

System for quality assurance of official statistics

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Preface

A new Act relating to official statistics and Statistics Norway (Statistics Act) was adopted on 21 June 2019. The objective of the Act is to promote the development, production and dissemination of official statistics that can help inform the public and support analysis, research, decision-making and general public discourse. Section 5 of the Statistics Act lays down quality requirements for official statistics. Section 6 states that Statistics Norway shall prepare an annual public report to the Ministry of Finance on the quality of official statistics.

In Statistics Norway's letter of allocation for 2021, follow-up of the national statistics programme is referred to as an especially important task. In the letter of allocation, Statistics Norway is requested to submit a proposal for a quality system for official statistics by 1 June 2021. This memo is our response to this request and has been prepared by Statistics Norway in consultation with the Committee for Official Statistics.

Statistisk sentralbyrå, 30 September 2021.

Arvid Olav Lysø

Abstract

The Statistics Act and the letter of allocation for 2021 entail new responsibilities for Statistics Norway. Section 6 of the Statistics Act states that Statistics Norway shall prepare an annual report for the Ministry of Finance on the quality of official statistics. According to the letter of allocation, Statistics Norway shall oversee the monitoring of compliance with the requirements for quality in official statistics and establish a system for following this up. The statistics programme identifies 12 producers of statistics, all of which are involved in the quality assurance work. In consultation with the Committee for Official Statistics, Statistics Norway shall establish a quality system in the first half of 2021 to ensure that work on quality assurance can start in the second half of the year. An initial report on the quality of official statistics shall be submitted to the Ministry in the first half of 2022.

This memo describes a proposal for a quality system for official statistics. The system consists of four general elements:

- i) A framework for the quality of official statistics consisting of the Statistics Act and the European Statistics Code of Practice. This is described in Section 3.
- ii) Methods and tools for measuring the quality of official statistics. Section 4 gives an assessment of established methods and tools, how these can be incorporated into a quality system, and what new methods need to be developed and applied.
- iii) Systems and processes for following up quality. Section 5 describes how the different elements of the system will interact and how quality can be assessed and followed up consistently.
- iv) Actors and their roles. Section 6 examines the responsibilities and roles of the different actors in the quality system for official statistics.

Statistics Norway has developed methods and tools to measure the quality of its own statistics. However, these are not sufficient for assessing and following up the requirements for quality in *all* official statistics as stipulated by the new Statistics Act. New methods and tools are needed to supplement the existing ones in order for Statistics Norway to comply with the requirements in the letter of allocation and be able to oversee the monitoring of compliance with the quality requirements in the framework throughout the statistical system. This will also include active involvement of the other producers and the Committee for Official Statistics.

Quality reviews are systematic assessments of statistics or statistical domains, where emphasis is placed on the production process, output and the user perspective. These provide good and specific information on the quality of the statistics being reviewed, but they fail, however, to include all dimensions of quality. Quality reviews are undertaken for a sample of statistics over time, and the results will not be representative of all official statistics. Eurostat's peer reviews are well known in the Norwegian statistical system. The peer review of Norway in 2014 spurred important improvements in the entire Norwegian statistical system. The upcoming peer review (2021) will provide a basis for a new assessment, not least in light of the changes since 2014. The limitation of peer reviews is that, in principle, they are restricted to European statistics and that they are only conducted every seven years. A third established method involves reporting on quality in administrative data systems that produce source data for many statistics in Statistics Norway. Quality-enhancing measures in these data systems can benefit other official statistics, provided that the same registers are being used.

Statistics Norway believes that the current knowledge base on official statistics is not extensive enough to provide a satisfactory account of the quality in the first quality report, which Statistics Norway is due to submit to the Ministry in 2022. More knowledge is needed about the current

situation in order to be able to propose a final quality system, prioritise quality improvement measures and follow up initiatives over time. It is therefore proposed that two new elements are added to the quality system: quality evaluations among all producers and expanding the quality reviews to include producers other than Statistics Norway.

Quality evaluations of official statistics are to be carried out at regular intervals at all statistical authorities, including Statistics Norway. Quality evaluations will provide knowledge about the internal quality systems that have already been established by the producers of official statistics and that can be developed further. These will be able to measure quality dimensions that are not sufficiently elucidated by established methods and tools. The first evaluation should be included in the knowledge base for the quality report to be submitted in 2022, and Statistics Norway proposes to give priority to a quality evaluation of official statistics in 2021. Eurostat plans to carry out a peer review in Statistics Norway and four other producers of European statistics in November 2021.¹ Seen as a whole, a quality evaluation and Eurostat's peer review in 2021 will provide a good basis for describing the present situation, identifying needs for development and proposing measures for quality improvement in the first report to be submitted in 2022. Similar evaluations will also need to be carried out on a regular basis to follow up measures and produce annual reports on quality after 2022.

Moreover, Statistics Norway proposes that future quality reviews encompass the entire statistics programme, and not only Statistics Norway's statistics as is currently the case. Quality reviews are resource-intensive, and it will not be feasible to review a large sample of statistics each year. It is proposed that the number of quality reviews be increased from three to six per year, and that coverage is shared between the producers of official statistics over time. At the start of 2021, the statistics programme includes 351 statistics. In Statistics Norway's opinion, including somewhat less than one per cent of the annual statistics output in quality reviews is an absolute minimum.

The letter of allocation points out that Statistics Norway as part of this quality system shall provide assistance, advice and guidance, and that various types of tools, manuals or guidelines that can help enhance the quality will be developed. This means that a system for following up quality should include more than evaluating and reporting quality. Statistics Norway has initiated efforts to establish a network for quality and methodology, as well as to develop and provide access to a number of training courses, manuals and other resources. This will facilitate competence enhancement and the sharing of experiences within and between members of the Committee for Official Statistics.

Statistics Norway is the main producer of official statistics and a large user of administrative data for statistical purposes. In addition, Statistics Norway has been tasked with coordinating all official statistics and producing an annual public report on the quality of official statistics. To avoid conflicts between these roles and with other actors in the Norwegian statistical system, it is crucial that the quality assurance work is transparent and well documented. It is essential that other members of the Committee for Official Statistics participate in this work. In this memo, it is proposed that a group of resource persons is established who can participate in the quality assurance work. It will be beneficial to include participants from more producers/committee members in the quality reviews and quality evaluations. The Committee for Official Statistics will also play a key role in the work on the annual report on quality.

¹ Norwegian Directorate of Immigration, Norwegian Directorate of Fisheries, Norwegian Institute of Public Health and Norwegian Institute of Bioeconomy Research.

Statistics Norway estimates that the permanent increase in the need for resources for the quality assurance of official statistics amounts to six man-years. The resource input that we assume will be provided by authorities other than Statistics Norway is not included in the estimate.

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1. Background and objective

A new Act relating to official statistics and Statistics Norway (Statistics Act) was adopted on 21 June 2019 [1]. The objective of the Act is to promote the development, production and dissemination of official statistics that can help inform the public and support analysis, research, decision-making and general public discourse. Section 5 of the Statistics Act lays down quality requirements for official statistics. Section 6 states that Statistics Norway shall prepare an annual public report to the Ministry of Finance on the quality of official statistics, and that a committee for official statistics shall be established. A national programme for official statistics, which will help achieve these objectives, was adopted on 18 December 2020 and remains in force for the period 2021–2023 [2] [3].

Section 3 of the Statistics Act defines official statistics as all statistics that are encompassed by the national programme for official statistics. The National Programme for Official Statistics 2021–2023 is based on an inventory of official statistics mainly within the limits of what is produced by the members of the Committee for Official Statistics. Much of the statistical output is not included in the programme and is therefore not considered official statistics. Examples include detailed governance or administrative statistics. Such statistics are not subject to the quality requirements laid down by the legal framework or the European Statistics Code of Practice.

In Statistics Norway's letter of allocation for 2021, follow-up of the national statistics programme is referred to as an especially important task. Statistics Norway's responsibilities include overseeing the monitoring of compliance with the quality requirements in official statistics and devising a system for following this up. In consultation with the Committee for Official Statistics, Statistics Norway shall establish a quality system in the first half of 2021, which will enable the work on quality assurance to start in the second half of the year. According to the letter of allocation, this will include:

- developing and providing access to tools, manuals, guidelines, training courses and other resources;
- providing assistance, advice and guidance to other producers in the choice of standards and methods for the production and quality assurance of official statistics.

In the letter of allocation, Statistics Norway is requested to submit a proposal for a quality system for official statistics by 1 June 2021. This memo is our response to this request and has been prepared by Statistics Norway in consultation with the Committee for Official Statistics. The quality system and a draft version of this memo were discussed in meetings of the Committee for Official Statistics on 2 December 2020 and 25 March 2021, and different versions of the memo have been submitted to the committee for written comment and input. The work was also presented to the Council for Statistics Norway on 19 February and 22 April 2021. In December 2020, quality assurance was also among the topics at senior executive level meetings between Statistics Norway and the Norwegian Labour and Welfare Administration, the Norwegian Tax Administration, the Norwegian Mapping Authority and the Brønnøysund Register Centre. The memo was also subject to two internal consultation rounds in Statistics Norway in the spring of 2021.

2. System structure

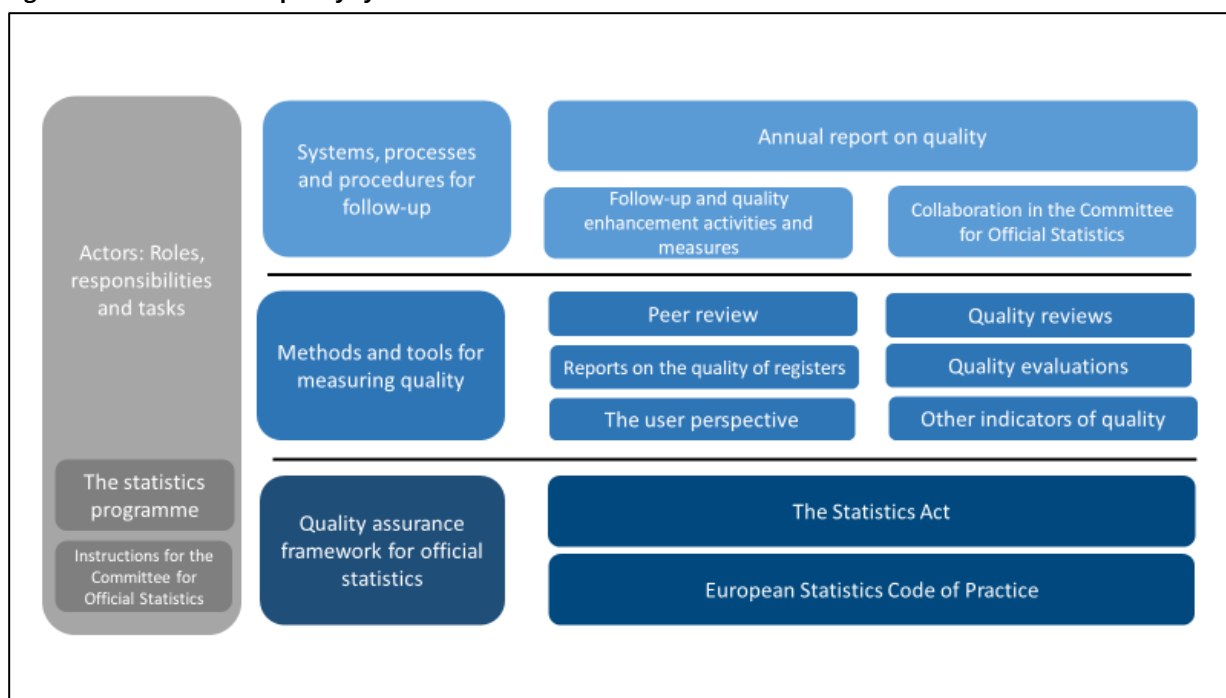
A system for quality and the quality assurance of official statistics must be established and developed over time in pace with the level of ambition and resource availability. It must also be adapted to changes that affect the way in which official statistics are produced, such as technological change and the introduction of new data sources. No system is currently available for assessing the quality of all official statistics and for identifying and following up improvement measures, even though Statistics Norway and other producers are already engaged in enhancing the quality of their own output.

This memo describes a proposal for a quality system for all official statistics, based on the quality assurance components and tools that have already been established and are in use. The system consists of four general elements and is illustrated in Figure 1:

- i) *A framework for quality* in official statistics consisting of the Statistics Act and the European Statistics Code of Practice. This is described in Section 3.
- ii) *Methods and tools for measuring the quality* of official statistics. Section 4 gives an assessment of established methods and tools, how these can be incorporated into a quality system, and what new methods need to be developed and applied.
- iii) *Systems and processes for following up quality*. Section 5 describes how the different components of the system will interact and how quality can be assessed and followed up consistently.
- iv) *Actors and their roles*. Section 6 examines the responsibilities and roles of the different actors in the system for quality in official statistics.

The system consists of frameworks and methods that have already been established, but also new elements that are partly based on existing quality systems. The system also includes completely new elements for measuring and following up quality.

Figure 1. Outline of a quality system for official statistics



3. Quality assurance framework for official statistics

3.1. The legal framework

The requirements for Norwegian official statistics are laid down in Section 5 of the Statistics Act:

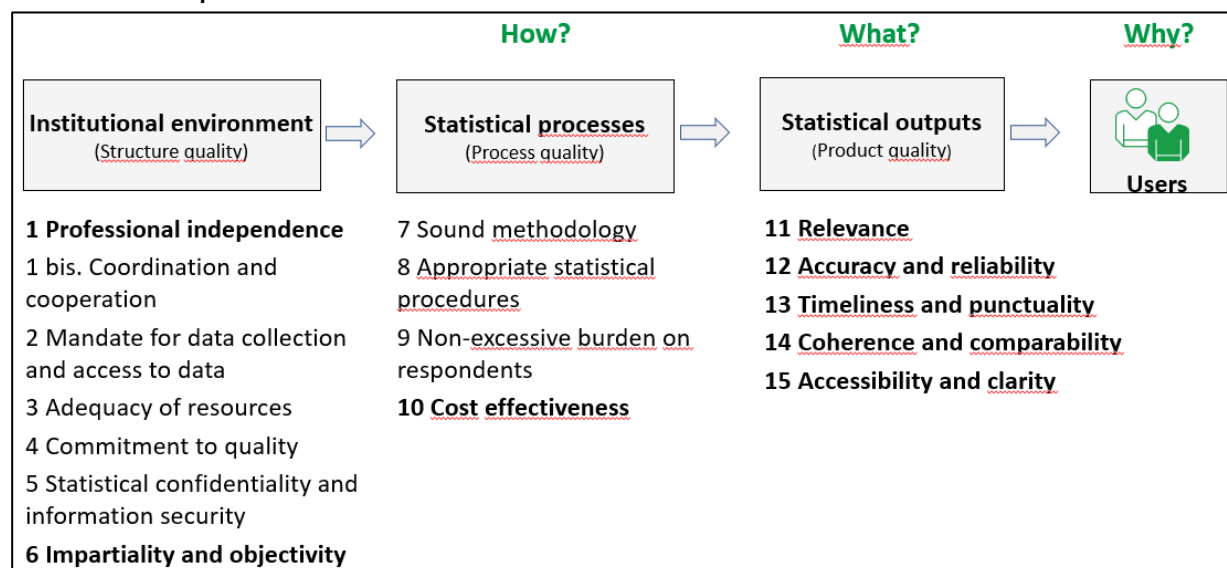
- 1) Official statistics shall be developed, produced and disseminated in a professionally independent, impartial, objective, reliable and cost-effective manner.
- 2) The development, production and dissemination of official statistics shall be based on uniform standards and harmonised methods. The statistics shall be relevant, accurate, timely, punctual, accessible and clear, comparable and coherent.

The requirements in the Statistics Act are consistent with Regulation No. 223/2009 of the European Parliament and of the Council on European statistics [4], which includes quality requirements or guidelines for the development, production and dissemination of European statistics. This regulation has been incorporated into Norwegian law through the EEA Agreement. The UN's fundamental principles for official statistics and the European Statistics Code of Practice combined constitute an international framework for official statistics. The current quality assurance framework for official statistics was established when the Statistics Act came into force in full on 1 January 2021.

3.2. European Statistics Code of Practice

The European Statistics Code of Practice imposes requirements about institutional factors, production processes and statistical output [5]. These requirements are formulated as 16 principles (see Figure 2) and several underlying indicators. The Code of Practice is also supplemented with the Quality Assurance Framework of the European Statistical System, which describes a set of recommended methods or practices [6].

Figure 2. Structure and principles from the European Statistics Code of Practice. Principles marked in bold are incorporated into Section 5 of the Statistics Act



Professional independence and impartiality are core values for producers of official statistics. Independence from political and other external influences on the development, production and dissemination of statistics is a statutory requirement for all authorities that produce official

statistics. For statistical authorities other than Statistics Norway, professional independence applies to the activities linked to the production of official statistics.

Professional independence refers to *how* statistics are produced and *when* they are disseminated. When it comes to *what* and *which* statistics are produced, this must reflect the users' needs. Statistics must be 'fit for purpose', a concept used in the preparatory works of the Statistics Act: The Official Norwegian Report NOU 2018:7 New Act on official statistics and Statistics Norway [7].

The European Statistics Code of Practice has been in place since 2005 and was revised in 2017.

3.3. Description of requirements for official statistics in the statistics programme

The National Programme for Official Statistics 2021–2123 was adopted by the King in Council on 18 December 2020 and includes a description of the requirements for official statistics based on the Statistics Act and international guidelines. Official statistics must be of general interest. This distinguishes official statistics from, for example, detailed administrative information, which is not subject to the same requirements as official statistics.

Official statistics typically provide comprehensive coverage of their specified areas (sector, geographical region etc.) and are incorporated into a coherent statistical system that enables comparisons between different sectors in society, geographic regions and over time. The statistics programme refers to Section 5 of the Statistics Act and underscores that official statistics must be adapted to the users' needs and cover relevant perspectives of society.

The programme specifies that some requirements for official statistics are more absolute than others, including the requirements for professional independence, impartiality and a non-excessive burden on respondents, see Sections 7, 8 and 9 of the Statistics Act.

4. Methods for measuring quality

4.1. Assessment of established methods for measuring quality

Appendix A reviews established methods for measuring the quality of official statistics. These are methods that are currently being used by Statistics Norway and in the collaboration between Statistics Norway and other producers or data owners, as well as methods that are used by Eurostat [8]. Statistics Norway proposes that these established methods continue to be used as part of the quality system and that their scope is adapted in accordance with the programme for official statistics (see Figure 1).

Quality reviews are an established and systematic method for enhancing the quality of a particular set of statistics, and Statistics Norway has extensive experience in its application. The objective of a quality review is to identify the strengths and weaknesses of a statistical production process and statistical output using various forms of analyses. A quality review results in a report that describes strengths, weaknesses and shortcomings, and recommends quality improvement measures for the statistical production process in question.

Peer reviews investigate whether Norway's contributions to the European Statistical System meet the quality requirements in the European Statistics Code of Practice. Peer reviews are undertaken at intervals of some years by an expert team on behalf of Eurostat, and much of their emphasis is on institutional factors. Eurostat's peer review in 2014 led to important improvements in Norway's entire statistical system, see Appendix A. The upcoming peer review (2021) might provide a basis for further improvements in Norwegian statistics.

Statistics Norway has established cooperation with owners of administrative data sources (registers). Cooperation on quality includes the production of annual *reports on quality in administrative data sources* that are submitted to Statistics Norway. The objective is to ensure that any errors are rectified directly in the data source. These corrections will thus also benefit other users of the data and will reduce Statistics Norway's resource use on rectifying errors.

The user perspective is the starting point for all quality enhancement work. This is ensured through various types of *user surveys* and contacts with users in advisory committees for specific statistics or statistical domains. The user perspective entails the statistical output corresponding to the users' need for information. The statistics shall be relevant, accurate and reliable, timely, consistent, comparable across regions and countries, and easily accessible for users. Various methods, for example surveys or focus groups with representatives for users can be applied. See a more detailed description in Appendix A.

The established methods explained above help describe the quality of official statistics, but will not by themselves constitute a sufficient basis for a quality system for all official statistics. Statistics Norway therefore recommends that a number of additional measures and activities also be implemented.

Quality reviews undertaken since 2011 have provided Statistics Norway with concrete information on the statistics or statistical domains that have been reviewed. In Section 7, Statistics Norway proposes that such reviews be undertaken in all producers of official statistics. Statistics Norway proposes that the quality review teams include participants from several members of the Committee for Official Statistics. The composition of the quality team should be based on the competencies required and the statistics or statistical domains to be reviewed. Participation by several authorities in a quality review team will help spread knowledge about key aspects of the quality evaluation work and provide an opportunity to learn from colleagues in other units that

produce statistics. Quality reviews are systematic appraisals of the production process, statistical output and user perspectives, and are undertaken for a limited sample of statistics.

Statistics Norway has experience from its own quality assurance work but lacks information on the work undertaken by other statistics producers and on the quality in the statistical system as a whole. Seen as a whole, the knowledge base on the quality of official statistics is currently inadequate. More knowledge is needed about the current situation in order to develop a quality system, prioritise the measures to be applied and follow up quality enhancement measures over time.

Statistics Norway therefore proposes to conduct evaluations of the quality of official statistics at regular intervals. The method is described in more detail in Section 4.2. Such evaluations will generate knowledge on which quality systems have already been established by producers of official statistics and can be used as a basis for further expansion. The evaluations could also measure quality dimensions that are insufficiently elucidated by established systems and methods.

4.2. Quality evaluations in all producers of official statistics

The term 'quality evaluation' refers to an evaluation undertaken in light of the quality requirements in Section 5 of the Statistics Act and further quality requirements in the European Statistics Code of Practice. Quality evaluations will be a new element in the Norwegian statistical system. The evaluations will be restricted to the unit that produces statistics in the relevant statistical authority. The quality evaluations will encompass all producers of official Norwegian statistics, including Statistics Norway. Statistics Norway wishes to involve representatives of the producers of official statistics in the implementation of the quality evaluations. This will give the quality evaluations the character of peer reviews, as known from Eurostat's peer reviews.

Statistics Norway is currently developing a method for carrying out quality reviews in the relevant statistical authorities. A quality evaluation will consist of two stages:

- 1) A self-assessment, in which a questionnaire is completed by authorities with responsibility for official statistics, including the statistics departments at Statistics Norway. The questionnaire will be based on the quality provisions in the Statistics Act and principles and indicators from the European Statistics Code of Practice.
- 2) Structured follow-up interviews with the relevant statistical authorities based on the responses in the questionnaire.

The self-assessment method is based on, inter alia, discussions between Statistics Norway and Statistics Denmark, which has experience in this area. When Statistics Denmark carried out its first self-assessment, the intention was for this to only consist of a questionnaire. The responses showed that there was a need for follow-up and supplementary information from interviews because some misunderstandings needed to be cleared up, and more comprehensive information was needed than could be ascertained in a questionnaire. The follow-up interview also provides a platform for a dialogue that can help the parties elucidate problems and arrive at solutions.

The first quality evaluation should be included as a core component of the knowledge base for the quality report to be submitted in 2022. Furthermore, it will be necessary to repeat equivalent or similar evaluations in order to follow up measures and produce annual quality reports after 2022.

5. Follow-up

5.1. Assessments of general aspects

The methods for measuring and reporting on quality in official statistics that have been described in Section 4 and Appendix A are likely to reveal some quality-related shortcomings in the individual producers of official statistics. A summary that collates findings from the quality evaluation and takes account of the quality requirements defined in the legal framework, the European Statistics Code of Practice and the statistics programme will give an indication of the general status and assessment of the quality of official statistics. The general status and the quality assessment with proposals for measures applicable to the entire statistics programme will be discussed in the committee. Moreover, the committee will be invited to evaluate the methods used to measure quality and the reporting procedure. The committee may also propose adjustments to the structure of the quality evaluations, and this will facilitate the development of the quality and quality assurance system for official statistics.

The quality of official statistics goes beyond the quality of the statistical processes and output, which is elucidated through measurements of the quality of the statistics or the individual producer. As described in the statistics programme, official statistics must be of general interest. They must comprehensively cover the areas they describe, be adapted to the users' needs and shed light on relevant perspectives on society. Use of common variables, classifications and standards should also characterise official statistics. This indicates that there is a need to undertake general quality assessments that are more overarching than the quality measurements that are obtained using the methods described in Section 4. Official statistics must be 'fit for purpose', i.e. expedient. It is therefore important that the general assessments also indicate whether there are changes in the environment or elsewhere in society that affect the need for and objectives of official statistics at an overarching level.

The status and development of such general elements of quality should be discussed in the committee in conjunction with the annual quality report. The committee can then suggest measures to improve the general quality of the programme as a whole.

5.2. Follow-up of improvement measures

Quality assessment methods involve identifying shortcomings in quality and measures to rectify these, and the evaluation results are published in reports that list, inter alia, recommended improvement measures. When a quality evaluation, quality review, peer review or report on the quality of an administrative data source is completed, work on following up and implementing improvement measures starts.

Producers of statistics must assume ownership of these measures and incorporate them into their work plans. This will help bring the quality of the statistical system closer to the goals for quality in the Statistics Act and the European Statistics Code of Practice.

The improvement measures from various quality measurements and the progress and status of these will be assembled in the annual quality report.

5.3. Other activities to promote quality

In Statistics Norway's opinion, a system for following up quality issues should include more than the evaluation and reporting of quality. The letter of allocation points out that the system also will

require Statistics Norway to provide assistance, advice and guidance, and that various types of tools, manuals and guidelines that can help promote quality need to be developed.

Competence enhancement and sharing experiences pertaining to quality and methodology are relevant follow-ups to these system requirements. Provisions must be made to ensure that competence and experiences can be shared between all members of the committee.

Statistics Norway proposes to establish and develop a network for quality and methodology for the institutions that participate in the Committee for Official Statistics. The objective of this network is to facilitate cooperation on methodology across the authorities that participate in the committee. Sharing competence will help safeguard the quality of official statistics so that they meet the requirements of existing and new users. This will also help foster the necessary rationalisation and modernisation.

Statistics Norway is giving consideration to developing and providing various types of learning resources for quality improvement work for the members of the Committee for Official Statistics. These could include online/in-person training courses, manuals or other forms of learning resources. They would be based on the European Statistics Code of Practice, the Quality Assurance Framework of the European Statistical System and the Generic Statistical Business Process Model (GSBPM) [9]. Experience from Denmark indicates that there will be a great demand for training courses in quality improvement work and network collaboration.

Statistics Norway wishes to collect examples of tools, measures and methods in an overview of best practices for quality improvement work in official statistics and make it available to the committee. Special attention will be paid to innovation in the production of official statistics. This could include, for example, modern cloud-based IT solutions, new methods for control, processing and estimation based on new data sources or use of machine learning and artificial intelligence. A collection of best practices would serve as a useful supplement to the European Statistics Code of Practice and the Quality Assurance Framework of the European Statistical System, and could focus on new methods and tools in the production of official statistics in particular.

6. Actors' roles and contributions in the quality system

6.1. Statistics Norway

Statistics Norway is the central producer of official statistics and a major user of administrative data for statistical purposes. Additionally, Statistics Norway has been tasked with coordinating all official statistics and producing an annual public report on the quality of official statistics.

Statistics Norway has been assigned several roles in connection with the coordination, production and quality assurance of official statistics. Adherence to the principles of the Statistics Act and the European Statistics Code of Practice helps ensure that role conflicts are avoided. Professional independence (Principle 1) and impartiality and objectivity (Principle 6) are particularly important in this context, see Section 3. To avoid conflicts between the roles and with other actors in the Norwegian statistical system, it is important that the quality assurance work is transparent and well documented, and that the members of the Committee for Official Statistics are actively involved, see Section 6.2 and 6.3. The instructions for the Committee for Official Statistics states that the committee shall assist Statistics Norway in the work of producing an annual report on the quality of official statistics in accordance with guidelines issued by Statistics Norway [10].

6.2. Other producers of statistics

A total of 12 members of the Committee for Official Statistics are responsible for the production of official statistics in the programme period 2021–2023: the Norwegian Directorate of Fisheries, the Norwegian Institute of Public Health, the Norwegian Agriculture Agency, the Norwegian Environment Agency, the Norwegian Labour and Welfare Administration, the Norwegian Institute of Bioeconomy Research, the Norwegian Communications Authority, the Research Council of Norway, the Norwegian Water Resources and Energy Directorate, the Norwegian Petroleum Directorate, Statistics Norway and the Norwegian Directorate of Immigration.

Responsibility for official statistics encompasses production and ensuring compliance with the requirements for such statistics. A public authority that is responsible for official statistics is responsible for the quality of the entire production chain and for the development of the statistics in question [2]. According to the statistics programme, producers of official statistics should identify the need and opportunities for statistical development in their annual work programmes. As members of the Committee for Official Statistics, the statistics producers also have a responsibility for coherence in Norway's statistical system (see Section 6.3).

6.3. Committee for Official Statistics

The mandate of the Committee for Official Statistics states that the committee shall assist Statistics Norway in the work of producing an annual report on the quality of official statistics in accordance with guidelines issued by Statistics Norway [10]. The committee also has responsibility for ensuring coherence in the statistics programme. The members shall, among other things, contribute to the coordination and development of official statistics and further development of the statistical system.

As of 1 January 2021, the Committee for Official Statistics consists of 24 public authorities. Authorities with no responsibility for official statistics in the first period of the programme may be considered for this role in the future. Some statistics may also be currently produced by authorities who are not members of the committee, but which may be involved in the programme in the future. The quality assurance work carried out by the current producers may therefore be relevant to other members of the committee, both on a general basis and in terms of their role as a potential producer of official statistics. This perspective shows the importance of involving the entire

committee in quality assurance and how authorities that so wish can draw on other committee members' experiences in their own statistical work.

Statistics Norway proposes establishing a group of resource persons from the members of the committee who can participate in quality assurance. In the first instance, participation in quality reviews and quality evaluations, including the follow-up interviews, will be relevant. The committee shall assist Statistics Norway in the production of the annual report. Statistics Norway will ensure that the reports are reviewed by the committee before being forwarded to the Ministry.

6.4. The Council for Statistics Norway

The Council for Statistics Norway, where key users of official statistics are represented, does not have an explicit role in the quality assurance work. Instead, it plays an indirect role through its mandate to ensure that Statistics Norway's work is performed to the highest standard [11]. The ongoing work of developing a proposal for a system to monitor quality in the Norwegian statistical system has been presented to the Council, and they will also receive a copy of the annual quality reports.

6.5. Eurostat

The Statistics Act and the Norwegian statistics programme are based on the Regulation of the European Parliament and of the Council on European Statistics and the European Statistics Code of Practice administered by Eurostat. Future changes and development of the Code of Practice will impact on the quality assurance framework of Norwegian official statistics. Eurostat also plays a role in the quality system in the form of regular peer reviews (see Appendix A). These have demonstrated a potential to significantly impact on the development of the Norwegian statistical system. The recommendations that followed the peer review in 2014 formed the basis for the new Statistics Act and the establishment of the statistics programme.

6.6. The Ministry of Finance

The letter of allocation to Statistics Norway and the management dialogue with the Ministry of Finance provide direction and serve as guidance for the quality assurance work. Statistics Norway shall document the status and progress of the quality assurance work for the Ministry through the annual quality reports. The dialogue with the Ministry about the reports will help setting the priorities and guide the direction of the work.

7. Plans and resource needs

In this section, we describe which activities should be carried out in 2021. These activities will form the basis for the first annual report on quality in official statistics for the Ministry of Finance in 2022. The section also includes assessments of which activities should be prioritised in the years ahead and of resource needs.

7.1. Prioritised work in 2021

As described in Section 4, our assessment is that the knowledge base on quality in official statistics is not well developed. In order to draw up a comprehensive proposal for a quality system for official statistics, more information is needed about the current situation. For example, more information is needed on the implementation of quality assurance frameworks and systems, the quality standard and how statistics producers currently safeguard quality.

Statistics Norway proposes to carry out a quality evaluation (see Section 4.2) of official statistics in 2021. This evaluation will improve the knowledge base on the quality assurance work among producers of official statistics and is a prerequisite for the preparation of the first quality report and monitoring of quality over time.

As described in Section 4.2, Statistics Norway has already started developing and planning this quality evaluation. The data will be collected in the autumn of 2021 prior to the visit from Eurostat's peer review team. Further work on the development of measures and reporting will be carried out in the first half of 2022.

In November, Eurostat is scheduled to conduct a peer review of Statistics Norway and four other Norwegian producers of European statistics (see Appendix A).

In combination, the quality evaluation and Eurostat's peer review in 2021 will provide a good basis for describing the current situation and for identifying needs for development and proposing quality improvement measures.

Through agreements on the supply of data and cooperation on quality with, currently, 28 owners of administrative data sources, Statistics Norway undertakes to report on quality in registers. This work will also be done in 2021.

In 2021, Statistics Norway will start work on establishing a network for quality and methods, as well as developing and providing access to courses, guidelines and other resources (see Section 5.3). This corresponds to the recommendations in the letter of allocation for 2021 which sets out how Statistics Norway will also provide assistance, advice and guidance, and that various types of tools, recommendations or guidelines will be developed that can lead to quality improvements.

7.2. Planned activities

As described in Appendix A, Statistics Norway has established quality reviews as a methodology for enhancing the quality of statistical production processes. Quality reviews are systematic appraisals of the production chain in which the strengths and weaknesses of a selected statistical process are identified. Such reviews often have a transfer value in relation to other statistical domains.

At the start of 2021, the Norwegian statistics programme consisted of 351 statistics. Of these, 297 are produced by Statistics Norway and 54 by other producers of official statistics. To date, Statistics Norway has conducted approximately three internal reviews annually. It is Statistics Norway's view

that covering one per cent of its own statistical production in annual quality reviews is an absolute minimum.

Statistics Norway proposes that future quality reviews should cover the entire statistics programme. Quality reviews are resource-intensive, and it will not be possible to review a large sample of statistics every year. It is therefore proposed that the number of quality reviews be increased from three to six per year. This is considered a minimum for being able to meet the requirements and achieve the goals for quality set out in the quality assurance framework for official statistics. The proposal forms the basis for the resource assessments (Sections 7.3 and 7.4).

One model for sharing the coverage between the producers of official statistics over time entails three reviews in Statistics Norway and three among other members of the committee each year. An alternative is to carry out six reviews per year and ensure that all authorities with responsibility for official statistics participate in at least one quality review in 2022 or 2023. This way, all institutions that are responsible for official statistics will participate in the current period of the national programme for official statistics, but the coverage of all statistics will remain minimal. Distributing the work in this way will also result in a very low coverage in Statistics Norway. One approach is to select statistics for review based on the criteria risk and significance².

Statistics Norway will decide which model is most appropriate once it has been clarified what resources can be used for this purpose. The quality reviews will be led and administered by Statistics Norway, and it is assumed that representatives of the committee members will participate in the quality review teams.

Statistics Norway will draw up a plan with a time frame for implementation of the measures resulting from the quality evaluation and the peer review in 2021. The plan will be devised in collaboration with the Committee for Official Statistics. The status of these measures will be followed up in the annual quality report for the Ministry.

Appendix B presents a proposal for an annual plan for the regular activities in a system for quality assurance in official statistics. Other activities that lead to quality improvements, such as a methodology network and training courses (see Section 4 and Appendix A), but which do not follow a set plan, are excluded from the annual plan shown in Appendix B.

7.3. Resource needs in Statistics Norway

Statistics Norway has a dedicated quality team of a total of two man-years. Additional resources are assigned to the team when necessary, for example when conducting quality reviews.

Statistics Norway otherwise utilises significant resources on quality assurance in the ongoing operations and development work in all departments. This quality assurance work is integrated with other work.

Statistics Norway has started planning and testing the quality evaluation in the first half of 2021 without the addition of new resources. The peer review and the annual follow-up of the status of the measures from the peer review do not require any additional resources in Statistics Norway. The reporting of quality in registers can also be followed up within the current resource framework.

² Based on how the Office of the Auditor General of Norway selects areas for auditing, see <https://www.riksrevisjonen.no/om-riksrevisjonen/slik-jobber-vi/> (text as at 29 April 2021).

The new Statistics Act and statistics programme entail a new, expanded role for Statistics Norway and even greater responsibility for quality assurance. The requirements and recommendations in the Statistics Act and the letter of allocation are more extensive than Statistics Norway's established system for the quality assurance of its own statistics. The new system described in this memo covers all producers of official statistics, including those who are new to official statistics. The comprehensive quality system will cover more activities, and more actors will need to work together. The work needs to be planned, coordinated and administered, and training will be needed for statistics producers with no previous experience of applying the European Statistics Code of Practice to quality. Annual quality reports will be prepared to cover all official statistics. The Committee for Official Statistics will assist in the efforts to develop the quality of official statistics and in preparing the annual report for submission to the Ministry.

We estimate that the administration and coordination of quality assurance, the annual reporting, follow-up of measures and other development and efforts related to following up and supporting all producers of official statistics will require approximately 2.5 man-years more than Statistics Norway's current resource level.

Statistics Norway estimates that its efforts in quality evaluations and quality enhancement measures require two additional man-years per year to cover data collection, analysis, reporting and follow-up.

In the past, Statistics Norway's quality review has required approximately 400 hours from the quality team and approximately 100 hours from the division responsible for the statistics under review. As described in Section 7.2, Statistics Norway proposes that the minimum number of quality reviews be increased from three to six per year and estimates that this will require an additional 1.5 man-years. There will also be contributions from statistics producers who participate in the review of their own statistics.

Statistics Norway thus estimates that the permanent increase in resources within the quality assurance of official statistics amounts to 6 man-years. The resource input from other authorities is not included in this estimate (see Section 7.4).

The need for resources described here is based on Statistics Norway's experiences from its own quality assurance work. The quality evaluation in 2021 and other reviews may generate information and identify needs that will require the estimate to be adjusted. Statistics Norway will be able to provide a final description of the activities, the annual plan and the need for resources in the quality report in 2022.

It is Statistics Norway's view that the proposed increase in resource input will help improve the quality of official statistics in line with the purpose of the Statistics Act (Section 1).

7.4. Resources of other statistics producers

No estimates have been made of the resources that other statistics producers utilise on quality assurance in their own organisations.

Through the statistics programme and the Committee for Official Statistics, all producers of official statistics and members of the committee have a responsibility to contribute to quality in official statistics beyond their own production, see Section 6.2. The statistics producers are responsible for the quality of their own statistics. All members must assist in the work of the annual report on quality, the coordination and development of official statistics and the further development of the statistical system.

Participation in quality assurance efforts outside their own organisation will be a new activity for all committee members and will require them to increase their resources. Our outline of the quality system shows that those who actually produce the statistics will need more resources than the other members of the committee. The system is based on involvement by the committee and the statistics producers, but how and to what extent they participate in quality assurance is largely up to them.

For example, statistics producers who choose to participate in quality review teams and networks for sharing experiences will use more resources than those who are less involved. Statistics Norway wants to establish a broad collaboration where the committee contributes to quality evaluations and reviews, a methodology network, the sharing of experiences and training courses. In practice, however, it will be the committee members themselves who will have to set their priorities for this work up against other work in their organisation. The level of resources that statistics producers use, for example, to act on the findings of quality reviews and other quality enhancement measures, is also up to the individual producer. In Section 7.2, it is proposed that six quality reviews be carried out annually. For the individual statistics producer, the number of reviews in their own organisation and their contributions to reviews by other organisations will impact on the use of resources.

For the time being, Statistics Norway has therefore not estimated the level of resources that will be used in the quality assurance efforts of other statistics producers and other members of the committee.

7.5. Development of the quality system over time

Advancements in technology and the emergence of new data sources, including big data such as satellite data, financial transaction data and mobile data, pave the way for new and more relevant statistics in the years ahead. Official statistics must be developed and adapted to changes in society, technology and data, and this is something that is also highlighted in Statistics Norway's strategy. There are also a large number of statistics that are not currently included in the statistics programme and therefore not classified as official statistics, both from committee members' organisations and others.

As the statistics programme is updated for new periods, consideration will be given to adding other relevant statistics. Combined with changing user needs, advancements in technology and the increased use of new sources, this means that the scope of the programme, the range of statistics included in the programme, the data and the technology on which the statistics are based will all change over time.

Advancements in technology will also affect the framework on which the quality system is based. The Quality Assurance Framework (QAF) for European statistics was developed in 2005 and revised in 2011 and 2017 to meet new requirements for statistics, new data sources and technology. The QAF will also be subject to further revisions in the years ahead, and even now does not necessarily take into account the variety of data sources and data collection methods that are currently employed by national statistical institutes. Revisions do not always entail dramatic changes to the QAF, but can shift the focus or emphasis and introduce new components.

Development will also lead to new methodological challenges in relation to formulating goals and indicators for quality, but will enable quality indicators to be incorporated into new, digital systems and solutions.

New data sources and new roles thus entail new challenges and needs in terms of the development and adaptation of quality frameworks and systems in the years ahead. The quality system for official

statistics presented in this memo is intended as a starting point for the further quality assurance work in the statistics programme.

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Appendix A: Established methods for measuring quality

Quality reviews

Statistics Norway has established quality reviews as a methodology for enhancing the quality of statistical production processes. Since 2011, Statistics Norway has completed reviews of 36 internal statistical domains and been subject to one external quality review. A quality review is similar to a peer review, but is limited to one set of statistics or one statistical domain and focuses on statistical processes, statistical output and user satisfaction. The aim of a quality review is to identify strengths and weaknesses, as well as any shortcomings in the production chain and to devise improvement measures.

A quality review consists of the following activities:

- A start-up meeting to explain the process to the statistics division/producer of official statistics and to agree on progress and deliverables.
- The statistics division/producer of official statistics conducts a self-assessment of the principles and indicators from the European Statistics Code of Practice. In the self-assessment, the main emphasis is on statistical processes and statistical output.
- A review of a production process that leads to completed statistics.
- The process review starts by mapping users in line with the Generic Statistical Business Process Model (GSBPM) [8].
- A review of how the statistics are disseminated on the producer's website and in other media.
- A group discussion (focus group) with representatives for users of the statistics. The focus group highlights, among other things, the quality principles for statistical output from the Code of Practice.
- A final meeting with the statistics producer in order to review the draft report.
- The final report is submitted to the head of the department or unit producing the official statistics that were the subject of the review. As with a peer review, a quality review concludes with a report giving a list of recommended improvement measures.
- The relevant producer of statistics draws up the final list of measures and is responsible for implementing them. The measures will help improve the quality of the reviewed statistics.

The status of the measures will be updated annually, and a status report will be prepared. This will form part of the report for the Ministry on quality in official statistics.

At present, around three quality reviews are conducted internally in Statistics Norway every year.

Peer reviews

Eurostat's peer reviews are limited to the Norwegian contributions to the European Statistical System and are carried out by an expert panel on behalf of Eurostat. Much of the emphasis in a peer review is on institutional factors. The starting point is a self-assessment of the quality of the statistics production. The self-assessment follows the principles and indicators in the European Statistics Code of Practice. After the self-assessment, the peer review team interviews key personnel in Statistics Norway, key personnel from four other Norwegian producers of European statistics and representatives of users.

Eurostat conducted peer reviews in 2007 and 2014, and a third round is planned for November 2021. In addition to Statistics Norway, the Norwegian Directorate of Fisheries, the Norwegian Directorate of Immigration and the Nordic Institute for Studies in Innovation, Research and Education were involved in the 2014 review. The other statistics-producing authorities that Statistics Norway has selected to take part in the 2021 review are the Norwegian Institute of Public Health, the Norwegian Directorate of Immigration, the Norwegian Directorate of Fisheries and the Norwegian Institute of Bioeconomy Research.

A peer review concludes with a report giving recommendations/measures to enhance the quality of the statistics production. Statistics Norway is responsible for following up the recommendations, regardless of whether they apply to Statistics Norway or another statistics producer. Eurostat follows up the implementation of the measures every year. In 2014, the peer review team considered Statistics Norway's work to be of a generally high standard in accordance with the European Statistics Code of Practice [12]. The recommendations from the peer review in 2014 were as follows:

- The term 'official statistics' should be clarified.
- The status and responsibilities of Statistics Norway's board should be clarified.
- The responsibilities of Statistics Norway's director general should be specified.
- Statistics Norway's coordinating role should be strengthened.
- The establishment, composition and mandate of the Committee for Official Statistics should be made law.
-

The recommendations were an important part of the basis for The Official Norwegian Report NOU 2018: 7 and the new Statistics Act, and had a major impact on the entire Norwegian statistical system.

Reports on quality in administrative data sources

Since 2012, Statistics Norway has had ongoing agreements for the supply of data to Statistics Norway and cooperation on quality in administrative data sources with 28 owners of administrative data (registers). Most members of the Committee for Official Statistics produce statistics based on their own registers. Statistics Norway has register agreements with 14 of these. The cooperation on quality includes the production of annual reports on quality in the administrative data sources that Statistics Norway uses. The agreements and the reports follow standardised templates. The template for the agreements was updated in connection with the full entry into force of the new Statistics Act on 1 January 2021. The template for the reports on quality is also being updated.

The aim of the audit is to enable reports to be produced that serve as useful tools in the ongoing quality efforts in administrative data by Statistics Norway and, not least, data owners. It is also beneficial if the reports can be conflated to shed light on the quality of administrative data sources in the annual quality report for the Ministry.

A broad-based process has been initiated to gather views and input from actors both in Statistics Norway and beyond. Written consultation rounds and group discussions have been held with those who produce the reports on quality in Statistics Norway and the data owners who receive the reports. The template will be tested before being adjusted and adopted in 2021.

The user perspective

The starting point for all quality assurance is the user perspective.

Statistics Norway conducted nine identical user surveys on the ssb.no website between 2012 and 2020. The purpose was to map user satisfaction [13]. The results from the surveys show that ssb.no

users are satisfied. This finding is stable and has not changed much in recent years. Respondents in the user survey have the opportunity to suggest improvements, and these can serve as a basis for quality improvement measures. The user survey is limited to the users of *ssb.no* and is voluntary, with users being invited to participate via a pop-up window. It covers principles for output quality from the Code of Practice and is limited to official statistics that are produced and disseminated by Statistics Norway.

Statistics Norway's quality reviews include participation from focus groups with user representatives. These groups discuss the principles of output quality in relation to specific statistics and are an important element of the quality reviews. Statistics Norway also has a number of advisory committees and other user forums in which key users of certain statistics or statistical domains are represented. The advisory committees meet regularly. Statistics Norway's division for microdata has a user committee that holds meetings on a regular basis, with representation from key users of the service.

The user perspective is important for quality assurance in statistics and should be at the core of the quality assurance system. As described above, Statistics Norway already employs various methods to safeguard the user perspective in the quality assurance work, but these only cover Statistics Norway and certain parts of Statistics Norway's activities in particular. A system for quality in all official statistics should adopt existing methods, such as focus groups and user surveys, to safeguard the user perspective of all statistics producers and contribute to the further development of this.

Other quality indicators

Statistics Norway reports annually on the performance requirements set by the Ministry of Finance in the annual report. Table 1 shows key figures for Statistics Norway's performance in the period 2018–2020. The table will be reviewed to examine whether all the indicators are relevant for all producers of official statistics. As from 2021, the table will be expanded to include key figures for all producers of official statistics.

Table 1. Key figures for Statistics Norway's performance in the period 2018–2020

	2018	2019	2020
Timeliness, monthly statistics, number of weeks from the end of the reference period until release of the statistics	3.6	3.7	3.5
Timeliness, quarterly statistics, number of weeks from the end of the reference period until release of the statistics	8.0	7.6	7.3
Timeliness, annual statistics, number of weeks from the end of the reference period until release of the statistics	33.5	32.5	29.9
Punctuality, proportion of statistics released as announced three months in advance	90	97	97
Statistics releases, proportion announced too late	5	11	8,5
Response rate, mandatory surveys	96	96	94
Response rate, voluntary surveys	61	58	56
Response burden, business sector. Number of man-years	75	73	69
Response burden, others. Number of man-years	12	16	17
Number of statistics releases	814	812	797
Number of active statistics	315	307	303
Number of discontinued statistics	21	10	1
Number of new statistics	5	2	3

Statistics Norway is in the process of developing a dashboard for real-time monitoring of critical parts of the statistics production process, such as monitoring data capture, editing (correcting errors in the source data) and data integration (linking data). The dashboard provides the capability to monitor units that are particularly crucial to the statistics and that require a strong focus in the statistics production process. Statistics Norway is also developing solutions to streamline the editing

of source data. The source data for the dashboard and the new editing solutions contain data that can be used to quantify the need for editing the data and can also serve as a quality indicator.

Section 5 of the Statistics Act places an emphasis on accuracy as an aspect of quality. This quality indicator is based on Principle 12 'Accuracy and reliability' in the Quality Assurance Framework of the European Statistical System [5]. This principle includes descriptions of the uncertainty in statistics, i.e. that tables are supplemented with descriptions of possible sources of error in the statistics. Uncertainty can also be calculated and presented as numerical estimates. Such calculations are often theoretically possible but can be very resource-intensive in practice and are not part of Statistics Norway's normal activity.

Advancements in technology mean that the volume of data in society is increasing, and this in turn is leading to a growth in new types of data sources with the potential to serve as a basis for official statistics. New methods therefore need to be developed to measure quality. For example, uncertainty calculations are one development area that could conceivably become more important when new data sources, such as data obtained through web scraping or sensor data, are adopted in official statistics. The use of new technological solutions for collecting and sharing data will also open up opportunities for developing associated systems for measuring quality.

Appendix B: Proposal for an annual plan for regular quality assurance activities

Other activities that facilitate quality improvement but do not follow a fixed schedule, are not included in the annual plan.

Activity	Deadline, first time	Subsequently
Development of the system		
Propose a system for quality in official statistics, send the proposal to the Ministry of Finance.	1 June 2021	-
Devise a questionnaire to capture data for quality evaluations.	1 June 2021	-
Quality evaluation		
Conduct a survey for the quality evaluations and follow-up interviews for 2021.	Aug.-Dec. 2021	As needed
The producers of official statistics formulate or update improvement measures based on the quality evaluations.	Jan.-March 2022	Annually
Evaluate the data capture in 2021 prior to conducting the 2022 survey. Make any necessary adjustments.	Jan.-June 2022	Annually
Update the status of improvement measures after the quality evaluations in 2022.	Dec. 2022	Annually
Peer review		
Eurostat's peer review	Nov. 2021	2028 (?)
Update the status of improvement measures after the peer review in 2021.	Dec. 2022	Annually
Quality reviews (tentative because it depends on resources)		
Minimum of 6 quality reviews of statistical processes among public authorities with responsibility for official statistics.	Jan.-Dec. 2022	Annually
Update the status of improvement measures from the quality reviews.	Dec. 2022	Annually
Reports on quality in administrative data sources		
Update the reports on quality in administrative data sources.	Dec. 2021	Annually
Reporting		
Official report for the Ministry of Finance on quality in official statistics in 2021.	June 2022	Annually