ICT Regional Forum on ICT Measurement

Dubai, United Arab Emirates
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Sessions 8 and 9:
Demand-side ICT Statistics: ICT Household indicators
PART 1: Statistical standards

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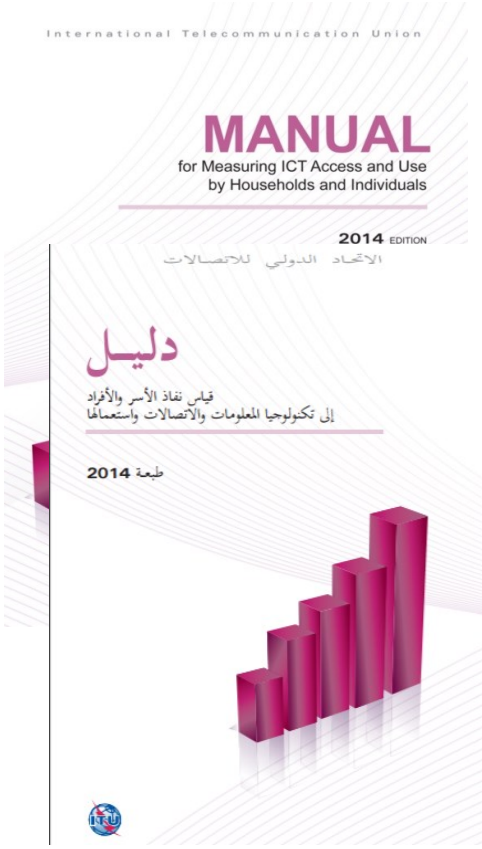
Contents

- Presentation of ITU **statistical** standards and methodologies
  - Manual
  - Indicators
  - Methodological recommendations
  - Recommendations on implementation

Overview of the 2014 ITU Manual

- 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 **not yet in the Manual**

PARTNERSHIP ON MEASURING ICT FOR DEVELOPMENT

Core list of ICT indicators

- Current core list of ICT indicators
  - Infrastructure
  - **Household and individuals (19 indicators)**
  - Businesses
  - ICT sector and trade in ICT goods
  - ICT in education
  - e-government

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).

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

Core ICT HH indicators (2016 rev.)

HH1	Proportion of households with a radio
HH2	Proportion of households with a television
HH3	Proportion of households with telephone
HH4	Proportion of households with a computer
HH5	Proportion of individuals using a computer
HH6	Proportion of households with Internet
HH7	Proportion of individuals using the Internet
HH8	Proportion of individuals using the Internet, by location
HH9	Proportion of individuals using the Internet, by type of activity
HH10	Proportion of individuals using a mobile cellular telephone
HH11	Proportion of households with Internet, by type of service
HH12	Proportion of individuals using the Internet, by frequency
HH13	Proportion of households with multichannel television, by type
HH14	Barriers to household Internet access
HH15	Individuals with ICT skills, by type of skills
HH16	Household expenditure on ICT
HH17	Proportion of individuals using the Internet, by type of portable device and network used to access the Internet
HH18	Proportion of individuals who own a mobile phone
HH19	Proportion of individuals not using the Internet, by type of reason

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HH1	Proportion of households with a radio
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HH7	Proportion of individuals using the Internet
HH8	Proportion of individuals using the Internet, by location
HH9	Proportion of individuals using the Internet, by type of activity
HH10	Proportion of individuals using a mobile cellular telephone
HH11	Proportion of households with Internet, by type of service
HH12	Proportion of individuals using the Internet, by frequency
HH13	Proportion of households with multichannel television, by type
HH14	Barriers to household Internet access
HH15	Individuals with ICT skills, by type of skills
HH16	Household expenditure on ICT
HH17	Proportion of individuals using the Internet, by type of portable device and network used to access the Internet
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HH8	Proportion of individuals using the Internet, by location
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HH10	Proportion of individuals using a mobile cellular telephone
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HH16	Household expenditure on ICT
HH17	Proportion of individuals using the Internet, by type of portable device and network used to access the Internet
HH18	Proportion of individuals who own a mobile phone
HH19	Proportion of individuals not using the Internet, by type of reason

17.8 Fully operationalize the technology bank and science, technology and innovation capacitybuilding mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology

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HH9	Proportion of individuals using the Internet, by type of activity
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HH11	Proportion of households with Internet, by type of service
HH12	Proportion of individuals using the Internet,
HH13	Proportion of households with multichannel
HH14	Barriers to household Internet access
HH15	Individuals with ICT skills, by type of skills
HH16	Household expenditure on ICT
HH17	Proportion of individuals using the Internet, used to access the Internet
HH18	Proportion of individuals who own a mobile phone
HH19	Proportion of individuals not using the Internet, by type of reason

5.2 Enhance the use of enabling technology, in particular information and communication technology, to promote the empowerment of women

Core ICT HH indicators (2016 rev.)

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HH2	Proportion of households with a television
HH3	Proportion of households with telephone
HH4	Proportion of households with a computer
HH5	Proportion of individuals using a computer
HH6	Proportion of households with Internet
HH7	Proportion of individuals using the Internet
HH8	Proportion of individuals using the Internet, b
HH9	Proportion of individuals using the Interr et, b
HH10	Proportion of individuals using a mobi'e cellu
HH11	Proportion of households with Inter net, by ty
HH12	Proportion of individuals using the Internet, b
HH13	Proportion of households with multichannel t
HH14	Barriers to household Inter net access
HH15	Individuals with ICT skills, by type of skills
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4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

Definition of indicators

- Definition of concepts: *computer, telephone, Internet access services, use of computer, use of Internet, multichannel TV…*
- Clarification of reference periods (three months), categories of response
- Model questions
- Disaggregations and classifications
- Formula of calculation
- Use (policy relevance)

Main concepts (continued)

- All the indicators are presented as **proportions** of the relevant population.

- Sub-indicators can be constructed using classificatory variables
  - E.g. Internet use by age (=characteristic of the individual).
  - E.g. Internet users by household income (=characteristic of the household)

http://www.itu.int/en/ITU-D/Statistics/Documents/coreindicators/Core-List-of-Indicators_March2016.pdf

HH16 Household expenditure on ICT

Definition:

percentage of total household expenditure that is expended on ICT goods and services

Methodological issues: goods and services are defined on the basis of the COICOP classification

Telephone and telefax equipment (COICOP 08.2.0)
Telephone and telefax services (COICOP 08.3.0)
Equipment for the reception, recording and reproduction of sound and picture (COICOP 09.1.1)
Information processing equipment (COICOP 09.1.3)
Repair of audio-visual, photographic and information processing equipment (COICOP 09.1.5)

Source: Household Income and Expenditure Surveys

HH17 Proportion of individuals using the Internet, by type of portable device and network used to access the Internet

Definition:

proportion of individuals who used the Internet using a portable device

Methodological issues:

A portable device can be a mobile phone, tablet or a portable computer (such as laptop, notebook, netbook, other portable devices e.g. portable games consoles, watches, e-book readers etc.).

The network used to access the Internet can be either via mobile cellular network (incl. USB key or integrated SIM) or via other wireless networks (e.g. WiFi).

Source: Household surveys

HH18 Proportion of individuals who own a mobile phone

Definition:

proportion of individuals who own a mobile phone

Methodological issues:

An individual owns a mobile cellular phone if he/she has a mobile cellular phone device with at least **one active SIM card for personal use**.

It includes mobile cellular phones **supplied by employers that can be used for personal reasons** (to make personal calls, access the 13 Internet, etc.) and those **who have a mobile phone for personal use that is not registered under his/her name**.

It excludes individuals who have only active SIM card(s) and not a mobile phone device.

Source: Household surveys

HH19 Proportion of individuals not using the Internet, by type of reason

Definition:

This measures the barriers to Internet use by individuals. It is expressed as a proportion of individuals who do not use the Internet.

Methodological issues: The reasons for not using the Internet are:

- Do not need the Internet (not useful, not interesting)
- Do not know how to use it
- Cost of Internet use is too high (service charges, etc.)
- Privacy or security concerns
- Internet service is not available in the area
- Cultural reasons (e.g. exposure to harmful content)
- Don’t know what Internet is
- Not allowed to use the Internet
- Lack of local content
- Other reason, specify

Source: Household surveys

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PART 2: Recommendations for implementation

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Recommendations for implementation: data collection

- Collection of ICT indicators through household surveys
  - Modules in multipurpose HH surveys (EU-SILC, LSMS, MICS, DHS…)
  - Stand-alone ICT households surveys
  - HBS
  - Population Census (low frequency)
- National representativeness:
  - probabilistic random sampling of households
  - *Problems in countries of the Region?*
- Discussion of data collection modes (face-to-face, CATI, CAPI)

Recommendations for implementation: data processing

- Weighting based on simple design
- Usual recommendations on *data editing and validation*
  - *Micro-editing*
  - *Macro-editing and validation*
- Recommendations on tabulation

Validation of country data

- Data validation should take place at three stages:
  - At the level of microdata (individual data from persons, households): MICRO-EDITING, carried out by the institution responsable for surveys (usually NSOs)
  - At the level of segment aggregates (estimated data for population segments): MACRO-EDITING, carried out by the institution responsable for surveys
  - At the level of country-level data:COUNTRY DATA VALIDATION, carried out by the country and ITU

Examples of micro-editing

- Range check (e.g. sex can be coded only as 1 or 2, household size >= 10 THEN WARNING)).
- Skip checks verify that the logic of the questionnaire has been followed, (e.g IF (use of Internet = NO) AND (TYPE OF CONNECTION ≠ blank) THEN WARNING)
- Consistency checks determine whether the information in the questionnaire is internally consistent (e.g. IF ("Does any member of this household have Internet access" = NO) AND ("Where did you use the Internet?" = "Home") THEN WARNING)

Examples of macro-editing and validation

- Check last data against trends (e.g. IF HH1= "Proportion of households with Radio" has a sharp increase)

- Check survey data against administrative records (e.g. HH3 = "Proportion of households with mobile cellular telephone" and A2 = "Mobile telephone subscriptions per 100 inhabitants")

- Consistency checks (e.g. IF (total in-scope population = 3.000 thousand inhabitants) AND (HH5 = "Number of individuals who used a computer in the last three months" = 3.020 thousand inhabitants) THEN WARNING)

Frequent mistakes (1)

- Reporting sample data, not population estimates

Sample	Population estimate	Formula
n= 1.000	N = 3.120.560	
a = 300	A = 3.120.560 x 300/1000 = 936.168	A = N x (a/n)
p = 300/1000 = 0.3 = 30%	P = 30%	P = A/ N

Frequent mistakes: reporting sample data, not population estimates

Sample	Population estimate	Formula
n= 1.000	N = 3.120.560	
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p = 300/1000 = 0.3 = 30%	P = 30%	P = A/ N

NO!

YES!

Frequent mistakes: incorrect weighting

Population size	Sample size	Weight	Sample value	Sample estimate	Population (weigthed) estimate
Urban = Nu= 5.000.000	nu = 1.000	$Wu = \frac{Nu}{nu} = 5.000$	au = 300	$pu = \frac{au}{nu} = \frac{300}{1000} = 30\%$	$\widehat{pu} = \frac{Au}{Nu} = \frac{au \cdot Nu/nu}{Nu} = 30\%$
Rural = Nr=2.000.000	nr= 1.000	$Wr = \frac{Nr}{nr} = 2.000$	ar = 200	$pr = \frac{ar}{nr} = \frac{200}{2000} = 10\%$	$\widehat{pr} = \frac{Ar}{Nr} = \frac{ar \cdot Nr/nr}{Nr} = 10\%$
Total = N = 7.000.000	n = 2.000			$\hat{A} = Wu \cdot au + Wr \cdot ar = 5.000 \times 300 + 2.000 \times 200 = 1.900.000$	$\hat{P} = \frac{\hat{A}}{N} = \frac{1.900.000}{7.000.000} = 27\%$

Tabulation by Classificatory variables - households

- Regions, urban/rural
  - New: definition *degree of urbanization* using population grids
- Household composition, size
  - Household composition – *households with and without children under 15*
  - Household size – *number of household members.*
- Household with or without electricity
- Characteristics of head of household
- Household income

Tabulation by Classificatory variables - individuals

- Urban/rural
- Sex
- Age
- Highest level of education attained (ISCED)
- Labour force status
- Occupation (ISCO)

Other classificatory variables

- level of literacy and languages spoken
- income level (household or individual)
- level of ICT skills
- disability status

Though most present statistical challenges

Cross-tabulation of variables

- Can produce information that is very useful for analytical purposes
  - example: Internet use by young women (data are cross-classified by age and gender).
- Cross-classified output is more detailed
  - especially for indicators with response categories
    - example: Internet use at home by young women (location by age and gender).
  - This detail has implications for sample size.

Hands-on exercise

1. Reproduce the calculations of the previous example with
   - Nu = 1.500.000, Nr = 2.000.000
   - nu = 500 , nr = 500
   - au = 400, ar = 100

Thank you

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