

Getting ICT data through surveys

ICT Data and Statistics Division
Telecommunication Development Bureau
International Telecommunication Union

Outline

- Collaborating and coordinating for household ICT statistics
- Getting ICT data through surveys: good practices
- The ITU Manual
- Data disaggregations

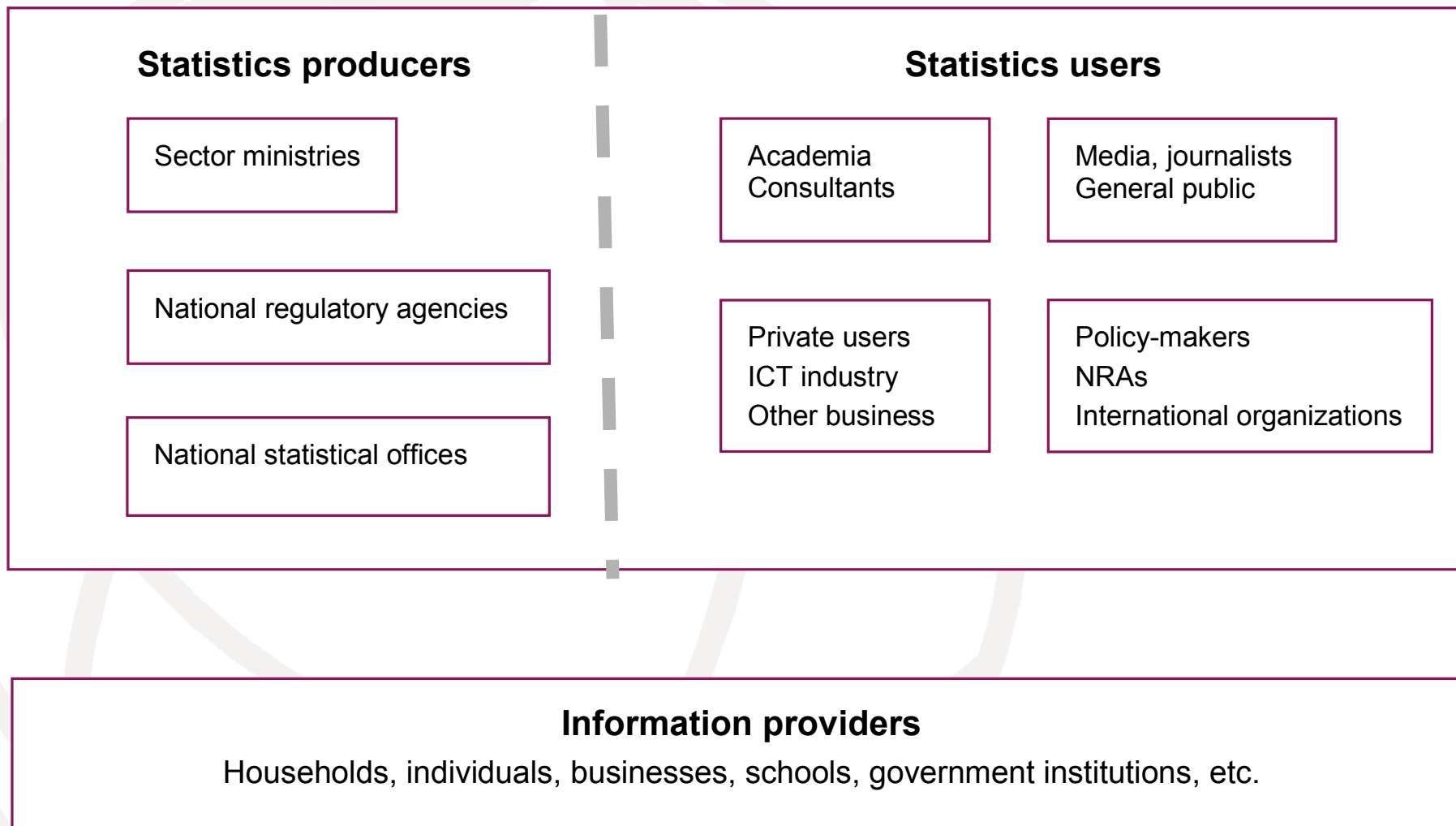
Collaborating and coordinating for household ICT statistics

National coordination of ICT statistics

10th WTIM (2012) and 11th WTIS (2013)

- **High-level panel debate** triggered numerous interventions from participants – issue is of concern to most involved in production of ICT statistics
- **Recommendations:**
 - Countries should put in place coordination mechanisms
 - NSOs should play an active role
 - Countries should include ICT statistics in NSDS
 - ITU should develop guidelines and models for coordination mechanisms to assist countries
 - Topic needs further discussion in international and regional forums

Stakeholders in the ICT statistics system



Why national coordination on ICT statistics?

- Objective: to produce high-quality official statistics
- ICT statistics are cross-cutting and therefore involve many stakeholders with different competencies and skills
- Statistical data collection and dissemination is often fragmented - data quality suffers, duplication of effort

Why national coordination on ICT statistics?

- Close data gaps
- Eliminate duplication of work
- Avoid conflicting data and statistics
- Promotes comparability
- Not to burden and confuse data providers and users
- Promote effectiveness

Fundamental Principle of Official Statistics - Principle 8

Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.

National coordination of ICT statistics

- Different coordination models exist
 - National statistical coordination bodies
 - Formal inter-institutional committees and working groups (involving different Ministries)
 - Multi-year planning
 - National information society observatories

National statistical coordination bodies

- National Statistical Commissions or Committees (established by statistical law)
- Usually coordinated by NSOs, which may have satellite units in sector Ministries (eg. health, education, agriculture)
- Can establish subject-matter working groups to discuss methodologies etc. (e.g. on ICT)
- Example: Inter Agency Committee on ICT Statistics

Inter-institutional committees and working groups

- Less institutionalized forms of collaboration among data-producing agencies
- Inter-institutional working groups with clearly defined responsibilities for establishing technical standards (e.g. for data collection and analysis, dissemination of findings)
- Bring together representatives from Ministries, NSOs, NRAs, etc.

Multiyear plans

- Most national statistical systems are governed by a multiyear program for the production of official statistics
- Multiyear plans should specify which institutions are responsible for each statistical operation, the timeframe and frequency
- Covering different domains including ICT

National information society observatories

- Objective: to centralize all ICT indicators and disseminate them through one national web portal
- Requires close cooperation with all data producers in the country
- Example: Spain – National Observatory for Telecommunications and the Information Society (ONTSI)

Spain

- National Observatory of the Telecommunications and the Information Society (ONTSI)
- Ministry of Industry, Tourism and Trade
- Covers many areas including ICT from private and public sources
- Surveys on ICT use in Households and Businesses carried out by the National Statistical Institute (INE)

Spain

- Economic data from telecommunication operators collected by said ministry
- Price information collected by National Telecommunication Commission (regulator)
- Telephone network and broadband coverage data from the State Secretary for Telecommunications and the Information society
- Ad-hoc studies by ONTSI itself


Dossiers de indicadores | OI X +

www.ontsi.red.es/ontsi/en/dossiers_de_indicadores

Most Visited Free Statistical Software Mail - Koay Hock Eng ... Download File

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DOSSIERS DE INDICADORES

 [Indicadores destacados de la Sociedad de la Información en España \(abril 2017\)](#)

Ya está disponible una nueva actualización del dossier de indicadores destacados de la Sociedad de la Información en España. En esta nueva versión del dossier se incluye la última actualización de los datos sobre la cifra de negocio del sector infomediario que publica el ONTSI. En 2015, el sector infomediario facturó 675 millones de euros, lo que supone un incremento del 8 % respecto de 2014.

 [Indicadores DESI 2017 \(marzo 2017\)](#)

El dossier resume los indicadores más relevantes del desarrollo digital en Europa y muestra la evolución de los Estados Miembros de la Unión Europea en lo que respecta a la competitividad digital. El informe recopila:

 [Esquema de Indicadores Confianza Digital en España \(febrero 2017\)](#)

ACTIVATE ACCESSIBILITY

Brazil

The Brazilian Network Information Centre (NIC.br), is a private non-profit organization, created to implement decisions from the Brazilian Internet Steering Committee (CGI.br). Comprised of members from the government, the corporate sector, non-profit organizations and the academic community, the CGI.br represents a unique Internet governance model for the effective participation of society in decisions involving network implementation, management and use.

The Brazilian Center of Studies on Information and Communication Technologies (CETIC.br) is a department of NIC.br, created in 2005 to tackle the challenge of periodically producing, organizing, analyzing and publishing data on the access and use of the Internet in Brazil.

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Brazil

CETIC.br conducts regular national surveys on the following topics: ICT Households; ICT Enterprises, ICT Kids Online Brazil, ICT in Education, ICT in Health, ICT e-Government, ICT Providers and ICT Non-profit Organizations.

In the process of collecting, organizing and disseminating information about ICTs, CETIC.br follows the standards and recommendations from:

- Partnership on Measuring ICT for Development,
- ITU,
- Eurostat,
- OECD and
- UNCTAD.

Brazil

The ICT Survey process at CETIC.br follows the principles of multilateralism, participation and transparency by fostering the participation and collaboration of an extensive network of academics and experts from government, the corporate sector and non-profit organizations who are renowned not only for their excellence in research methodology, but also for their expertise regarding the study of the use and impacts of ICTs.

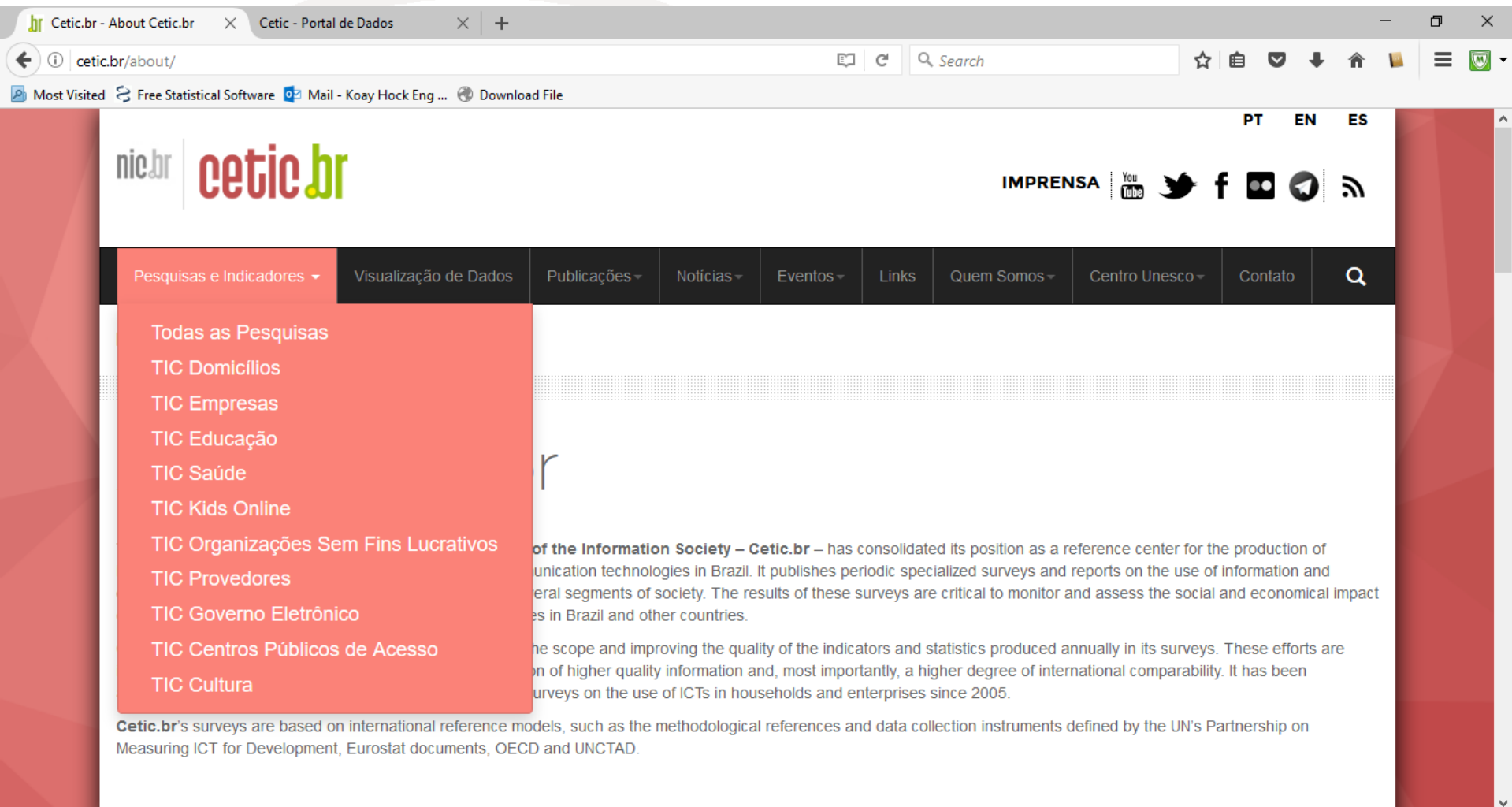
Each ICT survey relies on a specific group of experts from different segments of society who specialize in the theme of the survey. This group usually meets twice during the survey process, once during the planning phase, in order to validate methodology, indicators and questionnaires; and later again during the stage of data analysis to provide input for interpreting results.

Brazil

The results of the surveys and their microdata base are made available to the expert groups under a confidentiality and ethical use agreement for data use.

Engaging different stakeholders in the surveys conducted by CETIC.br reflects the multistakeholder model for Internet Governance in Brazil at CGI.br and is considered key to granting legitimacy of the survey process.

For more information on CETIC.br surveys and publications, see <http://www.cetic.br/english/>.



The screenshot shows a web browser window with the URL cetic.br/about/. The website header includes the logos for nic.br and cetic.br, along with language options (PT, EN, ES) and social media icons for IMPRENSA, YouTube, Twitter, Facebook, and RSS. A dark navigation bar contains the following menu items: Pesquisas e Indicadores (selected), Visualização de Dados, Publicações, Notícias, Eventos, Links, Quem Somos, Centro Unesco, and Contato. A dropdown menu is open under 'Pesquisas e Indicadores', listing the following categories: Todas as Pesquisas, TIC Domicílios, TIC Empresas, TIC Educação, TIC Saúde, TIC Kids Online, TIC Organizações Sem Fins Lucrativos, TIC Provedores, TIC Governo Eletrônico, TIC Centros Públicos de Acesso, and TIC Cultura. The main content area features a large heading 'r' and a paragraph: 'of the Information Society – Cetic.br – has consolidated its position as a reference center for the production of communication technologies in Brazil. It publishes periodic specialized surveys and reports on the use of information and general segments of society. The results of these surveys are critical to monitor and assess the social and economical impact in Brazil and other countries. The scope and improving the quality of the indicators and statistics produced annually in its surveys. These efforts are on of higher quality information and, most importantly, a higher degree of international comparability. It has been surveys on the use of ICTs in households and enterprises since 2005. Cetic.br's surveys are based on international reference models, such as the methodological references and data collection instruments defined by the UN's Partnership on Measuring ICT for Development, Eurostat documents, OECD and UNCTAD.'

Oman

Stakeholders

- Information Technology Authority (ITA)
- National Centre for Statistics and Information (NCSI)

Collaboration:

- Surveys on access to and Use of ICT by Businesses in 2011
- Surveys on access to and Use of ICT by Households in 2013

Frames: NCSI

Questionnaire: ITA

Data collection: NCSI / contractor

Data processing: NCSI / ITA

Dissemination: ITA

Used international standards in questionnaire design and compilation of indicators including partnership's core list



Getting ICT data through surveys: good practices

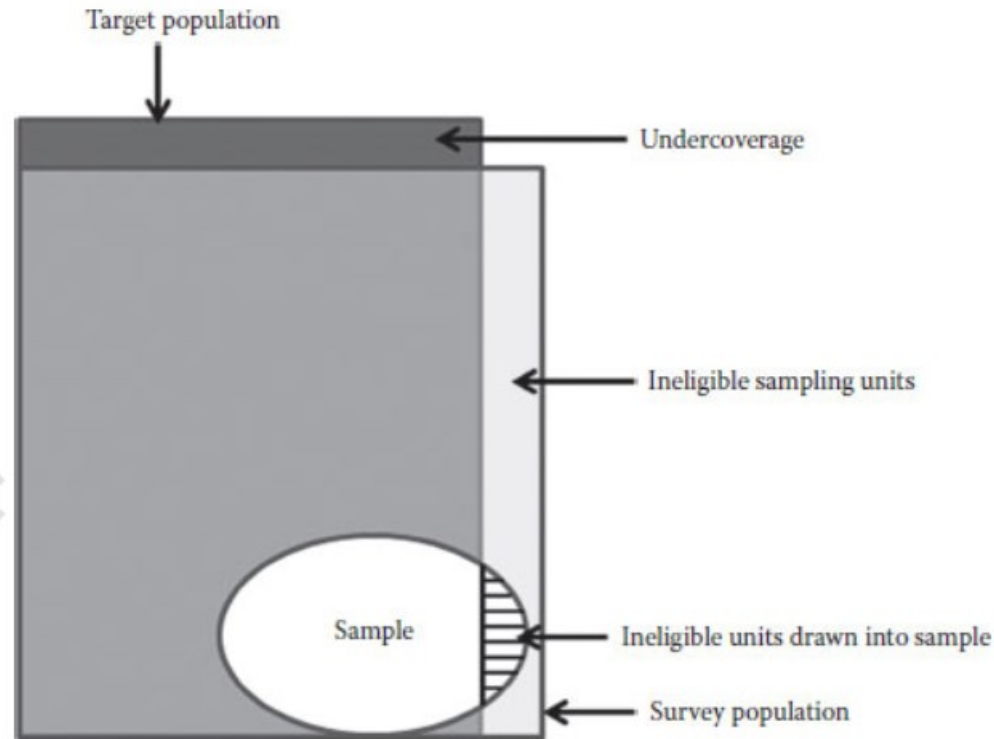
Some preliminaries

- Primary (1^o) data vs secondary (2^o) data / admin records
- Census vs sample survey



Some preliminaries

- Target population / survey population



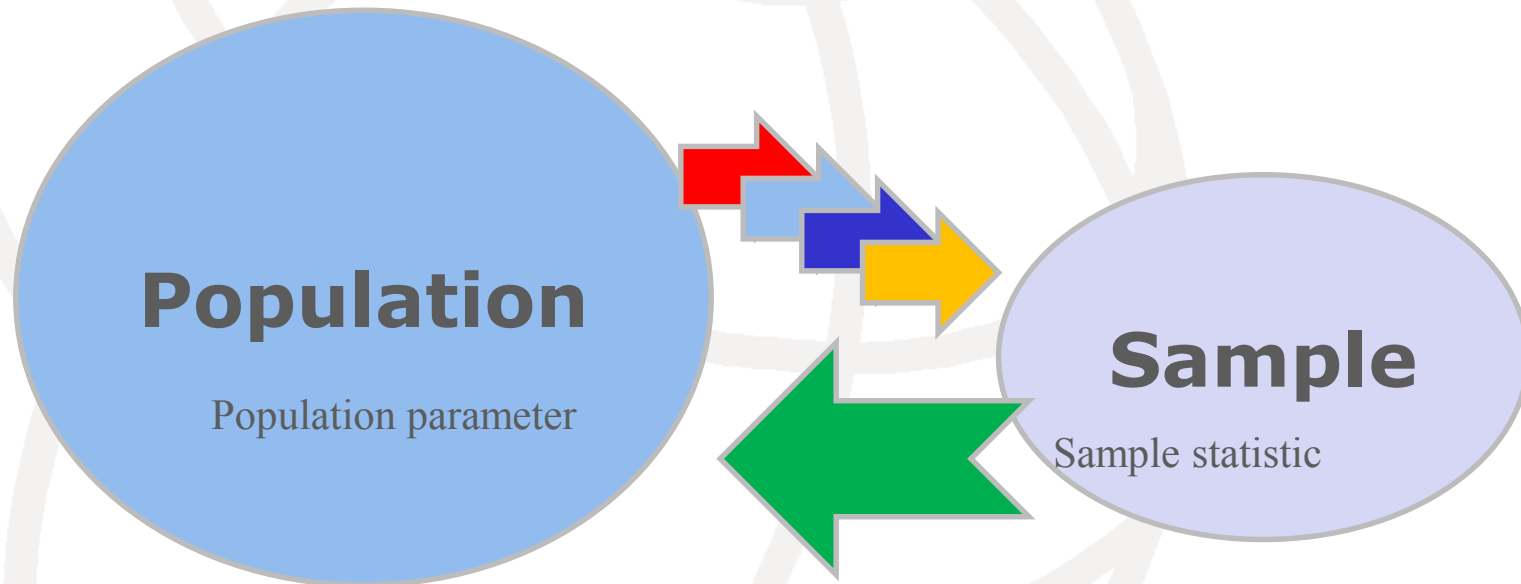
Some preliminaries

Sampling

- Simple Random Sampling (SRS)
 - Each statistical unit has the same chance of selection
- Complex sampling
 - Primary sampling Units
 - Strata (eg urban /rural)
 - Cluster
- Sample size and allocation

Some preliminaries

- Estimation (sample statistic and population parameter)



Some preliminaries


- Sampling variation / Sampling errors
- Dedicated surveys vs riders

We'd like you to carry these 4 questions in your survey, tabulate them according to our specifications, estimate the population totals, means and proportions and calculate the standard errors for us.



Some preliminaries

- Data collection methods
 - Direct observation
 - Postal
 - F2F
 - Telephone
 - CATI
 - CAPI
 - CAWI
 - Online



Let's move on to
good practices

Good practices

- Surveys usually done by the NSO and assumed as such in this presentation.
- Legal backing to collect data, usually the Statistics Law or Act or some other law that provides for compliance and confidentiality.
- Survey methodology must be scientific and based on probabilistic sampling. The skill to do this is with the statisticians in the NSO.

Good Practices: Planning of surveys

- Objectives
 - A clear statistical statement on the desired information, giving a clear description of the population and geographical coverage. How the results are going to be used. Budget. Stakeholders.
- Survey universe
 - Geographical areas ,Target population, exact population sampled to be identified, first stage units, second stage units, comprehensive and mutually exclusive frames for every stage of selection.

Good Practices: Planning of surveys

- Information to be collected
 - List of questions requiring statistical answers, availability of some required data in existing sources, include supplementary items that are correlated with main items, tabulation plan, tabulation plan to be circulated for comments and improvement
- Survey budget and survey timelines
 - Cost estimates as detailed as possible, every survey step exacts a cost, Survey budget will depend largely on survey design, precision required, geographical coverage, judicious cost control, accountability enhances credibility.

SURVEY COSTING

Estimated
units of work
(person-months
except where
otherwise
indicated)

Unit cost
(relevant unit
of currency per
person-month,
except where
otherwise
indicated)

Estimated
total cost
(relevant unit
of currency)

I. Planning and preparatory activities

A. Initial planning and subsequent monitoring (senior staff)

B. Selection and specification of subject matter

1. Subject-matter planning

2. Preparation of tabulation plans

3. Secretarial and other services

C. Development of survey design

1. Initial design planning: survey structure, population coverage, sampling procedures, data-collection methods, etc. (professional staff)

2. Development of sampling materials:

a) Cartographic materials (assumes census materials available):

Personnel costs

Maps and supplies

b) Field household listings (2,000 enumeration areas):

Personnel costs (mainly interviewers)

Travel costs

c) Sample selection and preparation from field lists

SURVEY COSTING

Estimated
units of work
(person-months
except where
otherwise
indicated)

Unit cost
(relevant unit
of currency per
person-month,
except where
otherwise
indicated)

Estimated
total cost
(relevant unit
of currency)

D. Design and printing of questionnaires and other forms

1. Professional staff

2. Secretarial and other services

3. Printing costs (after pretests)

E. Pretesting

1. Professional staff planning:

a) Initial preparations

b) Analysis of results and revision of materials

2. Field supervisor:

a) Personnel costs

b) Travel costs

3. Interviewers:

a) Personnel costs

b) Travel costs

SURVEY COSTING

Estimated units of work (person-months except where otherwise indicated)	Unit cost (relevant unit of currency per person-month, except where otherwise indicated)	Estimated total cost (relevant unit of currency)
--	--	--

F. Preparation of instructional and training materials for field use

1. Professional staff
2. Secretarial and other services
3. Reproduction costs

G. Miscellaneous planning activities (for example, public relations and publicity)

H. Subtotal components

1. Senior staff
2. Professional staff
3. Technical staff
4. Service staff
5. Travel
6. Printing
7. Cartography and miscellaneous

Subtotal

SURVEY COSTING

Estimated
units of work
(person-months
except where
otherwise
indicated)

Unit cost
(relevant unit
of currency per
person-month,
except where
otherwise
indicated)

Estimated
total cost
(relevant unit
of currency)

II. Field operations

A. Training of field supervisors

1. Personnel costs
2. Lodging and meals
3. Travel costs

B. Training of interviewers

1. Supervisor costs
2. Interviewer costs:
 - (a) Personnel costs
 - (b) Travel costs

C. Data collection (including quality control)

1. Supervisor costs
2. Interviewer costs:
 - (a) Personnel costs
 - (b) Travel costs

D. Field administration

1. Field direction
2. Travel
3. Other costs
(for example, control and shipment of materials)

**SURVEY COSTING**

Estimated units of work (person-months except where otherwise indicated)	Unit cost (relevant unit of currency per person-month, except where otherwise indicated)	Estimated total cost (relevant unit of currency)
--	--	--

E. Subtotal components**1. Professional staff****2. Technical staff****3. Service staff****4. Travel****5. Travel subsistence****6. Interviewing****7. Miscellaneous****Subtotal**

SURVEY COSTING

	Estimated units of work (person-months except where otherwise indicated)	Unit cost (relevant unit of currency per person-month, except where otherwise indicated)	Estimated total cost (relevant unit of currency)
III. Data processing			
A. Systems planning			
B. Computer programming			
C. Clerical coding			
1. Initial coding			
2. Quality control			
3. Supervision			
D. Key-to-disk operations			
1. Initial keying			
2. Quality control			
3. Supervision			
E. Computer time (including operator and maintenance costs)			
F. Miscellaneous processing costs (supplies, etc.)			
G. Subtotal components			
1. Professional staff			
2. Technical staff			
3. Quality control staff			
4. Service staff			
5. Computing			
6. Miscellaneous			
Subtotal			

SURVEY COSTING	Estimated units of work (person-months except where otherwise indicated)	Unit cost (relevant unit of currency per person-month, except where otherwise indicated)	Estimated total cost (relevant unit of currency)
IV. Data review and publication			
A. Professional time			
B. Publication costs			
V. Survey direction and coordination (continuing oversight over all activities)			
VI. Subtotal			
VII. Evaluation studies and methodological research (may be estimated at 10 per cent of cumulative total)			
VIII. General overhead (may be estimated at 15 per cent of cumulative total for administrative costs, space rental, general supplies and the like)			
IX. Total			

Source: United Nations (1984).

Timeframe for survey steps

- | | | |
|---|---|----------|
| 1 | Meeting with stakeholders (users and producers) | 1 month |
| 2 | Preparatory activities | 3 months |
| 3 | Initial questionnaire design | 2 months |
| 4 | Send questionnaires to user committee members | 1 month |
| 5 | Include in questionnaire agreed suggestions | 1 month |
| 6 | Draft interviewer's and supervisor's manuals | 2 months |
| 7 | Print questionnaires and manuals (coding questionnaire into CAPI) | 1 month |

Timeframe for survey steps

8	Make plans for pretest	1 month
9	Train interviewers and supervisors	2 months
10	Conduct the pretest	1 month
11	Revise questionnaire (if need be)	1 month
12	Revise manuals (if need be)	1 month
13	Sample design	1 month
14	Design and test data entry programme (s)	1 month
15	Design and test data cleaning programme (s)	1 month
16	Data collection	3 months

Timeframe for survey steps

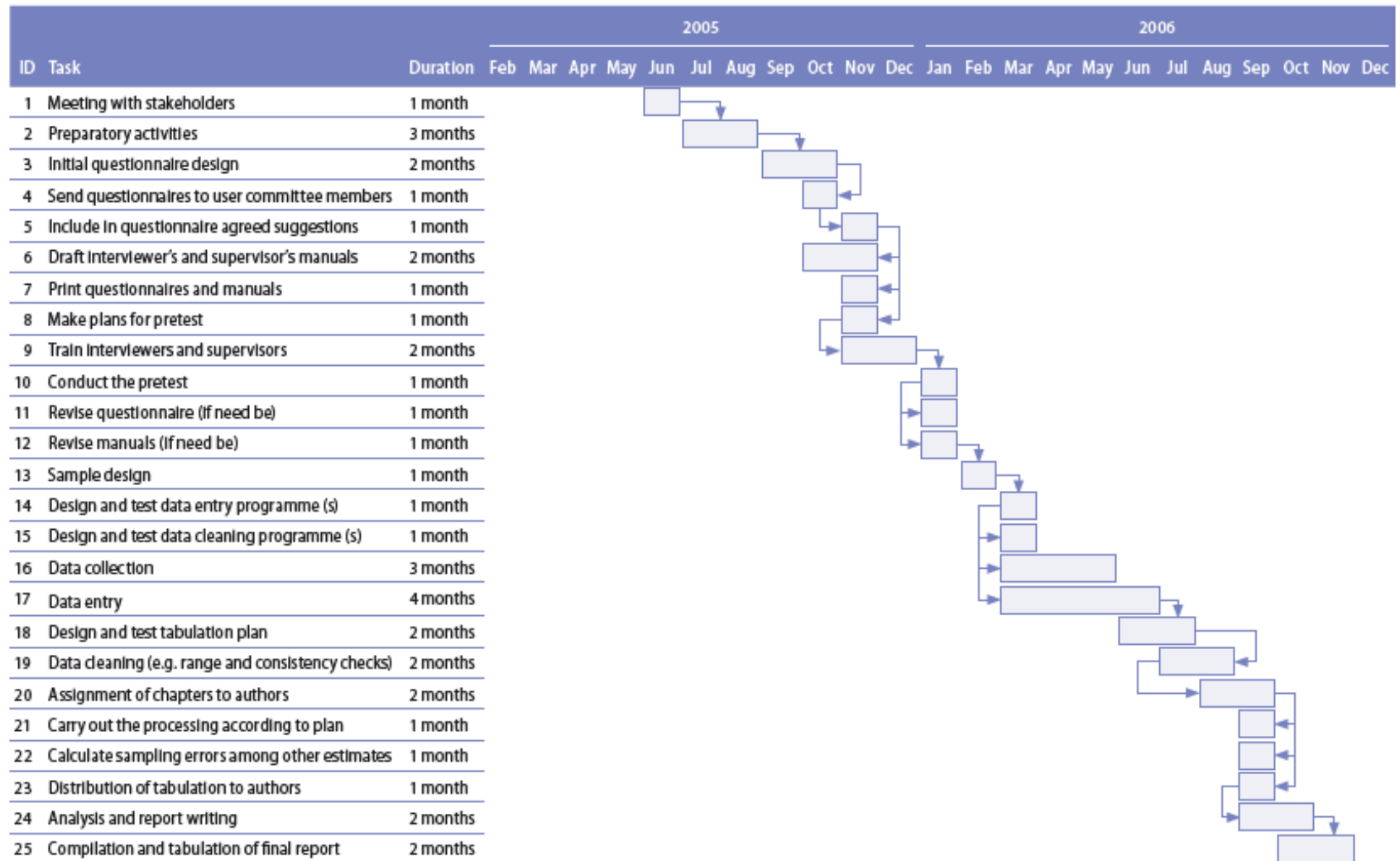
17 Data entry	4 months
18 Design and test tabulation plan	2 months
19 Data cleaning (e.g. range and consistency checks)	2 months
20 Assignment of chapters to authors	2 months
21 Carry out the processing according to plan	1 month
22 Calculate sampling errors among other estimates	1 month

Timeframe for survey steps

23	Distribution of tabulation to authors	1 month
24	Analysis and report writing	2 months
25	Compilation and tabulation of final report	2 months

Timeframe for survey steps

Time-table of household survey activities for country X



Good Practices: Execution of surveys

- Data collection methods
 - Direct observation and measurement, mail, personal interview (incl telephone, CATI, CAPI) online including web and CAWI
 - Response rate
- Questionnaire design
 - Size and format, suited to data collection mode, questions grouped in relevant sections, proper sequencing, easy reading, clear instructions, definitions, operational equivalents pre-testing (pilot)
 - For ICT access and Use by Households and Individuals, use globally accepted standard such as the model questions contained in ***Manual for Measuring ICT Access and Use by Households and Individuals.***
 - Translation into local language must be done by an expert and tested on the ground

Good Practices: Execution of surveys

- Tabulation and analysis plan
 - Tabulation plans, dummy tables, titles, stubs and captions, substantive variables, background variables, population groups, categories of classification
- Implementation of fieldwork
 - Need for a well-organised and effective field organisation
 - Equipment and materials
 - Management of survey operations, clear well defined line of command
 - Publicity
 - Selection of interviewers
 - Training of interviewers
 - Field supervisors
 - Follow-up of non-respondents
 - Reducing non-response

Documentation

“Documentation and evaluation of sample designs in particular and survey methodology in general are too often neglected in the rush to release survey findings. This is especially true in countries with little prior experience in conducting household surveys...”

-UNSD

Documentation

A record of how it went

- Keep careful records of the survey and sampling procedures as they are being carried out operationally in the survey process
- Sample plan, adaptations at various stages of field work
- To make sure the implementation is faithful to the design / record all departures
- For adjustments to be made in analysis
- Indispensable for planning future surveys

Documentation

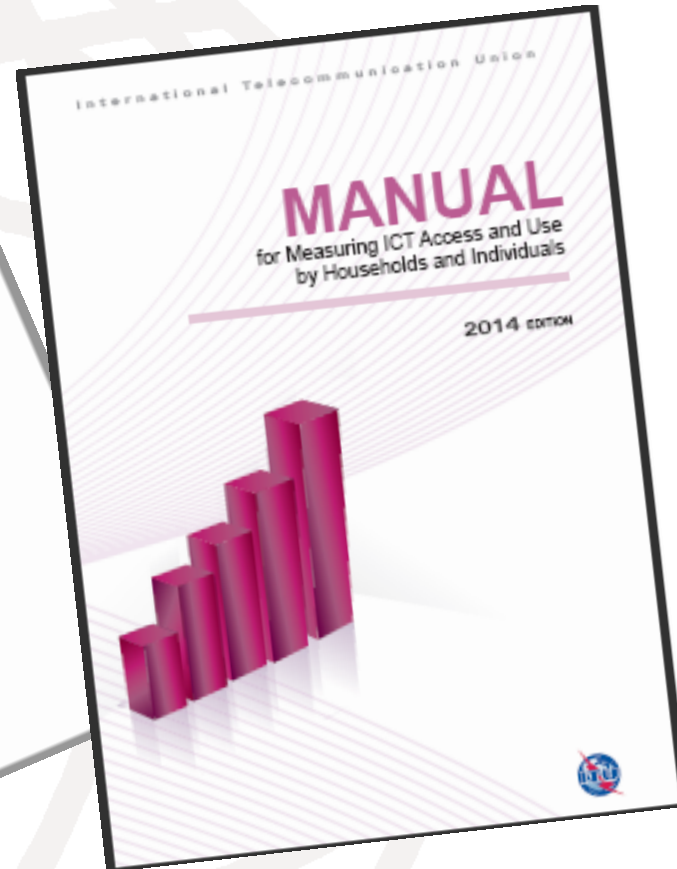
Technical reports

- Fairly brief , user-friendly description of survey methodology, sample plan and implementation
- Limitations
- Comprise the technical section of the various substantive reports on findings
- Stand alone more detailed description of survey methodology
- Intended for professional researchers, social scientists and statisticians rather than policy maker / public
- Publish in statistical journal / Present at WTIS
- Special office to handle documentation

References

- Designing Household Survey Samples: Practical Guidelines, UNSD, 2005
- Manual for Measuring ICT Access and Use by Households and Individuals, ITU, 2014
- Complex Survey Data Analysis with SAS, Lewis, 2017

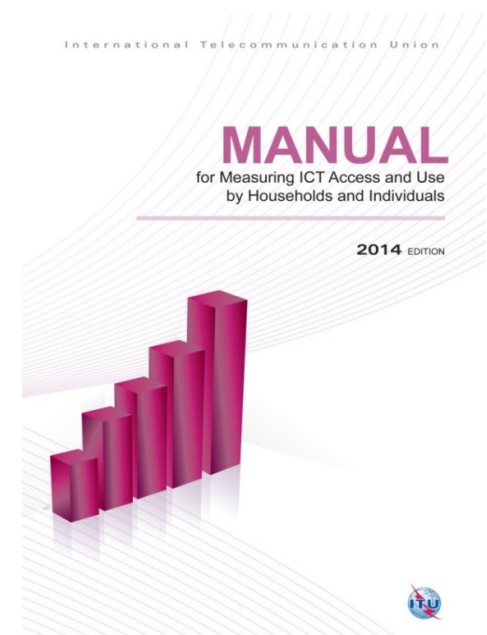
2 mainstays



The ITU Manual

ITU Manual (2014)

- Chapter 1. Introduction
- Chapter 2. **Coordination** among national stakeholders in ICT measurement
- Chapter 3. **Planning and preparation** for ICT household surveys
- Chapter 4. **Statistical standards** and measurement topics for ICT household statistics
- Chapter 5. **Data sources** and **collection techniques** for ICT household statistics
- Chapter 6. Question and **questionnaire** design for ICT household surveys
- Chapter 7. **Designing** ICT household surveys
- Chapter 8. **Data processing** for ICT household statistics
- Chapter 9. **Data quality and evaluation** for ICT household statistics
- Chapter 10. **Dissemination** of ICT household data and metadata



Preparation and revision process

- First release in 2009
- 2012-13: two rounds of complete revisions
- Comments from Expert Group on Household Indicators (EGH) forum
- Version 2 launched at WTIS 2013 (December 2013, Mexico)
- Revision of indicators in 2014-2015:
 - added HH16
 - HH17, HH18, HH19 on the website, but **not yet in the Manual**

ITU statistical standards: ICT household statistics

- Statistical standards associated with the **core ICT indicators** for household **access** to, and individual **use** of, ICT:
 - concepts
 - definitions of terms
 - model questions
 - classificatory variables (breakdowns)
 - scope
 - units (households and individuals)
- Formula of calculation
- Use (policy relevance)

Core household indicators, main concepts

- The indicators consist of those:
 - Referring to household access to ICT equipment and services
 - Referring to individuals' use/ownership of ICT equipment and services

Concept of access

- ICT device/service should be available for use of any member of the household at any time
- Device can be owned or not by the household
- Applies to all indicators referring to household ICT access
- Device should be in a working condition

Age scope

- Countries should report ICT usage information for the three main core indicators on individuals' use of ICTs (computer, mobile phone and Internet) for the entire population of the country, i.e. there is no minimum age scope any more for these indicators

Reference period

- Information on ICT usage should be collected and reported with a reference period of the last 3 months

Data disaggregations

Disaggregating the data by socio-demographics: why and how

- Important to policy-makers
- Disaggregation shows socio-economic problems that create barriers to use of ICT by individuals. These problems are diverse and broadly cover lack of opportunity and lack of ability. They include illiteracy and other linguistic limitations, socio-cultural barriers, lack of ICT and other skills, lack of confidence or awareness and low income.
- Gives more information i.e. who is using the ICTs i.e. male/ female, age, location (urban/ rural) etc

International Standard Classifications used in Core Questionnaire

- COICOP- Classification of Individual Consumption According to Purpose by UNSD
- ISCED - International Standard Classification of Education by UNESCO
- ICSE-93 – International Classification of Status in Employment by ILO
- ISCO – International Standard Classification of Occupations by ILO

Individual characteristics

Sex:

- Sex disaggregation of data is a fundamental requirement for gender statistics and in particular for the analysis of the gender gap in the use of ICT. A MUST HAVE FOR ALL CORE INDICATORS

Age:

- Age is a strong determinant of ICT use so a common age cut-off and categories are important
- *Recommended ranges: under 5; 5–9; 10–14; 15–24; 25–34; 35–44; 45–54; 55–64; 65–74 and 75 and over*

Education levels:

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For international comparisons, countries required to classify education as International Standards Classification of Education follows:

- primary education or lower (ISCED levels 0, 1),
- lower secondary education (ISCED level 2),
- upper secondary education or post-secondary non-tertiary education (ISCED levels 3,4),
- tertiary education (ISCED levels 5, 6), and
- post-tertiary education (ISCED levels 7, 8).

Labour Force:

Based on the International Labour Organization (ILO) International Classification of Status in Employment (ICSE-93), with additional categories for those who are unemployed or outside the labour force.

- Employee;
- Self-employed (includes the four categories: employers, own-account workers, members of producers' cooperatives, and contributing family workers);
- Workers not classifiable by status (for whom insufficient relevant information is available, and/or who cannot be included in the preceding categories);
- Unemployed; and
- Outside the labour force. i.e student, retired.

Further classification may be given as per occupation.

Disability status:

Because of a Health problem:

- 1) Do you have difficulty seeing even if wearing glasses?
- 2) Do you have difficulty hearing even if using a hearing aid?
- 3) Do you have difficulty walking or climbing stairs?
- 4) Do you have difficulty remembering or concentrating?
- 5) Do you have difficulty with (self-care such as) washing all over or dressing?
- 6) Using your usual language, do you have difficulty communicating (for example understanding or being understood by others)?

Response categories:

- No difficulty; Some difficulty; A lot of difficulty; Cannot do at all

Other classifications at individual level are:

- level of literacy, ethnicity, languages spoken, language skills.
- The revised ICT household indicators include HH15, *Individuals with ICT skills, by type of skills*. It will therefore be possible to cross-classify the individual use indicators by ICT skill level.

- Household composition (*households with children under 15 and households without children under 15*). Household composition is relevant to measuring the digital divide in households with children
- Household size (number of household members, including those outside any age scope imposed).
- Geographical disaggregation such as urban/ rural. Countries use their own definition for the urban/ rural and include it in the metadata. Countries can disaggregate this to towns, districts, counties to match their local needs.
- Household with electricity can be used especially for the household ICT access indicators
- Household income

Cross-classification of data

Committed to Connecting the World



Can produce information that is very useful for analytical purposes as is more detailed

- example: Internet use by young women (data are cross-classified by age and gender).

ITU proposes the following cross-classification:

- household composition by rural/urban,
- rural/urban by sex,
- age by sex,
- educational attainment by sex,
- status in the labour force by sex, and
- occupation by sex.

Thank you

For more information

<https://www.itu.int/en/ITU-D/Statistics/>

and

indicators@itu.int