

QUALITY ASSURANCE FOR STATISTICS IN INTERNATIONAL STATISTICAL SERVICES ¹

Report by OECD

1. At the 35th session of the Administrative Committee on Co-ordination (ACC) Subcommittee on Statistical Activities held in Vienna on 18-20 September 2001 the Committee decided that the issue of quality assurance required further analysis to facilitate discussion on future directions for co-ordination between international organisations in this area. To this end, the Subcommittee requested the OECD to prepare a report for the September 2002 meeting of the Inter-agency Meeting on Co-ordination of Statistical Activities (IAMCSA) that would:

(a) review information provided by Subcommittee members on quality assurance and related issues for the Washington meeting held in September 2000;

(b) look at national experience; and

(c) develop a number of discussion points.

2. Although this topic initially arose from an ACC discussion in 1999 on the processes international organisations use to ensure the quality and validity of data they receive from countries, there is a need to consider these issues in the context of broader quality frameworks, given the heightened attention these issues have received more recently at both the national and international levels. Therefore, in addition to the above points, this paper also outlines the results of a brief subjective review of current IAMCSA and OECD Member country websites on corporate data quality issues.

3. Five of the ten Fundamental Principles of Official Statistics² adopted by the UNSC in 1994 either directly or indirectly allude to issues related to data quality in the provision of official statistics. The last two years has seen more intensive discussion of broader issues relating to statistical data quality. For example, at the UNSC meeting in March 2002 the Commission welcomed IMF collaboration with Eurostat in the area of frameworks for the assessment of quality. During discussions at that meeting several European countries stressed the need for further co-ordination between international organisations on issues relating to data quality. The joint Eurostat/Statistics Sweden International Conference on Quality in Official Statistics, held in Stockholm in May 2001 discussed the results of work by the Leadership Group (LEG) on Quality. The LEG was led by Statistics Sweden and its members from eight NSOs had a mandate to investigate how the European Statistical System and its components could be improved through quality management and other efforts.

a. Summary of information provided by ACC members in 2000

4. At its meeting in Washington on 20-22 September 2000, the ACC briefly discussed submissions prepared by members outlining a range of issues concerning their policies on quality assurance. Reports

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² Namely, Principles 2,3,5, 9 10. Refer to <http://unstats.un.org/unsd/goodprac/bpabout.asp>

were received from the following 12 agencies: ESCAP; FAO; ILO; OECD; UNDP; UNECE; UNIDO; UN Population Division; UNSD; World Bank; World Tourism Organisation; World Trade Organisation. In addition to quality assurance, the reports also provided summary information on a number of related issues including: arrangements with common questionnaires and policies for publishing data collected under such arrangements; conflicting data in organisations even when the same original national data is used; and conflicts between nationally supplied data and internationally comparable data prepared by some international organisations.

5. The primary roles of most international organisations in the area of statistics were deemed to be the collection and dissemination of data compiled initially by national agencies. Many Committee Members maintain comprehensive databases containing annual and sub-annual time series covering a wide range of indicators. The national coverage of these databases varied significantly depending on the global reach/membership of the organisation. The databases contain not only primary or basic statistics but also derived statistics such as index numbers, etc. The quality of the statistics varied significantly between countries as a result of differences in statistical infrastructures and the adequacy and quality of human and other resources used in the initial compilation of the data. A number of Committee members also reported differences between countries in the culture of using information as a basis for sound policy formulation, particularly by government institutions.

6. Notwithstanding the primary function being the dissemination of national data, ACC members identified a number of areas where they did have some control/influence over data quality. These comprised:

- being selective in the data to be published. Some agencies review the quality of the data and do not publish where quality is not considered to be adequate;
- involvement in the development and promulgation of international statistical recommendations and guidelines;
- implementation of programmes of technical assistance to develop statistical capacity;
- the use of on-going processes for ensuring the quality of data disseminated. These entailed the review and analysis of data before they are published. Such reviews include assessments of the:
 - relevance of statistical concepts used;
 - comparability of statistics over time and between countries. Where necessary, some agencies adjust data to improve comparability.

More specifically, some ACC members reported their use of automated processes for data verification (ILO, UNIDO, World Trade Organisation, UNSD). Such automated verification processes include comparisons of year-to-year changes, inter-variable relations, matching between total and sum of component data and inter-industry consistency with regard to selected inter-variable relations (e.g. ratios) and changes over time, identification of missing values, etc. The sophistication of processes used varied between members. Several members referred queries on anomalies, ambiguities and inconsistencies back to source (either national agencies or other international organisations);

- use of questionnaires containing pre-filled data previously provided to encourage consistency in time series. Such questionnaires are often accompanied by submission guidelines (World Trade Organisation);

- collection and dissemination of metadata to enable internal assessments of quality and transparency of quality/comparability to external users. Use of metadata to enable assessment of comparability was emphasised in a number of reports (OECD, UNIDO, UNSD). Data are published with metadata and/or in footnotes that indicate methodological breaks in time series;
- use of specific processes to either highlight the (varying) quality of data disseminated by the ACC member or provision of opportunities for national providers to report on adjustments required. For example:
 - the organisation of databases (UNIDO) in “layers” determined by the degree of confidence each “layer” merits. Such layers included “official” statistics reported by NSOs, data provided by less authoritative sources;
 - the initial posting of clearly labelled provisional data on websites (World Trade Organisation) for a fixed period. Countries are informed of such posting and following the lapse of the fixed period the data are regarded as “approved” where the country has not requested any modifications.

7. Areas of future work/discussion cited by ACC members on data quality comprised:

The resolution of inconsistencies between national agency estimates and international agency estimates. Such differences arise as a result of: more recent (and perhaps more final) data not being made available to the international organisation; national data being designed to meet national administrative requirements (resulting in classifications, coverage, reference period and concepts used being tailored to national needs); delays in the incorporation of most recent data in international organisation databases; harmonisation of data by international organisations to make the data more internationally comparable (refer below).

A number of international organisations (OECD MEI, ESCAP, UNSD) mentioned their specific internal need for unmodified data from national sources. In the absence of suitable data or concerns over data quality, several members reported on practices in disseminating adjusted or estimated data.

- The need for more internationally comparable data, or in the absence of comparability, greater transparency on national differences and their significance. Comparability and the ability to make international comparisons between countries were regarded as being of paramount importance for international organisations. For institutions such as Eurostat and the European Central Bank (ECB) comparability is even more fundamental because of the need to compile aggregates for EU15 and euro area. Where adjustments were required to make the data more comparable, several members stressed the need to clearly explain the processes used.
- Further resolution of differences between data disseminated by different international organisations. Variations arise out of differences in data sources, timing of updates, different practices relating to reference period, time when data are supplied by the country, differences in specifications provided by different international organisations, differences in methods of estimation and data presentation practices.

Many international organisations make maximum use of data released in the statistical publications of other international organisations. In addition, a number of the ACC papers cited improvements in the consistency of data disseminated by international organisations in recent years through the widespread implementation of arrangements for co-ordination of data collection (e.g. ILO/IMF/UNSD on CPIs, ILO/OECD on unemployment, OECD/UNIDO on industry statistics, UNSD/WTO/OECD for detailed trade data, etc). However, such arrangements are not necessarily a guarantee for the dissemination of

comparable data, e.g. may be rebased differently by co-ordinating organisations. There are also differences in practices regarding the dissemination and presentation of metadata.

8. By and large, the quality assurance processes reported by ACC members in 2000 were confined to detecting errors in data reported to them (mostly) by national agencies. None of the international organisations submitting reports in 2000 systematically compile statistical measures of quality, though some compile qualitative assessments for either internal use or for use in country missions to improve data quality. Furthermore, none of the papers addressed the issue of quality assurance from a strategic or corporate perspective. Bearing in mind that these papers were prepared over two years ago, and because of the heightened importance of data quality in the intervening period, a very quick review of websites was undertaken in order to identify other issues that could be considered by the IAMCSA at this years meeting.

b. Review of websites

9. A lot of work has been undertaken in recent years at both the national and international levels to apply the concept of quality to statistical data. Statisticians within national and international organisations historically have frequently had a number of quality assurance processes in place. These included the treatment and validation of questionnaire replies, cross-checking with national and international publications, queries back to data source, etc. Whilst these processes undoubtedly enhanced quality, the absence of a common framework that could be used to systematically assess, compare and improve an organisation's statistics was frequently a perceived weakness of many national and international systems. As a result, a number of national and international organisations have identified various sets of data quality components and have adopted quality frameworks to improve their organisations and the quality of data produced. The following sections provide a brief (albeit) subjective summary of recent work in this area.

- National statistical organisations

10. The UNSD website on Good Practices in Official Statistics³ contains a comprehensive list of references relating to the work of a number of national statistical organisations in the area of data quality from a corporate perspective. In addition, a paper presented at the International Conference on Quality in Official Statistics referred to in para. 3 above⁴ reported the results of interviews carried out during 2000 with 16 national statistical organisations (NSOs) to identify quality practices used. References to data quality by these organisations, together with those presented in the IMF's Data Quality Reference Site (DQRS – see below) are provided in the following table. The list is by no means exhaustive, and many other countries are also undertaking corporate work in this area. However, the issues raised in these websites are illustrative of similar activities being considered elsewhere.

11. Most of the NSOs listed have historically conducted some kind of data quality activity, though most of these efforts were conducted on an ad-hoc basis, which were primarily collection-orientated. Very few adopted a more corporate and systematic approach to the issue of data quality that encompassed the entire data processing cycle across the whole range of statistical activities/subjects. In recent years however, there has been a growing awareness that quality is a corporate concern, and a concern of staff at all levels within the organisation. There is also an increasing awareness that maintenance and improvements in data quality are things that will not occur automatically but require the planning and

³ Refer to <http://unstats.un.org/unsd/goodprac/default.asp>

⁴ *Survey of Quality Practices in National Statistical Institutes*, L. Japac, Session 2.2 – Framework. This paper summarises the main findings of the LEG survey on national practices in the area of data quality. The issues covered were management models, quality reports, leadership and staff, customer/user orientation, strengths and weaknesses of the European Statistical System (ESS), and methods used to ensure data quality in statistics. The countries surveyed were: Austria, Belgium, Denmark, France, Finland, Germany, Greece, Ireland, Iceland, Italy, Norway, Netherlands, Portugal, Spain, Sweden, and United Kingdom.

organising of a wide range of inter-connected processes. Above all, the successful implementation of an integrated quality programme often requires a cultural shift within the organisation. Over half of the organisations cited in the following table have adopted a management model for their quality work, but most of them have just started.

12. The main point from the perspective of the ACC is that many of our member countries have started or are about to embark on quality management programmes. As will be outlined below, some international organisations have adopted similar programmes over the last few years. An issue for consideration by the ACC is whether or not international organisations have a role in helping member states implement quality management programmes at the national level and, if so, what precisely is that role?

Country	National agency	Location	Link
Austria	Statistics Austria	LEG	http://www.q2001.scb.se/
Canada	Statistics Canada	GPOS	http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=192&KeyId=12 http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=194&KeyId=12
Denmark	Statistics Denmark	GPOS	http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=166&KeyId=12
Finland	Statistics Finland	LEG	http://www.stat.fi/tk/tt/reviews_2000_6.pdf http://www.q2001.scb.se/
France	INSEE	LEG	http://www.q2001.scb.se/
Germany	Federal Statistical Office	GPOS	http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=19&KeyId=12
Hungary	Hungarian Central Statistical Office	DQRS	http://www.ksh.hu/pls/ksh/docs/news/eszakvizs.doc
Japan	Management and Co-ordination Agency	GPOS	http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=35&KeyId=12
	Bank of Japan	LEG	http://www.q2001.scb.se/
Korea	KNSO	LEG	http://www.q2001.scb.se/
Lithuania	Statistics Lithuania	GPOS	http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=367&KeyId=12
Netherlands	Statistics Netherlands	GPOS	http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=116&KeyId=12
New Zealand	Statistics New Zealand	GPOS	http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=50&KeyId=12 http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=136&KeyId=12
Norway	Statistics Norway	LEG	http://www.q2001.scb.se/
Poland	Poland Central Statistical Office	LEG	http://www.q2001.scb.se/
Portugal	National Statistical Institute	LEG	http://www.q2001.scb.se/
Switzerland	Swiss FSO	DQRS	http://www.statistik.admin.ch/stat_ch/ber00/peer_review/peer_review.pdf
Turkey	SIS	GPOS	http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=377&KeyId=12
United Kingdom	ONS	GPOS	http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=66&KeyId=12
United States	Bureau of Census	GPOS	http://unstats.un.org/unsd/goodprac/bpform.asp?DocId=252&KeyId=12

GPOS: UNSD Good Practices in Official Statistics; Eurostat LEG: Leadership Expert Group on Quality; DQRS: IMF Data Quality Reference Site

- International organisations

13. For an international organisation, the quality of statistics disseminated depends on two aspects – the quality of national statistics it receives and the quality of its internal processes for collection, processing, analysis and dissemination of data and metadata. In several fields, national statistics are developed closely in accordance with international standards. On the other hand, statistical processes at the international level are often derived from best practices developed at national level, thus there is a clear inter-dependence between the two dimensions. Current and recent work by some ACC members are summarised below. Again, the list is by no means exhaustive as no doubt other members are involved in similar corporate initiatives.

- **UNSD:** As mentioned in [para. 10](#) above, the UNSD website on Good Practices in Official Statistics (GPOS) contains a list of references describing the work of ten NSOs in the area of data quality from a corporate perspective.

- **IMF:** The IMF Data Quality Reference Site⁵ (DQRS) (<http://dsbb.imf.org/dqrsindex.htm>) was created to develop an understanding of issues surrounding data quality. The site includes contributions from both national and international agencies and covers definitions of data quality, provides examples of evaluations of data quality and outlines the different tradeoffs between the different dimensions of data quality (refer [para. 14](#) below). The DQRS is an adjunct to the IMF's Data Quality Assessment Framework (DQAF) which is designed to foster communication between users and compilers of statistics, and to provide a structure and common language for data quality. The three main areas where an assessment methodology, such as that provided by the DQAF, could be helpful are to guide⁶:

- countries' efforts to strengthen their statistical systems by providing a self-assessment tool and to identify areas for improvement in which donor support might be sought;
- IMF staff in preparing reports assessing the quality of data provided for country surveillance and operations, and in designing programmes of technical assistance;
- data users in gauging data quality for their own purposes.

Eurostat: Eurostat's approach on quality concentrates on the quality characteristics of statistical products following the ISO 8402-1986 definition. In this context, quality is "the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs". Eurostat has identified seven main components of quality⁷ (refer [para. 14](#) below). Recent work has resulted in the preparation of detailed basic guidelines⁸ for statisticians within the European Statistical System who have a need to report on statistical quality.

⁵ Report of the International Monetary Fund on the Special Data Dissemination Standard and the General Data Dissemination System, note by the Secretary-General, presented as Item 7(b) of the provisional agenda, UNSC, 5-8 March 2002, paras 11-17

⁶ Fourth Review of the Fund's Data Standards' Initiatives: Supplement on the Data Quality Assessment Framework, IMF Statistics Department, 10 July 2001, para. 4.

⁷ Available at http://forum.europa.eu.int/irc/Download/kgeuA6JAmjGMdfOYS4GRcD2r6Rgc1SRE/yxh_UX4xNf-mYv/04-1-1Definitions.pdf

⁸ Available at http://forum.europa.eu.int/irc/Download/kYeWA1JRmXGDukObR4GRcD2r6Rgc1SRE/yxh_UX4xNfIDV9gqQBe2/04-1-2%20StandardQualityReport_ver2final.pdf

OECD: Development of the Quality Framework for OECD Statistics⁹ commenced early in 2002. The framework focuses on improving the quality of data collected, compiled and disseminated by the OECD through an improvement of the Organisation’s processes and management, though there will be a positive spillover effect on the quality of data compiled at national level. The framework has four elements:

- a definition of quality (“as fitness for use”) and its eight dimensions. These dimensions are essentially the same as those used by Statistics Canada, Eurostat and the IMF;
- a procedure for assuring the quality of proposed new statistical activities;
- a procedure for evaluating the quality of existing statistical activities on a regular basis; and
- internal quality guidelines covering all phases of the statistical production process (currently being developed).

Given the work already done by several statistical organisations, the OECD was able to draw on existing guidelines and adapt them to the OECD context.

14. The objectives and emphasis of work on quality by the international organisations cited above vary. In the case of the OECD the main focus is the improvement of the statistical output of the organisation whereas for the IMF and Eurostat the main purpose is improvement in the quality of the statistical output of national agencies, and the assessment of the quality of data provided by national agencies. Obviously, these differences in emphasis are not mutually exclusive. There are also a number of common elements in the work of the organisations. All use the same definition of “quality” and define quality in more or less the same dimensions, albeit with different labels, as the following table shows

Statistics Canada ¹	Eurostat ²	OECD ³	IMF ⁴
relevance	relevance	relevance	
accuracy	accuracy	accuracy	accuracy and reliability
timeliness	timeliness	timeliness	
accessibility	accessibility and clarity	accessibility	accessibility
interpretability		interpretability	
coherence	coherence	coherence	
	comparability		
	completeness		
			integrity
			methodological soundness
			serviceability
		punctuality	
		credibility	

1. *Statistics Canada Quality Guidelines*, 3rd edition, October 1998, available at <http://www.statcan.ca/english/freepub/12-539-XIE/12-539-XIE.pdf>

2. Assessment of Quality in Statistics, Eurostat, April 2000

3. Quality Framework for OECD Statistics, presented at Meeting of the OECD High Level Group for Statistics, 13 June 2002

4. IMF Data Quality Assessment Framework available at <http://dsbb.imf.org/glossary.pdf>

⁹ A detailed description of the Quality Framework for OECD Statistics is available at <http://www.oecd.org/EN/document/0,,EN-document-notheme-15-no-20-29985-0,00.html>

c. Concluding remarks

15. Experience in many organisations, both national and international, has shown that the successful implementation of a quality framework within an individual agency often requires a willingness to address the issue of quality from a corporate perspective as distinct from a focus on individual statistical collections and outputs. One of the barriers frequently cited against corporate action in this area is the inadequacy of resources that preclude the implementation of various processes and procedures within the quality framework. Resource constraints are very real and do need to be squarely faced by senior management where additional work is required. However, many of the activities associated with the implementation of quality frameworks primarily require undertaking existing processes in a different way and in a corporate context, particularly with respect to the development of new collections and outputs. This frequently requires a cultural change within the organisation and a shift away from a “stovepipe” view of the organisation’s work. Such changes need the involvement of staff at all levels within the organisation and the active and visible support of senior management.

d. Points for discussion at the IAMCSA meeting

16. The following points are submitted for discussion at the IAMCSA meeting in New York on 17-19 September 2002:

I. Is there a role for the IAMCSA in the area of data quality? If “yes”, should that role:

- be restricted to merely sharing current experiences and practices in quality assurance of the data we collect from national agencies for dissemination in our statistical publications (in which case each member would need to provide more specific and detailed information on current processes); or
- does the IAMCSA have a role to facilitate the development and implementation of corporate quality frameworks, etc. What should the focus of such frameworks be? Should they be aimed at our statistical processes and outputs or should the focus be on their implementation by national agencies. None of the international organisation websites reviewed by the author readily described any corporate policy with regard to quality or described processes currently being undertaken to ensure/maintain data quality. Is it reasonable for international organisations to expect national agencies to adopt such practices/processes in the absence of our transparency in this area?

II. Would there be any significant benefit for the IAMCSA to formulate a set of broad recommendations on data quality for adoption by international organisations and national agencies. For example:

- agreement by international organisations on a broad set of issues in relation to data quality could help persuade national agencies to undertake work in this area and/or be useful to national statistical agencies seeking (financial) support from their government;
- making greater use of existing websites (such as the IMF DQRS or the UNSD GPOS) to share practices, etc.

III. The areas of future work/discussion outlined in para. 7 above (i.e. resolution of inconsistencies in data disseminated by national agencies and international organisations and between different international organisations; and the related issue of harmonisation of data and metadata presentation practices between international organisations) have been/or are being considered in other forums such as the CES and the UNSC under the heading of co-ordination of data collection and harmonisation of presentation practices. Further consideration of these topics by the IAMCSA would essentially duplicate these discussions. However, in the context of discussion by the IAMCSA, it should be emphasised that data sharing and the

development of common statistical infrastructures for use by international organisations (and national agencies) do have important data quality implications.

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