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# 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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# Preface

- 1 The purpose of this paper is to encourage public bodies to improve the quality of the data they use for decision making. It presents a set of clear and concise standards, based on accepted good practice, which public bodies can adopt on a voluntary basis.
- 2 The standards are endorsed by Audit Scotland, the Northern Ireland Audit Office, the Wales Audit Office and the Chartered Institute of Public Finance and Accountancy (CIPFA). The initiative also has the strong support of the National Audit Office, which continues to promote improvement in data quality in government.

# Introduction

- 3 Public services need information that is fit for purpose with which 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 the 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.
- 4 A great deal of time and money is spent on the activities and systems involved in collecting and analysing data, yet there remains a lack of confidence in some of the information produced from these data.<sup>1</sup> As increasing reliance is placed on performance information in performance management and assessment regimes, the need to demonstrate that the underlying data are reliable has become more critical.
- 5 The results of auditors' work on various 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.
- 6 The 2006 Local Government White Paper, *Strong and Prosperous Communities*, and the Local Government and Public Involvement in Health Act 2007 have set out a new performance framework for local services. This will place greater reliance on data quality, to provide robust data for local performance management, and to inform performance assessments. It also emphasises the need for local public services to use information to reshape services radically and to account to local people for performance.
- 7 This paper introduces a set of standards (set out at **Appendix 1**) to define the arrangements that public bodies can adopt to drive improvement in the quality of their data, building confidence in the data used by all bodies and partnerships.

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

# 1

## Why is data quality important?

### What data do we mean?

- 8 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, and to government departments and regulators, must be based on good quality data.
- 9 The terms 'data', 'information' and 'knowledge' are frequently used interchangeably (**Table 1**). This paper, and the standards it introduces, focuses on data; that is, the basic facts from which information can be produced by processing or analysis.

**Table 1**  
**Definitions**

Terminology	Definitions
Data	Data are numbers, words or images that have yet to be organised or analysed to answer a specific question.
Information	Produced through processing, manipulating and organising data to answer questions, adding to the knowledge of the receiver.
Knowledge	What is known by a person or persons. Involves interpreting information received, adding relevance and context to clarify the insights the information contains.

**Source:** Audit Commission<sup>1</sup>

<sup>1</sup> From a forthcoming related national study on improving the use of information in local public services.

- 10 The quality of financial data is generally higher than that of other data, because these data are collected according to professional accounting rules and are subjected to strong internal controls and a formal audit regime. The quality of non-financial data can be more variable, because internal controls for their recording and preparation are often less developed. There is often also less ownership of this data by those charged with governance. The standards set out in this paper provide general principles for the management of data quality which are applicable to all types of data.
- 11 Producing data that are fit for purpose should not be an end in itself, but an integral part of an organisation's operational, performance management, and governance arrangements. Bodies 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 for decision making.

## Responsibility for the quality of data

- 12 Good quality data are the essential ingredient for reliable performance and financial information. The data must be fit for purpose, representing in an accurate and timely manner an organisation's activity. At the same time, a balance must be achieved between the importance of the information need 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 arrangements to secure the quality of the data to satisfy these needs.
- 13 The responsibility for ensuring that data are 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.
- 14 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.

- 15 There are many audiences for the data collected by public services. This can cause problems with the reliability of reported information, because the need to aggregate and analyse raw data in various ways to suit different purposes (**Table 2**) 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 the originators of the data.

**Table 2**

**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 day to day at the front line; 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.
Regulators	Monitoring performance and use of resources of local bodies; publishing comparative performance information and national studies; planning work programmes proportionate to risk.

**Source:** Audit Commission

- 16 For performance management information, the introduction of successive performance measurement systems has increasingly underlined the need for reliable, consistent and comparable information, based on good quality data.
- 17 More recently the weight attached to published performance indicators as the basis for reducing the burden of regulation and awarding freedoms has significantly increased the importance of data quality. To be confident that they are focusing on the right things, regulators and government departments need assurance that reported information reflects actual performance.

## What makes good quality data?

- 18 Data quality can be described using six key characteristics or dimensions (**Table 3**). These characteristics can help public bodies and their partners to assess the quality of their data and take action to address potential weaknesses.

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### Table 3

#### Dimensions of data quality

There are six key characteristics of good quality data.

##### Accuracy

Data should be sufficiently accurate for their intended purposes, representing clearly and in enough detail the interaction provided at the point of activity. Data should be captured once only, although they may have multiple uses. Accuracy is most likely to be secured if data are 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.

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 are made on accuracy, the resulting limitations of the data should be clear to their users. This must be a judgement determined by local circumstances, and is unlikely to be appropriate in the case of the data supporting published performance indicators.

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Continued overleaf

### **Validity**

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, measuring what is intended to be measured.

Where proxy data are used to compensate for an absence of actual data, bodies must consider how well these data are 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 service or management decisions.

### **Relevance**

Data captured should be relevant to the purposes for which they are 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 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 body 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.

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**Source:** [Audit Commission](#)

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- 19 In practice, these characteristics must 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. Where data quality limitations exist, these must be clear to the users of the data. The existence of a clear and checkable audit trail is essential. Metadata, which describes the attributes of the data (such as the source, status or accuracy), may also help users to understand any limitations.
- 20 The standards set out in Appendix 1 have been developed to underpin consistent application of data quality principles over the longer term, and are in line with related guidance from the Office for National Statistics, *National Statistics Code of Practice: Protocol on Quality Management*; CIPFA Statistical Information Service, *Code of Conduct*; and the Central Sponsor for Information Assurance, *Information Assurance Governance Framework*. The standards focus on the high-level corporate arrangements for data quality, and are therefore intended to be complementary to other more detailed frameworks, for example the Information Governance Toolkit in the NHS, and the Government Interoperability Framework (e-GIF).
- 21 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. 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. The standards could form part of a body's wider arrangements covering all aspects of the management of information.
- 22 While assurance about the quality of data can also be obtained by testing the data themselves, 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 toward an outcomes-focused approach places increased reliance on survey data.
- 23 The standards therefore focus on the arrangements in place to manage the collection and reporting of data, rather than the data themselves. This should satisfy the needs for assurance about data quality of service providers themselves, as well as their stakeholders and regulators.

# 2

## How can organisations manage for improving data quality?

- 24 The standards at Appendix 1 define the 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.
- 25 The standards are intended to be voluntary, and bodies may choose whether or not they adopt them, taking account of local risks and resources. As the standards are based on existing guidance and recognised good practice, assessments which consider data quality are likely to incorporate these principles into their approach, recognising that they demonstrate arrangements which are above the minimum standard.

### Governance and accountability for data quality

- 26 If bodies are to achieve consistently high standards of data quality, clear corporate leadership from the top of the organisation is essential, together with a comprehensive management and accountability framework focused on this objective.
- 27 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 freestanding document, or could form part of other key 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.

- 28 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, however, recognised the need for leadership at the top of their organisations to reinforce the importance of, and responsibility for, data quality.
- 29 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 should include regular formal reporting on the accuracy of data supporting key performance measures, as well as on the appropriateness of the processes in place.
- 30 Together with the focus on internal aspects of data quality, quality assurance processes may involve analysis of external 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 to support quality review.
- 31 Increasingly, bodies working in partnership need to share data or rely on data from other providers. To be confident of the quality of these data, a data sharing protocol, statement, or service level agreement is needed.

## Policies and procedures

- 32 To ensure that data are recorded accurately and in accordance with prescribed definitions, the body's approach to recording and reporting data should be clearly specified, for example in a set of up-to-date policies or procedures, setting out 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 data recording practice. This can undermine data quality.
- 33 However, reliance on the existence of written policies is not enough 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. In larger organisations, a network of data champions may help to promote data quality aims.
- 34 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

- 35 Data requirements should ideally be tightly defined around the body's service and people needs. Arrangements for collecting and recording the data, and reporting them as performance information, should be integrated as far as possible into the business planning and management processes of the body.
- 36 Data should be collected and reported once only, on the principle of 'getting it right first time', with 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.
- 37 Periodically all systems and processes supporting a body's key data requirements should be reviewed to ensure that data are 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.

## People and skills

- 38 Staff at all levels within the organisation need the knowledge, competencies and capacity for their role 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 need to follow appropriate procedures. Data quality audits have consistently shown that good policies and arrangements are often undermined by weaknesses in actual entry of the data.
- 39 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.

- 40 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

- 41 Public bodies can show their commitment to data quality by taking seriously the process of preparing reported information, particularly for external reporting. The most fundamental step is to ensure that data supporting reported information are actively used in the decision making process, rather than being produced as a secondary administrative requirement.
- 42 As well as 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 must reflect the risk of misstating the data, the importance of the reported information concerned and the level of accuracy or timeliness required.
- 43 All public sector bodies have to collect a variety of performance indicators, which are submitted to central government or their agencies. While it is important that all reported information, whether for internal or external use, 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.

# 3

## Conclusion

- 44 The key to better information to support decision making and accountability lies with the actions public bodies take to foster a culture that values the quality of the data that underpins this information. Such a culture must be adopted at the very top of, and pervade, the whole organisation.
- 45 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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# Appendix 1: The standards

## The standards for better quality data

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.
- 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.

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