce the burden of administration as well as helping to ensure more accurate and timely data.
- 31 Periodically all systems and processes supporting an organisation's key data requirements should be reviewed to ensure that data is collected according to the relevant policies and definitions, that the processes used remain fit for purpose and are applied consistently. Front line staff have valuable expertise in the obstacles to securing data quality and can provide insights into how processes and systems can be better adapted to the working environment.
- 32 Increasingly, organisations working in partnership need to share data or rely on data from other providers. To be confident of the quality of this data, a data sharing protocol, statement, or service level agreement is needed.

People and skills

- 33 Staff at all levels within the organisation need the appropriate knowledge, competencies and capacity for their roles in relation to data quality, recognising that they are the key to recording accurate and reliable data. Staff must be accountable for data quality and understand the necessity of following appropriate procedures. Data quality audits have consistently shown that good policies and arrangements are often undermined by weaknesses in actual entry of the data.

- 34 The body's policies, procedures and guidance must be widely communicated. Staff should be trained in their use and properly updated when there are changes to data collection methods or system upgrades. Support should be easily accessible for all staff, for example through information packs, quick reference guides or online help.
- 35 A common obstacle to achieving consistently high data quality is the perception that this is not an important part of a person's job. Staff who record data need to obtain some benefit for their effort in securing the quality of that data, for example by receiving relevant performance information, at an appropriate level of disaggregation, in return.

Data use and reporting

- 36 Public bodies can demonstrate their commitment to data quality by taking seriously the process of preparing performance information, particularly for reporting externally. The most fundamental step is to ensure that data supporting reported information is actively used in the decision-making process, rather than being produced as a secondary administrative requirement.
- 37 In addition to implementing reliable arrangements to support accurate recording of data, bodies should ensure that reported information is subject to a system of internal control and validation. The extent of this validation will need to reflect the assessment of the risk of the data being misstated, the importance of the performance measures concerned and the level of accuracy or timeliness required for the reported information.
- 38 All public sector bodies have to collect a variety of performance indicators, which are submitted to central government or their agencies. While steps should be taken to ensure that all performance information, whether for internal or external reporting, is reliable and fit for purpose, a formal and documented process for preparing and approving externally reported information will increase the likelihood of accurate reporting of performance indicators.

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Conclusion

- 39 The key to better quality information to support performance management and accountability lies with the actions public bodies take themselves to foster a culture that values the quality of the data that underpins this information. Such a culture, which is central to an effective performance management system, must be adopted at the very top of, and pervade, the whole organisation.
- 40 Public bodies should take action, using the principles defined in these standards, to:
- define their priorities for data quality;
 - assess their arrangements for securing good quality data; and,
 - develop working practices which deliver these objectives.

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Consultation questions

- 41 The Commission has previously consulted national stakeholders in the local government sector on the proposed standards for data quality set out in this paper. It is now seeking the views of the wider local government community, with a view to publishing the standards for voluntary adoption only.
- 42 The consultation will close on 30 April 2007. Please note that we will not be able to accept replies after that date.
- 43 Feedback on the paper or the proposed standards (in **Appendix 1**) should be clearly headed 'LG data quality standards consultation' and sent to **lgdq@audit-commission.gov.uk**. Responses to the questions set out below would be particularly welcome.
1. Do the proposed standards provide a reasonable basis for a framework of corporate arrangements in relation to data quality, without extending into service-specific detail?

 2. Is there anything else the paper or the standards should incorporate to raise the profile of data quality?

 3. Do the standards achieve an appropriate balance between assurance and practicalities?

 4. Is there anything else the standards should cover to improve their impact?

 5. Do you think there are any further steps the Commission can take to support public bodies in relation to data quality?

 6. Are there any other comments you would make in relation to the paper or the standards?

- 44 Following the consultation, the standards will be published in June 2007.

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Appendix 1 – The standards

The standards for better quality data

These standards are intended for use by public bodies. They define a framework of management arrangements that organisations can put in place to ensure 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 to promote better data quality, rather than as a rigid set of requirements. Alternative approaches to achieving these aims may also be appropriate, where they achieve the outcome of securing reliable data to support informed decision making.

Governance and leadership

The organisation 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:

- 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.
- The corporate objectives for data quality are clearly and formally defined (although this may not necessitate a discrete document for data quality). The objectives are linked to business objectives, cover all the organisation's activities, and have been agreed and adopted at top management level.
- The strategic approach for data quality has an associated delivery plan, with clearly identified actions and timescales to support improvement. This is reflected in an appropriate document, for example the corporate plan.
- The commitment to data quality is communicated clearly, reinforcing the message that all staff have a responsibility for data quality.
- Accountability for data quality is clearly and formally defined and is part of the performance appraisal system.

- Where there is joint working, there is an agreed accountability framework for data quality with partners.
- Data quality is covered by corporate risk management arrangements, with regular assessments of the risks relating to the reliability and accuracy of the information produced and used by the body.
- Data is subject to robust scrutiny by those charged with governance, and there is formal reporting of data quality issues.
- There is a formal programme of data quality review, proportionate to risk and reported formally to those charged with governance. This includes periodic review of data quality arrangements, as well as reporting on the quality of data supporting key performance measures and published performance indicators.
- Where applicable, the body has taken action to address the results of previous internal and external reviews of data quality.

Policies

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

Key components:

- There is a comprehensive and current data quality statement, policy, or set of policies, in place. This covers data collection, recording, analysis and reporting, and has been implemented in all business areas.
- The policy is supported by a current set of operational procedures and guidance for staff.
- Policies and procedures meet the requirements of any relevant national standards, rules, definitions or guidance, as well as defining local practices and monitoring arrangements.
- Policies and procedures are reviewed periodically and updated when needed.
- All staff are able to access the policies, procedures and guidance. Where possible, this is supported by information systems.
- The organisation can demonstrate that it is proactive in informing staff of any policy or procedure updates on a timely basis.

- Policies, procedures and guidelines are applied consistently and comprehensively. Mechanisms are in place to monitor compliance in practice, and the results are subject to formal reporting to top management. Corrective action is taken where necessary.

Systems and processes

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

Key components:

- There are systems and processes in place for the collection, recording, analysis and reporting of data which are focused on securing data that is accurate, valid, reliable, timely, relevant and complete.
- Systems and processes operate according to the principle of 'right first time', rather than employing data cleansing or manipulation processes to produce the information required (for example, finance and activity systems are linked).
- Arrangements for collecting, recording, compiling and reporting data are integrated into the wider business planning and management processes of the organisation, and support staff in their day-to-day work.
- Adequate support is provided for all staff using the organisation's systems and processes for all aspects of the collection, recording, analysis, and reporting of data (for example, user and quick reference guides, online help and helpdesk services are available where appropriate).
- Information systems have in-built controls to minimise the scope for human error or manipulation and prevent erroneous data entry, missing data, or unauthorised data changes.
- Internal controls are reviewed at least annually to ensure they are working effectively. Results are reported to top management.
- Security arrangements for all information systems are in place (in line with international standards ISO/IEC 17799 and ISO/IEC 27001).
- The organisation regularly tests its performance information systems to ensure that processes are secure. Results are reported to top management.

- A formal set of quality requirements is applied to all data used by the organisation that is shared externally, or that is provided to the organisation by a third party (for example, in the form of a data sharing protocol, statement, or service level agreement).
- There are processes in place to validate data from third parties.

People and skills

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

Key components:

- Roles and responsibilities in relation to data quality are clearly defined and documented, and incorporated into job descriptions. Roles and responsibilities are applied consistently.
- Data quality standards are set, and staff are assessed against these.
- The organisation has recruited and trained the necessary staff, ensuring they have the capacity and skills for the effective collection, recording, analysis and reporting of data.
- There is a formal and ongoing programme of training on data quality, including regular update training to ensure that changes in data quality procedures are disseminated and acted on.
- There are corporate arrangements in place to ensure that training provision is periodically evaluated and adapted to respond to changing needs.
- Weaknesses identified in internal or external reviews of data quality are addressed, where appropriate, through the training programme or briefing sessions.

Data use and reporting

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

Key components:

- The suite of financial and performance data required for reporting on performance, internally and externally, has been critically assessed. The data is reviewed regularly to ensure it remains relevant to needs.
- Data used for reporting to those charged with governance is also used for day-to-day management of the organisation's business. As a minimum, reported data is fed back to those who generate it to reinforce understanding of the way it is used.
- Reports include an element of prediction when appropriate, as well as being a record of historical events.
- Data is used not only to measure the volume of activity delivered, but also to assess the quality of service provided.
- There is evidence that management action is taken to address service delivery issues identified by data returns and performance information reports.
- Information which is used for external reporting is subject to rigorous verification, especially where errors may lead to loss of income.
- Data returns are supported by a clear and complete audit trail.
- Data returns are prepared and submitted on a timely basis.
- All data is subject to senior management approval prior to external reporting.

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