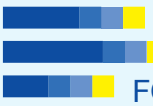
Measuring ICT: the global status of ICT indicators

Partnership on Measuring ICT for Development



Measuring ICT: the Global Status of ICT Indicators

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Published by
The United Nations Information and Communication Technologies Task Force
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Foreword

Following the World Summit on Information Society (WSIS) held in Geneva 2003, countries and regions were called upon to develop tools for measuring and monitoring progress toward the Information Society, including basic ICT indicators. To that end, several key stakeholders involved in the statistical measurement of the Information Society joined forces in a global '*Partnership on Measuring ICT for Development*', which was launched in June 2004.

The purpose of this report is to synthesize the results of a stocktaking exercise on ICT indicators undertaken by the Partnership. On behalf of the partnership, the UN Regional Commissions and UNCTAD, sent a questionnaire on the status of ICT indicators to 179 countries. The questionnaire aimed to take stock of the status of official Information Society statistics in developing countries. The results are presented by region, together with two chapters on global issues concerning household and business ICT indicators (these chapters also include information on the availability of ICT indicators in OECD countries).

The report was consolidated by José Cervera as consultant to the UN ICT Task Force based on the analysis made by regional commissions, ITU and UNCTAD, who received inputs from the Partnership members and several National Statistical Offices. The coordination of the report was done by UNCTAD. Jenifer Johnston, on behalf of the UN ICT Task Force, edited the report. Formatting and layout was provided by the ITU while the UN ICT Task Force sponsored the printing of the publication.

The Partnership thanks the National Statistical Offices and, other national institutions that responded to the questionnaire and, provided information on the availability of ICT indicators and statistical sources in their respective countries.

Geneva, July 2005.

Contents

Chapter 0. Introduction

Section 0.1 The Partnership on "Measuring ICT for Development"

At the World Summit on the Information Society (WSIS) in Geneva in December 2003, world leaders and heads of state highlighted the importance of benchmarking and measuring progress toward the information society. In the WSIS action plan, countries and international organisations were called upon to allocate appropriate resources for the provision of ICT statistics and to develop effective measurement methodologies including basic ICT indicators and an analysis of the state of the information society.

In response, the key stakeholders involved in the statistical measurement of the Information Society including the International Telecommunication Union (ITU), the Organisation for Economic Co-Operation and Development (OECD), Eurostat, the United Nations Conference on Trade and Development (UNCTAD), the UN ICT Task Force, four UN Regional Commissions (UNECA, UNECLAC, UNESCAP and UNESCWA), the UNESCO Institute for Statistics (UIS) and the World Bank, all joined forces to create a global Partnership for 'Measuring ICT for Development'. The Partnership was officially launched during the UNCTAD XI conference held in Brazil in June 2004.

The main objectives of the Partnership are the following:

(i) To agree on a common set of core ICT indicators that are comparable at the international level;
(ii) To assist in building the statistical capacity in developing countries, and
(iii) To set up a global database for hosting data on core ICT indicators.

To achieve these objectives, the respective partners have combined resources and coordinated activities related to measurement of the information society. One of the first activities undertaken on behalf of the partnership was a statistical workshop on 'Monitoring the Information Society: Data, Measurement & Methods' held as a side event at WSIS in Geneva. The workshop, organized jointly by UNECE, UNCTAD, OECD, ITU, UIS and Eurostat, led to an agreement that the UN Regional Commissions and other regional organisations would hold regional meetings on monitoring Information Society issues, bringing together both users and suppliers of official statistics, such as the National Statistical Offices (NSOs).

The role of the NSOs from both developed and developing countries has been of utmost importance to the Partnership. In developed countries, NSOs have provided guidance on methodologies and experiences in ICT data collection, analysis and dissemination. Whereas, NSOs from developing countries have voiced their challenges and needs with regards to ICT measurement, making the Partnership a practical forum for exchanging experiences.

Section 0.2 The Global Stocktaking Exercise on ICT Indicators

In order to assess the status of ICT indicators within each region, the Partnership undertook a global exercise to collect information from all countries regarding the statistical measurement of ICT. This project, referred to as the 'global stocktaking exercise', entailed the UN Regional Commissions and UNCTAD working together to disseminate a harmonised questionnaire (in Appendix) to each country according to a specific geographical division of tasks (outlined in the corresponding chapters of this report).

The questionnaire was divided into four main sections as described in Table 0.1. The questionnaire did not ask for concrete statistics on the penetration, use or impact of ICT in the participant countries, but rather focused on the institutional and technical systems established for collecting ICT statistics in general. Secondly the questionnaire requested data on the availability of a concrete set of ICT indicators. A large number of countries responded, which form the basis of the present report. These 'data about data' or *metadata* were stored in databases designed for the task.

The selection of a specific set of *metadata* to describe statistical results and operations is often discussed during statistical meetings. As a result, some attempts have been made to establish a comparable set of metadata at the international level (Eurostat, OECD, UNECE). In order to describe the statistical standards of a particular topic, several institutions use metadata frameworks such as the Special Data Dissemination System (SDDS) and the General Data Dissemination System (GDDS) or the Data Quality Assessment Framework (DQAF) which cover the technical and institutional aspects of the statistical system.

More specifically, the metadata referred to in the global stocktaking exercise provided information on the following:

- the institutional environment: institutions carrying out statistical operations that provide ICT indicators, the financing framework, the level of demand for ICT indicators
- the nature of statistical operations providing the indicators and some of their methodological aspects (data collection method, sample size and response rate, observation unit)
- the current and foreseeable availability of two specific sets of twenty ICT indicators for households and business

The questionnaire did not seek detailed information on key metadata at the indicator level, such as:

- definitions used (for example, the concepts of 'presence', 'access' or 'use' of ICT equipment,
- method of calculation (estimates for persons or households, use of population denominators, etc.) and estimates of indicators' reliability (accuracy)
- disaggregations available for each indicator and categories considered (for example, age intervals, firm size, etc.)
- last reference year for available and timely data dissemination (difference between reference and dissemination dates).

Table 0.1. Sections in the Metadata Questionnaire

Section	*Contents*
A) General Section	ICT definition Budget for ICT statistics Publication of ICT statistics
B) ICT Household Statistics	Statistical operations providing ICT household indicators Specialisation of statistical operations (number of ICT variables and total number of variables) Availability of data disaggregations Data collection methodology and performance (observation unit, type of data collection method, universe/ scope, sample size, response rate) Calendar of statistical operations Level of demand for ICT household indicators Availability of a concrete set of 20 ICT household indicators Institutions other than NSOs collecting ICT household statistics
C) ICT in Business	Statistical operations providing ICT business indicators Specialisation of statistical operations (number of ICT variables and total number of variables) Availability of data disaggregations Data collection methodology and performance (observation unit, type of data collection method, universe/scope, sample size, response rate) Calendar of statistical operations Level of demand for ICT business indicators Availability of a concrete set of 20 ICT business indicators Institutions other than NSOs collecting ICT business statistics
D) Other Areas for ICT Statistics	Statistical operations providing ICT indicators in other areas Specialisation of statistical operations (number of ICT variables and total number of variables) Availability of data disaggregations Calendar of statistical operations Institutions other than NSOs collecting ICT business statistics

Section 0.3 Methodology and Structure of the Report

The final report of the joint UNECE/UNCTAD/UIS/ITU/OECD/Eurostat Statistical Workshop on Monitoring the Information Society, held in December 2003, recommended that the five UN Regional Commissions organise in 2004 a meeting related to issues on the statistical monitoring of information society, within each region. The regional workshops should bring together users and producers of official statistics, and should provide input for the global meetings in 2005.

Regional seminars were therefore organised in Western Asia (October 2004), Africa (October 2004, January 2005) and Latin America and the Caribbean (November 2004)[1]. The follow-up global meeting held in Geneva (7-9 February 2005) took stock of these regional seminars. Most of the material presented during that conference, as well as the regional events, has been used as input to the present report[2]. Documents for other international meetings (such as the UN Statistical Commission) were also considered.

The regional stocktaking exercises results were presented in different formats, with a focus on regionally relevant aspects. This report attempts to standardise these results and integrate the findings into a common framework.

The questionnaire results were stored in five MS Access databases. Three of the five regions shared a common table and field structure. UNECLAC and UNESCWA used a different structure. The addition of external information to the information collected in the questionnaires improved the qualitative knowledge on metadata on ICT indicators.

a. Geographical Coverage

The same regional divisions made for data collection from each country were also used in the chapter reports. For this reason, country results are divided into the following five regions according to the organisation responsible for sending and analysing the country questionnaire: Africa (collected by UNECA), Central Asia and Central and Eastern European countries[3] (collected by UNCTAD), Western Asia[4] (collected by UNESCWA), Asia-Pacific (collected by UNESCAP) and Latin America and the Caribbean (collected by UNECLAC).

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[1] Although no such meeting could be organised for Asia an the Pacific, inputs from selected countries of Asia and the Pacific, which met in Wellington, New Zealand (30 November-2 December 2004), were also taken into account

[2] The consultant wishes to thank in particular the help of Roberto Pagan (UNESCAP), Hesham Auda (UNESCWA), Doris Olaya and Martin Hilbert (OSILAC/UNECLAC), Simon Ellis (UNESCO Institute for Statistics), Martin Schaaper (OECD), Esperanza Magpantay (ITU), Christine Zhen-Wei Qiang (World Bank), Susan Teltscher and Scarlett Fondeur (UNCTAD). For national reports, help was provided by Virginia Bâlea (INS Romania) and the Deputy Director-General of INSTAT Madagascar.

[3] The region also includes Andorra, Liechtenstein and Monaco. UNCTAD collected data from all UNECE member countries, except those that are members of the OECD or the EU.

[4] Data from Egypt, while included in the sub-region of Northern Africa, were collected by UNESCWA (of which it is a member State) and therefore included in the Western Asia region.

Associate members of the UN Regional Commissions and non-sovereign territories were generally not included in the stocktaking exercises.

The status of ICT indicators in OECD countries is not described in detail in this report, with the exception of Mexico and Turkey whose information was collected by UNECLAC and UNCTAD respectively. For other OECD countries, only the availability of the set of 40 indicators on household and businesses were considered in chapters 1 and 2.

b. Analysis of the Response Rate

The questionnaire was sent to a total of 179 countries, of which 86 countries returned the questionnaire.

The coverage of the stocktaking exercise has been assessed in terms of population and share of GDP for the respondent countries. This analysis was also correlated with income levels and digital access levels (Table 0.2). International statistical sources for population, GDP, GDP per capita and Digital Access Index (DAI) were used to classify the countries into income level and digital access groups, and to weight the response rate. More specifically, the population databases from the United Nations Statistical Division were used (reference year: 2002), as well as the World Bank's classification of per capita income levels[5] and the ITU digital access levels (reference year: 2002). Indeed, considering the percentage of responses as a measure of coverage of the stocktaking exercise gives the same weight to small and populous countries, or to small and large economies. In the case of ICT in households, the coverage was assessed not only with the percentage of countries answering the questionnaire, but also in terms of the population that those countries represented within the region. For business ICT indicators, the coverage was weighted according to each country's share of regional GDP.

Africa and Asia-Pacific were not well covered by the survey results. A supplementary effort is required to include countries such as *China*[6], *Nigeria* and *South-Africa* which are missing in the stocktaking exercise. This would improve the accuracy of the results for these countries respective regions.

Several sub-regions are also poorly represented, such as Small Pacific Islands, Central Asian countries and Sub-Saharan Africa. Given that their statistical systems are still in a developmental stage, the overall picture, presented this report, on the availability of ICT indicators in developing countries could be too optimistic.

Table 0.2. Coverage of the Stocktaking Exercise

Region	*Coverage in terms of*		
	Number of Respondent Countries	*Regional Population*	*Regional GDP*
Africa	19 out of 52	42%	29%
Central Asia and Central and Eastern European countries	19 out of 24	89%	95%
Western Asia	10 out of 13	83%	83%
Asia-Pacific	18 out of 44	51%	50%
Latin America and the Caribbean	20 out of 36	91%	95%

[5] Economies are divided into groups according to the following intervals: low income, USD 765 or less; lower middle income, USD 766 to USD 3.035; upper middle income, USD 3.036 to USD 9,385; and high income, USD 9,386 and above. Purchasing power parities are used.

[6] The Special Administrative Regions of Hong Kong and Macao are however included in the metadata collection.

Table 0.3. Coverage according to Income Level and Digital Access Level

Region	*Coverage according to*	
	Income evel	*Digital Access Level*
Africa	Coverage of lower-middle income countries is poor	Coverage of low DAI countries is poor
Central Asia and Central and Eastern European countries	Coverage of low income countries is poor	Coverage of low DAI countries is poor
Western Asia	Coverage of high income countries is poor	Coverage of upper DAI countries is poor
Asia-Pacific	Coverage of low income countries is poor	DAI not available for a large number of countries. Coverage of low DAI countries is poor
Latin America and the Caribbean	Coverage of low income countries is poor	No coverage of low DAI countries

In terms of income level and digital access level, Table 0.3 summarises the coverage. The pattern is similar in most regions except for Western Asia. In general, countries with low income and low digital access level did not have as high response rates to the questionnaire. The reverse occurred in Western Asia due to the lack of information from *Bahrain* and the *United Arab Emirates* (Table 0.3).

Consequentially, further analysis is needed to better understand the demand for and production of ICT indicators in poor countries. The lack of resources for statistical work may explain these countries inability to respond to the metadata questionnaire.

c. Analysis of Demand for Indicators

An item was included in the metadata questionnaire to assess the demand for ICT indicators in the household and business sectors. Since the questionnaire was addressed to NSOs, the assessment of demand is limited, in this report, to the producers' viewpoint, and no further information was collected on the users' viewpoint.

The existence of national ICT policies would indicate demand for indicators, however no information on indicators used in the national policies is available yet. Additional information such as the existence of inter-institutional working groups (composed by NSOs, authorities for ICT and other line ministries), the presence of ICT authorities in the National Statistical Councils (where these are functional), the inclusion of ICT indicators in National Statistical Programmes (where these are in place) and the preparation of joint publications could give further insight into the level of demand for ICT indicators and the possible response to it by statistical institutions.

d. Analysis of Availability of Indicators

The availability of each individual indicator (for households as well as for businesses) is assessed according to the responses to the metadata questionnaire. This includes the current availability, as well as the status in one year and in three years as planned by the respondent institutions (which is no guarantee of effective implementation).

In order to compile the availability of each indicator at the regional level, two measures have been produced: the percentage of respondent countries in the region that reported the availability of the indicator, and a weighted version of the same, using as weights the percentage of population (for household indicators) and share of GDP (for business indicators) for each country in the region. The weighted measures can be used as proxies for the regional coverage of the universe of all households or all productive units in the region.

e. Structure of the Report

The report includes seven main chapters. Chapters 1 and 2 relate to global results on ICT indicators in households and businesses. Chapters 3 to 7 correspond to the regional reports from Africa, Central Asia and Central and Eastern European, Western Asia, Asia-Pacific and Latin America and the Caribbean. A final concluding note provides some lessons learned from the exercise, and makes suggestions on further methodological work for collecting ICT statistics.

Inside each regional chapter, four main sections are presented:

1. Notes on the Regional Data Collection

This section describes the coverage of the stocktaking exercise in the region, according to the regional reports and registries in the databases. The methodology used for assessing coverage is described above, weighted by country population and share of GDP to obtain an index for the availability of ICT indicators in households and businesses respectively.

2. Institutional Environment for ICT Indicators in theRegion

This section first describes the existing demand for ICT indicators at the national and regional levels, based on the assessments reported by the respondents to the questionnaires.

The results for existing demand should be interpreted with caution due to their high degree of subjectivity. Not all Statistical Offices in developing countries have established formal mechanisms for consulting with users, and in many cases, the existing mechanisms established by the Law (such as National Statistical Commissions) include only government representatives (and not civil society or the business community) or, are not functional.

The demand has been analysed according to digital access level, in order to assess whether there is evidence of a correlation between high access and demand for indicators. Theoretically, the existence of national ICT policies should provide the basis for a high demand for indicators. It is then logical to conclude that a high digital access level is related to the existence of an ICT national policy and therefore with a high demand.

The second section describes the types of institutions responsible for statistical operations providing ICT indicators. NSOs, relevant Ministries (Communications, Education, Science and Technology, etc.), other national authorities (Regulatory bodies, Interministerial Commissions) and private organisations (Universities, Research institutes and professional associations) may be sources of data and information.

As well, this section reports on the existence of resources for the production of ICT indicators, namely, financial resources and inter-institutional collaboration. The analysis has been carried out in relation to demand level, in order to assess the linkages between adequate resources and real needs.

The use of a formal definition for ICT, which may be understood as a *proxy* for the interest in producing statistical indicators, is also analysed in this section. The lack of precision in the questionnaire about the use of 'some sort of ICT definition' did not allow further assessments on the international comparability of the concepts.

Finally, a list of surveys indicating the number of ICT-related variables and dates for the last data collection operations are given for both the household and on business sectors.

3. ICT in Households

This section goes into further detail on ICT indicators for access and use in households. The different topics investigated relate to methodological characteristics such as the sources of information, survey vehicles used to collect ICT household data; the dissemination of data, the availability of a concrete set of 20 indicators and the social classifications that can be used to get disaggregated ICT statistics.

The analysis of disaggregation classifications available, very much related to the purpose and design of the surveys that provide the data on which ICT indicators are built, takes into account the answers to the questionnaire, but is complemented – whenever possible - by information from the methodology used when the surveys correspond to international programmes (such as the *Living Standards Measurement Survey*).

Detailed tables describing which ICT household indicators are currently available and planned for the

next year and for the next three years are given in tables A3 to A8bis. The number corresponds to the chapter. Tables A8 and A8bis refer to OECD countries. Tables linking the type of statistical operation to the indicator collected in each country are included as well (tables B3 to B7).

4. ICT in Business

This section analyses the use of different types of business surveys and other statistical sources for compiling ICT indicators in the business sector.

Second, it describes the availability of indicators in each region, both in terms of number of countries collecting them and of the share of regional GDP that these countries represent. This ratio can be used as a *proxy* for the importance of the national business sector in the region.

Also, the section includes an analysis of the possibility of disaggregating ICT indicators, based on the classification variables that are used as breakdowns in the surveys providing the indicators. Since no detailed information is provided about sample size, sample design and classifications used (for sector, for size intervals, etc.), it is not possible, at this stage, to evaluate the possibility of harmonising indicator breakdowns.

Detailed tables describing which business ICT indicators are currently available, planned for the next year and planned for the next three years are given in tables C3 to C8bis. The number corresponds to the chapter. Tables C8 and C8bis refer to OECD countries. Tables linking the type of statistical operation to the indicator collected in each country are included as well (tables D3 to D7).

5. ICT indicators in other fields

Finally, selected statistical sources on the access and usage of ICT in other sectors (government, education, health, etc.) and on other topics (production of ICT, analysis of the ICT sector, etc.) are listed. Such information is limited however therefore further research may be required to fill this gap.

Chapter 1. ICT Household Indicators

This chapter synthesises the status of ICT household indicators in the regions covered by the stocktaking exercise with a specific focus on the list of 20 indicators proposed in the metadata questionnaire (Table 1.1). It also includes additional information about the availability of ICT indicators in OECD countries.

No formal definition is given for any of the 20 indicators proposed. Therefore, it is not possible, at this stage, to provide an analysis of data over time or, even compare the data on an international scale.

This chapter is structured as follows. The first section provides an analysis of the demand for ICT household indicators within each region – Africa, Central Asia and Central and European Countries, Western Asia, Asia-Pacific and Latin America and the Caribbean.

Table 1.1. Indicators on ICT in households included in the questionnaire

1) Presence of electricity in household
2) Presence of radio in household
3) Presence of fixed telephone line in household
4) Presence of mobile phone in household
5) Presence of TV in household
6) Presence of a computer in household
7) Presence of Internet access in household
8) Methods of access/bandwidth for Internet use in household
9) Location of the most frequent use of Internet
10) Frequency of Internet use
11) Purpose of PC use
12) Purpose of Internet use
13) Concrete services/activities for which the Internet is used
14) Languages of Internet sites visited
15) Types of products/services purchased over the Internet
16) Value of goods/services purchased over the Internet
17) Barriers to PC usage
18) Barriers to Internet usage
19) Barriers to purchases over the Internet
20) Geographic location where the Internet goods are purchased

Second, an analysis of the availability of the proposed indicators is presented, based upon the results of the stocktaking exercise. This section concludes by sorting each of the 20 indicators according to their availability.

The third section reviews the different methods used for collecting the indicators — including the statistical instruments employed for gathering individual data from households — and the respective institutions collecting the data.

Finally, areas for further development of ICT household indicators are identified, based upon the preceding analysis.

Section 1.1 Demand for household ICT indicators

Overall, the demand (as perceived by the NSOs) for household ICT indicators is medium to very high (Table 1.2). The Asian-Pacific demand was assessed as very high.(Graph 1.1).

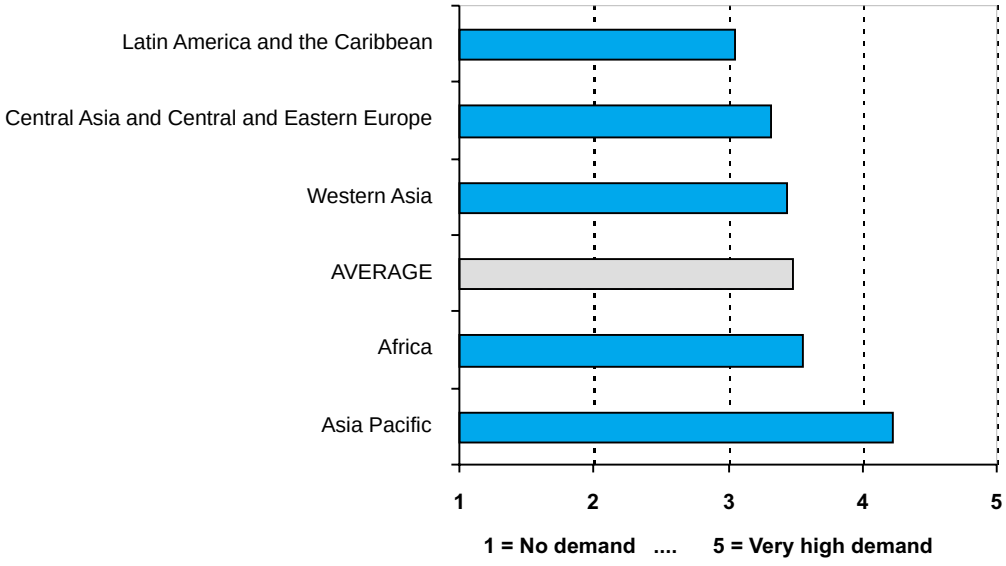
According to income groups, there is no clear relationship between level of income and level of demand (Graph 1.2).

There is no clear relationship between level of income and level of demand (Graph 1.2). However, within each region the level of demand for indicators is correlated with income level. There are exceptions however. For example some LDCs in Africa perceive a high demand whereas developed countries such as Liechtenstein have assessed a lower demand.

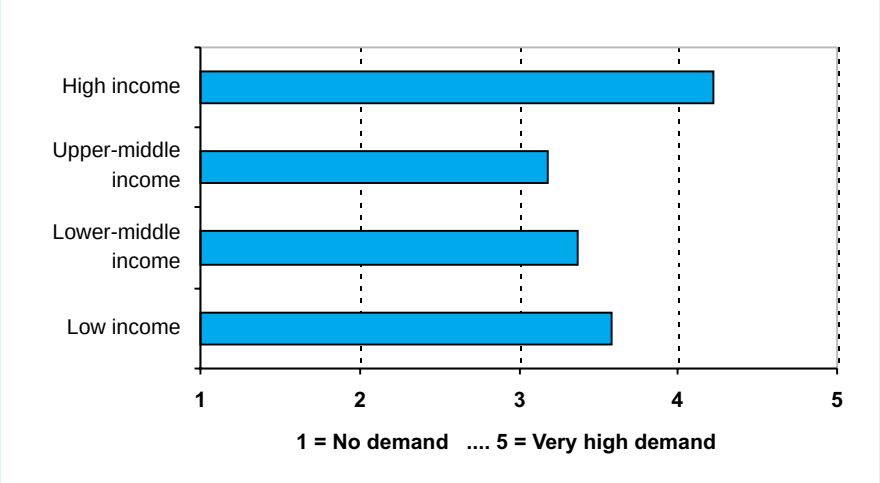
Similarly, the demand for household ICT indicators is not correlated to the digital access level (as measured by the Digital Access Index) (Graph 1.3). On the other hand, demand for these indicators has increased where national ICT policies and regional networks of policy-makers and information producers exist. For example, the African Information Society Initiative (AISI) and the SCAN-ICT initiative (see chapter 3), and the different sectoral observatories in Latin America (such as RICYT, CAIBI and OSILAC, see chapter 7) have increased demand in their corresponding regions. All respondent countries with widespread digital access have also reported a very high demand for household ICT indicators.

Since the general demand for household indicators was assessed at the country level, it is not possible,

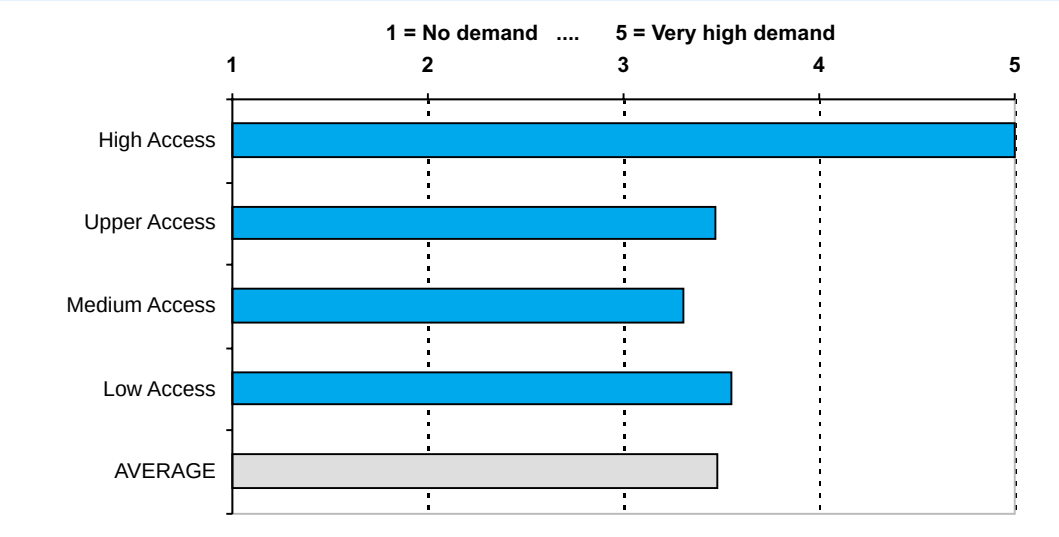
Graph 1.1. Level of demand for household ICT indicators by region



Graph 1.2. Level of demand for household ICT indicators by income level



Graph 1.3. Level of demand for household ICT indicators by digital access level



at this stage, to evaluate separately the demand for each individual indicator.

In general, the perception of a high level of demand accelerates NSOs implementation of statistical operations to collect ICT indicators in the household sector. Still, some have not yet satisfied the demand, and the opposite is also true. For example, in certain countries, such as Palestine and Lebanon where demand is perceived to be low, both have a wide availability of ICT household indicators.

Table 1.2. Demand for household ICT indicators

Region	*Demand Level*				
	Very High	*High*	*Medium*	*Low*	*No Demand*
Africa	Benin Tunisia	Central African Republic Kenya Lesotho Madagascar Mauritius Morocco Tanzania Zambia	Ethiopia Gambia Niger Rwanda Senegal Sierra Leone	Gabon Zimbabwe	Democratic Republic of Congo
Central Asia and Central and European Countries	Andorra Israel Turkey	Georgia Bulgaria Kazakhstan Ukraine Russian Federation	Kyrgyzstan Rep. Moldova Romania Azerbaijan Croatia	Liechtenstein Armenia	Belarus Bosnia and Herzegovina
Western Asia	Jordan	Syrian Arab Rep. Egypt Kuwait Oman	Palestine Qatar	Saudi Arabia Lebanon	
Asia-Pacific	Hong Kong, SAR China Mongolia New Caledonia Singapore Sri Lanka Thailand	Cambodia India Macao, SAR China Malaysia Vanuatu	Indonesia	Micronesia Niue	Pakistan
Latin America and the Caribbean	El Salvador	Chile Mexico Trinidad and Tobago Peru Saint Vincent and the Grenadines Venezuela	Bolivia Colombia Costa Rica Brazil Barbados Jamaica Uruguay	Saint Kitts and Nevis Dominican Rep. Paraguay	Belize Ecuador

Note: 79 countries reported on the level of demand for household ICT indicators.

Section 1.2 Availability of household ICT indicators

The availability of indicators on ICT equipment and usage in households differs across regions. Nonetheless, patterns exist that allow for the classification of indicators into 'clusters'. However, the availability in OECD countries follows a different pattern.

The results of a cluster analysis[1] based upon the proportion of countries (where the denominator is the total number of responding countries) that collect each indicator, as compared to the percentage that these countries represent in terms of the total population of the responding countries, for each region, favours the classification of the 20 household indicators into 5 clusters.

Cluster 1: Indicators with very high availability

This group of indicators includes basic ICT equipment (electricity and fixed telephone line are prerequisites for Internet use – except in the case of mobile networks). They are available in about 90% of the respondent countries, covering also about 90% of the total population within each region[2]:

- *presence of electricity*
- *presence of fixed telephone line*
- *presence of TV*

In OECD countries, these indicators are not collected through ICT surveys, but rather from other statistical sources such as population and housing censuses and household budget and living conditions surveys.

The international compilation of these indicators is justified by the high number of countries collecting them and the relative ease with which they can be collected. They pertain to the household unit.

Cluster 2: Indicators with high availability

This group of indicators pertains to more advanced ICT equipment for communication, including radio. They are available in about 75% of respondent countries, which accounts for approximately 80% of the population within each region:

- *presence of mobile telephone*
- *presence of a personal computer*
- *presence of radio*

The international compilation of these indicators is facilitated by the high level of countries collecting them. Mobile telephones are more often associated to individuals and/or households in many countries. The measurement of these variables is not difficult using the usual statistical instruments and commonly accepted definitions.

Africa lags behind other regions in terms of the availability of these three indicators.

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[1] Cluster analysis is a multivariate statistical technique that classifies objects (in this case indicators) based on a measure of the distance between them (here, based on the availability measures). The availability measures in OECD countries were not included in the multivariate analysis, given the different patterns observed.

[2] The measure of availability is based on weights attributed to the percentage of the population covered within each country. The numerator is the total population of respondent countries collecting the indicator, and the denominator is the total population of respondent countries. It was calculated for each region.

Cluster 3: Indicators with medium availability .

This group includes only one indicator that is collected on average[3] by 59% of countries and 48% of the regions.

- *presence of Internet access*

Less than 60% of the respondent countries collect this indicator.
Africa and Central Asia lag behind other regions collecting this indicator. As this indicator is not available in India and, no information about China is provided in the metadata questionnaire, the coverage weighted by population within each region is lowest in Asia-Pacific.

Cluster 4: Indicators with low availability .

This group includes indicators on the use of PCs, type of Internet access (method and location) and, use of the Internet. They are collected by approximately 20% of countries, covering roughly the same proportion of the population within each region.

- *Methods of access/bandwidth for Internet use in household*
- *Location of the most frequent use of Internet*
- *Frequency of Internet use*
- *Purpose of PC use*
- *Purpose of Internet use*
- *Concrete services / activities for which the Internet is used*

These indicators require clear definitions. Their international comparability can be difficult to assess since this would require an analysis of the various response categories for each question. Before a comparison of these indicators at the international level can be undertaken,, a technical analysis of definitions and collection methods should be completed. The Partnership is currently working on this task and will publish a relevant guide for the WSIS Tunis (November 2005).

Cluster 5: Indicators with very low availability .

This group includes the remaining indicators, which are collected by 10% or fewer countries and by a similar proportion of the population within each region. They include B2C e-commerce and barriers to ICT usage.

- *Languages of Internet sites visited*
- *Types of products/ services purchased over the Internet*
- *Value of goods/ services purchased over the Internet*

Table 1.3. Countries that have collected 10 or more ICT indicators (household) [4]

Region	*Countries*
Africa	Kenya, Madagascar Mauritius, Rwanda
Central Asia and Central and Eastern European Countries	Andorra, Bulgaria, Israel, Turkey
Western Asia	Jordan, Lebanon, Palestine
Latin America and the Caribbean	Barbados, Belize, Chile, Colombia, Costa Rica, Mexico, Trinidad and Tobago
OECD	Australia, Austria, Czech Republic, Denmark, Finland, Germany, Greece, Hungary, Iceland, Ireland, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Switzerland, United Kingdom, United States

[3] Simple averages do not take into account the number of countries nor the population within each region.

[4] Obviously, countries may have many other ICT-related variables collected through their household surveys or other statistical operations, besides the 20 proposed in the metadata questionnaire.

- *Barriers to PC usage*
- *Barriers to Internet usage*
- *Barriers to purchases over the Internet*
- *Geographic location where the Internet goods are purchased*

Currently, the compilation of these indicators at the international level is limited due to their very low availability within each country. The feasibility of collecting them in the near future has to be assessed while bearing in mind that, according to the questionnaire, many countries plan to collect these indicators in the next three years. Before completing an assessment of the feasibility of collecting these indicators, additional issues need to be addressed such as comparable definitions (such as those pertaining to barriers), classification of products and services and, other technical issues have to be agreed upon.

The following countries have collected more than half of the 20 indicators proposed in the questionnaire:

Table 1.4. Proportion of countries collecting household ICT indicators

	Indicators	*Africa*	*Latin America and Caribbean*	*Asia-Pacific*	*West Asia*	*Central Asia and CEE countries*	*OECD*
Basic access to ICT	1) Presence of electricity in household	89	95	94	90	84	4
	2) Presence of radio in household	84	80	67	80	68	4
	3) Presence of fixed telephone line in household	74	100	83	90	84	21
	4) Presence of mobile phone in household	53	95	78	70	68	79
	5) Presence of TV in household	74	100	78	80	79	82
	6) Presence of a computer in household	47	100	83	80	74	89
	7) Presence of Internet access in household	31	100	61	60	42	89
Internet access	8) Methods of access/bandwidth for Internet use in household	21	30	33	10	21	86
	9) Location of the most frequent use of Internet	21	40	33	0	16	79
	10) Frequency of Internet use	26	35	33	20	21	82
ICT usage	11) Purpose of PC use	26	25	33	30	26	21
	12) Purpose of Internet use	21	25	33	30	32	75
	13) Concrete services/activities for which the Internet is used	10	25	17	20	21	79
	14) Languages of Internet sites visited	5	0	6	0	0	0
	15) Types of products/services purchased over the Internet	5	20	17	0	16	71
	16) Value of goods/services purchased over the Internet	0	15	17	0	16	43
Barriers to usage	17) Barriers to PC usage	16	10	6	10	11	0
	18) Barriers to Internet usage	10	15	17	10	5	57
	19) Barriers to purchases over the Internet	0	15	11	0	16	57
	20) Geographic location where the Internet goods are purchased	0	10	6	0	5	0

Note: For OECD countries, the availability of indicators on *basic access to ICT* refers to their collection from specific ICT surveys, and not from other statistical sources.

Table 1.5. Coverage (% of population with each region) of collected household ICT indicators

	Indicators	*Africa*	*Latin America and Caribbe-an*	*Asia-Pacific*	*West Asia*	*Central Asia and CEE countries*	*OECD*
Basic access to ICT	1) Presence of electricity in household	79	92	100	86	86	1
	2) Presence of radio in household	78	81	95	71	94	1
	3) Presence of fixed telephone line in household	81	100	96	86	86	52
	4) Presence of mobile phone in household	53	99	96	70	78	83
	5) Presence of TV in household	74	100	91	85	91	89
	6) Presence of a computer in household	45	100	83	85	96	97
	7) Presence of Internet access in household	28	100	12	70	33	97
Internet access	8) Methods of access/bandwidth for Internet use in household	27	26	10	2	27	91
	9) Location of the most frequent use of Internet	22	41	14	0	21	80
	10) Frequency of Internet use	28	35	14	6	22	89
ICT usage	11) Purpose of PC use	22	34	6	9	11	39
	12) Purpose of Internet use	17	34	6	9	30	82
	13) Concrete services/activities for which the Internet is used	18	34	4	5	23	83
	14) Languages of Internet sites visited	3	0	0	0	0	0
	15) Types of products/services purchased over the Internet	3	31	4	0	23	52
	16) Value of goods/services purchased over the Internet	0	22	4	0	23	37
Barriers to usage	17) Barriers to PC usage	9	22	1	2	2	0
	18) Barriers to Internet usage	9	22	9	2	0	66
	19) Barriers to purchases over the Internet	0	22	1	0	21	48
	20) Geographic location where the Internet goods are purchased	0	22	0	0	2	0

Note: For OECD countries, the availability of indicators on basic access to ICT refers to their collection from specific ICT surveys, and not from other statistical sources.

The availability of household ICT indicators is correlated with the level of digital access, as measured by the Digital Access Index. In Africa, for instance, countries with widespread access have collected on average as many as 15 of the 20 indicators, while those with lesser digital access have collected, on average, only 6,6.

Detailed information about the availability of each indicator within each region using both simple and weighted percentages of respondent countries are given in Tables 1.4 and 1.5. Tables A3, A4, A5, A6, A7, A8 and A8bis of the Annex summarise the results of the stocktaking exercise by country.

Section 1.3 Statistical sources for the collection of household ICT indicators

Countries collect ICT household indicators in a variety of ways. Each approach has certain advantages and drawbacks.

The various sources of data that have been mentioned in the stocktaking exercise include administrative sources, population and housing censuses, household surveys that include some ICT-related questions and finally, ad hoc ICT household surveys.

It is important to note that data from Household surveys and censuses provide information at the household level and also at the household member level. This is the case with population censuses and household surveys, where different modules for the entire household (related to non-individual characteristics such as housing materials, presence of durables, etc.) and the persons in the household, are included in the questionnaire.

Administrative sources

Administrative sources are used to collect indicators on *basic access to ICT* (in general with the exception of indicators on *presence of a computer* and of *Internet access in the household*).

These types of sources include client subscription lists maintained by service providers and regulatory authorities. Electricity suppliers, telephone (fixed and mobile) companies, Internet service providers and cable TV companies keep records of their subscribers, which can either represent a household (as is the case of fixed telephone) or an individual (the case of mobile telephone), for billing and marketing purposes.

The recent increase in the number of regulatory authorities operating within the telecommunications sectors in many countries has provided a very efficient source of data. This source of information was previously difficult to obtain given the limited number of providers for some services (especially in least developed countries), or even the partial control by the Government of the telecommunications sector. NSO and other financial institutions can now obtain statistics more cheaply and efficiently from these regulators.

The main drawback of this source of data is the difficulty in correlating the presence and usage of equipment with the socio-economic profile of the individual subscriber, since this information is not generally collected. Therefore, per capita indicators derived from administrative data may not permit an analysis of ICT access across different groups of the population, or take into account the demographic composition of the country. Also if the administrative definitions are not harmonised. on an international level, it is difficult to compare administrative sources of data between countries.

Moreover, the access and use of ICT in public places (such as cybercafés, telephone booths, TV or radio in small rural villages, etc.) is not covered by administrative sources.

Population and housing censuses

Population and housing censuses are large-scale statistical operations that aim to collect detailed information from every person in the country. These censuses are carried out by the National Statistical Offices with a low periodicity due to their high cost and logistic complexity (UN recommends to carry out a population and housing census every 10 years). In this sense, while census results are very useful for policy-making in that they provide in-depth information, they are not well suited to monitor (as the only tool) the rapidly changing Information Society. Censuses cover not only persons living in households, but also in public institutions (student residences, prisons, hospitals, etc.).

Population and housing censuses investigate primarily the basic demographic characteristics of the population (age, sex, education, composition of households, etc.), and the characteristics of the house (materials, equipment, utilities, etc.). A list of topics has been proposed by the UN Recommendations on Population and Housing Censuses, which are adhered to by a large number of countries. Standard definitions are also provided.

An advantage of population censuses is their comprehensiveness, which allows for cross-tabulating the values of any indicator through any combination or classification of variables (including geographic location and socio-economic characteristics) without loosing accuracy.

A census is limited in its ability to investigate in detail the ICT equipment and usage in households. Only basic variables, pertaining to the *basic access to ICT* are included. Less than 10 ICT-related variables are generally included in this type of statistical operation.

Many countries have used population censuses to collect at least one ICT indicator (except for the Central Asian and Central and Eastern European region), including highly populated countries such as India, Brazil and Mexico.

Given that the next round of censuses is foreseen in 2010, the use of population and housing censuses to monitor ICT will probably be confined to the investigation of basic equipment in households (such as *presence of electricity, presence of radio, presence of fixed telephone line, presence of mobile telephone, presence of a computer* and *presence of Internet access*).

Non ICT-specific household surveys

A large number of countries collect some ICT indicators through variables included in the questionnaires of household surveys that address primarily non-ICT issues. The most frequent type of household survey used as a vehicle for ICT-related questions is the *household budget survey*.

Household budget surveys (HBS) are designed to measure consumption, expenditure and income of households. They form the basis for calculating a basket of goods and services used to follow the evolution of prices and measure inflation through the Consumer Price Index. They are carried out in the majority of countries (with unequal periodicity).

HBS are also the basis for poverty analysis, since they provide a measure of *poverty lines* (for example, defined as a percentage of the median expenditure). They include, in this case. questions to evaluate the endowment of households in durable goods and utilities and therefore, are a valid instrument to collect indicators on *basic access to ICT*. HBS questionnaires combine modules addressed to the household and modules addressed to its members and, hence, can be used to investigate personal ownership and use (such as *use of PC* or *of Internet*).

Other types of household surveys that have been used as a vehicle for ICT-related questions are *Labour Force surveys* or *Living Conditions* surveys, which may include modules on health, education, personal security and similar topics.

One advantage compared to population and housing censuses is the cost of household surveys, which is much lower due to the fact that only a sample of the population is selected.

At the same time, they allow for more specific questions. Given that an HBS is addressed to analyse the socio-economic conditions of households, ICT indicators collected via this kind of operation can be broken down and cross-tabulated by demographic and socio-economic classification variables (basically, age, gender, education and relation to the economic activity), thus allowing for an analysis of the digital divide.

The existence of international experiences in harmonising and improving household surveys is an incentive for NSOs, with little experience in this field, to use them. MECOVI (Programme for Improving the Household Living Conditions Surveys) in Latin America, and the World Bank initiative to establish a worldwide network of household surveys[5], are examples of international initiatives for increasing the use of household surveys.

The use of household surveys to collect indicators other than *basic access to ICT* is increasing. Indicators on *Internet access* and *ICT usage* have been mostly collected through this kind of household surveys.

[5] See www.internationalsurveynetwork.org/home.

The quality of statistical data collected through household surveys depends on several factors, which include:

- the accuracy and the possibility of disaggregation depending on the sample size and the survey design (stratification);
- the availability of up-to-date sampling frames (listing of *primary sampling units*, usually geographical groupings of households) to select the households to be interviewed and to estimate properly the weighting factors to extrapolate the results;
- the adequacy of training for interviewers, in order to be able to satisfy the needs of interviewed persons (short time, explanations for the definitions, etc.).

The inclusion of specific ICT modules or questions in household surveys, designed for other purposes, lengthens the questionnaire, which may entail a decrease in the quality of response. This drawback is compensated by the low-cost of collecting ICT indicators. The existence, at the national and international levels, of a community of users of household surveys is another advantage for the dissemination of ICT statistics and the better use of their results.

ICT-specific household surveys

A small number of countries have implemented specific household surveys to investigate the access to and use of ICTs. The diverse group of countries includes small states such as Andorra, Barbados, Trinidad and Tobago and very large countries such as Mexico, fast growing economies such as Chile, Bulgaria, Romania, Thailand, Tunisia, Hong Kong SAR, Macao SAR, and Singapore and lower-middle and low income countries such as Kazakhstan, Palestine, Kenya and Madagascar.

In most of these countries, demand for household ICT indicators was perceived as high or very high. No obvious correlation with the level of digital access is observed.

Indicators collected by specific ICT household surveys include many of those included in the categories *basic access to ICT, ICT usage* and *barriers to usage*. Indeed, in countries where the indicators grouped under these categories have been collected, it is generally through a specific ICT survey.

ICT household surveys are more complex than usual household surveys in several aspects:

- Their aim is to investigate a phenomenon that is still in its initial phase in many developing countries and therefore the number of households providing useful information is small. Disaggregations may be subject to a large sampling error.
- ICT-related concepts included in the questionnaire may not be familiar to interviewed households and even to interviewers.
- Several concepts are elusive even for trained persons. For instance, the definition of *activities for which the Internet is used* has been the subject of many discussions in technical working groups.

Detailed information at the country level about the type of statistical operation used to collect each one of the 20 indicators is given in Tables B3, B4, B5, B6 and B7 of the Annex.

Section 1.4 Issues for further work on household ICT indicators

An analysis of the results of the stocktaking exercise raised several issues for further work on ICT indicators for the household sector that had already been considered by the Partnership:

- The selection of a core list of indicators has to take into account the different level of specificity of ICT indicators and their relevance for the national and international users. In general, the more specific an indicator is, the lower number of countries that collect it.
- The international comparability would benefit from the establishment of clear and harmonised definitions for each one of the household ICT indicators. In that sense, the Partnership is currently working on the establishment of technical definitions for the indicators.
- Best practices should be identified for the implementation of ICT specific surveys and modules on ICT to be included in other household surveys. This may include technical issues such as sample design, wording of questions and data treatment.

Chapter 2. ICT Indicators in the Business Sector

This chapter provides a synthesis on the status of ICT business indicators in the regions covered by the stocktaking exercise with a specific focus on the 20 indicators proposed in the metadata questionnaire (Table 2.1). Information on the availability of these indicators in OECD countries is also included. A more in-depth analysis at the regional level is provided in the following chapters.

No formal definitions for the 20 proposed business indicators were provided. Therefore, it is not possible, at this stage, to provide an analysis of the collection of these indicators over time or, even compare data between countries.

This chapter comprises four sections. The first one summarises the level of demand for ICT business

Table 2.1. ICT Business Indicators included in the questionnaire

1) Presence of electricity in household
2) Presence of mobile devices
3) Presence of computer (PC, Mac, laptop)
4) Number of computers (PC, Mac, laptop)
5) Presence of Internet access
6) Methods of access/bandwidth used for Internet access
7) Presence of local network
8) Presence of web site
9) Recent ICT investments
10) Share of the total number of employees using a PC in their normal work routine
11) Share of the total number of employees using PC connected to the Internet during normal work routine
12) Concrete services/activities for which the Internet is used
13) Value of Internet purchases
14) Value of Internet sales
15) Customer groups/destination of Internet sales
16) Training/formation in ICT use for employees concerning ICT usage
17) Barriers to PC use
18) Barriers to Internet use
19) Barriers to e-commerce
20) Geographic location where Internet goods are sold (domestic, foreign, etc)

indicators as perceived by the National Statistical Offices (NSOs) participating in the stocktaking exercise.

The second section presents an overview of the availability of the 20 proposed ICT business indicators. Secondly, these indicators are then sorted into three categories according to the number of countries collecting them as well as to the proportion of regional GDP corresponding to countries collecting the respective indicators.

The third section reviews the different statistical instruments used for collecting the data and the respective institutions undertaking the collection. As for households, there is a rich variety of potential sources for statistical information about ICT in the business sector.

Finally, areas for further development of ICT business indicators are suggested.

Section 2.1 Demand for ICT Business Indicators

The demand (as perceived by the NSOs) for ICT business indicators is medium to very high (Table 2.2).

Since the demand for ICT business indicators was assessed by country only, it is not possible, at this stage, to evaluate the demand for each individual indicator separately.

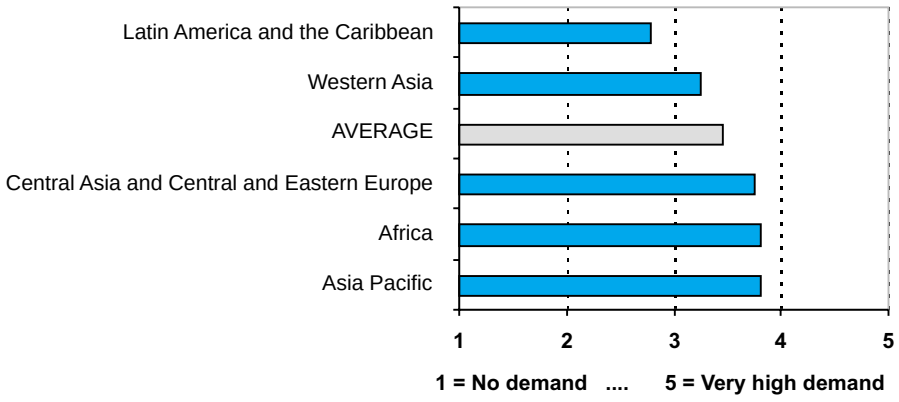
The level of demand for ICT business indicators in Latin America and the Caribbean and Western Asia is below the world average (Graph 2.1). No countries in Western Asia and only one in Latin America perceive demand to be very high.

Table 2.2. Demand for ICT Business Indicators

	Demand Level				
Region	*Very High*	*High*	*Medium*	*Low*	*No Demand*
Africa	Benin Tunisia	Lesotho Madagascar Morocco Senegal	Rwanda Sierra Leone	Zimbabwe	
Central Asia and Central and European Countries	Ukraine Israel Turkey	Armenia Bulgaria Kazakhstan Andorra	Kyrgyzstan Rep. Moldova Romania Georgia	Liechtenstein	
Western Asia		Saudi Arabia Egypt Kuwait Oman	Qatar Syrian Arab Rep. Jordan		Palestine
Asia-Pacific	Hong Kong SAR Mongolia Singapore Thailand	India Macao SAR Malaysia Vanuatu	Indonesia	New Caledonia	Philippines
Latin America and the Caribbean	El Salvador	Brazil Chile Mexico Trinidad and Tobago	Bolivia Colombia Costa Rica	Dominican Rep. Paraguay Uruguay	Belize Ecuador Saint Kitts and Nevis

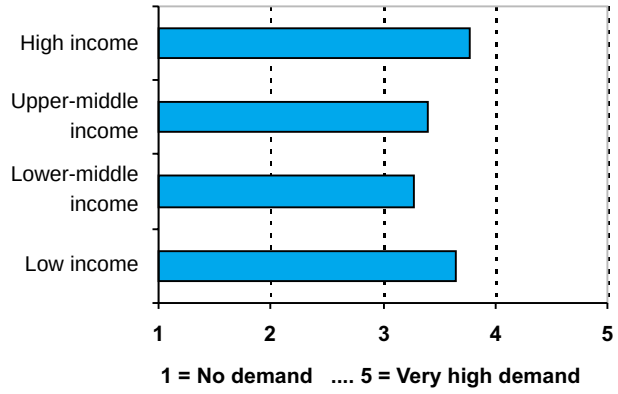
Note: 54 countries reported their level of demand for ICT business indicators.

Graph 2.1. Level of demand for ICT business indicators by region



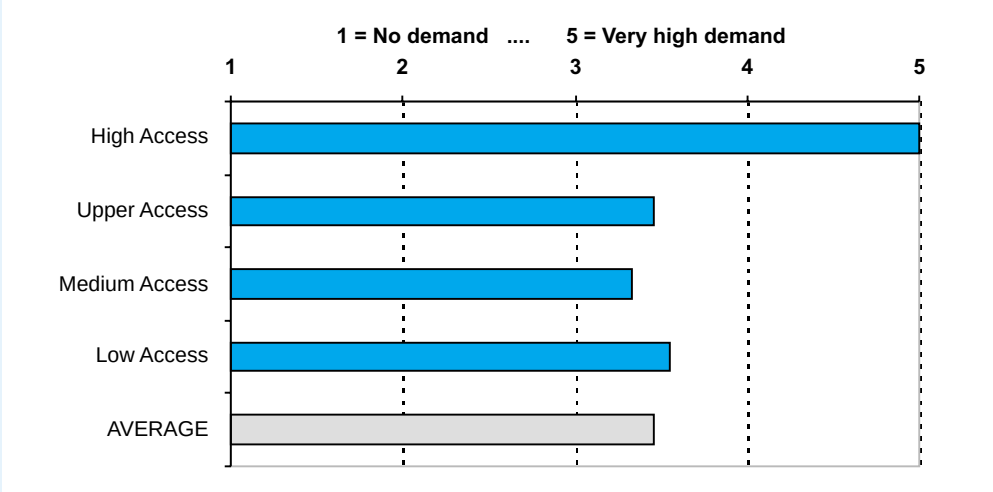
Within each region, demand for business indicators increases with the respective country's income level, however this correlation is not observed at the global level (Graph 2.2).

Graph 2.2. Demand for ICT Business Indicators by Income Level



The demand for ICT business indicators is not correlated with the digital access level (as measured by the Digital Access Index). However, it is observed that countries with widespread digital access report a very high demand for ICT business indicators (Graph 2.3).

Graph 2.3. Demand for ICT Business Indicators by Digital Access Level



Section 2.2 Availability of ICT Business Indicators

The availability of indicators to investigate access to and usage of ICT in business differs across regions. Although it is less clear than for household indicators, some patterns exist that permit the classification of ICT business indicators into similar 'clusters'. Two sets of availability measures are used for any one of the 20 indicators which are: the proportion of countries collecting the indicator within each of the five regions, and the percentage of regional GDP that these countries represent. The latter is a *proxy* for the economic importance of each national business sector within the regional economy.

The following section presents the results of an analysis of the proportion of countries (where the denominator is the total number of responding countries) collecting each indicator within their respective region, as well as what proportion of GDP each country accounts for with respect to the total GDP of responding countries. Together with the average (simple mean) of the percentage of countries and the percentage of GDP covered in each region, the analysis suggests a final grouping into 3 clusters.

Cluster 1: Indicators with medium-high availability

This group of indicators relates to *basic ICT access* for business and includes

- *presence of fixed telephone*
- *presence of mobile devices*
- *presence of Internet access*
- *presence of computers*
- *presence of a website*

The percentage (simple average of regional percentages) of respondent countries that collect these indicators is 31% (*presence of a website)* and 46% (*presence of fixed* telephone). They cover economies accounting for 53% to 74% of the GDP in each region.[1]

The indicator

- *number of computers*

closely related, is less available in Latin America and Western Asia. An effort to compile the indicator in both regions could enhance its global availability.

ICT surveys in OECD countries do not collect usually the indicators *presence of fixed line telephone, presence of mobile devices, number of computers.*

The international compilation of these indicators could reasonably cover half of the total number of respondent countries and about three quarters of the non-OECD economy.

Cluster 2: Indicators with medium-low availability

This group of indicators is collected by 15% to 24% of respondent countries, and accounts for about one-third of each regional economy. It includes indicators related to *advanced access to ICT* and the use of Internet:

- *type of Internet connection*
- *presence of local network*
- *value of ICT investments*

[1] Only respondent countries are considered in calculating the total GDP and the proportion each country represents.

- *services Internet is used for*
- *value of Internet sales.*

Western Asian countries lag behind in the collection of this group of indicators: some of they aren't collected in any country of the region. The collection of these indicators in OECD countries reaches very high percentages of respondent countries, except for *value of ICT investments.*

Cluster 3: Indicators with low availability .

The following indicators are collected by less than 15% of the countries in each region considered in the study:

- *share of employees using a computer*
- *share of employees using the Internet*
- *value of Internet purchases*
- *Customer groups/ destination of Internet sales*
- *Training/formation in ICT use for employees concerning ICT usage*
- *Barriers to computer use*
- *Barriers to Internet use*
- *Barriers to e-commerce*
- *Geographic location of sales*

Except for *barriers to computer use* and *barriers to Internet use*, the availability of these indicators in OECD countries is much higher (between 64% and 89% of respondent countries).

The following countries have collected more than half of the 20 indicators proposed in the questionnaire:

Table 2.3. Countries with 10 or more collected ICT business indicators

Region	*Countries*
Africa	Mauritius, Morocco, Rwanda, Tanzania
Central Asia and Central and Eastern European Countries	Bulgaria, Kyrgyzstan, Romania, Russian Federation
Western Asia	-
Asia-Pacific	Hong Kong SAR, Macao SAR, Philippines, Singapore, Thailand
Latin America and the Caribbean	Chile, Colombia, Trinidad and Tobago
OECD	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Norway, Poland, Portugal, Spain, Switzerland, United Kingdom

Countries may collect many other ICT-related variables in their business surveys or other statistical operations, in addition to the 20 proposed in the metadata questionnaire. Plans for collecting ICT business indicators in the next three years are important in Western Asia and, Latin America and the Caribbean.

As for household indicators, the availability of ICT business indicators is correlated with the level of digital access as measured by the Digital Access Index. Countries with high and upper digital access level have collected a larger number of indicators (in Asia-Pacific, as much as three times) than countries with low access.

Detailed information about the availability of each indicator by region using both availability measures (percentage of collecting countries out of total respondent countries and corresponding percentage of GDP) are given in Tables 2.4 and 2.5. At the country level, Tables C3, C4, C5, C6, C7, C8 and C8bis of the Annex summarise the results of the stocktaking exercise.

Table 2.4. Proportion of countries collecting ICT business indicators

	Indicators	*Africa*	*Latin America and Caribbean*	*Asia-Pacific*	*Western Asia*	*Central Asia and CEE countries*	*OECD*
Basic access to ICT	1) Fixed telephone	47	40	56	40	53	4
	2) Mobile devices	26	40	56	10	58	11
	3) Presence of computers	32	35	39	20	32	89
	4) Number of computers	32	20	33	10	32	4
	5) Presence of Internet access	32	55	56	10	58	89
Advanced ICT access and usage	6) Type of Internet access	26	25	33	0	32	86
	7) Local network	21	25	22	0	26	82
	8) Website	37	50	33	0	26	89
	9) ICT investment	21	15	28	0	32	21
	10) Share of employees using a computer	16	15	22	0	37	79
	11) Share of employees using the Internet	16	10	17	0	26	79
Internet activities and e-commerce	12) Services for which the Internet is used	11	20	28	10	21	89
	13) Value of purchases	16	15	6	0	16	61
	14) Value of sales	26	25	6	0	16	86
	15) Customer group	11	10	6	0	11	71
ICT training	16) ICT training	21	20	6	0	5	64
Barriers to usage	17) Barriers to computer use	21	10	28	0	11	0
	18) Barriers to Internet use	16	5	22	0	16	4
	19) Barriers to e-commerce	11	10	11	0	11	75
Geographic location of sales	20) Geographic location of sales	5	0	6	0	16	64

Table 2.5. Coverage (% of total regional GDP of responding countries) of collected business ICT indicators

	Indicators	*Africa*	*Latin America and Caribbe-an*	*Asia-Pacific*	*Western Asia*	*Central Asia and CEE countries*	*OECD*
Basic access to ICT	1) Fixed telephone	58	12	60	39	59	2
	2) Mobile devices	43	18	71	22	59	6
	3) Presence of computers	43	50	66	27	54	62
	4) Number of computers	43	10	66	22	54	2
	5) Presence of Internet access	44	86	83	22	60	62
Advanced ICT access and usage	6) Type of Internet access	40	10	39	0	13	47
	7) Local network	12	55	24	0	13	57
	8) Website	59	85	43	0	49	62
	9) ICT investment	21	40	35	0	55	47
	10) Share of employees using a computer	31	6	20	0	54	43
	11) Share of employees using the Internet	11	6	20	0	49	43
Internet activities and e-commerce	12) Services the Internet is used for	7	40	31	5	49	62
	13) Value of purchases	51	10	5	0	49	52
	14) Value of sales	58	44	11	0	49	98
	15) Customer group	35	5	11	0	7	56
ICT training	16) ICT training	39	45	5	0	41	35
Barriers to usage	17) Barriers to computer use	12	1	30	0	47	0
	18) Barriers to Internet use	9	1	31	0	49	15
	19) Barriers to e-commerce	9	1	20	0	43	53
Geographic location of sales	20) Geographic location of sales	7	0	6	0	49	35

Section 2.3 Statistical sources for the collection of ICT business indicators

Countries that collect ICT business indicators have used different types of statistical sources including administrative registers from suppliers and regulatory authorities, business registers, economic censuses, sectoral business surveys (manufacturing, trade, etc.) and ICT-specific surveys.

Administrative sources

The suppliers of ICT services such as telephone (fixed lines), mobile telephone and the Internet may provide the regulatory authorities (Ministries of Communication and their subsidiary or related bodies) with basic information about the firms subscribing to their respective services (generally in aggregate figures). The most important advantage of this information source is its reduced cost. However, the international comparability of indicators from administrative sources can be impeded by the various definitions employed by the supplier companies. Also, aggregate figures may not be able to be broken down into separate classifications.

NSOs and Ministries for Communication (and related responsibilities) usually retrieve and compile this information.

Business registers

Business registers are a key element of the statistical infrastructure. Their aim is to include all firms and their establishments. Their use in the statistical process includes the compilation of business demography and they provide a frame for the extraction of representative random samples for business surveys.

Since business registers are used to identify existing firms, they usually include variables such as *presence of fixed telephone, presence of mobile devices* and *presence of a website.*

Business registers include classification variables such as economic activity sector and size (in terms of number of employees and/or turnover). Economic classification can be used to identify the ICT sector and produce some basic statistical results.

The maintenance of business registers is usually continuous and done by the NSO, which uses a variety of sources (tax registers, social security registers, its own surveys, sectoral directories, etc.).

The maintenance of firms in the business register is of utmost importance. While registering "births" (newly created companies) is usually easy from administrative sources to obtain functioning licenses (fiscal, social security, etc.), the register of "deaths" is not straightforward and requires usually a combination of administrative steps (cease of activity licenses) and economic-financial indicators (turnover or number of employees equal to zero or similar conditions). The number of active firms from business register may therefore be overestimated and its use as a denominator may underestimate the indicators.

On the other side, business registers may cover inadequately the productive sector in countries with a large degree of informality in the establishment of firms. However, it is highly probable that firms in the informal sector have a low level of access and use of ICT.

The production of indicators from this type of source may have annual or even more frequent periodicity.

Economic censuses

Economic censuses are carried out with low periodicity due to their high cost. Therefore, they are not well suited for measuring the rapid changes of readiness and impact of ICT in businesses. However,

large countries such as Mexico and Egypt (and other Western Asian countries) have used economic censuses to collect some *basic ICT access* indicators.

No economic censuses collecting ICT variables were carried out in Central Asia and Central and Eastern Europe, which can be explained by the large size of the industrial sector in these countries.

The observation unit can be the establishment or local branch of the firm.

Sectoral business surveys

In many developing countries, NSOs carry out with annual periodicity surveys on the important sectors of their economy. Usually, the manufacturing and trade sectors are surveyed by selecting representative samples of firms (drawn from business registers).

Sectoral business surveys are used to investigate the economic and financial results and other common topics. Therefore, the number of ICT-related questions (which are of a horizontal nature) is limited by the response burden the interviewed firm is subject to. A number of 10 to 20 ICT-related variables have been included in sectoral surveys in many developing countries participating in the stocktaking exercise. The design of specific ICT modules to be included in sectoral surveys is an efficient way of collecting ICT indicators: the advantages include a lower cost than specific ICT surveys, their periodicity, which usually is set in national statistical plans, the fact that firms are used to participate in sectoral investigations (improving the quality of response) and the existence, at the national and international level, of a community of users already familiar with the surveys.

Some countries survey special sectors relevant for their economies (such as Chile and the mining industry). Countries with a large informal sector cannot investigate it with standard sectoral surveys. Therefore the coverage of collected ICT indicators by this tool can be inadequate (even if it can be expected that the readiness of the informal sector for ICT is very low).

The indicators collected through sectoral surveys cover *basic access to ICT* and less frequently *advanced access to ICT and usage*. Marginally, some countries collect other, more specific, indicators.

The observation unit is generally the firm and no disaggregations are usually possible at the establishment level.

ICT-specific business surveys

A number of developing and transition countries have implemented ICT-specific business surveys. These countries have a relatively widespread digital access in their regions (such as Morocco and Tunisia in Africa, or Argentina in Latin America) or have an economy increasingly based on ICT (Hong Kong SAR, Singapore). In general, countries that carried out specific ICT surveys reported a high or very high demand for business ICT indicators.

ICT surveys are generally based on representative samples of the business sector (an interesting counter-example is the use of a comprehensive business census for collecting ICT variables in Egypt). Another method used in several countries (Argentina, Uruguay) is to combine ICT surveys with Innovation Surveys, which cover topics related to the introduction of new technologies. Innovation surveys are based on the initial work by OECD, which was developed (in collaboration with Eurostat) standardisation manuals (Manual of Oslo). In Latin America, the regional network RICYT has prepared a similar manual adapted to the socio-economic environment in the region (Manual of Bogotá).

Specific indicators on *advanced ICT access and usage, Internet activities and e-commerce, barriers to ICT* are collected by this type of statistical operation.

The observation unit is generally the firm and no disaggregations are usually possible at the establishment level.

In order to monitor the rapid changes of an information society, the periodicity of surveys has to be ensured. One-off ICT surveys may loose very rapidly their relevance and should be avoided, due to the high costs in relation to the validity in time of the results.

Detailed information at the country level about the type of statistical operation used to collect each one of the 20 indicators is given in Tables D3, D4, D5, D6 and D7 of the Annex.

Section 2.4 Issues for further work on ICT business indicators

The analysis of the results of the stocktaking exercise raised several areas for further development and research on ICT business indicators for the business sector, which have already been considered by the Partnership:

- The selection of indicators for a core list has to take into account the different levels of specificity of ICT indicators and their relevance at the national and international level. The more specific the indicator, the lower number of countries that will collect it. It seems unnecessary to collect advanced indicators (such as those on *value of Internet sales*) in countries with low penetration of ICT in the business sector.

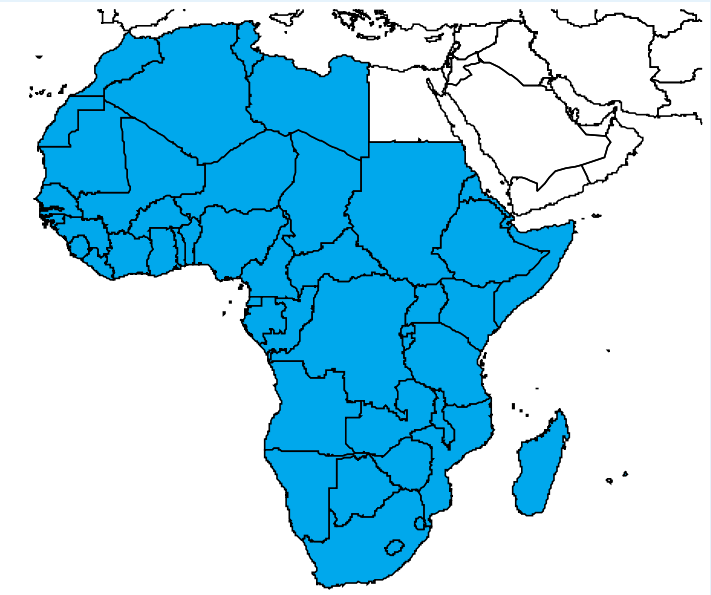
- The international comparability would benefit from the establishment of clear definitions for each one of the ICT business indicators. The use of well established definitions such as those given by the OECD and Eurostat may be of help for developing countries, and the Partnership is preparing a manual for the production of ICT indicators.

- The indicators on *usage of ICT* and particularly those on the *share of employees using a PC or Internet*, and *ICT training* are rarely collected, preventing the assessment of the real impact of ICT on firms as measured by their use in the workforce.

- Indicators on ICT-based processes (such as computer-assisted design or stock management) which are related to the introduction of new technologies through acquisition are not covered in the list of 20 proposed indicators. Their relevance in developing countries (which are usually importers of technology) should be assessed.

- The development or adaptation of modules on ICT in sectoral surveys to include 10 to 20 ICT-related questions is a promising tool for collecting the required indicators. Work should be done to assess best practices in developing countries.

Chapter 3. Status of ICT Indicators in Africa



Section 3.1 Notes on the Regional Data Collection

a. Geographic coverage of the response to the questionnaire

The stocktaking exercise on ICT sources and indicators in Africa was conducted in collaboration with the United Nations Economic Commission for Africa (UNECA), who sent the metadata questionnaire to 52 countries including all sub-regions in Africa. Egypt was included in the United Nations Social and Economic Commission for Western Asia (UNESCWA) data collection survey. (See Chapter 5)

The region is characterised by a low level of development and consequently, a very low distribution of ICT. No countries in the region are categorized as high income or with widespread digital access. Only five countries in the region are classified as upper-middle income. Widespread digital access is available only on the Islands of Mauritius and Seychelles, which account for less than .002% of the regional population (see Table 3.1 for a classification of countries by income and digital access level[1]).

[1] Income levels are defined according to the World Bank's country classification, based on the GDP per capita in PPPs, whereas the digital access level is based on the ITU's Digital Access Index (DAI) whose methodology is described in http://www.itu.int/ITU-D/ict/dai/index.html.

Table 3.1. Countries Included in the African Stocktaking Exercise

Digital Access Level						
Income Level	*DAI Not Available*	*High Access*	*Upper Access*	*Medium Access*	*Low Access*	
High Income						
Upper-Middle Income			Mauritius Seychelles	Gabon Botswana Libyan Arab Jamahiriya	Djibouti	
Lower-Middle Income				Algeria Cape Verde Morocco Namibia South Africa Swaziland Tunisia		
Low Income	Liberia Somalia				Angola Benin Burkina Faso Burundi Cameroon Central African Republic Chad Comoros Congo Côte d'Ivoire Democratic Republic of Congo Equatorial Guinea Eritrea Ethiopia The Gambia Ghana Guinea Guinea-Bissau	Kenya Lesotho Madagascar Malawi Mali Mauritania Mozambique Niger Nigeria Rwanda Sao Tome and Principe Senegal Sierra Leone Sudan Togo Uganda Un. Rep. of Tanzania Zambia Zimbabwe

Note: 19 out of 52 countries answered the questionnaire. They are shaded in the table above.

b. Analysis of response rate

The response rate for the ICT metadata questionnaire is low: only nineteen countries, corresponding to 38% of the countries, 42% of the African population and 29 % of the African GDP (see Graph 3.1), responded to the questionnaire.

Three countries' lack of response can explain the poor coverage of the exercise in demographic and economic terms: Nigeria, the most populous country, South Africa, the largest economy and second most populous country, and the Libyan Arab Jamahiriya, third largest share of GDP.

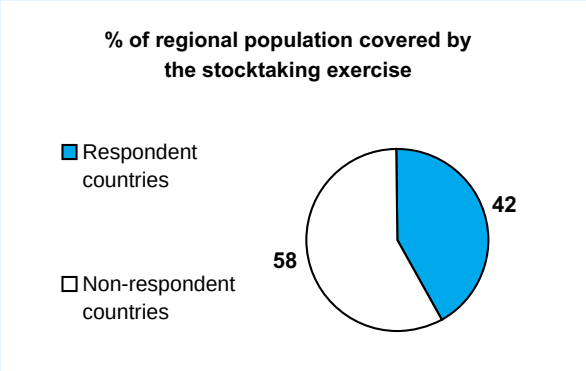
Morocco and Tunisia were the only respondents from the group of countries with middle level incomes and medium digital access. The low response rate from this group of countries, with a sizeable portion of the African population and economic weight (principally South Africa), suggests that efforts to gather metadata on ICT indicators need to be increased.

The majority of countries in the region are low income countries. Their response rate was slightly above the average, in terms of percentage of respondent countries, population and share of GDP.

The results for countries with upper and medium digital access have to be inferred from the answers from Mauritius and Gabon, which show a rather diverse situation with respect to availability of ICT indicators.

Due to the low response to the metadata questionnaire in Africa, the summary on the status of ICT indicators in the region given in this report is incomplete.

Graph 3.1. Coverage of the Stocktaking Exercise in Terms of Population and GDP share in Africa



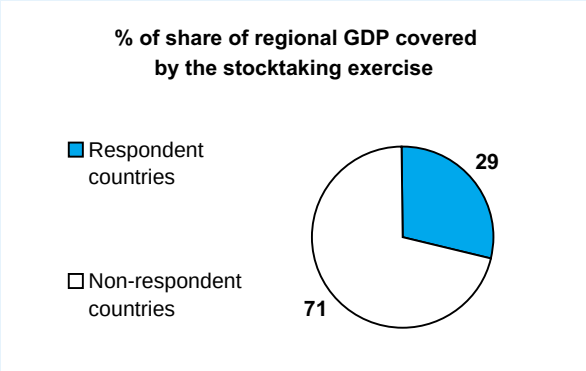


Table 3.2. Coverage by Income and Digital Access Group

Income	*% Countries*	*% Population*	*% GDP*
Upper-middle Income	40,0%	25,3%	27,2%
Lower-middle Income	25,0%	32,8%	25,4%
Low Income	38,5%	43,8%	33,3%
Total	**36,5%**	**41,8%**	**28,9%**

Digital Access Level	*% Countries*	*% Population*	*% GDP*
Upper Access	50,0%	93,7%	87,1%
Medium Access	30,0%	31,8%	24,4%
Low Access	39,5%	44,5%	33,5%
No information	0,0%	0,0%	0,0%
Total	**36,5%**	**41,8%**	**28,9%**

Section 3.2 Institutional Environment for ICT Indicators in Africa

a. Demand for ICT Statistics in Africa

Considerable progress has been made in advocating regionally for ICT indicators, and several countries in the region have undertaken statistical operations to investigate ICT readiness for households and businesses. The launching of ICT regional policies, such as the ICT component of the New Partnership for African Development (NEPAD), carried out by the International Telecommunications Union (ITU), the African Initiative for the Information Society (AISI) and the associated National Information and Communication Infrastructure (NICI) plans, have fostered demand for ICT indicators in the region.

According to the metadata questionnaire, the levels of demand for household and business ICT indicators in Africa are highly correlated, as they are related to the income level of countries (Table 3.3[1]). It is interesting to note that several Least Developed Countries (LDCs) assessed however, a high demand for indicators. This could be interpreted as the recognition that ICT may have a positive impact on development and secondly, that regional advocacy activities for ICT indicators have permeated the national institutions.

However, no obvious correlation can be found between the level of demand for ICT indicators and

Table 3.3. Demand for ICT Statistics in Africa

Demand Level	*Demand Level*				
	Very High	*High*	*Medium*	*Low*	*No Demand*
ICT Household Indicators	Benin Tunisia	Central African Republic Kenya Lesotho Madagascar Mauritius Morocco Tanzania Zambia	Ethiopia The Gambia Niger Rwanda Senegal Sierra Leone	Gabon Zimbabwe	Democratic Republic of Congo
ICT Business indicators	Benin Tunisia	Lesotho Madagascar Morocco Senegal	Rwanda Sierra Leone	Zimbabwe	

Note: The following countries did not assess demand for business indicators: Central African Republic, Democratic Republic of Congo, Ethiopia, Gabon, The Gambia, Kenya, Mauritius, Niger, Tanzania and Zambia.

[1] The information from the questionnaire has been completed with reports from the SCAN-ICT project.

Box 3.1. The SCAN-ICT Project

Scan-ICT is a multi-donor project initiative of the Economic Commission for Africa (ECA), the International Development Research Centre (IDRC, Canada), the European Union and the Norwegian Agency for Development Co-Operation (NORAD), which aims to build Africa's capacity to gather information and data in order to support ICT policies, as well as the transition of Africa to an information society. The goal is to create a pan-African ICT network, connecting all levels of ICT related issues, which will be co-ordinated and supported by an observatory/research institute.

One major component of SCAN-ICT is related to the production of monitoring indicators, related to the policies considered in the African Initiative for the Information Society (AISI), in particular infrastructure, strategic plans, capacity development, sectoral applications, e-governance, information society and information economy. Within the SCAN-ICT project, the ECA/IDRC Regional workshop (17-18 February 2004 in Addis Ababa, Ethiopia) brought together ICT practitioners and statisticians to review the SCAN-ICT methodology used in the first phase and, the countries' experiences. ICT country reports were prepared for the following participating countries: Ethiopia, Ghana, Morocco, Mozambique, Senegal and Uganda.

The SCAN-ICT project will be extended (Phase II), at the countries request and after the evaluation of the in-country capacity to undertake the study, to Botswana, Gambia, Mauritius, Niger, Rwanda, Sudan, Tanzania and Tunisia. The expected outputs of Phase II include the production of disaggregated indicators (especially by gender and disability status) as well as the preparation of sectoral applications in education, health, agriculture, public administration and e-commerce.

digital access level: countries with a low digital access level show high or even very high demand (like Benin), while countries with medium digital access have declared low demand (like Gabon on ICT household indicators).

The creation of a regional Task Force on ICT indicators, to be composed of representatives of Senegal, Mauritius, Morocco, Uganda, South Africa and Democratic Republic of Congo, was proposed in the regional workshop in Gaborone (Botswana, October 2004), optimistically showing an increased interest in Africa on the topic.

b. Institutions Collecting ICT Data in Africa

A total number of 28 statistical operations containing ICT household variables and 7 containing business ICT variables were identified in the region. Except for Tunisia and Morocco[2], where the Ministries responsible for Telecommunications carried out surveys on home PCs, ICT firms and investments, use of ICT in businesses, government and higher education, all statistical operations were carried out by the National Statistical Offices (NSOs). In Sub-Saharan Africa all ICT-related surveys identified in the metadata questionnaire were under the responsibility of NSOs.

Other institutions that provide ICT-related information in the region are Telecommunication Regulatory Authorities (Congo and Tanzania), the National Internet Agency (Tunisia) and the Association of ICT Professionals (Morocco).

This information has to be completed with an assessment of sources from the countries participating in the SCAN-ICT project (Box 3.1). One of the conclusions of the first phase of the project is that NSOs have to be involved more deeply in the measurement of ICT-related issues.

c. Resources

Several countries in the region (8 out of 19, 42%, all of them in Sub-Saharan Africa and 7 of them included in the list of Least Developed countries) declared not to have any financing[3] available for the collection of ICT indicators (Table 3.4). Nonetheless, respondents in three of those countries (Central African Republic, Lesotho and Senegal) perceived a high demand for ICT indicators.

[2] The population and Housing Census in Morocco is erroneously assigned in the database to the Department of Telecommunication, but was carried out by the Directorate for Statistics.

[3] The questionnaire of the Democratic Republic of Congo mentions simultaneously that no financing is available and international co-operation from France was received.

Table 3.4. Resources for ICT Statistics in Africa by Income Level

Origin of Funds	*Income level*			
	High Income	*Upper -Middle Income*	*Lower-Middle Income*	*Low Income*
Regular Budget		Mauritius		Benin Gambia Madagascar Rwanda Zambia
National Cooperation			Morocco Tunisia	Gambia Kenya
International Cooperation			Morocco	Ethiopia Democratic Republic of the Congo Ghana Mozambique Senegal Uganda
No Financing Available				Central African Republic Lesotho Niger Senegal Sierra Leone United Republic of Tanzania Zimbabwe

Note: Information is not available for Gabon.

Benin, The Gambia, Mauritius and Rwanda NSOs financed the statistical surveys by their running budget. In these cases, ICT variables were part of non-specific household surveys.

Operations in Morocco and Tunisia were funded by the line Ministries, who carried out the work on ICT indicators.

Inter-institutional co-operation was observed in Kenya, where the Central Bureau of Statistics collaborated with the University of Nairobi and the National Communications Commission (see Box 3.5).

d. Definition of ICT

Most countries in the region do not apply any formal definition of ICT (58%), while only 16% are developing one (Table 3.5). There is no straightforward correlation between the use of an established definition and the following: digital access level, income level, countries demand for ICT statistics, or participation in the SCAN-ICT project. In this situation, the analysis of the relevance of the international definitions (such as the ones given by OECD or Eurostat) for the ICT sector, products and uses may be useful.

Table 3.5. Existence of Definition for ICT in Africa

Country List	*Status of Definition*		
	No Definition	*Definition in Preparation*	*ICT Definition Applied*
Benin			X
C.A.R.	X		
DR Congo	X		
Ethiopia	X		
Gabon	X		
Gambia	X		
Kenya			X
Lesotho			X
Madagascar	X		
Mauritius		X	
Morocco		X	
Niger	X		
Rwanda			X
Senegal	X		
Sierra Leone	X		
Tunisia			X
U.R. of Tanzania		X	
Zambia	X		
Zimbabwe	X		
All countries in the region (% of responses)	**11 (58%)**	**3 (16%)**	**5 (26%)**

e. Dissemination of ICT Statistics

Thirteen [13] countries (Benin, The Gambia, Lesotho, Kenya, Madagascar, Mauritius, Morocco, Niger, Rwanda, Tunisia, Zambia and Zimbabwe) have published ICT reports which include statistics. The majority of these countries have reported a very high and high demand for ICT indicators. Interestingly, the availability of ICT indicators is very low in certain countries (such as The Gambia and Lesotho for households or Zimbabwe for businesses).

Furthermore, Tanzania and Ethiopia are planning to publish ICT reports. The other countries have not yet decided on how to disseminate of ICT statistics.

With respect to the timeliness of data (Tables 3.6 and 3.7), business surveys providing ICT indicators were generally carried out in Africa more recently than household surveys, with the exception of a few specific ICT household surveys. Tunisia is the only country, where the demand was assessed as very high, that declares collecting some ICT indicators through periodical surveys. The lengthy time lapse between population censuses makes them a very poor source for measuring the rapid changes in ICT status.

Table 3.6. Most Recent date of Surveys with an ICT Component (Business and Administration)

Country	*Type of statistical operation*	*Number of collected ICT variables*	*Most recent collection*
Benin	***ICT in Administrations***	***62***	***July 2002***
Madagascar	***ICT Survey in the Antananarivo agglomeration***	***136***	***September 2004***
Mauritius	Census of Economic Activities	8	2002
Morocco	***Use of ICT in the industrial sector***	***16***	***2000, 2003***
Rwanda	Annual Business survey	12	1999, 2000, 2001
Tunisia	***ICT enterprises***	***6***	***Periodical (6 months)***
Zimbabwe	Census of Industrial Production	3	1996/97, 1997/98, 1999/2002

Table 3.7. Most Recent Date of Surveys with an ICT Component (households)

Country	*Type of Statistical Operation*	*Number of Collected ICT Variables*	*Most Recent Collection*
Benin	Population Census	1	February 2002
	Labour Force Survey	12	August 2001
	Demographic and Health Survey	4	July- September 2001
Congo	Labour Force Survey (Kinshaha)	3	June 2004
Gabon	Demographic and Social Survey	n.a.	2002
Kenya	***Universal Access to communication***	***193***	***2004***
Madagascar	***ICT Survey in the Antananativo agglomeration***	***132***	***September 2004***
Mauritius	Continuous Multi Purpose Household Survey	14	January to December 2002
Morrocco	Population Census	2	September 2004
Niger	Survey on Informal Sector	5	June 1997
	Survey on Economic and Social situation	5	June 1997
Rwanda	Living conditions survey	n.a.	2003
Senegal	Population Census	2	December 2002, 1998
	Living conditions survey	2	1994, 1995, 2001, 2002
	Household Budget Survey	4	September 2001
Tanzania	Household Budget Survey	n.a.	1991/92
Tunisia	***National Stock of Computers***	***4***	***Periodical (6 months)***
	Survey on Home PCs	***4***	***Annual***
	Survey on ICT employment	***3***	***Annual***
Zambia	Living conditions survey	5	1996, 1998
	Priority Survey 1993	3	1991, 1993
Zimbabwe	Household Budget Survey	7	Jan-Dec., 2001

Section 3.3 ICT Indicators in Households in Africa

a. Sources of ICT Information from Households

In the region, a combination of sources for ICT indicators is observed, primarily of generic household surveys.

Some countries have tried to identify potential statistical sources even if these are not fully exploited to produce ICT indicators (See Box 3.2 on The Gambia). The case of Mauritius, a country with upper digital access, which combines many different sources is interesting (Box 3.3).

The governments task of gathering information from the suppliers is facilitated where the market for the provision of utilities such as electricity or telephone, public or semi-public in general is limited (see Box 3.4). This information includes only coverage of the utilities/services for subscriber households therefore, international comparability is not as easily reached as it could be with the use of harmonised methodologies for surveys.

The following patterns can be observed regarding the use of different sources for the provision of ICT indicators in African countries (Table B3 of the Annex). The cross-tabulation with income level is given in Table 3.8.

Box 3.2. Assessment of Potential Statistical Sources on ICT in The Gambia

A current low level of availability of statistical information on ICT is not a barrier to implementing interesting assessment exercises on the possibility of using existing surveys for the provision of ICT indicators. The experience of the Central Statistics Department (CSD) of The Gambia, presented at the Gaborone sub-regional workshop (October 2004) can be seen as a good practice.

The CSD has reviewed the potential use of population and business statistical operations such as the National Accounting Survey and the Employment and Earnings Survey, which may provide ICT indicators for the sector according to the ISIC classification of economic activities. Whereas, the Integrated Household Survey (IHS) that collects information from 4.800 households may provide indicators on access to basic infrastructure (electricity and telephone) as well as some aspects of ICT expenditures by income and geographic location. Other potential sources of ICT indicators reviewed by the CSD are the administrative systems in place, such as the foreign trade data (recorded with the widely disseminated ASYCUDA system) and administrative and accounting data from major companies (GAMTEL).

The preparation by NSOs of an assessment on statistical sources that potentially may provide ICT indicators is a necessary exercise for the co-ordination and efficient use of the existing resources of the National Statistical System.

Table 3.8. Statistical Operations Providing Indicators on ICT in Households in Africa

Type of Operation	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Population and Housing Census		Mauritius	Morocco	Benin The Gambia Niger Senegal Sierra Leone Tanzania
Multipurpose Household Surveys		Mauritius	Tunisia	Central African Republic Senegal Rwanda Tanzania Zambia Zimbabwe
Ad hoc ICT surveys			Tunisia	Kenya Madagascar
Suppliers		Mauritius		Rwanda Tanzania Zimbabwe

Use of Population and Housing Censuses

Benin, The Gambia, Niger, Mauritius, Morocco, Senegal Sierra Leone and Tanzania have used the Population and Housing Census to gather information about *presence of electricity* and *basic ICT equipment* (TV, radio, telephone).

Use of general household surveys

Francophone countries (Benin, Central African Republic, Gabon, Rwanda, Senegal, Tunisia) tend to use household surveys (living conditions and/or household budget surveys) carried out by NSOs to investigate the availability of *electricity, radio, fixed and mobile telephone* (a number of ICT variables between 1 and 14 according to the questionnaire). All of them show very high response rates (around 95% and more).

There is a general trend towards using household surveys instead of information from other sources for the production of indicators about the availability of PC and Internet, and their use. Tanzania, Zimbabwe, Mauritius and Rwanda used multi-purpose household surveys to this effect. Box 3.3 describes the experience of Mauritius, a country with upper digital access and a high demand for ICT indicators.

Box 3.3. Use of the Continuous Multi-Purpose Household Survey in Mauritius

The Continuous Multi-Purpose Household Survey (CMPHS) is carried out annually since 1999 by the Central Statistical Office in the Islands of Mauritius and Rodrigues. The topics to be covered by this survey are reviewed every year to take into consideration users' current needs. The CMPHS covers both urban and rural areas. Each round of the survey covers a representative sample of 6,000 private households, spread evenly over 12 months. Each round consists of several modules:

- A basic module covering the general characteristics of households and their members.
- One or more special topic modules dealing with subjects of current interest for in-depth investigation. Every year different topics are investigated and questions are usually addressed to members of the household. In 2002 it included a module on Information Technology (http://statsmauritius.gov.mu/quest/cmphs02.pdf).
- A final module grouping several other topics of general interest, but investigated in less detail.

The 2002 module in the CMPHS questionnaire included the following questions:

For the household:

- presence of a computer in the household
- reasons for not having a computer and intentions to purchase one
- since when are household members using the computer
- access to Internet
- expenditure for use of Internet
- intentions to get Internet access

For the household members:

- IT skills
- location of access to a computer
- personal access to Internet
- location of access to Internet
- since when is the person using Internet
- purposes of Internet use at home

Results can be disaggregated by household and demographic characteristics, as they are recorded in the first, general module of the CMPHS.

Use of information from suppliers and other organisations

Anglophone countries (Tanzania, Zimbabwe and Mauritius) rely more often on the utility of service suppliers' information (Electricity companies, Radio and TV Broadcasting services). Rwanda (a Francophone country) also gathers data from the utility suppliers.

Use of specific ICT household surveys

The implementation of specific ICT surveys in households is rare in the region. The stocktaking exercise identified only three, in Kenya (see Box 3.5), Madagascar and Tunisia. Both Kenya and Madagascar have low digital access and are low income countries that have indicated a high interest in ICT indicators.

Box 3.4. Telecom Operators as a Source for ICT indicators in Africa

The Regulatory Authorities in African countries, together with the state-owned and private Telecom operators, may be a potential source of ICT indicators, particularly in the domain of access to basic infrastructure. EriTel in Eritrea, Cellplus & Emtel in Mauritius, Maroc Télécom and Medi Télécom in Morocco, RwandaTel in Rwanda, MOBITEL, CELTEL, VODACOM in Tanzania and many other companies in African countries can provide regularly indicators on the number of subscribers to their services.

The number of subscribers is a proxy for the estimate of population with access to electricity, telephone (fixed and mobile) and Internet. The presence of TV and radio, generally not subject to subscription, is more difficult to gather from these sources.

The need for using standard definitions on the type of subscriber (personal, household, firm, public access location) is required to assess the actual coverage of the access to ICT.

Box 3.5. The Baseline Survey for the Universal Access Strategic Plan in Kenya

The Communications Commission of Kenya (CCK), a regulatory body, together with the Central Bureau of Statistics (CBS) and the University of Nairobi, carried out a baseline survey on access and use of ICT in order to support evidence-based policies for granting a Universal Access to Communications in the country. This specific household ICT survey was designed to be representative of the rural population of Kenya and therefore based on the rural coverage of the National Sample Survey and Evaluation programme (NASSEP IV) master sample developed by CBS. Census Enumeration Areas were stratified according to the availability of communication services (postal, fixed and mobile telephone, courier, Internet services and broadcasting) based on service providers' information. A multi-stage random sample of 1139 households was selected in 16 of the 72 country districts.

The survey investigates the availability of services both in households and in public places, the distance to access services, the demand and usage of ICT, the related expenditure and affordability, and the knowledge and preferences among the population of those services. All the results may be disaggregated by region, gender, age marital status, education level, economic activity and income level.

b. Availability of ICT Household Indicators

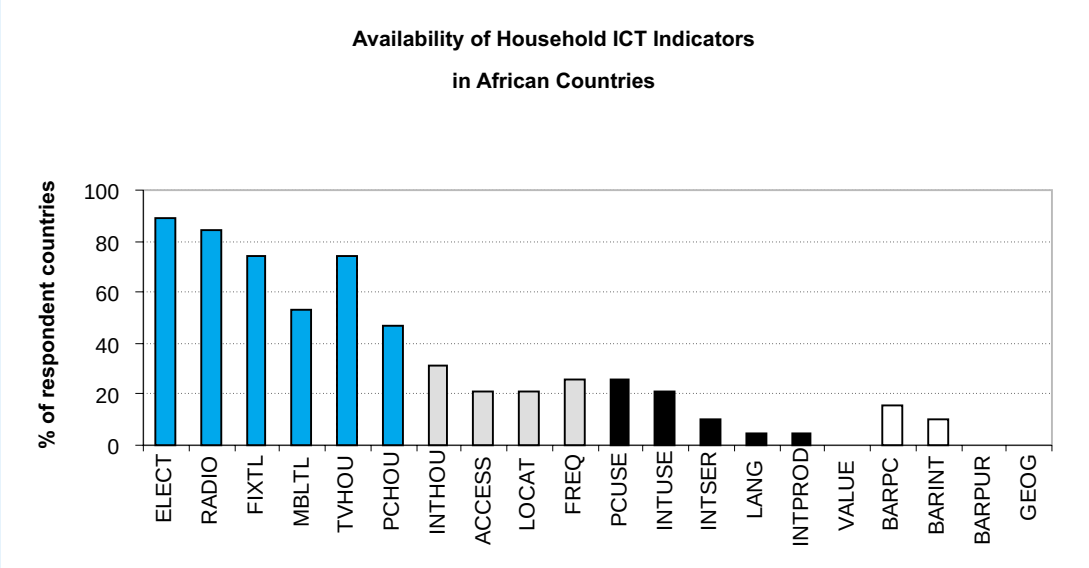
Detailed information at the indicator level for each country is given in Table A3 of the Annex. However, the figures summarising the availability of indicators (% of countries and % of population covered) have to be evaluated with due consideration given to the low coverage of the stocktaking exercise in the region. A dearth of metainformation on ICT indicators persists in the region (see Section 3.1).

The availability of basic ICT indicators is high for the following indicators: *presence of electricity, radio, fixed telephone and TV* (between 74% and 89% of the countries, representing 74% to 81% of the population of the responding countries). Less coverage is shown for the following basic indicators: *presence of mobile telephone* and *presence of Internet access.*

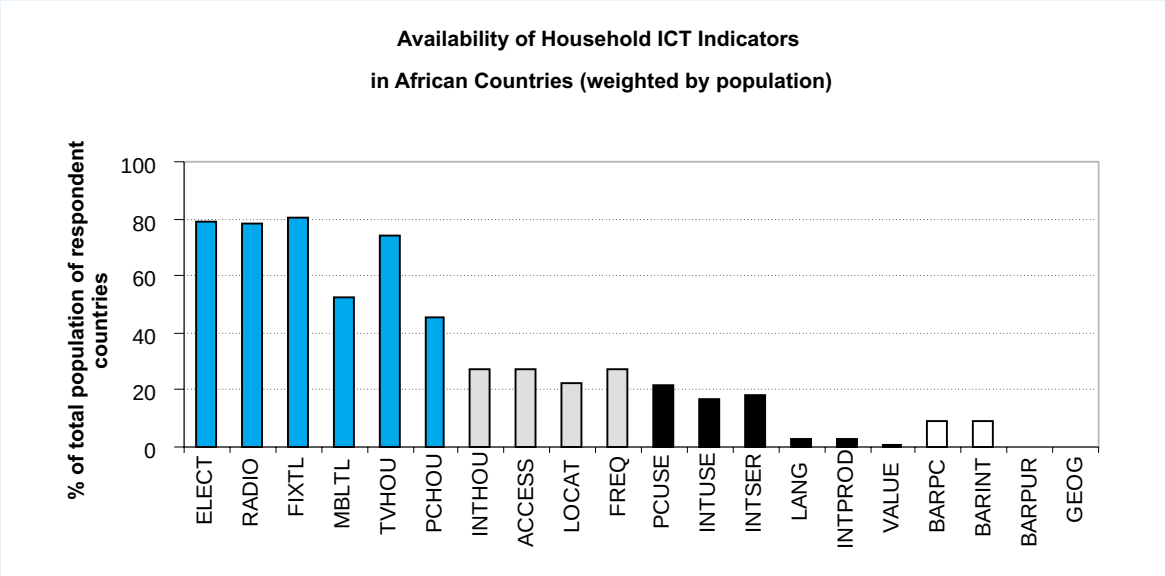
The indicators on *access to Internet* and *usage of ICT* are scarce in the region, and disseminated in less than 25% of the countries (covering about 25% of the regional population). A special effort must be undertaken to collect indicators in this group in the region.

Indicators 14 to 20 from the list are available in less than 10% of the countries that responded to the questionnaire.

Graph 3.2.



Graph 3.3.



There is concordance between the level of demand of household ICT indicators and the availability at the country level, with the exception of a few cases: the perceived needs are not met in Benin, Central African Republic, Lesotho, Tanzania, Tunisia and Zambia. In Kenya, Madagascar, Mauritius and Morocco, the availability of indicators may satisfy the existing demand.

Table 3.9 shows the correlation between level of digital access and availability of indicators. A higher digital access level entails a richer availability of indicators (15 out of 20), while less than one-third of indicators are, on average, calculated for the remaining countries. Due to the surveys carried out in Madagascar, Kenya and Rwanda, the availability in low digital access countries is on average higher than in medium digital access countries.

Table 3.9. Availability of ICT Household Indicators by Digital Access Level (average number of indicators in each group)

Indicator Group	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Basic access to ICT (7 indicators)	-	7/7	5/7	4,8/7
Internet access (3 indicators)	-	2/3	1/3	0,6/3
ICT usage (6 indicators)	-	4/6	0/6	0,9/6
Barriers to usage (3 indicators)	-	2/3	0/3	0,3/3
Geographical location (1 indicator)	-	0/1	0/1	0/1
TOTAL: Household ICT indicators	**-**	**15/20**	**6/20**	**6,6/20**

c. Disaggregations of Household ICT Indicators

In relation to the breakdown of ICT household indicators, it is important to recall that the design of the statistical operations, and in particular the sample size, are critical to the possibility of disaggregating the indicator values for subpopulations. In this sense, when household ICT indicators (and this is generally the case for indicators of *basic access to ICT*) are provided by censuses (such as those mentioned by Benin, The Gambia, Morocco and Senegal), the disaggregations are only limited by the statistical confidentiality, therefore it is possible to obtain any kind of breakdown by the remaining census variables (location, rural/urban habitat, age, gender and education level of the head of household, etc.). When household ICT indicators are produced by household surveys, the choice is limited by the survey design: the available ICT indicators (between 2 and 12 in the household surveys mentioned in the metadata questionnaire) can be disaggregated generally as described in Table 3.10.

Age, gender and location are the most common classification variables for household ICT indicators in African surveys, followed by education and economic activity. There is no detailed information about the classifications used (age intervals, classification of education levels, etc.) in the metadata questionnaire. No further analysis of comparability can be carried out at this stage. However, the application of internationally standardised household surveys in other African countries (such as '*Enquête 1-2-3'* or *'Living Standards Measurement survey,* LSMS') not mentioned in this assessment may provide further harmonisation of the classifications used in household indicators.

Table 3.10. Disaggregations for ICT Indicators from General Household Surveys in African Countries

Country list	*Classification Variables*							
	Age	*Gender*	*Education*	*Income/ expenditure level*	*Location*	*Ethnicity*	*Economic activity*	*Health status*
Benin	X	X	X		X	X	X	
Kenya	X	X				X		
Madagascar	X	X			X			
Mauritius	X	X	X	X			X	
Niger	(1)	(1)	(1)	X		(1)	(1)	(1)
Rwanda	X	X	X		X		X	
Senegal	X	X	X		X	X	X	X
Tunisia	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
U.R. of Tanzania				X	X			
Zambia				X	X			
Zimbabwe	X		X	X	X		X	
Total	**9**	**8**	**7**	**6**	**8**	**5**	**7**	**3**

Notes: - Only answers to the metadata questionnaire are considered
- (1) Niger mentions 'Demographic characteristics'
- (2) Tunisia mentions 'any kind' of disaggregation

Section 3.4 ICT Indicators in Business in Africa

a. Sources of information

There are basically three types of sources providing ICT indicators on the business sector in Africa: economic censuses, general enterprise surveys and specific ICT surveys in businesses (Table 3.11)

Use of economic censuses

Economic censuses that survey exhaustively the complete business sector are very expensive operations. In the region, Mauritius and Zimbabwe reported the inclusion of ICT questions in economic censuses (Zimbabwe only included the *presence of a fixed telephone*, while Mauritius included all the indicators on *basic* and *advanced access to ICT and usage*, and *value of e-commerce sales.* The small size of the Mauritius economy can justify the use of an economic census. However, its sustainability for larger countries should be examined.

In the case of economic censuses, the observation unit includes establishments.

Use of general enterprise surveys

Enterprise surveys based on sampling a representative subpopulation of firms are possible only where enterprise directories are kept up to date. Countries with a large informal sector risk leaving uncovered a large part of the economic sector if no other complementary surveys are carried out[1].

Table 3.11. Statistical Operations Providing Indicators on ICT in Business in Africa

Type of Operation	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Economic Census		Mauritius		Zimbabwe
General Enterprises Surveys				Rwanda
Ad Hoc ICT Surveys			Morocco Tunisia	Benin Madagascar
Suppliers				Senegal Tanzania

[1] For example, the Enquête 1-2-3 developed by DIAL and the French Ministry of Foreign Affairs have been applied to measure the informal sector in several West African countries.

In enterprise surveys, the observation unit is always the firm, not its establishments or local units.

Use of specific business ICT surveys

Madagascar, Morocco and Tunisia are the only three countries in the region that implemented specific ICT surveys in the business sector. The survey in Madagascar covered only the agglomeration of the capital (160 juridical persons including administrations). Morocco and Tunisia, which have an income level and digital access level above the regional average, carried out surveys restricted to the industrial and ICT sectors, respectively.

The observation units were the firms.

Use of other sources

Suppliers of telephone and Internet services are a possible source of information about their subscribers. They represent a source for ICT indicators in Senegal and Tanzania.

b. Availability of Business ICT Indicators

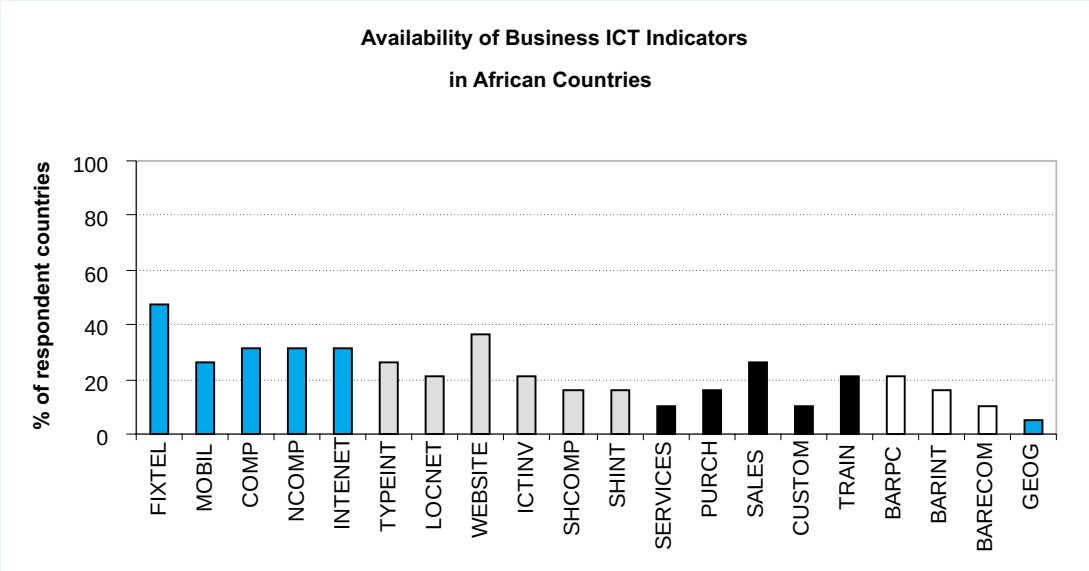
The availability of business ICT indicators is generally low in the region[2]. Country results are indicated in Table C3 of the Annex and represented in Graphs 3.4 and 3.5.

Indicators on *basic access to ICT* (except for *fixed telephone*) are available in less than 30% of the countries. The remaining indicators are available in less than 20% of the countries, except for *presence of a website* and *values of Internet sales*. Interestingly, results according to country GDP are better, since the two largest economies amongst the respondent countries (Morocco and Tunisia) have more indicators. Sub-Saharian Africa is however, lagging behind.

According to the country GDP, the availability of the indicators *presence of fixed telephone*, *presence of a website*, *value of Internet purchases* and *value of Internet sales* accounts for more than 50% of the total GDP of respondent countries.

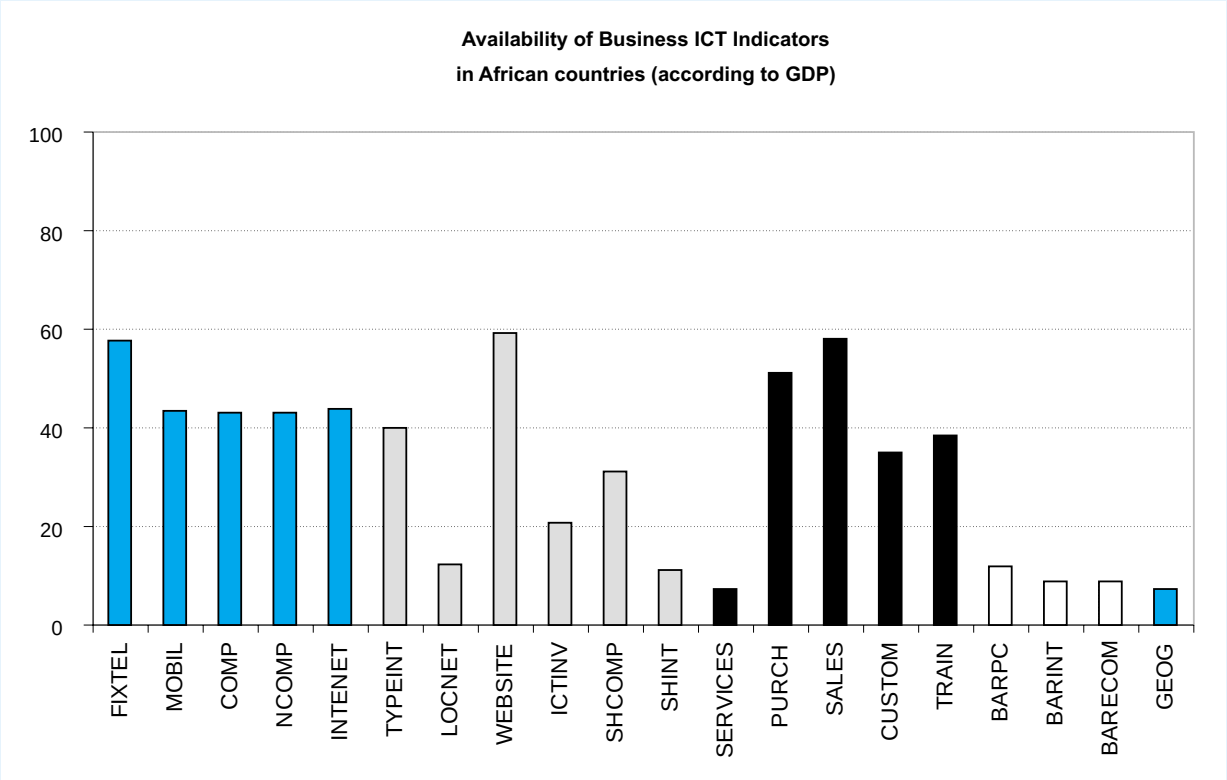
The following indicators: *share of employees using a PC* and *using Internet*, *types of services Internet is used for*, *barriers to computer and Internet use* and to *e-commerce*, and *geographic location of sales* are extremely scarce in the region.

Graph 3.4.



[2] It has to be taken into account that countries that declare the availability of any indicators represent only 7% of the GDP of the countries responding to the questionnaire, which is in turn only 29% of the region GDP.

Graph 3.5.



c. Disaggregations of Business ICT Indicators

The observation units can be classified according to different variables, as described in Table 3.12. The questionnaire does not provide information about class size (based on number of employees or turnover) used in Madagascar, Mauritius, Rwanda and Zimbabwe. Interestingly, the only country that declared to classify observation units is the smallest in size (Mauritius). In the case of Mauritius and Zimbabwe, the use of economic censuses should allow any kind of disaggregation of the available ICT indicators.

No information about the classifications used for economic activity in Morocco, Tunisia and Zimbabwe is available.

Table 3.12. Classification Variables for the Business ICT Indicators in Africa

Country	*Observation Unit*	*Economic Activity*	*Size (employees)*	*Size (Turnover)*	*Location*	*Juridical Form*
Madagascar	Enterprise			X		X
Mauritius	Establishment		X	X	X	
Morocco	Enterprise	X				
Rwanda	Enterprise		X	X		
Tunisia	Enterprise	X				
Zimbabwe	Enterprise or Establishment	X		X		

Section 3.5 ICT Indicators in Other Sectors in Africa

The stocktaking exercise identified other sources of data about the information society and the information economy based on statistical operations. Table 3.13 below shows the available information sources classified by domain and type of statistical operation.

As it can be seen, several sources of ICT indicators are related to the use of statistical operations in place of a more general profile: foreign trade statistics, National Accounts, Education statistics. Coherently, countries that have statistical operations reported (with the exception of The Gambia) a very high or high demand of ICT indicators.

Table 3.13. ICT Statistics in Other Sectors in Africa

Domain	*Countries*
Supply, demand and trade in ICT products	Gambia (External trade) Tunisia (Imports of ICT products)
Skills, occupations and qualifications	Gambia (employment and earnings survey) Tunisia (Formal education in ICT)
ICT enterprises	Gambia (component of the ICT sector in the National Accounts)
Infrastructure for the information society	Morocco (Cartography of ICT)
ICT in education	Morocco (Primary , Secondary, Tertiary and professional education)
ICT in government	Benin Madagascar Morocco
ICT investments	Tunisia

Key issues on the Availability of ICT Indicators in Africa

- **Metadata collection:** An effort has to be made to gather metadata information from medium digital access level countries in Africa. Special effort should be made to investigate the status of ICT indicators in *Nigeria, South Africa* and *Libyan Arab Jamahiriya*.

- **Data sources:** Based on the survey, NSOs are the main providers of ICT indicators in Africa. Only in two Maghreb countries (*Morocco* and *Tunisia*) other institutions provide ICT-related statistical information. The use of multi-purpose household surveys that include a specific module on ICT or at least several ICT-related questions is extended in the region and has to be explored for its cost-efficiency. The existence of harmonised household surveys in the region (*Enquête 1-2-3, LSMS*) may be of great help. The experience of *Kenya* in specific ICT household surveys or *Mauritius* in the preparation of a specific module in a multi-purpose household survey may be disseminated. For business ICT indicators, the situation is similar: two countries in Maghreb carry out specific surveys, while in Sub-Saharan Africa the scarcity of indicators is the rule. Economic censuses cannot monitor the rapidly changing ICT environment, and enterprise surveys are not fully in place. Suppliers of utilities (electricity, telephone, Internet) are a useful source but their coverage (normally they are restricted to subscriber persons or households) and international comparability of the estimates has yet to be established. The coverage of ICT in other sectors is also poor except for the government sectors in several countries.

- **Resources:** Least Developed Countries in Africa do not have financing for the collection of ICT indicators. Several countries that reported a high demand for indicators do not have the resources for producing them and have a low availability of indicators. National and international collaboration is rare in the region, except for the multi-country project SCAN-ICT. In some cases, policy makers (Ministries for Communications) have been involved with the implementation of household surveys on ICT.

- **Key gaps in ICT indicators:** Indicators on *basic access of households to ICT* are available in about 80% of the countries, but more specific indicators on *presence and access to Internet, mobile telephone, usage of ICT* are very scarce in the region and an effort has to be made to increase their availability.

Chapter 4. Status of ICT indicators in Central Asia and Central and Eastern European Countries

Section 4.1 Notes on the Regional Data Collection

a. Geographic Coverage of the Response to the Questionnaire

The United Nations Conference on Trade and Development (UNCTAD) undertook the metadata collection on ICT indicators in Central Asian and Central and Eastern European countries in collaboration with the United Nations Economic Commission for Europe (UNECE). The region includes UNECE member countries which are not members of the Organization for Economic Cooperation and Development (OECD) or the EU. It includes Central Asian and Caucasus countries, which are also members of the United Nations Economic and Social Commission for Asia Pacific (UNESCAP).

The region includes a majority of countries classified as lower-middle income and with medium digital access. Dominated in surface and population by the Russian Federation, the regional grouping is mainly composed of countries in transition from a centrally planned to a market-based economy. In this group, four candidate countries of the European Union (Bulgaria, Croatia, Romania and Turkey) are progressively harmonising their statistical systems to EU standards and many others benefit from co-operation activities in the field of official statistics. The regional grouping also includes three small states with an economy highly based on the financial sector (Andorra, Liechtenstein and Monaco).

The metadata questionnaire was sent to 24 countries. The list of countries to which the questionnaires were sent is classified by income and digital access level in Table 4.1. In the region, the Digital Access Index (DAI) classification is not available for three of the four countries with high income levels.

b. Analysis of Response Rate

Nineteen out of twenty-four countries (79%) responded to the questionnaire. The coverage of the stocktaking exercise is very high, both in terms of regional population (89%) and GDP (95%). The two most populous countries and largest economies (the Russian Federation and Turkey) responded to the questionnaire, as well as the third largest economy (Israel) and the third country in population (Ukraine).

In geographic terms, Central Asia had the lowest response rate.

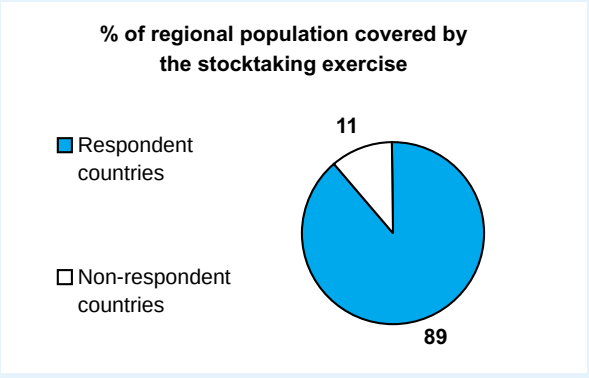
However, the group of four low income countries in the region is poorly covered accounting for 21% of its population and 23% of its GDP. This is in part due to the lack of response from Uzbekistan, the most populous country in this group.

Table 4.1. Country Coverage of the Stocktaking Exercise in Asia-Pacific

Income level	*Digital Access Level*				
	DAI not available	*High Access*	*Upper Access*	*Medium Access*	*Low Access*
High Income	Andorra Liechtenstein Monaco	Israel			
Upper-Middle Income			Croatia		
Lower-Middle Income			Bulgaria Russian Federation	Albania Armenia Belarus Bosnia and Herzegovina Georgia Kazakhstan Romania Serbia and Montenegro FYR Macedonia Turkey Turkmenistan Ukraine	Azerbaijan
Low Income				Kyrgyzstan Republic of Moldova Uzbekistan	Tajikistan

Note: 19 out of 24 countries to which the questionnaire was sent, answered. They are shaded in the table above.

Graph 4.1. Coverage of the Stocktaking Exercise in Terms of Population and GDP Share in Central Asia and Central and Eastern European Countries



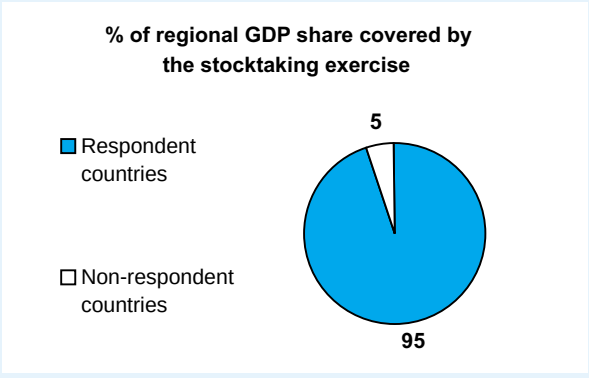


Table 4.2. Coverage by Income and Digital Access Group (%)

Income	*Countries*	*Population*	*GDP*
High income	75,0	99,5	99,3
Upper-middle income	100,0	100,0	100,0
Lower-middle income	86,7	95,8	96,2
Low income	50,0	21,3	22,7
Total	**79,2**	**88,5**	**95,4**

Digital Access Level	*Countries*	*Population*	*GDP*
High access	100,0	100,0	100,0
Upper access	100,0	100,0	74,2
Medium access	80,0	82,4	89,8
Low access	50,0	56,0	83,7
No information	66,7	75,2	74,2
Total	**79,2**	**88,5**	**95,4**

In terms of the digital access level, the coverage decreases along with the value of the DAI. Therefore, the availability of ICT indicators in the region is probably overestimated.

Consequently, a special effort should be made to gather information from the Central Asian countries and thereby increase the awareness of ICT metadata indicators.

Section 4.2 Institutional Environment for ICT indicators in Central Asia and Central and Eastern European Countries

a. Demand for ICT Statistics in Central Asia and Central and Eastern European Countries

The demand for ICT indicators in the region is medium to very high with the exception of four countries (Table 4.3). No demand for indicators on households was declared by Belarus and Bosnia and Herzegovina. The countries with highest access to ICT reported a very high demand with the exception of Liechtenstein.

The countries with very high demand on ICT household indicators have effectively implemented statistical operations. However, the high demand in countries such as Georgia, Kazakhstan (but it has plans to produce a larger number of indicators), Ukraine and the Russian Federation is not yet satisfied.

No information is available on ICT business indicators collected by Israel and Turkey, where a high demand is assessed. In Ukraine, the very high demand is reflected by the implementation of the *Survey on state of informatization 2000-2004.*

b. Institutions Collecting ICT data in Central Asia and Central and Eastern European Countries

NSOs were responsible for collecting the business indicators identified in the questionnaire.

Andorra is the exception, where the Department of Information Society and Strategic Projects completed a survey and a high number of institutions provided some sort of ICT indicators (including private banks and associations). Otherwise all household surveys

Table 4.3. Demand for ICT Statistics in Central Asia and Central and Eastern European Countries

Demand Level	*Demand Level*				
	Very High	*High*	*Medium*	*Low*	*No Demand*
ICT Household Indicators	Andorra Israel Turkey	Georgia Bulgaria Kazakhstan Ukraine Russian Federation	Kyrgyzstan Rep. Moldova Romania Azerbaijan Croatia	Liechtenstein Armenia	Belarus Bosnia and Herzegovina
ICT Business Indicators	Ukraine Israel Turkey	Armenia Bulgaria Kazakhstan Andorra	Kyrgyzstan Rep. Moldova Romania Georgia	Liechtenstein	

Note: The following countries did not assess the demand for household ICT indicators: Albania and FYR Macedonia. The following countries did not assess the demand for ICT business indicators: Albania, Azerbaijan, Belarus, Bosnia and Herzegovina, Croatia, FYR Macedonia and Russian Federation.

containing ICT indicators were also under the responsibility of NSOs.

Ministries responsible for Communication and/or Technology in Israel, Moldova and the Russian Federation were also mentioned as providers of other statistics on the business sector.

The academic sector was involved only in the Russian Federation (Academy of Sciences and State University – High School of Economy).

c. Resources

Most countries in the region (including those of low income level) finance the collection of ICT indicators through their regular NSOs (Table 4.4). The two EU candidate countries (Bulgaria – see Box 4.1 - and Romania) combined their regular budgets with international funds from the European Commission (Eurostat's projects for harmonising the statistical system). The national Romanian Ministry of Communication and Information provided funding from their regularly supported statistical activities, demostrating policy-maker's demand for these types of indicators.

Interestingly, Liechtenstein, a high-income country, reports a low demand for ICT indicators and no financing for the relevant statistical operations. Four other countries of lower-middle income do not have any specific financial source for ICT statistics.

The Ukrainian questionnaire made reference to international co-operation, specifically, collaboration with UNDP in the project 'Innovation springboard: ICT for Ukrainian welfare'.

Table 4.4. Resources for ICT Statistics in Central Asia and CEE Countries by Income Level

Origin of Funds	*Income Level*			
	High Income	*Upper -Middle Income*	*Lower-Middle Income*	*Low Income*
Regular Budget	Andorra Israel		Belarus Bulgaria Georgia Kazakhstan Romania Russian Federation Ukraine Turkey	Moldova Kyrgyzstan
National Cooperation			Romania	
International Cooperation			Romania Bulgaria Ukraine	
No Financing Available	Liechtenstein		Albania Armenia Azerbaijan Bosnia & Herzegovina	

Note: Multiple options are allowed. Information is not available for Croatia.

Box 4.1. PHARE activities in the field of ICT statistics in the EU candidate countries

The European Union-funded PHARE programme supports the statistical systems of the candidate countries through national and multi-country programmes. During the process of integration into EU, Bulgarian NSOs have benefited from PHARE support for the implementation of ICT surveys in accordance with the Eurostat recommendations.

The National Statistical Institute of Bulgaria, in co-operation with the European Union, conducted a Survey on Information and Communication Technologies Usage in Households 2004 according to Eurostat requirements (European Community Directives and Regulation No 808/2004 of the European Parliament).

The observation units considered in the survey are households and their members aged between 16 and 74 years. The universe did not include collective households and one-member households, comprising persons less than 16 years old and above 74 years old. The sample covered 4.614 households in total (10.150 persons) from different regions in Bulgaria. A stratified two-stage sampling strategy was applied, with primary sample units used as the statistical districts and households, the secondary sample units. Questionnaire forms for households and individuals were used separately. Geographical strata are defined by the administrative divisions of the country.

The questionnaires for households and persons include 27 main questions in total, combined into four modules:

- Households (Module A) - access to information and communication technologies ;
- Persons (Modules B, C and D): Usage of Information and communication technologies; usage of Internet; Internet trade.

The available disaggregations of data include age, sex, highest level of educational degree and different types of person's employment, as well as habitat (rural urban).

d. Definition of ICT

There is a high proportion of countries in the region with a formal definition of ICT (53%) and up to 71% of countries may have one in the near future, since Azerbaijan, Georgia and Kazakhstan are developing one (Table 4.5). The efforts toward harmonisation have been facilitated by the existence of regional organisations with competence in statistics (OECD, Eurostat, CIS-Stat). These organizations have had an impact in the use of formal definitions: some countries in the region apply the Eurostat definition (Bulgaria) while others (Israel) use the OECD definition of the ICT sector.

Out of the five countries without a definition, the following two reported low or no demand for ICT in household statistics, and did not identify financing sources for undertaking the necessary operations: Armenia and Bosnia and Herzegovina.

Table 4.5. Existence of an ICT Definition in Central Asia and Central and Eastern European Countries

Country List	*Status of Definition*		
	No Definition	*Definition in Preparation*	*ICT Definition Applied*
Albania	X		
Andorra			X
Armenia	X		
Azerbaijan		X	
Belarus			X
Bosnia & Herzegovina	X		
Bulgaria			X
Georgia		X	
Israel			X
Kazakhstan		X	
Kyrgyzstan			X
Liechtenstein	X		
Moldova			X
Romania			X
Russian Federation			X
Turkey	X		
Ukraine			X
All countries in the region (%)	**5 (29%)**	**3 (18%)**	**9 (53%)**

Note: Only answers to the metadata questionnaire are considered (missing information for Croatia).

e. Dissemination of ICT Statistics

A large number of publications on ICT indicators are available in the region, both on households' and businesses' access and usage (Tables 4.6 and 4.7), and data with the reference periods 2004, 2003 and 2002, exist in almost all countries in the region. Countries that use multi-purpose household surveys or specialised surveys (income and expenditure, labour force) publish results annually (Armenia, Azerbaijan, Israel, Ukraine). Several countries disseminate shorter-term household budget data (Belarus, Georgia, Russian Federation).

In the domain of business access and ICT usage, Armenia and Belarus disseminate monthly information about the ICT sector.

Romania and Ukraine are the only two countries in the region where specific business surveys on ICT are carried out annually. Israel, where a generic manufacturing survey is used to collect ICT indicators, also reports annual periodicity.

Based on the results of the questionnaire 8 out of 18 countries have a publication with ICT indicators. Five more are planning to publish ICT indicators. The

Table 4.6. Most Recent Date of ICT Collection (households)

Country	*Type of Statistical Operation(1)*	*Number of Collected ICT Variables*	*Most Recent Collection*
Albania	Living conditions survey	35	Spring 2002
Andorra	***Statistics of the Information Society***	***6***	***1st semester 2004 (Annual)***
Armenia	Labour Force survey		September 2003 (Annual)
	Household survey	n.a.	2003, 2002, 2001
Azerbaijan	Household Survey	7	Annual
Belarus	Household Budget Survey	6	2004 (Quarterly)
Bulgaria	***Survey on IT in households and individuals***	***21***	***June 2003***
Croatia	Household Budget Survey	10	2003
Georgia	Household survey	6	January 2004 (Semestrial)
Israel	Household Budget Survey	~100	2002 (Annual)
Kazakhstan	***Form N-020 "Survey of users of internet"***	***10***	
Romania	***Usage of ICT products by households***	***n.a.***	***2004***
Russian Fed.	Household Budget Survey	10	January 2004 (Semestrial)
Turkey	Household ICT usage survey (module of Household Labour Force Survey)	n.a.	June 2004
Ukraine	Living conditions survey	3	October 2003 (Annual)

Note: (1) The surveys have been described as closely as possible given the little amount of information in the questionnaires. Bold rows correspond to ICT-specific surveys.

following five do not have any publication plans: Albania, Croatia, Bosnia and Herzegovina, Liechtenstein and Armenia. Three of these countries, without publications, reported a low demand for ICT indicators.

Table 4.7. Most Recent Date of ICT Collection (Business)

Country	*Type of Statistical Operation(1)*	*Number of Collected ICT Variables*	*Most Recent Collection*
Armenia	Monthly statistical report "Incomes from telecommunication services"	6	June 2004 (Monthly)
Belarus	Monthly Statistical Report "Revenues from Communication Services"	6	June 2004 (Monthly)
Bulgaria	***ICT usage and e-commerce in enterprises***	***36***	***August 2004***
Israel	Manufacturing Survey	4	2001 (Annual)
Kazakhstan	***Form 3-Inform "Survey of use of ICT and production of related products (works and services)"***	***46***	
Kyrgyzstan	State Statistical Reporting	46	June 2004
Moldova	***Level of informatization and equipping with computer techniques***	***53***	***2003***
Romania	***Usage of ICT products by enterprises***	***51***	***2002, 2003, 2004***
Russian Fed.	***Federal Statistical Survey "information on the use of IT and production of related goods and services"***	***150***	***2003***
Ukraine	***National statistical survey on status of informatization***	***24***	***February 2002 (Annual)***

Note: (1) The surveys have been described as closely as possible given the little amount of information in the questionnaires. Bold rows correspond to ICT-specific surveys.

Section 4.3 ICT Indicators in Households in Central Asia and Central and Eastern European countries

a. Sources of Information:

The relatively stronger capacity of the statistical systems in this group of countries (mostly centrally planned economies that emphasized data collection) -with respect to other regions considered in the study- is reflected by the fact that most indicators are produced by household surveys, either adapting multi-purpose surveys, or ad hoc thematic surveys on ICT (Table 4.6).

Table 4.6. Statistical Operations Providing Indicators on ICT in Households in Central Asia and CEE

Type of Operation	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Population and Housing Census				
Multipurpose Household Surveys	Israel	Croatia	Albania Armenia Azerbaijan Belarus Bosnia & Herzegovina Georgia Russian Federation Turkey Ukraine	Kyrgyzstan Republic of Moldova
Ad hoc ICT Household Surveys	Andorra		Bulgaria Kazakhstan Romania	

Type of Operation	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Population and Housing Census				
Multipurpose Household Surveys	Israel	Croatia Russian Federation	Albania Armenia Belarus Bosnia & Herzegovina Georgia Kyrgyzstan Republic of Moldova Turkey Ukraine	Azerbaijan
Ad hoc ICT Household Surveys		Bulgaria	Kazakhstan Romania	

Note: Andorra does not have estimates for the DAI.

Box 4.2. Design and Result of ICT Household Survey in Turkey (Information Technologies Diffusion and Usage Survey)

The *Information Technologies Diffusion and Usage Survey - (ITDUS) 2000* was designed to gather data on ownership and usage characteristics of ICT users in Turkey. The Scientific and Technological Council of Turkey conducted the research in collaboration with academicians from Faculties of Communications.

The survey, whose sample was designed by the State Institute of Statistics, is representative of the urban population living in households (about 65 percent of all households). This may overestimate the availability in the national territory, since the rural population has traditionally more serious limitations in terms of diffusion and usage of ICT. The high cost of implementing the survey in rural areas was a major factor for not including them. ITDUS-2000 was based on a sample size of 6.000 households. The sample covered 65 provinces and 168 sub-provinces and was selected with a two-stage multi-stratified random block sampling.

The survey contained questions designed to measure characteristics of usage and ownership of ICT goods and services:

- Availability of telephone, mobile telephone, personal computer, Internet, TV/digital TV/ cable TV, other ICTs (fax, DVD)
- Expenditures (according to latest invoices/payments)
- Satisfaction/quality
- Usage: knowledge, location, purpose, frequency, barriers to use, services)

The profile variables used to disaggregate indicators include income, education, age, region, marital status and gender.

Use of Population and housing Censuses

No countries in the region reported the production of ICT indicators from Censuses.

Use of general household surveys

In the region, the majority of countries – independently of the income level and Digital Access Index - produce household ICT indicators by adding specific modules or ICT-related questions to multi-purpose household surveys. The existence of a strong statistical history in most of these countries ensures an easier implementation of this type of data collection with a periodicity higher than population censuses.

ICT modules have been included in different types of household surveys used in the region: *household budget surveys* (to record incomes by types and expenditures by products), *labour force surveys* (instruments that record the situation with respect to labour, type of employment, education level, and related topics) and *living condition surveys*, which consist of separate modules that may cover the topics listed before and others such as health, security, etc.

The periodicity of household surveys in the majority of countries in the region makes this particular instrument very useful for measuring the rapid changes of the Information Society. It has to be noted, however, that quality characteristics of the indicators produced from household surveys depend on the design of the survey (stratification, sampling method) and the availability of up-to-date sampling frames (listings of households by statistical districts). Also, the inclusion of a module on ICT may preclude the inclusion of other topics of interest in order to maintain the questionnaire length.

Use of specific ICT household surveys

Four countries in the region have implemented specific household surveys on ICT (Andorra, Bulgaria, Kazakhstan and Romania), according to the metadata questionnaire (see also Box 4.1).

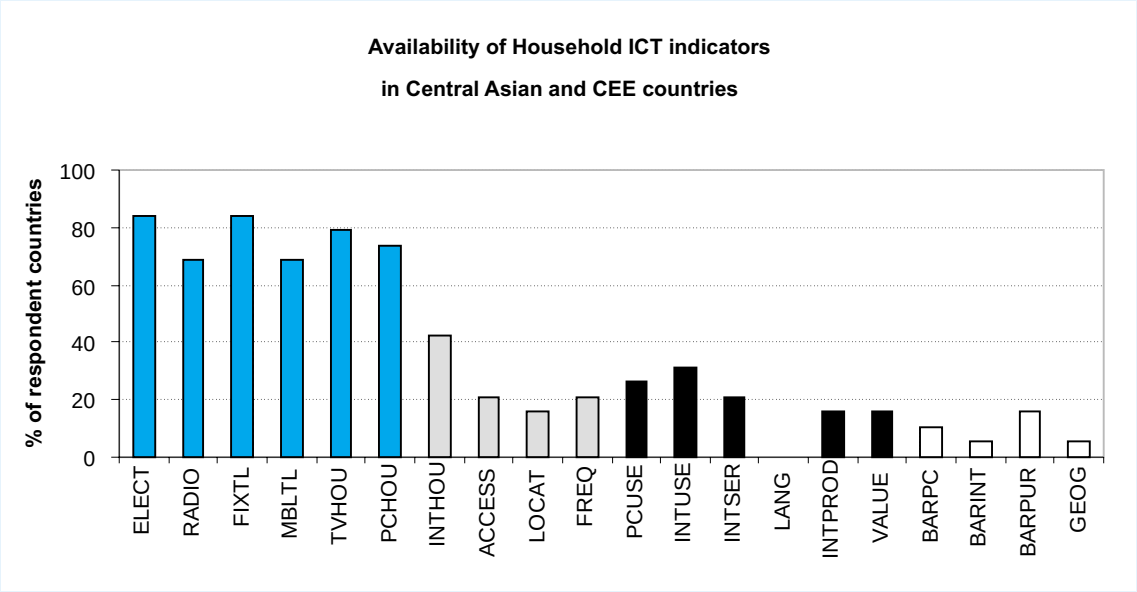
The use of classification variables both for individuals and households permits a breakdown of ICT indicators across the socio-economic and demographic groups thereby allowing an investigation of the 'digital gap'.

b. Availability of ICT Indicators

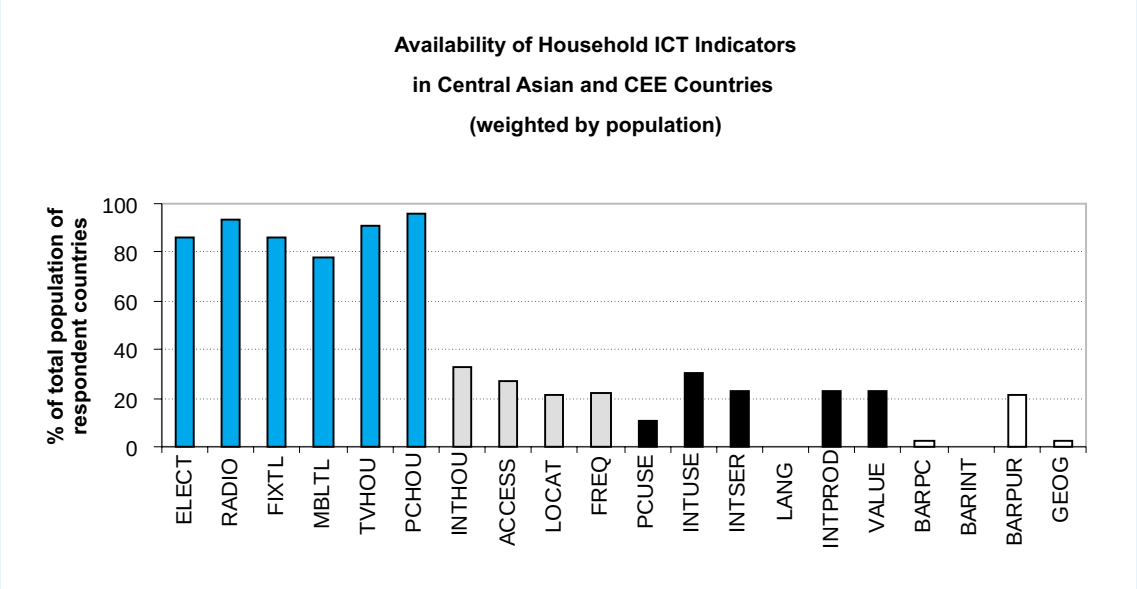
The availability of indicators about basic access to ICT is high ranging between 68% and 84% of the respondent countries, representing 78% to 96% of the total population[1] in the region. The *presence of Internet* indicator is an exception as it is available in only 42% of respondent countries covering 33% of the population (see Graphs 4.2 and 4.3):

[1] The figures refer to the countries that responded to the questionnaire. The absence of the indicator presence of electricity in the household in Ukraine should be reviewed, given that this is the third largest country (in terms of population).

Graph 4.2.



Graph 4.3.

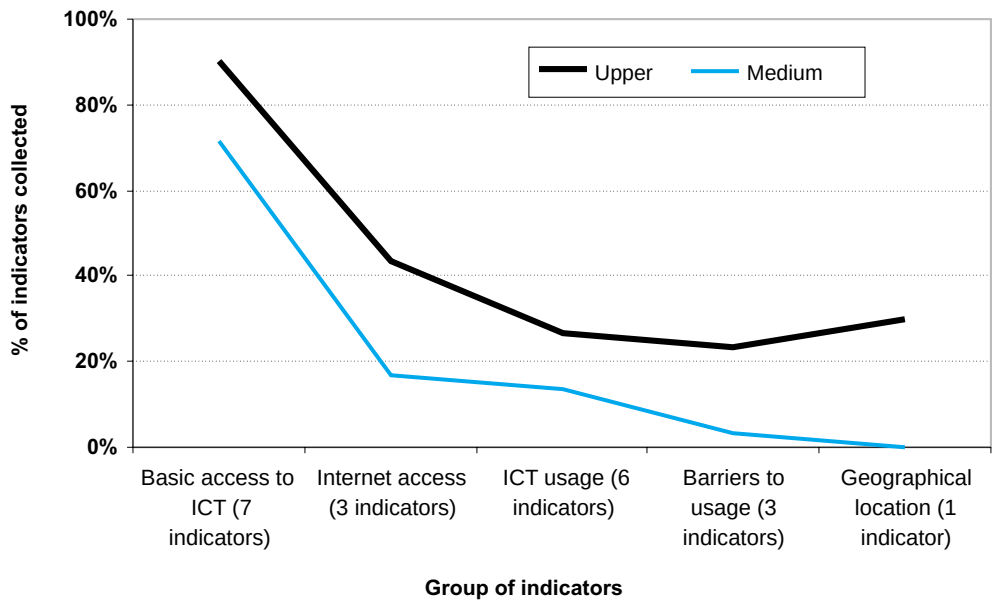


The indicators on *usage of Internet* are available in about 20% of respondent countries, also covering about 20% of the total population. The indicator with the greatest availability is *purpose of Internet use*.

The remaining indicators are available in less than 20% of the cases. The presence of *languages of the visited Internet sites* and *barriers to Internet usage* is particularly low.

Azerbaijan, Liechtenstein, Macedonia (FYR) and Ukraine have a particularly low level of availability of ICT household indicators. Georgia, Kazakhstan and the Russian Federation reported a high demand for

Graph 4.4. Availability of ICT Household Indicators by Group and Digital Access Level



ICT household indicators even though they are not yet available. There are plans for improving the availability of ICT household indicators in Armenia, Bosnia and Herzegovina, Georgia, Kazakhstan and Romania. Unfortunately, no financing has been identified for two of those countries.

It is interesting to recall that the availability of household ICT indicators is strongly correlated with the level of digital access, as shown in Table 4.9 and Graph 4.4. Countries with upper digital access[2] have a higher proportion of the 20 indicators included in the questionnaire: 10,4 out of 20 on average for upper digital access countries, 6,4 for medium digital access. The availability decreases with the more specific indicators on new technologies (*basic access* > *Internet access* > *ICT usage* > *Barriers to usage*) for all the digital access levels.

Table A4 in the Annex gives detailed information about the availability of ICT household indicators at the country level.

c. Disaggregations of Household ICT Indicators

Household surveys providing ICT indicators are prevalent in the region. Indeed, the international survey *Living Standards Measurement Survey* (LSMS) has been applied in several countries (Albania, Armenia, Azerbaijan, Bosnia & Herzegovina, Bulgaria…). This survey records (with some country differences) the presence in households of durables and utilities such as electricity, TV, radio and telephone (fixed and mobile), computers, together with some expenditure in ICT (such as the telephone bill). All disaggregations available in *LSMS* apply to ICT indicators provided by this survey.

The same conclusion is valid for ICT modules included in household surveys (*household budget* or *labour force*), since they record the basic demographic characteristics of individuals and households. These surveys allow disaggregating the indicators by basic personal characteristics (age, gender, education) and

[2] Israel and Azerbaijan were omitted from the graphical analysis, as they were the only countries with high and low digital access level respectively

Table 4.9. Availability of ICT Household Indicators by Digital Access Level (number of indicators in each group)

Indicator Group	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*LowAccess*
Basic access to ICT (7 indicators)	6/7	6,3/7	5/7	3/7
Internet access (3 indicators)	0/3	1,3/3	0,5/3	0/3
ICT usage (6 indicators)	5/6	1,6/6	0,8/6	0/6
Barriers to usage (3 indicators)	0/3	0,7/3	0,1/3	0/3
Geographical location (1 indicator)	0/1	0,3/1	0/1	0/1
TOTAL: Household ICT indicators	**11/20**	**10,4/20**	**6,4/20**	**3/20**

profession/ economic activity (see Box 4.3 on the gender perspective for ICT indicators in the region). Only Israel mentions that ethnicity can be used as a classification variable (Table 4.10).

Box 4.3. Gender Perspective in ICT Surveys in the ECE region

The interest of investigating the 'gender divide' within the 'digital divide' requires disaggregating the ICT indicators by sex, as well as employing gender-sensitive methodology and analysis ("Statistics on Women and Men and ICT: the ECE Region", document prepared by the Statistical Division of UNECE for the Geneva Workshop, December 2003).

Through a questionnaire to NSOs in the ECE region, UNECE assessed that in 19 countries there was some availability of ICT indicators disaggregated by sex, mainly in EU countries and North America, in about 30% of accession and candidate countries, but scarcely in the Balkan and CIS countries. According to the report, Ukraine carried out the *People's Security Survey* in 2001 (in collaboration with ILO and UNDP) where two ICT-related questions (on basic access to computers) were introduced.

The primary source for these indicators are household surveys that record personal characteristics and ICT questions related to access, use and knowledge of ICT.

UNECE Statistical Division acknowledges that specialized data collections on ICT are difficult to implement in countries with limited statistical resources. And secondly, more efforts should be made to develop short ad hoc modules to be included in ongoing surveys, in order to ensure that ICT data with respect to social conditions and factors are collected.

Table 4.10. Disaggregations for ICT Indicators from General Household Surveys in Central Asia and Central and Eastern European Countries

Country List	*Classification Variables*							
	Age	*Gender*	*Education*	*Income/ expenditure level*	*Location*	*Ethnicity*	*Economic activity*	*Health status*
Albania	X	X	X	X	X		X	X
Andorra †	X		X				X	
Armenia	X	X	X		X		X	
Azerbaijan	(3)	(3)	(3)	(3)	(3)		(3)	(3)
Belarus	X	X	X	X	X		X	
Bosnia & Herzegovina	(3)	(3)	(3)	(3)	(3)		(3)	(3)
Bulgaria †	(3)	(3)	(3)	(3)	(3)		(3)	
Croatia			(1)	X				
Georgia	X	X	X	X	X		X	
Israel	X	X	X	X	X	X	X	
Kazakhstan †	X	X	X					
Kyrgyzstan	X	X	X	X	X		X	(2)
Liechtenstein								
Moldova	X	X	X	X			X	X
Romania †				X	X			
Russian Federation	X		X	X	X		X	
Tajikistan	(3)	(3)	(3)	(3)	(3)		(3)	(3)
Turkey †	X	X	X	X			X	
Ukraine	X	X	X	X			X	
Total	**16**	**14**	**17**	**15**	**12**	**1**	**15**	**6**

Notes:
- Only answers to the metadata questionnaire are considered
- † Specific surveys on ICT in households exist
- (1) Croatia mentions 'socio-economic status'
- (2) Kyrgyzstan mentions 'anthropometric data'
- (3) means that the country has carried out an LSMS survey and that the ICT indicators provided may be disaggregated by the variables included in that survey

Section 4.4 ICT Indicators in Business in Central Asia and Central and Eastern European Countries

a. Sources of Information

The majority of countries that collected at least one of the 20 indicators specified in the questionnaire completed specific ICT surveys (Table 4.11). Since NSOs were responsible for data collection in all the cases, it can be assumed that they relied upon readily available statistical infrastructure such as enterprise directories, sampling strategies already tested or, questionnaire designs and other technical skills.

Use of economic censuses

No economic censuses have been used in the region for investigating ICT in businesses. This is reasonable due to the large industrial sector in the region, that would make this kind of source very expensive and unspecific.

Use of generic business surveys

In the region, there is a tradition of using surveys for the manufacturing sector that investigate industry inputs and outputs. These kinds of surveys can also be used to collect ICT indicators. This is the case with Israel, whose *Manufacturing Survey* collects 4 ICT-related variables out of 25 in the survey, and Kyrgyzstan, where a larger number of ICT variables (46) are recorded in the *State Statistical Reporting*.

Surveys to the ICT sector

Armenia and Belarus have carried out surveys on the ICT sector, specifically on revenues in the communications sector. While the development of ICT in this sector is important, it does not reflect the extension of the Information Society across the business sector.

Use of specific ICT surveys

Bulgaria, Kazakhstan, Moldova, Romania, the Russian Federation, and Ukraine completed specific surveys for collecting ICT indicators in the business sector.

Table D4 of the Annex gives a crosstabulation of the statistical operations used and indicators collected for countries in the region.

b. Availability of ICT Indicators

The availability of indicators is medium and covers the economies representing 50%-60% of the regional GDP[1]. For indicators on *basic access to ICT,* the coverage in terms of the economic size is 60%. The indicators *presence* and *number of computers* are available in only 32% of responding countries, however they account for up to 54% of the total GDP.

Indicators on *advanced ICT access and usage* are less available (between 26% and 37% of the respondent countries, representing between 13% and 55% of the economy). The availability of the two indicators *type of Internet access* and *presence of a local network* is lower, due to the fact that the Russian Federation does not collect them.

The availability of indicators about *Internet activities and e-commerce* is lower, accounting for between 11% and 21% of the respondent countries but almost 50% of the regional GDP, with the exception of the indicator

[1] The lack of information about indicator availability in Turkey and Israel should be reviewed since they represent a high proportion of the regional GDP.

Table 4.11. Statistical Operations Providing Indicators on ICT in Business in Central Asia and CEE Countries

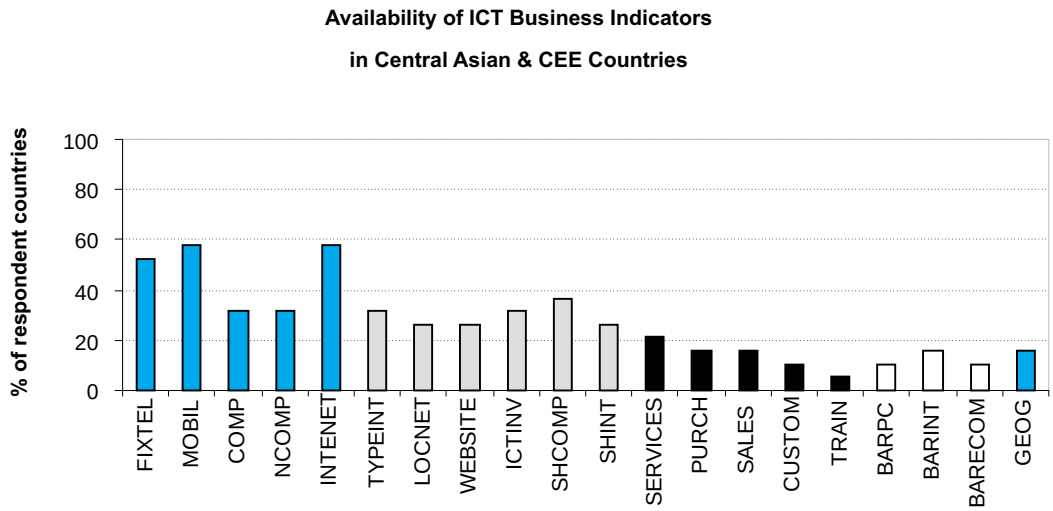
Type of Operation	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Economic Census				
General Enterprises Surveys	Israel			Kyrgyzstan
Ad hoc ICT Surveys			Armenia (1) Belarus (1) Bulgaria Kazakhstan Russian Federation Romania Ukraine	Republic of Moldova

(1) Armenia and Belarus mention statistical operations referring to the ICT sector as an economic activity

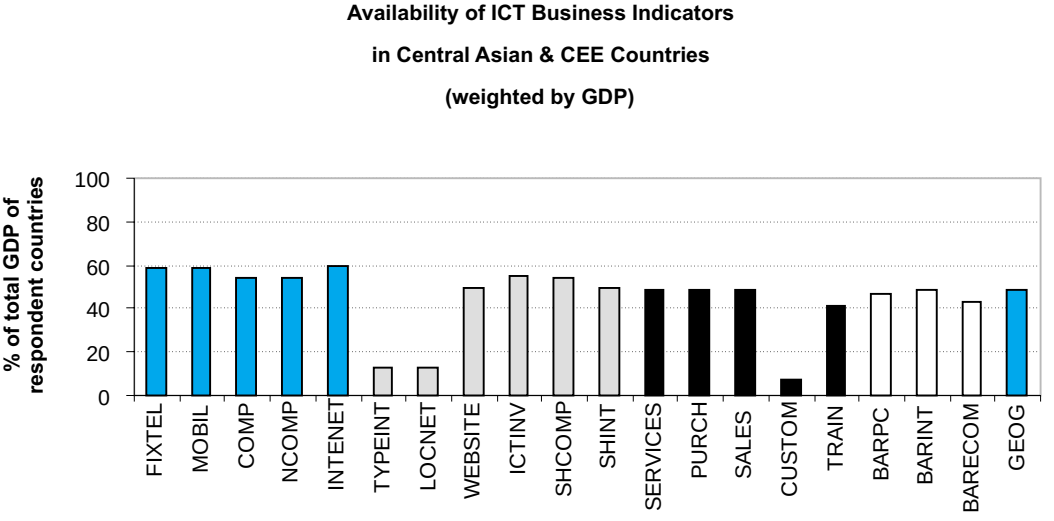
Type of Operation	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Economic Census				
General Enterprises Surveys	Israel		Kyrgyzstan	
Ad hoc ICT Surveys		Bulgaria Russian Federation	Armenia Belarus Republic of Moldova Kazakhstan Romania Ukraine	

customer groups - available only in Bulgaria and Romania - which covers 7% of the total GDP of respondent countries and where Eurostat type questionnaires were used.

Graph 4.5.



Graph 4.6.



The indicator *ICT training* is only available in the Russian Federation.

Indicators about *barriers to ICT* and *geographic location of sales* have been collected only in Bulgaria, Romania and the Russian Federation (which account for almost half of the regional economy).

Andorra and Kazakhstan, two countries very different in size and economic profile, have prospects to increase the availability of indicators on *Internet activities and e-commerce* for the next three years.

It has to be mentioned that the metadata about Western Balkan countries' (such as Bosnia and Herzegovina, Croatia, Macedonia FYR and Serbia and Montenegro) indicators is very scarce and of little use for the stocktaking exercise.

c. Disaggregations of ICT Business Indicators

There is little metadada information about the classification of variables used in the surveys collecting ICT indicators in the region (Table 4.12). The size of firm is the most common classification variable for disaggregating indicators. Economic activity, key to defining the ICT sector, is available in Bulgaria, Moldova and Romania according to the questionnaire. No countries mention the juridical form of the firm as a relevant classification field.

Table 4.12. Classification Variables for the Business ICT Indicators in Central Asia and Central and Eastern Europe

Country	*Observation Unit*	*Economic Activity*	*Size (employees)*	*Size (Turnover)*	*Location*	*Juridical form*
Bulgaria	enterprise	X	X			
Moldova	juridical persons	X	X		X	
Israel	Establishments		X	X		
Kyrgyzstan	enterprise institutions		X		X	
Ukraine	juridical persons and their substructures				X	
Romania	enterprises	X	X			

Section 4.5 ICT Indicators in other Sectors in Central Asia and Central and Eastern European Countries

Additional potential sources of information on ICT indicators in the region, identified in the stocktaking exercise, and have been analysed in this chapter (See Table 4.13). Basically, these additional sources consist of statistical operations completed by NSOs in Armenia, Bulgaria, Israel, Moldova, Romania and the Russian Federation, and by the Department responsible for Information Society in Andorra.

The most investigated topics are education and foreign trade. Given the generally high level of education in the region, it may be useful for countries to examine the impact of ICT on education.

Table 4.13. ICT Statistics in Other Sectors in Central Asia and Central and Eastern European Countries

Domain	*Countries*
Supply, demand and trade in ICT products	Andorra Armenia Moldova (Foreign trade of ICT products) Israel
ICT sector	Andorra Armenia (computer services)
ICT in education	Andorra Armenia Bulgaria Romania Russian Federation
ICT in government	Bulgaria Romania
ICT investments	Armenia (Foreign investment)

Key issues on the availability of ICT indicators in Central Asia and Central and Eastern European countries

- **Metadata collection:** The non-response to the questionnaire is concentrated in Central Asian countries (*Tajikistan*, *Turkmenistan* and *Uzbekistan*), which are classified as lower-middle or lower income and, with medium or low digital access. Results on ICT indicators availability are probably overestimated in the region. Very little information is available about ICT indicators in the *Western Balkan* countries.

- **Data sources:** *Population and housing censuses* and, *economic censuses* are not a source of ICT indicators in the region. A majority of countries used *multi-purpose household surveys* and added specific ICT-related questions or modules. *Specific surveys on ICT* have been completed in the household sector in a few countries from the region, while this was the most used instrument to collect indicators on the business sector. Other statistical surveys of the NSOs provide information on ICT in other fields, basically the education sector and foreign trade in ICT products.

- **Resources:** Four countries in the region did not identify financing sources for ICT statistics, while others have benefited from specific international co-operation for the strengthening of their statistical system on ICT. Countries reporting very high demand for household ICT indicators have satisfied their needs. This is not true for many countries with a high demand such as *Georgia*, *Kazakhstan*, the *Russian Federation* and *Ukraine*. The latter two countries should be a regional priority due to the size of their population. Two countries, *Bulgaria* and *Romania*, candidates to EU membership, benefited from the PHARE Programme.

- **Key gaps in ICT indicators:** Indicators on basic access to ICT by households are available in most countries, except *presence of Internet* that only covers 1/3 of the regional population. Indicators on *access to and usage of Internet* are available only in 20% of the countries (covering 20% of the population). Other indicators are marginally calculated. For the business sector, indicators on *basic access* cover about 60% of the regional economy. Indicators on *advanced ICT access and usage* are available in one-third of countries. In particular, the lack of the indicator - *presence of Internet access in the firm* - in the Russian Federation reduces the global availability in the region. Other indicators are marginally available.

Chapter 5. Status of ICT Indicators in Western Asia

Section 5.1 Notes on the Regional Data Collection

a. Geographic Coverage of the Response to the Questionnaire

The stocktaking exercise on ICT sources and indicators in Western Asia was coordinated by the Economic and Social Commission for Western Asia (ESCWA), who translated the metadata questionnaire into Arabic and sent it to the thirteen member countries (see Table 5.1 for a classification of countries by income and digital access level[1]). Egypt, a member of both ESCWA and the Economic Commission for Africa (ECA), was included in this exercise, accounting for the largest population in the region.

The region includes middle-income countries, except for Yemen (low income) and four rich oil-producing Gulf States.

A high response rate was obtained, despite the fact that several factors could have hampered the exercise as indicated below by ESCWA:

- There was no prior consultation with the National Statistical Offices (NSOs) to solicit their input on the design of the questionnaire, or to alert them as to how they would be involved in the exercise;
- It was assumed that the questionnaire, together with the explanatory note, was sufficient;
- It was unclear to some of the NSOs at the beginning as to which of their units should have undertaken the assignment as many of the NSOs in the ESCWA region had established technology departments with specific responsibilities.
- The data was collected during the summer.

b. Analysis of Response Rate

Ten countries, corresponding to 77% of the countries, and 83% both of the regional population and the regional GDP (see Graph 5.1), answered the questionnaire. The coverage of the stocktaking exercise in terms of number of countries, proportion of population and of regional GDP is shown in Table 5.2 according to income and digital access level.

All medium and low digital access countries were included in the questionnaire. It is important to note that high income countries in the region, with upper digital access levels, were poorly covered by the exercise (only 42% of the population and 44% of the GDP of that group). No information was collected from Bahrain and the United Arab Emirates.

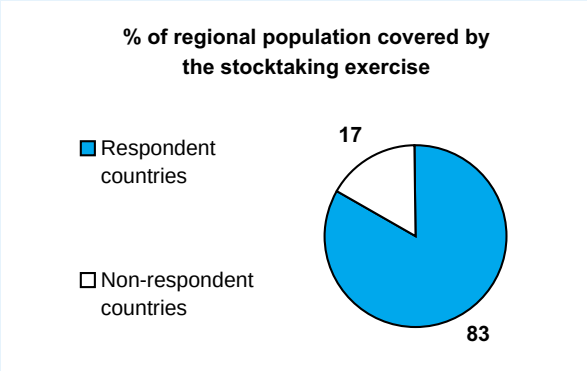
[1] Income levels are defined according to the World Bank classification of countries, based on the GDP per capita in PPPs, while digital access level is based on the ITU's Digital Access Index (DAI) whose methodology is detailed in http://www.itu.int/ITU-D/ict/dai/index.html.

Table 5.1. Country Coverage of the Stocktaking Exercise in Western Asia

Income Level	*Digital Access Level*				
	DAI not available	*High Access*	*Upper Access*	*Medium Access*	*Low Access*
High Income			Bahrain Kuwait Qatar United Arab Emirates		
Upper-Middle Income				Lebanon Oman Saudi Arabia	
Lower-Middle Income	Iraq			Egypt Jordan Palestine	Syrian Arab Republic
Low Income					Yemen

Note: 10 out of 13 countries to which the questionnaire was sent, answered. They are shaded in the table above.

Graph 5.1. Coverage of the Stocktaking Exercise in Terms of Population and GDP Share in Western Asia



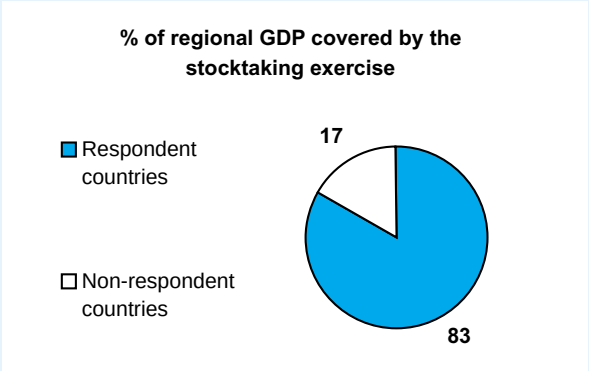


Table 5.2. Coverage by Income and Digital Access Group (%)

Income	*Countries*	*Population*	*GDP*
High Income	50,0	42,2	44,4
Upper-middle income	100,0	100,0	100,0
Lower-middle income	80,0	78,9	87,4
Low income	100,0	100,0	100,0
Total	**76,9**	**83,2**	**83,1**

Digital Access Level	*Countries*	*Population*	*GDP*
Upper access	50,0	42,2	44,4
Medium access	100,0	100,0	100,0
Low access	100,0	100,0	100,0
No information	0,0	0,0	0,0
Total	**76,9**	**83,2**	**83,1**

Section 5.2 Institutional Environment for ICT Indicators in Western Asia

a. Demand for ICT Statistics in Western Asia

According to the results of the metadata questionnaire as shown in Table 5.3, the demand for ICT household indicators is generally higher than for the ICT business indicators in every country in the region (an exception is Saudi Arabia, where the interest for indicators for households is low while for business it is high).

The countries with very high and high demand for ICT indicators have taken measures to address their needs: several indicators on ICT usage are available in Jordan, while Kuwait, Qatar and the Syrian Arab Republic are planning to collect more indicators in the near future.

Both Palestine, which shows a medium level of demand for ICT household indicators, and Lebanon, where demand is low, have the current largest availability of ICT usage indicators.

No obvious relationship between digital access level and level of demand for indicators can be deduced.

It has to be mentioned that the the stocktaking exercise had a positive effect on the demand for ICT indicators.

b. Institutions Collecting ICT Data in Western Asia

From an institutional viewpoint, ESCWA member countries' interest in ICT statistics is reflected in the creation of a Regional Technical Working Group on ICT indicators following the 6th Session of the ESCWA Statistical Committee (October 2004). This was endorsed during the ESCWA 23rd Ministerial Session (May 2005). The Committee stipulated that government statistical offices in ESCWA member countries be the principal source for the collection, processing and dissemination of the indicators.

Thirty-three statistical operations have been listed in the stocktaking exercise, each collecting at least one ICT indicator. All countries mention their National Statistical Offices as the main institution responsible for ICT indicators. In Oman and Qatar, the Ministry of National Economy and the Planning

Table 5.3. Demand for ICT Statistics in Western Asia

Demand Level	*Demand Level*				
	Very High	*High*	*Medium*	*Low*	*No Demand*
ICT Household Indicators	Jordan	Syrian Arab Rep. Egypt Kuwait Oman	Palestine Qatar Yemen	Saudi Arabia Lebanon	
ICT Business Indicators		Saudi Arabia Egypt Kuwait Oman	Qatar Syrian Arab Rep. Jordan		Palestine

Council respectively play the role of the statistical office[1].

c. Resources

There is little information about financial resources for ICT indicators in Western Asian countries (Table 5.4), and only from lower-middle income countries. Egypt, Jordan, Oman, Qatar and Yemen finance the operations with their regular budgets, while the Syrian Arab Republic combines regular funds and international cooperation, and Palestine draws from national and international sources. No financing is available in Kuwait and Lebanon.

d. Definition of ICT

A high proportion (two thirds) of Western Asian countries responding to the questionnaire already have a formal definition of ICT. Lebanon is the only country with no definition (according to the metadata questionnaire) with a low demand for ICT household statistics. (Table 5.5).

It is interesting to mention that Kuwait is developing a formal definition of ICT, but Lebanon, where the availability of indicators on Internet usage is relatively higher, does not have such a definition.

Table 5.4. Resources for ICT Statistics in Western Asia by Income Level

Origin of Funds	*Income Level*			
	High Income	*Upper -Middle Income*	*Lower-Middle Income*	*Low Income*
Regular Budget	Qatar	Oman	Egypt Jordan Syrian Arab Republic	Yemen
National cooperation			Palestine	
International cooperation			Palestine Syrian Arab Republic	
No financing available	Kuwait	Lebanon		

Note: Multiple options are allowed. No information is available for Saudi Arabia.

[1] According to the database prepared by ESCWA and containing the responses to the metadata questionnaire.

Table 5.5. Existence of an ICT Definition in Western Asia

Country List	*Status of Definition*		
	No Definition	*Definition in Preparation*	*ICT Definition Applied*
Egypt			X
Jordan			X
Kuwait		X	
Lebanon	X		
Oman			X
Palestine			X
Qatar			X
Syrian Arab Rep.			X
Yemen		X	
All respondent countries in the region (%)	**1 (11%)**	**2 (22%)**	**6 (67%)**

e. Dissemination of ICT Statistics

There is no information on publications for disseminating ICT indicators from the metadata questionnaire.

The reference period to statistical operations for collecting ICT indicators is listed in Tables 5.6 and 5.7 which show the last implementation dates.

Population and housing censuses incorporating ICT indicators are recent except in the case of the most populous country, Egypt (1996), a fact that possibly invalidates the relevance of ICT variables collected during that period for current uses. Interestingly, eight ESCWA countries will carry out general population censuses in the next 5 years: Egypt (2006), Palestine (2006), and six Gulf countries (2010).

Household surveys incorporating ICT indicators in Jordan, Lebanon, Palestine and the Syrian Arab Republic are recent (2003 and later).

In the case of business sources, Oman, Palestine and Qatar have carried out recent censuses or surveys (2003-2004). The *Industrial Query*, an annual publication from the Syrian Arab Republic,

Table 5.6. Most Recent Date of ICT Data Collection (households)

Country	*Type of Statistical Operation*	*Number of Collected ICT Variables*	*Most Recent Collection*
Egypt	Population and Housing Census	5	1996, 1986
	Statistics Bulletin on Telecommunications	n.a.	1999-2003 (Annual)
	Income and expenditure survey	6	2000, 1995
Jordan	Several family census	10	2003, 1997
	Income and expenditure survey	5	2002,1997,1992, 1986
	General census for population and households for 2004	7	2004
Lebanon	Lebanese Family Health Survey	6	2004
	Children Status in Lebanon	5	2000
	Family Living Status	89	2004
	Establishments and Institutions	4	2004
Oman	Population and Housing Census	4	December 2003
Palestine	Several family census	8	2004
	Census of news means	***30***	***June 2000***
	Census of personal computers and the Internet	***80***	***July 2004***
Qatar	Population and Housing Census	1	2004, 1997, 1986
Saudi Arabia	Population and Housing Census	6	2004, 1992
	Demographic survey	1	October 2000
Syrian Arab Republic	Labour Force Survey	n.a.	1999-2003 (Annual)
	Family Health	n.a.	2000
	Income and expenditure survey	n.a.	2003, 1996

Note: Bold rows correspond to ICT-specific surveys.

has not registered ICT variables yet, but projects using ICT variables in the future, which may increase dramatically the timeliness and relevance of figures in this country.

The economic census in Egypt shows a time lag which is again too large to provide relevant figures for current uses. However, the survey on *PC statistics*, collecting four indicators, was carried out five years ago.

Table 5.7. Most Recent Date for ICT Collection (business)

Country	*Type of Statistical Operations*	*Number of Collected ICT Variables*	*Most recent collection*
Egypt	Establishments Census	6	1996-1986
	Electronic Computers Statistics	***4***	***2000***
Oman	Census	3	December 2003
Palestine	Series of economical census	2	2001-2004 (Annual)
	Administrative records	8	2000-2004 (Annual)
Qatar	Establishments Census	2	2004, 1997, 1986
Syrian Arab Republic	Industrial Query	n.a.	1999-2003 (Annual)

Note: Bold rows correspond to ICT-specific surveys.

Section 5.3 ICT Household Indicators in Western Asia

a. Sources of Information

Three different sources of statistical information about ICT in households were reported in the metadata questionnaire: population and housing censuses, household surveys with a limited number of ICT related questions and finally, in the case of Palestine, a specific survey on ICT in households (Table 5.8).

Table 5.8. Statistical Operations Providing Indicators on ICT in Households in Western Asia

Type of Operation	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Population and Housing Census	Qatar	Oman Saudi Arabia	Jordan Palestine	
Multipurpose Household Surveys		Lebanon	Egypt Jordan Syrian Arab Republic	
Ad hoc ICT Household Surveys			Palestine	

Note: Multiple options are allowed.

Type of Operation	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Population and Housing Census		Qatar	Jordan Oman Palestine Saudi Arabia	
Multipurpose Household surveys			Egypt Jordan Lebanon	Syrian Arab Republic
Ad hoc ICT Household Surveys			Palestine	

Note: Multiple options are allowed.

Use of Population and Housing Censuses

Egypt, Jordan, Oman, Palestine, Qatar and Saudi Arabia have collected at least one ICT indicator through the population and housing census. In all cases, the collected indicators are in the group of *basic access to ICT* in households. Oman and Saudi Arabia only collect the *presence of electricity* indicator. Egypt and Palestine collect the same indicators through household surveys with a higher frequency.

The high cost of population and housing censuses renders them an inadequate source of data on the rapidly changing ICT environment. However, they provide very detailed information for the variables collected.

This type of source has been used in countries independently of their income levels.

Use of general household surveys

Household surveys based on a representative sample of the population have been used to collect some ICT-related data, principally on *basic access to ICT* (Egypt, Jordan, Lebanon and Syrian Arab Republic). The survey in Lebanon also included *ICT usage* variables such as *purpose of computer* and *frequency of Internet use*, and *concrete services / activities for which the Internet is used*. The Multi-Purpose Household Survey in Jordan included a question on *use of Internet*, and the Household Budget Survey included questions on the expenditure in telephone and Internet, as well as on equipment of different ICT goods.

Some of the other purposes for which surveys are used include: *household budget surveys, living conditions surveys* and *demographic and health surveys*.

The number of ICT indicators collected via this type of statistical tool is between four and seven.

Use of Specific ICT Household Surveys

Palestine is the only country in the region that has implemented specific ICT surveys . Up to 80 ICT-related variables were included. The households included in the survey were used to carry out a new, more specific ICT survey (see Box 5.1). The first survey covered the indicators on *basic access to ICT, ICT usage* and *barriers to usage.*

b. Availability of ICT Indicators

Table A5 in the Annex shows that indicators on *basic access to ICT* by households are available in the majority of countries in Western Asia. Kuwait and Yemen have plans for collecting them next year. Saudi Arabia – where demand for ICT in households indicators was reported as low - is the country in the region that reported the lowest availability of those indicators.

Taking into account the population of the countries covered by the available indicators, the picture is even more unclear. Except for *basic access to ICT* indicators, the remaining indicators cover less than 10% of the regional population (see Graphs 5.2 and 5.3)

A limited number of indicators on *access to Internet and barriers to its use* are available in Jordan, Lebanon and Palestine. Countries with plans for collecting them in the near future include: Egypt, Kuwait and Qatar (two of the upper digital access countries) and the Syrian Arab Republic, a low digital access country, but responsive to the high demand for household indicators.

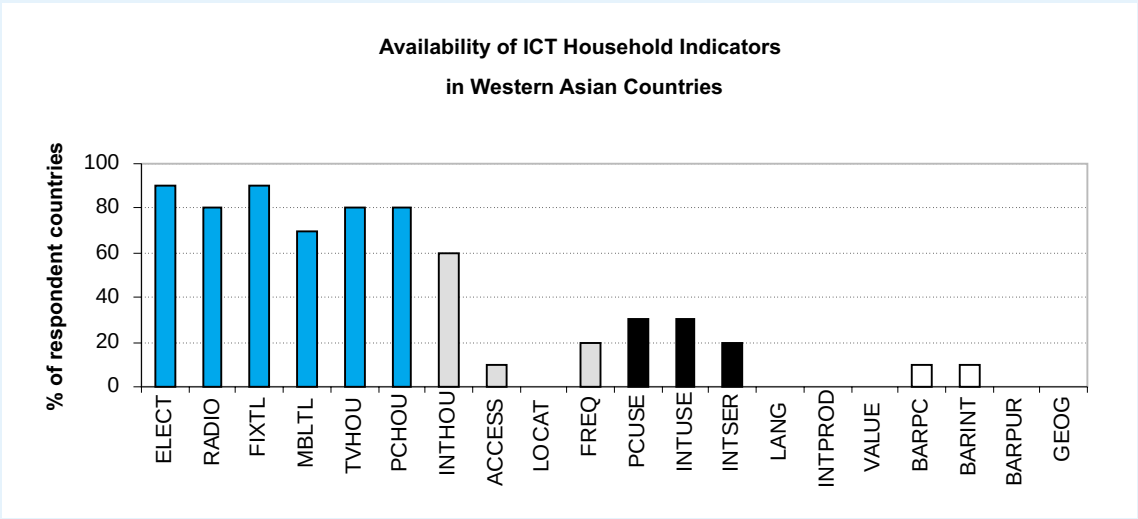
Box 5.1. Assessment of Direct Internet Project-2005 by the Palestinian Central Bureau of Statistics

The implementation of a specific ICT household survey in Palestine in 2004 has led to another, more specific one in 2005, dealing with access to Internet, speed of data download, cost of connection hours, degree of benefit, problems faced and suggestions for development.

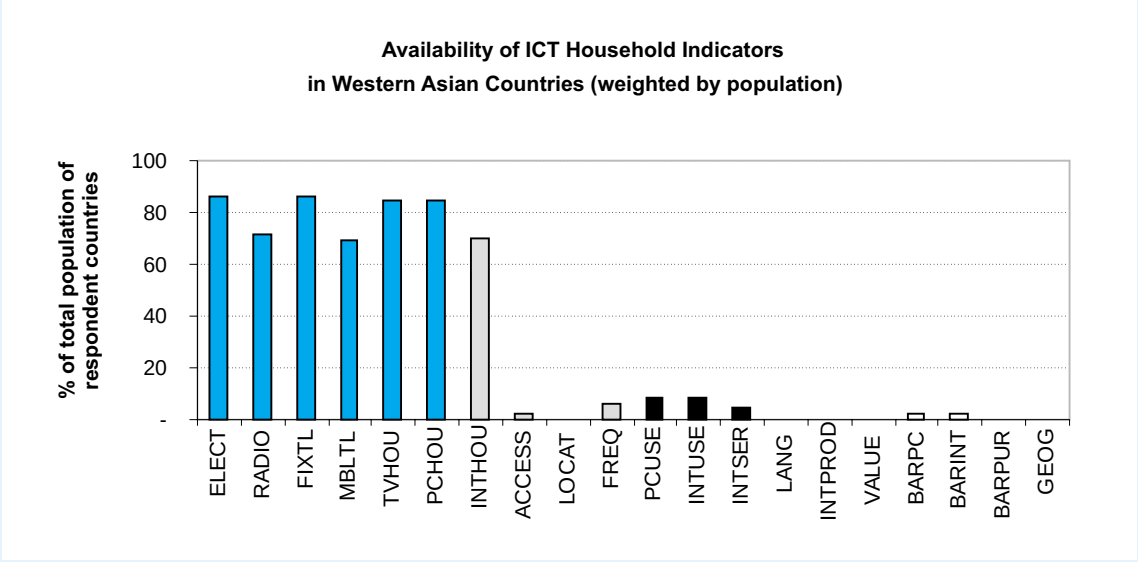
The sampling frame for the *Direct Internet Connection Survey 2005* was designed based on the main findings of the earlier *Computer, Internet and Mobile Phone Survey* carried out by the Palestinian Central Bureau of Statistics in July–August 2004, whose sample size comprised 7,557 households, 4,992 in the West Bank and 2,565 in the Gaza Strip. All households that reported in the 2004 survey to have a computer and telephone line were selected for the new survey.

For this new survey, the sample size is 739 households, 444 households in the West Bank and 295 households in the Gaza Strip. The target population is defined as all households with a computer and telephone lines. All household members aged 10 and above were included .

Graph 5.2



Graph 5.3.



At present, no countries in the region have information o the *location of access to Internet, languages of visited sites*, or any of the indicators related to online purchases.

In terms of planning prospects, Kuwait, Qatar and Syrian Arab Republic will increase the availability of indicators on *Internet access, ICT usage, barriers to usage* and *geographic location of purchase*. Kuwait and Yemen will also increase the availability of *basic access to ICT* indicators.

Table 5.9 shows the availability of indicators by digital access level. It is interesting to note that upper access countries have a lower availability of ICT indicators in comparison to medium access countries. This result is contrary to what was noted in other regions.

Table 5.9. Availability of ICT Household Indicators by Digital Access Level (average number of indicators in each group)

Indicator Group	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Basic access to ICT (7 indicators)	-	5/7	6.5/7	3/7
Internet access (3 indicators)	-	0/3	0.5/3	0/3
ICT usage (6 indicators)	-	0.5/6	1.7/6	0/6
Barriers to usage (3 indicators)	-	0/3	0.3/3	0/3
Geographical location (1 indicator)	-	0/1	0/1	0/1
TOTAL: Household ICT indicators	**-**	**5.5/20**	**9/20**	**3/20**

c. Disaggregations of Household ICT Indicators

The possibilities for disaggregating ICT indicators in the region depend on the nature of the statistical instrument used. In the case of a census, which provides a reduced number of ICT indicators (mostly on infrastructure), the choice of classifications is larger (as many as variables in the census questionnaire). However in the case of general household surveys, it depends on the design of the sample.

Table 5.10 recalls the classifications available in general-purpose household surveys in the region, according to the metadata questionnaire. Basic personal characteristics (age, gender and education) and location define the classifications available, yet no information about specific classification categories is recorded.

No mention of ethnicity and economic activity as classification variables was made in the questionnaires returned by these countries.

The observation unit is generally the household, while the individual is considered only in a few cases.

Table 5.10. Disaggregations for ICT Indicators from General Household Surveys in Western Asian Countries

Country list	*Classification Variables*							
	Age	*Gender*	*Education*	*Income/ expenditure level*	*Location*	*Ethnicity*	*Economic activity*	*Health status*
Egypt	X							
Jordan	(1)	(1)	(1)		X			
Lebanon		X	X					X
Palestine	X	X	X	(2)	X			
Saudi Arabia					X			
Total	**3**	**3**	**3**	**1**	**3**			**1**

Notes: - Only answers to the metadata questionnaire are considered
- (1) Jordan mentions 'Personal specifications'
- (2) Palestine mentions 'Social status'

Section 5.4 ICT Indicators in Business in Western Asia

Statistical sources on ICT access and usage in business are very scarce in Western Asia. According to the information provided in the stocktaking exercise, the next three years will witness an increase of statistical operations in the region, particularly in Egypt, Palestine, Qatar and the Syrian Arab Republic. Table D5 in the Annex lists the statistical operations covering the ICT indicators within each country.

a. Sources of Information

The region has experience in using economic censuses for covering exhaustively the productive sector. Thus, ICT indicators have been collected from these type of statistical operations in Oman, Qatar and Egypt (Table 5.11). Interestingly, a specific census recording ICT-related variables has been implemented in Egypt[1].

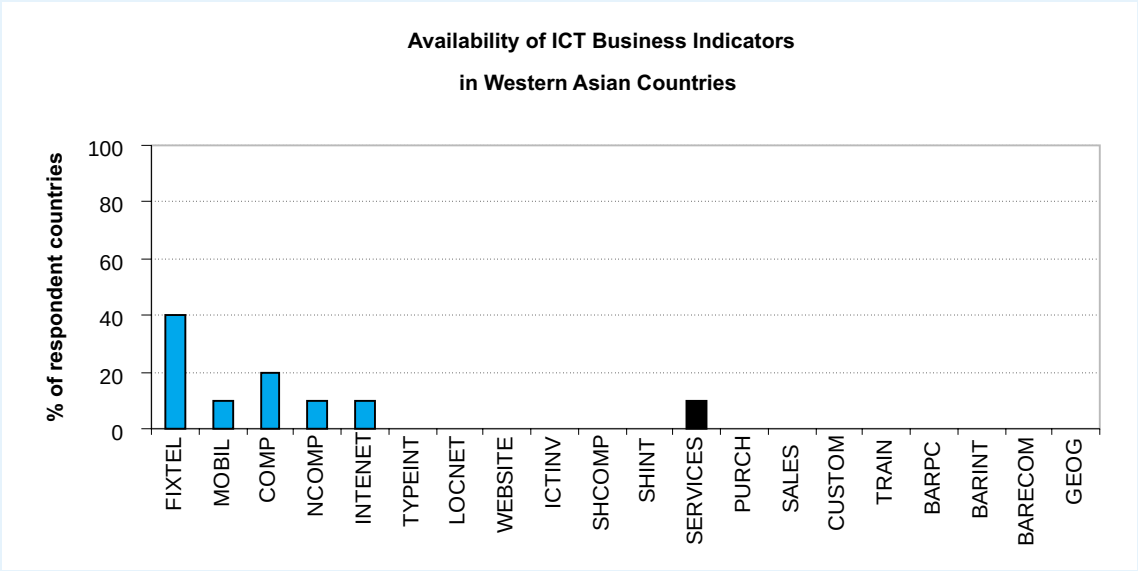
Table 5.11. Statistical Operations Providing Indicators on ICT in Business in Western Asia

Type of Operation	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Economic Census	Qatar	Oman	Egypt	
General Enterprises Surveys				
Ad hoc ICT Surveys			Egypt	
Other				

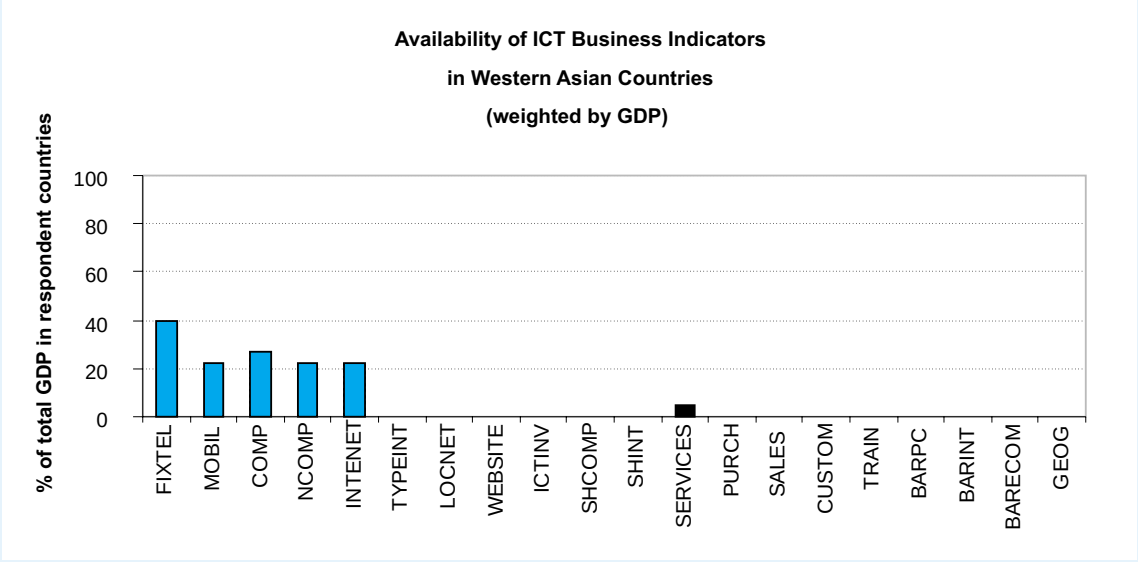
Type of Operation	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Economic Census		Qatar	Egypt Oman	
General Enterprises Surveys				
Ad hoc ICT Surveys			Egypt	
Other				

[1] The information available in the database provided by ESCWA is not complete: the number of ICT-related variables in the statistical operations called '*Establishments Census'* in Egypt is 6, and in '*Electronic Computer Statistics*' is 4. The response of CAPMAS indicates that the 5 indicators are from these two collections, without specifying the collection for each indicator.

Graph 5.4



Graph 5.5.



The planning projections for the next three years include adding a larger number of ICT-variables to the exhaustive survey in Egypt, and another census-like operation in Qatar.

Kuwait, Palestine and the Syrian Arab Republic plan to collect business surveys based on statistical samples (not exhaustive and with a large number of ICT indicators) in the next three years.

a. Availability of ICT Indicators

In accordance with the scarcity of statistical sources, the availability of ICT indicators for the business sector is rather limited (Graphs 5.4 and 5.5). Detailed information on the current and future availability of indicators is included in Table C5 of the Annex.

Only indicators on *basic access to ICT* and *concrete services for which the Internet is used* are available. The indicator on the *number of firms with a fixed telephone line* is available in 40% of respondent countries (covering 39% of the GDP of countries in the stocktaking exercise).

The remaining indicators are available in less than 20% of countries. Indicators on *mobile telephone devices, presence of computers, number of computers* and *presence of Internet access* are available in a number of countries accounting for slightly more than 20% of the GDP (Egypt alone stands for about 20% of the regional GDP).

The indicator on *concrete services for which the Internet is used* in business is only available in Oman.

No indicators are currently available on *advanced ICT access and usage, ICT training, Barriers to ICT use* and *geographic location where Internet goods are sold.*

Given the scarcity of ICT business indicators, it is not possible to corelate the availability to the level of demand nor with the level of digital access.

The stated plans for statistical production in the next three years are optimistic and will lead to a degree of availability of the 20 indicators listed in the questionnaire of 40% on average.

Section 5.5 ICT Indicators in Other Sectors in Western Asia[1]

Amongst the respondents, eight countries did not provide any information, with Oman indicating that collection of other ICT statistics does not exist, while Palestine and Egypt provided information as follows:

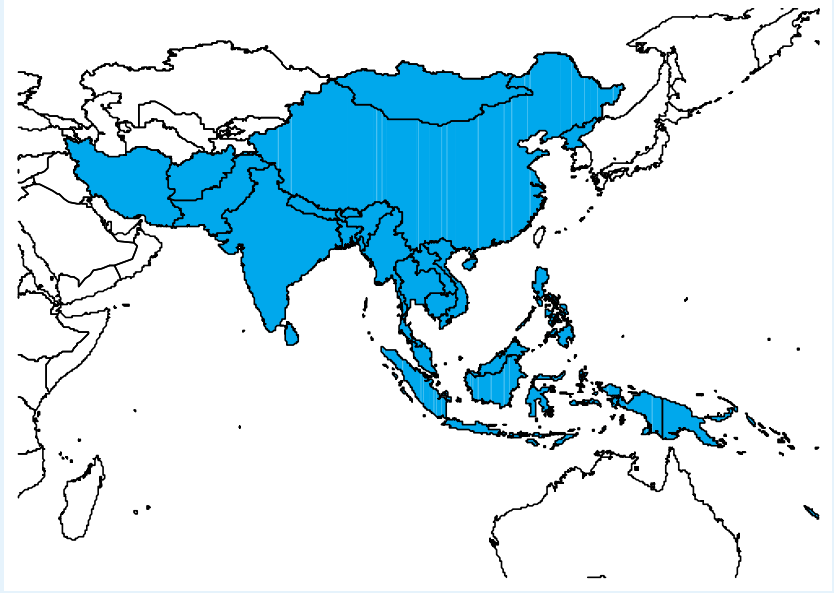
- The Central Bureau of Statistics in Palestine, collects ICT statistics on education, in collaboration with the Ministry of Education and Higher Education. The most recent date of the education collection is 2004;
- The Central Agency for Public Mobilization and Statistics (CAPMAS) in Egypt, collects ICT statistics on infrastructure for the Information Society, ICT content products, and ICT content industries within the "National Plan for Information and Communications," in collaboration with the Ministry of Communications and Information Technology.

Key issues on the availability of ICT indicators in Western Asia

- **Metadata collection:** The lack of information about *Bahrain* and the *United Arab Emirates* may bias (underestimate) the results on data availability. *Iraq* is the biggest country (in population terms) without results. Additional efforts should be made to analyse ICT information in these three countries.
- **Data sources:** The number of statistical operations providing ICT indicators is small. Population censuses and household surveys have been used to gather data on *basic access to ICT* by households, Only *Palestine* has carried out a specific survey on ICT in households. The information sources about the equipment and usage of ICT in the business sector are even scarcer and in most cases they consist of the collection of a small number of ICT-related variables in economic censuses, that is, exhaustive surveys of the business sector. However, plans for the next three years are optimistic and will increase the availability of ICT indicators, collecting a large number in about 40% of the countries.
- **Resources:** There is little information about resources, besides the fact that NSOs will be primarily involved in the collection of ICT indicators. Regular NSOs' budgets will be combined in some cases with collaborative resources from other national organisations.
- **Key gaps in ICT indicators:** Indicators on *basic access to ICT* in households are available in a large proportion of countries. *Presence of Internet access* in the household covers about 70% of the regional population. However, other indicators are very scarce, particularly in countries with low digital access. In the business sector data is diffuse with little information with the exception of the presence of *fixed telephone*.

[1] This section is entirely based on the document '*Partnership Activities of ESCWA*' prepared for the WSIS Thematic Meeting on Measuring the Information Society (Geneva, February 2005).

Chapter 6. Status of ICT Indicators in Asia-Pacific



Section 6.1 Notes on the Regional Data Collection

a. Geographic Coverage of the Response to the Questionnaire

The metadata collection on ICT indicators in the Asia-Pacific region was completed by the Economic Social and Economic Commission for Asia Pacific (ESCAP). The questionnaire was sent to all ESCAP member countries except for those also members of the Organisation for Economic Co-operation and Development (OECD) members[1].

Furthermore, ESCAP and the United Nations Conference on Trade and Development (UNCTAD) agreed on a division of work whereby UNCTAD undertook the task of sending the metadata survey to nine ESCAP Central Asian members (Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan, and Uzbekistan) which are also members of the United Nations Economic Commission for Europe (ECE).

In conclusion, ESCAP sent the metadata survey questionnaire to 44 countries or areas in the Asian-Pacific region. Table 6.1 shows the list of countries classified by income and digital access level.

In the region, the DAI classification is not available for as many as 17 countries, mainly Small Island States in the Pacific.

b. Analysis of Response Rate

Eighteen out of 44 countries (41%) responded. The lack of response from populous countries such as China and Bangladesh reduced the overall response rate when weighted according to the coverage of the population and share of GDP within the region. In particular, the group of middle-income countries that responded account for only 26% of the population and 30% of the GDP. All of the sub-regions within this vast region were represented in the analysis.

However, with the exclusion of China, the stocktaking exercise represents 83% of the total population and 89% of the total GDP, which signifies a high representation (Graphs 6.1 and 6.1bis).

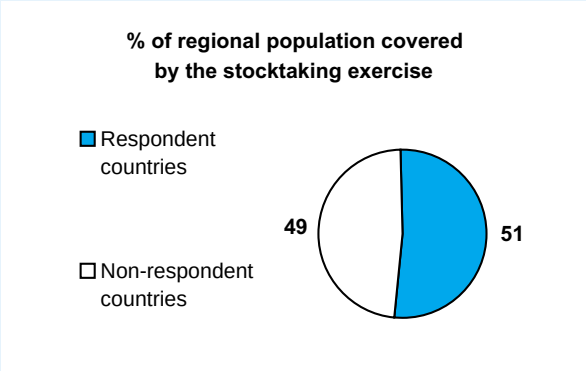
[1] Turkey was finally included in the UNCTAD survey of Central Asian and Eastern European countries.

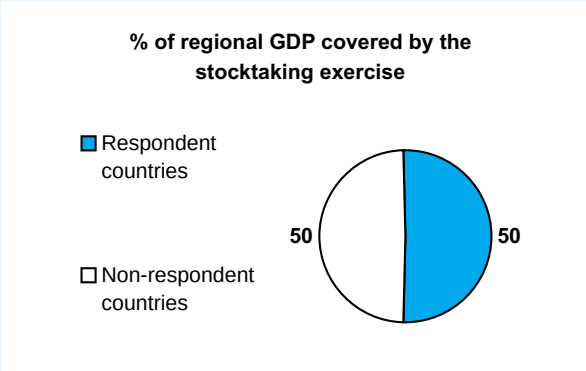
Table 6.1. Country Coverage of the Stocktaking Exercise in Asia-Pacific

Income Level	*Digital Access Level*				
	DAI not available	*High Access*	*Upper Access*	*Medium Access*	*Low Access*
Income level n.a.	Nauru				
High Income	French Polynesia Guam New Caledonia	Hong Kong Special Administrative Region of China Singapore	Brunei Darussalam Macao Special Administrative Region of China		
Upper-Middle Income	American Samoa Cook Islands Niue Northern Mariana Islands Palau		Malaysia		
Lower-Middle Income	Marshall Islands Micronesia Tonga Tuvalu			China Fiji Indonesia Iran (Islamic Republic of) Maldives Philippines Samoa Sri Lanka Thailand	Vanuatu
Low Income	Afghanistan DPR of Korea Kiribati Timor-Leste			India Viet Nam Mongolia	Bangladesh Bhutan Cambodia Lao People's Democratic Republic Myanmar Nepal Pakistan Papua New Guinea Solomon Islands

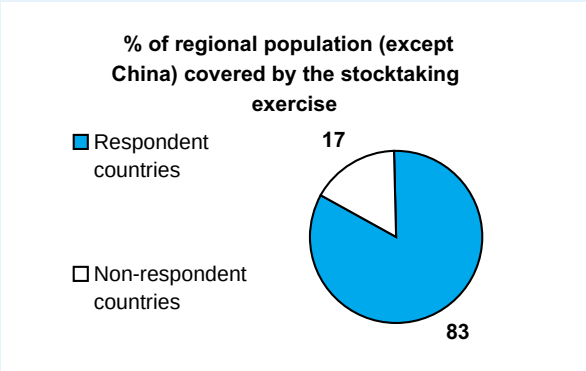
Note: 18 out of 44 countries to which the questionnaire was sent, answered. They are shaded in the table above.

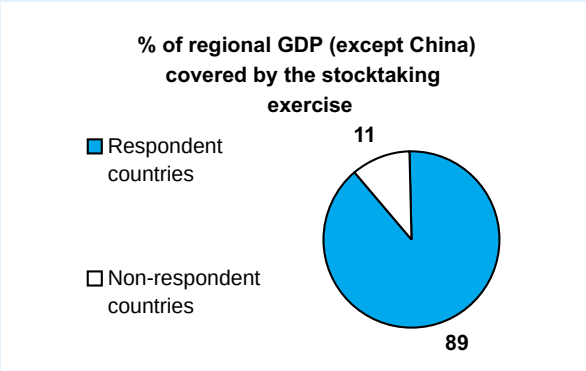
Graph 6.1. Coverage of the Stocktaking Exercise in Terms of Population and GDP Share in Asia-Pacific





Graph 6.1bis. Coverage of the Stocktaking Exercise in Terms of Population and GDP Share in Asia-Pacific Excluding China





The quality of the coverage, both in terms of population and share of GDP, increases with the level of digital access. Therefore, the results on the availability of ICT indicators in the region may give a rather optimistic picture (overestimation). Hong Kong (SAR China) and Singapore were included, while low digital access countries in the region were indeed poorly covered, with information on ICT metadata received only from Cambodia and Pakistan.

Considering China's weight in demographic and economic terms, this country merits further study on the status of ICT indicators. However the status of ICT indicators in China was not examined in this report.

Table 6.2. Coverage by Income and Digital Access Group (%)

Income	*Countries*	*Population*	*GDP*
High Income	57,1	94,1	97,1
Upper-middle income	33,3	99,3	99,8
Lower-middle income (except China)	57,1	25,6	29,5
Low income	61,5	99,7	99,6
Total	**25,0**	**78,3**	**77,5**

Digital Access Level	*Countries*	*Population*	*GDP*
High access	100,0	100,0	100,0
Upper access	66,7	98,6	96,0
Medium access	66,7	52,4	44,4
Medium access (except China)	72,7	94,9	96,5
Low access	30,0	42,6	37,5
No information	17,6	0,8	15,1
Total	**40,9**	**51,1**	**50,3**

Section 6.2 Institutional Environment for ICT Indicators in Asia-Pacific

a. Demand for ICT Statistics in Asia-Pacific

According to the results from the metadata collection, there is a strong interest in ICT indicators for both households and the business sector in the region. It is however interesting to note that the Philippines, where several institutions answered the questionnaire, responded that there was "no demand" for ICT business indicators. Similarly, Pakistan, a low income country with low digital access and highly populated (Table 6.2) reported no demand for ICT statistics on households. However supplementary information would indicate that it is unlikely that this self-assessment for both of those two countries was fully correct.

The demand for indicators was highest in the Asia-Pacific region of all the regions considered in the study.

b. Institutions Collecting ICT Data in Asia-Pacific

Although the metadata questionnaire was sent to the National Statistical Offices (NSOs) in the region, these organisations either reported on or transmitted it to other institutions that produce ICT indicators. Philippines is the exception, where 6 questionnaires were received from different agencies, and attests to the decentralisation of the ICT statistical system in that country (see Box 6.1).

The different institutions collecting ICT data in the region are given in Table 6.4 below. In most countries the NSO is the institution responsible for data collection. However, line ministries have played a role in the collection of ICT indicators in the Philippines.

Table 6.3. Demand for ICT Statistics in Asia-Pacific

Demand Level	*Demand Level*				
	Very High	*High*	*Medium*	*Low*	*No Demand*
ICT Household Indicators	Hong Kong SAR Mongolia New Caledonia Singapore Sri Lanka Thailand	Cambodia India Macao SAR Malaysia Vanuatu	Indonesia	Micronesia Niue	Pakistan
ICT Business Indicators	Hong Kong SAR Mongolia Singapore Thailand	India Macao SAR Malaysia Vanuatu	Indonesia	New Caledonia	Philippines

Note: The following countries did not assess the demand for ICT household indicators: Iran, Maldives, and Philippines. The following countries did not assess the demand for ICT business indicators: Cambodia, Iran, Maldives, Micronesia, Niue, Pakistan and Sri Lanka.

Box 6.1. Elements of an institutional framework for ICT statistics in the Philippines

The Philippino statistical system is highly decentralised and requires a strong co-ordination mechanism. The demand for ICT statistics has been taken into account by the co-ordination body, the National Statistical Co-ordination Board (NSCB), who has issued Board Resolutions calling for the adoption of statistical standards, mostly in the field of classifications. Thus, three resolutions have been passed for the whole Statistical System on the use of the Philippine Standard Industrial Classification to define the ICT sector, on the inclusion of electronic exports into the statistical system and on the updating of the 1992 Philippine Standard Occupational Classification to encompass the new occupations related to new technologies.

Table 6.4 Institutions Collecting ICT Indicators in the Region

Type of Institution	*Households/ Individuals*	*Business*	*Other*
National Statistical Office	Cambodia, Hong Kong SAR India, Indonesia Iran, Macao SAR Malaysia, Micronesia Mongolia, New Caledonia Niue, Singapore Sri Lanka, Thailand Vanuatu	Hong Kong SAR India, Indonesia Malaysia, Maldives Mongolia New Caledonia Singapore, Thailand Vanuatu	Hong Kong SAR India Macao SAR Mongolia Singapore Thailand
Ministry or authority for:			
- Post and telecommunications		Cambodia Philippines	
- Information			Philippines
- Education			Philippines
- Science and technology		Thailand	Philippines
- Transport	Philippines	Philippines	
- Economic development	Philippines	Philippines	Philippines
Country offices of international agencies		Philippines	

c. Resources

According to the results of the metadata questionnaire, most countries in the region finance the collection of ICT indicators from their regular NSOs budgets Exceptions are Cambodia, New Caledonia (which reported low demand for these indicators), Maldives, Philippines, Sri Lanka where no specific financing is available, and Mongolia where the Ministry for Infrastructure collaborates (table 6.5). Three countries (Cambodia, New Caledonia and Sri Lanka) declare simultaneously that no financing is available while the demand for ICT indicators is very high.

No countries identified international co-operation activities for financing the collection of ICT indicators.

Table 6.5. Resources for ICT Statistics in Asia-Pacific by Income Level

Origin of Funds	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Regular Budget	Hong Kong SAR Macao SAR Singapore	Malaysia	Indonesia Philippines Thailand Vanuatu	India Mongolia
National cooperation				Mongolia
International cooperation				
No financing available	New Caledonia		Maldives Sri Lanka	Cambodia Philippines

Note: Multiple options are allowed. No information is available for Iran.

d. Definition of ICT

Half of the respondent countries in the region reported that a formal definition of ICT was in place. However, it should be noted that even in countries with a very high demand for ICT indicators, the respondent agencies did not mention a definition (Hong Kong SAR China and Thailand).

The Philippines was the only country with several responding institutions[1]. Each with different answers depending on the institution surveyed, which shows either a lack of co-ordination or the need to refer to different definitions for different operational purposes.

e. Dissemination of ICT Statistics

A very large number of surveys have been implemented and disseminated in 2002, 2003 and even 2004 covering almost all the countries. Specific surveys are very recent, both on households and on business (including the ICT sector).

Several countries, such as Indonesia and Mongolia, periodically conduct household or business surveys collecting some ICT indicators. Macao SAR, Hong Kong SAR, Singapore and Thailand are the countries with highest availability of ICT-specific statistical operations and an annual periodicity.

Eighteen countries in the region have publications on ICT indicators. Only Pakistan, Maldives and New Caledonia do not have plans to prepare such publications. These countries have medium to low digital access and a perceived low demand for ICT indicators.

[1] The Department of Transportation and Communications, the National Computer Center (NCC), the Commission on Information & Communications Technology (CICT), the National Economic and Development Authority (NEDA), the National Telecommunications Commission, the Philippine Economic Zone Authority and the Board of Investments.

Table 6.6. Existence of a definition for ICT in Asia-Pacific Countries

Country List	*Status of Definition*		
	No Definition	*Definition in Preparation*	*ICT Definition Applied*
Cambodia		X	
Hong Kong SAR of China	X		
India			X
Indonesia			X
Iran (Islamic Republic of)	X		
Macao SAR of China		X	
Malaysia			X
Maldives	X		
Micronesia (Federated States)	X		
Mongolia			X
New Caledonia	X		
Niue			X
Pakistan			X
Philippines	(1)		X
Singapore			X
Sri Lanka			X
Thailand	X		
Vanuatu	X		
All respondent countries in the region (%)	**7 (39%)**	**2 (11%)**	**9 (50%)**

Notes: - Only answers to the metadata questionnaire are considered
- (1) The National Telecommunications Commission of Philippines does not have a formal definition of ICT, while the other agencies in the country responding to the questionnaire gave a positive answer.

Table 6.7. Most Recent Date for ICT Collection (households)

Country	*Type of Statistical Operation (1)*	*Number of Collected ICT Variables*	*Most Recent Collection*
Cambodia	Synthetic publication	10	2003,2001
	Living conditions survey	6	2003
Hong Kong SAR of China	***Household ICT survey***	***approx 90***	***2004 (Annual)***
India	Population and Housing Census	n.a	March 2001
Indonesia	Living conditions survey	5	2004 (every 3 years)
Macao SAR of China	Population and Housing Census	3	August 2001
Malaysia	Population and Housing Census	7	July 2000
Micronesia	Household Income and Expenditure Survey	8	1998
Mongolia	Household Income and Expenditure Survey	7	2203 (Annual)
	Population and Housing Census	2	January, 2000
	Living conditions survey	6	2002/2003
	Living conditions survey (in the Capital)	5	2004
New Caledonia	Population and Housing Census	1	2004-08-31
Niue	Population and Housing Census	1	Sept 2001
Singapore	Household Budget Survey	14	2002/2003
	Household ICT survey	n.a	2003 (Annual)
Sri Lanka	Living conditions survey	35	Jan - June: 2004
Thailand	***Household ICT survey***	***13 / 31***	***2003 / 2004***
Vanuatu	Synthetic publication	1	2004 (Quarterly)

Notes: (1) The surveys have been described as closely as possible given the little amount of information in the questionnaires
Bold rows correspond to ICT-specific surveys.

Table 6.8. Most Recent Date of ICT Collection (business)

Country	*Type of Statistical Operation(1)*	*Number of Collected ICT Variables*	*Most Recent Collection*
Hong Kong SAR of China	***Survey on IT Usage and Penetration in the business sector***	***55***	***Jun - Aug 2004 (Annual)***
India	Enterprise Survey	n.a	July 2001 to June 2002
India	***SNAP survey (ICT sector)***	***ca. 40***	***Annual***
India	***Survey on Software exports***	***ca. 50***	***Jan. To June 2004***
Macao SAR of China	Transport and Communication Statistics		Jun/2004
Macao SAR of China	***Usage of Information Technology in Business Sector***	***18***	***2001,2002,2003***
Malaysia	***Census of computer and telecommunications services establishments***	***3***	***2000,2001,2003***
Mongolia	Enterprise Census	3	October, 1998
New Caledonia	Business Registry	1	Continuous
Philippines	***Registered IT Firms***		***July 2004 (Monthly)***
Singapore	***Annual Survey on Infocomm Usage in Businesses***	***n.a***	***2003 (annual)***
Thailand	***ICT Survey***	***183***	***2004***
Thailand	Manufacturing Industry Survey	10	2003
Thailand	Business Trade and Services Survey	12	2002
Vanuatu	Quarterly Statistical indicators	1	2003 (Quarterly)

Notes: (1) The surveys have been described as closely as possible given the little amount of information in the questionnaires
Bold rows correspond to ICT-specific surveys.

Section 6.3 ICT Household Indicators in Asia-Pacific

a. Sources of Information for ICT in Households

A variety of sources on ICT equipment and usage in households exists in the region, including the use of population and housing censuses, use of existing household surveys and design and implementation of ICT-specific surveys (Table 6.9 and Box 6.2 on Thailand).

Use of population and housing censuses

Five countries in the region, with upper and medium digital access level and all ranges of income level, used this statistical instrument to collect some ICT variables (1 to 7) on households. This includes India, a heavily populated country.

Table 6.9. Statistical Operations Providing ICT household indicators in Asia-Pacific

Type of Operation	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Population and Housing Census	Macao SAR New Caledonia	Malaysia		India Mongolia
Multipurpose Household Surveys	Singapore		Indonesia Sri Lanka	Cambodia India Mongolia
Ad hoc ICT Household Surveys	Hong Kong SAR Singapore		Thailand	

Note: Multiple options are allowed. Niue does no have estimates for Income.

Type of Operation	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Population and Housing Census		Macao SAR Malaysia	India Mongolia	
Multipurpose Household surveys	Singapore		India Indonesia Mongolia	Sri Lanka
Ad hoc ICT Household Surveys	Cambodia	Hong Kong SAR Singapore		Thailand

Note: Multiple options are allowed. Niue and New Caledonia do no have estimates for DAI.

Population censuses are used to collect indicators only on *basic access to ICT* in these countries. They do not cover other topics more specific to the Internet.

Use of household surveys

Household budget surveys or living conditions surveys have been used in several Asian-Pacific countries for collecting ICT indicators (6 to 15, except for Sri Lanka where 35 variables were collected). The decision to include a number of ICT questions and/or indicators on *basic access to Internet* was taken primarily by lower-middle and low income countries. Only Singapore and Sri Lanka used surveys for collecting more advanced indicators, and may therefore almost be considered ICT-specific surveys.

Use of specific ICT household surveys

Only Thailand and Hong Kong SAR have ICT specific household surveys according to the results reported in the stocktaking exercise. Thailand initially used existing household surveys but the high demand for indicators for ICT policy making led to the implementation of more specific surveys (Box 6.2).

These surveys collect a larger number of ICT indicators including *Internet usage* and *barriers to usage*.

b. Availability of ICT Indicators

Detailed information about the availability of ICT household indicators by country is shown in Table A6 of the Annex and represented in Graphs 6.2 and 6.3.

Box 6.2. Diversity of sources on ICT in Thailand

The importance given to ICT indicators in Thailand has had an impact on the national statistical organisation: the NSO was established under the Ministry for Information and Communication Technology (MICT) in 2002, opting afterwards for full-scale ICT surveys in households and businesses.

Different types of sources for ICT indicators exist in Thailand which will be systematised in the *Unified ICT Indicators Project.* Namely, this would include private and administrative sources, adaptation of existing surveys and implementation of specific surveys.

Private organisations such as the Association of Thai Computer Industry (ATCI), the Association of Thai Software Industry (ATSI) and the Information Networking Association (INA) produce and disseminate market data on the ICT sector. This information, while interesting for market analysis, is less used by governmental agencies.

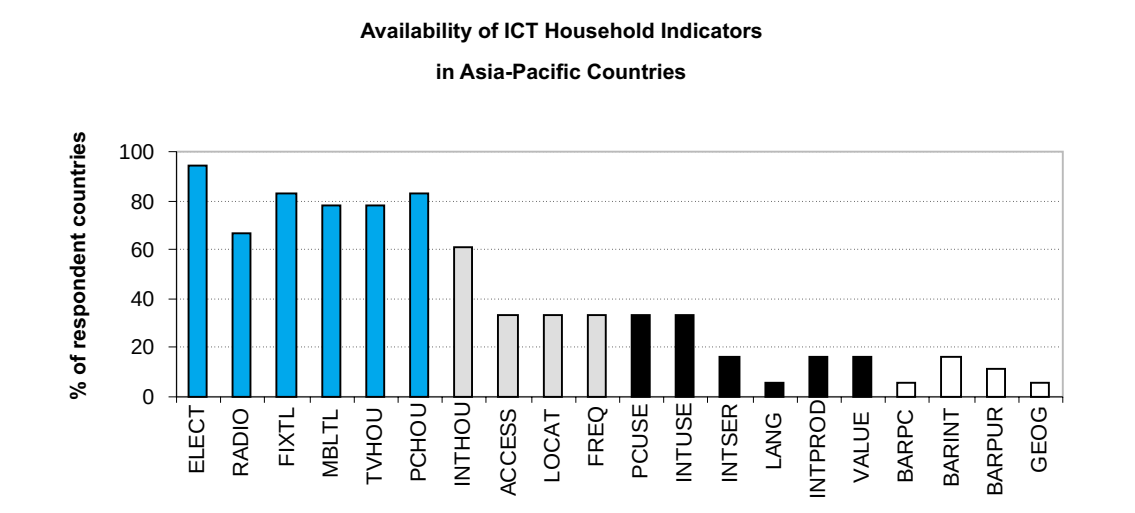
Administrative data are collected and maintained by governmental agencies. While their dissemination is not fully developed, agencies provided them when requested. An example is the foreign trade data from the Customs Department.

Existing surveys (such as the labour force survey) and censuses were adapted to include a set of ICT-related questions prepared in collaboration with the National Electronics and Computer Technology Center (NECTEC).

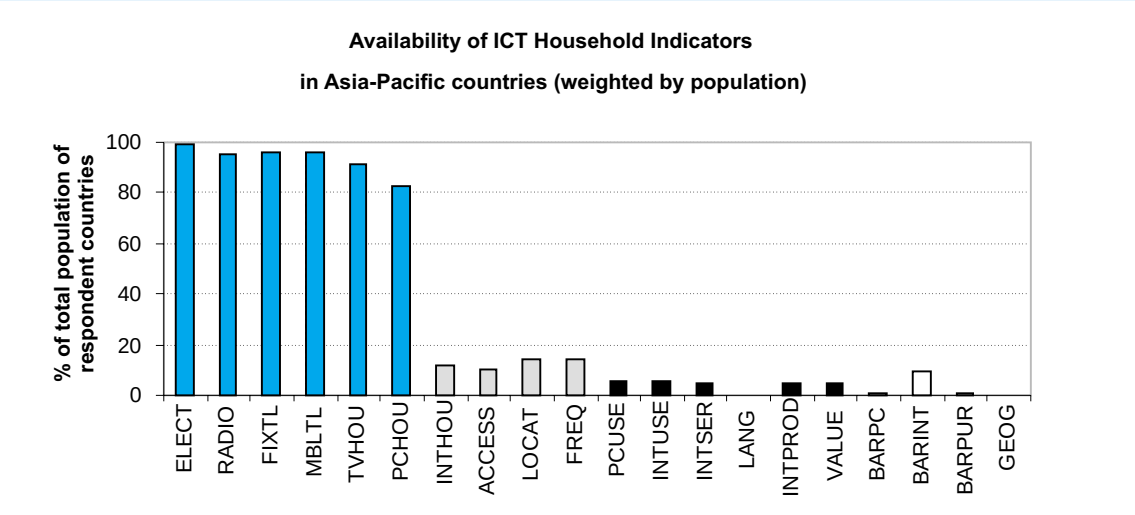
Finally, after a new institutional arrangement that brought the NSO under the authority of the MICT, specific surveys on ICT endowment and usage in households and businesses were launched in early 2004.

Source: "ICT indicators initiatives in Thailand: Progress and Lessons learned", presented in the WSIS meeting of Geneva (February, 2005).

Graph 6.2.



Graph 6.3.



The availability of indicators on *basic access to ICT* is very high in the region (60% to 90% of the respondent countries), particularly when weighted according to population.

However, indicators on *Internet access* are only available in countries that account for less than 20% of the population. The indicator on *languages of websites visited* is rarely collected.

The following household indicators are collected in less than 20% of the respondent countries:

13) Concrete service activities for which the Internet is use

14) Languages of Internet sites visited
15) Types of products/services purchased over the Internet
16) Value of goods/ services purchased over the Internet
17) Barriers to PC usage
18) Barriers to Internet usage
19) Barriers to purchases over the Internet
20) Geographic location where the Internet goods are purchased

Countries with high and very high demand for ICT household indicators have not fully satisfied that demand, as can be seen for Cambodia, India, Macao SAR, Malaysia, Mongolia, New Caledonia and Vanuatu.

Hong Kong SAR, Singapore, Sri Lanka and Thailand are the countries in the region with the largest number of ICT indicators collected in the household sector.

c. Disaggregations of ICT Household Indicators

There is little information about the classifications used in surveys for disaggregating ICT indicators. According to the metadata questionnaire, these are given in Table 6.10, and basically the only disaggregations possible are related to age, sex, education and income.

Countries that collected several indicators through population censuses may break them down into a larger set of classification variables, since no sample-size limitations exist.

Unfortunately, there is no information about the classification variables used in the ICT household survey in Thailand.

Table 6.10. Disaggregations for ICT indicators from General Household Surveys in Asia-Pacific Countries

Country List	*Classification Variables*							
	Age	*Gender*	*Education*	*Income/ expenditure level*	*Location*	*Ethnicity*	*Economic activity*	*Health status*
Cambodia					X			
Hong Kong SAR of China †	X	X	X	X			X	
India	X	X	X	X	X			
Indonesia			X	X				X
Macao SAR of China				X				
Micronesia (Federated States)	X	X	X	X		X	X	
Mongolia	(1)	(1)	(1)	(1)	(1)		(1)	(1)
Singapore †				X				
Sri Lanka	X	X	X					
Thailand †								
Total	**5**	**5**	**6**	**7**	**3**	**1**	**3**	**2**

Notes: - Only answers to the metadata questionnaire are considered
- † Specific surveys on ICT in households exist
- (1) means that the country has carried out an LSMS survey and that the ICT indicators provided may be disaggregated according to the variables investigated in that survey

Section 6.4 ICT Business Indicators in Asia-Pacific

a. Sources of Information

Detailed information on the different statistical operations providing ICT indicators in the business sector for the countries considered is included in Table D6. In some cases, it is difficult to classify, based on the information available, whether some operations contain a high proportion of ICT-related variables. There is neither information about the indicators collected by Malaysia through the *Census of computer and telecommunications services establishments*, that could be considered as a specific ICT survey, nor about the types of surveys used in Maldives and Pakistan, countries which effectively collect a small number of ICT indicators. The information from Philippines, obtained from 6 different agencies, is difficult to classify as one type of source.

As have the other regions, Asia-Pacific has used a variety of sources, including economic censuses, general and specific enterprise surveys, the business register and other sources such as information from the utilities and service providers.

Use of economic censuses

Malaysia and Mongolia have used economic censuses, that is, exhaustive surveys of the business sector, to collect a limited number of ICT indicators (3 in both cases). Economic censuses are very expensive operations undertaken by the Statistical Offices. These types of surveys, usually, cannot be undertaken by countries with a reduced budget for statistical units. In both countries, the resources for ICT indicators were obtained from the regular budget. The sustainability of this kind of source has to be examined further, as the small number of ICT-related indicators collected precludes the suitability of using economic censuses for investigating ICT. The demand for indicators in these two countries is high and very high respectively.

Use of the business registry

In the region, the business registry has only been used in New Caledonia to collect the *presence of fixed telephone* indicator. Other registries specific to some sectors may also be a source of information on the ICT sector (Philippines has such a registry).

Use of general business surveys

India, Indonesia, Singapore and Thailand implemented general business surveys which included ICT–related questions. In Thailand, the surveys collected up to 12 of the 20 ICT business indicators listed in the questionnaire, while the Indian survey collected only indicators on *basic access to ICT* and the Indonesian one on *presence of Internet access* and others on *advanced ICT access and usage*.

Use of specific ICT business surveys

Hong Kong SAR, Macao SAR, Singapore and Thailand have implemented specific ICT surveys in the business sector. Three of them are high income countries. The demand was high or very high for all of them. Specific surveys permitted the collection of a larger number of indicators (between 12 and 14 out of the 20 in the questionnaire list).

Use of other sources

A quarterly business survey in Vanuatu records the indicators on *presence of fixed* and *mobile telephone*.

Table 6.11. Statistical Operations Providing ICT Business Indicators in Asia- Pacific

Type of Operation	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Economic Census		Malaysia		Mongolia
General Enterprises surveys	Singapore		Indonesia Thailand	India
Ad hoc ICT surveys	Hong Kong SAR Macao SAR Singapore		Thailand	
Other	New Caledonia		Vanuatu	

Note: Multiple options are allowed

Type of Operation	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Economic Census		Malaysia	Mongolia	
General Enterprises surveys	Singapore		India Indonesia Thailand	
Ad hoc ICT surveys	Hong Kong SAR Singapore	Macao SAR	Thailand	
Other				Vanuatu

Note: Multiple options are allowed. New Caledonia does not have estimates for DAI level.

b. Availability of ICT Indicators

Indicators on *basic access to ICT* were the most widely available covering 33% to 56% of the countries but between 60% and 80% of the total GDP of the responding countries. The availability of the indicator on *presence of Internet access* is the highest amongst the 20 indicators (see Graphs 6.4 and 6.5).

By contrast, the remaining indicators accounts for 40% of the GDP and one-third of the countries. Particularly low is the proportion of countries collecting the indicators on the *value of purchases* and *sales*, *geographic location of sales*, *customer groups*, and *training in ICT*.

Several countries that reported very high or high demand for ICT business indicators, such as Mongolia and Vanuatu show a very limited availability of these.

When analysing the availability of ICT business indicators in relation to the level of digital access, the following pattern was found: higher digital access level corresponds to higher availability (12,3 indicators on average for high and upper, 6,9 for medium, 4,1 for low digital access out of the 20 in the questionnaire list). *Barriers to ICT usage* are more frequently examined than *ICT training* and the *geographical location of sales* (Graph 6.6. and Table 6.12)

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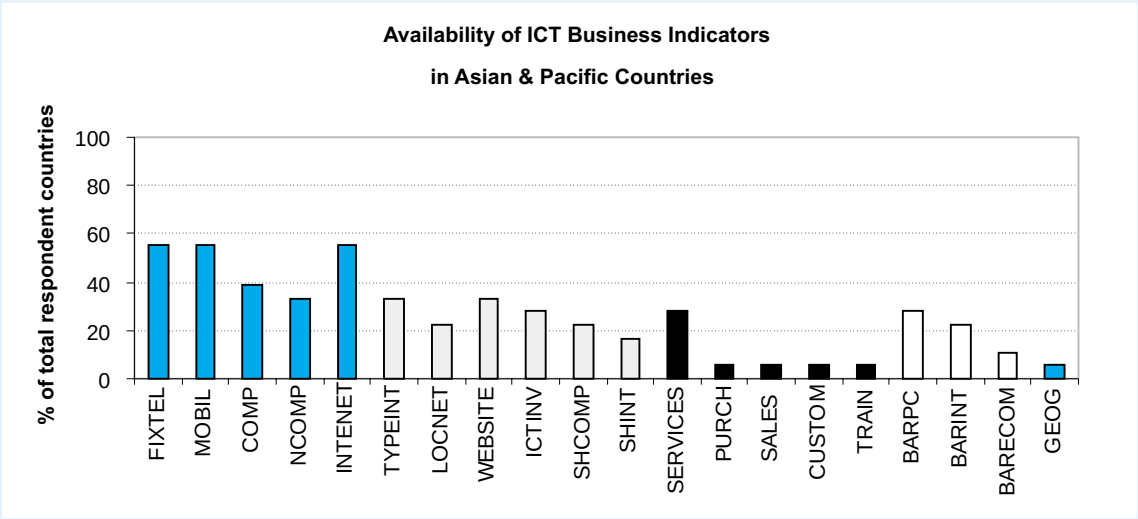
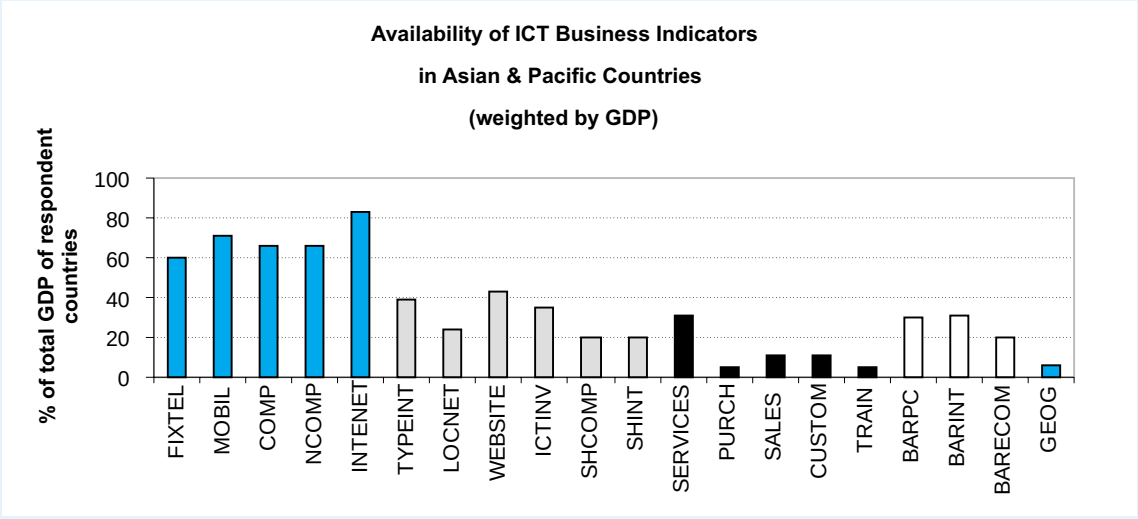
Graph 6.4.



Graph 6.5.



Graph 6.6. Availability of ICT business indicators by group and digital access level

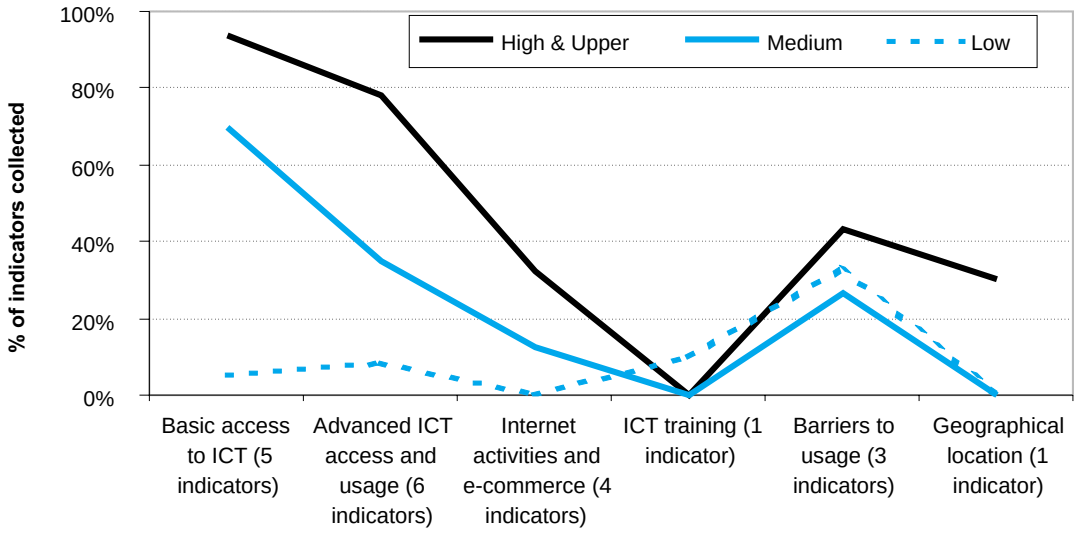


Table 6.12. Availability of ICT Business Indicators by Digital Access Level (number of indicators in each group)

Indicator Group	*Digital Access Level*		
	High & Upper Access	*Medium Access*	*Low Access*
Basic access to ICT (5 indicators)	4.7/5	3.5/5	2.5/5
Advanced ICT access and usage (6 indicators)	4.7/6	2.1/6	0.5/6
Internet activities and e-commerce (4 indicators)	1.3/4	0.5/4	0/4
ICT training (1 indicator)	0/1	0/1	0.1/1
Barriers to usage (3 indicators)	1.3/3	0.8/3	1/3
Geographical location (1 indicator)	0.3/1	0/1	0/1
TOTAL: Business ICT indicators	**12.3/20**	**6.9/20**	**4.1/20**

Section 6.5 ICT Indicators in other sectors in Asia-Pacific

Other potential sources of information on ICT identified in the stocktaking exercise have been analysed in this chapter (Table 6.13). They consist of statistical operations undertaken by the countries with highest demand and availability of ICT indicators (Hong Kong, SAR, Macao SAR, Singapore and Thailand) and Philippines.

The most surveyed topic is the ICT production sector.

Table 6.13

Domain	*Countries*
Supply, demand and trade in ICT products	Hong Kong SAR Macao SAR
Human resources in IT	Hong Kong SAR Singapore
ICT sector	Hong Kong SAR, Singapore, Thailand
ICT in education	Philippines
ICT in government	Philippines
ICT investments	Philippines
Prices of ICT goods and services	Macao SAR

Key issues on the availability of ICT indicators in Asia-Pacific

- **Metadata collection:** the lack of information on ICT indicators' metadata from *China* reduces the coverage of the stocktaking exercise in terms of regional population and share of GDP. A specific investigation is required for this country. The response from Small Developing *Pacific Islands* was also limited and should be further analysed.

- **Data sources:** Population censuses have been used in the region to collect indicators on *basic access to ICT*. More specific indicators are collected by including a limited number of ICT-related questions in household surveys (household budget surveys or living conditions surveys). Specific ICT household surveys, providing indicators on *Internet usage* and *barriers to ICT* are rare. In the business sector, the most common statistical instruments are *generic business surveys* that include a specific module. *Ad hoc ICT surveys* do exist in several countries in the region.

- **Resources:** Most countries in the region finance the collection of ICT indicators from the regular NSO budgets. No specific financing has been mentioned by *Cambodia, New Caledonia Maldives, Philippines, Sri Lanka.* No international co-operation for financing the collection of ICT indicators was identified.

- **Key gaps in ICT indicators:** *Basic access to ICT by households* is measured in the majority of countries. *Internet access* by households is measured in about 60% of countries but accounts for less than 20% of the population (if *China* is included). More specific household ICT indicators are collected in less than 20% of the countries, accounting for a marginal proportion of the regional population. The availability of *basic access to ICT* indicators in the business sector is rather high. However, less than one-third of countries collect any other business indicators. Less than 10% of countries have collected indicators on the *value of Internet purchases* and *sales.*

Chapter 7. Status of ICT Indicators in Latin America and the Caribbean

Section 7.1 Notes on the Regional Data Collection

a. Geographic Coverage of the Response to the Questionnaire

The UN Economic Commission for Latin America and the Caribbean (ECLAC) sent the ICT metadata questionnaire to the National Statistical Offices of Latin America and the Caribbean through its Observatory for the Information Society OSILAC, which is supported by the Institute for Connectivity in the Americas (ICA-IDRC) and the @LIS programme of the European Commission. Members of ECLAC that are also members of the Organisation for Economic Co-operation and Development (OECD) and/or the European Union were not included in the data collection (with the exception of Mexico).

Geographically, the region includes various sub-regions, among them Central America, the Caribbean and South America. The two most populous countries are Brazil and Mexico. Most are middle income countries. Only a small group of countries in the Caribbean Islands belong to the group of high income countries (Aruba, Bahamas, Bermuda, and Cayman Islands).

The classification of countries covered, by income and digital access level, is given in Table 7.1. The Digital Access Index was not calculated for countries with the highest GDP per capita countries (with the exception of Bahamas).

b. Analysis of Response Rate

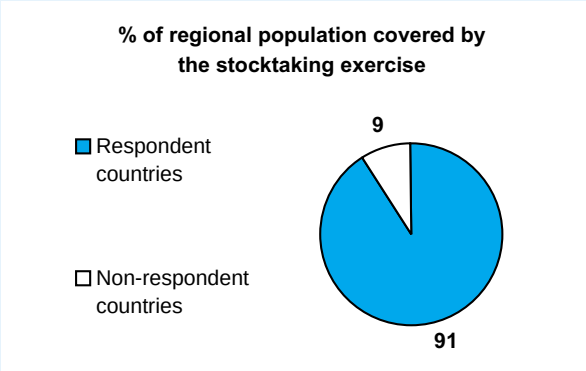
While slightly more than half of the countries answered the questionnaire, the response rate was very high, both in terms of population (91%) and, share of GDP (95%), as shown in Graph 7.1.

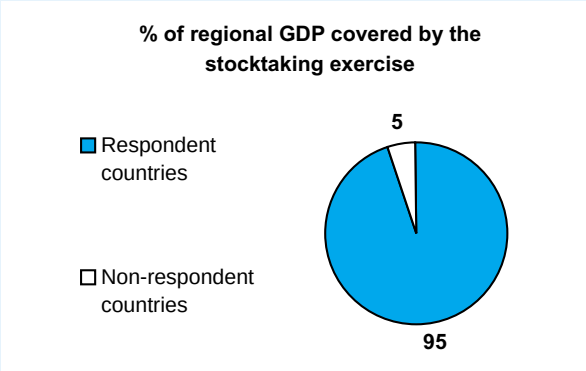
Table 7.1. Country Coverage of the Stocktaking Exercise in Latin America and the Caribbean

Income Level	*Digital Access Level*				
	DAI not available	*High Access*	*Upper Access*	*Medium Access*	*Low Access*
High Income	Aruba Bermuda Cayman Islands		Bahamas		
Upper-Middle Income			Antigua and Barbuda Argentina Barbados Chile Costa Rica Dominica Grenada Mexico Saint Kitts and Nevis Saint Lucia Trinidad and Tobago Uruguay	Panama Saint Vincent and the Grenadines Venezuela	
Lower-Middle Income			Jamaica Brazil	Belize Bolivia Colombia Cuba Dominican Republic Ecuador El Salvador Guatemala Guyana Paraguay Peru Suriname	Honduras
Low Income					Haiti Nicaragua

Note: 20 out of 36 countries to which the questionnaire was sent, answered. They are shaded in the table above.

Graph 7.1. Coverage of the Stocktaking Exercise in Terms of Population and GDP Share in the Latin America and the Caribbean





Upper-middle and lower middle countries were adequately covered by the response. Low income countries in the region (Haiti and Nicaragua) were included but did not respond to the questionnaire (see Table 7.2). These two countries, and Honduras, are classified as low digital access. Therefore the availability of ICT indicators within the region may be overestated.

Table 7.2. Coverage by Income and Digital Access Group (%)

Income	*Countries*	*Population*	*GDP*
Upper-middle income	66,7	98,2	98,7
Lower-middle income	66,7	90,3	92,0
Low Income	0,0	0,0	0,0
Total	**55,6**	**90,8**	**94,7**

Digital Access Level	*Countries*	*Population*	*GDP*
Upper access	66,7	99,8	99,5
Medium access	66,7	83,3	83,1
Low access	0,0	0,0	0,0
Total	**55,6**	**90,8**	**94,7**

Section 7.2 Institutional Environment for ICT Indicators in the Region

a. Demand for ICT Statistics in Latin America and the Caribbean

Statistical offices in Latin America and the Caribbean reported a medium-high demand for ICT indicators (Table 7.3). In general, countries reported a similar demand for household and business indicators. Only El Salvador mentioned a very high demand, whereas Belize and Ecuador declared that there was no demand for ICT indicators. Demand for ICT household indicators in Saint Kitts and Nevis is perceived to be very low.

As for other regions, no evident relationship exists between digital access level and demand for ICT indicators, whereas there is a correlation between digital access level and income.

The demand for ICT indicators in the region has been fostered by the existence of regional networks and observatories such as RICYT (Ibero-American Network for Indicators on Science and Technology), CAIBI (Conference of Ibero-American Authorities for Informatics) and OSILAC (Latin American and Caribbean Observatory of the Information Society) (see Box 7.1).

Table 7.3. Demand for ICT Statistics in Latin America and the Caribbean

Demand Level	*Demand Level*				
	Very High	*High*	*Medium*	*Low*	*No Demand*
ICT Household indicators	El Salvador	Chile Mexico Trinidad and Tobago Peru Saint Vincent and the Grenadines Venezuela	Bolivia Colombia Costa Rica Brazil Barbados Jamaica Uruguay	Saint Kitts and Nevis Dominican Rep. Paraguay	Belize Ecuador
ICT Business indicators	El Salvador	Brazil Chile Mexico Trinidad and Tobago	Bolivia Colombia Costa Rica	Dominican Rep. Paraguay Uruguay	Belize Ecuador Saint Kitts and Nevis

Note: Argentina did not assess the level of demand for household ICT indicators. The following countries did not assess the level of demand for business ICT indicators: Argentina, Barbados, Jamaica, Peru , Saint Vincent and the Grenadines and Venezuela.

Box 7.1. Regional Networks on IS measurement in Latin America and the Caribbean

The region has witnessed an increase in demand for and production of indicators on the Information Society.

In 1995, the Ibero-American Network for Indicators on Science and Technology (RICYT) was established, linking academic organisations, National Statistical Offices and Ministries responsible for Technology, Communications, Science and related fields (including institutions in Spain and Portugal). The production of harmonised indicators on STI was fostered, including the preparation of regional Manuals on statistical methods (such as the Bogotá Manual). Progressively, RICYT extended the topics it dealt with to other Information society indicators. Currently, a project has been launched to prepare the "*Lisbon Manual – guide for the production of IS statistical indicators*".

In parallel, the initiative called CAIBI gathered Latin American authorities on ICT, establishing its own lists of indicators to monitor the readiness and development of ICT in the region.

The Observatory for the Information Society in Latin America and the Caribbean (OSILAC), was created under the programme of international statistical work for Latin America and the Caribbean (July 2003-June 2005) of the Statistical Conference of the Americas (SCA-ECLAC) and is a joint project between ECLAC, ICA-IDRC and @LIS of the European Commission. Its mission includes the promotion of dialogue amongst all stakeholders and the facilitation of a continually updated inventory of current statistical work related to Information Society measurement in the region; the work on the standardization of information and communication technology (ICT) definitions; the exchange, centralization and harmonization of information and data in order to benchmark international and regional policy agendas of Information Society development and finally, the provision of technical assistance and training to strengthen the capabilities of national statistical systems in the field of statistics and measurement of Information Society. OSILAC conveys the views of Latin America and the Caribbean in national, regional and international events on Information Society measurement, including WSIS and related events.

OSILAC played an important role in the preparation of the metadata questionnaire that was used for the stocktaking exercise.

b. Institutions Collecting ICT Data in Latin America and the Caribbean

In the majority of countries, the National Statistical Office is the main provider of ICT indicators (Table 7.4). In a large number of countries, other governmental institutions produce some official indicators. Basically, the national authorities for telecommunications provide statistics only on access to ICT in households and businesses. Ministries or authorities for Science and Technology (S&T) also play a role, in conjunction with their involvement in the RICYT network (see Box 7.1).

c. Resources

The majority of NSOs that answered the questionnaire reported using their regular budgetary sources for the production of ICT indicators (table 7.5). Argentina, Colombia, Costa Rica, Mexico and Uruguay obtained funding from other national organisations. For example, the national authority for Science and Technology in Argentina and Uruguay provided funds for the production of ICT statitistics. Other organisations include the Colombian programme - 'Connectivity Agenda', and the Costa Rican public organisation providing ICT services (ICE and its subsidiary RACSA). Mexico received funding from its' Central Bank and the Ministry for Social Development.

Table 7.4. Institutions Playing a Role in the Production of ICT Statistics

Country List	*Type of Surveys*		
	Household Surveys/Census	*Business Surveys*	*Other*
Argentina	NSO		
Barbados	NSO, National Council for S&T	NSO, National Council for S&T	
Belize	NSO, Suppliers	NSO	
Bolivia	NSO, Ministry for Economic Development, Authorities for Electricity and Telecommunications, UNDP	NSO, Authorities for Electricity and Telecommunications	
Brazil	NSO, Ministry for Communications, Ministry of Labour	NSO, Ministry for Communications, Ministry of Labour, Ministry for Economic Development	NSO (ICT products)
Chile	NSO, Ministry for Development, private organisations	NSO, Authority for Telecommunications, Ministry of Transport, Authority for Banking and Financial Institutions	
Colombia	NSO	NSO	NSO (ICT in education)
Costa Rica	NSO, Authority for S&T, Authority for Electricity and Telecommunications	NSO	
Dominican Republic	NSO		
Ecuador	NSO		
El Salvador	NSO	NSO	
Jamaica	NSO		
Mexico	NSO	NSO	NSO (ICT in government, ICT in education, research on ICT)
Paraguay	NSO	NSO	
Peru	NSO, Ministry of Education, Ministry of Transport, Presidency of the Government		
Saint Kitts and Nevis	Ministry for Planning		
Saint Vincent and the Grenadines	NSO, Authority for Telecommunication, private supplier		

Table 7.5. Resources for ICT Statistics in Latin America by Income Level

Origin of Funds	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Regular budget		Barbados Chile Mexico Saint Kitts and Nevis San Vicente and the Grenadines Trinidad y Tobago Uruguay Venezuela	Bolivia El Salvador Jamaica Paraguay Peru Dominican Republic	
National cooperation		Argentina Costa Rica México Uruguay	Colombia	
International cooperation				
Other(s)				
No financing available			Belize Brazil	

Note: Multiple options are allowed. Information is not available for Ecuador.

Two countries do not have financing: Brazil, with a high demand for ICT indicators, and Belize, where no demand was reported.

d. Definition of ICT

More than half of the countries do not have a formal definition for ICT. Six out of twenty countries applied some kind of ICT definition and three are developing a definition (Table 7.6).

However, the metadata questionnaire does not provide information on specific definitions for ICT products, services, economic sectors, or processes and transactions used in the countries (see Box 7.2) for assessing the comparability of indicators at the regional level. OSILAC, undertook an initial effort to study the differences and similarities among ICT questions included in household and business surveys in the LAC region[1].

[1] "Towards an Information Society measurement instrument for Latin America and the Caribbean: getting started with census, household and business surveys" (available at: http://www.cepal.org/socinfo/osilac/destacados/).

Table 7.6. Existence of an ICT Definition in Latin America and the Caribbean

Country List	*Status of Definition*		
	No Definition	*Definition in Preparation*	*ICT Definition Applied*
Argentina			X
Barbados	X		
Belize	X		
Bolivia	X		
Brazil			X
Chile		X	
Colombia			X
Costa Rica	X		
Dominican Republic	X		
Ecuador	X		
El Salvador	X		
Jamaica	X		
Mexico			X
Paraguay		X	
Peru	X		
Saint Kitts and Nevis	X		
Saint Vincent and the Grenadines	X		
Trinidad and Tobago			X
Uruguay		**X**	
Venezuela			**X**
All countries in the region (%)	**11/20 (55%)**	**3/20 (15%)**	**6/20 (30%)**

Box 7.2. ICT Definitions in Colombia and Mexico

According to OSILAC's report on the workshop on Information Society Measurement for Latin America and the Caribbean, the following definitions for ICT are used in Colombia and Mexico:

"The information and communication technologies can be defined as the set of instruments, tools, and communication means like phones, computers, electronic mail and the Internet that allow the communication between persons and organizations" (Colombia)

"The information and communication technologies can be conceived as the result of a technological convergence between telecommunications, computer sciences, microelectronic, certain administration ideas and the management of information that has evolved in almost half a century. Hardware, software, services and telecommunications are considered as its components" (Mexico)

Neither of these definitions is directly applicable to defining ICT indicators: ICT-related economic activities, products, services and processes should be defined according to a statistical methodology, that, is definitions of terms and statistical classifications which establish and limit the scope of concepts.

e. Dissemination of ICT Statistics

Ten out of the 20 countries that responded to the questionnaire have published ICT statistical reports or general reports including ICT statistics (Argentina, Barbados, Brazil, Colombia, Dominican Republic, El Salvador, Mexico, Paraguay, Peru, Trinidad and Tobago). These countries' NSOs reported a medium to very high demand for ICT indicators. Chile and St. Vincent & the Grenadines have plans for publications in the near future.

With respect to the timeliness of ICT household indicators (Table 7.7), a large number of household surveys, conducted during 2001-2004 collect some indicators. The regional programme for improving the quality of household surveys MECOVI (an initiative of ECLAC, the Inter-American Development Bank and the World Bank) has fostered the production of this kind of statistical information.

Many countries collected a limited number of ICT indicators in their population and housing censuses, completed in 2000-2001 (Census Round 2001).

Only two ICT household surveys were reported in the stocktaking exercise by Mexico and Trinidad and Tobago[1]. The former has a high periodicity.

In relation to the business sector (Table 7.8), several countries have undertaken, in the last few years since 2001, a number of sectoral surveys (industry, services, trade) which have provided ICT statistics. No Central American countries, except for Mexico, reported the implementation of business surveys collecting ICT indicators.

In 2004, Chile completed a survey of telephone companies, collecting a large number of ICT-related variables.

[1] The questionnaires from Barbados and Chile mention ICT-specific surveys carried out by the National Council for Science and Technology and the Authority for Telecommunications respectively. However, no further information on their design was given.

Table 7.7. Most Recent Date of ICT collection (households)

Country	*Type of Statistical Operation (1)*	*Number of Collected ICT Variables*	*Most Recent Collection*
Argentina	Population and Housing Census	5	2001
Barbados	Population and Housing Census	1	May 2000
Belize	Household survey	n.a.	2001-2004 (Annual)
Bolivia	Household budget survey	3	2002-2004 (Annual)
Brazil	Demographic survey	7	2003
	Household survey	5	2000
	Household budget survey	44	2002/2003
Chile	Population and Housing Census	8	2002
	Living conditions survey	4	n.a.
Colombia	Household survey	17	2001
	Living conditions survey	8	2003
Costa Rica	Household survey	3-4	2000-2003
Dominican Republic	Population and Housing Census	5	2002
El Salvador	Household survey	n.a,	2004
Jamaica	Population and Housing Census	4	2001
	Living conditions survey	2	1999-2003 (Annual)
Mexico	Population and Housing Census	1	2004
	Household Budget survey	6	1994-2002 (Biannual)
	Survey on ICT in households	***37***	***2004, 2002, 2001, 1998, 1992***
Paraguay	Population and Housing Census	8	2002
	Household survey	8	2003
Peru	Household survey	n.a.	2000-2004 (Annual)
Saint Kitts and Nevis	Population and Housing Census	7	May 2001
Saint Vincent and the Grenadines	Population and Housing Census	8	June 2001
Trinidad and Tobago	***E-commerce survey***	***37***	***June2003***
Uruguay	Household survey	4	2000-2004 (Annual)
Venezuela	Household survey	7	2001-2003 (Annual)

Notes: (1) surveys have been described as closely as possible given the little amount of information in the questionnaire.
Bold rows correspond to ICT-specific surveys.

Table 7.8. Most Recent Date of ICT Collection (business)

Country	*Type of Statistical Operation(1)*	*Number of Collected ICT Variables*	*Most Recent Collection*
Argentina	***Innovation survey (with specific module on ICT)***	***112***	***2002***
Barbados	***E-readiness survey***	***n.a.***	***n.a***
Brazil	Industrial survey	8	2003, 2001
Chile	Industrial survey	17	2004
	SME survey	3 (2003) 20 (since 2003)	2004
	Service survey and Survey on the hotel and restaurant sector	9 (2001) 29 (since 2003)	2004, 2003
	Trade survey	9 (2001) 29 (since 2003)	2004, 2003
	Survey on Sales of consumption goods	17	2004, 2003
	Survey of sales of supermarkets	17	2003
	Surveys on agro-food sector	17	2004
	Survey on metallurgy and mining	17	2004
	Survey on local fixed telephone network	***507***	***2004***
	Survey on long distance telephone network	***585***	***2004***
	Survey on mobile telephone companies	***121***	***2004***
Colombia	Industrial survey	10	2001
	Trade survey	10	2001
	Service survey	10	2001
	Survey on micro-establishments	10	2001
Mexico	Economic census	4	2004
Paraguay	Industrial survey	3	2004, 2002/2003
Trinidad and Tobago	***E-commerce survey***	***43***	***2003***
Uruguay	Innovation survey	3	2003, 2002

Notes: (1) Surveys have been described as precisely as possible given the little amount of information in the questionnaire.
Bold rows correspond to ICT-specific surveys.

Section 7.3 ICT Household Indicators in Latin America and the Caribbean

a. Sources of Information

A variety of sources for collecting ICT household indicators (Table 7.9) were used in the region. Population and housing censuses are used in several countries to collect *basic access to ICT* indicators, while other countries include a larger number of ICT questions in household sample surveys. Both methods are used in parallel in countries such as Brazil, Chile, Jamaica, Mexico and Uruguay.

Population and housing censuses

Countries that used population and housing censuses for the collection of ICT indicators are diverse: highly populous countries such as Brazil and Mexico as well as small Caribbean islands. In all cases, population and housing censuses included only questions related to *basic access to ICT*, such as *presence of Internet access* in Argentina, Barbados, Chile, Dominican Republic, Jamaica, Paraguay, St. Kitts and Nevis and St. Vincent and the Grenadines and Venezuela.

Household surveys

Andean countries (Bolivia, Colombia, Ecuador, Peru, Venezuela) used only household surveys to collect ICT indicators. Except for Chile and Colombia, the ICT-related questions included in the household questionnaires only allow producing indicators on *basic access to ICT*. In Chile and Colombia they included questions on *ICT usage.*

Specific ICT household surveys

Specific ICT surveys were identified in Barbados, Chile, Mexico and Trinidad and Tobago. These surveys include most indicator groups, particularly *ICT usage* and *barriers to ICT usage*.

As regards the income level, ad hoc ICT surveys were undertaken by countries pertaining to the upper-middle income level. Whereas lower-middle income countries used household surveys as vehicles for posing ICT-related questions.

The results for digital access levels are correlated with income levels, that is specific ICT household surveys were mainly implemented in upper access countries.

Detailed information on the type of statistical operation used in each country for the collection of the 20 indicators listed in the questionnaire is provided in Table B7 of the Annex.

b. Availability of ICT Indicators

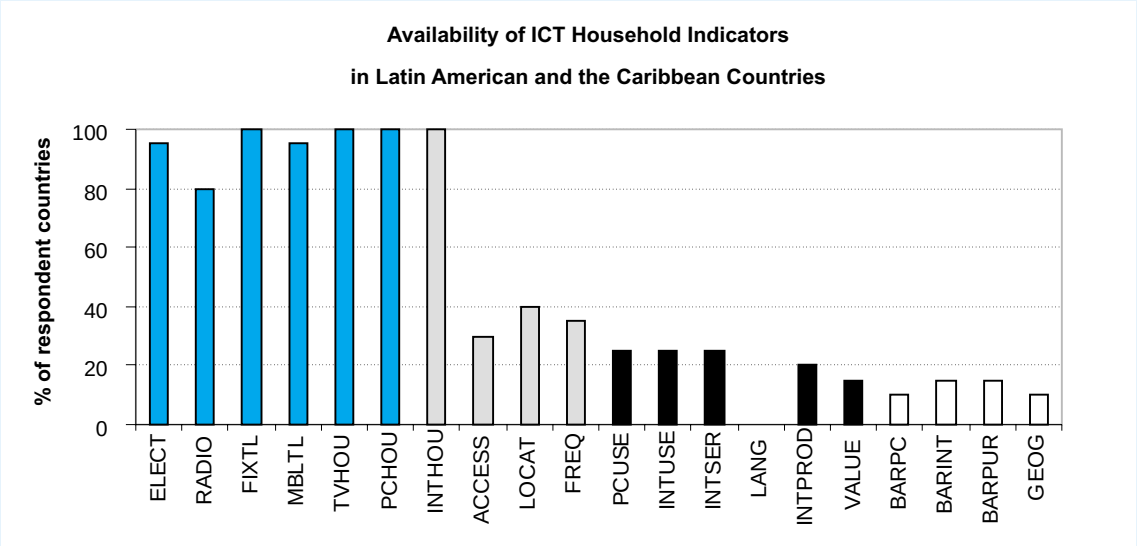
The availability of ICT indicators for the household sector is higher in this region compared to other parts of the developing world (Graphs 7.2 and 7.3). Indeed, indicators on *basic access to ICT* are available in more than 80% of the countries, accounting for more than 80% of the total regional population. Some of the indicators, such as *presence of fixed telephone, TV, PC* and *presence of Internet access* at home are available in 100% of the countries surveyed.

Table 7.9. Statistical Operations Providing ICTHousehold Indicators in Latin America and the Caribbean

Type of Operation	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Population and Housing Census		Argentina Barbados Chile Mexico Saint Kitts and Nevis St. Vincent and the Grenadines	Bolivia Brazil Dominican Republic Jamaica	
Multipurpose Household Surveys		Chile Costa Rica México Uruguay Venezuela	Bolivia Colombia Ecuador El Salvador Jamaica Paraguay Peru	
Ad hoc ICT household surveys		Barbados Mexico Trinidad and Tobago		

Type of Operation	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Population and Housing Census		Argentina Barbados Brazil Chile Jamaica Mexico Saint Kitts and Nevis	Bolivia Dominican Republic Saint Vincent and the Grenadines	
Multipurpose Household surveys		Chile Costa Rica México Uruguay	Bolivia Colombia Ecuador El Salvador Paraguay Peru Venezuela	
Ad hoc ICT Household Surveys		Barbados Mexico Trinidad and Tobago		

Graph 7.2.



Graph 7.3.

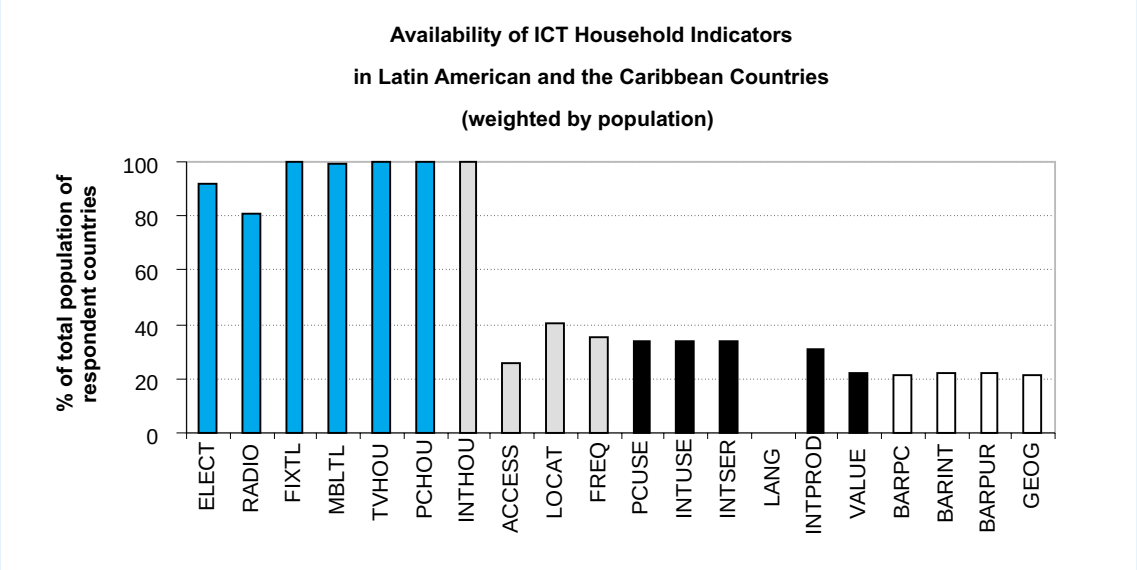


Table 7.10. Availability of ICT Household Indicators by Digital Access Level (regional average number of indicators in each group)

Indicator group	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Basic access to ICT (7 indicators)	-	6.5/7	6.8/7	-
Internet access (3 indicators)	-	1.5/3	0.5/3	-
ICT usage (6 indicators)	-	1.9/6	0.4/6	-
Barriers to usage (3 indicators)	-	0.5/3	0 3	-
Geographical location (1 indicator)	-	0.2/1	0/1	-
ICT in households (20 indicators)	**-**	**10.6/20**	**7.7/20**	**-**

Indicators on *Internet access* and *ICT usage* are available in approximately 20% of the countries. Those on *barriers to ICT usage* are compiled in less than 20% of the countries, but these account for only 20% of the regional population.

Detailed information at the country-level including the prospects for availability in the next year and in three years is presented in Table A7 of the Annex.

The possibility of increasing the availability of indicators is a concern for Bolivia, Brazil, Chile and the Dominican Republic. In terms of population covered, Brazil's production during the next three years of ICT household indicators, with more than 170 million inhabitants, will have an important impact in the region.

With respect to the digital access level, countries with upper levels collected on average 10.6 indicators out of the 20 specified in the questionnaire, while medium access countries collected only 7.7. The difference is due to the lack of indicators collected by the latter, with the exception of *basic access to ICT* indicators.

c. Disaggregations of ICT Household Indicators

As for the other regions, the possibilities for breaking down or disaggregating ICT household indicators in Latin America and the Caribbean depend on the design of the statistical instruments used for data collection (Table 7.11). Population and housing censuses, which collect a limited number of ICT indicators (1 to 8), permit more breakdowns of the indicator values, related to the other variables collected. Disaggregation of exhaustive censuses is limited by the need for data confidentiality.

Household surveys such as budget surveys (such as those in Bolivia and Mexico) allow disaggregation by the principal demographic variables (age, gender in 16 of 20 countries), and some socio-economic classifications (by education, income level and profession in 16, 10 and 8 countries respectively).

No further comparison between countries household surveys can be completed at this stage. However, the implementation of regional programmes for household surveys (such as MECOVI) and the sub-regional harmonisation exercises (in the Mercosur and Andean countries) may lead to further harmonisation of the classifications used in household indicators.

Table 7.11. Disaggregation of ICT indicators from General Household Surveys in Latin American and Caribbean Countries

Country List	*Classification Variables*							
	Age	*Gender*	*Education*	*Income/ expenditure level*	*Location*	*Ethnicity*	*Economic activity*	*Health status*
Argentina	(1)	(1)	(1)		(1)			
Barbados	(1)	(1)	(1)		(1)			
Belize	X	X	X	X	X	X	X	
Bolivia				X				
Brazil	X	X	X	X	X	X	X	
Chile	(1)	(1)	(1)		X			
Colombia	X	X	X				X	
Costa Rica	(2)	(2)	(2)				X	
Dominican Republic	(1)	(1)	(1)		(1)			
Ecuador								
El Salvador	X	X	X	X				X
Jamaica	(1)	(1)	(1)	X	(1)			
Mexico	X	X	X	(3)	(1)	(1)	(1)	
Paraguay	(1)	X	X	X	(1)	(1)	X	X
Peru	X	X	X	X	X	X	X	
Saint Kitts and Nevis	(1)	(1)	(1)		X			
Saint Vincent and the Grenadines	(1)	(1)	(1)		(1)			
Trinidad and Tobago	X	X	X	X	X		X	
Uruguay				X	X			
Total	**16**	**16**	**16**	**10**	**15**	**5**	**8**	**2**

Notes: - Only answers to the metadata questionnaire are considered. Venezuela does not specify the classification variables but attached a methodological document.
- (1) These countries collect some ICT variables through a population census. It is therefore supposed that the basic demographic variables *age, gender* and *education* and *location* are valid to produce disaggregated values for the ICT indicators collected.
- (2) The Household Survey of Costa Rica records 'Demographic and economic characteristics'
- (3) The household budget survey of Mexico records both income and 6 ICT indicators.

Section 7.4 ICT Business Indicators in Latin America and the Caribbean

a. Sources of Information

South-American countries usually collect ICT indicators in business surveys. Surveys collecting a larger number of ICT indicators were carried out in two Caribbean states and Argentina. Economic censuses are less well suited for monitoring the rapidly evolving Information Society. Some countries have combined the three types of statistical operations, in addition to administrative registries and data from service suppliers (see Box 7.3).

Detailed information on the statistical instruments used to collect each indicator at the country level is provided in Table C7 of the Annex and summarised in table 7.10.

Use of economic censuses

In the region, only Mexico collected ICT indicators through a comprehensive economic census in 2004. Indicators collected include *presence of computers* and *Internet access*, *presence of a local network* and *website*, and *ICT training*.

Use of sectoral business surveys

Chile, Colombia, El Salvador and Paraguay have used traditional sectoral business surveys to collect a limited number of ICT indicators. Different sectors are included depending on the economic importance of the sector in the country: mining, manufacturing, trade, services, tourism, agro-food, etc. The number of ICT-related variables was between 10 and 20.

Use of specific ICT business surveys

Argentina completed surveys on Innovation and Technological Behaviour of Enterprises that included a large number of ICT-related variables. This kind of survey, based on the OECD initial works on measuring innovation (Oslo Manual) is a useful source for investigating the adoption and use of new

Box 7.3. Assessment of statistical sources on ICT in business in Argentina

At the WSIS Thematic Meeting (Geneva, February 2005), the National Institute of Statistics and Censuses of Argentina (INDEC) presented a revision of the potential use of a variety of business statistical surveys for the provision of ICT statistics.

Argentina implements an *economic census* every ten years, the last one conducted in 2004/2005. It included questions on purchases, sales (including import and export) and production of ICT equipment. Similar indicators may be produced through business surveys such as the *Annual Industry Survey*. The *Internal registries of foreign trade,* produced by the Directorate for Customs and, collects data on foreign trade in ICT products also analysed by INDEC.

Qualitative data on ICT was collected in the *Annual survey of International Services* in 2003.

The *survey on Innovation and Technological Behaviour of Argentinean Enterprises* covering the reference period 1998-2001 included questions related to *presence of a website* and its use, *sales and purchases in e-commerce*, access to *mobile phones, e-mail and Internet accounts* by the employees, and on usage of ICT-related business processes such as robots, computer assisted design, materials resource planning or computer-assisted quality control.

A large amount of ICT-related information is also produced in Argentina by INDEC based on reports from service providers, including *basic telephony, mobile services, radio messages, cable TV and Internet*. The periodicity of this kind of information is higher (even monthly).

Table 7.10. Statistical Operations Providing ICT Business Indicators in Latin America and the Caribbean Countries

Type of Operation	*Income Level*			
	High Income	*Upper-Middle Income*	*Lower-Middle Income*	*Low Income*
Economic Census		Mexico		
General Enterprises surveys		Chile Uruguay	Brazil Colombia El Salvador Paraguay	
Ad hoc ICT surveys		Argentina Barbados Trinidad & Tobago		

Type of Operation	*Digital Access Level*			
	High Access	*Upper Access*	*Medium Access*	*Low Access*
Economic Census		Mexico		
General Enterprises surveys		Brazil Chile Uruguay	Colombia El Salvador Paraguay	
Ad hoc ICT surveys		Argentina Barbados Trinidad & Tobago		

technologies. It is more specific than surveys in the manufacturing sector on inputs and outputs in industries, and the questionnaire is usually addressed to the person responsible for ICT. In relation to the list of business ICT indicators in the questionnaire, the Argentinean survey collected only six indicators on *basic access to ICT, advanced access to ICT and usage* and *Internet activities and e-commerce*, while the Uruguayan one collected only *presence of computers, Internet access* and *Investment in ICT.*

Barbados and, Trinidad and Tobago also implemented specific ICT business surveys. The survey in Trinidad and Tobago included the majority of ICT business indicators in the questionnaire.

Use of business registries

NSOs use to maintain a register of all the legally constituted enterprises in the country, as infrastructure for selecting samples, carrying out statistical operations and investigating the business demography (creation and closing of firms). Business registries include contact details and may be a source for indicators such as *presence of fixed* and *mobile telephone*, and *presence of a web site*. Bolivia collects this indicator from the business registry.

Use of information from suppliers

NSOs from countries such as Bolivia and Costa Rica compile indicators on *basic access to ICT* from administrative records of the supplier companies. Usually, the licence by national authorities for the provision of services includes the obligation to submit periodic information on their subscribers.

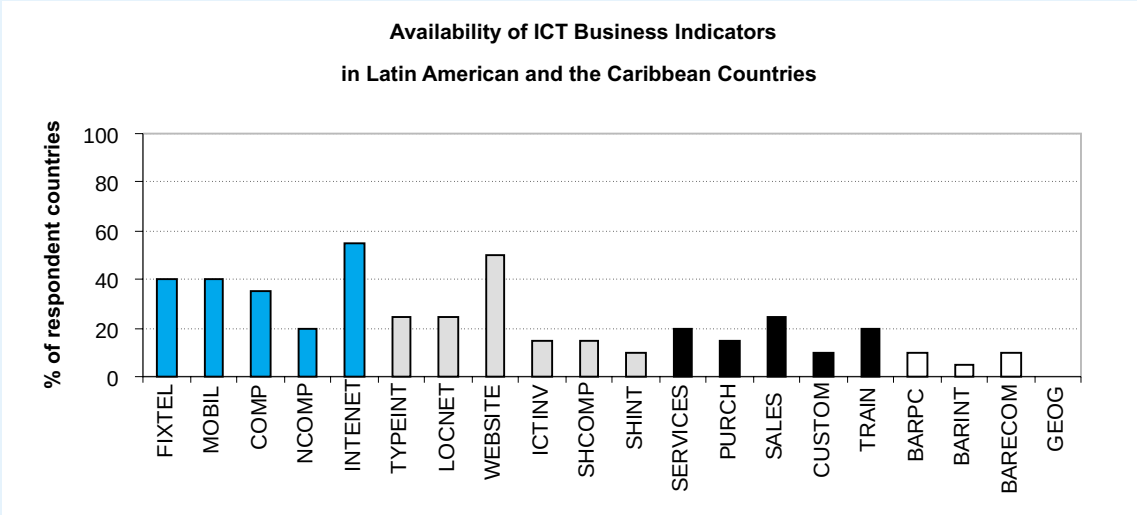
a. Availability of ICT Indicators

The pattern of availability of ICT business indicators is very different when weighted by their economic

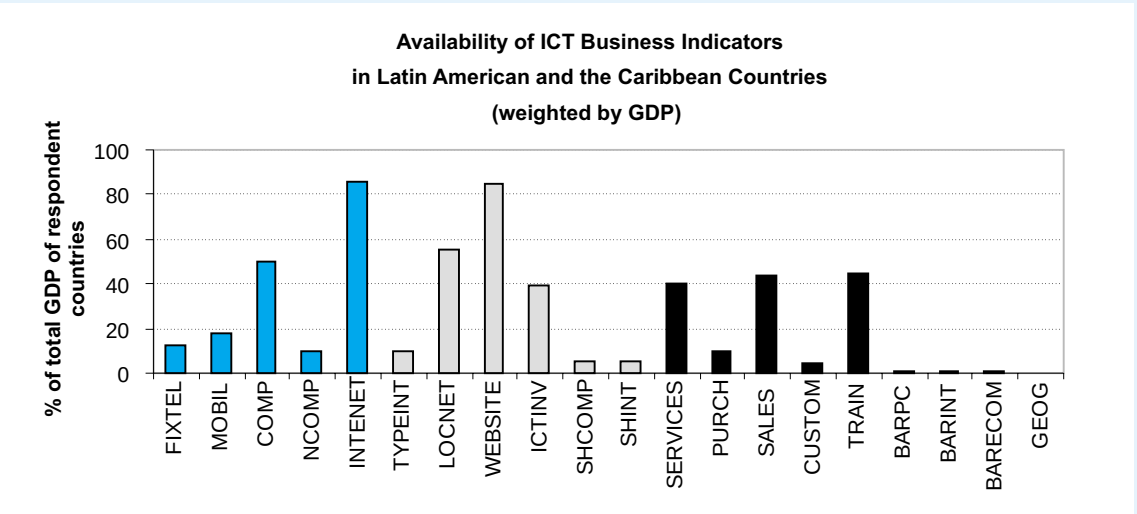
importance (measured by proportion of regional GDP) of the countries collecting them (Graphs 7.4 and 7.5). Detailed information on the availability at the country level is given in table C7 of the Annex.

The *presence of fixed* and *mobile telephone* in firms are available in 40% of the countries. Not being available in Mexico, Brazil and Argentina, the indicators' coverage in terms of regional GDP[1], is less than 20% of the econom. A similar effect occurs with the indicator - *number of computers*. The indicator *presence of computers*, closely related to the former, is available in 20% of the countries representing 50% of the share of regional GDP.

Graph 7.4.



Graph 7.5.



[1] Taking into account for the regional total the countries that answered the questionnaire.

The indicators available in the largest proportion of countries are *presence of Internet* and of a *website*, accounting for more than 80% of the economy.

The remaining indicators are available in less than 25% of the countries. However, five of them account for 40% or more of the regional economy: *presence of local network, investment in ICT, services for which the Internet is used, value of Internet sales* and *ICT training.*

Data on the *barriers to ICT use* and *geographic location on sales* are marginally (in economic terms) collected (only Barbados, Jamaica and Trinidad and Tobago declared the availability of these).

The correlation between the level of demand and the availability of ICT business indicators is not clear. Amongst the countries that reported a high or very high demand, only Chile and Trinidad and Tobago collect a large number of indicators; El Salvador has only one and Brazil and Mexico, the largest countries in terms of population and share of GDP, are planning to collect them in the near future.

In relation to the Digital Access Index (DAI), countries with higher levels have, on average, a larger number of indicators (Table 7.11) in all groups of indicators. The difference is bigger in relation to indicators on *advanced ICT access and usage*. No countries with medium access collected indicators on *barriers to usage* or on *geographic location of sales.*

d. Disaggregation of ICT Business Indicators

In order to further examine the readiness for and impact of ICT on the business sector, indicators have to be broken down into classification variables. Such disaggregations however, depend on the design of business surveys.

Mexico's economic census, highly exhaustive, allows as many disaggregations as valid combinations of the variables collected. The only limitation is imposed by the need to maintain confidentiality of statistical results.

For the remaining countries, a breakdown by economic sector and size (in terms of the number of employees) is the most common. This is relevant since most countries in the region use harmonised industrial classifications (such as ISIC).

Table 7.11. Availability of ICT Business Indicators by Digital Access Level

Indicator Group	*Digital Access Level*	
	Upper Access	*Low Access*
Basic access to ICT (5 indicators)	2.6/5	2.5/5
Advanced ICT access and usage (6 indicators)	2.4/6	1/6
Internet activities and e-commerce (4 indicators)	1.2/4	0.5/4
ICT training (1 indicator)	0.3/1	0.2/1
Barriers to usage (3 indicators)	0.6/3	0/3
Geographical location (1 indicator)	0/1	0/1
TOTAL: Business ICT indicators	**7.1/20**	**4.2/20**

Table 7.12. Classification Variables for the ICT Business Indicators in Latin America and the Caribbean

Country	*Observation Unit*	*Economic Activity*	*Size (employees)*	*Size (Turnover)*	*Location*	*Juridical form*
Argentina	Firm	X	X	X	X	
Brazil	Firm		X	X	X	
Chile	Firm	X	X		X	
Colombia	Firm/ establishment	X				
El Salvador	Establishment	X				
Mexico	Establishment	X	(1)	(1)	(1)	(1)
Paraguay	Firm	X	X	X		
Trinidad and Tobago	Firm	X	X	X		
Uruguay	Firm	X	X			
Total		**8**	**7**	**5**	**4**	**1**

Notes: - Only answers to the questionnaire are taken into account.
- (1) Mexico carried out a census collecting basic variables that can allow disaggregations by their values.

Section 7.5 ICT Indicators in other sectors in Latin America and the Caribbean

Other potential sources of information about ICT in the region analysed in this chapter have been identified in the stocktaking exercise (Table 7.12). The most researched topics are ICT in education and government.

Based on the information provided, Brazil collected up to four variables on ICT products. Colombia and Mexico carried out studies on the equipment and usage of ICT in the government (11 and 52 ICT variables respectively) and education sector (15 and 21 ICT variables respectively). The Mexican surveys have annual periodicity.

Chile surveyed the companies supplying telephone services (local, long distance and mobile) thereby collecting a large number of ICT-related variables.

Mexico also collected data on research and development in the ICT sector (30 ICT variables), including fields of research, type of institutions performing the research and R&D expenditure.

Table 4.13

Domain	***Countries***
Supply, demand and trade in ICT products	Brazil
ICT enterprises	Chile (telephone providers)
ICT in education	Colombia, Mexico
ICT in government	Colombia, Mexico
ICT investments	Mexico (research in ICT)

Key issues on the availability of ICT indicators in the region

- **Metadata collection:** The stocktaking exercise has resulted in a very high response rate when weighted by population or GDP. However, additional efforts should be made to gather metadata information from low income countries in the region (*Haiti, Honduras, Nicaragua*).

- **Data sources:** In Latin America and the Caribbean, NSOs are the main providers of ICT indicators. A large number of countries also obtain ICT indicators from national authorities for Telecommunications and Science and Technology. *Basic access to ICT* is measured in population and housing censuses (including in the two larger countries - *Brazil* and *Mexico)*. Questions on *ICT usage* are generally investigated through household surveys. Business ICT indicators are collected generally through sectoral business surveys, that include a limited (10 to 20) ICT-related questions.

- **Resources:** The large majority of countries finance the production of ICT indicators with the regular budget of their NSOs. *Brazil* and *Belize* reported no financing, while *Argentina, Costa Rica, Colombia, Uruguay* and *Mexico* received funding form national organisations.

- **Key gaps in ICT indicators:** Indicators on *Internet access, barriers to ICT usage* and other more specific are available in less than 40% of the countries. In the business sector, *presence of fixed* and *mobile telephone* do not cover *Mexico, Brazil* and *Argentina*. Five indicators (*presence of local network, investment in ICT, services for which the Internet is used, sales* and *ICT training* cover up to 40% of the regional economy. The remaining indicators are available in less than 25% of the countries.

Chapter 8. Concluding Notes

Section 8.1 Considerations on the Stocktaking Exercise

The stocktaking exercise on the status of ICT indicators undertaken by the Partnership for Measuring ICT for Development has provided valuable information on the institutional organisation, the sources and availability of ICT indicators at the global level.

The efforts of National Statistical Offices (NSOs) in a large number of countries to respond to the metadata questionnaire sent by the UN Regional Commissions, the United Nations Conference for Trade and Development (UNCTAD) and the Organisation for Economic Cooperation and Development (OECD), has permitted the consolidation of this information at the regional and global levels.

However, the lack of metadata on some countries that did not participate in the stocktaking exercise may bias the results obtained on the availability of ICT indicators. In particular, countries like *Nigeria, Libyan Arab Jamahiriya, Iraq, South Africa, Uzbekistan* and especially *China* deserve a particular study given the size of their population and/or importance in the corresponding regional economies. Sub-regions with low income and low digital access such as *Central Asia, Central America* and the developing *Pacific Islands* were also inadequately covered.

In some cases, the non-response may be due to the lack of human and technical resources in the National Statistical Offices available for completing the questionnaire.

The collection of metadata achieved through the stocktaking exercise can therefore be considered as a first step in the preparation of a global ICT indicators database, which is one of the main objectives of the Partnership. It provides important information on the current status of data collection, which serves as a starting point for further work on the harmonization of ICT statistics internationally as well as for the identification of capacity building needs in developing countries.

Section 8.2 Institutional Arrangements for the Collection of ICT Statistics

National Statistical Offices and Ministries responsible for Telecommunications share the responsibility of producing ICT indicators. In some countries, line ministries such as Education or Health provide ICT statistics on their respective fields of competence.

There is little information collected in the questionnaire about mechanisms for co-ordinating the production of ICT statistics within countries. There was evidence of a link between the demand for ICT indicators and resources available.

Key issues on the co-ordination of statistical systems are:

Financing the production of ICT indicators

NSOs regular budget usually provide the resources for the production of ICT indicators. In a few cases, countries reported the collaboration of other national institutions (basically Ministries for Telecommunications) and international entities (such as the multi-country project SCAN-ICT in Africa).

NSOs in developing countries usually face severe constraints on the amount and predictability of resources, according to recent studies[1]. Multi-annual financing plans are scarce and therefore the sustainability of statistical operations is rarely guaranteed. For a rapidly changing environment such as ICT, it is necessary to develop measuring systems that track the evolution over time. One-off surveys (which are not repeated periodically) financed and carried out with technical assistance from international organisations can even damage the national statistical systems of developing countries: higher salaries (even for short-term assignments) attract highly qualified staff that leave NSOs, and little know-how is transferred to these institutions, limiting the possibility of capacity building. Sustained co-operation programmes inserted in broader strategies, such as the PHARE assistance to candidate countries to the European Union, can ensure a higher degree of effectiveness.

In countries where other national institutions financed (partially or totally) the production of ICT statistics by NSOs, three major advantages can be easily identified.

- First, collaboration strengthens recognition of the role of the NSO as the main institution providing statistics. The financing institution recognises the expertise of official statisticians and know-how of the NSO.

- Second, the statistical operations may benefit from the existing infrastructure such as household listings in enumeration areas (used for household surveys), business directories (used for business surveys), local branches for data collection, trained interviewers, computing capacity and dissemination channels. Institutions other than the NSO may have similar capacities, but they are usually devoted to administrative tasks, not the production of statistics. Quality of output may therefore be improved.

- Third, statistics produced by the NSO have an official status, are recognised by the government and used in the definition of public policies. Surveys

[1] For example, the Marrakech Action Plan for Statistics (MAPS), developed under the aegis of the World Bank and other multilateral financing institutions.

carried out by other institutions may not be considered official status and therefore cannot be used for the definition of policies. This is usually the case with indicators on Internet use in many countries, produced by private operators and research institutes.

Programming the production of ICT indicators

The production of ICT indicators is supported by a variety of statistical sources.

These include, first, operations not specifically designed for measuring ICT and usually carried out by NSOs such as population censuses (for the indicators on *basic access to ICT by households*), household surveys (such as household budget surveys and living conditions surveys), economic censuses and sectoral business surveys.

Second, administrative operations by ICT service providers and regulatory authorities may become a source of ICT indicators, with limitations in terms of possible breakdowns and coverage, but with a lower cost for data collection.

Finally, a few countries have implemented ICT specific surveys for households and businesses.

In order to provide the users with a regular supply of ICT indicators, the following programming issues are crucial:

- Investigating users' demand for ICT indicators. Many countries have established working groups such as Statistical Councils where users and producers can meet in order to review the programmes and methods of official statistics. Unfortunately, in many developing countries these have a limited, formal role and do not allow for proper identification of the information needs and matching the existing resources with the demand. In the case of ICT indicators, these cross-cutting characteristics make it even more necessary to investigate the demand from different social, economic and governmental actors, national and international, in order to agree on a production plan. The agreement on a core list of ICT indicators, a major objective of the Partnership, is a key element of the analysis of users' demand.

- Implementing a multi-annual, comprehensive programme for ICT statistics. Producers and users of ICT indicators should first agree on a core list of required indicators and secondly analyse the different possibilities for compilation using the existing statistical tools mentioned above in order to find cost-effective solutions for the medium-term. The production of ICT indicators should be inserted in the existing national programmes for official statistics. The international initiatives for developing the national statistical systems[2] could be studied in order to accommodate the field of ICT.

- Distributing tasks to the relevant actors. The collaboration of different institutions such as NSOs, line Ministries, regulatory authorities and private providers in the exchange of information (raw data) and the compilation of aggregated statistics may increase the cost-effectiveness of producing ICT indicators. Establishing formally the distribution of tasks in the framework of a national programme is the only possibility for avoiding duplication of work, and the dissemination of redundant statistics (that may even be contradictory if the methods are not the same), as well as for benefiting from the comparative advantages of the different institutions' know-how.

There is a need for identifying the institutional factors hampering the collection of ICT indicators in countries with limited availability of ICT statistics. The lack of an evidence-based ICT policy in a country, or of a critical mass of users (private and public) requesting the data may explain their reduced availability. Or it may be the result of a lack of human and technical resources in the Statistical System. Projects and programmes of capacity building in the field of statistics and in particular on ICT indicators have been designed in some regions and could benefit from the diagnosis of the critical points in the measurement of Information Society, particularly in the poorest countries.

[2] Such as the National Strategies for Development of Statistics (NSDS) promoted by the consortium PARIS21. These are however focused on the development of systems to measure the achievements towards the Millennium Development Goals and other Poverty Reduction strategies.

Section 8.3 Issues for Further Methodological Work on ICT Indicators

In order to build the necessary capacity in the national statistical systems, the Partnership may promote the improvement of the co-ordination of the statistical activity on ICT, including the allocation of resources and the medium-term programming of the statistical operations, as mentioned in the previous section.

The Partnership may also mobilise existing expertise and know-how to produce methodological guidelines for the production of ICT indicators. The information collected through the metadata questionnaire provides impetus for further methodological work on ICT indicators:

- **Comparability issues:** How comparable is the information already collected from different countries on ICT access and usage in household and business? The use of different definitions, populations covered, sampling methods, estimation procedures, breakdown variables and other methodological elements makes the comparison of statistical measurement tools difficult. A framework for describing each national statistical system in terms of methods and institutional environment could be prepared, following the directions of other exercises (such as DQAF[1] or GDDS) towards increasing the transparency and harmonisation of ICT statistics. The work carried out by the Partnership on establishing a manual with definitions is greatly oriented toward ensuring comparability at the international level. This is a key step prior to the compilation of international databases on ICT.

- **Relevance:** How relevant are the collected ICT indicators for the design of policies, in particular, for development strategies? The link to national ICT policies and to international initiatives such as the Millennium Development Goals (MDG) should guide the production of specific ICT indicators with the relevant breakdowns to investigate the impact on different subpopulations or business sectors. In the particular field of MDG, current reporting practices include the *number of telephone lines and cellular phones, the number of PC in use and of Internet users per 100 population*, but progress in ICT statistics may allow the identification of other specific ICT indicators closely related to the other targets. The United Nations ICT Task Force Working Party on ICT indicators and MDGs (one of the members of the Partnership) examines precisely this issue and is preparing a report with concrete suggestions on time for the WSIS in Tunis.

- **Availability of specific indicators:** Many countries lag behind with regards to the availability of indicators other than those related to basic access to ICT by households and businesses. In general, the more specific an indicator is on advanced use of ICT, the lower its availability, both in the household and business sector. Therefore, a systemic approach for producing ICT indicators, covering the different topics and using different statistical instruments could be developed and promoted. The preparation by the Partnership of ICT-specific modules to be included in household or business surveys already established, and the

[1] The Data Quality Assessment Framework (DQAF) was initially proposed by the IMF for its application to National Accounts, Price Indices, Government Finance statistics, and other topics(http://dsbb.imf.org/Applications/web/dqrs/dqrsdqaf/) The World Bank and UNESCO have applied it for monetary poverty (http://siteresources.worldbank.org/INTPAME/Resources/Training-Materials/ dataquality_assessment.pdf) and education statistics (http://www.uis.unesco.org/TEMPLATE/pdf/ SCB/DQAF%20for%20education%20statistics.pdf).

identification of best practices in the use of administrative data could help the NSOs in increasing the availability of ICT indicators.

The necessity of monitoring the readiness for ICT use and its impact on living standards and economic performance requires the establishment of sound statistical systems for the production of ICT indicators.

Focusing on a shorter, 'core' list is a key issue for increasing the relevance, comparability and availability of ICT indicators. This has been one of the key objectives of the Partnership and much work has been devoted to it during the past year. As a result, a first list of core ICT indicators was agreed upon at the WSIS Thematic Meeting on "Measuring the Information Society", held in Geneva in February 2005.[2]

The initiative of the *Partnership for Measuring ICT* for the collection of information about the availability of ICT indicators and the institutional environment for their production is an important step in the achievement of the Partnership's goals.

[2] For more information on the meeting, as well as the agreed upon core list, see http://measuring-ict.unctad.org.

Annex. Country Tables

Series A: Availability of household ICT indicators

Series B: Statistical sources for household ICT indicators

Series C: Availability of business ICT indicators

Series D: Statistical sources for business ICT indicators

Note: Tables are numbered according to the chapters of the publication, that is 3 = Africa, 4 = Central Asia and Central and Eastern European Countries, 5 = Western Asia, 6 = Asia-Pacific, 7 = Latin America and the Caribbean, 8= OECD (countries covered by Eurostat), 8bis= OECD (Countries not covered by Eurostat).

Table A3. Availability of household ICT indicators in Africa

Indicator		Countries									
		Benin	Ethiopia	Gabon	Gambia	Kenya	Lesotho	Madagascar	Mauritius	Morocco	Niger
Basic access to ICT	1) Presence of electricity	√	√	√	√	√	√		√	√	√
	2) Presence of radio	√	√	√	√	√			√	√	√
	3) Presence of fixed telephone line	√	√	√	√	√		√	√	√	√
	4) Presence of mobile phone	√				√		√	√	√	√*
	5) Presence of TV	√	√	√	√	√			√	√	√
	6) Presence of a computer	√	√***			√		√	√	√***	
	7) Presence of internet access	√*	√***			√		√	√	√	
Internet access	8) Methods of access/ bandwidth for Internet access	√*	√***			√		√		√	
	9) Location of the most frequent use of Internet	√*				√			√	√	
	10) Frequency of Internet use	√*				√		√	√	√	
ICT usage	11) Purposes of PC use	√*	√***			√		√	√	√***	√
	12) Purposes of Internet use	√*	√***			√			√	√***	√
	13) Concrete services / activities the Internet is used for	√*	√***			√		√	√	√***	
	14) Languages of visited Internet sites					√*				√***	
	15) Types of products/ services purchased over the Internet					√*				√***	
	16) Value of purchased goods/ services over the Internet					√*			√	√***	
Barrier to usage	17) Barriers to PC usage	√*	√***			√*		√	√	√***	√
	18) Barriers to Internet usage	√*	√***			√*		√	√	√***	√
	19) Barriers to purchase over the Internet					√*				√***	
	20) Geographic location where the Internet goods are purchased					√*				√***	

Note: √: available. √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years .Shaded are the countries with high and very high demand for ICT indicators.

Table A3 (continuation)

Indicator		Countries								
		Central African Rep.	Democratic Rep. of Congo	Rwanda	Senegal	Sierra Leone	Tanzania	Tunisia	Zambia	Zimbabwe
Basic access to ICT	1) Presence of electricity	√	√*	√	√	√	√	√	√	√
	2) Presence of radio	√	√*	√	√	√	√	√	√	√
	3) Presence of fixed telephone line		√*	√	√		√	√	√	√
	4) Presence of mobile phone	√	√*	√	√	√*	√	√*	√	√
	5) Presence of TV	√	√*		√	√*	√	√	√	√
	6) Presence of a computer		√*	√	√	√*	√	√	√	√
	7) Presence of internet access		√***	√		√***	√***	√*	√*	
Internet access	8) Methods of access/ bandwidth for Internet access		√***	√		√***	√***	√*	√*	
	9) Location of the most frequent use of Internet		√***	√		√***	√***		√*	
	10) Frequency of Internet use		√***	√		√***	√***	√*	√*	
ICT usage	11) Purposes of PC use		√***	√		√***	√***		√*	
	12) Purposes of Internet use		√***	√		√***	√***		√*	
	13) Concrete services / activities the Internet is used for		√***	√		√***	√***		√*	
	14) Languages of visited Internet sites		√***	√		√***	√***			
	15) Types of products/ services purchased over the Internet		√***	√		√***	√***		√*	
	16) Value of purchased goods/ services over the Internet		√***			√***	√***		√*	
Barriers to usage	17) Barriers to PC usage		√***			√***	√***		√*	
	18) Barriers to Internet usage		√***			√***	√***		√*	
	19) Barriers to purchase over the Internet		√***			√***	√***		√*	
	20) Geographic location where the Internet goods are purchased		√***			√***	√***		√*	

Note: √: available; √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. No information is available for Congo. Shaded are the countries with high and very high demand for ICT indicators.

Table A3 (continuation)

Indicator		Countries								
		Central African Rep.	Democratic Rep. of Congo	Rwanda	Senegal	Sierra Leone	Tanzania	Tunisia	Zambia	Zimbabwe
Basic access to ICT	1) Presence of electricity	√	√*	√	√	√	√	√	√	√
	2) Presence of radio	√	√*	√	√	√	√	√	√	√
	3) Presence of fixed telephone line		√*	√	√		√	√	√	√
	4) Presence of mobile phone	√	√*	√	√	√*	√	√*	√	√
	5) Presence of TV	√	√*		√	√*	√	√	√	√
	6) Presence of a computer		√*	√	√	√*	√	√	√	√
	7) Presence of internet access		√***	√		√***	√***	√*	√*	
Internet access	8) Methods of access/ bandwidth for Internet access		√***	√		√***	√***	√*	√*	
	9) Location of the most frequent use of Internet		√***	√		√***	√***		√*	
	10) Frequency of Internet use		√***	√		√***	√***	√*	√*	
ICT usage	11) Purposes of PC use		√***	√		√***	√***		√*	
	12) Purposes of Internet use		√***	√		√***	√***		√*	
	13) Concrete services / activities the Internet is used for		√***	√		√***	√***		√*	
	14) Languages of visited Internet sites		√***	√		√***	√***			
	15) Types of products/ services purchased over the Internet		√***	√		√***	√***		√*	
	16) Value of purchased goods/ services over the Internet		√***			√***	√***		√*	
Barriers to usage	17) Barriers to PC usage		√***			√***	√***		√*	
	18) Barriers to Internet usage		√***			√***	√***		√*	
	19) Barriers to purchase over the Internet		√***			√***	√***		√*	
	20) Geographic location where the Internet goods are purchased		√***			√***	√***		√*	

Note: √: available; √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. No information is available for Congo. Shaded are the countries with high and very high demand for ICT indicators.

Table A4. Availability of household ICT indicators in Central Asia and Central and Eastern European Countries

Indicator		Countries									
		Albania	Andorra	Armenia	Azerbaijan	Belarus	Bosnia & Herzegovina	Bulgaria	Croatia	Georgia	Israel
Basic access to ICT	1) Presence of electricity	√	√	√	√	√	√	√	√	√	√
	2) Presence of radio		√			√	√	√	√	√	
	3) Presence of fixed telephone line	√	√	√	√	√	√	√	√	√	√
	4) Presence of mobile phone	√	√	√	√	√		√	√	√	√
	5) Presence of TV	√	√	√		√	√	√	√	√	√
	6) Presence of a computer	√		√		√		√	√	√	√
	7) Presence of internet access	√	√					√	√	√	√
Internet access	8) Methods of access/ bandwidth for Internet access		√					√			
	9) Location of the most frequent use of Internet		√					√			
	10) Frequency of Internet use	√	√					√			
ICT usage	11) Purposes of PC use	√	√					√			√
	12) Purposes of Internet use	√	√	√?			√***	√		√***	√
	13) Concrete services / activities the Internet is used for		√	√?			√***	√		√***	√
	14) Languages of visited Internet sites										
	15) Types of products/ services purchased over the Internet							√			√
	16) Value of purchased goods/ services over the Internet							√			√
Barriers to usage	17) Barriers to PC usage		√					√			
	18) Barriers to Internet usage		√	√?			√***			√***	
	19) Barriers to purchase over the Internet		√	√?			√***	√		√***	
	20) Geographic location where the Internet goods are purchased							√			

Note: √: available; √?: NSO plans to collect it in the next years; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators.

Table A4 (continuation)

Indicator		Countries								
		Kazakhstan	Kyrgyzstan	Liechtenstein	Macedonia FYR	Moldova	Romania	Russian Federation	Turkey	Ukraine
Basic access to ICT	1) Presence of electricity	√	√			√	√	√	√	
	2) Presence of radio	√	√			√	√	√	√	√
	3) Presence of fixed telephone line	√	√			√	√	√	√	
	4) Presence of mobile phone	√	√					√	√	
	5) Presence of TV	√	√			√		√	√	√
	6) Presence of a computer	√	√			√	√	√	√	√
	7) Presence of internet access						√		√	
Internet access	8) Methods of access/ bandwidth for Internet access						√		√	
	9) Location of the most frequent use of Internet								√	
	10) Frequency of Internet use								√	
ICT usage	11) Purposes of PC use						√			
	12) Purposes of Internet use	√?					√		√	
	13) Concrete services / activities the Internet is used for	√?					√***		√	
	14) Languages of visited Internet sites									
	15) Types of products/ services purchased over the Internet								√	
	16) Value of purchased goods/ services over the Internet								√	
Barriers to usage	17) Barriers to PC usage									
	18) Barriers to Internet usage	√?					√***			
	19) Barriers to purchase over the Internet	√?					√***		√	
	20) Geographic location where the Internet goods are purchased									

Note: √: available; √?: NSO plans to collect it in the next years; √***: NSO plans to collect it in 3 years. Information about Liechtenstein is not available because the questionnaire was almost empty. Shaded are the countries with high and very high demand for ICT indicators.

Table A5. Availability of household ICT indicators in Western Asia

Indicator		Countries									
		Egypt	Jordan	Kuwait	Lebanon	Oman	Palestine	Qatar	Saudi Arabia	Syrian Arab Republic	Yemen
Basic access to ICT	1) Presence of electricity	√	√	√	√	√	√	√	√	√	√*
	2) Presence of radio	√	√	√	√	√	√	√		√	√*
	3) Presence of fixed telephone line	√	√	√	√	√	√	√	√	√	√*
	4) Presence of mobile phone	√	√	√*	√	√	√	√	√***	√	√*
	5) Presence of TV	√	√	√*	√	√	√	√	√	√	√*
	6) Presence of a computer	√	√	√*	√	√	√	√	√	√	√*
	7) Presence of internet access	√	√	√*		√	√	√	√	√*	√*
Internet access	8) Methods of access/ bandwidth for Internet access	√*		√*			√	√***		√*	
	9) Location of the most frequent use of Internet	√*		√*				√***		√*	
	10) Frequency of Internet use		√	√*	√			√***		√*	
ICT usage	11) Purposes of PC use		√	√*	√		√	√***		√*	
	12) Purposes of Internet use		√	√	√		√	√***		√*	
	13) Concrete services / activities the Internet is used for			√*	√		√	√***		√*	
	14) Languages of visited Internet sites			√*				√***		√*	
	15) Types of products/ services purchased over the Internet			√*						√*	
	16) Value of purchased goods/ services over the Internet			√*						√*	
Barriers to usage	17) Barriers to PC usage			√*			√	√***		√*	
	18) Barriers to Internet usage			√*			√	√***		√*	
	19) Barriers to purchase over the Internet			√*						√*	
	20) Geographic location where the Internet goods are purchased			√*						√*	

Note: √: available; √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators.

Table A6. Availability of household ICT indicators in Asia and Pacific

	Indicator	Countries								
		Cambodia	Hong Kong SAR	India	Indonesia	Iran (Islamic Rep. of)	Macao SAR	Malaysia	Maldives	Micronesia
Basic access to ICT	1) Presence of electricity	√		√	√	√	√	√	√	√
	2) Presence of radio	√		√	√			√		√
	3) Presence of fixed telephone line	√		√	√		√	√	√	√
	4) Presence of mobile phone	√		√	√		√	√	√*	√
	5) Presence of TV	√		√	√		√	√	√	√
	6) Presence of a computer	√	√	√	√		√	√	√	√
	7) Presence of internet access		√		√***		√	√	√	√
Internet access	8) Methods of access/ bandwidth for Internet access		√		√***					√
	9) Location of the most frequent use of Internet		√		√***		√*			√
	10) Frequency of Internet use		√		√***					√
ICT usage	11) Purposes of PC use		√		√***					√
	12) Purposes of Internet use		√		√***					√
	13) Concrete services / activities the Internet is used for		√		√***					
	14) Languages of visited Internet sites									
	15) Types of products/ services purchased over the Internet		√		√***					
	16) Value of purchased goods/ services over the Internet		√		√***					
Barriers to usage	17) Barriers to PC usage		√		√***					
	18) Barriers to Internet usage		√		√***					
	19) Barriers to purchase over the Internet		√		√***					
	20) Geographic location where the Internet goods are purchased				√***					

Note: √: available; √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators.

Table A6 (continuation)

	Indicator	Countries								
		Mongolia	New Caledonia	Niue	Pakistan	Philippines	Singapore	Sri Lanka	Thailand	Vanuatu
Basic access to ICT	1) Presence of electricity	√	√	√	√	√	√	√	√	√
	2) Presence of radio	√		√	√	√		√	√	√
	3) Presence of fixed telephone line	√	√*	√	√	√	√	√	√	√
	4) Presence of mobile phone	√	√*	√	√	√	√	√	√	√
	5) Presence of TV	√		√	√		√	√	√	√
	6) Presence of a computer	√	√	√			√	√	√	√
	7) Presence of internet access		√	√	√		√	√		√
Internet access	8) Methods of access/ bandwidth for Internet access			√	√		√	√		√***
	9) Location of the most frequent use of Internet				√		√	√	√	√***
	10) Frequency of Internet use		√***		√		√	√	√	√***
ICT usage	11) Purposes of PC use		√***	√			√	√	√	√***
	12) Purposes of Internet use		√***	√			√	√	√	√***
	13) Concrete services / activities the Internet is used for		√***				√		√	√***
	14) Languages of visited Internet sites						√			√***
	15) Types of products/ services purchased over the Internet						√		√	√***
	16) Value of purchased goods/ services over the Internet						√		√	√***
Barriers to usage	17) Barriers to PC usage						√			√***
	18) Barriers to Internet usage				√		√			√***
	19) Barriers to purchase over the Internet						√			√***
	20) Geographic location where the Internet goods are purchased						√			√***

Note: √: available; √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators.

Table A7. Availability of household ICT indicators in Latin America and the Caribbean

Indicator		Countries									
		Argentina	Barbados	Belize	Bolivia	Brazil	Chile	Colombia	Costa Rica	Dominican Republic	Ecuador
Basic access to ICT	1) Presence of electricity		√	√	√	√	√	√	√	√	√
	2) Presence of radio		√	√	√	√	√			√	√
	3) Presence of fixed telephone line	√	√	√	√	√	√	√	√	√	√
	4) Presence of mobile phone	√	√	√	√	√	√	√	√	√	√
	5) Presence of TV	√	√	√	√	√	√	√	√	√	√
	6) Presence of a computer	√	√	√	√	√	√	√	√	√	√
	7) Presence of internet access	√	√	√	√	√	√	√	√	√	√
Internet access	8) Methods of access/ bandwidth for Internet access		√	√	√***	√***	√		√	√***	
	9) Location of the most frequent use of Internet		√	√	√***	√***	√	√	√	√***	
	10) Frequency of Internet use		√	√	√***	√***	√	√	√	√***	
ICT usage	11) Purposes of PC use		√		√***	√***	√	√		√***	
	12) Purposes of Internet use		√		√***	√***	√	√	√	√***	
	13) Concrete services / activities the Internet is used for		√		√***	√***	√	√		√***	
	14) Languages of visited Internet sites				√***	√***	√***			√***	
	15) Types of products/ services purchased over the Internet		√		√***	√***	√***	√		√***	
	16) Value of purchased goods/ services over the Internet		√		√***	√***	√***			√***	
Barriers to usage	17) Barriers to PC usage		√		√***	√***	√***			√***	
	18) Barriers to Internet usage		√		√***	√***	√***			√***	
	19) Barriers to purchase over the Internet		√		√***	√***	√***			√***	
	20) Geographic location where the Internet goods are purchased		√		√***	√***	√***			√***	

Note: √: available; √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators

Table A7 (continuation)

Indicator		Countries									
		El Salvador	Jamaica	Mexico	Paraguay	Peru	Saint Kitts & Nevis	St Vincent & the Grenadines	Trinidad & Tobago	Uruguay	Venezuela
Basic access to ICT	1) Presence of electricity	√	√	√	√	√	√	√	√	√	√
	2) Presence of radio	√	√	√		√	√	√	√		√
	3) Presence of fixed telephone line	√	√	√	√	√	√	√	√	√	√
	4) Presence of mobile phone	√	√	√	√	√	√	√	√		√
	5) Presence of TV	√	√	√	√	√	√	√	√	√	√
	6) Presence of a computer	√	√	√	√	√	√	√	√	√	√
	7) Presence of internet access	√	√	√	√	√	√	√	√	√	√
Internet access	8) Methods of access/ bandwidth for Internet access			√					√		
	9) Location of the most frequent use of Internet			√		√			√		
	10) Frequency of Internet use			√					√		
ICT usage	11) Purposes of PC use			√					√		
	12) Purposes of Internet use			√					√		
	13) Concrete services / activities the Internet is used for			√					√		
	14) Languages of visited Internet sites										
	15) Types of products/ services purchased over the Internet			√					√		
	16) Value of purchased goods/ services over the Internet			√					√		
Barrier to usage	17) Barriers to PC usage			√							
	18) Barriers to Internet usage			√					√		
	19) Barriers to purchase over the Internet			√					√		
	20) Geographic location where the Internet goods are purchased			√					√*		

Note: √: available; √*: NSO plans to collect it in 1 year. Shaded are the countries with high and very high demand for ICT indicators

Table A8. Availability of household ICT indicators in OECD countries (countries covered by Eurostat)

	Indicator	Countries										
		Austria	Belgium	Czech. Republic	Denmark	Finland	France	Germany	Greece	Hungary	Iceland	Ireland
Basic access to ICT	1) Presence of electricity											
	2) Presence of radio											
	3) Presence of fixed telephone line											
	4) Presence of mobile phone	√	√*	√	√	√	√*	√	√	√	√	√
	5) Presence of TV	√	√*	√	√	√	√*	√	√	√	√	√
	6) Presence of a computer	√	√*	√	√	√	√	√	√	√	√	√
	7) Presence of internet access	√	√*	√	√	√	√	√	√	√	√	√
Internet	8) Methods of access/ bandwidth for Internet access	√	√*	√	√	√	√*	√	√	√	√	√
	9) Location of the most frequent use of Internet	√	√*	√	√	√	√*		√	√	√	√
	10) Frequency of Internet use	√	√*	√	√	√	√*	√	√	√	√	√
ICT usage	11) Purposes of PC use	√	√*									
	12) Purposes of Internet use	√	√*	√	√	√	√*	√	√	√	√	√
	13) Concrete services / activities the Internet is used for	√	√*	√	√	√	√*	√	√	√	√	√
	14) Languages of visited Internet sites											
	15) Types of products/ services purchased over the Internet	√	√*	√	√	√	?	√	√	√	√	√
	16) Value of purchased goods/ services over the Internet	√			√			√	√			√
Barriers to usage	17) Barriers to PC usage											
	18) Barriers to Internet usage	√	√*	√*	√	√	?	√*	√	√	√*	√
	19) Barriers to purchase over the Internet	√*	√*	√*	√	√	?	√	√	√	√*	√
	20) Geographic location where the Internet goods are purchased											

Note: √: available; √*: NSO plans to collect it (no reference to date).

Table A8. (cont.)

	Indicator	Countries									
		Italy	Luxembourg	Netherlands	Norway	Poland	Portugal	Slovakia	Spain	Sweden	United Kingdom
Basic access to ICT	1) Presence of electricity										
	2) Presence of radio										
	3) Presence of fixed telephone line										
	4) Presence of mobile phone	√*	√	√	√	√	√	√*	√	√*	√
	5) Presence of TV	√	√	√	√	√	√	√*	√	√*	√
	6) Presence of a computer	√	√	√	√	√	√	√*	√	√*	√
	7) Presence of internet access	√	√	√	√	√	√	√*	√	√*	√
Internet	8) Methods of access/ bandwidth for Internet access	√	√	√	√	√	√	√*	√	√*	√
	9) Location of the most frequent use of Internet	√	√	√	√	√	√	√*	√	√	√
	10) Frequency of Internet use	√	√	√	√	√	√	√*	√	√	√
ICT usage	11) Purposes of PC use									√	
	12) Purposes of Internet use	√*	√	√	√	√	√	√*	√	√	√
	13) Concrete services / activities the Internet is used for	√*	√	√	√	√	√	√*	√	√	√
	14) Languages of visited Internet sites										
	15) Types of products/ services purchased over the Internet		√	√	√	√	√	?	√	√*	√
	16) Value of purchased goods/ services over the Internet				√	√	√	?	?		
Barriers to usage	17) Barriers to PC usage										
	18) Barriers to Internet usage	√*	√	√	√	√	√	?	?	√*	√
	19) Barriers to purchase over the Internet	√*	√	√*	√	√	√	?	√	√*	√
	20) Geographic location where the Internet goods are purchased										

Note: √: available; √*: NSO plans to collect it (no reference to date).

Table A8bis. Availability of household ICT indicators in OECD countries (countries not covered by Eurostat)

Indicator		Countries						
		Australia	Canada	Japan	Korea	New Zealand	Switzerland	United States
Basic access to ICT	1) Presence of electricity						√	
	2) Presence of radio						√	
	3) Presence of fixed telephone line		√	√	√	√	√	√
	4) Presence of mobile phone		√	√	√	√	√	√
	5) Presence of TV		√	√	√	√	√	√
	6) Presence of a computer	√	√	√	√	√	√	√
	7) Presence of internet access	√	√	√	√	√	√	√
Internet	8) Methods of access/ bandwidth for Internet access	√	√	√	√	√	√	√
	9) Location of the most frequent use of Internet	√	√*	√	√	√*	√	√
	10) Frequency of Internet use	√	√*	√	√	√*	√	√
ICT usage	11) Purposes of PC use	√			√	√*		√
	12) Purposes of Internet use	√	√*	√	√	√*		√
	13) Concrete services / activities the Internet is used for	√	√*	√	√	√*	√	√
	14) Languages of visited Internet sites				√*			
	15) Types of products/ services purchased over the Internet	√	√*	√	√	√	√*	
	16) Value of purchased goods/ services over the Internet	√	√*	√	√	√	√*	
Barriers to usage	17) Barriers to PC usage							
	18) Barriers to Internet usage		√*	√	√	√	√*	√
	19) Barriers to purchase over the Internet	√		√	√	√	√*	
	20) Geographic location where the Internet goods are purchased				√*			

Note: √: available; √*: NSO plans to collect it (no reference to date).
Note: Mexico and Turkey are included in the tables corresponding to Latin America and Caribbean, and Central Asia and Central and Eastern Europe, respectively

Table B3. Household ICT indicators and sources in Africa

Indicator		Sources and countries			
		Population and Housing Censuses	Household surveys	Suppliers	Specific ICT surveys
Basic access to ICT	1) Presence of electricity in households	Benin Mauritius Niger Sierra Leone	Benin Gabon Senegal Tunisia	Rwanda Tanzania Zimbabwe	Kenya
	2) Presence of radio in household	Niger Tanzania	Gabon Senegal Tunisia Sierra Leone	Mauritius Rwanda Zimbabwe	Kenya
	3) Presence of fixed telephone line in household	Niger	Gabon Senegal Tanzania Tunisia	Mauritius Rwanda Zimbabwe	Kenya
	4) Presence of mobile phone in household	Niger	Senegal Tunisia	Mauritius Rwanda Tanzania	Kenya
	5) Presence of TV in household		Senegal Gabon Mauritius Tanzania Tunisia	Rwanda Zimbabwe	Kenya
	6) Presence of a computer in household		Senegal Mauritius Rwanda Tanzania Tunisia		Kenya Madagascar
	7) Presence of internet access in household		Mauritius Rwanda		Kenya Madagascar

Table B3 (cont.).

Indicator		Sources and countries			
		Population and Housing Censuses	Household surveys	Suppliers	Specific ICT surveys
Internet access	8) Methods of access/ bandwidth for Internet access in household		Rwanda		Kenya Madagascar
	9) Location of the most frequent use of Internet		Mauritius Rwanda		Kenya Madagascar
	10) Frequency of Internet use				Madagascar
ICT usage	11) Purposes of PC use		Mauritius Rwanda	Niger	Kenya Madagascar
	12) Purposes of Internet use		Mauritius Rwanda		Madagascar
	13) Concrete services / activities the Internet is used for		Rwanda		Kenya Madagascar
	14) Languages of visited Internet sites		Rwanda		
	15) Types of products/ services purchased over the Internet		Rwanda		
	16) Value of purchased goods/ services over the Internet				
Barriers to ICT usage	17) Barriers to PC usage		Mauritius	Niger	Madagascar
	18) Barriers to Internet usage		Mauritius	Niger	Madagascar
	19) Barriers to purchase over the Internet				
	20) Geographic location where the Internet goods are purchased				

Table B4. Household ICT indicators and sources in Central Asia and Central and Eastern European countries

Indicator		Sources and countries			
		Population and Housing Censuses	Household surveys	Suppliers	Specific ICT surveys
Basic access to ICT	1) Presence of electricity in households		Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Croatia, Georgia, Israel, Kyrgyzstan, Moldova, Russian Fed., Turkey	Andorra	Bulgaria, Kazakhstan, Romania
	2) Presence of radio in household		Belarus, Bosnia and Herzegovina, Croatia, Georgia, Kyrgyzstan, Moldova, Russian Fed., Ukraine		Andorra, Bulgaria, Kazakhstan, Romania
	3) Presence of fixed telephone line in household		Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Croatia, Georgia, Israel, Kyrgyzstan, Moldova, Russian Fed., Turkey		Andorra, Bulgaria, Kazakhstan, Romania
	4) Presence of mobile phone in household		Albania, Armenia, Azerbaijan, Belarus, Croatia, Georgia, Israel, Kyrgyzstan, Moldova, Russian Fed., Turkey, Ukraine		Andorra, Bulgaria, Kazakhstan
	5) Presence of TV in household		Albania, Armenia, Belarus, Croatia, Georgia, Israel, Kyrgyzstan, Russian Fed., Turkey, Ukraine		Andorra, Bulgaria, Kazakhstan, Romania
	6) Presence of a computer in household		Albania, Armenia, Belarus, Croatia, Georgia, Israel, Kyrgyzstan, Russian Fed., Turkey, Ukraine		Andorra, Bulgaria, Romania
	7) Presence of internet access in household		Albania, Croatia, Israel, Turkey		

Table B4. (continued)

Indicator		Sources and countries			
		Population and Housing Censuses	Household surveys	Suppliers	Specific ICT surveys
Internet access	8) Methods of access/ bandwidth for Internet access in household		Turkey		Andorra, Bulgaria, Romania
	9) Location of the most frequent use of Internet		Turkey		Andorra, Bulgaria, Romania
	10) Frequency of Internet use		Turkey		Andorra, Bulgaria, Romania
ICT usage	11) Purposes of PC use		Israel		Andorra, Bulgaria, Romania
	12) Purposes of Internet use		Israel, Turkey		Andorra, Bulgaria, Romania
	13) Concrete services / activities the Internet is used for		Israel, Turkey		Andorra, Bulgaria, Romania
	14) Languages of visited Internet sites				
	15) Types of products/ services purchased over the Internet		Israel, Turkey		Bulgaria, Romania
	16) Value of purchased goods/ services over the Internet		Israel, Turkey		Bulgaria, Romania
Barriers to ICT usage	17) Barriers to PC usage				Andorra, Bulgaria, Romania
	18) Barriers to Internet usage				Andorra
	19) Barriers to purchase over the Internet		Turkey		Andorra, Bulgaria, Romania
	20) Geographic location where the Internet goods are purchased				Bulgaria, Romania

Table B5. Household ICT indicators and sources in Western Asia

Indicator		Sources and countries			
		Population and Housing Censuses	Household surveys	Suppliers	Specific ICT surveys
Basic access to ICT	1) Presence of electricity in households	Egypt Jordan Oman Palestine Qatar Saudi Arabia	Egypt Lebanon Syrian Arab Republic		Palestine
	2) Presence of radio in household	Egypt Jordan Palestine Qatar	Egypt Lebanon Syrian Arab Republic		Palestine
	3) Presence of fixed telephone line in household	Egypt Jordan Palestine Qatar	Egypt Lebanon Syrian Arab Republic		Palestine
	4) Presence of mobile phone in household	Egypt Jordan Palestine Qatar	Egypt Lebanon Syrian Arab Republic		Palestine
	5) Presence of TV in household	Egypt Jordan Palestine Qatar	Egypt Lebanon Syrian Arab Republic		Palestine
	6) Presence of a computer in household	Egypt Jordan Palestine Qatar	Egypt Lebanon Syrian Arab Republic		Palestine
	7) Presence of internet access in household	Egypt Jordan Qatar	Egypt		Palestine

Table B5. (continued)

Indicator		Sources and countries			
		Population and Housing Censuses	Household surveys	Suppliers	Specific ICT surveys
Internet access	8) Methods of access/ bandwidth for Internet access in household				
	9) Location of the most frequent use of Internet				
	10) Frequency of Internet use				Palestine
ICT usage	11) Purposes of PC use		Lebanon		Palestine
	12) Purposes of Internet use		Lebanon		Palestine
	13) Concrete services / activities the Internet is used for		Lebanon		Palestine
	14) Languages of visited Internet sites				
	15) Types of products/ services purchased over the Internet				
	16) Value of purchased goods/ services over the Internet				
Barriers to ICT usage	17) Barriers to PC usage				Palestine
	18) Barriers to Internet usage				Palestine
	19) Barriers to purchase over the Internet				
	20) Geographic location where the Internet goods are purchased				

Table B6. Household ICT indicators and sources in Asia-Pacific

Indicator		Sources and countries			
		Population and Housing Censuses	Household surveys (1)	Suppliers	Specific ICT surveys
Basic access to ICT	1) Presence of electricity in households	Macao SAR Malaysia Mongolia New Caledonia Niue, Sri Lanka	India Indonesia Macao SAR Mongolia	Micronesia Singapore	Thailand
	2) Presence of radio in household	Mongolia Niue Malaysia	India, Indonesia Micronesia, Mongolia Sri Lanka	Micronesia Sri Lanka	Thailand
	3) Presence of fixed telephone line in household	Macao SAR Mongolia Niue Malaysia	India Indonesia Macao SAR Singapore (1)	Micronesia Sri Lanka	Thailand
	4) Presence of mobile phone in household	Macao SAR Mongolia Niue Malaysia	India Indonesia Macao SAR Singapore		Thailand
	5) Presence of TV in household	Macao SAR Mongolia Niue Malaysia	India Indonesia Macao SAR Micronesia Mongolia Singapore Sri Lanka		Thailand
	6) Presence of a computer in household	Macao SAR Mongolia Niue Malaysia New Caledonia	Macao SAR Singapore Sri Lanka		Hong Kong SAR Thailand
	7) Presence of internet access in household	Macao SAR Malaysia New Caledonia		Micronesia Niue	Hong Kong SAR Thailand

(1) the Household Expenditure Survey – Availability of Consumer Durables in Households of Singapore contains 14 ICT-relatec variables out of 50. It can also be considered as a specific ICT survey .

Table B6 (cont.)

Indicator		Sources and countries			
		Population and Housing Censuses	Household surveys (1)	Suppliers	Specific ICT surveys
Internet access	8) Methods of access/ bandwidth for Internet access in household		Singapore Sri Lanka	Micronesia Niue	Hong Kong SAR Thailand
	9) Location of the most frequent use of Internet		Singapore Sri Lanka	Micronesia	Hong Kong SAR Thailand
	10) Frequency of Internet use		Singapore Sri Lanka	Micronesia	Hong Kong SAR Thailand
ICT usage	11) Purposes of PC use		Singapore Sri Lanka	Micronesia	Hong Kong SAR Thailand
	12) Purposes of Internet use		Singapore Sri Lanka	Micronesia Niue	Hong Kong SAR Thailand
	13) Concrete services / activities the Internet is used for		Singapore	Niue	
	14) Languages of visited Internet sites				
	15) Types of products/ services purchased over the Internet		Singapore		Hong Kong SAR Thailand
	16) Value of purchased goods/ services over the Internet		Singapore		Hong Kong SAR Thailand
Barriers to ICT usage	17) Barriers to PC usage				Hong Kong SAR
	18) Barriers to Internet usage		Singapore		Hong Kong SAR
	19) Barriers to purchase over the Internet		Singapore		Hong Kong SAR
	20) Geographic location where the Internet goods are purchased		Singapore		

(1) the Household Expenditure Survey – Availability of Consumer Durables in Households of Singapore contains 14 ICT-relatec variables out of 50. It canalso be considered as a specific ICT survey.

Table B7. Household ICT indicators and sources in Latin America and the Caribbean

Indicator		Sources and countries			
		Population and Housing Census	Multipurpose Household surveys	Ad hoc ICT household surveys	Other
Basic access to ICT	1) Presence of electricity	Barbados, Bolivia, Brazil, Chile Dominican Rep. Jamaica, Mexico Saint Kitts & Nevis St Vincent & the Grenadines Uruguay	Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Jamaica, Mexico, Paraguay, Peru ,Venezuela	Trinidad & Tobago	Bolivia
	2) Presence of radio	Barbados, Bolivia, Brazil, Chile, Dominican Rep. Mexico, Saint Kitts & Nevis, St Vincent & the Grenadines	Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Jamaica, Mexico, Peru, Venezuela	Trinidad & Tobago	
	3) Presence of fixed telephone line	Argentina, Barbados, Bolivia, Brazil, Chile, Dominican Rep., Jamaica, Mexico, Saint Kitts & Nevis, St Vincent & the Grenadines, Uruguay	Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Jamaica, Mexico, Paraguay, Peru, Uruguay, Venezuela	Mexico, Trinidad & Tobago	
	4) Presence of mobile phone	Argentina, Barbados, Bolivia, Brazil, Chile, Dominican Rep., Jamaica, Saint Kitts & Nevis, St Vincent & the Grenadines	Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Jamaica, Mexico, Paraguay, Peru, Venezuela	Trinidad & Tobago	
	5) Presence of TV	Argentina, Barbados, Bolivia, Brazil, Chile, Dominican Rep., Mexico, Saint Kitts & Nevis, St Vincent & the Grenadines, Uruguay	Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Jamaica, Mexico, Paraguay, Peru, Uruguay, Venezuela	Mexico, Trinidad & Tobago	
	6) Presence of a computer	Argentina, Barbados, Brazil, Chile, Dominican Rep., Jamaica, Mexico, Saint Kitts & Nevis, St Vincent & the Grenadines, Uruguay	Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Jamaica, Mexico, Paraguay, Peru, Uruguay, Venezuela	Mexico, Trinidad & Tobago	
	7) Presence of internet access	Argentina, Barbados, Chile, Dominican Rep. , Saint Kitts & Nevis, St Vincent & the Grenadines	Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Jamaica, Paraguay, Peru, Uruguay, Venezuela	Mexico, Trinidad & Tobago	

Table B7. (cont.)

Indicator		Sources and countries			
		Population and Housing Census	Multipurpose Household surveys	Ad hoc ICT household surveys	Other
Internet access	8) Methods of access/ bandwidth for Internet access		Costa Rica	Barbados, Mexico, Trinidad & Tobago	Chile
	9) Location of the most frequent use of Internet		Chile, Colombia, Costa Rica, Peru	Barbados, Mexico, Trinidad & Tobago	
	10) Frequency of Internet use		Colombia, Costa Rica	Barbados, Chile, Mexico, Trinidad & Tobago	
ICT usage	11) Purposes of PC use		Chile, Colombia	Barbados, Mexico, Trinidad & Tobago	
	12) Purposes of Internet use		Chile, Colombia	Barbados, Mexico, Trinidad & Tobago	
	13) Concrete services / activities the Internet is used for		Chile, Colombia	Barbados, Mexico, Trinidad & Tobago	
	14) Languages of visited Internet sites				
	15) Types of products/ services purchased over the Internet		Colombia	Barbados, Mexico, Trinidad & Tobago	
	16) Value of purchased goods/ services over the Internet			Barbados, Mexico, Trinidad & Tobago	
Barrier to usage	17) Barriers to PC usage			Barbados, Mexico	
	18) Barriers to Internet usage			Barbados, Mexico, Trinidad & Tobago	
	19) Barriers to purchase over the Internet			Barbados, Mexico, Trinidad & Tobago	
	20) Geographic location where the Internet goods are purchased			Barbados, Mexico	

Note: Belize collects indicators but does not provide information on the type of survey used.

Table C3. Availability of business ICT indicators in Africa

		Benin	Madagascar	Mauritius	Morocco	Democratic Rep. of Congo	Rwanda	Senegal	Sierra Leone	Tanzania	Tunisia	Zimbabwe
Basic access to ICT	1) Fixed telephone		√	√	√	√	√	√	√*	√		√
	2) Mobile devices		√	√***	√		√	√	√*	√		
	3) Presence of computers		√	√	√		√		√*	√		
	4) Number of computers		√	√	√		√		√*	√		
	5) Presence of Internet access			√	√		√	√	√*	√		
Advanced ICT access and usage	6) Type of Internet access			√	√		√		√*	√		
	7) Local network			√	√***		√		√*	√		
	8) Website		√	√	√		√		√*	√	√	
	9) ICT investment			√	√***		√		√*		√	
	10) Share of employees using a computer			√	√				√*	√***		
	11) Share of employees using the Internet			√***					√*	√***		
Internet activities and e-	12) Services the Internet is used for			√***	√***				√*	√		
	13) Value of purchases				√				√*	√	√	
	14) Value of sales		√	√***	√				√*	√	√	
	15) Customer group			√***	√				√*	√		
ICT training	16) ICT training			√	√				√*	√		
Barriers to ICT use	17) Barriers to computer use		√	√***			√		√*	√		
	18) Barriers to Internet use			√***	√***		√		√*	√		
	19) Barriers to e-commerce			√***			√		√*	√		
Location	20) Geographic location of sales			√***					√*	√		

Note: √: available; √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators. For the following countries any indicator is available and the NSO does not plan to collect any of them: Ethiopia, Gabon, Gambia, Kenya, Lesotho, Niger, Central African Rep., and Zambia.

Table C4. Availability of business ICT indicators in Central Asia and CEE countries

Indicators		Countries									
		Albania	Andorra	Armenia	Azerbaijan	Belarus	Bulgaria	Kazakhstan	Kyrgystan	Moldova	Romania
Basic access to ICT	1) Fixed telephone	√	√	√	√	√		√	√	√	√
	2) Mobile devices	√	√	√	√	√		√	√	√	√
	3) Presence of computers						√		√	√	√
	4) Number of computers						√		√	√	√
	5) Presence of Internet access		√	√	√	√	√	√	√	√	√
Advanced ICT access and usage	6) Type of Internet access		√				√		√	√	√
	7) Local network						√		√	√	√
	8) Website		√				√		√		√
	9) ICT investment							√	√	√	√
	10) Share of employees using a computer		√				√		√	√	√
	11) Share of employees using the Internet		√				√		√		√
Internet activities and e-commerce	12) Services the Internet is used for		√***				√	√***	√		√
	13) Value of purchases		√***				√	√***			√
	14) Value of sales		√***				√	√***			√
	15) Customer group		√***				√	√***			√
ICT training	16) ICT training										
Barriers to ICT use	17) Barriers to computer use										√
	18) Barriers to Internet use						√				√
	19) Barriers to e-commerce						√				
Location	20) Geographic location of sales						√				√

Note: √: available; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators. The following countries do not have any indicator available and the NSO do not plan to collect any of them or did not respond to this part of the questionnaire: Bosnia & Herzegovina, Croatia, Georgia, Israel, Liechtenstein, Macedonia FYR and Turkey.

Table C4 (continuation)

Indicators		Countries	
		Russian Federation	Ukraine
Basic access to ICT	1) Fixed telephone	√	√
	2) Mobile devices	√	√
	3) Presence of computers	√	√
	4) Number of computers	√	√
	5) Presence of Internet access	√	√
Advanced ICT access and usage	6) Type of Internet access		√
	7) Local network		√
	8) Website	√	
	9) ICT investment	√	√
	10) Share of employees using a computer	√	√
	11) Share of employees using the Internet	√	
Internet activities and e-commerce	12) Services the Internet is used for	√	
	13) Value of purchases	√	
	14) Value of sales	√	
	15) Customer group		
ICT training	16) ICT training	√	
Barriers to ICT use	17) Barriers to computer use	√	
	18) Barriers to Internet use	√	
	19) Barriers to e-commerce	√	
Location	20) Geographic location of sales	√	

Note: √: available

Table C5. Availability of business ICT indicators in Western Asia

Indicators		Countries					
		Egypt	Kuwait	Oman	Palestine	Qatar	Syrian Arab Republic
Basic access to ICT	1) Fixed telephone	√	√	√	√***	√	√*
	2) Mobile devices	√	√*		√***		√*
	3) Presence of computers	√	√*	√	√***		√*
	4) Number of computers	√	√*		√***		√*
	5) Presence of Internet access	√	√*		√***		√*
Advanced ICT access and usage	6) Type of Internet access		√*		√***		√*
	7) Local network	√*	√*		√***		√*
	8) Website	√*	√*		√***		√*
	9) ICT investment	√*	√***		√***		√*
	10) Share of employees using a computer	√*	√*		√***	√***	√*
	11) Share of employees using the Internet	√*	√*		√***		√*
Internet activities and e-commerce	12) Services the Internet is used for	√*	√*	√	√***		√*
	13) Value of purchases	√*	√***		√***		√*
	14) Value of sales	√*	√***		√***		√*
	15) Customer group	√*	√***		√***		√*
ICT training	16) ICT training	√*	√*		√***	√***	√*
Barriers to ICT use	17) Barriers to computer use	√*	√*		√***	√***	√*
	18) Barriers to Internet use	√*	√*		√***	√***	√*
	19) Barriers to e-commerce	√*	√*		√***		√*
Location	20) Geographic location of sales	√*	√***		√***		√*

Note: √: available; √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators. The following countries do not have any indicator available and the NSO do not plan to collect any of them or did not respond to this part of the questionnaire : Jordan, Lebanon, Saudi Arabia and Yemen.

Table C6. Availability of business ICT indicators in Asia & Pacific

Indicators		Countries									
		Hong Kong SAR	India	Indonesia	Macao SAR	Maldives	Mongolia	New Caledonia	Pakistan	Philippines	Singapore
Basic access to ICT	1) Fixed telephone		√		√	√	√	√	√	√	√
	2) Mobile devices	√	√		√	√	√	√*	√	√	√
	3) Presence of computers	√	√		√		√*	√		√	√
	4) Number of computers	√	√		√		√*			√	√
	5) Presence of Internet access	√	√	√	√	√*	√	√	√	√	√
Advanced ICT access and usage	6) Type of Internet access	√		√	√				√	√	√
	7) Local network			√	√					√	√
	8) Website	√		√	√					√	√
	9) ICT investment	√		√	√					√	√
	10) Share of employees using a computer				√					√	√
	11) Share of employees using the Internet									√	√
Internet activities and e-commerce	12) Services the Internet is used for	√			√					√	√
	13) Value of purchases									√	
	14) Value of sales	√									
	15) Customer group	√									
ICT training	16) ICT training									√	
Barriers to ICT use	17) Barriers to computer use	√			√				√	√	
	18) Barriers to Internet use	√								√	√
	19) Barriers to e-commerce	√									
Location	20) Geographic location of sales										√

Note: √: available;√*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators. The following countries do not have any indicator available and the NSO do not plan to collect any of them or did not respond to this part of the questionnaire: Cambodia, Iran (Islamic Republic of), Malaysia, Micronesia (Federal State of), Niue and Sri Lanka. NO PLANS?

Table C6 (continuation)

Indicators		Countries	
		Thailand	Vanuatu
Basic access to ICT	1) Fixed telephone	√	√
	2) Mobile devices	√	√
	3) Presence of computers	√	√***
	4) Number of computers	√	√***
	5) Presence of Internet access	√	√***
Advanced ICT access and usage	6) Type of Internet access		√***
	7) Local network		√***
	8) Website	√	√***
	9) ICT investment		√***
	10) Share of employees using a computer	√	√***
	11) Share of employees using the Internet	√	√***
Internet activities and e-commerce	12) Services the Internet is used for	√	√***
	13) Value of purchases		√***
	14) Value of sales		√***
	15) Customer group		√***
ICT training	16) ICT training		√***
Barriers to ICT use	17) Barriers to computer use	√	√***
	18) Barriers to Internet use	√	√***
	19) Barriers to e-commerce	√	√***
Location	20) Geographic location of sales		√***

Note: √: available. Shaded are the countries with high and very high demand for ICT indicators

Table C7. Availability of business ICT indicators in Latin America and the Caribbean

Indicators		Countries									
		Argentina	Barbados	Belize	Bolivia	Brazil	Chile	Colombia	Costa Rica	Dominican Republic	El Salvador
Basic access to ICT	1) Fixed telephone			√	√	√*	√	√	√	√***	√
	2) Mobile devices	√		√	√	√*	√	√	√	√***	
	3) Presence of computers		√	√		√*	√	√	√	√***	
	4) Number of computers					√*	√	√	√***	√***	
	5) Presence of Internet access	√	√	√		√	√	√	√	√***	
Advanced ICT access and usage	6) Type of Internet access		√			√*	√	√		√***	
	7) Local network	√				√*	√	√		√***	
	8) Website	√	√		√	√	√	√		√***	
	9) ICT investment				√***	√*				√***	
	10) Share of employees using a computer				√***	√*		√		√***	
	11) Share of employees using the Internet				√***	√*		√		√***	
Internet activities and e-commerce	12) Services the Internet is used for	√			√***	√		√		√***	
	13) Value of purchases				√***	√*	√	√		√***	
	14) Value of sales	√			√***	√	√	√		√***	
	15) Customer group				√***	√*	√			√***	
ICT training	16) ICT training		√		√***	√*		√		√***	
Barriers to ICT use	17) Barriers to computer use				√***	√*	√***			√***	
	18) Barriers to Internet use				√***	√*	√***			√***	
	19) Barriers to e-commerce		√			√*	√***			√***	
Location	20) Geographic location of sales					√*	√***			√***	

Note: √: available; √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators The following countries do not have any indicator available and the NSO do not plan to collect any of them or did not respond to this part of the questionnaire: Ecuador, Jamaica, Peru, Saint Kitts & Nevis, Saint Vincent and the Grenadines and Venezuela.

Table C7. (continuation)

Indicators		Countries			
		Mexico	Paraguay	Trinidad & Tobago	Uruguay
Basic access to ICT	1) Fixed telephone	√***	√	√	
	2) Mobile devices	√***	√		√
	3) Presence of computers	√		√	
	4) Number of computers	√***		√	
	5) Presence of Internet access	√	√	√	√
Advanced ICT access and usage	6) Type of Internet access	√***		√	
	7) Local network	√		√	√*
	8) Website	√		√	√
	9) ICT investment	√		√	
	10) Share of employees using a computer	√***		√	√*
	11) Share of employees using the Internet	√***		√	√*
Internet activities and e-commerce	12) Services the Internet is used for	√***		√	√*
	13) Value of purchases	√***		√	
	14) Value of sales	√***		√	
	15) Customer group			√	
ICT training	16) ICT training	√		√	
Barriers to ICT use	17) Barriers to computer use	√***		√	
	18) Barriers to Internet use	√***		√	
	19) Barriers to e-commerce	√***		√	
Location	20) Geographic location of sales				

Note: √: available; √*: NSO plans to collect it in 1 year; √***: NSO plans to collect it in 3 years. Shaded are the countries with high and very high demand for ICT indicators

Table C8. Availability of business ICT indicators in OECD countries (countries covered by Eurostat)

Indicator		Countries										
		Austria	Belgium	Czech. Republic	Denmark	Finland	France	Germany	Greece	Hungary	Iceland	Ireland
Basic access to ICT	1) Fixed telephone											
	2) Mobile devices											
	3) Presence of computers	√	√	√	√	√	√	√	√	√	√	√
	4) Number of computers											
	5) Presence of Internet access	√	√	√	√	√	√	√	√	√	√	√
Advanced ICT access and usage	6) Type of Internet access	√	√	√	√	√	√	√	√	√	√	√
	7) Local network	√	√	√	√	√	√	√	√	√	√	√
	8) Website	√	√	√	√	√	√	√	√	√	√	√
	9) ICT investment	√										
	10) Share of employees using a computer	√	√	√	√	√	√	√	√	√	√	√
	11) Share of employees using the Internet	√	√	√	√	√	√	√	√	√	√	√
Internet activities and e-commerce	12) Services the Internet is used for	√	√	√	√	√	√	√	√	√	√	√
	13) Value of purchases	√	√	√	√*	√*	√	√	√	√*	√	√
	14) Value of sales	√	√	√	√	√	√	√	√	√*	√	√
	15) Customer group	√	√	√	√	√	√	√	√	√*	√	√*
ICT training	16) ICT training	√	√	√*	√	√	√*		√	√	√	√
Barriers to ICT use	17) Barriers to computer use											
	18) Barriers to Internet use											
	19) Barriers to e-commerce	√	√		√	√	√	√	√	√		√
Location	20) Geographic location of sales	√	√	√*	√	√	√*	√	√	√	√	√*

Note: √: available; √*: NSO plans to collect it (no reference to date). Indicator 12 is replaced by three indicators: *whether the business uses the Internet for purchasing/procurement, whether the business uses the Internet for selling products* and *other Internet activities undertaken by businesses.*

Table C8. (cont.)

Indicator		Countries									
		Italy	Luxembourg	Netherlands	Norway	Poland	Portugal	Slovakia	Spain	Sweden	United Kingdom
Basic access to ICT	21) Fixed telephone										
	22) Mobile devices										
	23) Presence of computers	√	√	√	√	√	√	√*	√	√	√
	24) Number of computers										
	25) Presence of Internet access	√	√	√	√	√	√	√*	√	√	√
Advanced ICT access and usage	26) Type of Internet access	√	√	√	√	√	√	√*	√	√	√
	27) Local network	√	√	√	√	√	√	√*	√	√	√
	28) Website	√	√	√	√	√	√	√*	√	√	√
	29) ICT investment										
	30) Share of employees using a computer	√	√	√	√	√	√	√*	√	√	√
	31) Share of employees using the Internet	√	√	√	√	√	√	√*	√	√	√
Internet activities and e-commerce	32) Services the Internet is used for	√	√	√	√	√	√	√*	√	√	√
	33) Value of purchases	√	√	√*	√*	√	√	?	√	√*	√
	34) Value of sales	√	√	√*	√	√	√	?	√	√	√
	35) Customer group	√	√	√*	√	√	√	?	√	√	√
ICT training	36) ICT training	√	√	√	√	√	√	?	√	√	√*
Barriers to ICT use	37) Barriers to computer use										
	38) Barriers to Internet use										
	39) Barriers to e-commerce	√	√		√	√	√	?	√	√	
Location	40) Geographic location of sales	√	√	√*	√	√	√	?	√	√	√

Note: √: available; √*: NSO plans to collect it (no reference to date).

Table C8bis. Availability of business ICT indicators in OECD countries (countries not covered by Eurostat)

Indicator		Countries						
		Australia	Canada	Japan	Korea	New Zealand	Switzerland	United States
Basic access to ICT	41) Fixed telephone				√			
	42) Mobile devices		√		√	√*	√	
	43) Presence of computers	√	√	√	√	√*	√	
	44) Number of computers				√	√*		
	45) Presence of Internet access	√	√	√	√	√*	√	
Advanced ICT access and usage	46) Type of Internet access	√	√	√*	√	√*	√	
	47) Local network			√	√		√	
	48) Website	√	√	√	√	√*	√	
	49) ICT investment	√	√		√		√	√
	50) Share of employees using a computer		√			√*	√	
	51) Share of employees using the Internet		√			√*	√	
Internet activities and e-commerce	52) Services the Internet is used for	√	√	√	√	√*	√	
	53) Value of purchases			√	√	√*	√	
	54) Value of sales	√	√	√	√	√*	√	√
	55) Customer group		√	√	√	√*		
ICT training	56) ICT training			√	√			
Barriers to ICT use	57) Barriers to computer use							
	58) Barriers to Internet use			√		√*		
	59) Barriers to e-commerce	√	√	√	√	√*	√	
Location	60) Geographic location of sales		√		√	√*		

Note: Mexico and Turkey are included in the tables corresponding to Latin America and Caribbean, and Central Asia and Central and Eastern Europe, respectively.

Table D3. Business ICT indicators and sources in Africa

Indicator		Sources and countries			
		Economic censuses	General enterprise surveys	Ad hoc business ICT surveys	Other
Basic access to ICT	1) Fixed telephone	Mauritius Zimbabwe	Rwanda	Madagascar	Senegal Morocco Tanzania
	2) Mobile devices		Rwanda	Madagascar	Senegal Morocco Tanzania
	3) Presence of computers	Mauritius	Rwanda	Madagascar	Morocco
	4) Number of computers	Mauritius	Rwanda	Madagascar	Morocco
	5) Presence of Internet access	Mauritius	Rwanda		Senegal
Advanced ICT access and usage	6) Type of Internet access	Mauritius	Rwanda		Morocco, Tanzania
	7) Local network	Mauritius	Rwanda		Morocco, Tanzania
	8) Website	Mauritius	Rwanda	Madagascar Tunisia	Morocco, Tanzania
	9) ICT investment	Mauritius	Rwanda	Tunisia	Morocco
	10) Share of employees using a computer	Mauritius			Morocco
	11) Share of employees using the Internet	Mauritius			
Internet activities and e-commerce	12) Services the Internet is used for			Morocco	Tanzania
	13) Value of purchases			Morocco Tunisia	
	14) Value of sales	Mauritius		Madagascar Morocco Tunisia	Tanzania
	15) Customer group				Tanzania
ICT training	16) ICT training	Mauritius			Tanzania
Barriers to ICT use	17) Barriers to computer use		Rwanda	Madagascar	Tanzania
	18) Barriers to Internet use		Rwanda		Tanzania
	19) Barriers to e-commerce		Rwanda		Tanzania
Location	20) Geographic location of sales				

Note: The following countries collect business ICT indicators (see tables C3) but did not provide information on type of survey used: Democratic Republic of Congo, Senegal. The source for Tanzania is TACRA.

Table D4. Business ICT indicators and sources in Central Asia and Central and Eastern Europe

Indicator		Sources and countries			
		Economic censuses	General enterprise surveys	Ad hoc business ICT surveys	Other
Basic access to ICT	1) Fixed telephone		Kyrgystan	Armenia, Belarus, Kazakhstan, Republic of Moldova, Romania Russian Federation, Ukraine	
	2) Mobile devices		Kyrgystan	Armenia, Belarus, Kazakhstan, Republic of Moldova, Romania Russian Federation, Ukraine	
	3) Presence of computers		Kyrgystan	Bulgaria, Republic of Moldova, Romania, Russian Federation, Ukraine	
	4) Number of computers		Kyrgystan	Bulgaria, Republic of Moldova, Romania, Russian Federation, Ukraine	
	5) Presence of Internet access		Kyrgystan	Armenia, Belarus, Bulgaria, Kazakhstan, Republic of Moldova Romania, Russian Federation, Ukraine	
Advanced ICT access and usage	6) Type of Internet access		Kyrgystan	Bulgaria, Republic of Moldova, Romania, Ukraine	
	7) Local network		Kyrgystan	Bulgaria, Republic of Moldova, Romania, Ukraine	
	8) Website		Kyrgystan	Bulgaria, Romania, Russian Federation	
	9) ICT investment		Kyrgystan	Kazakhstan, Republic of Moldova, Romania, Russian Federation, Ukraine	
	10) Share of employees using a computer		Kyrgystan	Bulgaria, Republic of Moldova, Romania, Russian Federation, Ukraine	
	11) Share of employees using the Internet		Kyrgystan	Bulgaria, Romania, Russian Federation	
Internet activities and e-comme	12) Services the Internet is used for		Kyrgystan	Bulgaria, Romania, Russian Federation	
	13) Value of purchases			Bulgaria, Romania, Russian Federation	
	14) Value of sales			Bulgaria, Romania, Russian Federation	
	15) Customer group			Bulgaria, Romania	
ICT training	16) ICT training			Russian Federation	
Barriers to ICT use	17) Barriers to computer use			Romania, Russian Federation	
	18) Barriers to Internet use			Bulgaria, Romania, Russian Federation	
	19) Barriers to e-commerce			Bulgaria, Russian Federation	
Location	20) Geographic location of sales			Bulgaria, Romania Russian Federation	

Note: The following countries collect business ICT indicators (see tables C4) but did not provide information on type of survey used: Albania, Andorra and Azerbaijan. Israel informed on type of survey used but not on type of indicators collected.

Table D5. Business ICT indicators and sources in Western Asia

Indicator		Sources and countries			
		Economic censuses	General enterprise surveys	Ad hoc business ICT surveys	Other
Basic access to ICT	1) Fixed telephone	Egypt Oman Qatar		Egypt	
	2) Mobile devices	Egypt		Egypt	
	3) Presence of computers	Egypt Oman		Egypt	
	4) Number of computers	Egypt		Egypt	
	5) Presence of Internet access	Egypt		Egypt	
Advanced ICT access and usage	6) Type of Internet access			Egypt	
	7) Local network				
	8) Website				
	9) ICT investment				
	10) Share of employees using a computer				
	11) Share of employees using the Internet				
Internet activities and e-commerce	12) Services the Internet is used for				
	13) Value of purchases				
	14) Value of sales				
	15) Customer group				
ICT training	16) ICT training				
Barriers to ICT use	17) Barriers to computer use				
	18) Barriers to Internet use				
	19) Barriers to e-commerce				
Location	20) Geographic location of sales				

Note: Kuwait collects business ICT indicators but did not provide information on type of survey used.

Table D6. Business ICT indicators and sources in Asia and Pacific

Indicator		Sources and countries			
		Economic censuses	General enterprise surveys	Ad hoc business ICT surveys	Other
Basic access to ICT	1) Fixed telephone	Mongolia	India	Macao SAR Singapore Thailand	New Caledonia Philippines Vanuatu
	2) Mobile devices	Mongolia	India	Hong Kong SAR Macao SAR Singapore Thailand	Philippines Vanuatu
	3) Presence of computers		India	Hong Kong SAR Macao SAR Singapore Thailand	New Caledonia Philippines
	4) Number of computers		India	Hong Kong SAR Macao SAR Singapore Thailand	Philippines
	5) Presence of Internet access	Mongolia	India Indonesia	Hong Kong SAR Macao SAR Singapore Thailand	New Caledonia Philippines
Advanced ICT access and usage	6) Type of Internet access		Indonesia	Hong Kong SAR Macao SAR Singapore	Philippines
	7) Local network		Indonesia	Macao SAR Singapore	Philippines
	8) Website		Indonesia	Hong Kong SAR Macao SAR Thailand	Philippines
	9) ICT investment		Indonesia	Hong Kong SAR Macao SAR Singapore	Philippines
	10) Share of employees using a computer			Macao SAR Thailand Singapore	Philippines
	11) Share of employees using the Internet			Thailand Singapore	Philippines

Table D6. (cont.)

Indicator		Sources and countries			
		Economic censuses	General enterprise surveys	Ad hoc business ICT surveys	Other
Internet activities and e-commerce	12) Services the Internet is used for			Hong Kong SAR Macao SAR Singapore Thailand	Philippines
	13) Value of purchases				Philippines
	14) Value of sales			Hong Kong SAR	
	15) Customer group			Hong Kong SAR	
ICT training	16) ICT training				Philippines
Barriers to ICT use	17) Barriers to computer use			Hong Kong SAR Macao SAR Thailand	Philippines
	18) Barriers to Internet use			Hong Kong SAR Singapore Thailand	Philippines
	19) Barriers to e-commerce			Hong Kong SAR Thailand	
Location	20) Geographic location of sales			Singapore	

Note: The following countries collect business ICT indicators but did not provide information on type of survey used: Maldives and Pakistan. Malaysia informed on type of survey used but not on type of indicators collected.

Table D7. Business ICT indicators and sources in Latin America and the Caribbean

Indicator		Sources and countries			
		Economic censuses	General enterprise surveys	Ad hoc business ICT surveys	Other
Basic access to ICT	1) Fixed telephone		Chile, Colombia El Salvador, Paraguay	Trinidad & Tobago	
	2) Mobile devices		Chile, Colombia Paraguay, Uruguay	Argentina	
	3) Presence of computers	Mexico	Chile, Colombia	Barbados, Trinidad & Tobago	
	4) Number of computers		Chile Colombia	Trinidad & Tobago	
	5) Presence of Internet access	Mexico	Bolivia, Chile, Colombia, Paraguay, Uruguay	Argentina, Barbados Trinidad & Tobago	
Advanced ICT access and usage	6) Type of Internet access		Chile, Colombia	Barbados, Trinidad & Tobago	
	7) Local network	Mexico	Chile, Colombia	Argentina. Trinidad & Tobago	
	8) Website	Mexico	Bolivia, Chile, Colombia Uruguay	Argentina, Barbados Trinidad & Tobago	
	9) ICT investment	Mexico		Trinidad & Tobago	
	10) Share of employees using a computer		Colombia	Trinidad & Tobago	
	11) Share of employees using the Internet		Colombia	Trinidad & Tobago	
Internet activities and e-commerce	12) Services the Internet is used for		Bolivia, Colombia	Argentina ,Trinidad & Tobago	
	13) Value of purchases		Chile, Colombia	Trinidad & Tobago	
	14) Value of sales		Bolivia, Chile, Colombia	Argentina, Trinidad & Tobago	
	15) Customer group		Chile	Trinidad & Tobago	
ICT training	16) ICT training	Mexico	Colombia	Barbados, Trinidad & Tobago	
Barriers to ICT use	17) Barriers to computer use			Trinidad & Tobago	
	18) Barriers to Internet use			Trinidad & Tobago	
	19) Barriers to e-commerce			Barbados, Trinidad & Tobago	
Location	20) Geographic location of sales				

Note: The following countries collect business ICT indicators (see tables C7) but did not provide information on type of survey used: Belize, Bolivia, Costa Rica, Dominican Republic and Jamaica.

List of acronyms

ABSA	Advisory Board on Statistics in Africa
AISI	African Information Society Initiative
CAIBI	Conference of Ibero-american Authorities on Informatics
CIS	Commonwealth of Independent States
DAI	Digital Access Index
DQAF	Data Quality Assessment Framework
EU	European Union
GDDS	General Data Dissemination System
GDP	Gross Domestic Product
ICT	Information and Communications Technology
IDRC	International Development Research Centre
ITU	International Telecommunication Union
LDCs	Least Developed Countries
LSMS	Living Standards Measurement Survey
MDGs	Millennium Development Goals
MECOVI	Programme for Enhancing the Living Conditions Surveys
NEPAD	New Economic Partnership for African Development
NICI	National Information and Communication Infrastructure
NORAD	Norwegian Agency for Development Cooperation
NSOs	National Statistical Offices
OECD	Organisation for Economic Co-operation and Development
OSILAC	Observatory for the Information Society in Latin America and the Caribbean
PIACs	Public Internet Access Centres
RICYT	Ibero-American Network for Indicators on Science and Technology
SDDS	Special Data Dissemination System
STI	Science, Technology and Innovation
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
UNECE	United Nations Economic Commission for Europe
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational Scientific and Cultural Organization
UNESCWA	United Nations Economic and Social Commission for Western Asia
WSIS	World Summit on the Information Society

Other country-specific acronyms are explained in the main text.

SHORT NAMES FOR ICT INDICATORS USED IN GRAPHS

ICT Household Indicators	*Short name*
1) Presence of electricity in household	ELECT
2) Presence of radio in household	RADIO
3) Presence of fixed telephone line in household	FIXTL
4) Presence of mobile phone in household	MBLTL
5) Presence of TV in household	TVHOU
6) Presence of a computer in household	PCHOU
7) Presence of Internet access in household	INTHOU
8) Method of access/bandwidth for Internet access in household	ACCESS
9) Location of the most frequent use of Internet	LOCAT
10) Frequency of Internet use	FREQ
11) Purpose of PC use	PCUSE
12) Purpose of Internet use	INTUSE
13) Concrete services/activities for which the Internet is used	INTSER
14) Language of Internet sites visited	LANG
15) Types of products/services purchased over the Internet	INTPROD
16) Value of goods/ services purchased over the Internet	VALUE
17) Barriers to PC usage	BARPC
18) Barriers to Internet usage	BARINT
19) Barriers to purchases over the Internet	BARPUR
20) Geographic location where the Internet goods are purchased	GEOG

ICT Business Indicators	*Short name*
1) Presence of fixed telephone	FIXTEL
2) Presence of mobile devices	MOBIL
3) Presence of computers	COMP
4) Number of computers	NCOMP
5) Presence of Internet access	INTENET
6) Method of access/bandwidth for Internet use	TYPEINT
7) Presence of local network	LOCNET
8) Presence of Website	WEBSITE
9) Recent ICT investments	ICTINV
10) Share of employees using a computer	SHCOMP
11) Share of employees using the Internet	SHINT
12) Services for which the Internet is used	SERVICES
13) Value of Internet purchases	PURCH
14) Value of Internet sales	SALES
15) Customer group/destination of Internet sales	CUSTOM
16) ICT training	TRAIN
17) Barriers to PC usage	BARPC
18) Barriers to Internet usage	BARINT
19) Barriers to e-commerce	BARECOM
20) Geographic location where Internet goods are sold	GEOG

Measuring ICT: the global status of ICT indicators

Partnership on Measuring ICT for Development

Following the *World Summit on Information Society (WSIS)* in Geneva, countries and regions were called upon to develop tools to provide statistical information on the Information Society, with basic indicators and analysis of its dimensions. To that end, several key stakeholders involved in the statistical measurement of the Information Society joined forces in a global '*Partnership on Measuring ICT for Development*', which was launched in June 2004.

The purpose of this report, "Measuring ICT: the global status of ICT indicators", is to synthesize the results of the Partnerships' stocktaking exercise on the status of ICT indicators, carried out in collaboration with the United Nations Regional Commissions, UNCTAD and the OECD.

The status of official Information Society statistics in developing countries is presented in this report by region, together with two chapters on global issues concerning household and business ICT indicators.

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ISBN: 92-1-104558-4
Sales No. E.05.II.A.20

42742—October 2005—1,500