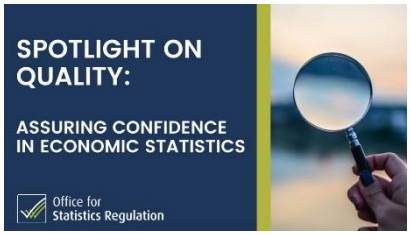

Spotlight on Quality: Assuring Confidence in Economic Statistics

Context

The landscape of economic statistics in the UK is changing, with more new and innovative data available than ever before. There have been multiple economic shocks in the last few years which have brought increased interest in economic statistics. The regulatory landscape has also changed: the UK's departure from the EU means that the role of the European statistical office (Eurostat) in verifying the quality of UK statistics will come to an end in due course. As the UK's independent regulator of statistics, we are developing a 'Spotlight on Quality: Assuring Confidence in Economic Statistics' programme, a key component of which will be a series of quality-focused assessments. We are building on our years of experience of assessing statistics against our Code of Practice for Statistics to ensure that users can have confidence in the quality of economic statistics in the UK.

This Quality Framework

Introduction

The vision of the Office for Statistics Regulation is simple: statistics that serve the public good. Public good is ensured by statistics that have public value, are high quality and are produced by people and organisations that are trustworthy.

Statistics being high quality means that the statistics fit their intended uses, are based on appropriate data and methods and are not materially misleading. Ensuring quality requires skilled professional judgement about collecting, preparing, analysing and publishing statistics and data in ways that meet the needs of people who want to use the statistics. It is important to recognise that no data sources are perfect: there are always strengths and limitations with any data.

We regulate the production of statistics using assessments against our Code of Practice. The need for enhanced scrutiny of the quality of economic statistics has driven us to develop a quality-focused framework of indicators against which to assess quality. This framework does not replace the Code of Practice but supplements it. 'Standard' assessments and assessments of new statistics will continue to be carried out using our Code of Practice framework of Trustworthiness, Quality and Value. Assessments where the focus of interest is on the quality of the statistics, or changes in it, will use a quality-focused approach. This framework of quality-focused indicators will be used to drive our quality-focused assessments and ensure that data and methods produce assured statistics. We will report on the indicators that are most relevant to explaining our judgements and requirements for

the statistics that we assess. Not all indicators will be relevant for all sets of statistics, and we do not intend to score and rate sets of statistics against them.

The framework was developed from the practices in the Quality pillar of the Code of Practice for Statistics[1] (the Code), the International Monetary Fund's Data Quality Assessment Framework (IMF DQAF) and the Quality Assurance Framework of the European Statistical System (ESS QAF)[2]. These frameworks include indicators at a range of levels that are relevant to ensuring the quality of statistics.

We have carried out pilot assessments on Producer Price Inflation statistics and the Profitability of UK Companies' and Gross Operating Surplus of non-financial corporations statistics in order to test and further develop the framework. These pilot assessments proved successful and demonstrated that the framework was able to be applied in practice. They also led to some improvements to the indicators in this framework. The framework is now being used for subsequent Spotlight on Quality assessments[3].

We are publishing this framework to provide transparency around our Spotlight on Quality assessments. We want to ensure that our framework will provide users and stakeholders of UK economic statistics with continued assurance around quality. We also want producers of economic statistics to understand the framework that we will be using to assess the quality of their statistics and strive to make sure that their statistics are meeting these standards. We welcome feedback on this framework and will review, refresh and re-publish it as appropriate.

The framework is being developed and first applied to economic statistics, due to the changing context of the regulation of these statistics. We intend to test, and then widen the use of, this framework on the regulation of statistics beyond economic statistics and will consider where the framework may need to be adapted for that use.

Overview of the framework

The framework is structured around four principles. The first captures foundational factors that affect quality, such as resources, development plans and prioritisation, and is based largely on practices from our Trustworthiness and Value pillars. The latter three are based on the three principles in the Quality pillar of the Code. Each of the four principles of the Spotlight on Quality framework has been designed to ensure the statistics fit their intended uses, are based on appropriate data and methods and are not materially misleading. This includes using appropriate systems and resources to produce statistics and data in ways that facilitate quality assurance and enhance trust in the statistics.

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[1] A review of the Code of Practice for Statistics was published in March 2024. A key action of that review was for the Code to be refreshed. Changes as a result of that refresh will be reflected in this framework at a subsequent version.

[2] The OCED also has a Data Quality Framework (https://www.oecd.org/sdd/qualityframeworkforoecdstatisticalactivities.htm) which was not explicitly used in the generation of this quality framework but which aligns with the frameworks used.

[3] The latest information on Spotlight on Quality assessments that we have carried out or are carrying out can be found on the Spotlight on Quality pages of our website.

Resources, plans and prioritisation

This principle covers the factors that enable the production of high-quality statistics, such as the availability and allocation of resources, the development and implementation of plans, and the prioritisation of user needs. It includes indicators such as there being sufficient human and financial resources; suitable systems; an established development work plan; user involvement in developing plans; and transparency around progress and prioritisation decisions.

Suitable data sources

This principle covers the factors that relate to the appropriateness and quality of the data sources used to produce statistics, such as the coverage, accuracy, timeliness and coherence of the data. It includes indicators such as definitions and concepts within data sources; relationships with data suppliers; source metadata; coherence of source data; explanation of data sources, and their quality and limitations, to users; innovation in sourcing data; and collaboration to maximise data use.

Sound methods

This principle covers the factors that relate to the validity and reliability of the methods used to produce statistics, such as the design, testing, documentation and review of the methods. It includes indicators such as the use of appropriate methods and recognised standards, classifications and definitions; explanation of reasons for deviations from standards; transparency of methods and their limitations; advance notice and user feedback on changes to methods; production of consistent time series; collaboration to improve methods; and the use of independent internal and external reviews.

Assured quality

This principle covers the factors that relate to how quality of statistics is assured, such as the organisational culture, the quality dimensions of the output data and provision of information about the quality of the statistics. It includes indicators such as that quality meets users' needs; proactive user engagement around quality; transparency of output quality; proportionate quality assurance and risk minimisation; quality of provisional data; and understanding of revisions.

For each indicator in the framework, we explain in more detail what it seeks to measure and the reasons for its inclusion in this framework, including where a similar indicator is included in international quality assessment frameworks. We also provide

examples of some of the questions that we will be asking when assessing statistics against the framework.

There are various ways in which the indicators could be grouped into a framework. For this version of the framework, we have chosen to broadly follow the structure in the Code. This structure is familiar to producers and users of statistics and to our regulator team and makes clear the links between the Code and the framework. Alternative structures could include using the Generic Statistical Business Process Model or grouping the indicators into those which relate to the quality of estimates, those that relate to communicating the quality and those which relate to current or potential risks to quality. Based on learning from future Spotlight on Quality assessments, changes to the Code during the upcoming refresh and feedback on the framework, we will consider the appropriateness of the structure at our next review.

The framework has been peer reviewed ahead of publication by colleagues in some producer and user organisations in the UK, and by colleagues in international organisations with experience in assessing the quality of a range of statistics.

In the final section of this document, we discuss the indicators that are included in other quality assessment frameworks but which we have chosen not to include in this framework. We explain the reasons for those decisions.

Annex A contains the framework of indicators.

If you would like to provide feedback on this framework or are interested in knowing about our Spotlight on Quality programme more broadly, please contact us at regulation@statistics.gov.uk.

1. Resources, plans and prioritisation

There are many practices in the Code that are associated with quality but are not directly related to the data sources, methods or quality assurance processes. These are predominantly around the resources that are available to produce the statistics, and the plans and prioritisation of developments. Adherence to these indicators helps ensure the quality of statistics. These are placed first in our framework to illustrate their foundational nature in considering quality. They are primarily based on the Trustworthiness and Value pillars of the Code.

1.1 Sufficient resources

Indicator 1.1: Sufficient human and financial resources are provided to produce statistics that meet users' needs.

The production of statistics that meet users' needs is dependent on sufficient resources being available and these being deployed effectively. These resources can be in the form of human resources, such as people with the right skills and understanding to collect, process and disseminate the statistics, or financial resources, which enable surveys or data collections that meet users' need to be

conducted. Insufficient resources are likely to be detrimental to one or more dimension of quality and may result in user needs not being met. Insufficient people with the right skills and knowledge may increase pressure on the people that are available to carry out processes, resulting in risks to accuracy, for example through errors being more likely. Insufficient human resources may also lead to a lack of understanding of users' needs and the quality required of statistics and whether this has been met. There may be a scarcity of staff with the technical knowledge necessary to produce niche statistics, such as National Accounts. It might lead to lack of time for the team to build skills and capability. Insufficient financial resources might mean sample sizes are cut below what is needed to meet required levels of accuracy. It might mean that additional expertise or data cannot be purchased. Finally, it could result in outputs being reduced or ceased altogether.

This indicator is derived from Code practice T4.3 with enhanced emphasis on statistics meeting user needs in line with the focus of this framework. The aspect of the Code practice around technological resources has been included in a later indicator. Both the IMF DQAF and ESS QAF include indicators around ensuring that resources are available to meet statistical needs.

Example questions:

- Does the producer team have sufficient people with the right skills to produce statistics which meet user needs?
- Has the number of people working on the output been reduced and, if so, what was the effect on quality and on meeting users' needs?
- Does the team have sufficient capacity to develop its understanding of the statistics, their uses and the required quality, and to develop its capability?
- Have any errors occurred as a result of insufficient people, knowledge or skills?
- Has lack of sufficient people with the right skills been a barrier to ensuring or improving quality or meeting user needs?
- Does the producer team have sufficient financial resources to produce statistics which meet user needs?
- Have the financial resources for the output been cut and, if so, what was the effect on quality?
- Has the team purchased the expertise, skills or data that they needed to enhance quality? Does the team think that it could purchase expertise, skills or data if required?
- Have insufficient financial resources been a barrier to ensuring or improving quality or meeting user needs?

1.2 Good business practices

Indicator 1.2: Good business practices are maintained in the use of resources. Where appropriate, statistics producers take opportunities to share resources and collaborate to achieve common goals and produce coherent statistics.

As well as sufficient resources being made available to meet statistical needs, it is also important that good business practices are maintained in the use of the resources. This will enable the best possible use of those resources to ensure that statistics are produced with the best possible quality. Taking opportunities to share resources and collaborate will enable maintenance and improvement of quality to take place as far the available resources allow. Examples of good business practices might include the use of staff on multiple annual outputs to manage peaks and troughs in resource demands or sharing technical expertise between teams. These practices can also help the coherence of statistics and statistical processes, which in turn enable greater contingencies when resources are constrained as staff do not need to learn multiple different processes for similar statistics.

This indicator is derived from the Code practice T4.4. The ESS QAF also includes indicators around the effective use of resources, cost effectiveness and efficiency.

Example questions:

- What business practices are used to make the best possible use of resources?
- Does the team share resources and collaborate to achieve common goals and produce coherent statistics?
- Do desk instructions exist to support quality when staffing changes?
- Are the desk instructions sufficient to enable new team members to understand the sources, methods and quality of the statistics that they are producing?

1.3 Clarity of responsibilities

Indicator 1.3: The responsibility for collecting, processing, quality-assuring and disseminating the statistics is clearly specified.

By being clear on the responsibility for collecting, processing and disseminating data and statistics, it will be clear who is responsible for ensuring the quality of the statistics at each stage. These responsibilities could be split within teams, departments or other organisations or across them. Clarity on who is ensuring quality at each stage ensures the end-to-end quality of the statistics. Making reasons for collecting, processing, quality-assuring and disseminating statistics clear, such as through stating the legal basis for those activities, further ensures quality and supports public confidence in the use of the data. It also ensures that those activities are legal. Public confidence is important in ensuring that people respond to surveys and agree to their data being used, which in turn supports the quality of the data. The legal basis also allows for businesses to be mandated to respond to surveys, which improves response rates, and for data sharing agreements to be made, allowing access to the data for statistical purposes.

This indicator is derived from the IMF DQAF indicator 0.1.1, ‘The responsibility for collecting, processing, and disseminating the statistics is clearly specified’, with the legal basis added in line with indicator 1.2.2, ‘The terms and conditions under which statistics are collected, processed, and disseminated are available to the public.’ Similar indicators are also included in the ESS QAF around the ‘mandate of the statistical authorities to collect and access information from multiple data sources for the development, production and dissemination of European Statistics is specified in law.’ Elements of this indicator are also captured in the Code under T4, Transparent processes and management, and T6, Data governance.

Example questions:

- Who is responsible for collecting, processing and quality-assuring the data and disseminating the statistics? Does responsibility fall on one team or is it split between teams within one organisation? How are the responsibilities made clear to those involved in the process?

- Is more than one department or organisation responsible for collecting, processing and quality-assuring the data and disseminating the statistics? If so, how are the responsibilities made clear to those involved in the process, to data suppliers and to users?

- What is the legal basis on which the data are collected and processed?

1.4 Suitable systems

Indicator 1.4: Sustainable, robust and flexible systems are used to produce statistics that meet current user needs and enable innovation and improvement.

As technology advances, there is an increasing need for sustainable, robust and flexible systems to ensure that statistics which meet user needs can be produced. As new, and ever-larger, datasets become available, new methods are developed, and new parts of the economy or societal trends need to be measured, it is important that systems are flexible enough to incorporate new data and methods to enable the best-quality estimates to be produced. With increasing use of reproducible analytical pipelines to safeguard the quality of statistics, it is important that the systems on which they are built are sustainable and robust. The move away from statistics being produced in spreadsheets is an important one in terms of quality, but that move is threatened when the systems are not robust, cannot be amended or are not understood by the teams using them.

This indicator is derived from Code practice T4.3 with specific emphasis on technological resources. This indicator arises from an emerging risk that we identified in the first pilots of the Spotlight on Quality programme. In the UK, we are seeing large transformation programmes to modernise the architecture underpinning statistics, but these programmes need to deliver across large numbers of statistical outputs to ensure statistics meet user needs.

Example questions:

- Are the systems sustainable, robust and flexible enough to produce statistics that meet user needs? Have problems with the systems led to any issues with quality?

- Are the systems sustainable, robust and flexible enough to enable innovation and improvement? Have resources been a barrier to ensuring or improving quality or meeting user needs?

- Is the team able to understand and amend the processes undertaken by the computing systems to maintain and improve quality?

1.5 Established development work programme

Indicator 1.5: A development work programme is established, published and regularly reviewed and includes planned improvements to quality.

A published work programme makes clear the plans for improvements to the statistics and helps users understand the developments that are planned for a set of statistics and when they might be implemented. These development plans should include any improvements to quality so that users are aware of the quality issues that are going to be addressed, can plan for any changes to the statistics and understand changes to quality over time and how the statistics meet their needs. Including longer-term quality improvements that will not be addressed in the short term can help users understand the quality of the statistics. A work programme can also support producers in identifying the improvements that need to be made and when they can be implemented. The work programme needs to be regularly reviewed to ensure that it remains up to date and achievable. The level at which the work programme is published will depend on the context. The work programme should be user focused. Sets of statistics with the same or similar user bases might be grouped together, and the development of new sources that will replace, or supplement, a set of statistics should be presented alongside the work programme for those statistics. Where data sources, processes and outputs cut across multiple teams, the work programme should cover the full end-to-end process.

This indicator is derived from the first part of the Code practice T4.2 with the addition of the need for the work programme to be published. Additional wording has been added to make it clear that the work programme should include planned improvements to quality. The IMF DQAF includes indicator 0.4.3, ‘Processes are in place to deal with quality considerations in planning the statistical program.’ The ESS QAF includes indicator 1.5, ‘The statistical work programmes are published and periodic reports describe progress made.’ The reporting of progress is included in a later indicator in this framework.

Example questions:

- Has a work programme been established including development plans and improvements to quality?

- Where the data sources, processes and outputs cut across multiple teams, does the work programme cover the full end-to-end process?
- Is the work programme published? If so, where?
- How often is the work programme reviewed?

1.6 User involvement in developing plans

Indicator 1.6: Users and other stakeholders help develop and prioritise statistical plans.

Users and other stakeholders will often know most about whether the statistics are fit for their purpose and meet their needs. They will know the quality issues that have the most effect on them and their use of the statistics. Therefore, users and other stakeholders should be involved in developing and prioritising statistical plans. Different users may have different priorities, but understanding these different perspectives will help producers to understand the effect of prioritising some developments over others.

This indicator is derived from the last part of Code practice T4.2 with the addition of users and stakeholders helping in developing plans as well as prioritising them. The ESS QAF has a similar indicator, 11.2: 'Priority needs are being met and reflected in the work programme'.

Example questions:

- How are users and stakeholders involved in helping to develop and prioritise statistical plans?
- Is a wide range of users involved and, if so, how?
- Have users or stakeholders raised any concerns around prioritisation?

1.7 Transparency of progress towards plans

Indicator 1.7: Statistics producers are open about progress towards meeting development priorities and objectives.

As well as publishing development plans, updating them and involving users and stakeholders in their development, producers should also be transparent about progress towards meeting them. Transparency here will help users understand when changes might be implemented to statistics and the barriers to making them. Discussions around plans and priorities should be an ongoing dialogue to ensure that the statistics can best meet user needs whilst balancing resources and other constraints.

This indicator is derived from the second part of Code practice T4.2. It also features in Code practice V4.1 around being transparent in conducting development activities. The ESS QAF indicator 1.5 includes the requirement 'periodic reports describe progress made'.

Example questions:

- Is the producer open about progress towards meeting development priorities and objectives?

- If so, where is this information published or communicated?

1.8 Transparency of prioritisation decisions

Indicator 1.8 Producers are transparent about prioritisation and how decisions on priorities affect quality.

Constraints such as resources, time, availability of data sources and systems mean that producers have to make decisions about what to prioritise. Sometimes these decisions will be within the team producing a set of statistics. Sometimes they will be across statistical outputs or even organisations. Each development will have different effects on quality and the ability of the statistics to meet user needs. Producers should be transparent about where they have taken prioritisation decisions, how those decisions have been made and what effect the prioritisation has had on all the statistics involved. This enables more-informed discussions with stakeholders about priorities in ensuring quality.

This indicator is derived from the third part of Code practice T4.2 and has been developed from learning from our pilot assessments and in discussion with stakeholders. It was apparent that it is not always clear what decisions have been made about priorities and the effects on quality. The effects on quality of these decisions were significant enough for us to include an indicator on this specifically.

Example questions:

- How transparent is the producer about prioritisation decisions it has taken?

- Is it clear how decisions on priorities affect quality?

2. Suitable data sources

The Code of Practice for Statistics states that statistics should be based on the most appropriate data to meet intended uses. The effect of any data limitations on use should be assessed, minimised and explained. Adherence to these indicators ensures that data sources are suitable.

2.1 Appropriateness and quality of source data

Indicator 2.1 Statistics are based on data sources that are appropriate for the intended uses. Producers evaluate appropriate quality dimensions in relation to data sources to ensure that statistics are suitable for the intended uses.

A range of data sources are used in the production of UK economic statistics. These can include surveys, administrative data, data gathered from websites or third parties, modelled estimates and alternative data sources, such as web-scraped data or scanner data. In some cases, there may be more than one data source, each with its own strengths and limitations. Producers should evaluate these data sources against the most relevant quality dimensions.

The most relevant quality dimensions will vary according to the source. Examples of quality dimensions that could be used to assess the quality of input data include the European Statistical System dimensions of quality and the UK Government Data Quality Framework. The ESS dimensions are designed for reporting output quality, but as the inputs to a set of statistics are often the output from another, these dimensions may prove useful. For administrative sources, the producer team should have evaluated the completeness of the dataset both in terms of the population of interest and the level of missing values and any differences between the concept being collected and the concept of interest, such as national accounting versus commercial accounting concepts. For survey sources, we would expect producer teams to have evaluated the suitability of the sample sizes, questionnaire design, response rates and sampling errors associated with the survey as well as other dimensions, such as timeliness. For modelled estimates, the producer team should have evaluated the assumptions of the model, the sensitivity of estimates to these assumptions and the scale of modelling errors. For other data sources, such as web-scraped or scanner data, producers should identify the most appropriate quality dimensions and ensure that they understand the fitness for purpose of the data source. Our Quality Assurance of Administrative Data (QAAD) toolkit provides guidance to producers about the practices they can adopt to assure the quality of data they receive whatever the source.

This indicator is derived from the first part of Code practice Q1.1. Both the IMF DQAF and the ESS QAF also include indicators relating to the quality of data sources. For example, the ESS QAF includes indicator 6.2, 'Choices of data sources and statistical methods as well as decisions about the dissemination of statistics are based on statistical considerations'.

Example questions:

- What data sources are used to produce the statistics?
- Considering each data source used in the statistics being assessed in turn, and including sources used for adjustments:
    - For survey sources: What are the sample sizes, response rates and sampling errors of the data? Has good practice been followed in the design of the data collection? How do these factors affect the suitability of the data sources for the purpose? How does the producer mitigate any limitations?
    - For administrative sources: What are the coverage and conceptual limitations of the data? Are there missing values for some observations of interest? How do these factors affect the suitability of the data sources? How does the producer mitigate any limitations?
    - For modelled estimates: What are the assumptions and modelling errors associated with the model? What is the quality of the input data to the model? How have the results been quality assured? How do these factors

affect the suitability of the data sources? How does the producer mitigate any limitations?

    - For alternative data sources: How have the data been collected? What are the coverage and conceptual limitations of the data in relation to the intended use? What are the sources of potential bias? How do these factors affect the suitability of the data sources? How does the producer mitigate any limitations?

- For each data source, has the producer completed a QAAD or similar process to assure themselves that the data are appropriate for the intended uses?
- What information is available to the producer about the quality of the data and is it sufficient to judge quality?
- What quality dimensions has the producer considered and what are the findings for each? Have any issues been identified?
- Have any quality dimensions not been considered? (Think about both the ESS dimensions of quality and the quality dimensions in the QAAD).
- What feedback have users given about the choice of data sources?
- Are the statistics based on appropriate data sources for the intended uses?

2.2 Definitions and concepts of data sources

Indicator 2.2 Data sources are based on definitions and concepts that are suitable approximations of what the statistics aim to measure, or that can be processed to become suitable for producing the statistics.

The definition and concepts used in the source data may not always be the definition or concept that the statistics aim to measure. This can be for a variety of reasons, including the ability of respondents to provide the information in a survey or the purpose of an administrative data source. In using these data sources, the producer needs to consider whether the concepts and definitions are suitable approximations of what the statistics aim to measure and, if not, whether the data can be processed to become suitable.

This indicator is derived from the second part of the Code practice Q1.1. Both the IMF DQAF and the ESS QAF include indicators for the definitions and concepts in source data approximating the required definitions and concepts. For example, IMF DQAF includes indicator 3.1.2, ‘Source data reasonably approximate the definitions, scope, classifications, valuation, and time of recording required.’

Example questions:

- What are the concepts and definitions of the data sources?
- Are they suitable approximations of what the statistics aim to measure?

- What processing, if any, is required to make them suitable?

2.3 Coherence of source data

Indicator 2.3 Source data are coherent across different levels of aggregation, consistent over time, and comparable between geographical areas, whenever possible. Internal coherence of source data is regularly monitored.

Coherence, consistency and comparability are important dimensions of quality, ensuring that comparisons within and across datasets are robust. If data are not coherent across levels of aggregation, then totals will not be able to be compared with more-granular estimates. If data are not consistent over time, then analysis of trends over time will not be possible, and if data are not comparable between geographical areas, then any comparison will not be robust. The coherence within the source data should be monitored to ensure that it does not change over time.

This indicator is derived from the Code practice Q1.4 with wording from the ESS QAF process 14.1.1 added to reflect the monitoring of internal coherence within the source data. The IMF DQAF also includes similar indicators, such as 4.2.1: 'Statistics are consistent within the dataset.'

Example questions:

- Are the source data coherent across levels of aggregation, time and geographical area?
- When was the coherence of the data last monitored? Is coherence considered as a part of regular quality assurance?

2.4 Explanation of data sources

Indicator 2.4 The nature of data sources used, how and why they were selected, and any adjustments applied to them are explained to users.

Where users understand the data sources used to produce statistics, they are better able to understand the quality and suitability of the statistics for their uses. Explaining the data sources used, how and why they were selected, and any adjustments applied to them will aid discussions with users about the quality of the resulting statistics and ensure that they are fit for purpose. Transparency of the data sources will also help the producer of the statistics when there are changes in personnel.

This indicator is derived from the first part of the Code practice Q1.5. Reference to adjustments has been added to reflect that in economic statistics, adjustments are often applied when estimating National Accounting concepts. The ESS QAF includes a similar indicator, 6.4: 'Information on data sources, methods and procedures used is publicly available.'

Example questions:

- Where are the data sources explained to users?
- Do these explanations include information on how and why the data sources were selected and any adjustments applied to them?

2.5 Explanation of the quality of source data

Indicator 2.5 Quality of the source data, including potential bias, uncertainty and possible distortive effects, is explained to users and the extent of any impact on the statistics clearly reported.

In addition to explaining the data sources used to users of the statistics, it is important that the producer also explains the quality of the source data used in the statistics. Things to acknowledge include potential bias, uncertainty or possible distortive effects in the source data. Clearly explaining potential quality issues to users will aid informed discussions on the quality of the resulting statistics for each use and will also help when there are changes in personnel in the producer team.

This indicator is derived from the second part of the Code practice Q1.5.

Example questions:

- Where is the quality of the data sources explained to users?
- Do these explanations include information on potential bias, uncertainty and distortive effects and the impact on the statistics?

2.6 Limitations of data sources

Indicator 2.6 The limitations of data sources are identified and addressed where possible. Statistics producers are open about the extent to which limitations can be overcome and the effect on the statistics.

Understanding the limitations of the data sources used to produce statistics is important for understanding their quality. It is rare that a data source perfectly matches the required concepts, coverage and completeness. Therefore, identifying the limitations of the available data sources, understanding the underlying causes and seeking ways to address them, where possible, will help improve the quality of the statistics. Producers should be open about the extent to which limitations can be overcome and the effect on the statistics so that the quality and fitness for purpose of the statistics are understood.

This indicator is derived from the Code practice Q1.6.

Example questions:

- What causes of limitations in the data sources have been identified?
- How have these limitations been mitigated?
- How have producers been open about the extent to which limitations can be overcome and the effect on statistics?

2.7 Relationships with data suppliers

Indicator 2.7 Producers establish and maintain constructive relationships with those involved in the collection, recording, supplying, linking and quality assurance of data.

The relationship between a producer team and those involved in the collection, recording, supplying, linking and quality assurance of data is key to ensuring the quality of source data. These relationships enable communication that aids the producer's understanding of the quality of the source data and the supplier's understanding of the quality dimensions that are important for the intended uses. Concerns around the data are more effectively communicated and resolved where these relationships are strong.

This indicator is derived from the Code practice Q1.2. The ESS QAF includes a related indicator, 8.7, which states 'Statistical authorities co-operate with holders of administrative and other data in assuring data quality.'

Example questions:

- What are the relationships between the producer and those collecting, recording, supplying, linking and quality-assuring the data?
- How do these relationships help ensure the data are suitable and of the required quality?
- How are those relationships maintained?
- Have the suppliers raised any concerns around this relationship?

2.8 Statement of data requirements

Indicator 2.8 Producers share a clear statement of data requirements with the organisations that provide that data, setting out decisions on timing, definitions and format of data supply, and explaining how and why the data will be used.

Providing clear statements of the requirements of the data and explanations of how and why the data will be used can help suppliers understand the required quality of the data and the types of concerns that will have the most effect on the use of the data. These statements can be included in Memoranda of Understanding, Service Level Agreements or similar arrangements to help to ensure that appropriate data are supplied, and received, at the required timescales and in the required format. How the receiver of the data can raise queries around the data and any quality concerns could also be included. Agreeing these aspects in advance will improve the quality of the data and enable resources to be used for other improvements to quality rather than chasing or re-formatting data.

This indicator is derived from the Code practice Q1.3. The ESS QAF includes a similar indicator, 8.6, which states 'Agreements are made with holders of administrative and other data which set out their shared commitment to the use of these data for statistical purposes.'

Example questions:

- Does a statement of data requirements exist (for example, a Service Level Agreement or Memorandum of Understanding) for each data source?
- If so, do they set out decisions on timing, definitions and format and explain how and why the data are used?
- Has a feedback mechanism been identified for raising any queries or concerns about quality of the data?

2.9 Source metadata

Indicator 2.9 Producers specify and receive appropriate metadata with each data delivery to ensure the quality of the data is understood.

Whilst statements of data requirements set out the required aspects of data quality that apply to all data deliveries, metadata can also provide quality information about an individual instance of data delivery and help the producer understand the quality of that data delivery. Depending on the type of data source, the metadata may include response rates, levels of missing data, information on real-world context that affect the data (such as adverse weather) or any quality issues that the supplier has identified. Metadata may also include information on strengths and limitations of the data for their intended use. These metadata facilitate conversations about quality and enable the statistics producer team to understand and explain the quality of the resulting statistics to its users.

The Code refers to the provision of metadata to users of statistics but does not explicitly refer to metadata being provided by suppliers of data. This indicator has been included in this framework as the lack of provision of metadata by suppliers is a determinant of the quality of the statistics that are based on that data source. The ESS QAF includes a related process, 8.6.4: ‘Documentation of administrative and other data. The data holder systematically provides the statistical authorities with documentation/metadata about the content of the administrative and other data as well as the production process of the data (e.g. a methodological document, concepts and definitions, and populations)’.

Example questions:

- Do metadata accompany each delivery?
- What metadata are received and how does the producer use the metadata?
- How do the metadata help the producer understand the quality of the data and communicate it clearly to users?

2.10 Regular review of source data

Indicator 2.10 Producers regularly review data sources to ensure that they continue to be suitable.

In addition to evaluating the quality and suitability of data sources when developing new statistics, producers should regularly review the data sources to ensure that they continue to be suitable. Over time, there can be changes in the quality of a data

source, such as reducing response rates or changes to the collection of administrative sources. In addition, new data sources which improve quality may become available.

This indicator relates to Code practice Q3.5 around systemic and periodic reviews on the strengths and limitations of data and methods. Both the IMF DQAF and ESS QAF include indicators around regular reviews of data sources, including the sample selections, questionnaires and comprehensiveness of the sources. For example, the IMF DQAF includes indicator 3.2.1, 'Source data-including censuses, sample surveys and administrative records-are routinely assessed, for example for coverage, sampling error, response error, and non-sampling error; the results of the assessments are monitored and made available to guide statistical processes.'

Example questions:

- When did the producer last review its data sources?
- Were any new or emerging data sources identified which may be more suitable to estimate the concept of interest?
- What were the key findings of those reviews?
- Are there any data sources which have not been recently reviewed? If so, why not?

2.11 Innovation in sourcing data

Indicator 2.11 Producers are innovative with their approach to sourcing data and consider alternative data sources to facilitate better-quality or timelier statistics, where appropriate

As technology has improved, the range of data sources available to producers has increased. Producers should be innovative in evaluating the most suitable data source for the concept that they are estimating and the quality dimensions which are important for their users. A non-traditional data source may provide statistics that are timelier, have a higher periodicity or which have a larger sample and so may have improved accuracy or allow for more-granular statistics. At the same time, producers need to ensure that they have considered any negative effects on quality, such as a decrease in relevance or coherence and comparability. Producers will need to take into account the risks to future stability and supply of the data and the impact of the use of the data on their methods. Looking at international practice for measuring the same concept may also help producers be innovative around sources of data by highlighting the potential of new data sources.

This indicator is aligned with Code principle V4, which encourages innovation and improvement. This principle states that statistics producers should be creative and motivated to improve statistics and data, recognising the potential to harness technological advances for the development of all parts of the production and dissemination process. We have included this indicator in our framework to reflect the drive towards innovation where it can provide improvements in quality and value.

The ESS QAF includes indicator 10.3, ‘Proactive efforts are made to improve the statistical potential of administrative and other data sources and to limit recourse to direct surveys’.

Example questions:

- What innovative ways of sourcing the data, including alternative data sources, has the producer considered?
- What were the benefits and limitations of using these data? Has there been a transparent evaluation of the effect across all quality dimensions?
- Were any new ways of sourcing data implemented? If so, what has been implemented, how and why?
- What are the barriers to investigating and implementing alternative ways of sourcing data?

2.12 Explanation of changes to data sources to users

Indicator 2.12: The effect of changes in the circumstances and context of a data source on the statistics over time should be evaluated. Reasons for any lack of consistency and related implications for use should be clearly explained to users.
Over time, there may be changes in the circumstances or context of a data source. This may be due to changes in the policy environment or changes to a survey such as the sample selection or response rates. The effect of these changes should be evaluated so that their implications for the statistics are understood. If these changes result in a lack of consistency over time or other related implications, then these should be explained to users so that they can assess the continued fitness for purpose of the statistics. Where possible, a consistent time series should be published.

This indicator is derived from the Code practice Q1.7. The ESS QAF also includes indicator 14.2, ‘Statistics are comparable over a reasonable period of time’.

Example questions:

- Have there been any changes in the circumstances and context of the data sources? If so, what implications are there for the statistics?
- Where have reasons for a lack of consistency and related implications been explained to users?
- Are the explanations clear?
- Has a consistent time series been published, where possible?

2.13 Monitor and minimise burden

Indicator 2.13: Statistics producers are transparent in their approach to monitoring and reducing the burden on those providing their information, and on those involved in collecting, recording and supplying data. The burden imposed should be proportionate to the benefits arising from the use of the statistics.

As set out in the Government Analysis Function guidance on Monitoring and reducing respondent burden, response burden can affect response quality through non-response or attrition to surveys. In addition, where the burden of providing data is high, respondents might get survey fatigue, which may lower the quality of their responses. The fewer data people are asked to provide, and the quicker and easier data collections are to complete, the higher the quality of the data is likely to be. Statistics producers should therefore take measures to monitor and reduce response burden, through balancing it with user need, to help maximise the quality of their data. In a similar way, reducing burden on those involved in collecting, recording and supplying data, whether from survey, administrative or alternative data sources, will help to ensure the quality of the data.

This indicator is derived from Code practice V5.5. It appears in the efficiency and proportionality principle of the Value pillar and, as described above, is key to ensuring quality. The ESS QAF has several indicators around non-excessive burden on respondents under Principle 9, 'The response burden is proportionate to the needs of the users and is not excessive for respondents. The statistical authorities monitor the response burden and set targets for its reduction over time'.

Example questions:

- What is the producer's approach to monitoring and reducing burden on those providing their information?
- How transparent is the approach? For example, is there public information on it?
- What is the producer's approach to monitoring and reducing burden on those collecting, recording and supplying data?

2.14 Collaborate to maximise use of data

Indicator 2.14: Statistics producers communicate and collaborate with others to maximise their use of administrative data, data sharing, cross analysis of sources and the re-use of data to avoid duplicating requests for information.

Re-use of data can help ensure quality through reducing burden on those collecting, recording and supplying data, providing additional evidence for validation and enabling cross analysis of sources. It also increases the use of the data for different purposes, which can increase the amount of validation of the data. Communicating and collaborating with others, whether they are holders of additional data or potential users, helps maximise the use of the data to deliver these quality benefits.

This indicator is derived from Code practice V5.1, with emphasis on communication and collaboration added. The indicator is supplemented with wording from the ESS QAF around avoiding duplicating requests for information. The ESS QAF also has a similar indicator, 9.5: ‘Data sharing and data integration, while adhering to confidentiality and data protection requirements, are promoted to minimise response burden.’

Example questions:

- How has the producer communicated and collaborated with others to maximise the use of data?
- How else has the producer maximised its use of administrative data, data sharing, cross analysis of sources and the re-use of data?
- What are the barriers to collaborating with others to maximise the use of administrative data, data sharing, cross analysis of sources and the re-use of data?

3. Sound Methods

The Code states that producers of statistics and data should use the best available methods and recognised standards and be open about their decisions. Adherence to these practices ensures that methods are sound.

3.1 Use of appropriate methods and processes

Indicator 3.1: Methods and processes are appropriate and based on national and international good practice, scientific principles or established professional consensus.

Statistics should be produced using appropriate methods and processes. There may be more than one available method that could be used, and different methods might be suitable for meeting different user needs.

Using methods that are based on national or international good practice, scientific principles or established professional consensus can help ensure that the methods are robust. It also aids comparability and consistency between sets of statistics that are estimating the same thing for different countries or similar concepts. As the UK no longer has a legal requirement to meet European standards, there may be more than one set of international guidance that the UK could follow. Equally, in some cases, there may be more than one method that is based on established good practice, or there may not be professional consensus around the best method. In these cases, producers should consider methods against the quality criteria which meet the needs of UK users. There should be a clear rationale for the choice of methods and processes.

This indicator is derived from the Code practice Q2.1. Both the IMF DQAF and ESS QAF include similar indicators around methodological soundness and the use of international good practice.

Example questions:

- What methods and processes are used in the production of these statistics?
- Are the methods and processes used appropriate for the intended uses of the statistics?
- What national or international good practice, scientific principles or established professional consensus are the methods based on?
- How were the methods and processes chosen?
- What quality criteria were considered in choosing methods and processes?
- What feedback have users given about the choices of methods and processes?
- How does the producer ensure that outputs are produced in line with the stated methods?

3.2 Use of recognised standards, classifications and definitions

Indicator 3.2: Statistics, data and metadata are compiled using national and international recognised standards, classifications and definitions which are harmonised to be consistent and coherent with related statistics and data where possible.

As well as following good practice in methods, the use of recognised standards, classifications and definitions also improves the quality of statistics. This is particularly the case for economic statistics where the framework of National Accounts requires estimates of multiple concepts for the same industries or products and the same concepts for different sectors. The use of recognised standards, classifications and definitions makes this possible. Following international standards enables estimates to also be comparable between different countries.

This indicator is derived from the first part of the Code practice Q2.2. The practice has been split to distinguish between following recognised standards, classifications and definitions and the need to explain any deviations to users. International standards are emphasised for this framework due to their important role in economic statistics. Similar indicators are included in both the IMF DQAF and ESS QAF.

Example questions:

- What standards, classifications and definitions are used to compile the data?
- Are these recognised standards, classifications or definitions?

- What feedback have users provided about the standards, classifications and definitions?
- Are the standards, classifications and definitions consistent and coherent with related statistics and data?
- How does the producer ensure that statistics are produced in line with the stated standards, classifications or definitions?

3.3 Explanation of reasons for deviations from standards

Indicator 3.3: Reasons for deviations from standards, classifications and definitions are clearly explained, including any implications for use of the statistics and data.

Whilst the UK was part of the ESS, it had a legal obligation to follow the international standards, classifications and definitions agreed in the legislation. Since leaving the EU, the UK has greater scope to deviate from these standards and innovate where this enables it to meet domestic statistical needs, while recognising for economic statistics there is often a strong demand for compliance with international standards. Maintaining trust in the resulting statistics will require clear explanations for any deviations and the reasons for them. The implications for the use of the statistics and data, including for international comparisons, will need to be made clear to ensure that statistics are used appropriately.

This indicator is derived from the second part of the Code practice 2.2. Whilst the ESS QAF requires the consistent application of standards due to its context in the production of European statistics, the IMF DQAF requires the overall structure to follow internationally accepted standards and for classifications to be 'broadly' consistent. Although this indicator does not require the UK to fully follow the international standards, classifications and definitions, it is not out of line with the international frameworks as the UK context now enables deviation where that better meets users' needs.

Example questions:

- Are there any deviations from standards, classifications and definitions?
- What are the reasons for any deviations from standards?
- Where are these reasons explained and how clear is the explanation?
- Are the implications for the use of the statistics explained?

3.4 Transparency of methods

Indicator 3.4: Producers are transparent about the methods, standards, classifications and definitions used, giving the reasons for their selection. The level of detail is proportionate to the complexity of the methods chosen and reflects the needs of different types of users and uses. Published methods information is reviewed and updated whenever needed.

By clearly explaining the methods, standards, classifications and definitions used in production of statistics, including the reasons for their selection, producers enable their users to understand whether the statistics are fit for their purpose. Such explanations provide important information about the relevance, accuracy, coherence and comparability of the statistics. Different users will require different levels of detail and technical information, and these different audiences should be catered for. Producers could also consider different ways to explain the methods used to meet the needs of different audiences. The level of detail should be proportionate to the complexity of the methods. More-complex methods may require a greater level of detail. Published information should be reviewed and updated whenever there are changes to the methods, standards, classifications or definitions. Being transparent about this information can also help producer teams when there are changes in personnel.

This indicator is derived from the Code practice Q2.3 and has been expanded to specifically highlight standards, classifications and definitions. The need to keep methods information up to date has also been added based on experience from the pilot assessments. A similar indicator, indicator 6.4, is included in the ESS QAF: 'Information on data sources, methods and procedures used is publicly available'.

Example questions:

- Where are methods, standards, classifications and definitions described? Are relevant levels of detail readily accessible for different audiences, such that the information that they need to inform their use is clear?
- Are the explanations transparent?
- Is the level of detail proportionate to the complexity of the methods?
- Do the explanations reflect the different types of users and uses?
- When were the explanations last reviewed and updated?
- In the course of the assessment, did we find that the latest published guidance or background information was out of date?

3.5 Explanation of limitations of methods

Indicator 3.5: Limitations of the methods and their application are identified and explained to users, including the effect on the statistics and their use.

Understanding the limitations of the methods being used to produce statistics is important for understanding their quality. The selection of methods will often involve

balancing competing requirements such as accuracy, timeliness and ease of application and explanation. Identifying how these competing priorities have been balanced, and the constraints on the chosen methods, will help identify any limitations of the methods. These competing priorities and constraints should be clearly explained to users, including the effect on the statistics, to aid understanding about the fitness for purpose of the statistics for their use.

This indicator is derived from the Code practice Q2.4. Reference to bias and uncertainty has been removed as an indicator covering these concepts has been added in the Assured Quality principle of this framework. Explicit reference to limitations of methods is not included in the international frameworks.

Example questions:

- Have any limitations of the methods and their application been identified by the producers, users or the OSR team?
- Have limitations of the methods been explained the users, including the effect on the statistics and their use?

3.6 Advance notice of changes to methods

Indicator 3.6: Producers of statistics and data provide users with advance notice about changes to methods, explaining why the changes are being made. Users are made aware of the nature, extent and effect of the changes.

When changes are made to methods, users should be provided with advance notice so that they can understand the likely impact on their use of the statistics. It is important that users understand why the changes are being made and the nature, extent and impact of them. This will help users understand whether the statistics will still meet their needs. It also helps ensure that statistics are not misunderstood when they are released. For example, if the change in method affects the trend in the statistics.

This indicator is derived from the Code practice Q2.5 with the added provision that the change's effect should be clearly specified alongside the nature and extent of the change added to the indicator. The requirement for a consistent back series, where possible, has been removed as a separate indicator covering this has been included. Both the IMF DQAF and the ESS QAF include indicators for providing advance notice of changes to methods.

Example questions:

- Have any changes been made to the methods in recent years?
- Were users provided with advance notice of changes?
- Were reasons for the changes given along with the nature, extent and effect of the changes?

3.7 User feedback on changes to methods

Indicator 3.7: Producers seek and implement, where appropriate, feedback from users about changes to methods.

When making changes to methods, producers should seek feedback from users about the changes and the likely impact on their use of the statistics. Users of statistics will be best placed to understand the effect of the change on their use and their views should be sought and, where appropriate, implemented to ensure that statistics remain fit for purpose.

This indicator has been added to make the need to engage with users over changes to methods explicit and is in line with the Code practice V4.3, which states that users should be involved in the ongoing development of statistics and data, exploring and testing statistical innovations, so that the statistics remain relevant and useful. The ESS QAF includes indicator 15.6, 'users are kept informed about the methodology of statistical processes including the use and integration of administrative and other data'.

Example questions:

- Did the producer seek and implement, where appropriate, feedback about any methods changes?
- Did the producer provide information back to users on the changes made as a result of user feedback?

3.8 Consistent time series

Indicator 3.8: Where a change in methods leads to a break in the time series, a consistent time series is produced, with back series provided where possible.

Innovation and changes in technology or the availability of data sources may lead to a change in methods. Where a change leads to a break in the time series, a consistent time series is often needed by users and should be provided where possible. This reduces the risk of changes in the series being attributed to 'real-world' change where they are due to a change in methods. Many users of statistics are interested in making comparisons of changes over time. The ability to do this is an important determinant of whether the statistics are fit for their purpose.

This indicator is derived from the middle part of the Code practice Q2.5. It has been amended with wording from ESS indicator 14.2.3 around breaks in the time series to make the issue explicit.

Example questions:

- Has a change in methods led to a break in the time series?
- If so, was a consistent time series provided, including a back series?
- How was the back series constructed to ensure that it represented the 'real-world' change over time?

- What were the constraints in developing the back series and what impact did these have?

- If a consistent time series or back series was not provided, what were the barriers to providing it?

3.9 Collaboration to improve methods

Indicator 3.9: Statistics producers collaborate with topic and methods experts, the scientific and international community and producers of related statistics and data to improve methods wherever possible.

There is a wealth of knowledge and experience about the production and use of statistics that can help with developing and improving methods. By collaborating with topic and methods experts, the scientific community, the international community and producers of related statistics, producers can tap into this knowledge to improve their own methods wherever possible. Collaboration has the potential to improve the quality of statistics as well as potentially improving coherence and comparability, which will bring quality gains of their own. Each producer team should take responsibility for collaborating to improve methods. In larger organisations, such as ONS, central functions may also collaborate with the scientific and international community to establish general principles or develop new cutting-edge methods.

This indicator is derived from the Code practice Q2.6 with reference to the scientific community added from the ESS QAF indicator 7.7. Wording was also added to reinforce that collaboration can improve methods. This indicator is closely aligned with ESS QAF indicator 7.7, which states ‘Statistical authorities maintain and develop cooperation with the scientific community to improve methodology, the effectiveness of the methods implemented and to promote better tools when feasible.’

Example questions:

- When has the producer collaborated with topic and methods experts and the scientific community over improvements to methods?

- When has the producer collaborated with the international community over improvements to methods?

- When has the producer collaborated with producers of related statistics over improvements to methods?

3.10 Up-to-date knowledge of developments

Indicator 3.10: Producers keep up to date with developments that might improve methods and quality. They assess the added value of potential improvements and evaluate the likely impact on the statistics, including in relation to comparability and coherence.

As a result of improvements to technology, increases in data collection and other developments, there may be opportunities to improve methods and quality. Producers should keep up to date with these developments to enable them to take

advantage of new data or methods when they become available and may improve quality. The added value of potential improvements and effects on the statistics should be evaluated to ensure that statistics remain fit for purpose and meet users' needs.

This indicator is derived from the Code practice V4.5. The ESS QAF includes a similar, indicator 7.7: 'Statistical authorities maintain and develop cooperation with the scientific community to improve methodology, the effectiveness of the methods implemented and to promote better tools when feasible'. There is also an emphasis on innovation and improvement within the international frameworks. Keeping up to date with developments, which could improve quality, is one way of doing this.

Example questions:

- How does the producer keep up to date with developments that might improve methods and quality?
- How has the producer team assessed the value added of potential improvements and likely effects on the statistics, including in relation to comparability and coherence?
- How has the producer team balanced completing priorities for improvements?

3.11 Independent internal and external review

Indicator 3.11: Producers seek independent internal and external review of their statistical methods and are open to identified areas for improvement.

Independent review of methods and processes can provide useful feedback on the quality of statistics and identify ways in which it can be improved. Independent review can take different forms, and we are not explicit about which ways should be used. It can include peer review, methods show-and-tell sessions, use of expert panels or formal quality reviews. In the context of UK economic statistics, openness to identified areas for improvement may include whether recommendations from the 2016 Independent review of UK economic statistics and the 2014 National Statistics Quality Review of National Accounts and Balance of Payment statistics have been implemented or whether the methods have changed following review by the Economic Statistics Centre of Excellence or an appropriate external technical panel. For some areas, there may be other specific reviews of relevance, such as the 2015 UK Consumer Prices review. These all provide opportunities to improve quality, and producers should be open to making improvements in areas identified as needing them.

This indicator is based on the Code practice T4.6 but is less specific about the types of independent review that could be undertaken. The indicator has also been made more specific about the reviews being carried out on methods and statistical processes so as to focus on the quality of the statistics. The ESS QAF includes a similar indicator, 4.4: 'There is a regular and thorough review of the key statistical outputs using also external experts where appropriate.'

Example questions:

- Have the statistics been subject to a formal independent review?
- If so, what did the review find?
- What other forms of independent review are undertaken (for example, peer review or expert panels)
- What have these found?
- Was the producer open to identified areas for improvement?
- What were the barriers to implementing findings of independent reviews, peer reviews or the suggestions of expert panels?

4. Assured Quality

The Code states that producers of statistics and data should clearly explain how they assure themselves that statistics and data are accurate, reliable, coherent and timely. Adherence to these practices ensures that quality has been assured.

4.1 The environment and organisational culture prioritise quality in statistics

Indicator 4.1 Organisations are open about their commitment to quality, make clear their approach to quality management and create an environment that prioritises quality in statistics. They ensure that the organisational culture, structure and tools are in place to manage quality effectively and promote and adopt appropriate quality standards. Individual sets of statistics are produced in line with the organisation's approach to quality management.

Quality is ensured not just through the approaches and actions of the producer teams responsible for the individual sets of statistics but through an organisational culture and procedures that place a high value on quality. By being open about their commitment to quality and their approach to quality management, both within the organisation and publicly, organisations can ensure they have the right culture and procedures in place. Ensuring that the environment within which statistics are produced makes quality is a priority and that the tools and processes are in place to manage quality effectively can help ensure that quality is prioritised throughout the organisation. The promotion and adoption of appropriate quality standards can further support producer teams in producing quality outcomes.

This indicator is derived from the Code practice T4.5. Similar indicators also exist in the international frameworks. For example, the IMF DQAF includes indicator 0.4.1, 'Processes are in place to focus on quality.' The ESS QAF includes indicator 4.1, 'Quality policy is defined and made available to the public. An organisational structure and tools are in place to deal with quality management.' The requirement

for the statistics being assessed to be produced in line with the organisational approach has been added.

Example questions:

- What information is available on the organisation's commitment to quality and their approach to quality management?
- How does the organisational structure and tools manage quality effectively?
- How does the organisation promote and adopt appropriate quality standards?
- Are the statistics produced in line with the organisation approach to quality management?

4.2 Quality meets users' needs

Indicator 4.2: Statistics are produced to a level of quality that meets users' needs. The strengths and limitations of the statistics and data are evaluated in relation to different uses, and trade-offs between dimensions of quality are fully understood.
Statistics will often have several different uses and different strengths and limitations in relation to each. Producers should evaluate the strengths and limitations of their statistics and data in relation to the known and anticipated uses of key users but also proactively explore other potential uses of the data. Where there are competing priorities between different dimensions of quality, these should be fully understood and the implications of decisions on the different uses of the statistics fully explored to ensure that the quality meets users' needs.

This indicator is derived from the Code practice Q3.1 with references to trade-offs between dimensions of quality added to reflect wording in the ESS QAF indicator 4.3, 'Output quality is regularly monitored, assessed with regard to possible trade-offs, and reported according to the quality criteria for European Statistics'. The part of the Code practice around the strengths and limitations being clearly explained to users has been moved to a later indicator on transparency of output quality.

Example questions:

- What are the strengths and limitations of the statistics in relation to the different intended uses?
- What are the competing priorities for quality between different uses?
- What are the competing priorities between different dimensions of quality across a range of uses?
- What attempts has the producer made to evaluate the strengths and weaknesses of the statistics and data beyond the known and anticipated uses of key users?

4.3 Proactive user engagement around quality

Indicator 4.3: The producer actively seeks, and acts on, input from users about all dimensions of quality of the statistics and data through proactive user engagement.

Users of statistics and data should be at the centre of decisions about statistics. Their needs should be understood, and their views sought and acted on. As a key aspect of quality is that statistics fit their intended uses, it is important that producers actively seek user input through proactive user engagement. This feedback should include satisfaction with, and emerging needs, around all dimensions of quality. This will enable producers to understand the competing priorities between dimensions of quality for different uses and where user needs are not being met, facilitating discussion on the highest priority improvements to quality that are required.

This indicator is derived from the Code practice V1.3, 'User satisfaction with the relevance and usefulness of the statistics and data should be reviewed routinely. This should consider the timeliness, accessibility, clarity and accuracy of the statistics and data.' The ESS QAF has a similar indicator, 11.3, 'User satisfaction is monitored on a regular basis and is systematically followed up', and the IMF DQAF includes an indicator about monitoring the relevance and practical utility of existing statistics in meeting user needs.

Example questions:

- How does the producer actively seek input on user satisfaction with the quality of the statistics and data?
- What forms of proactive engagement does the producer use?
- What input from users has the producer recently received and what improvements did the producer make as a result of the feedback?
- How were users informed of improvements to quality as a result of proactive user engagement?

4.4 Accuracy and communication of uncertainty and bias

Indicator 4.4. User needs around the accuracy of the statistics are considered and the nature and scale of any uncertainty and bias in the estimates are understood and clearly explained.

A key determinant of quality of statistics is their accuracy, that is, the difference between the estimate and the true value. Uncertainty and bias are inherent in all statistics to a varying degree and should be understood by the producer team as part of understanding the quality of their statistics and data. Different users may have different requirements around the accuracy of the statistics depending on their use. Producers should understand user needs for accuracy and factor this into their methods and processes. The nature and scale of uncertainty and bias should be explored and the effect on the statistics understood and communicated. As set out in our report Approaches to presenting uncertainty in the statistical system, ensuring that uncertainty around estimates is conveyed well is critical to the appropriate use and interpretation of statistics. Our report also found that different users may want

different information about uncertainty depending on the nature of the decisions they're faced with making and their level of expertise. Guidance on communicating uncertainty has been published by the Government Analysis Function to support analysts.

This indicator is derived from the last part of Code practice Q3.3 with explicit reference to accuracy and to understanding and communicating bias added.

Example questions:

- What information does the producer have on the required level of accuracy of their statistics?
- How does this inform choices of methods and processes?
- How does the producer ensure that the statistics are as accurate as possible?
- Do the statistics meet these requirements and are estimates of uncertainty and bias published?
- Where and how is uncertainty and bias explained to users?
- Has the producer followed the guidance on communicating uncertainty?
- How well are uncertainty and bias understood by the producer and users? What steps has the producer taken to better understand them in relation to their statistics?

4.5 Timeliness

Indicator 4.5: Statistics and data are released on a timely basis and at intervals that meet the needs of users as far as practicable. The statistics are released as soon as they are considered ready.

A key dimension of quality for users is the timeliness of the statistics. This relates both to how long after the end of the reference period the statistics are published and the frequency of the publication. As we have commented on in our State of the Statistical System 2022/23 report, there is continued demand for more-timely statistics. Increased timeliness creates tension with other dimensions of quality as more-timely statistics may be based on fewer data, and so have reduced accuracy, or on data that do not match the concept of interest as closely. Producers should have a clear understanding of users' needs around the timeliness of statistics and data and be transparent about the impact of meeting those needs on other dimensions of quality.

The Code discusses timeliness in all three pillars – Trustworthiness, Quality and Value. The wording of this indicator has come from the practice T3.5 in the Trustworthiness pillar. In the Quality pillar, timeliness is mentioned in practice Q3.3 around monitoring and reporting on various quality dimensions. In the Value pillar, timeliness is mentioned in a practice around regularly reviewing user satisfaction. The need for regular reviews of user satisfaction is included in this framework in a

later indicator. Both the IMF DQAF and ESS QAF include indicators specifically around periodicity and timeliness meeting dissemination standards in line with their role in assuring the quality of statistics provided to them.

Example questions:

- What is the timeliness and frequency of the statistics?
- How has the timeliness and frequency of the statistics been determined?
- Which user needs does this timeliness and frequency meet and are there any user needs that are not met? If so, why not?
- Are the statistics released as soon as ready or is the timing driven by other considerations?

4.6 Granularity

Indicator 4.6: Statistics are published to a level of detail that meets users' needs whilst protecting confidentiality. Information about quality should be provided alongside granular estimates to support their appropriate use.

Many users of statistics and data have an interest in statistics below the headline national figures. This can be due to a desire to understand the headline statistics better or an interest in sub-populations. It is important that more-granular statistics are produced to meet user needs, whilst protecting confidentiality, to ensure the relevance of the statistics. The quality of these more-granular estimates may be different to that of the headline statistics due to smaller sample sizes or different sources or methods being used to produce the estimates. In addition, statistical disclosure control methods may affect the quality of the statistics, for example, due to rounding techniques affecting accuracy. Producers should seek to understand the quality of granular estimates and communicate it to users alongside the estimates to support their appropriate use.

This indicator is derived from Code practice V2.4. Elements around protecting confidentiality and providing information about the quality of granular estimates have been added. The indicator was included in this framework following stakeholder feedback on the importance of granularity including during our pilot assessments, which found that the availability and quality of more-granular statistics was a key concern of users. The IMF DQAF mentions granularity in a practice on data users being consulted or kept informed on specific aspects of current data, including the usefulness in terms of detail. The ESS QAF includes indicator 3.2, 'The scope, detail and cost of statistics are commensurate with needs. '

Example questions:

- What is the lowest level of disaggregation published?
- Does this level of granularity meet user needs?

- What quality information is provided alongside granular estimates to support their appropriate use?

- Does the producer actively seek feedback from users of granular estimates about the data quality issues faced and act on the feedback to improve quality where possible?

4.7 Transparency of output quality

Indicator 4.7: The quality of the statistics and data, including their accuracy and reliability, coherence and comparability, and timeliness and punctuality, is monitored and reported regularly.

In order for users to use statistics effectively and appropriately, they need to understand the quality of the statistics and data. Understanding the accuracy and reliability of the statistics and data can ensure that they do not place too much weight on the statistics or make decisions based on small movements in trends or differences between groups where this is not appropriate. Understanding the coherence and comparability of the statistics and data enables users to only make appropriate comparisons between time periods, geographic areas or data sources. Understanding the timeliness and punctuality of statistics and data enables users to understand to which time period the statistics refer and whether that is suitable for their needs. Providing this information clearly alongside the statistics and data ensures that users have the information they need to not misuse the data. Producer teams should regularly monitor all these dimensions of quality, and any other suitable quality dimensions, and report on them to ensure that users of the statistics and data understand the fitness for their use and can use them appropriately.

This indicator is derived from the first part of the Code practice Q3.3. The ESS QAF includes a similar indicator, 15.7: ‘Users are kept informed about the quality of statistical outputs with respect to the quality criteria for European Statistics.’

Example questions:

- Is there a prominent and clear statement on the quality of the statistics and data included with the statistics, including any data tables, build-your-own table functions or other ways for people to access the data?

- How clear is the producer on the accuracy and reliability, coherence and comparability, and timeliness and punctuality of the statistics and how these relate to intended uses?

- Does the user have sufficient information to not misuse the statistics and data?

- How is the quality monitored?

4.8 Provision of metadata

Indicator 4.8 Up-to-date and relevant metadata are accessible alongside the statistics and data.

Whilst quality dimensions, such as the ESS quality dimensions, provide information on the quality of a set of statistics, metadata provide information on a particular release of that data. The metadata can include a range of indicators, such as the response rates for a survey source or the coverage of an administrative source. These things can change over time, so producer teams should ensure that the metadata are kept up to date and are accessible alongside the statistics and data. Where these metadata are not kept up to date, users can get a misleading impression of the quality of the data.

This indicator is derived from IMF DQAF indicator 5.2, 'Up-to-date and pertinent metadata are made available'. The ESS QAF also includes several indicators on metadata, such as indicator 15.1: 'Statistics and the corresponding metadata are presented, and archived, in a form that facilitates proper interpretation and meaningful comparisons.' It is also reflected in Code practice V1.3.

Example questions:

- What metadata are provided alongside each release of the statistics and data?
- How accessible are the metadata?

4.9 Proportionate quality assurance

Indicator 4.9 Quality assurance arrangements are proportionate to the nature of the quality issues and the importance of the statistics in serving the public good.

Producers should be curious about the statistics that they are producing and explore any unexpected results effectively. The nature of the data sources and methods on which statistics are based varies. Therefore, different sets of statistics and data will require different quality assurance arrangements. Producers should ensure the arrangements are proportionate to the nature of the quality issues and the importance of the statistics in serving the public good. For example, the quality assurance arrangements for statistics that are based on a simple summing of administrative data records with a small user base will be different to the arrangements for a set of statistics that are based on multiple data sources and which are used for a variety of major policy decisions.

This indicator is derived from the first part of the Code practice Q3.2. Similar indicators are not included in the international frameworks. The ESS QAF includes a principle around cost effectiveness, and the IMF DQAF includes indicators around the efficient use of resources.

Example questions:

- Have there been any errors in these statistics in recent years?
- If so, what was the cause of the error and what has been put in place to prevent further errors?

- What are the quality assurance processes, for example has the producer used QAAD? How does the producer ensure that their statistics are error free?
- Are these processes proportionate to the nature of quality issues and the importance of the statistics?
- How does the producer ensure that the quality assurance is proportionate to the nature of quality issues?

4.10 Risk minimisation

Indicator 4.10. The risk quality issues pose to statistics and data and their impact are minimised to an acceptable level for the intended uses, taking users' needs of quality and uncertainty into account.

The risk and impact of quality issues will vary depending on the statistics that are being produced. For some sets of statistics, quality issues will have a larger impact than for others. Producers should aim to understand the intended uses and users' needs regarding quality and uncertainty and take these into account in identifying the impact of quality issues. Users' views on the acceptable risk of quality issues should also be taken into account in developing processes. For example, the processes used for statistics that need a high degree of accuracy and for which there would be a high impact from errors should provide a higher degree of risk minimisation with additional quality assurance processes to ensure that errors do not occur.

This indicator is derived from the last part of the Code practice Q3.2. Risk management is also referred to in the institutional methods underpinning indicator 4.1 in the ESS QAF.

Example questions:

- What is the risk and impact of quality issues on the statistics?
- How are those risks minimised to an acceptable level?
- How are user needs of quality and uncertainty taken into account?

4.11 Application of Reproducible Analytical Pipelines (RAP) principles

Indicator 4.11: Wherever possible, Reproducible Analytical Pipelines (RAP) principles are implemented to embed robust quality management, improve transparency of the process and reduce the risk of errors.

In 2021, OSR published a review called Reproducible, Analytical Pipelines: Overcoming Barriers to adoption. The reproducible analytical pipeline, also known as RAP, is a set of principles and good practice for data analysis and presentation. RAP was developed as a solution to several problems, including time-consuming, error-prone manual processes. RAP combines modern statistical tools with good practice in software development to allow all the steps of statistical production, from input data to the final high-quality output , to be carried out in a sustainable and transparent way. The use of RAP helps ensure the quality of the output through

embedding robust quality management in the statistical production process. It improves the transparency of the process and reduces the risk of errors.

This indicator builds on the practices in the Code, such as T4.3 and T4.5, and reflects our 2021 report and our subsequent focus on supporting producers in using RAP principles to ensure the quality, sustainability and transparency of their processes.

Example questions:

- How have RAP principles been implemented?
- How have processes implemented using RAP principles been validated?
- How are the processes using RAP principles maintained?
- What benefits has the team or organisation seen?
- Are there barriers to implementing and maintaining RAP principles? If so, what are they?

4.12 Validation with other data sources

Indicator 4.12: Statistics are validated through comparison with other relevant statistics and data sources. The validation process is clearly communicated to users.

Other statistics and data sources can provide useful information to validate statistics and assure their quality. Other sources may provide data on related concepts or on concepts that vary in a similar way. By using these sources to validate the statistics, producers can be more confident of their data. This validation process should also be communicated to users so that they can understand how the statistics have been validated and how they relate to other statistics and data.

This indicator is derived from the second Code practice, Q3.3, with the addition of communication of the validation process to users. Similar indicators are included in the international frameworks, for example, the IMF DQAF indicator 4.2.3: ‘Statistics are consistent or reconcilable with those obtained through other data sources and/or statistical frameworks.

Example questions:

- Are statistics validated through comparison with other sources?
- How is that validation communicated to users?

4.13 Transparency of quality assurance

Indicator 4.13. Statistics producers are transparent about the quality assurance approach taken throughout the preparation of the statistics. This includes the aspects of quality assurance carried out by other teams or organisations.

Transparency around the quality assurance approach taken can help users to understand more about the quality of the data. Producers being open about what they have found through being curious in their quality assurance will help users understand the reasons for any unexpected results. It can also help in conversations with stakeholders around the level of quality assurance that is needed. Being transparent around quality assurance can also enable teams to fully understand their own quality assurance approach more fully. It can help improve quality by facilitating collaboration over quality assurance approaches between teams. This transparency should include aspects of quality assurance undertaken by other teams and organisations. This allows for a more rounded understanding of the quality assurance and reduces the potential for either duplication of effort or some quality assurance steps to be missed.

This indicator is derived from Code practice Q3.2. The ESS QAF also includes indicators around information on processes being publicly available.

Example questions:

- What information is available to users on the quality assurance approach?
- Does quality assurance information include quality assurance carried out by other teams or organisations?

4.14 Quality of provisional estimates

Indicator 4.14: Data accuracy and reliability are considered before the publication of preliminary estimates. When preliminary estimates are released, appropriate information is provided to the user about the quality of the published estimates.

For some sets of statistics, there is a user need for more-timely estimates. Producers need to consider whether the accuracy and reliability of preliminary estimates are sufficient for them to be published. These preliminary estimates might be based on a lower response to a survey, prior to a quality assurance-checking exercise on an administrative data source or based on different, more-timely data sources. Producers and users need to understand the quality of these preliminary estimates in relation to subsequent estimates, and appropriate information should be published alongside them. Any additional uncertainty or bias in preliminary estimates should be clearly communicated. In the example of estimating quarterly Gross Domestic Product in the UK, provisional estimates are based on the output approach; subsequent estimates then include income and expenditure approaches. These estimates will then be revised in future years when annual data have been included and supply use balancing is applied. Quarterly estimates of GDP may be revised for many years.

This indicator is derived from practices in the ESS QAF under indicator 13.5, ‘Preliminary results of acceptable aggregate accuracy and reliability can be released

when considered useful.' There are also practices around the dissemination of preliminary results taking account of data accuracy and reliability and appropriate information being provided to the user. The IMF DQAF also includes practices around the 'Assessment and validation of intermediate data and statistical outputs' and 'Preliminary and/or revised/updated data are clearly identified'. Although provisional estimates are not specifically mentioned in the Quality pillar of the Code, this indicator relates to practices on understanding and communicating quality more generally which are widely included in the Code.

Example questions:

- Are preliminary estimates published? If so, how were data accuracy and reliability considered?
- What information is provided to the user about the quality of the provisional information?
- Is this information appropriate and sufficient?

4.15 Explanation of revisions and corrections

Indicator 4.15 Scheduled revisions, or unscheduled corrections that result from errors, are released as soon as possible and explained alongside the statistics, being clear on the scale, nature, cause and impact.

Scheduled revisions and unscheduled corrections should be released as soon as possible to ensure that users have the best-quality estimates available. Schedules for revisions should be transparent. Users should be notified clearly when corrections are made. The revisions and corrections should be clearly explained alongside the statistics so that users can understand the impact on their use of the statistics. These explanations should include clear information on the scale, nature, cause and impact of the revisions and corrections. Where revisions or corrections alter the narrative that the statistics provide, this change in narrative should be made clear to users.

This indicator is adapted from the Code practices Q3.4 and T3.9. Similar practices are included in the international frameworks, such as ESS QAF indicators 6.3, 'Errors discovered in published statistics are corrected at the earliest possible date and publicised', and 8.5, 'Revisions follow standard, well-established and transparent procedures'.

Example questions:

- Are revisions and unscheduled corrections released as soon as possible?
- Is there a revisions and corrections policy and is it adhered to? What examples of its use does the producer provide ?
- Are revisions and unscheduled corrections explained alongside the statistics, being clear on the scale, nature, cause and impact?

4.16 Revisions analysis

Indicator 4.16: Revisions analysis is conducted and published on a regular basis. The analysis examines differences between preliminary and revised estimates where applicable.

Where revisions are routinely made to estimates, revisions analysis provides useful insight into the quality of preliminary estimates, including the amount of uncertainty and any bias in the estimates. It is helpful for producers to understand whether any changes to sources, methods or processes might help improve the quality of preliminary estimates. It is helpful for users in understanding the likely scale of revisions and whether they have historically been in the same direction. Therefore, the analyses should be both conducted and published transparently on a regular basis. There is a variety of measures of the scale of revisions, each of which will bring different insight into the revisions, and producers should consider and engage with users to discuss which are the most useful.

This indicator is derived from practices in the IMF DQAF. These are 3.5.1 (first part), 'Studies and analyses of revisions are carried out routinely and used internally to inform statistical processes', and 4.3.3, 'Studies and analyses of revisions are made public'. The ESS QAF also includes a practice on revision studies. Revision studies or analysis are not explicitly mentioned in the Code but will be part of regular reviews included in Code practice Q3.5 on the strengths and limitations in the data and methods.

Example questions:

- Is revisions analysis conducted?
- Is revisions analysis published on a regular basis?
- Are differences between preliminary and revised estimates analysed?
- Are revisions unbiased?

4.17 Reduction in revisions

Indicator 4.17: Revisions analysis is used to reduce future revisions by informing improvements to sources, methods, processes and outputs, as appropriate.

Producers should ensure that they use the results of any revisions analysis to inform improvements to sources, methods, processes and outputs. Having an understanding of the scale, nature and direction of revisions can help inform improvements through identifying any systemic issues in preliminary estimates. These improvements can help to increase the accuracy of preliminary estimates and reduce future revisions.

This indicator is derived from ESS QAF indicator 12.3, 'Revisions are regularly analysed in order to improve source data, statistical processes and outputs', and the second part of IMF DQAF indicator 3.5.1, 'Studies and analyses of revisions are carried out routinely and used internally to inform statistical processes'. Acting on revision analyses is not explicitly mentioned in the Code but will be part of being

open in addressing issues identified and transparent about decisions as a result of reviews in line with Code practice Q3.5.

Example questions:

- How has revisions analysis been used to inform improvements to sources, methods, processes and outputs?

Comparison with other international quality assessment frameworks

As noted throughout this document, many of the indicators that we have chosen for our quality assessment framework are similar to indicators in the IMF DQAF and the ESS QAF. This gives us confidence that our framework is sufficient to assess the quality of economic statistics in the UK. However, in reviewing the international frameworks, there are some indicators that we have chosen not to include. Predominantly, this is where we believe that the indicators relate to the perception of quality rather than contributing to ensuring quality itself. In most cases, there are practices within the Trustworthiness and Value pillars of the Code that cover the same concepts which align with these indicators. This section describes the main themes of the indicators that we have chosen not to include in our quality assessment framework.

Professional Independence

Both the IMF DQAF and ESS QAF have principles and indicators around the independence of statistical production. These include indicators such as the ESS QAF indicator 1.1, 'The independence of the National Statistical Institutes and Eurostat from political and other external interference in developing, producing and disseminating statistics is specified in law and assured for other statistical authorities', and the IMF DQAF indicator 1.1.1, 'Statistics are produced on an impartial basis'. The Code includes a principle under the Trustworthiness pillar (T2): independent decision making, which includes similar practices. We, in the UK, have legislation which ensures the independent production of statistics produced by the Office for National Statistics, the recognised national statistical institute of the UK, and structures in place to safeguard the statistics produced by government departments. Adherence to this legislation is assessed as part of our broader regulatory work. Therefore, in the UK these factors around independence are more closely related to the perception of quality than to quality itself, and we have chosen not to include such indicators in this quality assessment framework.

Statistical confidentiality

Both the IMF DQAF and ESS QAF include principles and indicators around data being kept confidential and being used solely for statistical purposes. This includes indicators such as indicator 5.1 in the ESS QAF, which states that 'Statistical confidentiality is guaranteed in law'. The Code also includes a principle around data governance which is aligned with the practices in the international frameworks. Statistical confidentiality is important to quality due to the need to ensure that there is

trust in how statistics producers use data. This helps to ensure that people and businesses respond to surveys and are willing for their data to be used. There would be large effects on quality if this trust is broken. However, we have chosen not to include statistical confidentiality in our quality assessment framework. This is because confidentiality itself does not ensure or improve quality. We recognise that constraints relating to confidentiality may affect granularity or accuracy and have made reference to this in indicator 4.6. We are focussing our assessments on the indicators that help to ensure or improve quality.

Cost of statistics

The ESS QAF includes indicators around the cost of the statistics being commensurate with needs and procedures existing to assess and justify demands for new statistics against costs. Cost will often interact with quality in that there needs to be a balance between cost and quality. The Code does not explicitly mention cost, and we have chosen not to include it in our quality assessment framework. The Code does mention efficiency and proportionality, however, and we have reflected this through indicators around minimising burden and reusing data. We have also included indicators around there being sufficient resources and clear prioritisation. Adherence to these indicators should also help ensure that cost is minimised and use of resources are maximised.

Equal access and presentation of statistics

The IMF DQAF includes several indicators around equal access to statistics, the pre-announcing of statistics and the presentation of statistics and availability of statistics. The ESS QAF also includes principle 15, ‘Accessibility and Clarity. European Statistics are presented in a clear and understandable form, released in a suitable and convenient manner, available and accessible on an impartial basis with supporting metadata and guidance.’ These types of indicators are included in practices within the Trustworthiness and Value pillars of the Code. As with independence and statistical confidentiality, these practices contribute to the perception of quality of statistics and trust in the organisations that produce them. We have not included these indicators in the framework explicitly.

Annex A – The framework of indicators for ‘Spotlight on Quality’ assessments

1. Resources, plans and prioritisation

1.1 Sufficient resources

Indicator 1.1: Sufficient human and financial resources are provided to produce statistics that meet users’ needs.

1.2 Good business practices

Indicator 1.2: Good business practices are maintained in the use of resources. Where appropriate, statistics producers take opportunities to share resources and collaborate to achieve common goals and produce coherent statistics.

1.3 Clarity of responsibilities

Indicator 1.3: The responsibility for collecting, processing, quality-assuring and disseminating the statistics is clearly specified.

1.4 Suitable systems

Indicator 1.4: Sustainable, robust and flexible systems are used to produce statistics that meet current user needs and enable innovation and improvement.

1.5 Established development work programme

Indicator 1.5: A development work programme is established, published and regularly reviewed and includes planned improvements to quality.

1.6 User involvement in developing plans

Indicator 1.6: Users and other stakeholders help develop and prioritise statistical plans.

1.7 Transparency of progress towards plans

Indicator 1.7: Statistics producers are open about progress towards meeting development priorities and objectives.

1.8 Transparency of prioritisation decisions

Indicator 1.8 Producers are transparent about prioritisation and how decisions on priorities affect quality.

2. Suitable data sources

2.1 Appropriateness and quality of source data

Indicator 2.1 Statistics are based on data sources that are appropriate for the intended uses. Producers evaluate appropriate quality dimensions in relation to data sources to ensure that statistics are suitable for the intended uses.

2.2 Definitions and concepts of data sources

Indicator 2.2 Data sources are based on definitions and concepts that are suitable approximations of what the statistics aim to measure, or that can be processed to become suitable for producing the statistics.

2.3 Coherence of source data

Indicator 2.3 Source data are coherent across different levels of aggregation, consistent over time, and comparable between geographical areas, whenever possible. Internal coherence of source data is regularly monitored.

2.4 Explanation of data sources

Indicator 2.4 The nature of data sources used, how and why they were selected, and any adjustments applied to them are explained to users.

2.5 Explanation of the quality of source data

Indicator 2.5 Quality of the source data, including potential bias, uncertainty and possible distortive effects, is explained to users and the extent of any impact on the statistics clearly reported.

2.6 Limitations of data sources

Indicator 2.6 The limitations of data sources are identified and addressed where possible. Statistics producers are open about the extent to which limitations can be overcome and the effect on the statistics.

2.7 Relationships with data suppliers

Indicator 2.7 Producers establish and maintain constructive relationships with those involved in the collection, recording, supplying, linking and quality assurance of data.

2.8 Statement of data requirements

Indicator 2.8 Producers share a clear statement of data requirements with the organisations that provide that data, setting out decisions on timing, definitions and format of data supply, and explaining how and why the data will be used.

2.9 Source metadata

Indicator 2.9 Producers specify and receive appropriate metadata with each data delivery to ensure the quality of the data is understood.

2.10 Regular review of source data

Indicator 2.10 Producers regularly review data sources to ensure that they continue to be suitable.

2.11 Innovation in sourcing data

Indicator 2.11 Producers are innovative with their approach to sourcing data and consider alternative data sources to facilitate better-quality or timelier statistics, where appropriate

2.12 Explanation of changes to data sources to users

Indicator 2.12: The effect of changes in the circumstances and context of a data source on the statistics over time should be evaluated. Reasons for any lack of consistency and related implications for use should be clearly explained to users.

2.13 Monitor and minimise burden

Indicator 2.13: Statistics producers are transparent in their approach to monitoring and reducing the burden on those providing their information, and on those involved in collecting, recording and supplying data. The burden imposed should be proportionate to the benefits arising from the use of the statistics.

2.14 Collaborate to maximise use of data

Indicator 2.14: Statistics producers communicate and collaborate with others to maximise their use of administrative data, data sharing, cross analysis of sources and the re-use of data to avoid duplicating requests for information.

3. Sound Methods

3.1 Use of appropriate methods and processes

Indicator 3.1: Methods and processes are appropriate and based on national and international good practice, scientific principles or established professional consensus.

3.2 Use of recognised standards, classifications and definitions

Indicator 3.2: Statistics, data and metadata are compiled using national and international recognised standards, classifications and definitions which are harmonised to be consistent and coherent with related statistics and data where possible.

3.3 Explanation of reasons for deviations from standards

Indicator 3.3: Reasons for deviations from standards, classifications and definitions are clearly explained, including any implications for use of the statistics and data.

3.4 Transparency of methods

Indicator 3.4: Producers are transparent about the methods, standards, classifications and definitions used, giving the reasons for their selection. The level of detail is proportionate to the complexity of the methods chosen and reflects the needs of different types of users and uses. Published methods information is reviewed and updated whenever needed.

3.5 Explanation of limitations of methods

Indicator 3.5: Limitations of the methods and their application are identified and explained to users, including the effect on the statistics and their use.

3.6 Advance notice of changes to methods

Indicator 3.6: Producers of statistics and data provide users with advance notice about changes to methods, explaining why the changes are being made. Users are made aware of the nature, extent and effect of the changes.

3.7 User feedback on changes to methods

3.7: Producers seek and implement, where appropriate, feedback from users about changes to methods.

3.8 Consistent time series

Indicator 3.8: Where a change in methods leads to a break in the time series, a consistent time series is produced, with back series provided where possible.

3.9 Collaboration to improve methods

Indicator 3.9: Statistics producers collaborate with topic and methods experts, the scientific and international community and producers of related statistics and data to improve methods wherever possible.

3.10 Up-to-date knowledge of developments

Indicator 3.10: Producers keep up to date with developments that might improve methods and quality. They assess the added value of potential improvements and evaluate the likely impact on the statistics, including in relation to comparability and coherence.

3.11 Independent internal and external review

Indicator 3.11: Producers seek independent internal and external review of their statistical methods and are open to identified areas for improvement.

4. Assured Quality

4.1 The environment and organisational culture prioritise quality in statistics

Indicator 4.1 Organisations are open about their commitment to quality, make clear their approach to quality management and create an environment which prioritises quality in statistics. They ensure that the organisational culture, structure and tools are in place to manage quality effectively and promote and adopt appropriate quality standards. Individual sets of statistics are produced in line with the organisations approach to quality management.

4.2 Quality meets users' needs

Indicator 4.2: Statistics are produced to a level of quality that meets users' needs. The strengths and limitations of the statistics and data are evaluated in relation to different uses and trade-offs between dimensions of quality are fully understood.

4.3 Proactive user engagement around quality

Indicator 4.3: The producer actively seeks, and acts on, input from users about all dimensions of quality of the statistics and data through proactive user engagement.

4.4 Accuracy and communication of uncertainty and bias

Indicator 4.4. User needs around the accuracy of the statistics are considered and the nature and scale of any uncertainty and bias in the estimates are understood and clearly explained.

4.5 Timeliness

Indicator 4.5: Statistics and data are released on a timely basis and at intervals that meet the needs of users as far as practicable. The statistics are released as soon as they are considered ready.

4.6 Granularity

Indicator 4.6: Statistics are published to a level of detail that meets users' needs whilst protecting confidentiality. Information about quality should be provided alongside granular estimates to support their appropriate use.

4.7 Transparency of output quality

Indicator 4.7: The quality of the statistics and data, including their accuracy and reliability, coherence and comparability, and timeliness and punctuality, is monitored and reported regularly.

4.8 Provision of metadata

Indicator 4.8 Up-to-date and relevant metadata are accessible alongside the statistics and data.

4.9 Proportionate quality assurance

Indicator 4.9 Quality assurance arrangements are proportionate to the nature of the quality issues and the importance of the statistics in serving the public good.

4.10 Risk minimisation

Indicator 4.10. The risk quality issues pose to statistics and data and their impact are minimised to an acceptable level for the intended uses, taking users' needs of quality and uncertainty into account.

4.11 Application of Reproducible Analytical Pipelines (RAP) principles

Indicator 4.11: Wherever possible, Reproducible Analytical Pipelines (RAP) principles are implemented to embed robust quality management, improve transparency of the process and reduce the risk of errors.

4.12 Validation with other data sources

Indicator 4.12: Statistics are validated through comparison with other relevant statistics and data sources. The validation process is clearly communicated to users.

4.13 Transparency of quality assurance

Indicator 4.13. Statistics producers are transparent about the quality assurance approach taken throughout the preparation of the statistics. This includes the aspects of quality assurance carried out by other teams or organisations.

4.14 Quality of provisional estimates

Indicator 4.14: Data accuracy and reliability are considered before the publication of preliminary estimates. When preliminary estimates are released, appropriate information is provided to the user about the quality of the published estimates.

4.15 Explanation of revisions and corrections

Indicator 4.15 Scheduled revisions, or unscheduled corrections that result from errors, are released as soon as possible and explained alongside the statistics, being clear on the scale, nature, cause and impact.

4.16 Revisions analysis

Indicator 4.16: Revisions analysis is conducted and published on a regular basis. The analysis examines differences between preliminary and revised estimates where applicable.

4.17 Reduction in revisions

Indicator 4.17: Revisions analysis is used to reduce future revisions by informing improvements to sources, methods, processes and outputs, as appropriate.