

Q2010 Training Courses

Quality Assurance

Quality Assurance

■ Time

- Monday 3 May 2010
- 09:30-17:00

■ Venue

- Statistics Finland
- Työpajankatu 13, FI-00580, Helsinki, Kalasatama

■ Instructor

- Michael Colledge

Introduction

Background

- First substantive item on agenda at February meeting of UN Statistical Commission was Statistics Canada's paper
 - [National Quality Assurance Frameworks](#)

- Quality assurance framework (QAF):
 - Umbrella for quality work at a national statistical office
 - Place for recording quality concepts, policies, and practices
 - Basis for creating and promoting quality culture

- Proposal to develop a generic QAF
 - In form of QAF template and guidelines on QAF construction

Course Objectives, Format and Content

▪ Objectives

- To impart/refresh understanding of quality assurance principles and practices
- To describe the content and benefits of a quality assurance framework (QAF)
- To facilitate development of QAFs for national statistical offices

▪ Format

- Presentations
- Small group and plenary discussions

Content

1. Quality concepts and practices – review of literature
2. Quality assurance frameworks (QAFs)
 - Reasons for, benefits, scope
 - Content, generic template
3. QAF development guidelines
 - QAF Introduction
 - Quality concepts and instruments
 - Quality assurance procedures at corporate level
 - Quality assurance procedures at survey level
 - Quality assessment
 - Quality and performance management and improvement
 - Other considerations

Participant Introductions and Expectations

Session 1

Quality Concepts and Practices - Review of Literature

Content of Session 1

- Terminology
- General approaches to quality
- Quality in context of national statistical office (NSO)
- Internationally developed quality concepts and policies for NSOs
- Internationally developed quality standards and guidelines for NSOs
- Nationally developed quality tools

Terminology

- The term **survey** is used in a broad sense to mean
 - sample survey
 - census
 - administrative data collection
 - statistical process involving multiple data sources
 - production of price or other economic index
 - statistical compilation like national accounts or balance of payments
- This is an extension of the more usual meaning of survey
- In the *ESS Standard for Quality Reports* the term **statistical process** is used to mean survey in this broad sense
 - This usage is avoided in this presentation
 - Here, statistical process refers to a generic survey function, such as imputation, or sequence of such functions.

Terminology (continued)

- The term ***survey program*** is used to mean *a group of surveys within a domain*
- The term ***statistical program*** means *the complete suite of surveys within a NSO* as distinct from a survey program.
- The term ***quality*** is used in a broad sense encompassing all aspects of how well surveys and statistical outputs fulfil user and stakeholder expectations
- Good quality is not just meeting users needs but also
 - addressing respondent concerns regarding reporting burden and confidentiality
 - ensuring institutional environment is impartial, objective, comprising sound methodology and cost-effective procedures

General Approaches to Quality

Evolution of Quality Management

- Statistical quality control
 - Walter Shewart, control charts
 - Inspection and correction
- Upstream quality control
 - Prevention rather than correction
 - Quality assurance
- J Edwards Deming's Fourteen Principles
- Joseph Juran – focusing on the human aspect
- Total quality management (TQM)

Total Quality Management Principles

■ Customer Focus

- Organisation depends on its customers
- Must understand and strive to meet their needs
- Customers determine what is “good quality”

■ Leadership/Constancy of Purpose

- Leaders must establish unity of purpose
- Create environment in which staff can be fully involved in meeting organisation’s objectives
- Quality improvements require leadership and direction

Total Quality Management Principles (continued)

- Involvement of People
 - People at all levels are the essence of an organisation
 - Their full involvement enables their abilities to be fully used
- Process Approach
 - Managing activities and resources as a process is efficient
 - Any process can be broken down into a chain of subprocesses, for which output of one is input to next
- Systems Approach to Management
 - Identifying, understanding and managing processes as a “system” contributes to efficiency and effectiveness

Total Quality Management Principles (continued)

- Continual Improvement
 - Should be a permanent objective
 - An organisation that is not improving is falling backwards
- Factual Approach to Decision Making
 - Effective decisions are based on analysis of information and data
- Mutually Beneficial Supplier Relationships
 - An organization and its suppliers are interdependent
 - A mutually beneficial relationship enhances both

ISO 9000 Series

- ISO 9000:2005: Quality Management System - Fundamentals and Vocabulary
 - Contains TQM principles

- ISO 9000:2000: Quality Management System - Requirements
 - Provides basis for quality certification

- ISO 9004:2000: Quality Management System – Guidelines
 - For organizations already certified

ISO 9001:2000 QMS - Requirements

- Requirements presented under five headings
 - Quality Management System
 - Management Responsibility
 - Resource Management
 - Product Realisation
 - Measurement, Analysis and Improvement

Other General Quality Approaches

European Foundation for Quality Management (EFQM) Excellence Model

Excellence

- Outstanding practice in managing an organization and achieving results

Principles

- Results orientation
- Customer focus
- Leadership and constancy of purpose
- Management by processes and facts
- People development and involvement
- Continuous learning
- Innovation and improvement
- Partnership development
- Corporate social responsibility

Other General Quality Approaches

▪ **Baldrige Criteria for Performance Excellence**

- Administered by Baldrige National Quality Program
- Criteria similar to ISO 9001 and EFQM Excellence Model

▪ **Six Sigma**

- Business management strategy with set methodology
- Achieving specified financial targets through identifying and removing causes of defects/errors

▪ **Balanced Scorecard**

- Derivative of *Management by Objectives*
- Focuses on human issues as well as financial outcomes

Other Quality Approaches

- **ISO 20252:2006 Market, Opinion and Social Research – Vocabulary and Requirements**
 - Based on an old British standard (BSI 7911)
 - Aimed at commercial organizations conducting research
 - Sections on:
 - Quality management systems
 - Managing research
 - Data collection – fieldwork, self-completion, secondary sources
 - Data management and processing – capture, coding, editing, analysis, security

Developing Quality Management in Context of a National Statistical Office (NSO)

- Every organization needs a quality management system, or equivalent
- ***What approach should an NSO use?***

In the context of a national statistical office

quality
is defined in terms of

Quality Components (or Dimensions)

and a Quality Management System
is typically expressed in the form of a

Quality Assurance Framework

Developing Quality Management in Context of an NSO

- From ISO 9001:
 - *the design and implementation of an organisation's QMS is influenced by varying needs, particular objectives, products provided, processes employed and size and structure of the organisation. It is not the intent of the standard to imply uniformity in the structure of QMSs or uniformity of documentation*

In other words

- ***Must adapt (interpret) quality standard to (within) particular context of a national statistical office***

Developing Quality Management in Context of an NSO

- What makes a national statistical office special?
...what are its distinguishing features?

Distinguishing Features of NSOs

- Government not private enterprise
 - Not profit based
- Supply data to non-paying users, not paying customers
 - Users cannot influence quality through purchase decisions
- Important internal users
 - national accounts unit is a user as well as a producer
- Primary inputs are data from individual enterprises, households and persons
 - collected directly or through administrative processes
 - not paid for
- Core production processes are transformations of individual data into aggregate data
- Primary products are statistics and accompanying services

Internationally Developed Quality Concepts and Policies for NSOs

- International organisations, including
 - Eurostat - Quality in Statistics WG; Leadership Group on Quality
 - IMF Statistical Division
 - UN Statistical Division
 - OECD
- and NSOs have been
 - adopting general quality standards
 - adapting general quality standards to NSO context
 - developing quality concepts, policies and practices

Internationally Developed Quality Concepts and Policies for NSOs

- UN Principles of Official Statistics

- European Statistical System (ESS)
 - System Mission and Vision
 - Quality Declaration
 - European Statistics Code of Practice
 - ESS quality components

- IMF Data Quality Assessment Framework

UN Principles of Official Statistics

- **Principle 1.** Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honor citizens' entitlement to public information.
- **Principle 2.** To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.

UN Principles of Official Statistics (continued)

- **Principle 3.** To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics.
- **Principle 4.** The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.
- **Principle 5.** Data for statistical purposes may be drawn from all types of sources, be they statistical surveys or administrative records. Statistical agencies are to choose the source with regard to quality, timeliness, costs and the burden on respondents.

UN Principles of Official Statistics (continued)

- **Principle 6.** Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes.
- **Principle 7.** The laws, regulations and measures under which the statistical systems operate are to be made public.
- **Principle 8.** Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.

UN Principles of Official Statistics (continued)

- **Principle 9.** The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.
- **Principle 10.** Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

ESS Quality Declaration

▪ **European Statistical System Mission**

- “We provide the European Union and the World with high quality information on the economy and society at the European, national and regional levels and make the information available to everyone for decision-making purposes, research and debate.”

▪ **European Statistical System Vision**

- “The ESS will be a world leader in statistical information services and the most important information provider for the European Union and its member states
- Based on scientific principles and methods, the ESS will offer and continuously improve a programme of harmonized European statistics that constitutes an essential basis for democratic processes and progress in society.

ESS Quality Declaration: 10 Principles

- User focus
 - Products and services that meet user needs
 - User needs guide ESS members, employees and operations
- Continuous improvement
 - User needs change over time
 - Advances in technology provide new possibilities
 - Work methods are improved accordingly
- Product quality commitment
 - High quality products using scientific methods
 - Objectivity and confidentiality
 - Information that enables users to assess product quality

ESS Quality Declaration: 10 Principles (cont)

- Commitment of leadership
 - Active and visible leadership in creating and sustaining quality culture
 - Providing clear direction, prioritizing improvement activities, and stimulating empowerment and innovation
- Systematic quality management
 - Systematically and regularly identify strengths and weaknesses
 - Long-term strategic orientation
- Effective and efficient processes
 - Work efficiently to produce output with minimum resources and errors
 - Continuous review and improvement
- Staff satisfaction and development
 - Treat employees as the key resource

General Definition of Quality

- “Quality” has to be defined in NSO context
- Many general definitions exist, none definitive
- A commonly used succinct definition is
 - *fitness for use*
- ISO 9000 definition:
 - *degree to which a set of inherent characteristics fulfils requirements*
- ISO 8402:1986 gives more comprehensible definition:
 - *totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs*

General Definition of Quality (continued)

- These definitions provide basic notion of product quality
 - Require more precise definition in NSO context

- **ESS Definition of Quality in Statistics**
 - Revised October 2003
 - Clarified in ESS Handbook for Quality Reports, 2009
 - Defines *components* of (output) quality
 - Basis for defining quality in all subsequent quality related ESS documents, including
 - Code of Practice and
 - legal framework on European Statistics

ESS Components of Output Data Quality

▪ **Relevance**

- outputs meet current and potential users' needs

▪ **Accuracy and Reliability**

- outputs accurately and reliably portray reality

▪ **Timeliness and Punctuality**

- outputs are disseminated in timely, punctual manner

▪ **Accessibility and Clarity**

- outputs are presented in clear, understandable form
- disseminated in a suitable and convenient manner
- made available and accessible on impartial basis
- accompanied by supporting metadata and guidance

ESS Components of Output Data Quality (cont)

▪ **Coherence and Comparability**

(as clarified in ESS Handbook for Quality Reports, 2009)

- Coherence means that outputs are mutually consistent and can be used in combination
- Comparability is an aspect of coherence
- Comparability means that outputs referring to same data items are mutually consistent and can be used for comparisons across time, region, or any other relevant domain
- Coherence and comparability are entirely determined by metadata
- Coherence does not imply numerical consistency

Other Definitions of Quality

IMF Data Quality Assessment Framework

- Prerequisites of quality
- Dimensions of quality
 - Assurances of integrity
 - Methodological soundness
 - Accuracy and reliability
 - Serviceability
 - Accessibility
- Concerns *process quality* as well as *output quality*
- Concordance table has been developed with ES Code of Practice

European Statistics Code of Practice

- Adopted May 2005
- Inspired by international standards, ESS Quality Declaration, and ESS quality definition
- Comprises fifteen principles in three groups:
 - Institutional environment
 - Statistical processes
 - Statistical outputs
- Each principle illustrated by a set of indicators
- Self-regulation by NSOs and Eurostat plus periodic reviews

European Statistics Code of Practice

Institutional environment

- Principle 1: Professional Independence
- Principle 2: Mandate for data collection
- Principle 3: Adequacy of Resources
- Principle 4: Quality Commitment
- Principle 5: Statistical Confidentiality
- Principle 6: Impartiality and Objectivity

European Statistics Code of Practice

Statistical Processes

- Principle 7: Sound Methodology
- Principle 8: Appropriate Statistical Procedures
- Principle 9: Non-Excessive Burden on Respondents
- Principle 10: Cost Effectiveness

Statistical Output

- Principle 11: Relevance
- Principle 12: Accuracy and Reliability
- Principle 13: Timeliness and Punctuality
- Principle 14: Coherence and Comparability
- Principle 15: Accessibility and Clarity

Process Quality

- IMF DQAF and European Statistics Code of Practice both refer indirectly to the quality of processes
- ***Output quality*** is achieved through ***process quality***
- Process quality has two broad aspects
 - Effectiveness: which leads to outputs of good quality
 - Efficiency: which leads to production of outputs at minimum cost to NSO and to respondents
- IMF DQAF covers process quality under headings
 - *Prerequisites of quality*
 - *Methodological Soundness*

Process Quality

- Guidance on formulation of process quality components provided by first 10 principles in ESS Code of Practice

- Based on Code of Practice, ESS Handbook on Quality Reports identifies three composite process quality components
 - Assessment of user needs and perceptions
 - Performance, cost and respondent burden
 - Confidentiality, transparency and security

- They complement the output quality components

Internationally Developed Quality Standards and Guidelines

- Sources include:
 - Eurostat – through working groups
 - SDMX Partnership of international organizations
 - OECD, IMF, UN, Eurostat, ECB...

ESS Quality Standards and Guidelines

- **ESS Standard for Quality Reports (ESQR) (revised 2009)**
 - For preparation of comprehensive quality report about a survey
 - Summarises what should be included in a quality report under 10 headings based on Code of Practice
 - Aim is to harmonise quality reporting across the ESS
- **ESS Handbook for Quality Reports (EHQR) (revised 2009)**
 - Accompanies ESQR, providing more details and examples
 - Includes summary of ESS quality concepts and documentation
 - Classifies types of quality report according to scope, level (NSO or ESS), producer/user orientation, output/process orientation, degree of detail, and frequency
- **Standard Quality Indicators**
 - updated version in ESQR and EHQR

ESS Quality Documentation (continued)

- ESS Quality Glossary
 - providing short definition of each term and source of definition
 - Some key terms are missing
- European Self Assessment Checklist for Survey Managers (DESAP)
 - enabling conduct of quick but systematic and comprehensive quality assessment of a survey
 - and identification of potential improvements
- Electronic Version of Self Assessment Checklist
 - with a Electronic Version User Guide
- Condensed Version of Checklist for survey managers
 - Contains only selected key questions

ESS Quality Documentation (continued)

- Handbook on Data Quality - Assessment Methods and Tools
 - Details full range of methods for assessing process and output quality and the tools that support them
 - Makes recommendations on how these methods and tools can be implemented
 - Is primarily targeted at quality managers, enabling them to introduce, systematise and improve data quality assessment
- Handbook on Improving Quality by Analysis of Process Variables
 - general approach and tools for identifying, measuring and analysing key process variables

Other Relevant Documentation

- **Metadata Common Vocabulary**
 - More comprehensive and up to date glossary
 - developed by SDMX partnership of international organisations
- **Generic Statistical Business Process Model**
 - Developed by METIS work group of UNECE
 - Layered description of survey cycle from specification to evaluation
 - Defines 9 phases at top level
 - Specify needs, Design
 - Build
 - Collect, Process, Analyse, Disseminate, Archive
 - Evaluate

Nationally Developed Quality Assurance Tools

- Individual NSOs have developed numerous quality policies, standards and procedures for own purposes
 - and made them publicly available
- Quality documentation on websites of
 - Statistics Canada, Statistics Finland, UK Office for National Statistics, Australian Bureau of Statistics
 - US Office for Budget and Management, US Bureau of Labor Statistics, US Census Bureau, US National Center for Health statistics
- Many other agencies have produced documents with similar content and made them available
- Here discuss three documents that typify content of all

Nationally Developed Quality Assurance Tools

Statistics Canada Quality Assurance Framework

- Describes how agency manages the quality of its products
- Provides overview of management approach
 - balancing evolving needs of clients, costs, respondent burden, and
 - quality dimensions
- Describes management structure, policies and guidelines, consultative mechanisms, and project management methods as means to
 - facilitate effective quality management
 - reinforce each other in serving client needs
 - display agency's objective professionalism and concern for quality

Nationally Developed Quality Assurance Tools

Statistics Canada Quality Assurance Guidelines

- Describes how to assure quality through effective and appropriate design and implementation of surveys
 - from inception through design, data collection and processing to dissemination and evaluation
- Organized into subsections corresponding to main steps (activities) in a typical survey; each subsection provides:
 - summary of scope and purpose of activity
 - broad, underlying policies, directions and approaches which govern design of activity
 - known good practices associated with activity
 - corresponding quality indicators

Nationally Developed Quality Assurance Tools

Statistics Canada Quality Framework and Guidelines

- Defines *quality of statistical information* in terms of six dimensions
 - closely aligned to European Code of Practice output principles
- *Relevance* - degree to which information meets real client needs
 - whether it sheds light on issues of most importance to users
- *Accuracy* - degree to which the information correctly describes the phenomena it was designed to measure
- *Timeliness* - delay between reference point/ period to which information pertains, and date on which information becomes available

Nationally Developed Quality Assurance Tools

Statistics Canada Quality Framework and Guidelines

- *Accessibility* - ease with which information can be obtained, including
 - how readily its existence can be ascertained
 - suitability of format and medium through which it can be accessed
- *Interpretability* - availability of supplementary information and metadata necessary to utilize information appropriately, including
 - underlying concepts and classifications
 - methodology of data collection and processing
 - indications of accuracy
- *Coherence* - degree to which information can be successfully brought together with other statistical information
 - within a broad analytic framework and over time
 - not necessarily implying full numerical consistency

Nationally Developed Quality Assurance Tools

Statistics Finland Quality Guidelines for Official Statistics

- Gathers existing knowledge and current best methods into a single document
- Intended to support improvement of statistics production and interaction with stakeholders
- Underpins the drive for increased productivity and for continuous improvement of the quality of statistics
- Aligned with European Statistics Code of Practice, including the output quality indicators
 - relevance, accuracy and reliability, timeliness and punctuality, coherence and comparability
- Presented in four parts

Nationally Developed Quality Assurance Tools

Statistics Finland Quality Guidelines for Official Statistics

- Chapter 1 concerns operating framework within which statistics are produced, the norms that regulate official statistics, and universal quality requirements
- Chapter 2 covers statistical production and survey processes
 - All stages in functional sequence from definition to compilation
- Chapter 3 deals with documentation
 - Emphasises documentation is integral element of working approach
- Chapter 4 concerns publication and dissemination of statistical information and services provided to customers
 - Stresses importance of customer orientation and
 - continuous development of customer services

Issues for Discussion

1. Should a NSO seek ISO 9001 certification?
 - Assess advantages and disadvantages
2. From perspective of defining quality how comprehensive is the ESS Code of Practice?
 - What is missing? What is unclear?
3. Which of the two sets of quality dimensions - ESS and IMF-DQAF - is more appropriate for your NSO, and why?
4. Which international and national quality standards and guidelines have proved particularly useful from your perspective?
 - What additional quality guidelines would be useful?

Session 2: Quality Assurance Frameworks

Content of Session 2

- Reasons for having a QAF
- Scope of QAF
- Content of QAF
- Towards an international (generic) QAF

Reasons for Quality Assurance Framework

- NSOs are involved in wide range of re-engineering/ quality improvement activities
- Need an over-arching framework
 - to provide context
 - explain relationships between activities and
 - make quality tools readily available
- In effect, need a **Quality Management System** or equivalent
- Some NSOs have actually adopted ISO 9001 Quality Management Systems as their over-arching quality framework
- Others, like Statistics Canada, have constructed a quality management system, tailored to their particular needs

In the context of a national statistical office
a Quality Management System
is typically called / expressed in the form of a
Quality Assurance Framework

Benefits of Quality Assurance Framework

- Provides systematic mechanism for ongoing identification and resolution of quality problems
 - stimulating interaction between staff across NSO
- Gives greater transparency to processes by which quality is assured
 - Reinforces NSO image as a credible provider of good quality statistics
- Provides basis for creating/maintaining quality culture
- Source of reference material for training
- Mechanism for exchanging ideas on quality assurance with other producers of statistics
 - within national statistical system
 - with other NSOs and international statistical organizations

Scope of Quality Assurance Framework

From Statistics Canada's NQAF Paper

- Targeted at roughly same organisational level as ISO 9000 series *quality management system* described in the series,
 - with similar objectives
 - but tailored to the specific context of an NSO
- Refers to the ***complete statistical program*** of an NSO,
 - including supporting infrastructure
 - not just an individual survey or group of surveys
- Is forward looking
 - proposing current and future organization of quality assurance,
 - not simply an assessment of quality
- Focuses on management of ***core statistical functions***

Scope of Quality Assurance Framework

From Statistics Canada's NQAF Paper (continued)

- Is less detailed than *quality guidelines*
 - references good practices, rather than describing them
- Is at higher level than *quality guidelines*
 - describes mechanisms by which good practices can be implemented

Option - as in Statistics Finland's Quality Guidelines

- Embed quality guidelines in quality assurance framework
 - in other words, combine framework and guidelines

Content of Quality Assurance Framework

- Can draw ideas on content from existing frameworks
- QAFs for NSOs
 - Statistics Canada: *Quality Assurance Framework*
 - Statistics Finland: *Quality Guidelines for Official Statistics*
- QAFs for international organizations compiling statistics
 - OECD: *Quality Framework and Guidelines for OECD Statistical Activities*
 - Eurostat: *Quality Assurance Framework*
 - European Central Bank: *Statistics Quality Framework*
 - Eurostat: *Guidelines for implementation of quality assurance frameworks for international and supranational organisations compiling statistics*

Content of Quality Assurance Framework

OECD: *Quality Framework and Guidelines (2003)*

■ Part 1:

- definitions of quality dimensions
- broad basic principles on which OECD statistical activities conducted
- procedures for assuring quality of new statistical activities
- procedures for evaluating quality of existing statistical activities

■ Part 2:

- quality guidelines for all phases of statistical production process.

■ Part 3:

- specific steps to be followed in planning and carrying out statistical activities
- examples of good practice currently in use in OECD Directorates

Content of Quality Assurance Framework

OECD: *Quality Framework and Guidelines (2003)*

- Output data quality is defined in terms of seven dimensions
 - Relevance, accuracy, credibility, timeliness, accessibility, interpretability, and coherence
 - *Credibility* is an addition to usual set of dimensions, reflecting key role of user and stakeholder perceptions in OECD context.
- Another factor specifically in framework is *cost-efficiency*

Content of Quality Assurance Framework

Eurostat: *Quality Framework and Guidelines (2008)*

- Quality assurance viewed as comprising five basic elements:
 - *documentation*
 - *standardisation of processes and statistical methods*
 - *quality measurement*
 - *strategic planning and control*
 - *improvement actions.*
- Four quality assessment types are defined, which in increasing order of complexity, are:
 - *self-assessment, supported self-assessment,*
 - *peer review, and rolling review*

Content of Quality Assurance Framework

European Central Bank: *Statistics Quality Framework(2008)*

- Defines main quality principles and elements guiding production of ECB statistics, including
 - governance, code of conduct, international collaboration, public commitment, planning, development of new statistics
- Specific quality assurance procedures cover
 - confidentiality protection, data collection,
 - compilation and statistical analysis,
 - data accessibility and dissemination policy,
 - monitoring and reporting, and monitoring and reinforcing the satisfaction of key stakeholders.

Content of Quality Assurance Framework

Eurostat: *Guidelines for implementation of QAFs...*

- Elements of existing quality initiatives brought together in a model QAF
 - to be adapted by individual international organisations to fit their particular environment
- Concludes that one-size-fits-all, generic QAF not feasible
 - Environments within which organisations operate are too different from one another

Towards a Generic Quality Assurance Framework

Stat Can NQAF paper to the 2010 UN Statistical Commission

- Starts with notion of developing an international (generic) QAF
- *Cites European Standard for Quality Reports* as example of detailed generic standard for NSOs
- Envisages a generic set of *Quality Guidelines* could be prepared along the same lines
- Notes that quality reporting standards and quality guidelines deal with *statistical techniques*
- whereas QAF has more focus on the *organisation* of an NSO and the environment within which the techniques are applied

Towards a Generic Quality Assurance Framework

Stat Can NQAF paper to the 2010 UN Statistical Commission

- Notes organisational arrangements and environment differ far more from one NSO to another than statistical techniques
- Concludes that *generic, one-size-fits-all* QAF for NSOs is not feasible
- Proposes development of a generic National Quality Assurance Framework (NQAF) **template** that
 - provides general structure within which individual QAFs can be developed
 - is accompanied by **NQAF guidelines** indicating how to formulate and operationalize a QAF and giving practical examples

Towards a Generic Quality Assurance Framework

Stat Can NQAF paper to the 2010 UN Statistical Commission

- Proposes three alternative NQAF templates
- All have same basic structure
 1. *Introduction*
 2. *Quality concepts and instruments*
 3. *Quality assurance procedures*
 4. *Quality assessment*
 5. *Quality and performance management and improvement*
 6. *Conclusion*
- They differ in how they present quality assurance procedures

Generic QAF Template

1. *Introduction*

- Current circumstances, key issues driving need for quality management
- Benefits of QAF
- Relationship to other corporate policies, strategies and frameworks.
- Content of document

2. *Quality concepts and instruments*

- Existing quality policies, models, objectives and procedures
- Role of QAF - where the QAF fits in corporate quality toolkit

3. *Quality assurance procedures*

- (3 options presented – will be discussed)

Generic QAF Template

4. *Quality assessment*

- Quality indicators – defining, collecting, analysing, synthesizing – composite indicators, quality barometer/dashboard
- Quality targets – setting and monitoring
- Quality assessment program – self-assessment, peer review, quality audit, certification

Generic QAF Template

5. *Quality and Performance Management*

- Performance management – planning, cost and efficiency, sharing good practices, change management, risk management
- Recruitment and training – resource planning, determining recruitment and training needs, developing and conducting training courses
- Continuous improvement program – quality culture, ongoing enhancements within operating budgets.
- Governance structure - for quality and performance trade-offs and reengineering initiatives, based on results of quality assessments

6. *Conclusion*

- Summary of benefits
- Reference to guidelines and implementation plans

Generic QAF Template

- Alternative presentations of *3. Quality Assurance Procedures* are based on
 - Statistics Canada QAF
 - IMF DQAF
 - European Statistics Code of Practice

Generic QAF Template: Section 3 QA Procedures based on Stat Can QAF

- Managing user and stakeholder relationships – user satisfaction surveys, feedback mechanisms, councils
- Coordinating the national statistical system – protocols, standards
- Managing relevance – program review, planning process, data analysis
- Managing accuracy – design, accuracy assessment, quality control, revision policy
- Managing timeliness and punctuality – advanced release dates, preliminary/final releases
- Managing accessibility – product definition, dissemination practices, search facilities
- Managing interpretability/clarity – concepts, sources, methods, informing users of quality

Generic QAF Template: Section 3 QA Procedures based on Stat Can QAF(continued)

- Managing coherence and comparability – standards, harmonized concepts and methods
- Managing output quality tradeoffs – especially relevance, accuracy and timeliness
- Managing provider relationships – response burden measurement and reduction, response rate maintenance
- Managing statistical infrastructure – standards, registers, policies
- Managing institutional infrastructure -. confidentiality, security, transparency, professional independence, impartiality, objectivity
- Managing metadata – relating to quality

Generic QAF Template: Section 3 QA Procedures based on IMF DQAF

- Prerequisites of quality
 - *Legal and institutional environment*
 - *Resources*
 - *Relevance*
- Assurances of integrity
 - *Professionalism*
 - *Transparency*
 - *Ethical standards*
- Methodological soundness
 - *Concepts and definitions*
 - *Scope*
 - *Classification and sectorization*
 - *Basis for recording*

Generic QAF Template: Section 3 QA Procedures based on IMF DQAF (continued)

- Accuracy and reliability
 - *Data sources*
 - *Statistical techniques*
 - *Assessment and validation of intermediate data and statistical outputs*
 - *Revision studies*
- Serviceability
 - *Periodicity and timeliness*
 - *Consistency*
 - *Revision policy and practice*
- Accessibility
 - *Data accessibility*
 - *Metadata accessibility*
 - *Assistance to users*

Generic QAF Template: Section 3 QA Procedures based on European Statistics Code of Practice

- Managing the Institutional Environment
 - *Professional independence*
 - *Mandate for data collection*
 - *Adequacy of resources*
 - *Statistical confidentiality and security*
 - *Impartiality and objectivity*

- Managing Statistical Processes
 - *Sound methodology*
 - *Appropriate statistical procedures*
 - *Respondent considerations*
 - *Effective use of resources*

Generic QAF Template: Section 3 QA Procedures based on European Statistics Code of Practice

- Managing Statistical Outputs
 - *Relevance*
 - *Accuracy and reliability*
 - *timeliness and punctuality*
 - *Coherence and comparability*
 - *Accessibility and clarity*

What Quality Assurance Procedures to include in QAF Section 3?

There are two basic options

- Include quality assurance procedures at both *corporate and survey levels*
 - Example: Statistics Finland Guidelines on Quality for Official Statistics
- Include only *corporate level* procedures and record quality assurance procedures at survey level elsewhere
 - Example: Statistics Canada's Quality Assurance Framework and Quality Guidelines

Terminology: Survey Level and Corporate Level

- *Survey level* refers to procedures that are applicable to a survey individually
 - Typically covers the processes that constitute the survey life cycle
 - from defining survey objectives, through designing survey, collecting and processing data to generating data outputs and evaluating survey
 - Includes processes carried out on behalf of survey by functional (service) areas within the agency, for example sample design
- *Corporate level* refers to procedures that are applicable to the agency as a whole
 - Example would be running a Methodology Advisory Committee comprising experts from universities and other organisations
- In practice, this distinction is not totally clear cut
 - Publication could be a corporate responsibility in which survey managers not involved

Choice of Structure and Content for QAF Section 3: Quality Assurance Procedures

- Depends upon circumstances of NSO
 - State of development of NSO as a whole
 - Legal and operational environment
 - Resources available
 - Quality issues of importance
 - Ongoing and planned re-engineering and quality improvement initiatives
 - Quality reporting obligations
- Example
 - European country might prefer Code of Practice structure
 - Country completing IMF ROSC might prefer IMF DQAF structure

*Topics for Small Group Discussion

- Does your agency have a QAF?
 - If yes, does it have any impact? What are its benefits?
 - If no, would the benefits of a QAF justify the expenditure of resources in developing and implementing it? Discuss the benefits, costs and construction process

- Is Statistics Canada's QAF template useful?
 - Does it cover all topics that should be included?
 - Are there better ways in which a QAF could be structured?
 - In your view should the QAF include survey level quality guidelines, or should these be in a separate document?
 - In each case what would be your preferred structure for presenting quality assurance practices and why?

Session 3: QAF Development Guidelines

How to complete each section in generic template

- QAF introduction
- Quality concepts and instruments
- Quality assurance procedures at corporate level
- Quality assurance procedures at survey level
- Quality assessment
- Quality and performance management and improvement
- Other considerations

QAF Development Guidelines

Section 1 Introduction

Content according to generic template

- *Current circumstances, key issues driving need for quality management*
- *Benefits of QAF*
- *Relationship to other corporate policies, strategies and frameworks.*
- *Content of document*

QAF Development Guidelines (continued)

Section 1 Introduction

Content

- *Circumstances and issues - examples*
 - Recent published errors, large increase/decrease in resources, government wide reform initiative, change of management, restructuring of NSO...
- *Benefits of QAF*
 - as discussed and recorded in previous slide
- *Relationship to other corporate policies, strategies, frameworks - examples*
 - Mission and vision statement, multi-year plan, annual plan, human resources strategic plan...

QAF Development Guidelines

Section 2 Quality Concepts and Instruments

Content according to generic template

- *Existing quality policies, models, objectives and procedures*
- *Role of QAF - where the QAF fits in corporate quality toolkit*

QAF Development Guidelines (continued)

Section 2 Quality Concepts and Instruments

Content

- *Existing quality policies, models, objectives and procedures – examples*
 - Definition of quality/quality dimensions
 - (for European NSOs) EU statistical regulations relating to quality
 - International or supranational standards and guidelines used by NSO , for example ESS Code of Practice, Standard for Quality Reports

- Role of QAF: where the QAF fits in corporate quality toolkit - examples
 - QAF is over-arching framework, as previously discussed...

***QAF Development Guidelines**

Section 3 Quality Assurance Procedures

Reference Documents

- Statistics Canada: NQAF paper for UN Stat Commission
- Statistics Canada Quality Assurance Framework
- Statistics Finland: Quality Guidelines for Official Statistics
- Quality guidelines from other agencies

Guidelines

- Start with decision whether to include quality assurance procedures at survey level
 - If guidelines already exist, reference them in QAF, do not include them
- Decide on structure
 - Statistics Canada's QAF based approach, Eurostat's Code of Practice approach, IMF's DQAF based approach, other approach

***QAF Development Guidelines**

Section 3 Quality Assurance Procedures

at Corporate Level

- Managing institutional infrastructure
- Managing user and stakeholder relationships
- Managing provider relationships
- Managing statistical infrastructure
- Managing output quality tradeoffs
- Managing metadata relating to quality
- Coordinating national statistical system
- Managing relevance
- Managing accuracy
- Managing timeliness and punctuality
- Managing accessibility
- Managing clarity
- Managing coherence and comparability

****QAF Development Guidelines Section 3: Managing Institutional Infrastructure**

Notes on Content

- ***(generic template) confidentiality, security, transparency, professional independence, impartiality, objectivity***
- How commitments to professional independence, impartiality, objectivity are expressed
 - Procedures for appointment /removal of head of NSO
- Impartial data release policy
 - schedule of releases well in advance,
 - release to all users simultaneously/ provisions for early release
- Security provisions
 - Procedures to safeguard data collection, transmission, storage

****QAF Development Guidelines Section 3: Managing Institutional Infrastructure**

Notes on Content (continued)

- Confidentiality provisions
 - Confidentiality guaranteed by statistical law
- Transparency provisions
 - Policy on informing users of methodology and quality
 - Publishing results of program evaluations
 - Survey metadata publicly available

****QAF Development Guidelines Section 3: Managing User and Stakeholder Relationships**

Notes on Content

(from generic template) user satisfaction surveys, feedback mechanisms, councils

- User satisfaction surveys
 - Frequency of conduct, date of most recent, how results translated into actions to improve quality
- National statistical council (or equivalent)
 - Membership, operations results
- Methodology and ICT expert committees
 - Membership, operations results
- Subject matter specific advisory committees
 - Membership, operations results

****QAF Development Guidelines Section 3: Managing Provider Relationships**

Notes on Content

(from generic template) response burden measurement and reduction, response rate maintenance

- Provider relations program
 - Defining and publicising respondents' rights and responsibilities
- Measurement of respondent burden
 - Policy statement, definition, procedures
- Respondent burden reduction targets
 - Setting targets and monitoring progress in achieving them

****QAF Development Guidelines Section 3: Managing Provider Relationships**

Notes on Content (continued)

- Standard definition(s) of response rate(s)
- Analyses of response rates by survey and over time
- Mechanisms for maintaining relationships with administrative providers
 - Memoranda of understanding, regular meetings

****QAF Development Guidelines Section 3: Managing Statistical Infrastructure**

Notes on Content

(from generic template) standards, registers, policies

- Mechanisms for managing concepts and classifications
 - Development and maintenance of standard classifications
 - Monitoring use and deviations from use in conducting surveys
 - Harmonisation with international standards
- Policies, standards, guidelines for
 - Questionnaire design
 - Appearance of printed publications and web pages
 - Presentation of data in tables and graphs
 - Data revision
 - Seasonal adjustment and trend-cycle estimation

****QAF Development Guidelines Section 3: Managing Statistical Infrastructure**

Notes on Content (continued)

- Mechanisms for assuring quality in construction, maintenance and use of business register
 - Policy on use of business register to provide survey sampling frames
- Mechanisms for assuring quality in construction, maintenance and use of household register and/or area based sampling frame
 - Mechanisms for assuring quality in their construction, maintenance and use

****QAF Development Guidelines Section 3: Managing Metadata**

Notes on Content

(from generic template) metadata related to quality

- Data and metadata management policies and facilities
 - Dedicated unit responsible for metadata management
- Corporate database for metadata describing quality

****QAF Development Guidelines Section 3: Coordinating National Statistical System**

Notes on Content

(from generic template) protocols, standards

- Role of NSO in coordination of NSS
 - Legislated, de facto
- What the NSO does to coordinate
 - Commonly maintained website with statistical data
 - Training in statistics for staff of other agencies
 - Promotion of statistical standards and best practices
- Impact of NSO coordination activities
 - how measured

QAF Development Guidelines Section 3: Managing Relevance

Notes on Content

- Describe mechanisms used for establishing and revising statistical program
- Indicate what proportion of program is non-discretionary
 - EU regulations
 - Long standing national demands
- Indicate how limited are the opportunities for revising the program, that introduction of a new survey requires
 - additional budget
 - efficiency gains in conducting other surveys or maintaining infrastructure
- Note it is difficult to discontinue a survey
 - Lots of analysis, strong justification

QAF Development Guidelines Section 3: Managing Relevance

Notes on Content (continued)

- Describe mechanisms for identifying user needs, e.g.,
 - EU and national regulations
 - Liaison with key users
 - Program managers liaise with clients and monitor client feedback on content and format of products
 - Discussions with other national statistical offices
- Explain how un-met user needs are considered and may be transformed into an approved program, e.g.,
 - via annual planning process
 - survey funded on cost recovery basis

QAF Development Guidelines Section 3: Managing Accuracy

Notes on Content

- Describe generic ways of achieving accuracy
- Achieving accuracy through survey design
 - Requires state of the art methodology and quality monitoring processes to identify and control errors
- Decisions on what constitutes acceptable accuracy have to be made by individual survey managers
 - Based on their knowledge of user requirements, budget, human resources
- Methodology must be within realm of commonly accepted and defensible statistical practices
- Use of new technologies and innovations is encouraged
 - but must be adequately tested to minimize risk.

QAF Development Guidelines Section 3: Managing Accuracy

Notes on Content (continued)

- Describe how pool of methodologists is established and maintained
 - Experts in sampling and estimation, questionnaire design, editing, imputation, analysis
- Describe general approach of build quality and performance monitoring mechanisms into survey processes
- Describe how accuracy is monitored and assessed
 - monitor and correct, in real time, data collection problems
 - assess whether survey design was implemented as planned
 - assess whether aspects of design were problematic in operation
 - lessons learned to aid future designs

QAF Development Guidelines Section 3: Managing Timeliness & Punctuality

Notes on Content

- Explain planned timeliness is a design decision, based on trade-offs with accuracy and cost, and how decision made
- Describe policy for announcing release dates in advance
- Describe arrangements for monitoring timeliness across programs
 - to warn of general deterioration
 - to identify extremes of lateness
 - to identify good practices

QAF Development Guidelines Section 3: Managing Timeliness & Punctuality

Notes on Content (continued)

- Explain release of preliminary data followed by revised and final figures is strategy for making data timelier
- Show that tracking of size and direction of revisions serves
 - to assess appropriateness of chosen timeliness-accuracy trade-off
 - as basis for recognizing persistent or predictable biases in preliminary data that could be removed through estimation

QAF Development Guidelines Section 3: Managing Accessibility

Notes on Content

- Describe primary dissemination vehicles
 - paper publications, electronic publications, online databases, public library
- Describe ways output is being made more accessible, e.g.
 - production of public-use microdata files
 - provision of a custom data provision service
 - contracts with external researchers

QAF Development Guidelines Section 3: Managing Clarity

Background Notes

- Ensuring interpretation of data is primarily about provision of metadata falling under three broad headings:
 - conceptual metadata - concepts, variables and classifications that underlie the data
 - procedural metadata - methodology used to collect and compile the data
 - operational metadata - indicators of the accuracy of the data
- Metadata may accompany tables (titles, row, column headings, footnotes) or be in commentary accompanying tables, or in Sources and Methods publications

QAF Development Guidelines Section 3: Managing Clarity

Notes on Content

- Describe corporate level mechanisms for ensuring clarity, for example
 - User feedback survey
- Describe whether/how serious misinterpretations of data by the media or in public arena are challenged publicly

QAF Development Guidelines Section 3: Managing Coherence and Comparability

Notes on Content

- Describe procedures for development, use and maintenance of international/national standards
 - frameworks, concepts, variables and standard classification systems
 - for example, System of National Accounts
- Describe corporate level efforts to minimise incoherence in surveys by use of (as applicable)
 - business register as the frame for all business surveys
 - farm register for agricultural surveys
 - master sample of households for household surveys
 - harmonized methodologies and systems
 - quality guidelines and international standards

QAF Development Guidelines Section 3: Managing Coherence and Comparability

Notes on Content (continued)

- Describe areas of expertise and oversight committees that promote coherence, for example
 - National account
 - Data analysis area
 - Methodologists
- Describe work on integration, comparison and analysis of data from different sources and over time
 - Indicate how to recognize situations where variation or inconsistency exceeds levels expected, given accuracy of data
 - Refer to any routine coherence assessments, for example labour cost survey, national accounts, labour force, structural business survey comparisons, or in quality reports, for example prepared for Eurostat

QAF Development Guidelines Section 3: Managing Coherence and Comparability

Notes on Content (continued)

- Describe how information from users is handled
 - Journalists often draw attention to apparent data discrepancies
 - How criticisms in press are handled

****QAF Development Guidelines Section 3: Managing Output Quality Trade-offs**

Notes on Content

(from generic template) ...especially between relevance, accuracy and timeliness

- Studies of how estimates evolve as number of responses increases
- Policies and methods for dealing with changes in estimates due to improvements in methodology
- Policies for dealing with known biases

QAF Development Guidelines

Section 3 Quality Assurance Procedures

at Survey Level

Reference Documentation

- Quality guidelines of NSOs
 - Statistics Canada's Quality Guidelines
 - Statistics Finland's Quality Guidelines for Official Statistics...
- ESS Handbook for Quality Reports...

Background Notes and Content

(See supplementary presentation)

QAF Development Guidelines

Section 4 Quality Assessment

Reference Documentation

- ESS Standard for Quality Reports (ESQR)
- ESS Handbook for Quality Reports (EHQR)
- (ESS) Handbook on Data Quality Assessment: Methods and Tools (DatQAM)
- (ESS) Handbook on Improving Quality by Analysis of Process Variables...

QAF Development Guidelines

Section 4 Quality Assessment

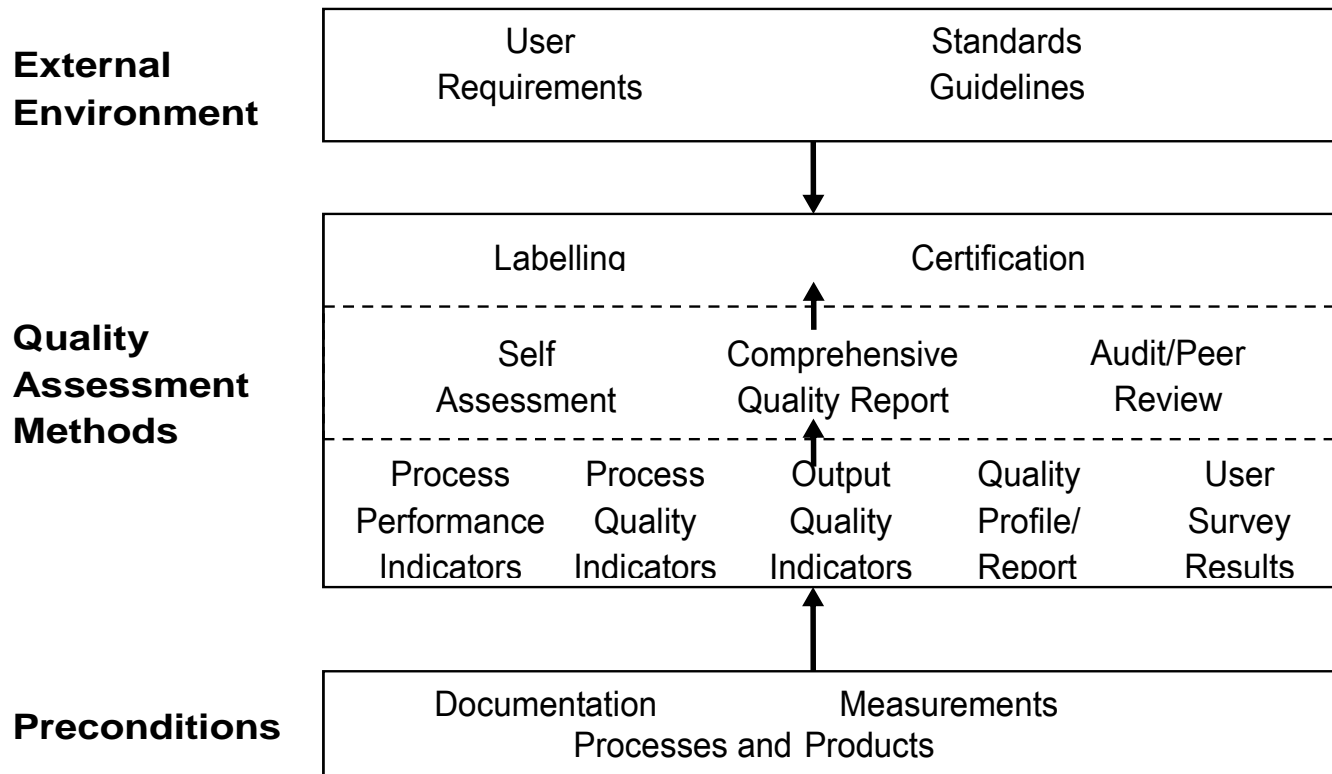
Background Notes

- *Assessment method* is an approach to evaluation
 - for example documenting, calculating indicators, auditing, self-assessing, questioning user
- *Assessment tool* is form by which method is implemented
 - for example, producing quality report, using auditing procedure, checklist, user survey
- *Prerequisites for quality assessment* characterised as:
 - *preconditions* - documentation describing key components of process /outputs plus basic systematic quality measurements
 - *external environment* - references with respect to which assessment can be undertaken, for example international standards, guidelines, user requirements

QAF Development Guidelines

Section 4 Quality Assessment

Spectrum of Quality Assessment Methods



QAF Development Guidelines

Section 4 Quality Assessment

Notes on Content

- *Quality indicators – defining, collecting, analysing, synthesizing – composite indicators, quality barometer/dashboard*
 - List indicators for reporting at senior management level
 - Describe general mechanisms for collection, monitoring, analysis, use

- *Quality targets – setting and monitoring*
 - List quality targets
 - Explain how set and how monitored

QAF Development Guidelines

Section 4 Quality Assessment

Notes on Content (Continued)

- *Quality assessment program – self-assessment, peer review, quality audit, certification*
 - List and describe types of assessment used
 - Describe how results of assessment are used...

QAF Development Guidelines

Section 5 Quality Performance Management and Improvement

Reference Documentation

- ISO 9000 series
- EFQM Excellence Model...
- Corporate multi-year plan, government directives impacting on quality...

Background Notes

- This section includes all the *non-statistical aspects of QAF*
 - those aspects that are common to many/all organizations,
 - that are not particular to core business of NSOs

QAF Development Guidelines

Section 5 Quality Performance Management and Improvement

Notes on Content

- *Performance management – planning, cost and efficiency, sharing good practices, change management, risk management*
 - Describe strategies and practices

- *Recruitment and training – resource planning, determining recruitment and training needs, developing and conducting training courses*
 - Describe strategies and practices

***QAF Development Guidelines**

Section 5 Quality Performance Management and Improvement

Notes on Content (continued)

- *Continuous improvement program – quality culture, ongoing enhancements within operating budgets*
- Mechanisms that help create quality culture and provide quality tools
 - Quality unit
 - Quality improvement a regular item at senior management meetings
 - Staff opinion surveys

QAF Development Guidelines

Section 5 Quality Performance Management and Improvement

Notes on Content (continued)

- *Governance structure - for quality and performance trade-offs and reengineering initiatives, based on results of quality assessments*
 - Describe major ongoing and planned initiatives to improve quality
 - Describe governance strategies and practices

****QAF Development Guidelines**

Section 6 Conclusion

Notes on Content *(from generic template) summary of benefits, reference to guidelines and implementation plans*

- Summary of major quality issues and how they are being addressed

QAF Development Guidelines

Other Considerations

Development of Quality Assurance Framework at NSO

- Best carried out by an NSO task force with experienced staff drawn from a range of areas
 - program planning, survey design, survey operations
 - dissemination, infrastructure development , ICT
- Development process has intrinsic benefits in its own right
 - obliges staff to come together from various disciplines
 - to confront quality issues and think through requirements

****Issues for Discussion**

- List and describe the 10 items you think it would be most important to include in a QAF

Issues for Discussion

1. Performance management – planning, cost and efficiency, sharing good practices, change management, risk management
2. Recruitment and training – resource planning, determining recruitment and training needs, developing and conducting training courses
3. Continuous improvement program – quality culture, ongoing enhancements within operating budgets
4. Governance structure - for quality and performance trade-offs and reengineering initiatives, based on results of quality assessments

Concluding Remarks

▪ Course Objectives

- To impart/refresh understanding of quality assurance principles and practices
- To describe the content and benefits of a quality assurance framework (QAF)
- To facilitate development of QAFs for national statistical office

Achieved?

What else should have been included?

What could have been omitted?

Thank you for your attention

michael.colledge@gmail.com