The Survey Process

- Research Objectives
  - Concepts
  - Population
- Mode of Administration
- Questions
  - Questionnaire
- Sampling Design
- Data Collection
- Data Processing
- Analysis/Interpretation
The Concept of a Survey—According to Dalenius

- concerns a set of objects comprising a population
- population under study has one or more measurable properties
- goal is to describe the population by one or more parameters defined in terms of the measurable properties
The Concept of a Survey (cont’d)

- access to the population requires a frame
- sample is selected in accordance with a sampling design specifying a probability mechanism and a sample size
The Concept of a Survey (cont’d)

- observations are made in accordance with a measurement process
- based on the measurements an estimation process is applied to compute estimates
- overall purpose is to infer to the population
Variants of Quality

- Quality as in Quality Control (1930-)
- Neyman’s landmark paper in 1934
- Accuracy measured by MSE (1945-)
- “Data quality” enters around 1965 (Kish, Zarkovich)
- Quality frameworks are developed in the 70s
  - Accuracy
  - Relevance
  - Timeliness
  - Accessibility
Definitions of Quality

- Degree of deviation from survey definition
- Fitness for use or fitness for purpose
- Quality of design
- Quality of conformance
Quality dimensions in official statistics (one of them is accuracy)

Accuracy measured by MSE in survey models

Quality according to some business excellence model

Performance indicators
Eurostat’s Quality Dimensions

- Relevance of statistical concepts
- Accuracy of estimates
- Timeliness and punctuality in disseminating results
- Accessibility and clarity of the information
- Comparability
- Coherence
Relevance

Degree to which survey addresses the needs for the data; responsiveness to user needs

- Data “resolution” is sufficient to meet users needs
- Measures or indicators of relevance
  - User satisfaction with the survey content and reported results
  - Existence of data elements needed to address key research questions
  - Size of the user community or survey constituency
  - Importance of the analytical results from the survey
Accuracy

Degree of absence of survey error in the data

- Components include
  - Sampling error
  - Nonsampling error
    » Nonresponse error
    » Frame coverage error
    » Measurement error
    » Data processing error
    » Specification error
Timeliness

Minimize time between survey end date and data dissemination, minimize survey time, be punctual

- Data and related documentation are released on schedule
- Subsequent revisions to the data and analysis weights are minimal
- Survey estimates are reported in time to maximize their usefulness
- Length of survey process

Timeliness is the easiest to observe by users
Accessibility (Clarity)

Data are accessible, well-documented, and available in the form users require

- User-friendly data files and data extraction tools
- Complete and well-written documentation and reports
- Access to the data is affordable
- De-identified data in public use files are still sufficiently complete for important types of analysis
Comparability

Within survey comparisons over time, geographies, and subpopulations are meaningful

- Changes in methodologies, definitions, target populations are well-documented
- Information required to deal with the changes in analysis is provided
- Examples –
  - Discontinuities in a data series due to redesigns are disclosed and evaluated
  - Consistent modes across demographic groups and geographic regions
  - Impact of methodological changes in the measurement process are assessed and reported
Coherence

Between survey comparisons are meaningful

- Consistent systems of data collection
- Standardization of concepts, classifications, methodologies
- Thorough documentation of methodological differences across similar data series
- Comparisons of estimates of the same parameter with explanations for the differences
Other frameworks

- Statistics Canada
- Statistics Sweden
- International Monetary Fund
- OECD
Framework issues

- Model quality reports
- Quality is multidimensional
- Dimensions in conflict
- Developing measures of the not so easily assessed dimensions
- Measurements on a continuing basis?
- Error-free processes
- One global framework?
Measuring quality

- Dimensions must be measured individually
- Measurement capability varies by dimension
- Accuracy
  - Gold standard
  - Replication with or without reconciliation
  - Variance estimation
  - Special measurement studies such as interpenetration
- Sometimes other dimensions can be seen as constraints, no good measures exist
Some terminology

- **Quality assurance**
  - Having good methods in place
  - Anticipate problems at the planning stage
  - Move quality upstream

- **Quality control**
  - Checks that outgoing quality is acceptable

- **Quality management**
  - Techniques for obtaining quality and cost improvements in a systematic fashion
A Broader View on Quality

- Customer orientation
- Understanding variation
- Cooperation with respondents
- Standardization
- Quality assessment tools
- Quality management models
The Current Line of Thinking

- Product characteristics are established together with the user
- The quality of the product is decided by the processes generating the product
- The quality of the processes is decided by the organizational quality
Three Levels

- **Product quality**
  - Error estimates, conformance quality, evaluations

- **Process quality**
  - Key process variables, control charts, process improvement

- **Organizational quality**
  - Business excellence models, TQM, Six Sigma, Balanced scorecards
Some developments within ESS

- **LEG**
  - Quality declaration
  - 22 recommendations for future work

- **LEG Implementation group**
  - Process data handbook
  - Response burden handbook
  - Design of customer satisfaction surveys
  - Conferences on quality

- **WG on Quality**
Components of Quality

1. Setting Standards
   - NS Quality Reviews
   - Public Confidence
   - Quality Measurement & Reporting
   - Metadata Project
   - Standards and Guidance

2. Sound Methodologies
   - Methodological Reviews
   - Survey Control
   - Information Management

3. Standardised Tools
   - Analysis of Current Practice
   - Project Management
   - Statistical Infrastructure Development

4. Effective Leadership and Management
   - Good Documentation
   - Risk Management

5. Quality Measures
   - Effective Leadership and Management
   - Good Documentation
   - Standardised Tools

6. Quality Monitoring
   - Ongoing Monitoring
   - Methodological Reviews
   - Survey Control

7. Ongoing Quality Monitoring
   - Setting Standards
   - Sound Methodologies
   - Standardised Tools
   - Leadership and Management
   - Quality Measures

Public Confidence

Quality Assurance
which means fragmentation

- NSIs tend to work on topics of local interest
- The financial, methodological and other resources tend to influence choice of topics rather than the real need
- The general approach might vary due to the underlying value system, legal framework or other cultural differences
But quality work is also uniform....

- A wide-spread awareness of the importance of quality
- An ESS Quality Declaration

- All members of ESS are working in ways that are different compared to, say, 1990
- Almost all members have strategic issues on the agenda
The ESS Quality Declaration – Underlying principles (similar to TQM)

- User focus
- Continuous improvement
- Product quality commitment
- Accessibility of information
- Partnership within and beyond ESS
- Respect for the needs of data suppliers
- Commitment of leadership
- Systematic quality management
- Effective processes
- Staff satisfaction and development
Examples of Tools used by NSIs

- Self-assessment via excellence model
- External assessment
- Checklists
- Process data
- Working with the customer
- Customer satisfaction surveys
- Evaluation
- Quality Control
- Current Best Methods (CBM)
Improving Quality

- Changing processes
- Experimentation - PDCA
- Project teams
- Standardization via current best methods documents
- Development of quality guidelines
Some Recurring Problems

- Accuracy in business surveys
- Not everything is documented
- Very slim organizations and dependence on individuals
- Unjustified variation
- Difficult to make trade-offs between quality and cost
- Difficult to make trade-offs between different quality dimensions
Some Challenges

- Improving accuracy and timeliness
- Common research agendas with excellence centers
- Sharing resources in general
- International comparability
- Accepting measurement error as the most problematic error source, Total error focus
- Cognitive research in business surveys
- More integration of theories needed
- Make sure that quality does not become a buzzword