



UN-ESCWA



Distr.
LIMITED
E/ESCWA/ICTD/2005/WG.1/3
6 June 2005
ORIGINAL: ENGLISH

Economic and Social Commission for Western Asia - ESCWA

Capacity-Building Workshop on Information Society Measurements:
Core Indicators, Statistics, and Data Collection
Beirut, 7-10 June 2005

**METHODOLOGIES AND MODEL QUESTIONS: HOUSEHOLD AND
INDIVIDUAL CORE ICT USE INDICATORS**

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Introduction

At the WSIS Thematic Meeting on Measuring the Information Society, held in Geneva in February 2005, a core list of indicators for ICT measurement was established as an agreed upon outcome of the meeting. To complement the core list, the meeting asked for a methodological annex, with definitions and recommendations for data collection. This methodological annex will be presented – together with the core list itself – at the second phase of WSIS in November in Tunis, at a side event that will be organised by the Partnership on Measuring ICT for Development.

The current core list consists of three parts: (i) infrastructure indicators; (ii) indicators on ICT access and use by households and individuals; and (iii) indicators on ICT access and use by businesses and the ICT sector. This paper deals with the second set of indicators, and will offer preliminary suggestions on how to collect survey data corresponding to the household and individual core ICT use indicators HH-1 to HH-13. It is almost identical to the paper that was presented at the February meeting in Geneva.

The paper raises some issues that were also raised at the meeting in February as well as at the Working Party on Indicators for the Information Society (WPIIS) meeting of OECD member countries in April 2005. Feedback on these issues is most welcome, and will be integrated in the final version of the methodological annex of the core indicators.

It should be noted that this paper does not provide detailed advice on how to conduct or process household surveys. Its aim is to convey those methodological points and conceptual issues which are most relevant to the collection of household/individual ICT use information. Even though the guidance in the paper refers to statistical collections, those countries using other sources (for instance, administrative data) might find the suggestions for units, scope and classificatory variables useful.

The paper covers:

- collection methodologies for surveys of household and individual ICT use;
- particular statistical issues associated with household and individual ICT use measurement;
- statistical units;
- survey scope and coverage;
- classificatory variables; and,
- suggested questions and metadata corresponding to the core indicators.

It is important to note that the suggestions are based largely on current development work by the OECD's Working Party for Indicators on the Information Society (WPIIS) which is linked to work being done by Eurostat and individual OECD member countries on this topic. It is possible that some suggestions would change following future decisions taken by OECD member countries, especially in respect of relatively new questions such as Question 9 on individual mobile phone use¹. Particular use has been made of the following:

- the OECD's 2002 model questionnaire for measuring ICT use and electronic commerce in households and by individuals; for the full document, see Model Survey: Measuring ICT Usage and Electronic Commerce in Households/by Individuals, Revision 2/2002²;

¹ The WPIIS met at the end of April 2005, where these issues were discussed. Delegates had until the end of May for written comments. At the time of writing of this document, it was not possible yet to take these comments into account.

² Full URL <http://www.oecd.org/dataoecd/3/3/20630152.pdf>.

- current work being undertaken by the OECD and participating countries on revising that model questionnaire;
- Eurostat's model questionnaires for ICT usage in households and by individuals (the latest finalised version is in respect of 2005); and,
- Eurostat's November 2004 draft *Methodological Manual* for measuring ICT usage in households and by individuals.

Link to Guide to Information Society Measurement

Of interest for anyone wishing to collect indicators relating to the information society is the forthcoming OECD publication, *Guide to Information Society Measurement*. The *Guide* will bring together all WPIIS methodological work in an easily accessible form. Its primary aims are:

- to help consolidate Information Society measurement work in OECD member countries;
- to share best practices with participating countries; and,
- to assist newly participating countries to start or further develop measurement programs in this area.

Of particular relevance for this paper, the *Guide* will:

- explain WPIIS work on household/individual ICT use surveys in more detail than is possible in this paper, and
- provide extensive metadata in respect of the collection practices of OECD countries.

Collection methodologies for surveys of household and individual ICT use

Please note that no recommendations are made in this paper on the following aspects of collection methodology:

- for use of a particular type of sample frame, sampling methodology or sample size; these will vary according to country practices and the availability of information (for instance, administrative information on individuals);
- whether collections should be mandatory or voluntary – both types of collections are used among OECD member countries; however, where collections are voluntary, non-response will tend to be higher and therefore the recommendations below regarding survey bias will be more relevant; and,
- how to process collected information, including editing, imputation and benchmarking of data.

For most countries, there will be established procedures in place for household (e.g. labour force) surveys which will apply also to collection of ICT use data. Other countries could benefit from Eurostat's *Methodological Manual* and the OECD's *Guide*, both due to be finalised this year. These outputs will be sources of more detailed guidance on collection of ICT use data from households.

In general, participating countries should note that different collection methodologies can lead to inconsistencies in output. All countries should therefore aim to reduce sampling and non-sampling error as much as possible by:

- using well designed samples which are of sufficient size to produce reliable data (that is having low standard errors for the aggregates suggested in this paper);
- careful design and testing of questions and question sequences;
- intensive training and checking of interviewers, where they are used;
- reducing the non-response rate as far as possible; and,
- minimising data entry, editing and other processing errors.

Survey vehicle and collection methods

There are a variety of survey vehicles which could be used to collect data on household and individual ICT use. A few OECD countries have a stand-alone survey for this purpose but most use existing surveys. Many other participating countries will also have existing survey vehicles, for instance, labour force surveys, household expenditure surveys, population censuses or general social surveys. This paper does not propose a particular type of survey vehicle.

Most OECD countries use personal interview techniques (face-to-face or telephone interviewing) for collecting data on household and individual use of ICT. For either method, interviewers may be assisted by computers (using, for instance, CAPI or CATI applications respectively). Telephone interviews should be avoided where telephone penetration is low or it is not possible to include mobile or unlisted subscribers. OECD suggests to its member countries that postal surveys generally not be used. There are three main reasons to avoid such surveys: first, there is little or no interaction with the respondent and therefore questions might be less well understood; second, response rates are likely to be lower for a postal survey; and, third, there is likely to be a systematic non-response bias as non-users are less likely to complete the questionnaire. However, this advice does not necessarily preclude other questionnaire-based approaches such as a drop-off/call-back (or post back) approach which is used by at least one OECD country and may enable some interaction and improve the response rate.

Frequency and reference period/date

The question of collection frequency for core ICT indicators has not been discussed in any detail yet. However, it is probably unrealistic to expect participating countries to conduct surveys more frequently than annually. For some participating countries, even an annual collection will not be feasible, in which case it is important that those countries try to align their collection years as far as possible.

As some of the information collected is point-in-time data, it would be preferable to also have alignment of reference dates across participating countries. However, the dependence of many countries on existing survey vehicles probably makes this unrealistic.

Particular statistical issues associated with household and individual ICT use measurement

Units: households versus individuals

A key issue concerns the appropriate statistical unit for measurement. Either the household or individual unit could be used depending on the use to be made of the data. In general, the household unit is used to elicit information about the facilities in place in the household (for example, whether there is a TV, computer or Internet connection). The individual unit is used to provide information on use of these facilities (both in and away from the home) and, most importantly, the intensity of that use (for instance, frequency and range of activities undertaken). Debate continues among OECD countries on the preferable unit, though at this stage most use both.

Mobile phones

A particular issue concerns mobile phones, for which there are both household and individual indicators in the core list. In OECD countries, this information has conventionally been collected in respect of the household (therefore whether the household, through one or more of its members, has access to a mobile phone). However, there is increasing recognition that it is more important to examine individual use of mobile phones, especially since they are typically owned and/or used by an individual rather than a group of people. The suggested questions at the Annex to this paper include one on individual mobile phone use. It should be noted that such a question is relatively untested in OECD countries and therefore might change as experience increases.

Recall period

Amongst OECD countries, this has been a much-debated issue, though mainly in the context of the value of Internet purchases by individuals.

Based on the experience of those OECD countries which use it, it is suggested that a 12-month recall period for questions which are less reliant on detailed recollection will not introduce significant recall bias

effects. On the other hand, using a different period (for example, three months) potentially introduces seasonal bias effects.

The OECD model questionnaire uses a 12 month recall for all questions. The Eurostat model asks some questions in respect of both 12 months and three months (for instance, individual use of a computer and the Internet, whether the individual has purchased products over the Internet) but asks others (e.g. location of use and activities undertaken) in respect of the last three months.

A 12 month period is suggested for the core indicators in order to avoid seasonal effects and to enable maximum comparability. The latter point is important given that most participating countries will probably be conducting surveys annually or even less frequently. A longer recall period should also better capture less frequent activities such as purchasing on-line or searching for health information.

Choice of denominator for indicators

Most indicators arising from ICT use surveys are presented as proportions data. They include: proportions of the whole population of households/individuals or of sub-populations, such as particular household types or age groups. Additionally, countries might present proportions of sub-classes of households/individuals which have access to/use the Internet. This can be very confusing to users so it is important to be quite clear which denominator is used to construct a particular indicator and to have a common approach between countries. To enable this, when providing aggregate data, it is suggested that countries present proportions only in respect of the population and those sub-populations corresponding to the classificatory variables, such as household type or age.

Statistical units

Both households and individuals are proposed as statistical units, as they are in the OECD and Eurostat model surveys. It is suggested that all questions be asked of a randomly selected adult (some-one aged 16 or over) who responds in respect of the household questions (1-7) and in respect of him/herself for the remaining questions. Households, and individuals within those households, need to be selected in an unbiased manner.

Because the sample of households and individuals selected is unlikely to be perfectly representative of the population, it is important to weight responses according to independent estimated distributions of the population and relevant sub-populations.

Survey scope and coverage

Households

All households in a country are in scope of the OECD model survey but not all member countries include all households. A number of European countries, for instance, have an age scope of 16-74 years on individuals included in the survey and therefore households consisting only of members over 74 (or, less likely, under 16) are usually excluded from the survey. Such a situation might exist in other countries as well, especially where labour force surveys are used as vehicles.

Discussion point: scope of households in the survey. Should household scope be limited by age of household members?

Many countries will also restrict household surveys to those living in private dwellings. For some countries, there could be other reasons for a more limited scope (or coverage) of the national survey. They include exclusion or undercoverage of particular sub-populations, for example those living in remote or inaccessible areas. While such scope and coverage limitations are likely to be unavoidable for many countries, OECD recommends that they be reduced as far as possible. In addition, it is useful if countries note any exclusions from scope or areas of poor coverage and, where possible, advise of the likely impact on survey estimates.

Individuals

The scope of individuals would normally be limited by age. OECD recommends that all individuals aged 16 years or over are included in the scope of the survey. However, as noted above, some European

countries have an age range of 16-74 and therefore exclude individuals aged outside this range. It is suggested that participating countries adhere to the lower age of 16 years for output purposes (which means that they could collect from individuals younger than 16 years if they have a need for such data). However, it is not clear whether there should be an upper age limit.

Discussion point: scope of individuals in the survey. What should the age scope be – 16+ or 16-74 (or something else)?

Other scope limitations on individuals are likely to be relatively minor and could include things like limiting the survey to those living in private dwellings (therefore excluding individuals in institutions such as prisons and nursing homes and special dwellings such as hotels); excluding full-time members of the armed forces; and excluding non-residents and some foreign residents.

Classificatory variables

The metadata associated with the core indicators needs to include a set of classificatory variables, with relevant categories. Data for these variables will usually be collected as part of the survey (though note that questions have not been suggested in this paper). A minimal set based on the OECD and Eurostat model surveys is proposed below, though many participating countries will decide to use extra classificatory variables and/or additional categories. Of possible interest to those countries where a rural/urban divide exists is a geographical classification. For many countries, an income variable will also be of interest. The inclusion of such classifications is therefore raised as discussion points.

Discussion point: is a geographic classification needed? For instance, Eurostat uses a type of locality classification³ consisting of: densely-, intermediate- and thinly- populated. The Australian Bureau of Statistics has a Remoteness Area classification⁴ with categories based on average accessibility. It is likely that cross-country comparability of any geographic classification would be statistically challenging.

Discussion point: is an income variable needed, noting the conceptual and collection difficulties in household or individual income? Eurostat proposes an optional household income variable, defined as average net monthly income. The existing (2002) OECD model proposed gross income from all sources for all household members. The output is often a classification by income percentile.

Household characteristics

- household composition (two-way classification: *households with/without children under 16*) and
- household size (number of members including those outside the age scope).

Individual characteristics

- age (age is a strong determinant of ICT use so a common age cut-off is important – see discussion above under Scope); to maximise comparability, OECD uses output age groupings of 16 to 24; 25 to 44; 45 to 64; 65 to 74 (Eurostat's are finer but compatible);
- gender;

³ Defined as follows: **Densely-populated area** - a contiguous set of local areas, each of which has a density superior to 500 inhabitants per square kilometre, where the total population for the set is at least 50,000 inhabitants; **Intermediate-populated area** - a contiguous set of local areas, not belonging to a densely-populated area, each of which has a density superior to 100 inhabitants per square kilometre, and either with a total population for the set of at least 50,000 inhabitants or adjacent to a densely-populated area; **Thinly-populated area** - a contiguous set of local areas belonging neither to a densely-populated nor to an intermediate area.

⁴ The ABS categories are: Major cities, Inner regional, Outer regional, Remote, Very Remote and Migratory. The average accessibility measure is based on the physical road distance to the nearest urban centre.

- highest education level received (three-way classification: *No formal education, primary or lower secondary (ISCED 0,1,2); Upper secondary and post-secondary non-tertiary (ISCED 3,4); Tertiary (ISCED 5,6)*)⁵;
- employment status (four-way classification: *paid employee; self-employed⁶; unemployed; not in the labour force*)⁷; and,
- occupation (use ISCO88 major groups where possible)⁸; countries may also wish to output at a finer level in order to distinguish special interest groups such as ICT workers.

In terms of output, many countries will also wish to cross-classify some of these variables⁹. While OECD does not ask countries for cross-classified output, such information can be very useful for analytical purposes.

Eurostat collects several cross classifications from its member states, including:

- household composition by size;
- gender by age, and gender by educational level; and,
- age by educational level.

Suggested questions and metadata corresponding to the core indicators

Suggested questions, along with definitions of terms used and associated metadata notes, are presented in the Annex below. Please note that the questions presented there do not constitute an operational questionnaire, the form of which will vary according to factors which are specific to each survey and country. Because it is not an operational questionnaire, it does not show:

- questions which establish the values of classificatory variables (household and individual characteristics);
- interview instructions (though it does indicate question logic); and,
- how questions are asked (this will vary depending on the collection methodology used, for instance, personal interviewers might use prompt cards for the “list” questions whereas telephone interviewers might use a running prompt i.e. ask each response item as a yes/no question).

⁵ For more information on ISCED (1997), see http://www.uis.unesco.org/ev.php?ID=3813_201&ID2=DO_TOPIC.

⁶ Self employed includes: employers; own account workers; contributing family workers; and members of producers' cooperatives.

⁷ For more information on the ILO definitions, see <http://www.ilo.org/public/english/bureau/stat/class/icse.htm>.

⁸ For more information on ISCO, see <http://www.ilo.org/public/english/bureau/stat/class/isco.htm>.

⁹ Note that, if they do so, sample sizes should be sufficient to support such disaggregations.

Annex. Preliminary wording for core household/individual ICT use questions

Household access to information and communication technologies		Logic, definitions and notes
1	HH1 [#] Does any member of this household/do you ¹ have access to a radio at home? ²	<p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p> <p>Radios also include: those combined with other equipment such as cassette players/recorders, portable radios such as transistor radios, and radios in motor vehicles.</p>
2	HH2 Does any member of this household/do you ¹ have access to a television at home? ²	<p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p>
3	HH3 Does this household have a fixed line telephone at home? ³	<p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p>
4	HH4 Does any member of this household/do you ¹ have access to a mobile telephone at home? ²	<p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p>
5	HH5 Does any member of this household/do you ¹ have access to a computer at home? ²	<p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p> <p>A computer includes: a personal computer, laptop or personal digital assistant (handheld computer). A computer does not include equipment with embedded computing abilities, such as cell phones, VCR's or TV sets.</p>
6	HH7 Does any member of this household/do you ¹ have access to the Internet at home regardless of whether it is used? ⁴	<p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p> <p>"No" response - go to Q8. The Internet is a world-wide public computer network. It provides access to a number of communication services including the World Wide Web and carries email, news, entertainment and data files. Internet access may be via a computer, Internet-enabled mobile phone, digital TV, games machine etc.</p>

Household access to information and communication technologies

Logic, definitions and notes

7 HH12 What type/s of Internet connections are used for Internet access at home?⁵

Multiple responses allowed

Analogue modem (dial-up via standard phone line)

An analogue modem converts a digital signal into analogue for transmission by traditional (copper) telephone lines. It also converts analogue transmissions back to digital.

ISDN (Integrated Services Digital Network)

ISDN is a telecommunication service that turns a traditional (copper) telephone line into a higher speed digital link. It is usually regarded as narrowband.

DSL (ADSL, SDSL, VDSL etc)

Digital subscriber line; it is a high-bandwidth, local loop technology carrying data at high speeds over traditional (copper) telephone lines.

Cable modem

A modem which uses cable TV lines for connection to the Internet.

Other narrowband⁶

Including most mobile phone access (e.g. WAP, i-mode) and other forms of access with an advertised download speed of less than 256 Kbps (kilobits per second).

Other broadband⁶

Including optic fibre cable, some mobile phone access (e.g. UMTS), satellite, fixed wireless, with an advertised download speed of \geq 256 Kbps.

Do not know

Individual (adult) use of information and communication technologies

8 HH6 Have you used a computer in the last 12 months?⁷ No Yes

From any location, including work. The definition of computer is per Q5 above.

9 HH11 Did you have the use of a mobile phone during some or all of the last 12 months?⁸ No Yes

The phone need not be owned or paid for by the person but should be reasonably available through work, a friend or family member etc. Excludes occasional use, for instance borrowing a mobile to make a particular call.

Individual (adult) use of information and communication technologies

Logic, definitions and notes

10 HH8 Have you accessed the Internet in the last 12 months?⁷

No
 Yes

"No" response - no more questions. From any location; definition of Internet is per Q6 above. This and the following questions refer to use of the Internet rather than availability.

11 HH9 Where did you access the Internet in the last 12 months?⁹

Multiple responses allowed

Home

Work¹⁰

Place of education

At another person's home

Free public access facility¹¹

Charged public access facility¹¹

Other places

These will tend to be government or non-profit facilities but will also include commercial organisations which offer free Internet access.

These include commercial facilities which specifically charge for Internet access, e.g. most Internet cafés, but also any non-commercial organisations which charge for access.

12 HH13 How often did you USUALLY access the Internet during the last 12 months?

At least once a day

At least once a week but not every day

At least once a month but not every week

Less than once a month

"Usually" means on most days (or a typical day). It is included so that respondents will ignore weekends (if they only access the Internet from work) and breaks from their usual routine, such as holidays.
To be interpreted as at least once each working day for respondents who only (or most frequently) access the Internet from work.

Individual (adult) use of information and communication technologies

Logic, definitions and notes

13 HH10 For which of the following activities did you use the Internet in the last 12 months?¹²

Multiple responses allowed

For getting information

About goods or services

Related to health or health services

Health information covers injury, disease, nutrition and improving health generally.

From government organisations/public authorities¹³ (via Web sites or email)

Other information or general Web browsing

For communicating

Sending or receiving email, telephoning via Internet, using chat rooms/sites, message boards, instant messaging etc.

For purchasing or ordering goods or services (except investment products, shares)

For Internet banking or other financial services (e.g. trading shares)

For education or learning

This can be formal or informal education or learning.

For dealing (interacting) with government organisations/public authorities¹³

Includes downloading/requesting forms, completing/lodging forms on-line, making on-line payments, purchasing from government.

For leisure activities

Playing/downloading video or computer games

Includes downloading games, file sharing games or playing games on-line.

Obtaining movies, music or software

Includes downloading or file sharing. For software, includes patches and upgrades.

Reading/downloading electronic books, newspapers or magazines

Other leisure activities

Includes gambling, listening to radio (streamed audio), watching television (streamed video).

Notes

- #
- 1 The relevant core indicator is shown in the column next to the question number. Indicators HH1 to HH10 are basic core and HH11 to HH13 are extended core.
- 2 The terminology "Does any member of this household/do you" is used to cover single person households. This is distinct from asking questions of individuals.
- 3 This question refers to access rather than use. The equipment should be in working order or expected to be returned to working order soon.
- 4 The necessary equipment should be in working order or expected to be returned to working order soon.
- 5 This question refers to access rather than use. The connection should be functional at the time of enumeration (that is, any equipment or software needed should be in working order or expected to be returned to working order soon). Note that access is not assumed to be only via a computer. It may also be by mobile phone, games machine etc. Therefore this question is asked even if there is a "No" response to Q5.
- 6 Possible country variations are: remove categories where items are not feasible; add or split categories according to technologies available and country data requirements. The aim is to enable estimation of the proportion of households with broadband access. Note also the comments against the categories "Other narrowband" and "Other broadband".
- 7 This wording would not normally be used on questionnaires - countries would add appropriate category/ies based on services available.
- 8 An alternative way of phrasing this question (done by Eurostat and in the proposed revised OECD model questionnaire) is: "When did you most recently use a computer/the internet?", with as response options: * Within the last three months. * Between three months and a year ago. * More than a year ago. * Never.
- 9 This question is untested in this format so the suggested wording could change.
- 10 Possible country variations are: add or split categories according to country data requirements.
- 11 Where a person's workplace is located at his/her home, then he/she would answer both home and work categories referring to Internet use. Some countries might also like to ask the chosen adult whether he/she works exclusively from home.
- 12 This category would not appear on country questionnaires. It is expected that each country would tailor categories for facilities available in their country.
- 13 From any location. There are alternative ways of asking activities questions. For instance, each could be rated according to its frequency or intensity of use. These questions use a simplified method of presentation which asks respondents for all activities. It is presumed that reasonably comparable output can be compiled by those countries taking a different approach. Possible country variations are: add or split categories according to country data requirements.
- 14 Note that government organisations/public authorities are defined per the SNA93. They include government organisations at local, regional and national level. See <http://unstats.un.org/unsd/sna1993/glossform.asp?getitem=219>.