

# The Global Information Society: a Statistical View

 PARTNERSHIP ON  
MEASURING ICT  
FOR DEVELOPMENT



*The Global Information Society: a Statistical View* was prepared by a consultant, Ms Sheridan Roberts, with substantive input from members of the Partnership on Measuring ICT for Development. Their contributions are described below.

Esperanza Magpantay and Vanessa Gray of the International Telecommunication Union (ITU) provided general comments as well as data and other information on ICT infrastructure and access, and on use of ICT by households and individuals (Chapters 2 and 3).

Susan Teltscher, Scarlett Fondeur Gil and Diana Korka of the United Nations Conference on Trade and Development (UNCTAD) provided comments on the publication, as well as data and other information on business use of ICT, the ICT sector, ICT trade and ICT impacts (chapters 4, 5 and 7).

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## Preface

Measurement is an important aspect of the debate about the information society and the role it plays in economic and social development. This publication uses information and communication technology statistics to provide a view of the information society in both developed and developing economies.

Measuring information and communication technology (ICT) for development was a major concern for the two World Summits on the Information Society, held in Geneva in 2003 and Tunis in 2005. The Geneva *Plan of Action* highlighted the development of "...international performance evaluation and benchmarking... through comparable statistical indicators and research results..." and emphasized measurement of the magnitude of the national and international 'digital divide', growth of the ICT sector and the impacts of ICT use on women and girls. Countries were asked to develop tools that would enable the provision of statistical information on the information society, with priority for "coherent and internationally comparable indicator systems".

The Partnership on Measuring ICT for Development was launched in June 2004, following the first World Summit on the Information Society,

and members have worked collaboratively with statistical agencies and policymakers to establish an agreed set of statistical indicators (the 'core list') for measuring ICT. They also provide statistical agencies with technical assistance that enables collection of the statistics that underlie the core indicators. The main objective of these efforts is the production of internationally comparable and reliable ICT statistics.

The 2005 Tunis phase reiterated the importance of measuring the digital divide and called for the tracking of progress in the use of ICT to achieve agreed international goals. The efforts of the *Partnership* in developing a core list of ICT indicators and promoting statistical capacity-building were noted and the international community was invited to assist in strengthening the statistical capacity of developing economies.

As well as presenting available statistics, this publication assesses progress in measuring the information society by exploring the data gaps that remain. Whilst availability of the core indicators for developed economies is good – and improving for some developing economies – for most of the core indicators, data availability in the developing world is limited. In addition, more work is required by most countries that

already collect core indicators to better align their statistical programs with the requirements of the core indicators in order to improve the international comparability of ICT statistics.

The *Partnership's* efforts in capacity-building and awareness raising, and the endorsement in 2007 of the core list of ICT indicators by the UN Statistical Commission, should lead to improvements in the number of countries that collect core ICT indicators and the comparability of the indicators.

Note on the aggregations used in this publication

The publication presents information categorized or aggregated by *level of development* and *region*. Economies have been assigned to categories based on the United Nations Statistical Division's *Standard country or area codes for statistical use* (<http://unstats.un.org/unsd/methods/m49/m49.htm>). An economy appears once (and only once) in each *level of development* and *region* broad category, for instance, Japan is shown in *Developed economies* and in *Asia* (and in no other categories).

*Taiwan, China* has been added to the UNSD list because some organizations collect relevant

information for this economy (the name of the economy follows ITU practice).

No judgement is implied in allocating economies to levels of development. In relation to the classification, UNSD notes that "There is no established convention for the designation of "developed" and "developing" countries or areas in the United Nations system. In common practice, Japan in Asia, Canada and the United States in northern America, Australia and New Zealand in Oceania, and Europe are considered "developed" regions or areas."

There are differing practices among international organizations for classifying economies by level of development. As all data in this publication use the list described above, some aggregates will differ from those produced by the individual organizations that provided information for this publication.

The designation of some economies as 'developed' or 'transition' has recently changed (as shown in the 31 January 2008 revision). However, these changes are not reflected in this publication as the previous version was used. The economies affected by the revision are Croatia, Bulgaria and Romania.

# Chapter 1. Introduction

## 1. Objectives of The Global Information Society: a Statistical View

1. The aim of this publication is twofold. The first is to present a coherent picture of the state of the information society in the world. To achieve this, the publication presents available statistical data based on a core set of internationally agreed information and communication technology (ICT) indicators.
2. While some of these statistics have been compiled before (for instance, for a small set of countries or for a limited set of indicators), this is the first attempt to compile core ICT indicators for a wide range of countries and across all the areas covered by the core ICT indicators. These are:
  - ICT infrastructure and access;
  - Access to, and use of, ICT by households and individuals;
  - Use of ICT by businesses; and
  - The ICT sector and trade in ICT goods.
3. The second aim of the publication is to show recent developments in ICT measurement and, importantly, highlight the considerable gaps that remain.
4. The publication has been produced by the Partnership on Measuring ICT for Development, whose membership, history and objectives are outlined later in this chapter. The *Partnership* arose because of a global recognition of the importance of ICT for social and economic development, especially in developing economies. The policy interest in ICT was accompanied by a need for measurement, which was a major concern for the two World Summits on the Information Society. The Geneva phase highlighted the importance of benchmarking and measuring progress towards the information society through internationally comparable statistical indicators. It was followed by the formation of the *Partnership*, which was launched in June 2004 at UNCTAD XI in Brazil.
5. This introductory chapter will consider the broader statistical concepts used in the measurement of the information society. It will discuss the *Partnership*, looking at its history, objectives, members and major achievements. The *Partnership's* activities in the development of core ICT indicators are explored in more depth as is its involvement in capacity-building for developing and least developed economies.

## 2. Statistical standards for measuring the information society

6. The Organisation for Economic Co-operation and Development (OECD) started developing statistical standards for information society measurement about 10 years ago, through its Working Party on Indicators for the Information Society (WPIIS). The WPIIS provides a forum for national statistical experts to share experiences and collaborate on the development of information society statistical standards. Its main achievements to date are:
  - Industry-based definitions of the *ICT* sector and *content and media* sector (the most recent versions are based on ISIC Rev. 4);
  - An ICT goods and an ICT services classification (based on the Harmonized System and CPC Ver. 2 respectively);
  - Narrow and broad definitions of electronic commerce transactions; and
  - Model surveys of ICT use by businesses and households/individuals.
7. A classification for all information economy products, based on CPC Ver. 2, is almost completed. It will include updates to the ICT goods and services classifications, and a new classification for content and media products.
8. The WPIIS has produced a conceptual model for information society measurement which includes:
  - ICT supply (the ICT sector);
  - ICT products, production and trade;
  - ICT infrastructure;
  - ICT demand by businesses, households, individuals and other entities such as government organizations;
  - The content and media sector and its products;
  - The impacts of ICT on society, the economy and the environment; and
  - The impacts of various factors, such as policy decisions, on elements of the information society.
9. Eurostat has also been active in the area of developing standards for information society measurement, mainly through its community surveys on ICT use by households/individuals and businesses. The surveys have been running since the early 2000s and use harmonized questionnaires provided to member states to use in their national surveys.
10. Other members of the *Partnership* have also been involved in developing statistical standards for measuring the information society. In particular, the International Telecommunication Union has been actively developing standards for measuring infrastructure and access indicators for a number of years. ITU's reference for this work is *Telecommunication Indicators Handbook*, which includes definitions for all their telecommunication/ICT indicators (ITU, 2007a).



## 3. The Partnership on Measuring ICT for Development

### 3.1 History and major achievements

11. Following a WSIS statistical event in Geneva,<sup>1</sup> the United Nations Conference on Trade and Development (UNCTAD) led the coordination of international agencies in the area of ICT measurement, commencing preparatory work to create a global partnership on ICT measurement in January 2004. The founding members of the *Partnership* were UNCTAD, the International Telecommunication Union (ITU) and the OECD. Discussions quickly followed with other agencies interested in joining the group.
  - The founding members (UNCTAD, ITU and OECD);
  - The United Nations Educational, Scientific and Cultural Organization's Institute for Statistics (UIS);
  - UNECLAC;
  - The United Nations Economic and Social Commission for Western Asia (UNESCWA);
  - The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP);
  - The United Nations Economic Commission for Africa (UNECA);
  - The UN ICT Task Force (whose mandate expired at the end of 2005); and
  - The World Bank.
12. The United Nations Economic Commission for Latin America and the Caribbean (UNECLAC) also followed through on the recommendations of the WSIS event, producing a draft questionnaire for stock-taking ICT statistics in its region of responsibility.<sup>2</sup> After consultation with the other UN Regional Commissions and relevant international organizations, the final questionnaire was adopted by four Regional Commissions and UNCTAD (on behalf of UNECE) for conducting stock-taking surveys in their respective regions.
13. On 17 June 2004, the multi-stakeholder *Partnership on Measuring ICT for Development* was launched at UNCTAD XI in Sao Paulo, Brazil (UNCTAD, 2004). Its members, at that time, were:
  - 14. Eurostat officially joined the *Partnership* in February 2005.
  - 15. The first phase of the *Partnership* ran from June 2004 to December 2005. Major events and achievements during this period were:
    - June 2004: Presentation of a *Partnership* project document (objectives, expected output, proposed activities, partners' main contributions) (*Partnership*, 2004) and formal launch of the *Partnership* at UNCTAD XI (Sao Paulo, Brazil).
    - July/August 2004: Initiation of a global stocktaking exercise through a metadata questionnaire on ICT statistics sent by UNECA, UNECLAC, UNESCAP,

- UNESCWA and UNCTAD (on behalf of UNECE) to statistical agencies in developing member countries. A parallel exercise for OECD member countries was organized by the OECD, with input from Eurostat.
- October to December 2004: Regional workshops were held in Western Asia, Africa, and Latin America and the Caribbean (organized by UNESCWA, ITU/UNECA and UNECLAC/Institute for Connectivity in the Americas respectively). Participants considered the results of the metadata questionnaire and discussed information society measurement activities in their regions. Important outcomes from these workshops were recommendations for a common core set of ICT indicators. Inputs to the core list were also received through other means (such as via e-mail and an Asia-Pacific ICT statisticians meeting held in New Zealand in December 2004). The end result was a set of recommendations on core ICT indicators for input into a WSIS thematic meeting held in February 2005.
  - February 2005: WSIS Thematic Meeting on Measuring the Information Society held in Geneva under the umbrella of the *Partnership*, to produce input to the second phase of the WSIS in Tunis (November 2005). The outcomes of the meeting included agreement on a core list of ICT indicators (*Partnership*, 2005a), with agreement to develop others that would reflect the broader information society (in areas such as education, health and government).
  - March 2005: Presentation of the core list of ICT indicators and a *Partnership* progress report to the meeting of the UN Statistical Commission (New York) (*Partnership*, 2005b).
  - June and October 2005: Regional meetings in Western Asia and Latin America and the Caribbean (organized by UNESCWA/ITU and UNECLAC respectively).
  - November 2005: Second phase of WSIS in Tunis. A Parallel Event on Measuring the Information Society was organized by the *Partnership* and held on 15 November. This global event brought together ICT stakeholders at national, regional and international levels. The objectives of the meeting were:
    - To present the agreed core list of indicators to policymakers, together with an accompanying methodological publication (*Core ICT Indicators, Partnership*, 2005c);
    - To debate the importance of measuring the information society for ICT policymaking and development; and
    - To launch the publication, *Measuring ICT: The Global Status of ICT Indicators (Partnership*, 2005d); this publication presents the results of the global stocktaking exercise on ICT indicators carried out during 2004.
16. The second phase of the *Partnership* started in January 2006 and will run until about the middle of 2008. The outcomes of the WSIS Tunis (November 2005) were incorporated into the planning of the second phase of the *Partnership*.
  17. By early 2008, the achievements during the second phase include:
    - The *Partnership* submitted a report containing a short overview of its recent work and the core list of ICT indicators to the 38th session of the UN Statistical Commission (February 2007). The Commission endorsed the *Partnership* core list and encouraged countries to use it in their data collection programmes (*Partnership*, 2007; UNSC, 2007). The Commission congratulated the *Partnership* on its achievements and noted it as an example of successful cooperation between international organizations.
    - A core list of indicators for ICT in education has been proposed by UIS (which leads the *Partnership's* Task

Group on Education). This list will be considered for inclusion in the core list during 2008.

- Several regional meetings on information society measurement have occurred since the WSIS Tunis. They are described in *Capacity-building and training* below.<sup>3</sup>
- A programme on technical assistance and capacity-building for developing economies has been established and is

being carried out by individual members of the *Partnership* during the second phase (described in *Capacity-building and training* below).

- A Memorandum of Understanding was signed by the partners in 2007, with the objective of further strengthening the institutional commitment of the partners and to provide guidelines to new members wishing to join the *Partnership*.

### Box 1. The Partnership on Measuring ICT for Development

**Launched:**

June 2004 at UNCTAD XI (Sao Paulo, Brazil).

**Current members:**

UNCTAD, ITU, OECD, UIS, UNECLAC, UNESCWA, UNESCAP, UNECA, Eurostat and The World Bank.

**Objectives:**

To achieve a common set of core ICT indicators, to be harmonized and agreed upon internationally, which will constitute the basis for a database on ICT statistics;

To enhance the capacities of national statistical offices in developing economies and to build competence to develop statistical compilation programmes on the information society, based on internationally agreed indicators; and

To develop a global database of ICT indicators and to make it available via the Internet.

**Memorandum of Understanding:**

Signed by the partners in 2007 in order to further strengthen their commitment and to provide guidelines to potential new members.

**Structure:**

A Steering Committee (consisting of ITU, UNCTAD and UNECLAC) plus four task groups (on ICT in education indicators, e-government indicators, capacity-building and database development).

### 3.2 Objectives of the Partnership

18. The *Partnership* provides an open framework for coordinating ongoing and future activities. It is a joint effort among the stakeholders involved and assumes equality of the partners. The original objectives of the *Partnership* are shown in Box 1 above.
19. The objectives of the second phase build on those of the first, and are as follows:
  - Continue to raise awareness among policymakers on the importance of statistical indicators for monitoring ICT policies and carrying out impact analysis;
  - Expand the core list of indicators to other areas of interest, such as ICT in education, government and health;
  - Conduct technical workshops at the regional level to exchange national experiences and discuss methodologies, definitions, survey vehicles and data collection efforts;
  - Assist statistical agencies in developing economies in their ICT data collection and dissemination efforts, including the development of national databases to store and analyse survey results (during 2006, a needs assessment was undertaken, as a result of which more than 50 requests for technical assistance have been received); and

- Develop a global database of ICT indicators and make it available on the World Wide Web.

of the Partners in the area of database development for ICT indicators.

### 3.3 Structure of the Partnership

20. Several structural improvements were introduced to the *Partnership* early in the second phase. A Steering Committee was elected to help coordinate activities and promote the work of the *Partnership*. The Committee presents a ‘public face’ for the *Partnership*. It provides secretariat functions, coordinates the work programme of the *Partnership*, initiates and coordinates various *Partnership* activities, and reviews applications from potential new members. The current members of the Steering Committee are ITU, UNCTAD and UNECLAC.
21. At the same time, four task groups were created to address specific objectives and activities of the *Partnership*. Each task group is led by a volunteer organization and its members are interested partners. The task groups are:
  - The Task Group on Education (led by UIS) whose objective is to develop a plan of activity to collect a core data set of indicators on the role of ICT in education;
  - The Task Group on eGovernment (led by UNECA) whose objective is to coordinate and further develop the various activities of the partners in the area of e-government indicators;
  - The Task Group on Capacity-building (led by UNCTAD) whose objective is to coordinate and further develop the various activities of the partners in the area of capacity-building on ICT measurement in developing countries; and
  - The Task Group on Database Development (led by the World Bank), the objective of which is to coordinate and further develop the various activities

### 3.4 Global stocktaking exercise

22. An early achievement of the *Partnership* was the conduct of an exercise designed to assess the state of ICT statistics and identify best practices in UN economies.
23. The stocktaking exercise was carried out during 2004 and was undertaken by four UN commissions for their respective regions (UNECA, UNECLAC, UNESCAP and UNESCWA). The questionnaires were sent to statistical agencies of member economies, excluding OECD countries (OECD provided metadata information in respect of its member countries). UNCTAD sent the questionnaire to United Nations Economic Commission for Europe (UNECE) economies not covered by the OECD or Eurostat.
24. While the exercise produced some valuable information, the response for some regions was disappointing and no doubt affected the reliability of the statistics generated from the exercise. Of the 169 economies that were sent questionnaires, 86 responded (51 per cent). Response rates varied by region, ranging from 37 per cent (Africa) to 79 per cent (Western Asia).
25. The results of the stock-taking exercise were published in *Partnership* (2005d). A summary can be found in Annex 4 of OECD (2007a).

### 3.5 Core list of ICT indicators

26. A major aim of the *Partnership* at its inception was the development of a core list of ICT indicators that could be collected by all countries. A number of regional workshops on ICT measurement were held after the Geneva phase of WSIS and included discussion of regional ICT indicators of interest to policymakers. Outcomes of these meetings included

regional core lists that were presented for information to the United Nations Statistical Commission at its meeting of March 2005 (*Partnership*, 2005b). The *Partnership* consolidated a global core list and circulated it to all national statistical offices (NSOs) for further comment. A final list was discussed, and agreed on, at the WSIS Thematic Meeting on Measuring the Information Society, held in Geneva in February 2005.

27. The list (published as *Core ICT Indicators*) was officially presented at the second phase of WSIS, held in Tunis in November 2005, during the Parallel Event on Measuring the Information Society. Since then, the list has been disseminated widely and now serves as a basis for the *Partnership*'s work on measuring ICT. The core list was endorsed by the United Nations Statistical Commission (UNSC) at its thirty-eighth meeting of March 2007 (UNSC, 2007).
28. The core list forms the basis for data presented in this publication, which is the first comprehensive compilation of core ICT indicator data.
29. There are 41 core ICT indicators in four groups as follows:
  - ICT infrastructure and access (12 indicators, see Annex 2);
  - Access to, and use of, ICT by households and individuals (13 indicators, see Annex 3);<sup>4</sup>
  - Use of ICT by businesses (12 indicators, see Annex 4); and
  - The ICT sector and trade in ICT goods (4 indicators, see Annex 5).
30. The main purpose of the core list is to help countries that are developing ICT surveys – or adding ICT questions to existing collections – to produce high quality and internationally comparable data. In order to achieve this objective, the indicators have associated standards and metadata including:
  - Definitions of terms (e.g. *computer*, *the Internet*); these can be found in the annexes referenced above;
  - Model questions;
  - Calculation of indicators (e.g. use of appropriate denominators for calculating proportions);
  - Classificatory variables (e.g. business size for business ICT use core indicators; gender for individual ICT use core indicators); these can be found in annexes 3 and 4;
  - Advice on particular statistical issues (such as the measurement of e-commerce);
  - Collection scope (e.g. by business size or industry, age of individuals); and
  - Limited recommendations on methodology (e.g. statistical units, survey vehicles).
31. Whilst the core list is not mandatory, its use has been recommended by the UNSC. Importantly, the list is not limiting – countries will also need to respond to national policy needs and these may only be partially covered by the core list.
32. Each indicator is nominated as either 'basic core' or 'extended core', where the latter are considered more suitable for countries with relatively advanced ICT statistical systems (*Partnership*, 2005c).
33. The development of ICT indicators is a continuing process and the *Partnership* will review the list periodically. For example, some minor revisions have been proposed to the ICT business indicators in line with progress made elsewhere (in particular by Eurostat). Ongoing work includes the development of new ICT indicators – especially in the areas of education and government. These are likely to be discussed at a global meeting in mid 2008.

### 3.6 Capacity-building and training

34. A key objective of the *Partnership* is to assist statistical agencies of developing economies to collect and disseminate ICT data. The *Partnership's* Task Group on Capacity-building is led by UNCTAD, which has conducted a stocktaking exercise on the capacity-building requirements of developing economies. UNCTAD also maintains a register of ICT statistics experts who are able to provide assistance to developing economies.
35. In an effort to improve the availability of internationally comparable ICT statistics, offers of technical assistance presume a commitment by the recipient economy to follow the core list of ICT indicators.
36. UNCTAD released the *Manual for the Production of Statistics on the Information Economy* (UNCTAD, 2007a) in November 2007. The *Manual* is a reference for NSOs and other producers of official statistics on the information economy. It covers data collection and analysis techniques; statistical standards, including definitions and model questions; methodological advice on statistical issues of particular interest to developing countries, and institutional aspects of the statistical process. The *Manual* is the subject of consultation with NSOs worldwide, with a view to submitting a revised version for approval by the UN Statistical Commission in 2009.
37. UNCTAD has also developed a training course on measuring the information economy. The training course, which was developed under the framework of the UNCTAD *TrainForTrade* programme, is based on the UNCTAD *Manual* described above and includes presentation slides, a participant's handbook, group exercises, tests and evaluation questionnaires.
38. ITU is planning to release a complementary manual and training course on the production of household ICT statistics in 2008.
39. Partners also run regional capacity-building workshops and training courses. Recent examples are:
  - Regional Workshop on Measuring the Information Society, 11-12 February 2008, San Salvador, El Salvador. The workshop was organized by UNECLAC, with the support of UNCTAD, the NSO and the Ministry of Economics of El Salvador. The OSILAC information system and NSO experiences in the collection of ICT statistics, were presented. Agreements on the harmonized presentation of indicators were reached and four working groups were created to work on, among other things, methodological issues and proposals for new indicators.
  - Training course on the Production of Statistics for the Information Economy for Asia, 18-22 February 2008, Incheon, Republic of Korea. The course was organized by UNCTAD and hosted by the UNESCAP Asia and Pacific Training Centre for Information and Communication Technology for Development, in collaboration with the UN Statistical Institute for Asia and Pacific.
  - The UNCTAD training course on the Production of Statistics for the Information Economy was first delivered in Colombia in December 2007, in cooperation with the Centro Andino de Altos Estudios (CANDANE) for the member countries of the Andean Community and UNECLAC.
  - Capacity Building Workshop on Information Society Statistics: Infrastructure and Household Indicators, 6-8 November 2007, Bangkok, Thailand. The workshop was jointly organized by ITU, UNESCAP and the Asia-Pacific Telecommunity (APT). The workshop covered definitions, collection methodologies and data

collection issues for ICT statistics, with an emphasis on infrastructure and household ICT statistics. The workshop was addressed primarily to staff of NSOs who are responsible for information society measurement, as well as representatives of ministries and regulatory agencies who are producers and/or users of ICT statistics.

- A training course, How to Establish an ICT Indicators Database, took place from 29 October to 2 November 2007, in Indonesia. The training taught statisticians and data collectors (from the NSO and the telecommunication regulatory authority) about ITU's definition and collection of telecommunication/ICT indicators, as well as collection and dissemination of ICT statistics collected using an ICT household survey. The training included discussions on the definition of telecommunication/ICT indicators, data collection techniques, and examples of how to compile country data using company annual reports.
- Capacity-Building Workshop on Information Society Measurements: Household and Business Surveys, June 2007, Cairo, Egypt. The workshop was jointly organized by UNESCWA, UNCTAD, OECD, the ITU Arab Regional Office, the League of Arab States and the Egyptian Ministry of Communications and Information Technology. It focused on the technical and methodological aspects of capacity-building and on the use of surveys for the collection of data for the core indicators on ICT use by households and businesses. In addition, participants discussed global and regional experiences in ICT measurement and statistics on the ICT sector.
- Regional Workshop on Information Society Measurement in Africa, March 2007, Addis Ababa, Ethiopia. The workshop was jointly organized by UNCTAD-UNECA-ITU and built on the work of the *Partnership* and the Scan-ICT measurement project, and aimed to advance the availability of comparable ICT data for Africa. The event allowed statisticians and policymakers to discuss the need for comparable data on the information society and share best practices in ICT measurement at the regional level. The meeting also discussed possible core indicators for e-government, reviewed the results achieved and challenges encountered in the implementation of Phase II of Scan-ICT and identified technical assistance needs. The workshop provided practical recommendations on policies, programmes and mechanisms for monitoring and measuring regional information society development with the aim of promoting the production of comparable ICT indicators for effective ICT policymaking.
- Expert Group Meeting on ICT Indicators Adoption and Data Collection: ICT Indicators in Education and E-government, February 2007, Cairo, Egypt. The meeting was jointly organized by UNESCWA, UNESCO Institute for Statistics (UIS), the Knowledge Management Branch/DPADM/UNDESA, and the Cabinet Information and Decision Support Center (IDSC). The meeting considered a proposal from UIS for core indicators on the use of ICT in education for possible endorsement and adoption into the *Partnership* list of core ICT indicators. It also provided a forum for disseminating case studies and presenting proposals for indicators on the use of ICT by government, thereby paving the way for establishing a preliminary regional list to start collecting data for these indicators.
- An UNCTAD training course, January 2007, Bangkok, Thailand. UNCTAD and the Thai National Statistical Office carried out a joint research project to measure the impact of the adoption

and use of ICT on the productivity of Thai firms. The training course was on applying econometric methods to ICT data analysis and followed a conference held the previous day on Measuring ICT.

- Capacity-Building Workshop on Information Society Measurements: Core Indicators, Statistics and Data Collection, December 2006, Amman, Jordan. The workshop was organized by the ITU Arab Regional Office, the Jordanian Ministry of ICT, UNESCWA and the Arab Institute for Training and Research in Statistics (AITRS). It aimed to build on the outcomes of the Geneva and Tunis phases of the WSIS and considered implementation of the decisions endorsed by the earlier capacity-building workshop held in the region, in June 2005. In addition, participants explored the steps necessary for fulfilling mandates outlined in the Arab Initiative that was presented at the fourth World Telecommunication Development Conference (Doha, 7-15 March 2006).
- The Third Regional Workshop on Information Society Measurement in Latin America and the Caribbean, November 2006, Panama. The workshop

highlighted the progress made in collecting ICT data via household and business surveys. The meeting, which included participants from NSOs, ministries and regulatory agencies, also discussed capacity-building and technical assistance requirements. The workshop was organized by UNECLAC with the support of ITU and the NSO from Panama.

- Training on Information and Communications Technology measurement in Panama, November 2006 (prior to the Third Regional Workshop). The training was promoted by UNECLAC, and presented by Statistics Canada.
- The Joint UNCTAD–ITU–UNESCAP Regional Workshop on Information Society Measurements in Asia-Pacific, July 2006, Bangkok, Thailand. The Workshop allowed participants (representatives from NSOs, ministries and regulatory agencies) to discuss the need for comparable data on the information society and to share best practices in ICT measurement at the regional level. The meeting focused on the core ICT indicators, definitions, methodologies and data collection issues. In addition, it identified technical assistance needs in this area.



## 4. Regional measurement initiatives

### 4.1 Africa

40. The African Information Society Initiative<sup>5</sup> (AISI), adopted in 1996, is the basis of UNECA's work on promoting ICT as a motor for African development. At the inception of AISI, it was recognised that regional efforts to harness ICT for development would only be realized if nations implemented effective measurement tools. Currently, reliable statistical indicators for collecting and compiling data on the impact of ICT in Africa are scarce because most African nations lack basic information on key ICT and related economic and social indicators.
41. To respond to this challenge, the Scan-ICT Initiative was launched in November 2000 as a collaborative project between the Acacia programme of the International Development Research Centre (IDRC) and UNECA. Phase 1 of the initiative aimed to monitor the penetration, impact and effectiveness of ICT in six African countries and thereby assist member states to develop national information societies and economies by developing and compiling suitable statistical indicators.
42. The first phase ended in 2004 and involved pilot surveys in Ethiopia, Ghana, Mozambique, Morocco, Senegal and Uganda. The surveys addressed education, health, public administration and the private sector/private ICT firms. Major findings included:
  - ICT penetration is generally higher in educational institutions and public administration facilities than in health institutions;
  - While many institutions report ICT use, frequently only a few staff in each institution actually possess that capability;
  - A shortage of qualified staff appears to be a critical issue in all areas; and
  - The proportion of institutions with websites is low and the content of the sites is frequently limited to generic information. Thus, the resources of the Internet as a tool for business and commerce have yet to make a substantive impact in the pilot countries.
43. The Scan-ICT survey results show that the six pilot countries are following different ICT development patterns that have resulted in different ways of addressing ICT challenges. In some cases, building infrastructure has been emphasized, while in others, the focus is on education/training and a strong skills base.
44. Several research efforts of UNESCAP have attempted to characterize the supportive environment for ICT in the region, including its use. However, these efforts have been impaired by lack of data. UNESCAP (2006), attempted to solve such problems by computing a value of the (UNDP)

### 4.2 Asia-Pacific

Human Development Index (HDI), as well as a separate Connection Index (CI), which uses data on fixed and mobile telephone users, and Internet users. The indexes are available for all UNESCAP member and associate member economies. The HDI can be used to summarize the enabling environment and the CI the delivery of ICT results to the people of economies of the region.

45. The *Statistical Yearbook for Asia and the Pacific 2007* (UNESCAP, 2007) presented a range of current ICT statistics for the region.

#### 4.3 Latin America and the Caribbean

46. In response to a lack of regional ICT data, in 2003, UNECLAC and the Institute for Connectivity in the Americas (ICA) of the International Development Research Centre of Canada (IDRC) created the Observatory for the Information Society in Latin America and the Caribbean (OSILAC). The main objective of the Observatory is to foster the development of ICT statistics in Latin America and the Caribbean. The Observatory operates under the umbrella of the Statistical Conference of the Americas of UNECLAC and works with members of the *Partnership* and NSOs of the region to achieve harmonized measurement of access to, and use of, ICT at a regional, national and local level. Since 2005, additional donor agencies have joined the effort; they included the European Commission through the @LIS program of the Europe Aid Co-operation Office. In the same year, countries of the region adopted a plan of action that called on participants to “Support and foster, with technical co-operation programmes, institution-building and methodological strengthening and the development of

ICT access and use indicators ...” and to “carry out annual technical seminars, with the participation of national and regional statistical agencies, such as those of the Observatory for the Information Society in Latin America and the Caribbean (OSILAC)”.<sup>6</sup>

#### 4.4 Western Asia and the Arab region

47. The region has been involved in a number of capacity-building workshops/meetings relating to ICT measurement (these are listed above).
48. Following the recommendations of one such meeting (the *Expert Group Meeting on ICT Indicators Adoption and Data Collection: ICT Indicators in Education and E-government*, held in February 2007), UNESCWA, in collaboration with the Arab Institute for Training and Research in Statistics (AITRS), has translated the core list of ICT indicators into Arabic for wider dissemination in the Arab region.
49. In addition, UNESCWA and AITRS have published, in Arabic, a booklet entitled *Guidelines for ICT Indicators Measurement* (UNESCWA, 2007a). This booklet constitutes the first step towards the standardization of the measurement process for ICT indicators.
50. Several UNESCWA member economies collect ICT statistics in the areas of ICT expenditure (including its percentage of GDP) and exports of ICT services. The statistics can be found on the World Development Indicators 2007 CD-ROM (World Bank, 2007) in tables 4.2 *Structure of output*, 5.11 *The Information Age* and 4.6 *Structure of service exports*. An analysis of these statistics can be found in UNESCWA (2007b).

## Notes

- <sup>1</sup> Joint UNECE/UNCTAD/UIS/ITU/OECD/Eurostat side event to WSIS on “Monitoring the Information Society”, December 2003, Geneva.
- <sup>2</sup> This was presented to an inter-agency coordination meeting on information society statistics at the occasion of the thirty-fifth session of the UN Statistical Commission, New York, 5 March 2004.
- <sup>3</sup> See also UNCTAD’s website: [http://new.unctad.org/templates/calendar\\_\\_\\_\\_631.aspx](http://new.unctad.org/templates/calendar____631.aspx).
- <sup>4</sup> A ‘reference indicator’, HHR1, on the proportion of households with electricity is also part of this set. However, few economies collect it.
- <sup>5</sup> [www.uneca.org/aisi](http://www.uneca.org/aisi).
- <sup>6</sup> Plan of Action for the Information Society in Latin America and the Caribbean eLAC2007, June 2005, goals 26.1 and 26.3.



# Chapter 2. ICT infrastructure and access

## 1. Introduction

51. The data presented in this chapter are based on the core *ICT infrastructure and access* indicators, which are shown in Table 1 below and defined in Annex 2. These

indicators are collected by the International Telecommunication Union (ITU) and are published in the *World Telecommunication/ICT Indicators Database* (ITU, 2007b)

**Table 1. Core indicators on ICT infrastructure and access**

<b>Basic core indicators</b>	
A1	Fixed telephone lines per 100 inhabitants
A2	Mobile cellular telephone subscribers per 100 inhabitants
A3	Computers per 100 inhabitants
A4	Internet subscribers per 100 inhabitants
A5	Broadband Internet subscribers per 100 inhabitants
A6	International Internet bandwidth per inhabitant (bits)
A7	Percentage of population covered by mobile cellular telephony
A8	Internet access tariffs (20 hours per month), in US\$ (A8a), and as a percentage of <i>per capita</i> income (A8b)
A9	Mobile cellular tariffs (100 minutes of use per month), in US\$ (A9a), and as a percentage of <i>per capita</i> income (A9b)
A10	Percentage of localities with public Internet access centres (PIACs) by number of inhabitants (rural/urban)
<b>Extended core indicators</b>	
A11	Radio sets per 100 inhabitants
A12	Television sets per 100 inhabitants

Source: Core ICT Indicators (*Partnership*, 2005c).

and other publications such as the *World Telecommunication/ICT Development Report* (ITU, 2006). They are defined in ITU's *Telecommunication Indicators Handbook* (ITU, 2007a), with the goal of assisting the standardization of statistics in this field.

52. Given rapid changes in the area of telecommunications and ICT, it is necessary for the indicators to be updated regularly. Changes are discussed, and revised indicators adopted, at ITU's World Telecommunication/ICT Indicators (WTI) meeting, which is organized regularly. The fifth WTI meeting took place in October 2006 and approved a revised version of the *Telecommunication Indicators Handbook* (ITU, 2007a). The sixth WTI meeting

was held in December 2007 and included discussion of indicators to measure community access and to reflect newer technologies and services, particularly the uptake of mobile broadband. The discussions did not result in modifications to the indicator definitions.

53. ITU collects data from several sources but mainly through an annual survey of telecommunication authorities, telecommunication/ICT Ministries and some operators. Additional data are obtained from reports provided by telecommunication regulatory authorities, ministries and operators, and from ITU staff reports. In some cases, estimates are derived from ITU background documents or other references (ITU, 2003; 2007b).

## 2. Measurement status

54. As Table 2 shows, data on the infrastructure and access indicators (A1–A9) are widely available. Data for the three indicators, A10–12 are available for a smaller proportion of economies, with the least available indicator being A10 (‘percentage of localities with public Internet access centres (PIACs) by number of inhabitants (rural/urban)’) that is available for only 12 per cent of economies.<sup>1</sup> The reason for the relatively high availability of the other infrastructure and access indicators is that the underlying statistics are based on administrative data collected by telecommunication/ICT regulatory authorities or ministries directly from service providers, rather than from ICT users directly.
55. ITU collects and publishes a much larger set of telecommunication/ICT indicators than the set of core indicators. These are available from the World Telecommunication/ICT Indicators Database (ITU, 2007b).
56. Annex 1 shows the availability of indicators A1–A12 for individual economies.

**Table 2. Summary of global measurement status by level of development:<sup>2</sup>  
ICT infrastructure and access<sup>3</sup>**

Indicator	Developed economies	Transition economies	Developing economies	Least developed economies	Total number of economies with each indicator
	Proportion of economies with each indicator				
A1	84%	100%	89%	94%	214
A2	86%	100%	90%	98%	218
A3	69%	89%	83%	94%	197
A4	67%	68%	58%	66%	148
A5	80%	89%	67%	88%	180
A6	90%	100%	97%	100%	229
A7	71%	84%	57%	36%	137
A8a	67%	89%	70%	88%	178
A8b	67%	89%	67%	86%	173
A9a	76%	89%	77%	84%	188
A9b	67%	89%	69%	82%	174
A10	4%	11%	14%	16%	29
A11	12%	26%	31%	66%	81
A12	35%	32%	43%	52%	100
Total economies	49	19	120	50	238

Source: ITU (see Annex 1 for more detail).

### 3. Statistical summary

#### 3.1 Infrastructure and access statistics

57. There are two broad types of infrastructure and access indicators – those where a higher value implies a better situation in terms of ICT infrastructure and access development (the ‘positive’ indicators) and those where a lower value usually indicates a better situation (tariff indicators). Indicators A1 to A7, and A10 to A12 are ‘positive’ indicators. The remaining indicators, A8a & b and A9a & b, are tariff indicators.
58. Because a large number of countries have core infrastructure and access indicators, data have been aggregated (by level of development and region). This both improves presentation and provides views of the data that are easier to understand and analyse.
59. The data have been presented at aggregate level in two different ways. The first is aggregations formed from components of country level data, namely, the original numerator and denominator data. These are aggregated across levels of development/regions and then the ratios are calculated at aggregate level.<sup>4</sup> Table 3 shows aggregations from country level component data for the indicators for which this is possible (A1 to A7).<sup>5</sup> However, not all indicators can be aggregated in this manner. Therefore, the median of indicator values was used to show level of development and region aggregations for the remaining indicators (A8 to A12). These can be found in Table 4.
60. Tables 3 and 4 show that the developed economies have higher aggregate or median values for all the positive indicators – in most cases much higher than for the other levels of development. There is a clear pattern of decreasing value of positive indicators with decreasing level of development.
61. In respect of tariff indicators, A8a (Internet access tariffs in US\$) is lowest for transition economies and second lowest for developed economies. Indicator A9a (mobile phone tariffs in US\$) is highest for developed economies and lowest for developing economies. When looked at on a ‘per capita income’ basis (indicators A8b and A9b), it is clear that both Internet and mobile phone tariffs are low in relative income terms for developed economies and very high for the least developed economies.



**Table 3. ICT infrastructure and access core indicators, aggregate values,<sup>6</sup> latest year available<sup>7</sup>**

Level of development and region <sup>2</sup>	A1. Fixed telephone lines	A2. Mobile cellular telephone subscribers	A3. Computers	A4. Internet subscribers	A5. Broadband Internet subscribers	A6. International Internet bandwidth per inhabitant (bits)	A7. Percentage of population covered by mobile cellular telephony
	Number per 100 inhabitants						
<b>Developed economies</b>	<b>51</b>	<b>92</b>	<b>62</b>	<b>24</b>	<b>19</b>	<b>4 755</b>	<b>99</b>
Asia <sup>8</sup>	43	79	na	27	21	1 038	100
Europe	49	107	50	24	17	6 245	99
Northern America	58	75	77	22	20	3 645	99
Oceania	48	95	52	32	18	10 026	98
<b>Transition economies</b>	<b>23</b>	<b>77</b>	<b>10</b>	<b>3</b>	<b>2</b>	<b>223</b>	<b>88</b>
Asia	11	20	4	1	0.1	25	69
Europe	26	93	11	3	2	277	97
<b>Developing economies</b>	<b>15</b>	<b>33</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>177</b>	<b>74</b>
Africa	6	35	2	2	0.3	58	77
Asia	16	30	4	4	2	168	69
Latin America and the Caribbean	18	55	12	5	3	335	90
Oceania	4	9	7	4	0.5	50	74
<b>Least developed economies</b>	<b>0.9</b>	<b>10</b>	<b>0.7</b>	<b>0.2</b>	<b>0.0</b>	<b>7</b>	<b>59</b>
Africa	0.7	8	0.6	0.3	0.0	8	48
Asia	1	13	0.9	0.2	0.0	5	76
Latin America and the Caribbean <sup>8</sup>	2	6	0.2	0.9	na	18	na
Oceania	4	5	3	0.6	0.1	25	20

Source: ITU World Telecommunication/ICT Indicators Database.

**Table 4: ICT infrastructure and access core indicators, median values,<sup>6</sup> latest year available<sup>9</sup>**

Level of development and region <sup>2</sup>	A8a. Internet access tariffs, in US\$	A8b. Internet access tariffs, as a percentage of per capita income	A9a. Mobile cellular tariffs, in US\$	A9b. Mobile cellular tariffs, as a percentage of per capita income	A10. Percentage of localities with PIAC's by number of inhabitants	A11. Radio sets	A12. Television sets
	20 hours per month		100 minutes of use per month			per 100 inhabitants	
<b>Developed economies</b>	<b>16</b>	<b>1</b>	<b>30</b>	<b>2</b>	<b>na</b>	<b>128</b>	<b>57</b>
Asia <sup>8</sup>	14	0.5	52	2	na	na	na
Europe	19	1	28	2	na	114	55
Northern America	na	na	12	na	na	na	na
USA <sup>10</sup>	15	0.4	10	0.3	na	na	na
Oceania	17	0.9	43	2	na	na	63
<b>Transition economies</b>	<b>12</b>	<b>11</b>	<b>27</b>	<b>17</b>	<b>na</b>	<b>54</b>	<b>24</b>
Asia	12	26	19	35	na	na	23
Europe	13	7	27	15	na	46	25
<b>Developing economies</b>	<b>22</b>	<b>8</b>	<b>20</b>	<b>8</b>	<b>26</b>	<b>29</b>	<b>22</b>
Africa	31	21	20	14	50	23	16
Asia	12	3	13	3	99	43	32
Latin America and the Caribbean	24	11	26	9	6	40	22
Oceania	25	53	22	6	na	55	19
<b>Least developed economies</b>	<b>41</b>	<b>123</b>	<b>22</b>	<b>60</b>	<b>6</b>	<b>15</b>	<b>2</b>
Africa	42	168	23	87	11	15	2
Asia	26	39	8	18	2	10	6
Latin America and the Caribbean <sup>8</sup>	71	213	13	39	na	na	na
Oceania	58	50	34	35	na	13	1

Source: ITU World Telecommunication/ICT Indicators Database.

62. For the 'positive' core indicators, A1 to A7, it is possible to look at change over time, in this case based on aggregate values at three points in time, 1995, 2000 and 2006.<sup>11</sup> Table 5 shows such an analysis by level of development. It reveals large increases in the value of some indicators, for all levels of development – particularly the number of mobile phone subscribers. For others, increases were lower or were restricted to some levels of development. The number of fixed telephone lines has increased modestly for most levels of development but has stabilized since 1995 for developed economies. With the exception of mobile phone subscribers and international bandwidth, indicators for the least developed economies have not increased much over the 11-year period.
63. As the table shows, even the latest values of some of the indicators are still very low for transition, developing and least developed economies, especially those relating to computers and the Internet. It is therefore important to consider both absolute values and percentage changes when attempting to analyse differences between levels of development and over time.

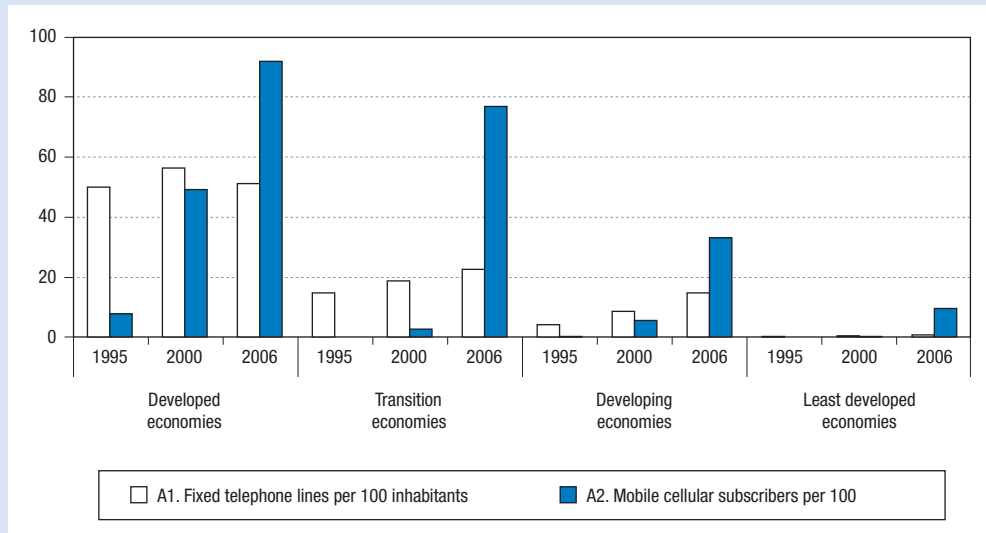
**Table 5. Change over time by level of development, selected core indicators,<sup>6</sup> 1995, 2000 and 2006**

Level of development and region <sup>2</sup>	Year	A1. Fixed telephone lines	A2. Mobile cellular telephone subscribers	A3. Computers	A4. Internet subscribers	A5. Broadband Internet subscribers	A6. International Internet bandwidth per inhabitant (bits)	A7. Percentage of population covered by mobile cellular telephony
		Number per 100 inhabitants						
Developed economies	1995	50	8	19	na	na	na	na
	2000	57	50	37	14	1	606	98
	2006	51	92	62	24	19	4 755	99
Transition economies	1995	15	0.1	5	na	na	na	na
	2000	19	3	5	0.3	na	12	76
	2006	23	77	10	3	2	223	88
Developing economies	1995	5	0.4	3	na	na	na	na
	2000	9	6	3	0.9	na	5	71
	2006	15	33	5	4	2	177	74
Least developed economies	1995	0.3	0.0	0.3	na	na	na	na
	2000	0.5	0.3	0.3	0.0	na	0.2	34
	2006	0.9	10	0.7	0.2	0.0	7	59

Source: ITU World Telecommunication/ICT Indicators Database.

64. Chart 1 compares changes in the numbers of fixed and mobile phone subscribers (per 100 inhabitants) over the period 1995 to 2006. It illustrates:
- The dramatic difference between fixed and mobile phone growth over the period;
  - The low levels in least developed economies compared with developing economies; and
  - The stabilization of the number of fixed telephone lines in developed economies, with steady growth for other levels of development.

Chart 1. Fixed phone lines and mobile phone subscribers, per 100 inhabitants



Source: ITU World Telecommunication/ICT Indicators Database.

65. Some interesting time series comparisons between the developed and developing world have been made by ITU and can be found on their website, see: <http://www.itu.int/ITU-D/ict/statistics/ict/index.html>.

### 3.2 Regional analysis

66. As discussed above, indicators A1 to A7, and A10 to A12 can be thought of as ‘positive’ ICT infrastructure and access indicators, that is, a higher value implies a higher level of ICT infrastructure and access development. Tables 3 and 4 show that, for most of the positive indicators, Northern

America, Europe and the developed Oceania and Asian countries have the highest aggregate or median values. The lowest values of the positive indicators can be found in African and Asian countries, especially those that are among the least developed economies. The tariff indicators 8a and 9a (indicating the monthly cost in US dollars of Internet and mobile phone access respectively) are more even across regions, although they are relatively low for Asia and the USA. However, when looked at on a ‘per capita income’ basis, the least developed economies in Africa fare much worse than other regions, with the relative cost for those services very high.<sup>12</sup>

## Notes

<sup>1</sup> This indicator has only been collected for a relatively short time. It provides important information for developing economies, where few households have Internet access and therefore many individuals use the Internet at public facilities. Data on the indicator are scarce because many countries find it difficult to measure this indicator. Problems often start with the definition of ‘localities’ (which include villages, towns and cities) and the availability of data on localities. In addition, locality data may not be linked to the availability of public Internet access centres (PIACs). In other cases, the number of PIACs (or their location) are not tracked. ITU is encouraging more countries to collect this information.

- <sup>2</sup> Annex 1 shows the economies which are included in each ‘level of development’ and ‘region’ category. The classification is based on the UN Statistical Division’s *Standard country or area codes for statistical use*, see <http://unstats.un.org/unsd/methods/m49/m49.htm>. The classification was revised in January 2008 and is now slightly different from the version used to aggregate data for this publication. The differences are detailed in Annex 1.
- <sup>3</sup> An indicator was considered to be *available* if ITU received data for it (including zero values) for the year 2002 or later. The total economy count includes countries from which ITU does not collect data. See Annex 1 for details.
- <sup>4</sup> For example, for the indicator A1 (the number of fixed telephone lines per 100 inhabitants), the number of fixed telephone lines is summed, as is the number of inhabitants. The value of the indicator A1 is calculated as the ratio: total number of fixed telephone lines to total number of inhabitants divided by 100.
- <sup>5</sup> In theory, A10-12 could be aggregated from component data, however, they have not been because of lack of data.
- <sup>6</sup> A note on the presentation of values in tables of this chapter: the term ‘na’ means not available, that is, there are insufficient data to produce a meaningful result or no data are available. All values which are less than 1 have been shown to 1 decimal place.
- <sup>7</sup> *Latest year available* is generally 2005 or 2006. See Annex 1 for details.
- <sup>8</sup> This category consists of one country only.
- <sup>9</sup> *Latest year available* is generally 2005 or 2006 with the exception of indicators A11 and A12, where data were generally older. See Annex 1 for details.
- <sup>10</sup> Northern America is a small region consisting of only five economies, therefore median values may not be meaningful. For comparative purposes, data for USA are shown separately.
- <sup>11</sup> 2006 data or latest year available. Data for 1995 are not available for all indicators.
- <sup>12</sup> The only exception is for the Latin America and the Caribbean region which consists of only one country.



# Chapter 3. Access to, and use of, ICT by households and individuals

## 1. Introduction

67. The data presented in this chapter are based on the core ICT indicators on access to, and use of, ICT by households and individuals (HH1-HH13). These are shown in Table 6 below and are defined in Annex 3.
68. Statistics on household/individual ICT access and use are typically collected by NSOs through household surveys. These may be surveys that are dedicated to measuring ICT access and use, or surveys such as labour force or ‘omnibus’ (‘general purpose’) surveys where ICT is one of several topics. Most developed economies have been collecting these statistics in a reasonably coordinated fashion for a number of years, using model questionnaires recommended by the OECD and Eurostat. Other economies are starting to collect these indicators using the core indicators methodological recommendations (*Partnership*, 2005c) and/or those of the OECD (2007a) and Eurostat (2006 and 2007a). Among developing economies, the Latin American and Caribbean countries have recently been very active in the collection of household ICT indicators (see Box 2).
69. The OECD and Eurostat have been collecting and publishing household/individual ICT access and use statistics from their member countries since 2002. More recently, ITU has started to collect these statistics from developing economies and compile statistics for all economies.
70. Statistical standards for household/individual ICT access and use indicators have been developed primarily by the OECD and Eurostat. As we saw in Chapter 1, the *Partnership* has played an important role in extending these standards to developing economies, via the core list of ICT indicators. Several international organizations are proactive in promoting household statistical standards and methodologies more generally. The UN Statistics Division plays a major role in developing and promulgating standards, while the International Household Survey Network (IHSN) fosters the improvement of the availability, accessibility and quality of household survey data in developing economies, and encourages their use by decision-makers and others.<sup>1</sup>
71. This chapter presents data and metadata collected by ITU, supplemented by information from Eurostat, national statistical sources and the OECD.

**Table 6. Core indicators on access to, and use of, ICT by households and individuals**

<b>Basic core indicators</b>	
HH1	Proportion of households with a radio
HH2	Proportion of households with a TV
HH3	Proportion of households with a fixed line telephone
HH4	Proportion of households with a mobile cellular telephone
HH5	Proportion of households with a computer
HH6	Proportion of individuals who used a computer (from any location) in the last 12 months
HH7	Proportion of households with Internet access at home
HH8	Proportion of individuals who used the Internet (from any location) in the last 12 months
HH9	Location of individual use of the Internet in the last 12 months At home At work Place of education At another person's home Community Internet access facility Commercial Internet access facility Others
HH10	Internet activities undertaken by individuals in the last 12 months Getting information: About goods or services Related to health or health services From government organizations/public authorities via websites or email Other information or general web browsing Communicating Purchasing or ordering goods or services Internet banking Education or learning activities Dealing (interacting) with government organizations/public authorities Leisure activities Playing/downloading video or computer games Downloading movies, music or software Reading/downloading electronic books, newspapers or magazines Other leisure activities
<b>Extended core indicators</b>	
HH11	Proportion of individuals with use of a mobile telephone
HH12	Proportion of households with access to the Internet by type of access Narrowband access Broadband access See Annex 3 for detailed categories.
HH13	Frequency of individual access to the Internet in the last 12 months (from any location) At least once a day At least once a week but not every day At least once a month but not every week Less than once a month
HHR1	Proportion of households with electricity <sup>2</sup>

Source: Core ICT Indicators (*Partnership*, 2005c).



## 2. Measurement status

72. Table 7 shows that some of the core indicators on household/individual ICT access and use are reasonably widely available, especially for developed economies. However, there remain questions of data comparability, including variable age scope (for individuals) and variations in questions asked (for instance, how locations and activities are defined). In addition, most countries do not have good time series of ICT access and use data and much of the available data are out-of-date and therefore less useful given the pace of change in adoption of many technologies (this is especially true of developing and least developed economies; see Annex 1 for more information on the currency of data).
73. Some of the access indicators are not widely available, including those for access to a radio (HH1) and the reference indicator, access to electricity (HR1). The individual ICT use indicators are generally less widely available than those for household ICT access. In particular, the more complex indicators on location and frequency of Internet use and the nature of Internet activities (HH9, HH10 and HH13) are collected by relatively few countries, with the exception of developed economies.<sup>3</sup>
74. Not surprisingly, European countries have the most comparable and available data, while the wider membership of the OECD has a reasonable set of statistics, although they are less comparable than Eurostat data.<sup>4</sup> Amongst developing economies, a number of Latin America and Caribbean economies have quite comprehensive and recent datasets, although differences in age scope still exist (see Box 2).

**Table 7. Summary of global measurement status by level of development:<sup>5</sup> access to, and use of, ICT by households and individuals<sup>6</sup>**

Indicator	Developed economies	Transition economies	Developing economies	Least developed economies	Total number economies with each indicator
	Proportion of economies with each indicator				
HH1	14%	21%	26%	34%	59
HH2	61%	42%	33%	32%	94
HH3	63%	37%	36%	32%	97
HH4	65%	26%	31%	2%	75
HH5	76%	47%	41%	20%	105
HH6	63%	26%	14%	0%	53
HH7	69%	37%	33%	6%	83
HH8	65%	26%	23%	4%	66
HH9	61%	26%	18%	0%	56
HH10	63%	26%	17%	0%	55
HH11	57%	21%	17%	0%	52
HH12	59%	26%	8%	0%	43
HH13	61%	26%	11%	0%	47
HR1	14%	16%	19%	6%	36
Total economies	49	19	120	50	238

Source: ITU and Eurostat (see Annex 1 for more detail).

## Box 2. Measurement initiatives in the Latin America and the Caribbean region

In respect of household access statistics, most countries of the region have been asking questions on ICT access for some years. The main goods and services about which information is collected are radio, television, fixed telephone and, more recently, the ownership of a computer, mobile telephone and access to the Internet. Between 2005 and 2006, a small group of LAC countries added a module of ICT use questions to household surveys. By 2006, about half of the countries of the region, including most of

the larger ones, collected information on household access to the Internet and about 15 countries collected all or some of the ICT indicators on household access and use recommended by the *Partnership*. A variety of survey types is used to collect these statistics, including multi purpose household surveys, life conditions surveys and stand-alone ICT surveys. Most countries collect the core access indicators annually, with the core use indicators collected less frequently for some countries.

Source: Olaya (2007).

## 3. Statistical summary

### 3.1 Household access to ICT

75. Table 8 below shows household ICT access data classified by level of development. For the 25 European Union countries comprising ‘EU25’,<sup>7</sup> data are shown as a single aggregate. Other countries are shown individually.
76. Despite some data comparability issues (as outlined above), a general picture emerges of reasonably high access to newer technologies amongst households of developed economies and lower levels in other economies.
77. In developed economies (and many developing and transition economies), most households have access to older technologies, such as TV (HH2) and fixed phone (HH3).<sup>8</sup> In most developed economies, over half of all households have access to the newer technologies – mobile phones (HH4), computers (HH5) and the Internet (HH7). Access to computers and the Internet in other economies is generally low but appears to be increasing (see charts 3 and 4 below). With very few exceptions, in least developed economies, there is a low level of access to all technologies, except for radios.
78. The proportion of households with the Internet can be further split to show the type of Internet access services used (HH12). Table 9 shows HH12 for a small number of countries, plus EU25. Even though data are not widely available, the broad pattern appears to be that developed economies have a higher level of household broadband access compared to economies at other levels of development. Exceptions are some of the wealthier Asian economies, which have very high levels of broadband access.

**Table 8. Household ICT access core indicators, proportion of households, latest year available<sup>9</sup>**

Level of development and region <sup>10</sup>	Economy <sup>11</sup>	HH1 (radio)	HH2 (TV)	HH3 (fixed phone)	HH4 (mobile phone)	HH5 (computer)	HH7 (Internet)	HR1 (electricity)
<b>Developed economies</b>								
Asia	Japan		99%	91%	90%	81%	61%	
Europe	Croatia	50%	94%	88%		28%		99%
Europe	Iceland		93%	94%	98%	89%	84%	
Europe	Monaco		96%	93%	81%	56%	32%	100%
Europe	Norway		95%	67%	95%	82%	78%	
Europe	San Marino					83%		
Europe	Switzerland					71%	77%	
Europe	EU25 <sup>7</sup>		97%	82%	87%	66%	56%	
N. America	Bermuda	73%	96%	91%	74%	66%	57%	100%
N. America	Canada		99%	99%	64%	72%	64%	
N. America	United States	99%				62%	55%	100%
Oceania	Australia					73%	64%	
Oceania	New Zealand		98%	93%	86%	72%	65%	95%
<b>Transition economies</b>								
Asia	Armenia		93%	72%	5%	4%	2%	99%
Asia	Azerbaijan	99%	69%		26%	9%	0%	100%
Asia	Georgia	19%	89%	33%		2%		100%
Europe	Belarus		93%	81%		16%	9%	100%
Europe	Bulgaria		98%	73%	64%	23%	19%	
Europe	Rep. Moldova		82%	55%		2%		
Europe	Romania		97%	52%	58%	34%	22%	
Europe	Serbia					34%	26%	
Europe	TFYR Macedonia	39%	99%	84%	71%	25%	14%	
<b>Developing economies</b>								
Africa	Botswana	70%		22%		6%	1%	
Africa	Cameroon	63%	23%	2%	22%		1%	
Africa	Congo	57%	25%	1%				
Africa	Egypt	85%	93%	56%		14%		
Africa	Ghana	71%	26%	7%	5%			
Africa	Kenya	74%	19%	13%				
Africa	Mauritius		96%	77%	69%	24%	17%	99%
Africa	Morocco	79%	77%	18%	59%	13%	4%	
Africa	Nigeria	77%	25%	6%				
Africa	Réunion					55%	39%	
Africa	Saint Helena					25%		
Africa	Seychelles		92%			12%		
Africa	South Africa	81%	59%	55%	50%			80%
Africa	Tunisia			36%				
Africa	Zimbabwe					24%		
Asia	Cyprus <sup>12</sup>		100%	92%	91%	53%	39%	
Asia	Hong Kong SAR China					72%	67%	
Asia	India	33%	45%		1%	0%		
Asia	Indonesia	70%	65%	14%		3%		91%
Asia	Iran, Islamic Republic of					26%		
Asia	Israel		93%	87%	84%	59%	41%	
Asia	Lebanon		97%	37%	43%	24%		100%
Asia	Macao SAR China					56%	32%	100%
Asia	Malaysia					28%		
Asia	Mongolia	25%	86%	20%	28%	6%	9%	86%
Asia	Occ. Palestinian Terr.		93%	8%	30%	26%	9%	

Level of development and region <sup>10</sup>	Economy <sup>11</sup>	HH1 (radio)	HH2 (TV)	HH3 (fixed phone)	HH4 (mobile phone)	HH5 (computer)	HH7 (Internet)	HR1 (electricity)
Asia	Oman	69%	84%	44%	72%	24%	14%	98%
Asia	Philippines	71%	63%	12%	36%	7%		77%
Asia	Republic of Korea <sup>13</sup>					79%	94%	
Asia	Singapore		99%			78%	71%	
Asia	Sri Lanka					4%	1%	
Asia	Taiwan, China		100%	98%		65%	87%	
Asia	Thailand			27%		16%	6%	99%
Asia	Turkey		98%		73%	12%	9%	
Asia	Viet Nam			56%	87%			
LAC	Bolivia	67%	63%	19%	39%	12%	4%	67%
LAC	Brazil <sup>14</sup>	88%	91%	48%	59%	19%	14%	97%
LAC	Chile		27%	47%	84%	33%	19%	
LAC	Colombia	71%	85%	56%			8%	
LAC	Costa Rica	85%	91%	65%	50%	27%	10%	97%
LAC	Cuba	38%	88%	17%	1%	2%	0%	100%
LAC	Dominican Republic	62%	76%	26%	44%	9%	3%	95%
LAC	Ecuador	73%	87%	36%	64%	18%	3%	96%
LAC	El Salvador	58%	78%	41%	35%	7%	2%	
LAC	Falkland Islands					72%		
LAC	Honduras	65%	64%	30%	41%	8%	2%	70%
LAC	Martinique					50%	26%	
LAC	Mexico	88%	93%	49%	47%	21%	10%	
LAC	Panama	80%	83%	40%	64%	16%	8%	88%
LAC	Paraguay	80%	82%	17%	64%	6%	3%	97%
LAC	Peru	84%	69%	28%	28%	10%	5%	77%
LAC	Suriname			46%	23%			96%
LAC	Trinidad and Tobago				60%	31%	17%	
LAC	Uruguay	94%	91%	70%	49%	24%	14%	
LAC	Venezuela	83%	91%	34%	25%	10%	2%	99%
Oceania	French Polynesia					45%		
Oceania	New Caledonia			43%	44%			
Oceania	N. Mariana Islands	79%		71%		40%	31%	
<b>Least developed economies</b>								
Africa	Burkina Faso	63%	12%	4%		3%		
Africa	Chad	37%	3%	1%				
Africa	Eritrea					0%		
Africa	Ethiopia	34%	5%	4%			0%	
Africa	Guinea	64%	11%	6%				
Africa	Lesotho	54%	13%	18%				
Africa	Madagascar	59%	18%	5%		9%	1%	
Africa	Malawi	62%	5%	5%				
Africa	Mozambique	53%	9%	2%				
Africa	Rwanda	46%	2%	1%				
Africa	Senegal	87%	40%	16%				
Africa	Sudan	39%	16%			16%		
Africa	Uganda					6%		
Africa	U. Rep. of Tanzania	58%	6%	9%				11%
Asia	Bangladesh	30%	23%	5%				41%
Asia	Bhutan	77%	58%			5%	0%	
Asia	Lao People's Dem. Rep.					0%		
Asia	Maldives	72%	85%	67%	83%	28%	8%	
Asia	Nepal			6%				37%

Source: ITU, UNECLAC and Eurostat (30 November 2007).

**Table 9. Households with access to Internet, by type of access,<sup>15</sup> proportion of households with Internet access, latest year available<sup>9</sup>**

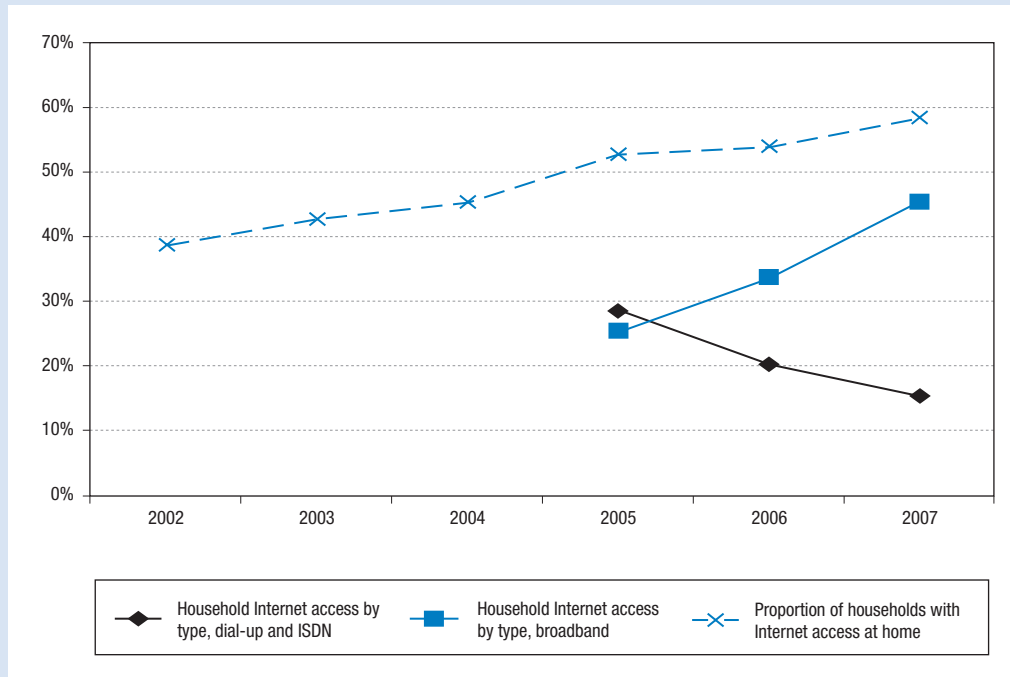
Level of development and region <sup>10</sup>	Economy <sup>11</sup>	Dial-up modem	ISDN	DSL	Cable modem	Other modes of access
<b>Developed economies</b>						
Asia	Japan	16%	19%	34%	16%	15%
Europe	Iceland	7%		89%		
Europe	Norway	22%		77%		
Europe	EU25 <sup>7</sup>	25%		61%		
Oceania	Australia <sup>16</sup>	31%		54%	14%	9%
Oceania	New Zealand	48%		36%	9%	9%
<b>Transition economies</b>						
Asia	Azerbaijan	41%	1%	1%	1%	56%
Europe	Bulgaria	17%		16%		
Europe	Romania	62%		6%		
Europe	Serbia	75%		12%		
Europe	TFYR Macedonia	76%		5%	4%	31%
<b>Developing economies</b>						
Africa	Mauritius	76%	3%	17%	0%	4%
Asia	China	25%		58%		17%
Asia	Occ. Palestinian Terr.	69%	1%	15%		16%
Asia	Republic of Korea	3%	1%	82%	22%	23%
Asia	Taiwan, China	4%		80%	6%	5%
Asia	Thailand <sup>17</sup>	26%		53%		21%
LAC	Brazil	63%	43%			
LAC	Costa Rica	61%	3%	20%	16%	1%

Source: ITU and Eurostat (30 November 2007).

79. There are several examples of time series data for household ICT statistics. Chart 2 below shows time-series data for Eurostat countries (represented by the EU15 aggregate in order to show a longer series of observations) in respect of household

access to the Internet. It shows a steady rise in Internet access from 2002 to 2007. The method used to access the Internet in the three years, 2005 to 2007, shows a rapid rise in broadband access, with a corresponding drop in dial-up and ISDN access.

Chart 2. Change in household means of accessing the Internet, EU15, proportion of all households<sup>18</sup>

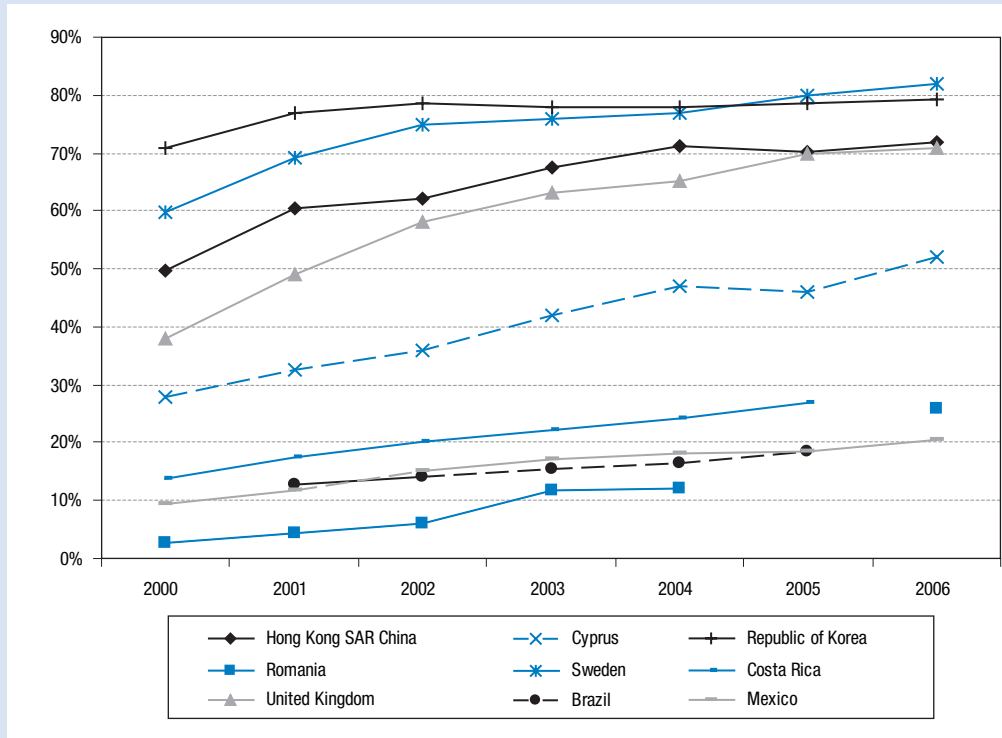


Source: Eurostat, 30 November 2007.

80. Charts 3 and 4 below show a selection of time series data for household computer and Internet access. Even though the data are not necessarily comparable, they all show the same rising trend over recent years. For some economies, the level of access to computers is stabilizing, presumably

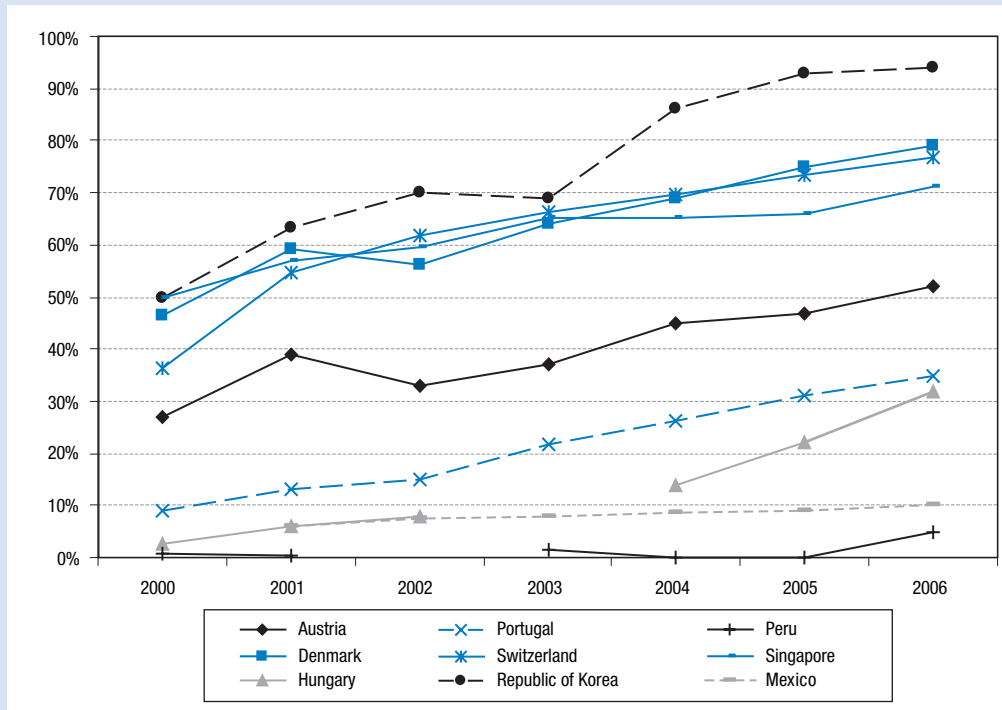
reflecting the fact that most households with an interest in computers had access by 2006. As at 2006, the same general trend was not evident for the Internet, where the access level was still increasing for most economies.

Chart 3: Change in household level of access to a computer, selected countries



Source: ITU.

Chart 4. Change in household level of access to the Internet, selected countries



Source: ITU.



### 3.2 Individual use of ICT

81. Table 10 shows individual data for use of computers, the Internet and mobile phones. As with the household access indicators, for the 25 European Union countries comprising 'EU25', data are shown as a single aggregate.
82. Despite some data availability and comparability issues (described under *Measurement status* above), a general picture emerges of high computer and
- Internet use by individuals in developed economies and some developing economies (particularly, the wealthier Asian economies). Levels of use are considerably lower for the transition and most developing economies, including the two least developed economies for which data are available.
83. Mobile phone use is generally higher than computer or Internet use, with the difference in the penetration rate often greater in developing economies.

**Table 10. Individual use of computers, the Internet and mobile phones,<sup>19</sup> latest year available<sup>9</sup>**

Level of development and region <sup>10</sup>	Economy <sup>11</sup>	HH6. Proportion of individuals who used a computer <sup>20</sup>	HH8. Proportion of individuals who used the Internet <sup>20</sup>	HH11. Proportion of individuals with use of a mobile phone
<b>Developed economies</b>				
Asia	Japan	56%	68%	71%
Europe	Iceland	92%	91%	97%
Europe	Norway	91%	87%	97%
Europe	Switzerland		64%	
Europe	EU25 <sup>7</sup>	68%	62%	85%
N. America	Bermuda	89%	80%	45%
N. America	Canada		72%	
N. America	United States	72%	68%	
Oceania	Australia		69%	
Oceania	New Zealand	74%	69%	80%
<b>Transition economies</b>				
Asia	Azerbaijan	17%	10%	
Europe	Bulgaria	37%	34%	70%
Europe	Romania	38%	28%	67%
Europe	Serbia	44%	33%	77%
Europe	TFYR Macedonia	38%	29%	63%
<b>Developing economies</b>				
Africa	Botswana		4%	25%
Africa	Mauritius	30%	17%	
Africa	Morocco	64%	46%	89%
Asia	China		12%	
Asia	Cyprus <sup>12</sup>	49%	41%	91%
Asia	Hong Kong SAR China	63%	61%	86%
Asia	Israel	52%	42%	81%
Asia	Macao SAR China	54%	46%	
Asia	Malaysia			50%
Asia	Occ. Palestinian Terr.	87%	36%	74%
Asia	Oman	11%	6%	55%

Level of development and region <sup>10</sup>	Economy <sup>11</sup>	HH6. Proportion of individuals who used a computer <sup>23</sup>	HH8. Proportion of individuals who used the Internet <sup>20</sup>	HH11. Proportion of individuals with use of a mobile phone
Asia	Republic of Korea	79%	80%	80%
Asia	Singapore	64%	60%	47%
Asia	Taiwan, China <sup>21</sup>		64%	
Asia	Thailand	26%	14%	41%
Asia	Turkey <sup>22</sup>	20%	15%	
LAC	Brazil		21%	37%
LAC	Chile	43%	37%	54%
LAC	Costa Rica		22%	33%
LAC	Cuba	57%	24%	1%
LAC	Dominican Republic	28%	16%	57%
LAC	Ecuador		7%	38%
LAC	Honduras		15%	22%
LAC	Mexico	31%	20%	40%
LAC	Panama <sup>24</sup>		22%	44%
LAC	Paraguay		8%	
LAC	Peru		12%	
LAC	Trinidad and Tobago	33%	27%	60%
LAC	Uruguay		29%	
<b>Least developed economies</b>				
Asia	Afghanistan		21%	
Asia	Bhutan		10%	

Source: ITU, UNECLAC, national statistical sources and Eurostat (30 November 2007).

84. Table 11 below shows where individuals use the Internet. Not surprisingly, home is the major location of access for most countries. In developed economies, the use of public and educational facilities is relatively low in favour of use at home and work. In many developing economies, work and/or commercial Internet access facilities were

common locations of Internet use. Use of community Internet access facilities was relatively low for most economies. However, this finding may not be generalizable to the poorer developing economies and the least developed economies that do not collect this information.

Table 11. Location<sup>25</sup> of Internet use by individuals,<sup>19</sup> proportion of Internet users, latest year available<sup>9</sup>

Level of development and region <sup>10</sup>	Economy <sup>11</sup>	Age	Home	Work	Place of education	Another person's home	Community Internet access facility	Commercial Internet access facility	Other places
<b>Developed economies</b>									
Asia	Japan	6+	83%	34%	12%		4%	5%	
Europe	Iceland	16-74	93%	63%	30%	48%	30%		
Europe	Norway	16-74	92%	56%	15%	18%	13%		
Europe	EU25 <sup>7</sup>	16-74	82%	43%	13%	22%	12%		
N. America	Canada	18+	61%	26%	12%		10%		20%
N. America	United States	3+	80%	36%	23%				
Oceania	Australia	15+	88%	45%	23%	38%			
Oceania	New Zealand	15+	88%	36%	16%	24%	9%	11%	0%
<b>Transition economies</b>									
Asia	Azerbaijan	15+	69%	38%	17%	11%	1%	44%	11%
Europe	Bulgaria	16-74	71%	38%	12%	6%	16%		
Europe	Romania	16-74	67%	34%	21%	12%	9%		
Europe	Serbia	16-74	76%	32%	13%	18%	6%		
Europe	TFYR Macedonia	15-74	32%	17%	19%	9%	54%		
<b>Developing economies</b>									
Africa	Morocco	12-65	28%	7%	3%	3%	1%	71%	
Africa	Mauritius	12+	73%	28%	23%	2%	2%	9%	0%
Asia	China	6+	76%	33%	13%			32%	1%
Asia	Cyprus <sup>12</sup>	16-74	70%	51%	16%	15%	9%		
Asia	Hong Kong SAR China	10+	91%	42%	14%		2%	1%	4%
Asia	Macao SAR China	3+	86%	26%	12%				8%
Asia	Republic of Korea	5+	95%	32%	17%	7%	4%	21%	17%
Asia	Singapore	10+	82%	50%	25%	13%	6%	5%	
Asia	Taiwan, China	12+	93%	36%	19%	8%	5%	16%	4%
Asia	Thailand	6+	33%	28%	46%	17%	2%		
LAC	Brazil	10+	50%	40%	26%	31%	10%	22%	
LAC	Chile	5+	40%	19%	35%		2%	28%	5%
LAC	Costa Rica	5+	32%	27%	20%	5%	0%	46%	1%
LAC	Dominican Republic	12+	20%	32%	34%	28%	8%	41%	2%
LAC	Honduras	15+	10%	11%	7%		0%	81%	1%
LAC	Mexico	6+	34%	24%	16%	2%	1%	42%	
LAC	Paraguay	10+	21%	25%	15%	2%		51%	1%
LAC	Uruguay	6+	41%	26%	14%	11%	3%	52%	

Source: ITU, UNECLAC, national statistical sources and Eurostat (30 November 2007).

85. Table 12 shows available data on the frequency of Internet use by individuals. It appears that Internet users, whatever country they are from, tend to use the Internet frequently (at least once a week). However,

this finding may not be generalizable to the poorer developing economies and the least developed economies that do not collect this information.

**Table 12. Frequency of Internet use by individuals,<sup>19</sup> proportion of Internet users, latest year available**

Level of development and region <sup>10</sup>	Economy <sup>11</sup>	Age	At least once a day	At least once a week but not every day	At least once a month but not every week	Less than once a month
<b>Developed economies</b>						
Europe	Iceland	16-74	82%	14%	3%	1%
Europe	Norway	16-74	77%	17%	4%	1%
Europe	EU25 <sup>7</sup>	16-74	67%	23%	8%	3%
N. America	Canada	18+	64%	26%	5%	2%
Oceania	Australia <sup>26</sup>	15+	50%	41%	8%	1%
Oceania	New Zealand	15+	58%	30%	6%	5%
<b>Transition economies</b>						
Asia	Azerbaijan	15+	41%	51%	5%	3%
Europe	Bulgaria	16-74	64%	28%	6%	2%
Europe	Romania	16-74	49%	41%	9%	1%
Europe	Serbia	16-74	50%	37%	8%	4%
Europe	TFYR Macedonia	15-74	44%	40%	13%	3%
<b>Developing economies</b>						
Africa	Morocco	12-65	55%	34%	8%	3%
Africa	Mauritius	12+	33%	47%	15%	5%
Asia	Hong Kong SAR China	10+	72%	19%	5%	4%
Asia	Occ. Palestinian Terr.	10+	49%	40%	10%	0%
Asia	Republic of Korea	5+	71%	21%	2%	5%
Asia	Singapore	10+	70%	22%	8%	
Asia	Thailand	6+	23%	60%	17%	1%
LAC	Brazil	10+	36%	47%	12%	3%
LAC	Costa Rica	5+	34%	38%	24%	5%
LAC	Mexico	6+	20%	68%	10%	2%
LAC	Uruguay	6+	37%	48%	12%	3%

Source: ITU, UNECLAC, national statistical sources and Eurostat (30 November 2007).

86. Table 13 below shows the types of Internet activities undertaken by individuals. Unsurprisingly, in most countries, a large proportion of Internet users use it for communicating. Use of the Internet for

getting information is also important, particularly obtaining information about goods and services and information from government. The residual 'other' category may include general web browsing

Table 13. Internet activities<sup>27</sup> undertaken by individuals,<sup>19</sup> proportion of Internet users, latest year available<sup>9</sup>

Level of development and region <sup>10</sup>	Economy <sup>11</sup>	Getting information										
		Age	About goods and services	Related to health/health services	From government	Other	Communication	Purchasing goods or services	Internet banking	Education or learning activities	Dealing with government	Leisure activities
<b>Developed economies</b>												
Asia	Japan	6+	67%	49%	60%		69%	41%	10%	2%	5%	
Europe	Iceland	16-74	87%	43%	65%		92%	36%	80%			
Europe	Norway	16-74	89%	42%	48%		91%	56%	83%			
Europe	EU25 <sup>7,28</sup>	16-74	82%	42%		13%	87%	41%	45%	16%	31%	
N. America	Bermuda	16-65	71%	56%		51%	92%	42%	42%	24%	31%	
N. America	Canada	18+	69%	35%	30%		56%	45%	35%	26%		
N. America	United States	3+	69%	35%			82%	61%	23%	25%		
Oceania	Australia	15+	65%	28%	56%		91%	41%	11%	54%	31%	
Oceania	New Zealand	15+	65%	28%	56%		91%	41%	11%	54%	31%	
<b>Transition economies</b>												
Asia	Azerbaijan	15+	10%	8%	5%	78%	38%	6%	1%	8%	2%	
Europe	Bulgaria	16-74	56%	16%	14%		90%	6%	5%			
Europe	Romania	16-74	51%	26%	16%		87%	6%	7%			
Europe	Serbia	16-74	65%	16%	12%		80%	4%	14%			
Europe	TFYR Macedonia	15-74	43%	12%	46%		83%	4%	1%	22%	19%	
<b>Developing economies</b>												
Africa	Morocco	12-65					7%				1%	5%
Africa	Mauritius <sup>26</sup>	12+					68%	3%		9%		27%
Asia	China	6+					56%	24%				
Asia	Hong Kong SAR China	10+	15%	14%	42%	84%	85%	30%		17%	11%	76%
Asia	Macao SAR China	3+					40%					
Asia	Occ. Palestinian Terr.	10+		1%		46%	9%	0%	1%	19%	0%	23%
Asia	Republic of Korea	6+					85%	50%		47%		86%
Asia	Singapore	15+					84%	27%	33%	30%	36%	56%
LAC	Brazil <sup>9</sup>	10+					69%	14%	19%	72%	27%	
LAC	Chile	5+					59%	6%	6%	12%	9%	53%
LAC	Costa Rica	5+					70%	8%	19%	59%	3%	45%
LAC	Cuba	5-65		2%	16%	10%	10%	8%	13%	39%	3%	
LAC	Dominican Republic	12+	31%	21%			58%	2%		70%	11%	18%
LAC	Honduras	15+					34%	2%				20%
LAC	Mexico	6+	8%	10%	6%	42%	49%	4%	2%	35%	5%	
LAC	Paraguay	10+					65%	1%		22%		21%
LAC	Uruguay	6+					80%	4%	4%		12%	42%

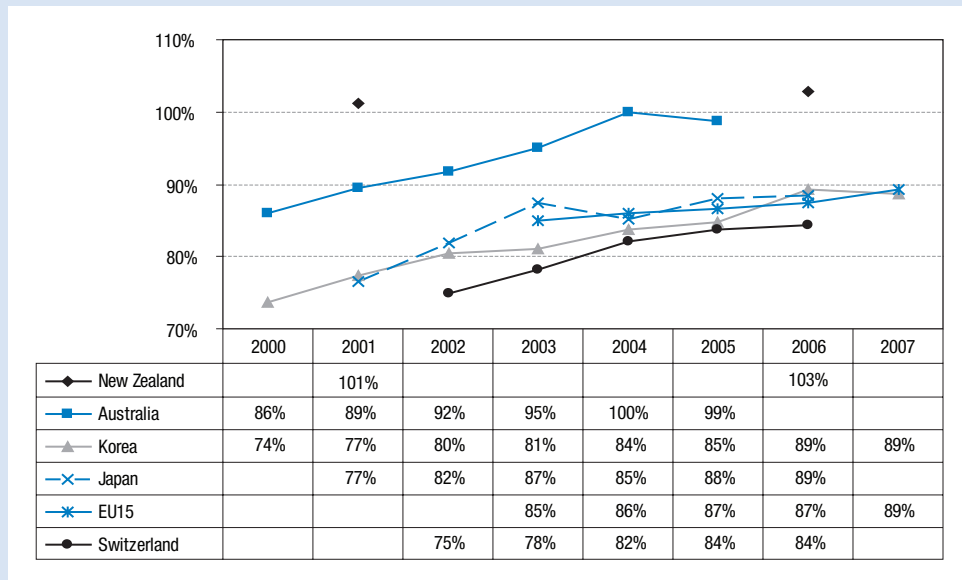
Source: ITU, UNECLAC, national statistical sources and Eurostat (30 November 2007).

for some countries (which probably explains its relatively high value for some countries). Use of the Internet for education or learning activities, Internet banking and purchasing goods or services tends to be higher among users in developed economies (with some notable exceptions in developing economies such as the Republic of Korea, Singapore and some Latin American countries). It is possible that the category descriptions for Internet activities vary more between countries than for other categories presented in this chapter. Therefore, it is quite likely that the data are not particularly comparable across countries.

87. Most OECD countries are able to disaggregate Internet use data by individual characteristics, including age, level of education and gender. The main findings, which hold well over time and across OECD countries, are as follows:

- Younger people are much more likely to be Internet users (the highest rates are for those in the 16-24 age group). Older people are much less likely to use the Internet, with rates of use dropping off sharply for the oldest group (those over 75);
- People with tertiary qualifications are more likely to be Internet users; and
- Of particular interest to policymakers are differences in Internet use by gender. As Chart 5 shows, for most OECD countries, males are slightly more likely to be Internet users than females (with a female to male user ratio of less than 100 per cent). The gender gap has closed significantly since 2000 for most OECD countries, with the general trend being towards increasing female-to-male ratios among Internet users.<sup>30</sup>

Chart 5. Gender gap: ratio of female to male Internet users, OECD countries, 2000–2007<sup>31</sup>

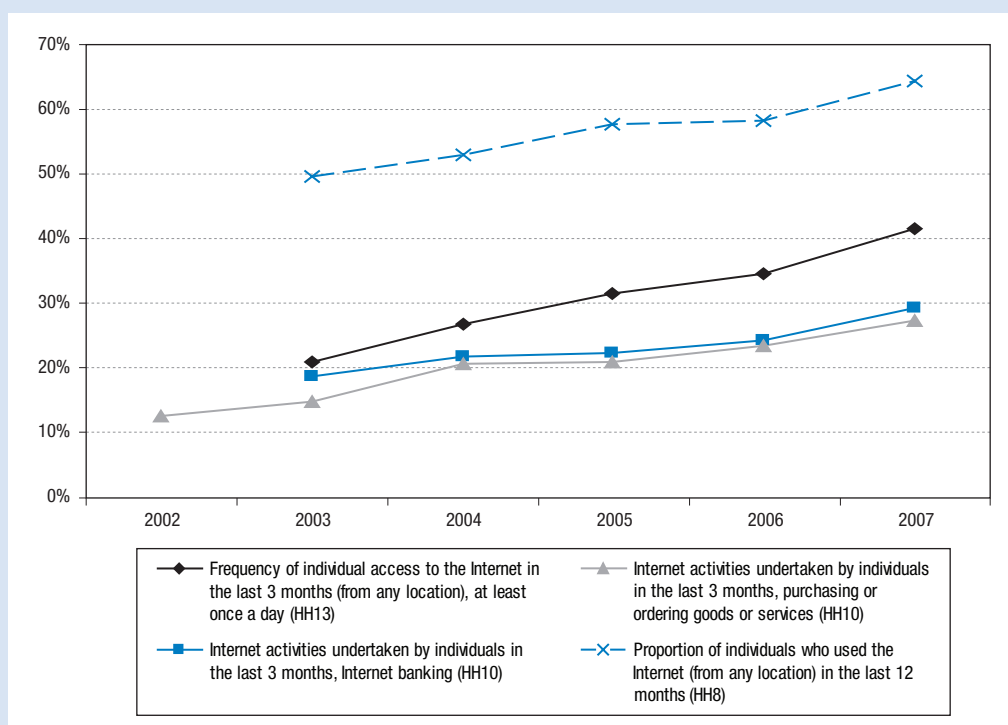


Source: OECD, data collection for 2007 *Scoreboard* publication.

88. Good time series data are available from Eurostat for a number of the individual use indicators. Chart 6 below shows selected data series covering the period for which Eurostat has been collecting ICT use data. The series show growth in Internet use,

with more frequent (daily) use growing more quickly than total use. The selected activities, Internet banking and purchasing over the Internet, are also growing steadily.

**Chart 6. Change in individual use of ICT for selected indicators, EU15, proportion of all individuals<sup>32</sup>**



Source: Eurostat, 30 November 2007.

### 3.3 Regional analysis

89. Regional data are shown in the tables above. They show a clear hierarchy regarding access to, and use of ICT, by region. In general, Africa has the lowest level of household access and individual use of ICT, and Europe and Northern America have the highest. Among individual countries, some developing economies have a very

high level of access to mobile phones, computers and/or the Internet. They include the Republic of Korea, where 94 per cent of households have Internet access, and Hong Kong (SAR China), Singapore and Taiwan (China), where over two thirds of households have Internet access.

90. Box 2 highlights measurement initiatives in the Latin America and Caribbean region.

## Notes

- <sup>1</sup> The IHSN is a partnership of international organizations and has 18 members, including ITU, Paris21, UNSD, UNICEF and the UNDP. For more information see: [www.surveynetwork.org](http://www.surveynetwork.org).
- <sup>2</sup> Electricity is not an ICT commodity, but is an important prerequisite for using many ICTs. It is therefore included in the core list as a reference indicator.
- <sup>3</sup> Whilst developed economies score well on most of the household indicators, that is almost entirely due to the European countries, which collect the data as part of Eurostat's coordinated data collection of ICT access and use statistics.
- <sup>4</sup> Eurostat, the statistical office of the European Communities, also collects data from a small number of non EU countries, including Norway, Iceland and candidate countries. Data for those countries are not included in EU aggregates.
- <sup>5</sup> Annex 1 shows the economies which are included in each 'level of development' and 'region' category. The classification is based on the UN Statistical Division's *Standard country or area codes for statistical use*, see <http://unstats.un.org/unsd/methods/m49/m49.htm>. The classification was revised in January 2008 and is now slightly different from the version used to present data for this publication. The differences are detailed in Annex 1.
- <sup>6</sup> An indicator was considered to be *available* if ITU or Eurostat received complete or partial data for it (including zero values) for the year 2002 or later. The total economy count includes countries from which ITU does not collect data. See Annex 1 for details.
- <sup>7</sup> There are 27 countries in the European Union but two (Romania and Bulgaria) are classified as transition economies for the purposes of this publication. The aggregate chosen for display is therefore EU25, representing the remaining 25 EU countries. Note that Cyprus is included in the EU25 aggregation but is classified in this publication as a developing economy. Its data are therefore also shown with those of other developing economies. EU25 data are the latest available (2006 or 2007, but mainly the latter) and were extracted from Eurostat's database, version 30 November 2007. The scope of Eurostat data presented in this publication is all households and all individuals aged 16-74.
- <sup>8</sup> Data for HH1 (access to radio) are not widely available for developed economies.
- <sup>9</sup> *Latest year available* is generally 2005 or 2006 (except for European Union countries, where 2007 data have been used for most indicators). See Annex 1 for details of data availability. Data from 2002 or earlier have been excluded, except for a small number of cases where older data indicate a saturation level (97% or higher level of access). In this case, the figure has been included in the table even though it dates from 2002 or earlier. Indicators affected are HH1, HH2, HH3 and HR1.
- <sup>10</sup> Some region names have been abbreviated to save space. Full names can be found in Annex 1.
- <sup>11</sup> Some economy names have been abbreviated to save space. Full names can be found in Annex 1.
- <sup>12</sup> Cyprus is also included in the EU25 aggregate.
- <sup>13</sup> Republic of Korea. Home Internet access includes mobile telephone access.
- <sup>14</sup> Brazil. Households with Internet access at home by computer.
- <sup>15</sup> Multiple access services are possible (for instance, if a household has both dial-up and cable modem access, they would report both).
- <sup>16</sup> 'Other modes of access' includes broadband households who do not know what kind of connection they have.
- <sup>17</sup> 'Other modes of access' are in respect of those households who are not sure what kind of connection they have. The 'DSL and Cable modem' figure of 53% refers to broadband access.
- <sup>18</sup> The number of countries included in EU15 is 14 or 15, except for Internet access in the years 2002 to 2004, where 11-13 countries were included in the aggregate.
- <sup>19</sup> Reference periods for individual use indicators are the last 12 months. However, some countries use a different reference period, commonly three months. Eurostat data on computer and Internet use (HH6 and HH8) refer to 12 months, while their data on location of use, activities and frequency refer to the last three months.



- <sup>20</sup> The indicator refers to use from any location in the last 12 months. The age scope of surveys is variable. Information on the age range for most countries can be found in the following tables or as a footnote to this table.
- <sup>21</sup> Taiwan, China. Individuals aged 12+.
- <sup>22</sup> Turkey. Individuals aged 16+.
- <sup>23</sup> The indicator refers to use from any location in the last 12 months. The age scope of surveys is variable. Information on the age range for most countries can be found in the following tables or as a footnote to this table.
- <sup>24</sup> Panama. Individuals aged 15+.
- <sup>25</sup> Note that respondents could report use at multiple locations.
- <sup>26</sup> Refers to use at home.
- <sup>27</sup> Note that respondents could report multiple activities.
- <sup>28</sup> For dealing with government organizations/public authorities – the Eurostat variable refers to downloading official forms.
- <sup>29</sup> Communication refers to sending and receiving email.
- <sup>30</sup> It is possible that demographic differences between the genders account for a small part of the ‘gender gap’. In particular, in OECD countries, there are more women than men in older age groups, and older people are less likely to use the Internet.
- <sup>31</sup> There are age scope differences between countries. However, the scope is usually the same for a given country for different years. The exception is Australia where the age scope has changed slightly between years.
- <sup>32</sup> The number of countries included in EU15 ranges from 11 to 15, with generally lower numbers of countries in the earlier years.



## Chapter 4. Use of ICT by businesses

### 1. Introduction

91. The data presented in this chapter are based on the core indicators on business use of ICT. These are shown in Table 14 below and are defined in Annex 4. Statistics on business use of ICT are usually collected via a dedicated (stand-alone) business ICT survey or through a module of ICT questions in another business survey. Most OECD and European Union countries have been collecting business ICT use statistics for a number of years and most have dedicated surveys that are conducted annually. They adapt the model questionnaires recommended by the OECD and Eurostat, though it should be noted that these do not include questions covering all the core indicators on business use of ICT. Other economies are starting to collect business ICT use indicators, using the core indicators methodological recommendations (*Partnership, 2005c*) and/or those of the OECD (2007a) and Eurostat (2006 and 2007a).
92. This chapter includes data from the collections of Eurostat and UNCTAD. Eurostat collects ICT use data from its member states annually. It provides guidance in the form of a model survey and produces data that are very comparable. UNCTAD collects business use of ICT statistics from its member countries on an annual basis. It sends a questionnaire based on the core ICT business indicators (covering the use of ICT by businesses and the ICT sector) to NSOs worldwide (except those in Eurostat member states). For developing economies, in particular, UNCTAD provides a framework for data collection.<sup>1</sup>

**Table 14. Core indicators on business use of ICT**

<b>Basic core indicators</b>	
B1	Proportion of businesses using computers
B2	Proportion of employees using computers
B3	Proportion of businesses using the Internet
B4	Proportion of employees using the Internet
B5	Proportion of businesses with a web presence
B6	Proportion of businesses with an intranet
B7	Proportion of businesses receiving orders over the Internet
B8	Proportion of businesses placing orders over the Internet
<b>Extended core indicators</b>	
B9	Proportion of businesses using the Internet by type of access Narrowband access Broadband access See Annex 4 for detailed categories.
B10	Proportion of businesses with a local area network (LAN)
B11	Proportion of businesses with an extranet
B12	Proportion of businesses using the Internet by type of activity <sup>2</sup> Sending or receiving email Getting information about goods or services Getting information from government organizations/public authorities via websites or email Performing Internet banking or accessing other financial services Interacting with government organizations/public authorities Providing customer services Delivering products on line Other information searches or research activities

Source: Core ICT Indicators (*Partnership*, 2005c).

## 2. Measurement status

93. Table 15 shows the availability of the core business use indicators. Apart from OECD and European Union countries, data on use of ICT by businesses are not widely available. No data are available for the least developed economies.
94. The European Union provides the most comparable regional dataset on this topic, with a standardized survey across EU countries.<sup>3</sup> The wider membership of the OECD has a reasonably comparable set of statistics, though there are some differences in scope (industry and business size) and data collected. So far, few developing economies collect business ICT use statistics, but they are increasingly using the core list of indicators and the standards set by the *Partnership*. Recent measurement initiatives by economies of the Latin America and Caribbean region are described in Box 3 below.

**Table 15. Summary of global measurement status by level of development:<sup>4</sup> use of ICT by businesses<sup>5</sup>**

Indicator	Developed economies	Transition economies	Developing economies	Least developed economies	Total number of economies with each indicator
	Proportion of economies with each indicator				
B1	61%	37%	17%	0%	56
B2	57%	26%	8%	0%	42
B3	65%	42%	18%	0%	61
B4	57%	26%	9%	0%	43
B5	65%	47%	16%	0%	60
B6	59%	21%	12%	0%	47
B7	65%	26%	13%	0%	53
B8	65%	26%	13%	0%	53
B9	63%	21%	14%	0%	52
B10	55%	42%	10%	0%	47
B11	61%	21%	8%	0%	43
B12	61%	32%	14%	0%	53
Total economies	49	19	120	50	238

Source: UNCTAD and Eurostat (see Annex 1 for more detail).

### Box 3. Measurement initiatives in the Latin America and the Caribbean region

In the last three years, nine of the region's countries have incorporated at least one core ICT indicator in their business surveys. More than half of the nine countries collect all the core indicator data for business ICT use and the questions asked are reasonably comparable. However, differences in survey vehicles and scope between countries mean that there are comparability

issues in respect of survey output. The types of surveys generally used as vehicles for ICT use data are regular surveys of manufacturing, commercial or service firms; innovation and R&D surveys; or stand-alone ICT surveys. Many of the countries collect ICT use data annually, though others collect them less frequently or have only collected them as a one-off exercise.

Source: Olaya (2007).

### 3. Statistical summary

#### 3.1 Business ICT use statistics

95. Table 16 shows available data for the core indicators without sub-categories. The other indicators are shown in Table 17 and Chart 8 below and refer to Internet activities undertaken and the means of accessing the Internet, respectively.<sup>6</sup>
96. For the European Union countries comprising 'EU25',<sup>7</sup> data are shown as a single aggregate. Other countries are shown individually.
97. The data show a similar pattern as for households, that is, that businesses in developed economies are more likely to have a high level of ICT use. For most economies, the proportion of employees using a computer or the Internet is considerably smaller than the proportion of businesses that use a computer or the Internet. This indicates that within businesses with ICT, widespread use of ICT by employees has not been achieved by any economies. The situation is more marked for transition and developing economies.<sup>8</sup>

Table 16. Selected core indicators on use of ICT by businesses,<sup>9</sup> latest year available<sup>10</sup>

Level of development and region <sup>11</sup>	Proportion of businesses				Proportion of employees			Proportion of businesses using the Internet			
	Using computers (B1)	Using the Internet (B3)	With an intranet (B6)	With a LAN (B10)	With an extranet (B11)	Using computers (B2)	Using the Internet (B4)	With a web presence (B5)	Receiving orders via Internet (B7)	Placing orders via Internet (B8)	
<b>Developed economies</b>											
Asia		98%	90%	40%	60%			86%	16%	21%	
Europe		99%	94%	40%	50%	63%	34%	65%	16%	26%	
Europe		99%	97%	36%	50%	58%	46%	72%	7%	13%	
Europe		97%	94%	34%	16%	59%	50%	76%	25%	66%	
Europe		99%	98%	61%	80%	57%	48%	92%	23%	58%	
Europe		96%	93%	35%	70%	49%	37%	69%	15%	42%	
N. America		80%	71%	34%	17%	62%	37%	56%	14%	41%	
N. America		96%	87%					71%	13%	65%	
Oceania		96%			8%			52%	21%	55%	
Oceania		96%	22%	62%				63%	37%	60%	
<b>Transition economies</b>											
Asia		38%	9%	11%		9%	2%	33%			
Europe		84%	38%	41%				27%			
Europe		90%	75%	53%	4%	21%	15%	44%	5%	8%	
Europe		77%	58%	45%	19%	22%	16%	41%	4%	11%	
Europe		91%	53%	52%		30%	12%	28%	24%	31%	
<b>Developing economies</b>											
Africa		100%	53%	34%	79%	18%	10%	71%	35%	21%	
Africa		94%	87%	37%				46%	33%	35%	
Asia			47%	16%				24%	12%	10%	
Asia		95%	86%	21%	7%	43%	31%	50%	6%	21%	
Asia		88%	83%	29%	10%	58%	46%	52%	3%	22%	
Asia		76%	53%					26%	16%	21%	
Asia		84%	68%	38%				99%	51%	41%	
Asia		97%	96%	37%				59%	8%	34%	
Asia		93%	91%	74%	36%			75%	15%	34%	
Asia		88%	70%					51%	11%	14%	
Asia		88%	80%	39%	8%	41%	34%	60%			
LAC		100%	96%	47%	21%	40%	25%	74%	46%	45%	
LAC		99%	94%	39%	22%	48%	37%	50%	50%	52%	
LAC		60%	49%		3%			39%	4%	7%	
LAC		95%	71%	34%		59%	30%	24%	1%	4%	
LAC		90%	80%	28%	53%	32%	20%		39%	44%	

Source: UNCTAD and Eurostat (7 December 2007).



98. Table 17 below provides information on the functions for which businesses use the Internet. Unfortunately, the activities are not very comparable between countries.<sup>17</sup> However, some broad conclusions can be drawn.
99. Not surprisingly, use of the Internet for email and for finding information is generally high among Internet business users, irrespective of their country. Use of the Internet for providing customer services and delivering products on line is generally less common. The transaction-based activities of banking and transacting with government are generally higher among Internet users in developed economies, although there are some developing economies that also have a high level of these activities.

Table 17. Businesses<sup>9</sup> using the Internet by type of activity, proportion of Internet users, latest year available<sup>10</sup>

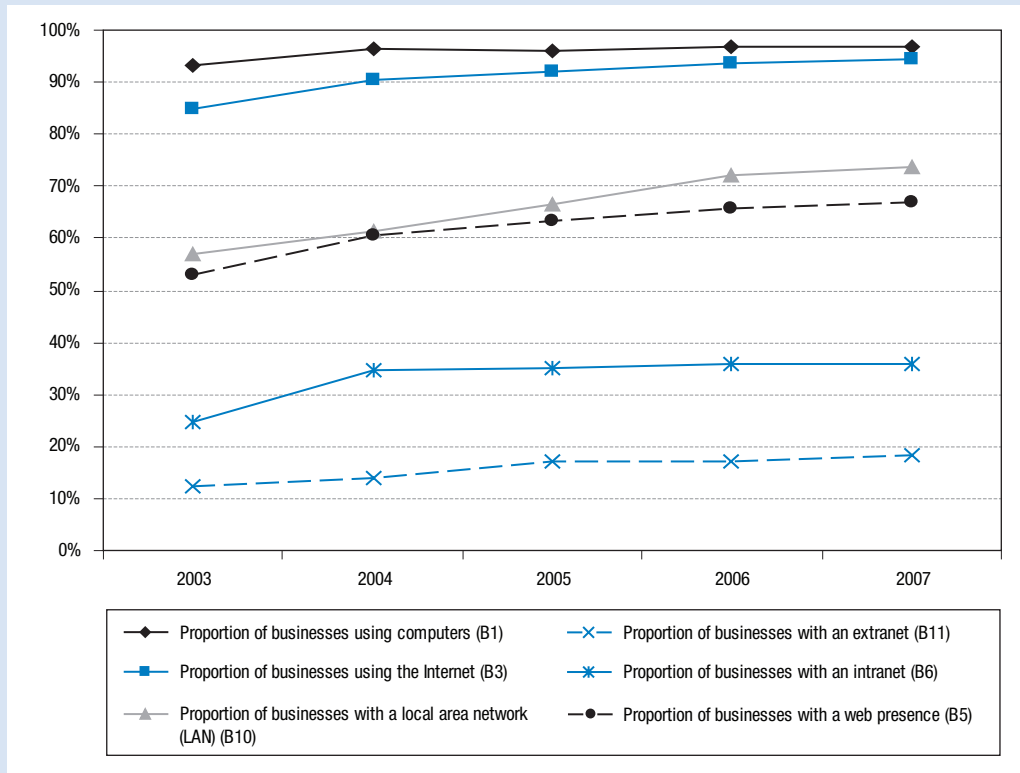
Level of development and region <sup>11</sup>	Economy <sup>12</sup>	Sending or receiving e-mail	Getting information about goods or services	Getting information from government	Other information searches or research	Internet banking or financial services	Transacting with public authorities	Providing customer services	Delivering products on line	Other types of activity
<b>Developed economies</b>										
Europe	France <sup>7</sup>					77%	66%			
Europe	Iceland	90%	87%			94%	65%			
Europe	Norway			55%		92%	74%			
Europe	Switzerland	98%		60%		85%	57%	21%	22%	
Europe	EU25 <sup>7, 18</sup>		59%			84%	60%	65%	8%	
N. America	Canada <sup>19</sup>	98%					50%			
Oceania	Australia						77%	30%		
Oceania	New Zealand <sup>20</sup>		68%			87%				
<b>Transition economies</b>										
Asia	Azerbaijan		26%			26%	26%			
Europe	Bulgaria		57%	47%		53%	61%			
Europe	Romania	94%	65%	65%		52%	10%	9%	4%	
Europe	Russian Federation <sup>21</sup>	92%	55%	43%		15%		5%	5%	
<b>Developing economies</b>										
Africa	Egypt	93%	59%		59%	27%	6%	36%		0%
Asia	China	80%	65%	46%	39%	57%	37%	35%	11%	
Asia	Cyprus <sup>14</sup>				67%	42%	44%			
Asia	Hong Kong SAR China <sup>22</sup>	97%	96%	73%	69%			23%	43%	53%
Asia	Macao SAR China	89%		20%				15%		4%
Asia	Rep. of Korea	89%	61%	54%	78%	67%	43%	35%	13%	2%
Asia	Singapore	93%	93%			64%			42%	
Asia	Thailand <sup>15</sup>	81%			65%	10%		24%	21%	14%
Asia	Turkey			56%		75%	63%	16%	38%	
LAC	Argentina <sup>16</sup>	97%	88%	75%	40%	84%	57%	43%	6%	55%
LAC	Brazil	98%	78%	59%	82%	80%	84%	31%	14%	
LAC	Chile	99%								
LAC	Panama	97%	81%	68%	61%	70%	36%	39%		70%

Source: UNCTAD and Eurostat (7 December 2007).

100. As is the case for household indicators, few time series of business ICT use data exist. The best examples are for the EU15 countries and selected series are shown

in Chart 7 below. It shows that use of computers, the Internet, LANs, extranets and intranets, and a web presence are leveling off.

**Chart 7. Change in business use of the Internet for selected indicators, EU15, proportion of all businesses with 10 or more employees<sup>23</sup>**

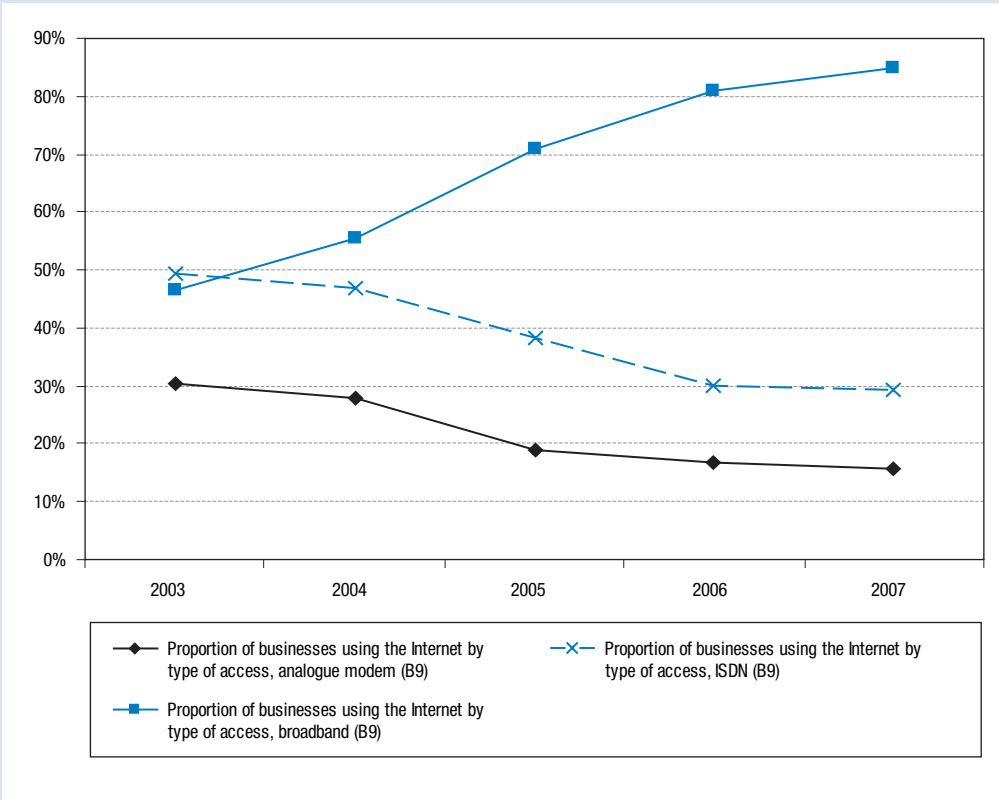


Source: Eurostat, 7 December 2007.

101. Chart 8 shows that EU15 businesses, like households, are increasingly using broadband to access the Internet, with a

big drop in access by dial-up (analogue modem) and ISDN over the period 2003 to 2007.

Chart 8. Change in how businesses access the Internet, EU15, proportion of Internet users<sup>24</sup>

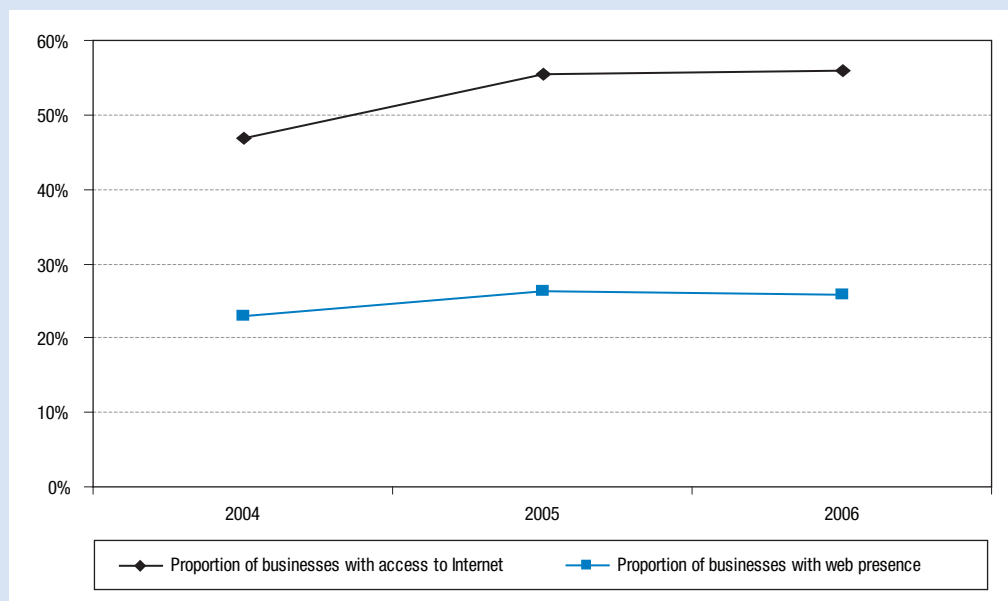


Source: Eurostat, 7 December 2007.

102. Some good time series data are available for other countries, especially those that are members of the OECD (for instance, Australia (ABS, 2007); Canada (Statistics

Canada, 2007) and Japan (MIC, 2006)). A small number of developing economies also have several years' worth of data, including Thailand (see Chart 9 below).

Chart 9. Internet use and web presence of Thai businesses, with 10 or more employees



Source: UNCTAD.

### 3.2 Regional analysis

103. The only region that is well represented in business ICT use statistics is Europe. Historically, this is because European countries were quick to influence and adopt OECD recommendations on measuring use of ICT by businesses. In addition, Eurostat member states are obliged to produce ICT use statistics annually per framework regulation 808/2004.<sup>25</sup> This ensures harmonised data for EU member states and will accelerate the production of ICT use statistics by other participating countries.

104. Other regions outside Europe, and excluding OECD member countries, have started to produce business ICT use statistics only fairly recently. At an UNCTAD expert meeting on measuring e-commerce in September 2003, the methodologies developed by WPIIS were first presented to a number of developing economy participants. At that time, hardly any developing economy was collecting business ICT use statistics. During the past five years, this number has increased to over 20 developing and transition economies. Given the slow pace implicit in the design and production of statistics generally, this is an impressive development and is expected to continue during the next few years. Most progress is being made in the Latin American and Caribbean region, strongly supported by UNECLAC (see Box 3).

## Notes

<sup>1</sup> The framework includes the publication *Manual for the Production of Statistics on the Information Economy*. The *Manual* includes a model questionnaire on business use of ICT plus other reference material.

- <sup>2</sup> Some categories have been slightly reworded, consistent with the UNCTAD Manual (UNCTAD, 2007a). The changes are minor and no changes to time series data are expected.
- <sup>3</sup> Eurostat, the statistical office of the European Communities also collects data from a small number of non EU countries, including Norway, Iceland and candidate countries. Data for those countries are not included in EU aggregates.
- <sup>4</sup> Annex 1 shows the economies which are included in each ‘level of development’ and ‘region’ category. The classification is based on the UN Statistical Division’s *Standard country or area codes for statistical use*, see <http://unstats.un.org/unsd/methods/m49/m49.htm>. The classification was revised in January 2008 and is now slightly different from the version used to aggregate data for this publication. The differences are detailed in Annex 1.
- <sup>5</sup> An indicator was considered to be *available* if UNCTAD or Eurostat received complete or partial data for it (including zero values) for the year 2002 or later. The total economy count includes countries from which UNCTAD does not collect data. See Annex 1 for details.
- <sup>6</sup> The means of accessing the Internet refers to the type of Internet access service used (ISDN, DSL etc). While quite a large number of countries collect this information, the definitions of response categories are variable (possibly reflecting the technical complexity of the response items). Therefore a table of data has not been included in this publication. However, Eurostat time series data showing the change in analogue modem, ISDN and broadband services over time have been included (Chart 8).
- <sup>7</sup> There are 27 countries in the European Union but two (Romania and Bulgaria) are classified as transition economies (for the purposes of this publication). The aggregate chosen for display here is therefore EU25, representing the remaining 25 EU countries. Note that Cyprus is included in the EU25 aggregation but is classified in this publication as a developing economy. Data for Cyprus are therefore also shown with those of other developing economies. France is not included in the EU25 aggregate so its data are shown separately. EU25 data are the aggregates for 2006 and were extracted from Eurostat’s database, version 7 December 2007. The scope of Eurostat EU25 data presented here is all (in scope) industries excluding the financial sector (NACE D,F,G,H,I,K,O) and businesses with 10 or more employees.
- <sup>8</sup> Indicators B2 and B4 are affected by industrial composition. For instance, an economy with a high proportion of manufacturing businesses is likely to have a lower level of employee ICT use.
- <sup>9</sup> Generally businesses with 10 or more employees. Exceptions, where known, are shown in endnotes.
- <sup>10</sup> *Latest year available* is generally 2005 or 2006. While data for 2007 are available for many EU countries, 2006 data have been used for EU25 because the 2006 aggregates include more EU countries than the 2007 aggregates. Data from 2002 or earlier have been excluded. See Annex 1 for details of data availability.
- <sup>11</sup> Some region names have been abbreviated to save space. Full names can be found in Annex 1.
- <sup>12</sup> Some economy names have been abbreviated to save space. Full names can be found in Annex 1.
- <sup>13</sup> Data refer to enterprises with 100 or more employees.
- <sup>14</sup> Cyprus is also included in the EU25 aggregate.
- <sup>15</sup> Data refer to enterprises with 16 or more employees.
- <sup>16</sup> Data refer only to the manufacturing sector.
- <sup>17</sup> Information on the categories for which countries collect data is not widely available, therefore it is possible that comparability is worse than indicated by the notes.
- <sup>18</sup> Providing customer services refers to the proportion of Internet users which use a website to do at least one of: marketing, facilitating access to catalogues and price lists, or providing after sales support. Transacting with public authorities refers to businesses using the Internet to obtain forms from government organizations/public authorities. Delivering products on line refers to Internet users which have a website facility to deliver digital products (2005 data).
- <sup>19</sup> Enterprises using the Internet for delivering products on line refer to enterprises delivering digitised products (via website or other Internet).
- <sup>20</sup> Enterprises using the Internet for providing customer services includes delivery of products on line and other types of activity.

- <sup>21</sup> Enterprises using the Internet for banking or accessing other financial services includes enterprises using the Internet to pay for supply products (procurement).
- <sup>22</sup> Enterprises using the Internet for getting information from Government organizations/public authorities include transactions with government authorities. Enterprises using the Internet for other types of activity include on-line purchase/ordering and sales of goods, services or information, software download and miscellaneous activities.
- <sup>23</sup> The number of countries included in EU15 is fewer for 2007 (between 10 and 12 countries); some component countries have a narrower industry scope for 2003 and/or 2004.
- <sup>24</sup> The number of countries included in EU15 is fewer for 2007 (12 countries); some component countries have a narrower industry scope for 2003 and/or 2004.
- <sup>25</sup> The regulation ensures harmonised data for EU member states and other participating EEA countries until 2010.





# Chapter 5. The ICT-producing sector and international trade in ICT goods

## 1. Introduction

105. The data presented in this chapter are based on the core ICT indicators for the ICT-producing sector (hereafter referred to as the ICT sector) and international trade in ICT goods. The indicators are shown in Table 18 below and are defined in Annex 5.
106. Statistics on the ICT sector are usually compiled from the output of sectoral surveys that collect employment, income and expense data for national accounts purposes. While some countries specifically survey the ICT sector, most use available industry statistics. Particular *ICT* characteristics of these statistics include the definition of the ICT sector (see Box 4 below) and definitions of the variables used in the core indicators.
107. The ICT sector definition used in this publication dates from 2002 and is based on ISIC Revision 3.1. A more recent version, based on ISIC Rev. 4 was released by the OECD in 2007 but given that it will be some time before most countries adopt ISIC Rev. 4, the 2002 version is likely to be in use for some years. More information on the 2007 version may be found in Annex 1b of OECD's *Guide to Measuring the Information Society* (2007a) and UNCTAD's *Manual for the Production of Statistics on the Information Economy* (2007a).
108. OECD and Eurostat compile ICT sector data based on the collections of their member countries. UNCTAD collects ICT sector core indicator data from its member countries. It sends an annual questionnaire, based on the core ICT business indicators (covering the use of ICT by businesses and the ICT sector), to NSOs worldwide, except those countries who are members of the European Statistical System. The United Nations Industrial Development Organization (UNIDO) compiles manufacturing industry statistics (including those relevant to the ICT manufacturing industries) for a number of countries.<sup>1</sup>
109. The core indicators on trade in ICT goods use administrative trade data collected by individual countries for customs purposes. The data are ultimately brought together by the United Nations Statistics Division (UNSD) in the United Nations

Commodity Trade Statistics Database (*UN COMTRADE*) (UNSD, 2007a). Particular *ICT* characteristics of these indicators include the definition of ICT goods, and sources and concepts relating to international trade statistics.

110. The definition of ICT goods associated with the core indicators on trade (ICT3 and

ICT4) is that agreed by OECD member countries in 2003. It is based on the Harmonized System classifications of 2002 and 1996, and can be found at Annex 6. It should be noted that the OECD is currently developing an ICT goods classification based on the Central Product Classification Version 2.

**Table 18. Core indicators for the ICT sector and trade in ICT goods**

ICT1	Proportion of total business sector workforce involved in the ICT sector (usually expressed as a percentage)
ICT2	Value added in the ICT sector (as a percentage of total business sector value added). (See Table 19 below for the valuation of value added.)
ICT3	ICT goods imports as a percentage of total imports
ICT4	ICT goods exports as a percentage of total exports

Source: Core ICT Indicators (*Partnership*, 2005c).

**Box 4. The 2002 OECD ICT sector definition (based on ISIC Rev. 3.1)**

<b>ICT Manufacturing</b>	
- 3000	Manufacture of office, accounting and computing machinery
- 3130	Manufacture of insulated wire and cable*
- 3210	Manufacture of electronic valves and tubes and other electronic components
- 3220	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
- 3230	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods
- 3312	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment*
- 3313	Manufacture of industrial process control equipment*
<b>ICT Services</b>	
- 5151	Wholesale of computers, computer peripheral equipment and software
- 5152	Wholesale of electronic and telecommunications parts and equipment
- 6420	Telecommunications
- 7123	Renting of office machinery and equipment (including computers)
- 72	Computer and related activities

\* Note that the activity of these classes is excluded from the OECD's 2007 definition of the ICT sector. Source: Guide to Measuring the Information Society 2007 (OECD, 2007a).

111. The concept, ‘value added’, is used in the indicator, ICT2, and is defined by the SNA 1993 as “the value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector; gross value added is the source from which the primary incomes of the SNA are generated and is therefore carried forward

into the primary distribution of income account.” (UNSD website). Note that the concept defined here and used in ICT2 is ‘gross value added’; ‘net value added’ is gross value added less the consumption of fixed capital. Value added can be calculated in various ways as shown in Table 19 below. Most countries appear to use value added at factor costs.

**Table 19. Valuation of value added**

Value added at factor costs	(1). These consist mostly of current taxes (and subsidies) on the labour or capital employed, such as payroll taxes or current taxes on vehicles and buildings.
+ other taxes, less subsidies, on production (1)	
= Value added at basic prices	
+ taxes less subsidies, on products (2) (not including imports and VAT)	(2). These consist of taxes (and subsidies) payable per unit of some good or service produced, such as turnover taxes and excise duties.
= Value added at producers’ prices	
+ taxes, less subsidies, on imports	
+ Trade and transport costs	
+ Non-deductible VAT (value added tax)	(3). Market prices are those that purchasers pay for the goods and services they acquire or use, excluding deductible VAT. The term is usually used in the context of aggregates such as GDP, whereas purchaser prices refer to the individual transactions.
= Value added at market prices (3)	

Source: Core ICT Indicators (*Partnership*, 2005c), based on concepts outlined in both the 1968 and 1993 versions of the System of National Accounts (SNA68 and SNA93).

## 2. Measurement status

### 2.1 The ICT sector

112. Table 20 below summarizes the global measurement status for ICT sector indicators by level of development. The table shows that the availability of indicators, ICT1 and ICT2, ranges from reasonable for developed economies (about two thirds produce ICT sector data) to very poor for the least developed economies (with no economies known to produce ICT sector data).
113. Compounding lack of data in this area, there are several issues concerning data comparability between countries. This is most marked for the definition of the ICT sector used by different economies but also affects the definition of the business sector, and the currency of available data.
114. The most likely explanation for both the lack of ICT sector data and poor comparability between countries is that the ICT sector includes several 4 digit level ISIC classes and many countries only collect industry data at the two digit level of detail.
115. Regarding the ICT sector definition, the major scope difference between countries is that UNIDO data refer only to ICT and total manufacturing, whereas data from UNCTAD refer to the whole ICT sector. Apart from that, the ICT sector is defined in different ways by countries, with most being broader than the definition specified for the core indicators (many countries can only provide approximate data for the ICT sector, often using broader level industry data instead of the narrower detail of the ICT sector definition). Even amongst European countries, there are significant differences in industry data available to compile statistics for the ICT sector. The endnotes to Table 22 below use available metadata to describe these limitations. However, for some countries, the metadata are limited, so do not sufficiently describe the statistics used for the core indicators.
116. Differences in the scope of the business sector include whether the financial sector is included or excluded (it is included by most but not all European countries). Other differences no doubt exist but are not generally well described by countries.
117. In addition, much of the data are relatively dated, with quite a large number of economies only having data available for 2003 or earlier and only a small number having data for 2006. Data from 2002 or earlier have not been included in this publication.
118. It is not known to what extent these differences affect data comparisons, although some conclusions are obvious, for instance:
- That countries will have higher values of the indicators if the scope of their ICT sector is broader than the OECD standard (for instance, it includes broader manufacturing or wholesaling industries categories);

- That countries will have higher values of the indicators if their ICT and business sector scope is restricted to more strongly performing industries (for instance, a restriction to manufacturing for economies that have strong manufacturing industries); and
  - That a narrower scope of the business sector (e.g. the exclusion of the financial sector by some European countries) will increase the value of ICT sector indicators (and vice versa).
119. It is hoped that the situation with regard to ICT sector measurement will improve in the future. In particular, the introduction of the 2007 definition of the ICT sector (based on ISIC Rev. 4) would simplify the ICT definition by narrowing it (see the note in Box 4). It may also provide an impetus for countries to re-develop their industry surveys and to introduce more detail in respect of the ICT sector.
120. It would be useful to review the ICT sector core indicators and, in particular, to consider whether the total business sector should be re-specified to better reflect data availability.
121. Initiatives by UNESCWA to enhance the availability of ICT sector data in the Western Asia and the Arab region are described in Box 5.

**Table 20. Summary of global measurement status by level of development:<sup>2</sup> ICT sector<sup>3</sup>**

Indicator	Developed economies	Transition economies	Developing economies	Least developed economies	Total number of economies with each indicator
	Proportion of economies with each indicator				
ICT1	67%	37%	15%	0%	58
ICT2	65%	16%	10%	0%	47
Total economies	49	19	120	50	238

Source: UNCTAD and UNIDO (see Annex 1 for more detail).

**Box 5. Measurement initiatives in the Western Asia and the Arab region**

While economies of the region are active in some areas of ICT measurement (for example, ICT expenditure and exports of ICT services), there is a need to increase efforts in developing and measuring the ICT sector, in order to attain regional development goals. UNESCWA plans to address the measurement gap by

initiating regional surveys for the collection of data on basic indicators related to ICT sector development. It will also provide technical assistance to national ICT statistics units with respect to sectoral data collection and analysis. These activities are expected to commence during 2008–2009.

## 2.2 Trade in ICT goods

122. Table 21 summarizes the global measurement status for trade in ICT goods indicators by level of development. Data

are widely available from country trade statistics, which are collected by the UNSD and published in their *UN COMTRADE* database.

**Table 21. Summary of global measurement status by level of development:<sup>2</sup> trade in ICT goods<sup>4</sup>**

Indicator	Developed economies	Transition economies	Developing economies	Least developed economies	Total number of economies with each indicator
	Proportion of economies with each indicator				
ICT3	73%	79%	71%	66%	169
ICT4	73%	79%	68%	62%	164
Total economies	49	19	120	50	238

Source: UN COMTRADE database (see Annex 1 for more detail).

### 3. Statistical summary

#### 3.1 The ICT sector

123. Table 22 presents data on the ICT sector for individual economies. The limitations on data comparability are discussed above and are detailed in the endnotes to the chapter.

124. Notwithstanding the significant comparability limitations that exist, two broad observations may be made:

- The value of ICT1 (proportion of total business sector workforce involved in the ICT sector) is almost invariably less

than the value of ICT2 (value added in the ICT sector as a percentage of total business sector value added), indicating that, compared with other industries, the ICT sector produces a relatively high level of output for the labour input required; and

- The ICT sector is strong for a number of developed and developing economies, but not as strong for the transition economies (with the exception of Romania). It is not possible to be more specific given the comparability limitations described above.

**Table 22. ICT sector core indicators, latest year available<sup>5</sup>**

Level of development <sup>2</sup>	Region <sup>2</sup>	Economy <sup>6</sup>	ICT1. Proportion of total business sector workforce involved in the ICT sector	ICT2. Value added in the ICT sector (as a percentage of total business sector value added)
Developed	Asia	Japan	7%	12%
Developed	Europe	Austria <sup>7</sup>	6%	9%
Developed	Europe	Belgium <sup>7</sup>	7%	11%
Developed	Europe	Croatia <sup>8</sup>	3%	
Developed	Europe	Czech Republic <sup>7</sup>	4%	9%
Developed	Europe	Denmark <sup>7</sup>	7%	8%
Developed	Europe	Finland <sup>7</sup>	10%	15%
Developed	Europe	France <sup>7</sup>	7%	11%
Developed	Europe	Germany <sup>7</sup>	5%	9%
Developed	Europe	Iceland	6%	7%
Developed	Europe	Ireland <sup>7</sup>	5%	6%
Developed	Europe	Italy <sup>7</sup>	5%	9%
Developed	Europe	Latvia <sup>9</sup>	3%	9%
Developed	Europe	Lithuania <sup>10</sup>	4%	9%
Developed	Europe	Luxembourg <sup>11</sup>	4%	9%

Level of development <sup>2</sup>	Region <sup>2</sup>	Economy <sup>6</sup>	ICT1. Proportion of total business sector workforce involved in the ICT sector	ICT2. Value added in the ICT sector (as a percentage of total business sector value added)
Developed	Europe	Netherlands <sup>7</sup>	6%	7%
Developed	Europe	Norway <sup>12</sup>	5%	12%
Developed	Europe	Poland <sup>13</sup>	2%	3%
Developed	Europe	Portugal <sup>7</sup>	3%	4%
Developed	Europe	Slovakia <sup>13</sup>	6%	10%
Developed	Europe	Slovenia <sup>14</sup>	3%	5%
Developed	Europe	Spain <sup>7</sup>	4%	8%
Developed	Europe	Sweden <sup>13</sup>	8%	12%
Developed	Europe	United Kingdom <sup>13</sup>	7%	12%
Developed	Northern America	Bermuda	3%	4%
Developed	Northern America	Canada <sup>15</sup>	4%	4%
Developed	Northern America	United States <sup>16</sup>	5%	9%
Developed	Oceania	Australia <sup>17</sup>	5%	10%
Developed	Oceania	New Zealand	3%	7%
Transition	Asia	Azerbaijan <sup>18</sup>	3%	
Transition	Asia	Kyrgyzstan <sup>19</sup>	2%	
Transition	Europe	Bulgaria <sup>20</sup>	1%	2%
Transition	Europe	Romania <sup>21</sup>	3%	10%
Transition	Europe	Russian Federation	4%	5%
Transition	Europe	Ukraine <sup>22</sup>	3%	
Developing	Africa	Egypt	6%	
Developing	Africa	Mauritius <sup>23</sup>	4%	7%
Developing	Africa	Morocco <sup>24</sup>	1%	2%
Developing	Africa	South Africa <sup>22</sup>	2%	
Developing	Asia	Cyprus <sup>14</sup>	3%	8%
Developing	Asia	Hong Kong SAR China <sup>25</sup>	4%	5%
Developing	Asia	India <sup>26</sup>	2%	4%
Developing	Asia	Indonesia <sup>27</sup>	3%	5%
Developing	Asia	Iran, Islamic Republic of <sup>28</sup>	3%	2%
Developing	Asia	Malaysia	6%	
Developing	Asia	Republic of Korea <sup>29</sup>	11%	20%
Developing	Asia	Singapore <sup>22</sup>	27%	33%
Developing	Asia	Thailand	3%	
Developing	Latin America and the Caribbean	Brazil <sup>30</sup>	2%	
Developing	Latin America and the Caribbean	Chile	1%	3%
Developing	Latin America and the Caribbean	Cuba	3%	5%
Developing	Latin America and the Caribbean	Panama <sup>31</sup>	3%	

Source: UNCTAD, UNIDO and OECD (which provided estimates for the United States).



### 3.2 Trade in ICT goods

125. Table 23 below presents 2006 data on trade in ICT goods, aggregated by level of development and region. In 2006, developing economies had the highest value of ICT3 (ICT goods imports as a percentage of total imports), at 22 per cent. Whilst developed economies had a lower proportion (12 per cent), their total value of ICT goods imports was the highest at 949 USDbillion. Least developed economies had the lowest value of ICT3 (3 per cent).
126. Developing economies had a much higher proportion of ICT goods exports to total exports (ICT4) than countries at other levels of development (23 per cent). In addition, the absolute value of ICT goods exports was highest for developing economies, at 942 USDbillion. The high values for developing economies reflect the domination of several Asian economies in ICT goods exporting, namely China, Hong Kong (SAR China), Malaysia and Singapore, which together contributed two thirds (67 per cent) of total ICT goods exports for developing economies.
127. Although it is not a core indicator, the ratio ‘Value of ICT goods exports as a percentage of value of ICT goods imports’ shows the ICT goods balance of trade. The ratio shows that Asian developing economies are net exporters (125 per cent) and that developed economies are marginal net importers (84 per cent). Transition and least developed economies have a large balance of trade deficit for ICT goods (at 14 and 5 per cent respectively).

**Table 23. ICT trade core indicators,<sup>32</sup> 2006**

Level of development and region <sup>2</sup>	ICT3. ICT goods imports as a percentage of total imports	ICT4. ICT goods exports as a percentage of total exports	ICT goods exports as a percentage of ICT goods imports
<b>Developed economies</b>	12%	11%	84%
Asia <sup>33</sup>	14%	19%	158%
Europe	11%	10%	89%
Northern America	14%	13%	59%
Oceania	12%	2%	14%
<b>Transition economies</b>	6%	1%	14%
Asia	5%	0.1%	2%
Europe	7%	1%	15%
<b>Developing economies</b>	22%	23%	117%
Africa	6%	1%	18%
Asia	24%	27%	125%
Latin America and the Caribbean	14%	9%	68%
Oceania	4%	0.1%	3%
<b>Least developed economies</b>	3%	0.2%	5%
Africa	5%	0.4%	5%
Asia	1%	na	3%
Latin America and the Caribbean <sup>33</sup>	na	na	na
Oceania	na	na	na
<b>Total world</b>	15%	15%	98%

Source: UN COMTRADE database, February 2008.

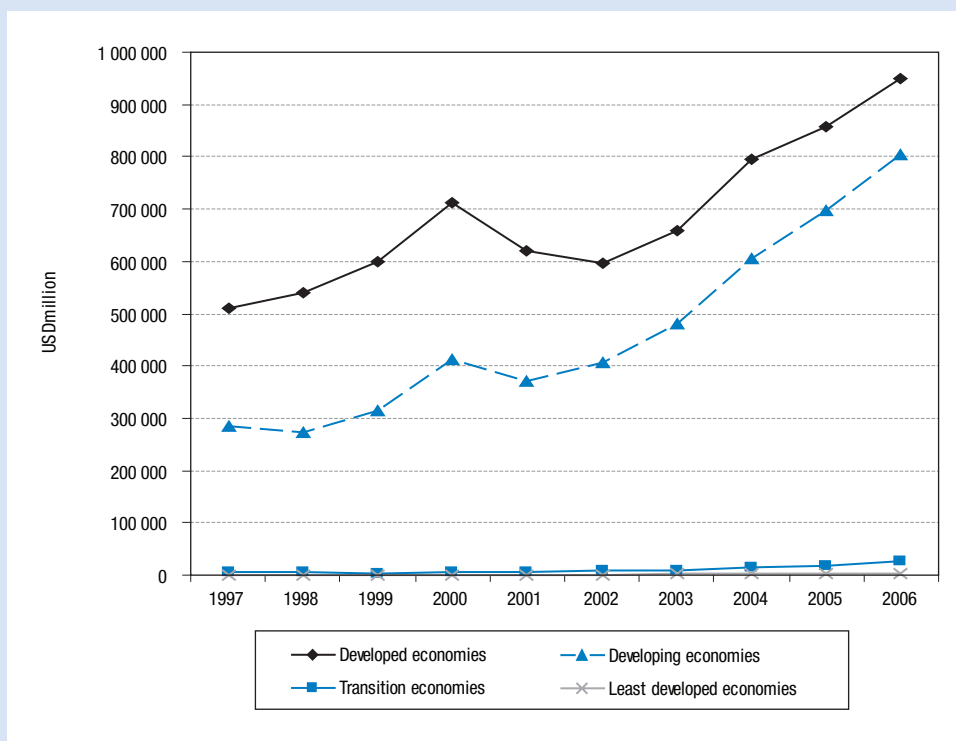
128. Charts 10 and 11 present a ten-year time series of ICT trade data from the year 1997 to 2006. Chart 10 reveals a significant rise over the period in the value of ICT imports for all levels of development. The rise was not steady, being interrupted for a short time after 2000. While the rise for transition and least developed economies was also very high, the 2006 values are still low relative to other levels.

129. Chart 11 shows that the increase in the value of ICT exports has risen very quickly since 2001. In terms of value, the developing economies overtook the

developed economies in 2004. As with ICT imports, the year 2000 was a peak year and values dropped in the following year for all levels of development except for the transition economies, where the value rose slightly.

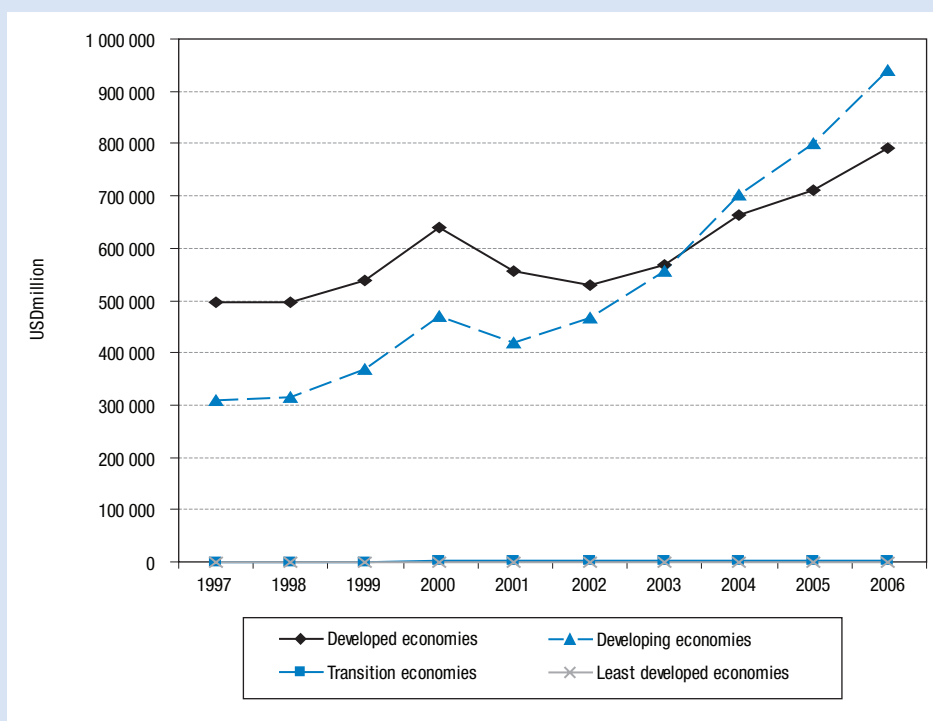
130. Among developing economies, China accounted for nearly half (44 per cent) of the change in the value of ICT goods exports over the period, 1997 to 2006. China also dominated the growth in ICT exports globally, accounting for just under a third (30 per cent) of total growth in value between 1997 and 2006.

Chart 10. ICT goods imports, 1997 to 2006



Source: UN COMTRADE database, February 2008.

Chart 11. ICT goods exports, 1997 to 2006



Source: UN COMTRADE database, February 2008.

### 3.3 Regional analysis

#### 3.3.1 The ICT sector

131. As discussed earlier in this chapter, ICT sector data have various limitations in terms of international comparability. Nevertheless, data in Table 22 do not show particular regional patterns. Instead, individual countries in Asia and Europe have relatively high values of the core indicators, with small values more evenly spread. Of particular note, with high values, are Finland in Europe and the Republic of Korea and Singapore in Asia. Many countries with small values of ICT1 have

relatively high values for ICT2, indicating that their ICT industries are more labour-intensive than those of other countries. Plans for measuring the ICT sector in the Western Asia and the Arab region are described in Box 5.

#### 3.3.2 Trade in ICT goods

132. Table 23 presents regional data on trade in ICT goods. The developing economies of Asia had the highest levels of both ICT3 and ICT4 (24 and 27 per cent respectively). Values for Africa and the developing economies of Oceania were low for both indicators, but particularly for ICT4.

## Notes

- <sup>1</sup> UNIDO's *INDSTAT4* (2007) database contains time series data for 113 countries. Data from non-OECD countries are collected from NSOs by UNIDO (and data from OECD member countries are collected by OECD and provided to UNIDO). All data are supplemented by estimates generated by UNIDO (UNIDO, 2007).
- <sup>2</sup> Annex 1 shows the economies which are included in each 'level of development' and 'region' category. The classification is based on the UN Statistical Division's *Standard country or area codes for statistical use*, see <http://unstats.un.org/unsd/methods/m49/m49.htm>. The classification was revised in January 2008 and is now slightly different from the version used to aggregate data for this publication. The differences are detailed in Annex 1.
- <sup>3</sup> An indicator was considered to be *available* if UNCTAD or UNIDO received complete or partial data for it (including zero values) for the year 2002 or later. The total economy count includes countries from which UNCTAD and UNIDO do not collect data. See Annex 1 for details.
- <sup>4</sup> An indicator was considered to be *available* if data were available from the *UN COMTRADE* database at the time of extraction (September 2007 with an update on 22 February 2008 for 2005 and 2006 data). See Annex 1 for details.
- <sup>5</sup> *Latest year available* is generally 2004 or 2005. Data from 2002 or earlier have been excluded. See Annex 1 for details.
- <sup>6</sup> Some economy names have been abbreviated to save space. Full names can be found in Annex 1.
- <sup>7</sup> The ICT sector is the sum of NACE Rev.1.1 categories, D30, D313, D321, D322, D323, D3320, D3330, G518, I642, K7133, K72. The total business sector is the sum of NACE categories, C, D, E, F, G, H, I, J 6512\_652, J 6601, J 66021, J 6603, J 6605, K 71-74. Data were extracted from the Eurostat on-line database in August 2007. Value added is at factor cost.
- <sup>8</sup> Manufacturing sector only, number of employees is as of 31 March of the reference year.
- <sup>9</sup> The total business sector consists of NACE Rev. 1.1 C,D,E,F,G,H,I,K except 70.
- <sup>10</sup> The ICT sector is the sum of available NACE classifications (NACE rev.1.1 D 30-33, G 51, I 64, K 71, K 72). The total business sector is the sum of the available NACE classifications (NACE rev.1.1 C, D, E, F, G, H, I, J 6512\_652, J 6601, J 66021, J 6603, J 6605, K 71-74). Data were extracted from the Eurostat on-line database in August 2007. Value added is at factor cost.
- <sup>11</sup> The ICT sector is the sum of NACE Rev.1.1 categories, D30, D313, D321, D322, D323, D3320, D3330, G5184, I642, K7133, K72. The total business sector is the sum of NACE categories, C, D, E, F, G, H, I, J 6512\_652, J 6601, J 66021, J 6603, J 6605, K 71-74. Data were extracted from the Eurostat on-line database in August 2007. Value added is at factor cost.
- <sup>12</sup> The ICT sector is the sum of NACE Rev.1.1 categories, D 30-33, G 5184, G 5186, I 64, K 71, K 72. The total business sector is the sum of NACE categories, C, D, E, F, G, H, I, J 6512\_652, J 6601, J 66021, J 6603, J 6605, K 71-74. Data were extracted from the Eurostat on-line database in August 2007. Value added is at factor cost.
- <sup>13</sup> The ICT sector is the sum of NACE Rev 1.1 categories, D30, D313, D321, D322, D323, D3320, D3330, G518, I642, K7133, K72. The total business sector is the sum of NACE categories, C, D, E, F, G, H, I, K 71-74, i.e. excluding J65-67 (financial intermediation). Data were extracted from the Eurostat on-line database in August 2007. Value added is at factor cost.
- <sup>14</sup> The ICT sector is the sum of NACE Rev 1.1 categories, D 30-33, G 518, I 642, K 713, K 72. The total business sector is the sum of NACE categories, C, D, E, F, G, H, I, J 6512\_652, J 6601, J 66021, J 6603, J 6605, K 71-74. Data were extracted from the Eurostat on-line database in August 2007. Value added is at factor cost.
- <sup>15</sup> The ICT sector workforce does not include the following industries: ISIC 7123; ISIC 7240; parts of ISIC 7250. Data were either not available or not suitable for release due to confidentiality. The total business sector workforce includes employee jobs and self-employed jobs.
- <sup>16</sup> OECD estimate. Total business sector excludes agriculture, fishing etc, real estate and non-market services.
- <sup>17</sup> The ICT sector workforce estimate has a relative standard error of 10% to less than 25% and should be used with caution. The ICT sector excludes ISIC classes 3230, 3313 and 7123.

- <sup>18</sup> Manufacturing sector only. The data presented in ISIC (Rev. 3) were originally classified according to NACE (Rev. 1).
- <sup>19</sup> Manufacturing sector only, data collected under the national classification system have been reclassified by the national authorities to correspond with ISIC (Rev. 3). Employees are the number of people engaged.
- <sup>20</sup> Manufacturing sector only, excludes classes 3312 and 3313. Data were converted from NACE (Rev. 2.2) to ISIC (Rev. 3). Value added is at producers' prices.
- <sup>21</sup> The total business sector is the sum of NACE Rev 1.1 categories, C, D, E, F, G, H, I, J 6512\_652, J 6601, J 66021, J 6603, J 6605, K 71-74. Data were extracted from the Eurostat on-line database in August 2007.
- <sup>22</sup> Manufacturing sector only.
- <sup>23</sup> The ICT sector excludes G5151 but includes G5239 – Other retail sale in specialized stores (not part of the ICT sector) and K7499 – Other business activities, n.e.c. The figure for the total ICT sector workforce is provisional. The total ICT sector workforce includes NSIC 80220 part (technical and vocational institutions providing training courses in IT only). The total business sector includes NSIC K74999 (other business activities, n.e.c. call-centres only), NSIC G52396 (retail trade, dealer in computer equipment), and M80220 part (technical and vocational institutions providing training courses in IT only).
- <sup>24</sup> Manufacturing sector only, excludes class 3313. The scope is enterprises with 10 or more employees or a turnover of more than 100,000 dirhams per year. Data collected under the national classification system have been reclassified by UNIDO to correspond with ISIC (Rev. 3). Value added is at factor cost.
- <sup>25</sup> The coverage of the business sector used in the statistics largely follows the OECD's definition, except that 'maintenance and repair of motor vehicles and motorcycles' is not included due to the lack of detailed data. In other words, the business sector covers mining and quarrying; manufacturing; electricity, gas and water; construction; wholesales, retail, import/export trades, restaurants, hotels; transport, storage and communications; financing, insurance and business services.
- <sup>26</sup> Manufacturing sector only. Data were originally classified according to the National Industry Classification (1998) which is fully compatible with ISIC (Rev. 3). Employees equal to persons engaged. Value added is at producers' prices.
- <sup>27</sup> Manufacturing sector only, excludes class 3313. Value added is at factor cost.
- <sup>28</sup> Manufacturing sector only. Value added in producers' prices.
- <sup>29</sup> For the ICT sector, ISIC G5151 refers to ISIC G515 (3-digit level), and K7210 refers to ISIC K72 (2-digit level).
- <sup>30</sup> There are no official data for the business sector workforce. While the data on the ICT sector workforce comes from RAIS, the figure for the total business sector workforce comes from the IBGE's "Estatísticas do Cadastro Central de Empresas 2004".
- <sup>31</sup> ICT sector workforce figures are provisional.
- <sup>32</sup> A note on the presentation of values in this table: the term 'na' means not available, that is, there are insufficient data to produce a meaningful aggregation or no data are available. All values which are less than 1 have been shown to 1 decimal place.
- <sup>33</sup> This category consists of one country only.



# Chapter 6. ICT in education

## 1. Introduction

133. Following the first phase of the World Summit on the Information Society, in 2003, the UNESCO Institute for Statistics (UIS) joined other stakeholders involved in ICT measurement to form the Partnership on Measuring ICT for Development. UIS' current role in the *Partnership* is to lead the Task Group on Education, the brief of which is to develop a plan to collect a core set of indicators on the role of ICT in education.
134. Through various initiatives and fora,<sup>1</sup> a high priority has been placed on the improvement of education in all countries, with particular emphasis on the most marginalized groups (including girls and women, youth and least developed economies). In support of the WSIS Plan of Action, in 2000, UNESCO created the Information for All Programme (IFAP) that enables Governments to “harness the new opportunities of the information age to create equitable societies through better access to information” (UNESCO, 2007).

### Box 6. International imperatives for education and ICT policy

#### UN Millennium Development Goals

Goal 2 Achieve universal primary education. TARGET Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.

Goal 8 Develop a global partnership for development. TARGET In cooperation with the private sector, make available the benefits of new technologies, especially information and communications.

#### WSIS Geneva 2003 *Declaration of Principles* “Our Common Vision of the Information Society”

2. Our challenge is to harness the potential of information and communication technology to promote the development goals of the Millennium Declaration, namely the eradication of extreme poverty and hunger; achievement of universal primary education; ....

**WSIS Geneva 2003 Plan of Action “Objectives, goals and targets”**

- B6b to connect universities, colleges, secondary schools and primary schools with ICTs.
- B6c to connect scientific and research centres with ICTs.
- B6g to adapt all primary and secondary school curricula to meet the challenges of the Information Society, taking into account national circumstances.

**WSIS Geneva 2003 Plan of Action “Capacity building”**

C4,11 Everyone should have the necessary skills to benefit fully from the Information Society. Therefore, capacity building and ICT literacy are essential. ICTs can contribute to achieving universal education worldwide,

Source: The UN Millennium Development Goals (UN, 2007), WSIS Outcome Documents: Geneva 2003 – Tunis 2005 (ITU, 2005).

through delivery of education and training of teachers, and offering improved conditions for lifelong learning, encompassing people that are outside the formal education process, and improving professional skills.

**WSIS Tunis Commitment 2005**

11. Furthermore, ICTs are making it possible for a vastly larger population than at any time in the past to join in sharing and expanding the base of human knowledge, and contributing to its further growth in all spheres of human endeavour as well as its application to education, health and science. ICTs have enormous potential to expand access to quality education, to boost literacy and universal primary education, and to facilitate the learning process itself, thus laying the groundwork for the establishment of a fully inclusive and development-oriented Information Society and knowledge economy which respect cultural and linguistic diversity.

135. UIS work towards the identification of a set of comparable indicators on ICT in education has been informed by a range of international surveys that assess the educational achievements of students, with some components related to ICT, for instance, ICT use by students. The surveys include:

- Latin American Laboratory for the Assessment of Quality in Education (LABORATORIO 1997);
- Monitoring Learning Achievement (MLA 1992-2003);
- Programme d’Analyse des Systèmes Educatifs des pays de la CONFEMEN (PASEC 1993-1998);
- Programme for International Student Assessment (PISA 2003);
- Progress in International Reading Literacy Study (PIRLS 2001);
- Second Information Technology in Education Study (SITES-M1 1997-1999, SITES-M2 1999-2002, SITES-M3 2006);
- Southern and East Africa Consortium for Monitoring Educational Quality (SACMEQ 2000-2003);

- Trends in International Mathematics and Science Study (TIMSS 2003);
- World Education Indicators – Survey of Primary Schools (WEI-SPS 2004); and
- UNESCO Bangkok: Asia-Pacific Regional Survey (UAPRS 2004).

136. The surveys vary in their approach and content, for instance, reference periods, target populations, country coverage, survey methodology and data collected. Some surveys focus on monitoring the presence of ICT in schools, while others deal with other aspects of formal education. This diversity clearly presents challenges for comparison of results. Despite this, the surveys do present some useful data on ICT in education.

137. As a member of the *Partnership*, UIS has been working on the development of a core set of ‘ICT in education’ indicators through consultations with countries at regional workshops. These meetings have presented opportunities for discussion and endorsement of the core set of education indicators proposed by UIS at the WSIS in Tunis 2005. The proposed set of education indicators (see Table 24) is being considered



for addition to the agreed core list of ICT indicators. It is likely that a decision will be made at the *Global Event on Measuring the Information Society* organized by the *Partnership* from 27-29 May 2008.

138. In parallel with this work, UIS has undertaken a world-wide scoping study to collect evidence of countries' preparedness to supply comparable data for the proposed education indicators. Further consultations

with countries and partners are anticipated in order to determine the scope of a more substantive survey. The views of countries and partners will be sought to determine the most effective approach to such a data collection exercise. The lessons learnt from the pilot survey and country consultations are also intended to help UIS to devise capacity-building priorities for consideration by countries.

**Table 24. Core indicators for ICT in education proposed by UIS**

<b>Basic core indicators</b>	
ED1	Percentage of schools with electricity (by ISCED <sup>2</sup> level 1 to 3)
ED2	Percentage of schools with a radio set used for educational purposes (by ISCED level 0 to 4)
ED3	Percentage of schools with a television set used for educational purposes (by ISCED level 0 to 4)
ED4	Student to computer ratio (by ISCED level 0 to 4)
ED5	Percentage of schools with basic telecommunication infrastructure or telephone access (by ISCED level 1 to 3)
ED6	Percentage of schools with an Internet connection (by ISCED level 1 to 3)
ED7	Percentage of students who use the Internet at school (by ISCED level 0 to 4) <sup>3</sup>
<b>Extended core indicators</b>	
ED8	Percentage of students enrolled by gender at the tertiary level in an ICT-related field (ISCED level 5 to 6)
ED9	Percentage of ICT-qualified teachers in primary and secondary schools (of the total number of teachers) <sup>3</sup>

Source: UIS.

## 2. Measurement status

139. In late 2006, UIS undertook the scoping study referred to above. Its primary goal was to assess data holdings by countries in the area of ICT in education in order to evaluate the potential for comparable measurement of the proposed core set of indicators shown in Table 24.
140. In total, 209 countries were sent a questionnaire seeking data on the following topics:
- ICT or related resources in schools/ institutions (availability of electricity, telephone line, radio, television, Internet or satellite connectivity, computers and their dedicated use as teaching and learning support tools);
  - Time allocated to ICT classes;
  - Teachers trained for ICT and those on ICT teaching assignments;
  - Tertiary institutions students in e-learning courses or in ICT-related fields of study; and
  - Expenditures on ICT in education.
141. The scoping study questionnaire was sent to the same country contacts who complete the annual UIS education questionnaire. In most cases, these contacts are located in the statistics units of ministries of education. For various reasons, UIS experienced delays in country response and questionnaires are still being received. As of February 2008, the overall response rate was 46 per cent (97 respondents out of 209 countries, including 14 ‘nil returns’).
142. Information from the scoping study on data availability for the core list of ICT in education indicators is shown in Table 25 below. It indicates that ED1, ED4, ED5 and ED6 are likely to be the most available indicators. It should be noted that, for over half the countries of the world, it is not known whether any of the indicators are available. The availability indicated in Table 25 is therefore highly likely to understate the true availability of the indicators.

**Table 25. Summary of global measurement status by level of development:<sup>4</sup>  
ICT in education<sup>5</sup>**

Indicator	Developed economies	Transition economies	Developing economies	Least developed economies	Total number of economies with each indicator
	Proportion of economies with each indicator <sup>6</sup>				
ED1	41%	21%	32%	14%	69
ED2	10%	5%	13%	6%	25
ED3	8%	11%	20%	6%	33
ED4	24%	21%	28%	4%	51
ED5	39%	21%	31%	6%	63
ED6	31%	16%	32%	2%	57
ED7	22%	16%	23%	2%	43
ED8	33%	5%	16%	8%	40
ED9	10%	21%	28%	2%	44
Total economies	49	19	120	50	238

Source: UIS.

143. The results are not sufficiently conclusive for UIS to feel strongly optimistic or pessimistic regarding the potential for a worldwide collection of the core set of indicators on ICT in education. The key unknown is the situation for non-responding countries. Some reasons that countries could lack ICT in education data include:
- ICT in/for education is not prominent in the country's public policy agenda;
  - The application of ICT to education is limited to a small number of public or private schools/institutions;
  - Use of ICT in education is restricted to vocational, post-secondary and tertiary education institutions;
  - Attempts to collect ICT in education data have proven problematic because of gaps in countries' capacities; and/or
  - The UIS contact institution is not the mandated entity for national collection of ICT in education statistics (UIS attempted to test this assumption, but with only partial success).
144. Despite the modest response rate, the sample of respondent countries provides a useful basis for re-engineering the UIS surveys on ICT in education. The replies indicate that a more tailored questionnaire approach might be feasible, based on groups of countries with homogeneous capacities and similar policy concerns. Some commonalities could be retained for the sake of ensuring international comparability for a minimum core set of indicators.

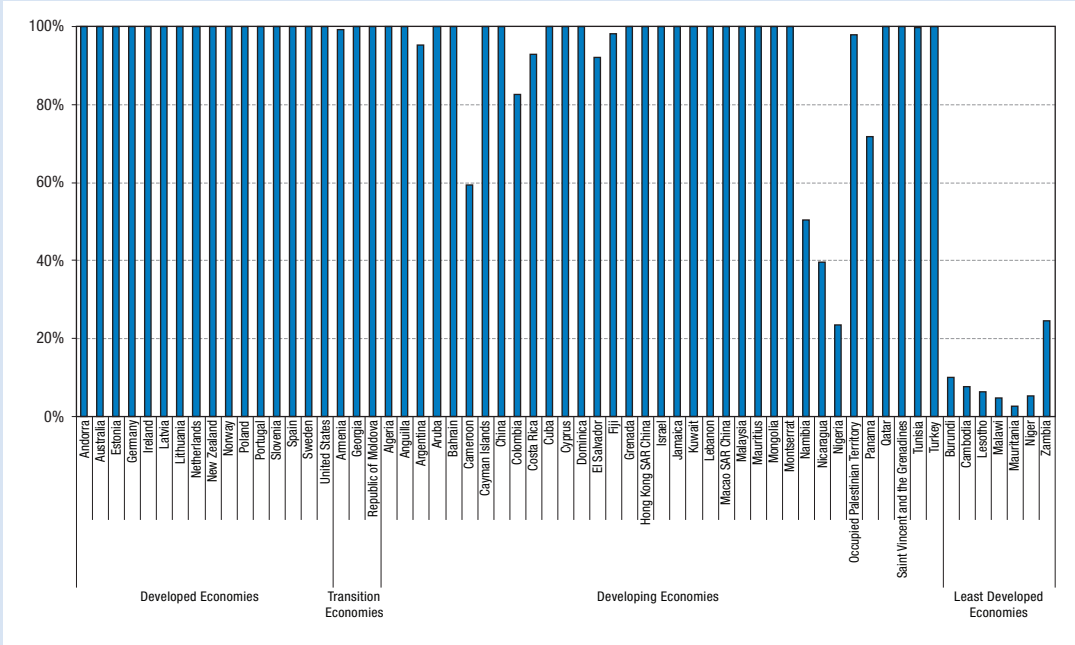
### 3. Statistical summary

145. An analysis of trends would be premature on the basis of the data on the core indicators calculated from the UIS scoping study as it is a first time exercise that did not aim to collect time series data. Moreover, many of the data points were requested more for the purpose of assessing or making value judgments on the potential availability of core indicator data rather than as a data collection exercise *per se*. However, with

this caveat in mind, some provisional data are presented in the charts below.

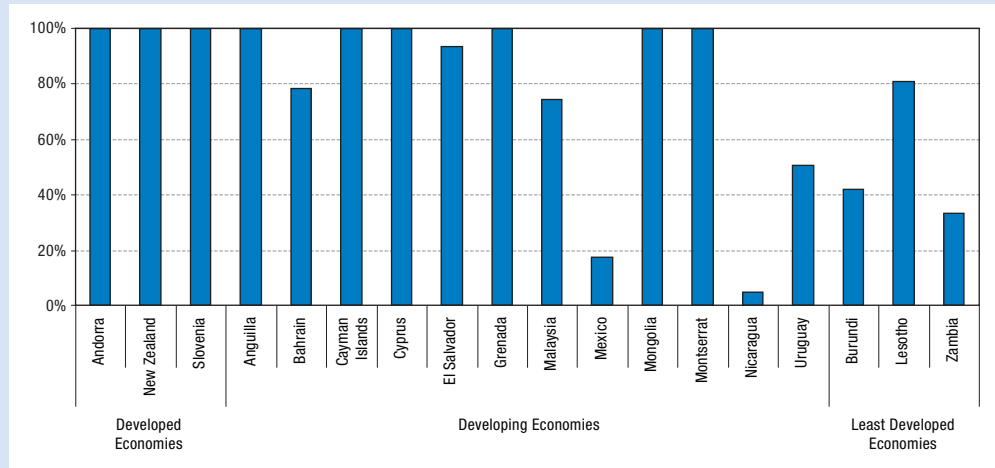
146. Data are shown by level of development and indicate low levels of basic infrastructure for some developing and least developed economies. Some developing economies are relatively advanced, especially with regard to tertiary level enrolments in ICT studies.

Chart 12. Percentage of schools with electricity, latest year available



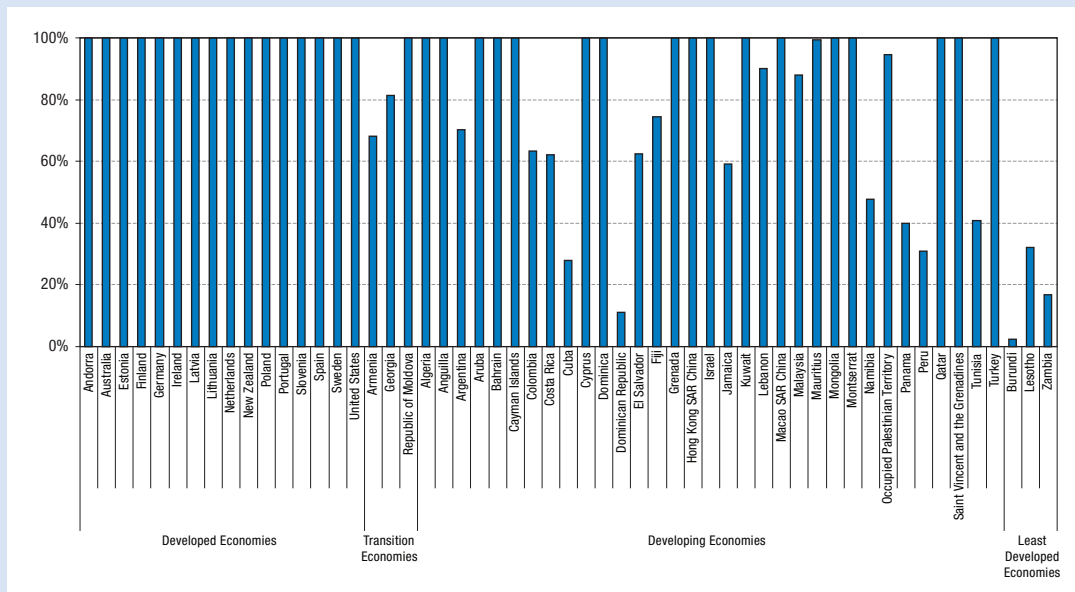
Source: UIS.

Chart 13. Percentage of schools with a radio for educational purposes, latest year available



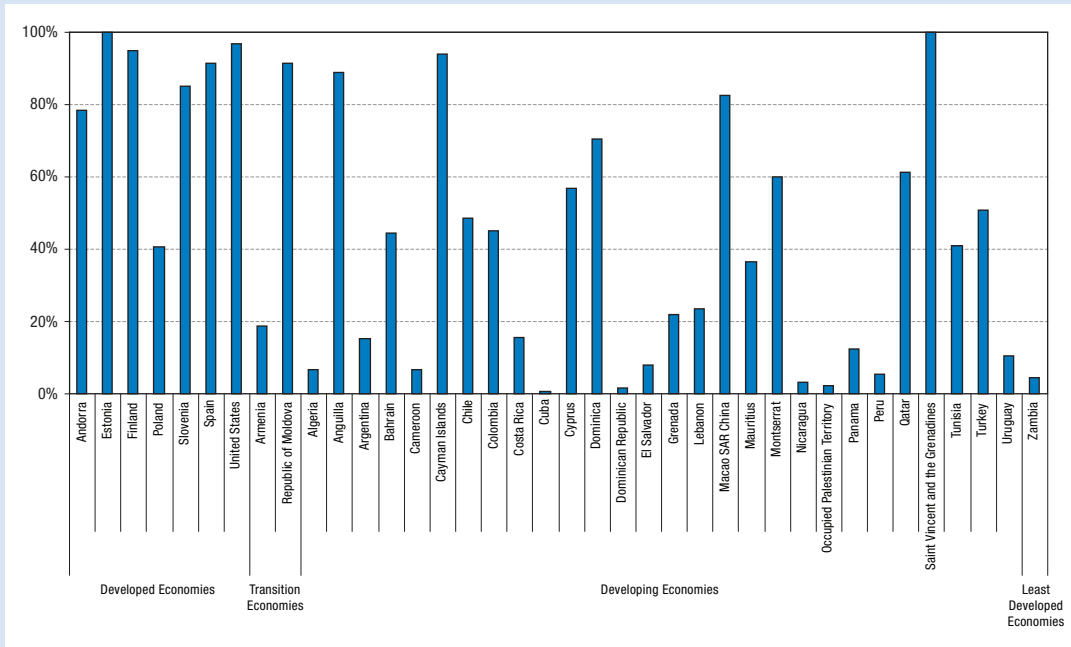
Source: UIS.

Chart 14. Percentage of schools with a telephone, latest year available



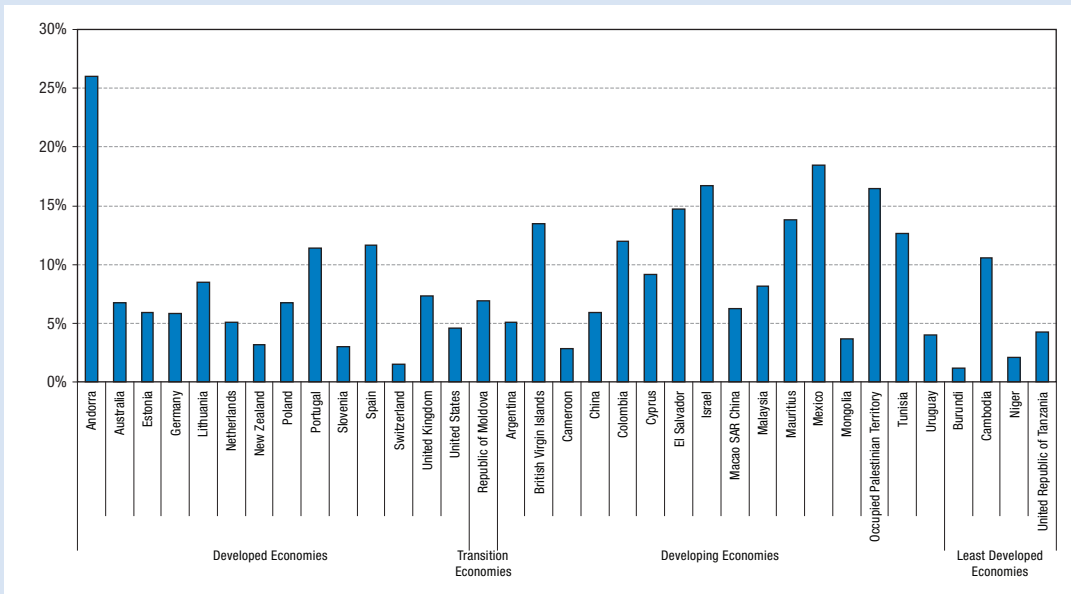
Source: UIS.

Chart 15. Percentage of schools with an Internet connection,<sup>7</sup> latest year available



Source: UIS.

Chart 16. Percentage of students enrolled at the tertiary level in an ICT-related field, latest year available



Source: UIS.

## 4. Regional activities

147. UIS is continuing to explore the availability of data for the proposed core indicators through regional meetings. In February 2007, an expert group meeting on indicators on the use of ICT in education and e-government was jointly organized by UNESCWA and UIS in Cairo. A consultative workshop was held in December 2007 in Addis Ababa, in cooperation with UNECA. The workshop's objectives were to:
- Include African countries in the process of adoption of the UIS proposed core set of indicators on ICT in education;
  - Present and review the scoping survey results in order to analyse challenges faced by countries and to seek views on the most effective strategy for expanding data collection activities on ICT in education; and
  - Discuss the feasibility of developing a broader range of ICT in education indicators adapted to national and regional needs and based on the programme of work carried out by the UNESCO Bangkok office (which has developed a manual on collecting ICT in education indicators).
148. UIS regional advisors from Asia as well as key country representatives from the Middle East and North Africa took part in the workshop, which led to the following conclusions:
- The UIS-proposed core indicators on ICT in education were adopted.
- Participants strongly recommended that UIS produce detailed definitions of the variables to be collected by countries in order to ensure consistent national data and international comparability.
- The main challenge facing national data collection efforts in this area is that the introduction of ICT in education in many regions is at an early stage, thus confirming UIS views that it would be premature to collect the proposed indicators for all countries in the next survey on ICT in education.
  - The formation of an international working group of countries committed to collecting data for measuring ICT in education was endorsed by workshop participants. UIS was invited to develop terms of reference for the selection of candidate countries. Country discussions during the UIS education regional workshops of 2008 will be held to identify candidates for the international Working group on ICT Statistics in Education (WISE).
149. Wishing to maintain momentum generated by the scoping study, workshop participants strongly supported the idea that UIS pursue efforts under the *Partnership* to encourage capacity-building for data collection on ICT in education. In particular, UIS will support regional initiatives by the UN commissions aimed at capacity-building in this area.
150. Possible follow-up action for the international working group includes:

- Development of a prototype statistical instrument, standard definitions, a user manual, and indicator guidelines in conjunction with members of the *Partnership*. Participants would include UNESCO Bangkok, and leading experts on ICT in education from Latin America and the Caribbean, Arab States and Africa; and
- The launch, in 2009, of an initial round of surveys in respect of working group member countries.

## Notes

- <sup>1</sup> Including the Millennium Development Goals (UN, 2007), the Education for All Goals (UNESCO, 2007) and the World Summit for the Information Society (WSIS, Geneva 2003 and Tunis 2005).
- <sup>2</sup> ISCED is the International Standard Classification of Education. The levels are: ISCED 0 – Pre-primary education; ISCED 1 – Primary education; ISCED 2 – Lower Secondary Education; ISCED 3 – Upper secondary education; ISCED 4 – Post-secondary non tertiary education (programmes that lie between the upper-secondary and tertiary levels of education); ISCED 5 – First stage of tertiary education, and ISCED 6 – Second stage of tertiary education.
- <sup>3</sup> The values of ED7 and ED9 are proxies, that is, the values displayed are not the true values of these indicators but are estimated from other data.
- <sup>4</sup> Annex 1 shows the economies which are included in each ‘level of development’ and ‘region’ category. The classification is based on the UN Statistical Division’s *Standard country or area codes for statistical use*, see <http://unstats.un.org/unsd/methods/m49/m49.htm>. The classification was revised in January 2008 and is now slightly different from the version used to aggregate data for this publication. The differences are detailed in Annex 1.
- <sup>5</sup> Available or partially available. The total economy count includes countries from which UIS does not collect data.
- <sup>6</sup> The situation is unknown for 141 countries (out of 238). The percentages shown here are therefore likely to understate the availability of indicators.
- <sup>7</sup> The data item for all countries was either: percentage of schools with a dial up connection only or percentage of schools with a broadband connection only.



# Chapter 7. Measuring the impact of ICT

## 1. Introduction

151. Assessing the impact of ICT on economies and societies is critical to national and international ICT policymaking. Much of the interest in developing an ICT industry, or promoting use of ICT by businesses and individuals, has been based on the potential of ICT to improve productivity and economic growth, and provide social benefits.
152. This chapter outlines recent work in this area and provides some suggestions for statistical agencies to consider in terms of data collection and analysis. It concludes with a section on the impact of ICT on education, which is based on information provided by UIS.

## 2. Statistical work on measuring the impact of ICT

153. Overviews of the available theoretical approaches and empirical evidence can be found in recent publications including ITU's *World Telecommunication/ICT Development Report 2006: Measuring ICT for social and economic development* (ITU, 2006), the OECD paper "Measuring the impacts of ICT using official statistics" (OECD, 2007b), UNCTAD's *Information Economy Report 2007-2008* (UNCTAD, 2007b) and UNECA's publication *Project on Information Society (IS) indicators by the African Academia Research Network (ARN) – Current situation and prospects, 2007* (UNECA, 2007b).
154. The measurement of ICT impacts is challenging for a number of reasons including:
- The range of effects that can be characterized as impacts, for instance, strong or weak influences, direct or indirect impacts, positive and negative impacts, short or long term impacts, intended and unintended impacts, intermediate and final impacts;
  - The range of possible statistical approaches to impact measurement, combined with a lack of both comparable measurement models and data;
  - The large range of potential impact measures, reflecting the scope of the information society and the interactions between its elements;
  - The general challenge in measuring impacts of any kind (demonstrating the impact of one factor on another can be difficult because a positive correlation cannot readily be attributed to a cause-and-effect relationship); and
- The nature of ICT itself; as explained by ITU (2006), measuring the impact of ICT can be compared with measuring the impact of electricity, "Part of the difficulty is that both ICTs and electricity are "enabling" or "General Purpose Technologies"... which means their use and their impacts are ubiquitous yet difficult to measure because they are mainly indirect. It is not electricity or ICTs as such that make the (bulk) impact on economy and society but how they are used to transform organization, processes and behaviours." (OECD, 2007b).
155. It is beyond the scope of this chapter to review these issues in depth; instead, readers are referred to the references provided above. However, we will examine one of the more prominent areas of ICT impact measurement, that is, use of micro data analysis to assess the impact of ICT on productivity at the firm level. Firm level studies of ICT impacts are based on linking statistics from various sources, where the linked data can include statistics on firm performance, ICT use, innovation and organizational factors. The OECD started coordinating such work among member countries in the early 2000s and Pilat (2004) provides a history of those early efforts.

156. There are various approaches to analysing firm level data, as well as a variety of data sources used. While this diversity has some benefits, it also limits cross-country comparison. Work is currently underway amongst European Union countries to develop a comparable methodology for measuring firm level impacts. The project is funded by Eurostat and led by the United Kingdom's Office for National Statistics. Its aim is to assess ICT impacts by linking firm level data from different sources, each of which is comparable across EU countries. The project is scheduled to conclude in 2008, with delivery of analysis and recommendations for indicators (OECD, 2007b).
157. Some generalized findings from firm level studies (Eurostat, 2007b) are that ICT affects productivity in a positive way – for example, through hardware and software investment, through firm level use of multiple electronic business links, and through greater employee engagement with computers and the Internet (especially with high speed broadband).
158. The extent of the gain differs according to the type of firm – for example across industries (with some service industries showing a particularly strong effect), between young and established firms (with the former showing greater gains from IT investment), and between firms with different ownership and geographic scope. There are also relationships with other firm attributes, for instance, there is a greater positive impact where firms have more fixed investment, a higher number of skilled employees and a greater level of innovative activity (Eurostat, 2007b).
159. Among developing economies, the Thai National Statistical Office has conducted a joint research project with UNCTAD to assess the link between ICT use and labour productivity in Thai manufacturing firms. The study was part of a broader UNCTAD initiative to improve ICT measurement and is the first known example of use of official statistics to measure the impact of ICT on labour productivity in developing economies.
160. The study found that the use of ICT (computers, the Internet and web presence) by Thai manufacturers is associated with significantly higher sales per employee. Importantly, the use of even the most basic of these ICTs – computers – accounts for large differences in labour productivity between firms. Furthermore, variations in the intensity of computer use resulted in larger productivity differentials, for example, a 10 per cent increase in the share of employees using computers was associated with a 3.8 per cent rise in labour productivity (UNCTAD, 2007b).
161. The study's findings support the hypothesis that businesses in developing economies can benefit from the use of ICT, even simple ICTs such as computers. While further analysis is needed to identify the complementary factors that lead to productivity gains from ICT, the importance of impact measurement in developing economies is evident.
162. Individual economies that are interested in including impacts measures in surveys should consider it at the survey design stage. For instance, micro data analysis can be performed using data from a single survey source, provided that the source collects the requisite ICT and performance data. The possibility of linking ICT data with data from other sources such as taxation data or data from other business surveys should also be considered at the design stage (UNCTAD, 2007a). An important factor here is that the match rate of units from the difference sources should be maximized for meaningful analysis. For example, if the match is with taxation data, it is useful if taxation records are used as the basis of the population frame used for the survey. If the match is with data from other surveys, maximum overlap of

units between surveys and a common unit identifier are necessary. While this often occurs for larger units, arguably, there is more interest in the ICT-productivity link for small and medium sized businesses.<sup>1</sup>

163. Other areas of ICT impacts measurement that statistical agencies could explore are described in OECD (2007b). In the economic area, they include:

- Compilation of an ICT satellite account (per the work of Australia and Chile) based on System of National Accounts (SNA93) standards and ICT statistical standards (for example, the definition of ICT goods); and
- Impact perceptions measures; these are simple questions that can be included in a business survey; examples are included in model questionnaires of the OECD and Eurostat.

164. In the social area, countries could consider the following (also from OECD, 2007b):

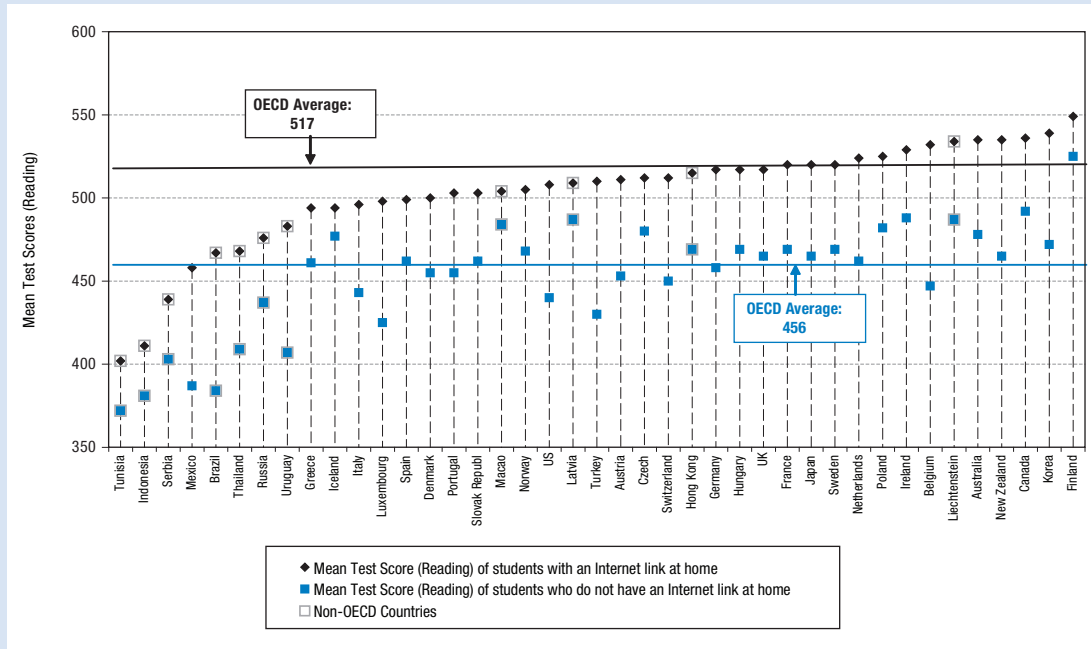
- Including questions on the perception of ICT impacts on household survey questionnaires;
- Using time use surveys to collect information on time spent on ICT activities by individuals;
- Use of household expenditure surveys to collect information on household ICT budgets; and
- Use of labour force or other household surveys to collect statistics on 'teleworking' and other changes in work patterns that are driven by ICT.

165. In all these areas, statistical agencies should consider issues of harmonization. Where international standards exist (for instance, the SNA, ICT statistics standards, methodologies and classifications for time use and household expenditure surveys), these should be utilized in order to maximize the potential for comparing results across economies.

### 3. The impact of ICT in education

166. Although policymakers hope to achieve positive outcomes from applying ICT to education, there is still not much widespread evidence of positive impacts of ICT on educational goals – and often such evidence is qualified by reference to particular conditions (for instance, that access to ICT at school alone may be insufficient to affect student achievement). However, the introduction of ICT in the education sector can be quite costly, in terms of both the capital costs of basic infrastructure (hardware, software and connectivity) and the recurrent costs of maintenance and human resources development. Therefore, any credible evidence of impacts – positive or negative – would play an essential role in decision-making in this area.
167. A search of existing literature by UIS reveals that a lot more needs to be learned about the cost-effectiveness of investment in this area for achieving educational goals. Even for developed economies, hard evidence of positive impact of ICT on students' achievement is scant, although some exists. For instance, the 1999 TIMSS-R study<sup>2</sup> showed that student proficiency in mathematics is lower when teachers use a computer but that students with Internet access at home had a higher average proficiency in science than those without Internet access (those with Internet access at home as well as school had even higher average proficiency).<sup>3</sup>
168. The OECD's Programme for International Student Assessment (PISA) surveys were conducted in 2000, 2003 and 2006. They assess the performance of 15-year old students in the principal industrialized economies. The 2003 survey assessed proficiency in mathematics, reading, science and cross-curricular problem solving. However, the main focus was on mathematics. Analysis of results shows that, for all countries in the survey, the mathematics performance of students without access to computers at home was significantly below that of those with home access. Importantly, in 23 out of the 31 countries in the study, a performance advantage remained even after accounting for different socio-economic backgrounds of students. There is also a performance advantage associated with school access to computers though, for most countries, it is less marked.
169. The highest performances in both mathematics and reading tended to be from students with a medium level of computer use, which suggests that excessive computer use could have a negative impact on school performance (OECD, 2005a). The 2003 PISA study also revealed that students with Internet access at home had a higher proficiency in reading than those who do not (see Chart 17 below).

Chart 17. Link between Internet access at home and student proficiency



Source: UIS, original source PISA 2003 (OECD).

## Notes

- <sup>1</sup> NSOs often prefer to minimize overlap between the sampled sectors of business surveys in order to reduce respondent burden. Where one of the surveys to be matched is a census, this situation does not apply (this will be the case for some economic surveys which are conducted as periodic censuses).
- <sup>2</sup> Third International Mathematics and Science Study-Repeat: TIMSS 1999, also known as TIMSS-Repeat (TIMSS-R), measured progress in eighth-grade mathematics and science around the world. TIMSS 1999 provided countries that participated in the 1995 testing with trend data at Grade 8. The four-year period between the first and second data collection saw the population of students originally assessed as fourth graders move on to Grade 8. This development allowed countries that participated in 1995 at Grade 4 to compare the performance of fourth-graders in that year with their performance as eighth-graders in 1999. As in the 1995 study, TIMSS 1999 also investigated, through background questionnaires, the context for learning mathematics and science in the participating countries. Information was collected about educational systems, curriculum, instructional practices, and characteristics of students, teachers, and schools.
- <sup>3</sup> Given that these results predate much of the development of the information society, arguably, their importance lies in providing an indication of the type of analysis that is possible rather than relevant information.

# Chapter 8. Conclusions and future work

## 1. Conclusions

170. There is a strong policy interest worldwide in ICT and its impacts on society. The important role of high quality and comparable ICT statistics in informing policymaking is acknowledged at the global level, for instance through the Geneva and Tunis phases of WSIS. At the country level, this role may be less clear and it is hoped that this publication will encourage more engagement by NSOs with the international organizations that are guiding developments in this field.

### 1.1 The state of the information society

171. The 41 core indicators presented in the statistical summaries of this publication, together present a view of the global information society – and the picture they present is a highly consistent one. Developed economies in general, along with several developing economies in Asia, are well advanced as users and producers of ICT. They have good infrastructure at reasonable cost, and penetration of ICT in their businesses and households is high. Use of ICT by businesses and individuals in these economies is growing and becoming more sophisticated (no doubt due to

increasing access to broadband Internet). They spend a lot of money importing ICT goods and many of them are significant producers of ICT goods and/or services. In this context, the rise of some of the developing economies of Asia (China, in particular) as exporters of ICT goods is notable.

172. While data for other economies is scarcer, it is clear that their levels of ICT infrastructure and access are generally lower and, on a *per capita* basis, more expensive. Despite this, there are encouraging signs, including strong growth in mobile phone use and international bandwidth *per capita*, strong growth in ICT imports, and relatively high levels of use of commercial Internet access facilities in many countries.

173. Regarding ICT in education (Chapter 6), the overall picture is not as clear as for other indicators, though there is a disparity between developed and many less developed economies, especially concerning Internet connection in schools. As with the other indicators, some developing economies are relatively advanced, especially with regard to tertiary level enrolments in ICT studies.

## 1.2 Data gaps and deficiencies

174. In a discussion of the state of information society measurement, it is first necessary to distinguish those core indicators that are based on reasonably available data sources, from those that require the conduct of statistical surveys. In the former category are trade data (providing data for the ICT trade indicators, ICT3 and ICT4) and the infrastructure data collected by the ITU (A1 to A12). The other indicators are usually collected using household or business surveys and are therefore expected to be less available, because of the significant resources and statistical infrastructure required to conduct surveys.
175. A quick review of the global measurement status tables in each chapter shows the clear relationship between data availability and the requirement to conduct surveys. Most of the infrastructure indicators (Table 2) and both the ICT trade indicators (Table 21) are available for a high proportion of countries, irrespective of their level of development. In fact, for most of the infrastructure indicators, availability is higher for least developed economies than for developed economies. For the two trade indicators, availability is similar for all levels of development. Trade statistics have been compiled for many years and are readily available.
176. It is also likely that the infrastructure and trade indicators are of higher quality and more internationally comparable than the other indicators. This is because they are based on long established concepts and definitions and, especially for trade data, a standardized collection framework.
177. The predominant concern here is more for those core ICT indicators that are survey-based and therefore present collection challenges for countries (collecting these indicators implies either adding ICT questions to existing surveys or developing new stand-alone ICT surveys, which is resource intensive). A review of the global measurement status tables for those indicators shows that most of the household indicators (HH1 to HH13) are reasonably available for developed economies but, so far, have low availability for other levels of development (Table 7). In particular, for most of the least developed economies, no individual ICT use indicators are available yet. With respect to the business use indicators (B1 to B12), to date, few developing economies collect any of the indicators and no least developed economies collect them (Table 15). The situation for developed and transition economies is more advanced, with about two thirds of developed economies, and about a quarter to a third of transition economies, collecting most of the household and business indicators.
178. ICT sector indicators (ICT1 and ICT2) are usually collected via industry surveys that are designed to collect national accounts data and are therefore not ICT-specific. Unfortunately, the definition of the ICT sector requires data collection at the detailed (4-digit) industry level and this level of detail is not required for national accounts purposes. The result is that many countries are not able to provide ICT sector data and those that do, frequently cannot provide data according to the international standard definition of the ICT sector. Data availability for the ICT sector indicators is shown in Table 20 and reveals similar patterns to the other survey-based indicators. About two thirds of developed economies are able to provide data for the ICT sector indicators. This reduces for subsequent levels of development, with none of the least developed economies able to provide either of the indicators.
179. However, progress has been made in the collection of the survey-based indicators. The work of the *Partnership* in providing standardized indicators and related metadata has encouraged more countries to start collection work. The significant



work of the partners in building capacity is paying dividends and will continue to do so in the future (see Chapter 1 for a description of these efforts).<sup>1</sup> The work being done in some regions is also very encouraging, especially by countries of Latin America and the Caribbean (see boxes 2 and 3 for more information).

180. Clearly, more work is required to better harmonize the survey-based indicators. Currently, there are several sources of incompatibility for these indicators; these can be viewed at the survey and the item (question) level. Regarding the former, differences in survey scope may have a large impact, especially where the scope is either much broader or narrower than the scope suggested for the core indicators. Variations in the scope of the ICT sector were discussed in Chapter 5 and are particularly problematic. The same issue applies to business use indicators, where survey scope may vary in terms of business size and/or industry. For household surveys, scope differences relating to age of individuals included in the survey may be significant where, for instance, the scope of a particular survey includes more high level users and fewer low level users.
181. Differences in definitions or response categories directly affect comparability for a number of indicators. Those that are apparently most affected are the ICT access and use indicators involving activities (HH10 and B12) and type of Internet access (HH12 and B9). For activities response categories, there are often differences in what is included in each category. For the Internet access indicators, there is variation in how the categories are defined. A particular problem is that it is still difficult for countries to create categories that enable the aggregation of Internet access services to broadband and narrowband. It should be noted that it is possible to have narrower response categories than those recommended as long as they do not overlap the core indicator categories.<sup>2</sup>
182. In Chapter 7, we described the policy interest in the impact of ICT and outlined the complexities of its measurement. Clearly, more work is required on development of impacts concepts and measurement models as well as on data collection. An area of particular interest is measurement of the impact of ICT on business performance and productivity. Evidence from a number of studies indicates positive effects for businesses from using ICT. Efforts by European countries to develop comparable models for measuring firm level impacts of ICT at the firm level will be followed with interest by those interested in this field of statistics.
183. On the social side, the picture is much less clear. There is little statistical information available and anecdotal evidence indicates both positive and negative impacts for individuals and society through greater use of individual ICT. An example is access to broadband, which would usually be considered as beneficial by the individuals who use it for various purposes. However, some of those purposes, such as illegal downloading of music or movies, are negative in a broader sense. Other negative effects are suggested by the 2003 PISA study (OECD, 2005a) which found that the highest performances in mathematics and reading were associated with a medium, rather than high, level of computer use by students.

### **1.3 Recommendations**

184. Closer adherence to the core indicators definitions and methodological recommendations would solve a large number of the comparability issues that affect the statistics. Countries are urged to carefully consider the core indicators when designing or re-designing ICT surveys.
185. It should be noted that the core indicators, and their associated metadata, are subject to change. Some minor changes have already occurred since they were first released at

the end of 2005. These have mainly been due to changes in technologies; see annexes 3 and 4 for details. Other changes to the core indicators could be considered, based on changing policy interests and collection experiences. An example of the latter is to change the denominator used to calculate the ICT sector indicators; this was discussed in Chapter 5. An important consideration, when contemplating changes to the core indicator concepts and definitions, is how best to retain the time series value of existing data.

186. Some changes to the core indicators will occur because of other statistical developments, notably the introduction of ISIC Rev. 4 and the CPC Ver. 2. These will affect the definitions of the ICT sector and ICT goods respectively, thereby changing the definitions of ICT 1 to ICT 4. A revised definition of the ICT sector based on ISIC Rev. 4 already exists (see OECD, 2007a for details) but is unlikely to be implemented by countries for some time. As discussed in Chapter 5, the implementation of ISIC Rev. 4 presents an opportunity for countries to re-design their industry statistics programs and, in the process, change their measurement practices for the ICT sector.
187. While most developed economies incorporate ICT statistics in their ongoing statistical programs, the same generalization is not true of less developed economies, many of which run surveys on an *ad hoc*

basis. This is suboptimal for several reasons<sup>3</sup> and it is suggested that those economies attempt to incorporate ICT surveys into their mainstream statistical programs.

188. It is strongly suggested that countries use the resources of the *Partnership* and its partners to progress development work in ICT statistics. A number of useful references have been discussed in this publication and include:

- Partnership on Measuring ICT for Development (2005c), *Core ICT Indicators*, New York/Geneva, <http://measuring-ict.unctad.org/>;
- OECD (2007a), *Guide to Measuring the Information Society*, Paris, [www.oecd.org/sti/measuring-infoeconomy/guide/](http://www.oecd.org/sti/measuring-infoeconomy/guide/);
- UNCTAD (2007a), *Manual for the Production of Statistics on the Information Economy*, Geneva, <http://measuring-ict.unctad.org/>; and
- Eurostat (2007a), *Methodological Manual for Statistics on the Information Society, Survey year 2007 v2.0*, Luxembourg, [http://europa.eu.int/estatref/info/sdds/en/isoc/isoc\\_metmanual\\_2007.pdf](http://europa.eu.int/estatref/info/sdds/en/isoc/isoc_metmanual_2007.pdf).

189. The ITU is developing a manual for measuring household/individual ICT access and use, which is expected to be released in the first half of 2008.

## 2. Future work

190. In setting an agenda for the future, the *Partnership* is guided by the objectives of its second phase. Important amongst these are the extension of the core ICT indicators to include core indicators for ICT in education (Chapter 6) and e-government indicators (see below). The core indicators, including the proposed education indicators, will be considered at the 2008 *Global Event on Measuring the Information Society* organized by the *Partnership* from 27-29 May 2008 in Geneva.
191. Activities such as capacity-building and provision of technical resources will continue and will probably expand. In addition, it is likely that more effort will be devoted to raising awareness of the importance of ICT indicators for policymaking.

### 2.1 Creation of an ICT indicators database

192. Another important objective of the *Partnership* is to have an Internet-based platform for dissemination of core indicator data. In 2006, a Task Group on Data Development (TGDD) was formed to pursue this objective. The TGDD is led by the World Bank, which had started work on conceptualizing a global ICT database, with an intended release about mid 2008.
193. However, those plans are now being revised in the light of UNSD development work on a data portal that will include a range of UN data, including the ICT indicators for target

18 of the Millennium Development Goals (fixed telephone lines, mobile cellular subscribers and Internet users). Discussions about including other core ICT indicators in the UN data portal are planned. The main benefits to the *Partnership* of using the UN portal are the greater visibility and technical infrastructure offered by such a platform.

### 2.2 Development of e-government indicators

194. As discussed in Chapter 1, the current *Partnership* core list is not intended to be a final list, as it does not cover all areas of the information society. Members of the *Partnership* have agreed to further develop specific areas including e-government. UNECA has agreed to coordinate development of e-government indicators and leads the Task Group on eGovernment.
195. Based on various key functions of ICT, the following topics are proposed by UNECA as a starting point for defining an exhaustive list of e-government indicators for the *Partnership*:
- Public sector management;
  - Delivery of public services;
  - Legal and judicial reforms;
  - Policy, legal and regulatory frameworks;
  - Strengthening the capacity of parliaments; and
  - Empowering local authorities.

196. Future plans are to work with the United Nations Department of Economic and Social Affairs (UNDESA) to further develop the indicators, including their scope and definitions. UNECA expects to present the indicators at the African as well as international levels for review by *Partnership* members and others.

## 2.3 Regional plans

### 2.3.1 Africa

197. In evaluating Phase I of Scan-ICT in Africa (see Chapter 1), regulators and statisticians found the process and outcomes useful for implementation on a larger scale. This finding concords with the outcomes from Phase I of WSIS, which urged countries to regularly review activities related to ICT deployment, development and use. In Phase II of the Scan-ICT initiative, NSOs, national observatories for ICT and ICT ministries from participating countries have been identified as partner agencies to undertake country studies. Currently, the programme is being implemented in five countries: Cameroon, Gambia, Ghana, Mauritius and Rwanda. The ultimate goal of Scan-ICT is to create a pan-African ICT network that would collect, analyse and disseminate ICT4D (ICT for development) indicators.

298. Scan-ICT II countries are expected to develop a document on methodology which will include: priority theme areas; selected indicators; data collection and analysis; development of survey instruments; geographical coverage; and publication and dissemination. In addition, they will develop country profiles with baseline data and conduct qualitative analysis on ICT use and impact in the priority theme areas. The outcomes will be published on a national Scan-ICT website and database. The process has been launched with national consultation workshops in all participating countries, which have identified the core ICT4D indicators and methodology.

199. In Scan-ICT Phase II, UNECA developed a comprehensive framework for the development of information society measurement indicators. A toolkit was built on the methodology developed as part of the Scan-ICT Phase I pilot project. It incorporates a framework for the development of suitable indicators for assessing the status of the development, deployment and use of ICT in African countries.

200. The methodology is based on the so-called 'CUT' model<sup>4</sup> and incorporates specific frameworks for:

- Development of ICT-related indicators for the ICT sector; services, industry and commerce, agriculture, education, health, and the public sector;
- Developing indicators targeted at measuring the status of the use of ICT to implement application areas such as: e-government, e-commerce, e-business, e-education, e-health and telemedicine;
- Classifying indicators in terms of ICT4D policy focus areas including infrastructure development, universal access and services, legal and regulatory institutional frameworks and environment; and
- Classifying indicators in terms of features of the information and knowledge economy and society (e.g. high income economy dominated by trading in ICT products and services).

201. ECA's Academia Research Network (ARN) has developed an evolving and modular conceptual framework for impact indicators in African countries. Future work will focus on implementation of impact indicators at country and institution levels in order to address the basic factors hindering or stimulating the use and impact of ICT.

### 2.3.2 Latin America and the Caribbean<sup>5</sup>

202. The Observatory for the Information Society in Latin America and the

- Caribbean (OSILAC) is currently creating an information system<sup>6</sup> designed to store data from all the LAC countries that collect information on ICT. It is intended that the system will become an instrument to assist national and regional policymaking, with the ultimate goal being the benefit of society as a whole.
203. OSILAC plans to examine the economic and social impact of ICT on people's lives, and on firms' organizational development and productivity. Individual countries, through their NSOs, are also performing analyses of ICT access and use (examples are the Brazilian, Dominican Republic and Uruguayan statistical agencies).<sup>7</sup>
  204. The importance of harmonizing variables and methodologies is recognized. Issues still pending include the period to be covered by ICT questions, relevant age brackets for questions on individual ICT use, the denominator used to calculate indicators for ICT use (e.g. the whole population or the in-scope population) and the comparability of statistical units in differently designed surveys (in particular, business surveys).
  205. There is also emphasis on the need to improve measurement of ICT access and use in educational institutions, health-care organizations, and national and local government institutions. Measurement of use in sports institutions, cultural centres and public Internet access establishments has been proposed in order to determine the extent to which individuals are using the Internet in publicly available locations.
  206. Countries of the region are being urged to increase measurement of the ICT sector, including the impact of the sector's production on job creation, value added, imports and exports. Some countries are already taking such steps, with Chile, notably, being one of the very few countries in the world to compile an ICT satellite account.
  207. A third phase of OSILAC (2008 to 2010) will extend work on ICT statistics, including:
    - Further analysis of determinants for, and impacts of, ICT access and use;
    - Expansion of the on-line information system referred to above, in order to facilitate public access to indicators and project outputs; and
    - Continuation and expansion of work on capacity-building through methodological guides and training.
  208. OSILAC also has a monitoring role in respect of policies and projects connected to the implementation of the Regional Action Plan eLAC. It recently presented its third monitoring exercise of the Regional Political Action Plan (OSILAC, 2007),<sup>8</sup> in an attempt to outline the region's situation and delineate the challenges remaining in the area of ICT. The current monitoring methodology is based on the lessons learned in the two previous exercises (Hilbert and Olaya, 2005; OSILAC, 2005).<sup>9</sup>
- ### 2.3.3 Western Asia and the Arab region
209. The statistical publication *Regional Profile of the Information Society in Western Asia* (UNESCWA, 2007c) will help UNESCWA member countries to monitor progress in the adoption and use of ICT and to make comparisons with other countries in the region. This should promote cooperation and regional integration opportunities in an increasingly knowledge-based global economy.
  210. UNESCWA is planning a study on the impact of ICT on community development in UNESCWA member countries. The study will be based on measurement of the impact of ICT on community development; its results should assist member countries to develop programmes for improving ICT access in rural and remote areas. Statistics will be collected via surveys targeting

ICT access centres in various UNESCWA member countries.

211. A conference, *Regional Follow-up on the Outcome of the World Summit on the Information Society*, is planned for October/November 2008. The main aim of the conference is to assess progress made in the implementation of the WSIS Geneva Plan of Action and Tunis Agenda, the UNESCWA regional plan of action (RPoA) for building the information society and the Arab Strategy on ICT. Targets will be set for narrowing the digital divide in the region and revising the RPoA accordingly, for example, by adding new programmes and/or projects and strengthening partnership mechanisms.

212. UNESCWA is working towards development of a web portal on measuring the information society in the UNESCWA region. The portal is expected to be operative by mid 2008, providing a crucial tool to assist UNESCWA member countries to define and collect ICT indicators, build statistical capacity, follow-up on progress in the implementation of the RPoA and share experiences. The portal will be a bilingual (English and Arabic) and dynamic tool for measuring progress towards building the information society in Western Asia and the Arab Region. It will provide access to RPoA status and partnerships, information society indicators, publications, country/regional profiles and communications/networking tools.

## Notes

- <sup>1</sup> The *Partnership* actively seeks contributions from donors to support capacity-building in developing countries. Donors interested in contacting the *Partnership* are invited to send an e-mail to [emeasurement@unctad.org](mailto:emeasurement@unctad.org).
- <sup>2</sup> Narrower categories can be aggregated by counting the number of respondents (businesses, households or individuals) which undertake any of the actions of interest, for instance, for the indicator 'businesses using the Internet for providing customer services' component categories could be using the Internet for 'facilitating access to on-line catalogues', for 'providing after sales support' and for 'enabling order tracking'. The indicator 'businesses using the Internet for providing customer services' would be constructed by taking all respondents who did any of those 'component activities'. This avoids the double counting which would occur if, for instance, the number undertaking each activity were simply added together.
- <sup>3</sup> These are discussed in UNCTAD's *Manual* (UNCTAD, 2007a).
- <sup>4</sup> The CUT model classifies ICT4D indicators into three categories: Capacity indicators: targeted at measuring the level and the extent of development and deployment of ICT infrastructure and related resources; Usage indicators: aimed at assessing and measuring the extent of use of the ICT infrastructure and related resources by households, businesses and government entities; and Transformation or impact indicators: indicators targeted at measuring the social and economic impact of ICT infrastructure and use within the economy and society.
- <sup>5</sup> Most of the content of this section has been taken from Olaya (2007) and from an internal UNECLAC document dealing with a proposed OSILAC phase III.
- <sup>6</sup> See <http://www.eclac.cl/tic/flash/default.asp?idioma=IN>.
- <sup>7</sup> See <http://www.eclac.cl/id.asp?ID=30206>.
- <sup>8</sup> See <http://www.eclac.cl/id.asp?ID=29951>.
- <sup>9</sup> See <http://www.eclac.cl/SocInfo/OSILAC>.

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## Abbreviations

ADSL	Asymmetric digital subscriber line
CPC	Central Product Classification (UN)
DSL	Digital subscriber line
EDI	Electronic data interchange
EU	European Union
GDP	Gross domestic product

GSM	Global system for mobile communications
HS	Harmonized System (WCO)
ICT	Information and communication technology
IDRC	International Development Research Centre (Canada)
IP	Internet protocol
ISDN	Integrated services digital network
ISIC	International Standard Industrial Classification of All Economic Activities (UN)
ISP	Internet service provider
ITU	International Telecommunication Union
Kbit/s	Kilobits per second
LAN	Local area network
Mbit/s	Megabits per second
NACE	Nomenclature Generale des Activities Economiques dans L`Union Europeenne
NAICS	North American Industry Classification System
NSO	National statistical office
OECD	Organisation for Economic Co-operation and Development
SDSL	Symmetric digital subscriber line
SME	Small and medium enterprise
SNA	System of National Accounts
UIS	UNESCO Institute for Statistics
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
UNECLAC	United Nations Regional 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
UNIDO	United Nations Industrial Development Organization
UNSC	United Nations Statistical Commission
UNSD	United Nations Statistics Division
URL	Uniform resource locator
VDSL	Very high speed digital subscriber line
WCO	World Customs Organization
WPIIS	Working Party on Indicators for the Information Society (OECD)
WSIS	World Summit/s on the Information Society
WWW	(the) World Wide Web



# Annexes



## Annex 1 Availability of core ICT indicators

### Notes on the Annex

1. This annex shows the availability of the core ICT indicators for individual economies. Not all of the data which are available are included in the publication (though most are). Some data were omitted for statistical reasons (for instance, definitions of categories or indicators differed considerably from the core ICT indicator standards).
2. Availability is defined as known availability at the time of compilation. It is possible that some indicators are available for more economies than shown in this annex.
3. Data are arranged by 'level of development' and 'region' according to the 2007 version of the UN Statistical Division's Standard country or area codes for statistical use, see <http://unstats.un.org/unsd/methods/m49/m49.htm>. The classification was revised in January 2008 and is now slightly different from the version used in this publication. The main differences are: Croatia has moved from Developed to Transition economies, and Bulgaria and Romania have moved from Transition to Developed economies.
4. Taiwan, China has been added to the UNSD list because some organizations collect relevant information for this economy (the name of the economy follows ITU practice).
5. Notation used in the Annex is as follows:
 

<i>A</i>	Available and year of latest data (for example, A05 means that the indicator is available in respect of 2005). PA is used for the ICT sector core indicators, ICT1 and ICT2, and indicates availability for the manufacturing sector only.
<i>NA</i>	Apparently not available in respect of the year 2002 or later.
<i>NC</i>	Data not collected from this economy by the relevant agency.

Availability of the core indicators on ICT infrastructure and access

Level of development, region and economy,	A1. Fixed telephone lines per 100 inhabitants	A2. Mobile cellular subscribers per 100 inhabitants	A3. Computers per 100 inhabitants	A4. Internet subscribers per 100 inhabitants	A5. Broadband Internet subscribers per 100 inhabitants	A6. International Internet bandwidth per inhabitant	A7. Percentage of population covered by mobile cellular telephony	A8a. Internet access tariffs (20 hours per month), in US\$	A8b. Internet access tariffs (20 hours per month), as a percentage of per capita income	A9a. Mobile cellular tariffs (100 minutes of use per month), in US\$	A9b. Mobile cellular tariffs (100 minutes of use per month), as a percentage of per capita income	A10. Percentage of localities with public Internet access centres (PIACs) by number of inhabitants (rural/urban)	A11. Radio sets per 100 inhabitants	A12. Television sets per 100 inhabitants
<b>Developed economies</b>														
<i>Asia</i>														
Japan	A06	A06	A05	NA	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
<i>Europe</i>														
Åland Islands	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Andorra	A05	A05	NA	NA	A05	A05	A06	A06	NA	A06	NA	NA	NA	NA
Austria	A06	A06	A05	A06	A06	A04	A05	A06	A06	A06	A06	NA	NA	NA
Belgium	A06	NC	A05	NC	A05	NC	NC	NC	NC	NC	NC	NC	NC	A05
Channel Islands	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Croatia	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
Czech Republic	A05	A06	A05	A04	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
Denmark	A06	A06	A05	A06	A06	A05	NA	A06	A06	A06	A06	NA	NA	NA
Estonia	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	A02/3	NA
Faeroe Islands	A05	A05	NA	A04	A05	A05	A06	A06	NA	A06	NA	NA	A04	A04
Finland	A06	A06	A05	A04	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
France	A06	A06	A06	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	A05
Germany	A06	A06	A05	NA	A06	A05	A05	A06	A06	A06	A06	NA	A02/3	NA
Gibraltar	A04	A04	NA	NA	NA	A05	A04	NA	NA	NA	NA	NA	NA	NA
Greece	A06	A06	A05	A06	A06	A05	A04	A06	A06	A06	A06	NA	NA	NA
Guernsey	NA	A04	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Holy See	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Hungary	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	A05
Iceland	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	A05
Ireland	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
Isle of Man	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Italy	A05	A05	A05	A04	A06	A05	A06	A06	A06	A06	A06	NA	NA	NA
Jersey	A06	A04	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Latvia	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
Liechtenstein	A05	A05	NA	A04	A05	A05	NA	NA	NA	NA	NA	NA	NA	A05
Lithuania	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	A04
Luxembourg	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	A05
Malta	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	A04
Monaco	A05	A05	A05	NA	A05	A05	NA	NA	NA	NA	NA	NA	A02/3	A05
Netherlands	A05	A05	A05	A04	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
Norway	A06	A06	A05	A06	A06	A05	NA	A06	A06	A06	A06	NA	NA	NA

Annex 1 Availability of core ICT indicators

Level of development, region and economy	A1	A2	A3	A4	A5	A6	A7	A8a	A8b	A9a	A9b	A10	A11	A12
Poland	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
Portugal	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
San Marino	A05	A05	A05	A04	A05	A05	NA	NA	NA	NA	NA	NA	NA	A05
Slovakia	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	A05
Slovenia	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
Spain	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	A06	NA	A04
Svalbard and Jan Mayen Islands	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Sweden	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
Switzerland	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	NA	A05
United Kingdom of Great Britain and Northern Ireland	A06	A06	A05	A06	A06	A04	A05	A06	A06	A06	A06	NA	NA	NA
<i>Northern America</i>														
Bermuda	A05	A05	NA	A05	A05	A05	A04	NA	NA	A06	NA	A04	NA	NA
Canada	A05	A05	A05	A04	A06	A05	A05	A06	A06	A06	A06	NA	NA	A04
Greenland	NA	NA	NA	NA	NA	A05	NA	NA	NA	A06	NA	NA	NA	NA
Saint Pierre and Miquelon	NA	NA	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	A02/3	NA
United States of America	A06	A06	NA	NA	A06	A04	A05	A06	A06	A06	A06	NA	NA	NA
<i>Oceania</i>														
Australia	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	A05	A05
New Zealand	A05	A05	A05	NA	A06	A05	A05	A06	A06	A06	A06	NA	NA	A05
<b>Transition economies</b>														
<i>Asia</i>														
Armenia	A05	A05	A05	A04	A05	A04	A06	A06	A06	A06	A06	NA	NA	NA
Azerbaijan	A06	A06	A05	A04	A05	A05	A05	A06	A06	A06	A06	NA	NA	A05
Georgia	A06	A06	A05	A06	A06	A05	A06	A06	A06	A06	A06	NA	A02/3	NA
Kazakhstan	A06	A06	NA	A06	A06	A06	NA	A06	A06	A06	A06	A06	NA	NA
Kyrgyzstan	A05	A05	A05	A05	A05	A05	A05	A06	A06	A06	A06	NA	NA	A05
Tajikistan	A05	A05	A05	NA	A05	A05	A06	A06	A06	A06	A06	NA	NA	NA
Turkmenistan	A05	A05	A05	NA	NA	A05	A06	A06	A06	A06	A06	NA	NA	NA
Uzbekistan	A05	A05	A06	NA	A05	A06	NA	A06	A06	A06	A06	NA	NA	A05
<i>Europe</i>														
Albania	A05	A05	A05	NA	A05	A05	A06	A06	A06	A06	A06	NA	A02/3	NA
Belarus	A06	A06	A05	A06	A06	A06	A06	A06	A06	A06	A06	NA	A04	NA
Bosnia and Herzegovina	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	NA	A05
Bulgaria	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	A06	NA	NA
Montenegro	A06	A06	NA	A06	A06	A06	A05	NA	NA	NA	NA	NA	NA	NA
Republic of Moldova	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	A04	A04
Romania	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	A02/3	NA
Russian Federation	A05	A05	A05	NA	A06	A05	NA	A06	A06	A06	A06	NA	NA	NA
Serbia	A06	A06	A06	A06	A06	A06	A06	NA	NA	NA	NA	NA	NA	A06
The former Yugoslav Republic of Macedonia	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	NA
Ukraine	A06	A06	A06	NA	NA	A05	A05	A06	A06	A06	A06	NA	NA	NA

Level of development, region and economy	A1	A2	A3	A4	A5	A6	A7	A8a	A8b	A9a	A9b	A10	A11	A12
<b>Developing economies</b>														
<i>Africa</i>														
Algeria	A06	A06	A05	NA	A05	A05	A05	A06	A06	A06	A06	NA	A02/3	A05
Botswana	A06	A06	A05	NA	A05	A06	A06	A06	A06	A06	A06	NA	A02/3	NA
Cameroon	A05	A05	A05	NA	A05	A05	A05	A06	A06	A06	A06	NA	A02/3	A05
Congo	A06	A06	A05	A05	NA	A05	A06	A06	A06	A06	A06	NA	NA	A05
Cote d'Ivoire	A06	A06	A05	A05	NA	A05	A06	A06	A06	A06	A06	NA	A02/3	A05
Egypt	A06	A06	A05	A06	A06	A06	A06	A06	A06	A06	A06	A06	A05	A05
Gabon	A06	A06	A05	A06	A06	A06	A06	A06	A06	A06	A06	A06	A05	A05
Ghana	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	NA
Kenya	A06	A06	A05	A06	NA	A06	NA	A06	A06	A06	A06	NA	NA	NA
Libyan Arab Jamahiriya	A06	A06	A05	A06	NA	A06	A06	A06	A06	A06	A06	NA	NA	NA
Mauritius	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	NA
Mayotte	NA	A04	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Morocco	A06	A06	A05	A04	A05	A06	A05	A06	A06	A06	A06	NA	NA	A04
Namibia	A06	A05	A05	A04	NA	A05	A05	A06	A06	A06	A06	NA	A02/3	NA
Nigeria	A06	A06	A05	NA	A05	A05	A05	A06	A06	A06	A06	NA	A05	NA
Réunion	NA	A04	A04	NA	NA	A05	NA	NA	NA	NA	NA	NA	A02/3	NA
Saint Helena	A05	NA	A05	A04	A05	A05	NA	NA	NA	NA	NA	NA	A05	A05
Seychelles	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	A06	A02/3	NA
South Africa	A05	A05	A05	NA	A05	A05	A05	A06	A06	A06	A06	NA	A02/3	NA
Swaziland	A06	A06	A05	NA	NA	A05	NA	A06	A06	A06	A06	NA	A02/3	NA
Tunisia	A06	A06	A06	A06	A06	A06	A06	A06	A06	A06	A06	A06	NA	A05
Western Sahara	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Zimbabwe	A06	A06	A06	A06	A06	A06	NA	A06	A06	A06	A06	NA	A05	A06
<i>Asia</i>														
Bahrain	A06	A06	A05	A06	A06	A05	A06	A06	A06	A06	A06	NA	NA	A04
Brunei Darussalam	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	NA	NA	NA	NA
China	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	NA	NA	NA
Cyprus	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	A02/3	NA
Democratic People's Republic of Korea	NA	NA	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Hong Kong Special Administrative Region	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	A06	NA	A05
India	A05	A06	A05	A06	A06	A06	A06	A06	A06	A06	A06	A06	NA	NA
Indonesia	A06	A06	A05	NA	A05	A05	A05	A06	A06	A06	A06	NA	NA	NA
Iran, Islamic Republic of	A06	A06	A06	A06	A05	A06	A06	A06	A06	A06	A06	NA	A02/3	NA
Iraq	A04	A04	NA	NA	NA	A05	A06	NA	NA	NA	NA	NA	NA	NA
Israel	A06	A06	A05	A04	A06	A05	A06	A06	A06	A06	A06	NA	NA	NA
Jordan	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	NA	NA
Kuwait	A05	A05	A05	A04	A05	A05	A06	A06	A06	A06	A06	NA	NA	A04
Lebanon	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	A05
Macao Special Administrative Region of China	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	A05	A04



## Annex 1 Availability of core ICT indicators

Level of development, region and economy	A1	A2	A3	A4	A5	A6	A7	A8a	A8b	A9a	A9b	A10	A11	A12
Malaysia	A06	A06	A05	A06	A06	A05	NA	A06	A06	A06	A06	NA	NA	NA
Mongolia	A05	A05	A05	NA	A05	A05	NA	A06	A06	A06	A06	A04	A02/3	A05
Occupied Palestinian Territory	A06	A06	A05	A06	A06	A06	A06	A06	A06	A06	A06	NA	A02/3	A04
Oman	A06	A06	A05	NA	A05	A05	A06	A06	A06	A06	A06	NA	A02/3	NA
Pakistan	A06	A06	A05	NA	A05	A05	A06	A06	A06	A06	A06	NA	A02/3	NA
Philippines	A06	A06	A05	A06	A06	A06	A05	A06	NA	A06	NA	NA	NA	NA
Qatar	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	A04
Republic of Korea	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	NA	NA	A05
Saudi Arabia	A06	A06	A05	A06	A06	A06	A06	A06	A06	A06	A06	NA	NA	A04
Singapore	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	A06	NA	A05
Sri Lanka	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	NA
Syrian Arab Republic	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	NA	NA
Taiwan, China	A06	A06	A05	A06	A06	A06	A05	A06	NA	A06	NA	A06	A05	A05
Thailand	A06	A06	A05	NA	A05	A06	A06	A06	A06	A06	A06	NA	NA	NA
Turkey	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	A02/3	NA
United Arab Emirates	A06	A06	A05	A06	A06	A06	A06	A06	A06	A06	A06	NA	NA	A04
Viet Nam	A05	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	NA	NA	NA
<i>Latin America and the Caribbean</i>														
Anguilla	A05	A05	A05	NA	A05	A05	NA	NA	NA	NA	NA	NA	NA	NA
Antigua and Barbuda	A06	A06	A05	A06	A06	A06	A06	A06	A06	A06	A06	NA	NA	NA
Argentina	A05	A05	A05	NA	A05	A05	A05	NA	NA	NA	NA	NA	NA	A05
Aruba	A05	A05	A05	NA	A05	A05	A05	NA	NA	NA	NA	NA	NA	NA
Bahamas	A05	A05	A05	A04	NA	A05	A05	A06	A06	A06	A06	A04	NA	NA
Barbados	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	NA	NA	NA
Belize	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	NA	NA	A05
Bolivia	A06	A06	A05	A04	A05	A05	NA	A06	A06	A06	A06	NA	NA	NA
Brazil	A05	A05	A05	NA	A05	A05	A05	A06	A06	A06	A06	NA	NA	NA
British Virgin Islands	A06	NA	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Cayman Islands	A06	A04	NA	NA	NA	A05	A05	NA	NA	NA	NA	NA	NA	NA
Chile	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	NA	A02/3	A05
Colombia	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	A04	A05	A05
Costa Rica	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	A06	A05	A05
Cuba	A06	A06	A05	A06	NA	A06	A05	A06	A06	NA	NA	NA	NA	A05
Dominica	A04	A04	A04	A04	NA	A04	NA	A06	A06	A06	A06	NA	NA	NA
Dominican Republic	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	A05	A05
Ecuador	A06	A06	A05	A04	A05	A06	A05	A06	A06	A06	A06	A04	A04	A05
El Salvador	A06	A06	A05	A04	A05	A06	A05	A06	A06	A06	A06	NA	NA	A05
Falkland Islands (Malvinas)	A05	A05	A05	NA	NA	A05	A05	NA	NA	NA	NA	A06	NA	NA
French Guiana	A06	A04	A04	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Grenada	A05	A05	A04	NA	NA	A04	NA	A06	A06	NA	A06	NA	NA	NA
Guadeloupe	A06	A04	A04	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Guatemala	A06	A06	A05	NA	A05	A05	NA	A06	A06	A06	A06	NA	NA	A05
Guyana	A05	A05	A05	A04	A05	A05	A05	A06	A06	A06	A06	NA	NA	NA
Honduras	A06	A06	A05	A06	NA	A05	NA	A06	A06	A06	A06	NA	NA	A05
Jamaica	A05	A05	A05	NA	A05	A05	A05	A06	A06	A06	A06	NA	A02/3	NA
Martinique	A06	A04	A04	NA	NA	A05	A05	NA	NA	NA	NA	NA	NA	NA

Level of development, region and economy	A1	A2	A3	A4	A5	A6	A7	A8a	A8b	A9a	A9b	A10	A11	A12
Mexico	A06	A06	A05	A06	A06	A05	A05	A06	A06	A06	A06	A04	NA	A04
Montserrat	A06	A04	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Netherlands Antilles	A06	A04	NA	NA	NA	A05	NA	NA	NA	A06	NA	NA	NA	NA
Nicaragua	A06	A06	A05	A06	A06	A05	NA	A06	A06	A06	A06	NA	NA	A05
Panama	A06	A05	A05	A04	A05	A06	A06	A06	A06	A06	A06	A06	NA	A05
Paraguay	A06	A06	A05	A06	A06	A05	NA	A06	A06	A06	A06	NA	NA	NA
Peru	A06	A06	A05	A06	A06	A05	NA	A06	A06	A06	A06	NA	NA	NA
Puerto Rico	A05	A05	A05	NA	A05	A05	A05	NA	NA	NA	NA	NA	NA	NA
Saint Kitts and Nevis	A04	A04	A04	NA	NA	A05	NA	A06	A06	A06	A06	NA	NA	NA
Saint Lucia	A06	A05	A04	NA	NA	A05	A05	A06	A06	A06	A06	NA	NA	NA
Saint Martin (French part)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Saint Vincent and the Grenadines	A06	A06	A05	A04	A05	A06	A04	A06	A06	A06	A06	NA	A05	NA
Saint-Barthélemy	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Suriname	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	NA	NA	NA
Trinidad and Tobago	A06	A06	A05	A06	A06	A05	NA	A06	A06	A06	A06	NA	NA	NA
Turks and Caicos Islands	A04	A04	NA	A04	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
United States Virgin Islands	A06	A05	A05	NA	A05	A05	NA	NA	NA	NA	NA	NA	NA	NA
Uruguay	A06	A06	A05	A06	A06	A05	A04	A06	A06	A06	A06	NA	NA	NA
Venezuela (Bolivarian Republic of)	A06	A06	A05	A06	A06	A05	NA	A06	A06	A06	A06	NA	NA	A05
<i>Oceania</i>														
American Samoa	A04	A04	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	A04
Cook Islands	A05	A05	NA	A05	A05	A05	NA	NA	NA	NA	NA	NA	A02/3	A05
Fiji	A05	A05	A05	NA	A05	A05	A05	A06	A06	A06	A06	NA	A04	A05
French Polynesia	A06	A06	A05	A04	A05	A06	A05	NA	NA	A06	A06	A06	NA	A05
Guam	NA	A04	NA	NA	NA	A05	NA	NA	NA	A06	NA	NA	NA	NA
Marshall Islands	NA	A04	A04	NA	NA	A05	NA	NA	NA	A06	A06	NA	NA	NA
Micronesia, Federated States of	A06	A05	A05	A04	A04	A05	NA	NA	NA	A06	A06	NA	A02/3	A05
Nauru	NA	NA	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
New Caledonia	A06	A05	A05	A04	A05	A05	NA	NA	NA	A06	A06	NA	A02/3	A05
Niue	A06	A04	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	A04
Norfolk Island	NA	NA	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Northern Mariana Islands	NA	A04	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Palau	NA	NA	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Papua New Guinea	A06	A06	A05	NA	NA	A05	NA	A06	A06	A06	A06	NA	A02/3	A04
Pitcairn	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Tokelau	A04	NA	A04	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Tonga	A06	A06	A05	NA	A05	A05	A04	A06	A06	A06	A06	NA	A02/3	A05
Wallis and Futuna Islands	A04	NA	NA	NA	A04	A05	NA	NA	NA	NA	NA	NA	NA	NA
<b>Least developed economies</b>														
<i>Africa</i>														
Angola	A06	A06	A05	NA	A04	A06	NA	A06	A06	A06	A06	NA	A02/3	NA
Benin	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	NA	A05	A05

## Annex 1 Availability of core ICT indicators

Level of development, region and economy	A1	A2	A3	A4	A5	A6	A7	A8a	A8b	A9a	A9b	A10	A11	A12
Burkina Faso	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	A04	A05
Burundi	A05	A05	A05	NA	A04	A05	NA	A06	A06	A06	A06	NA	A02/3	A05
Cape Verde	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	NA	A02/3	NA
Central African Republic	A05	A05	A05	A04	NA	A05	NA	A06	A06	A06	A06	NA	A02/3	A05
Chad	A06	A06	A05	A04	NA	A06	NA	A06	A06	A06	A06	NA	A02/3	A05
Comoros	A05	A05	A05	NA	A05	A05	NA	A06	A06	A06	A06	NA	A02/3	A05
Democratic Republic of the Congo	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	A06	A02/3	A05
Djibouti	A05	A05	A05	A04	A05	A05	NA	A06	A06	A06	A06	NA	A02/3	A05
Equatorial Guinea	A05	A05	A05	NA	A05	A05	A05	A06	A06	NA	NA	NA	NA	NA
Eritrea	A06	A06	A05	A06	A04	A06	NA	A06	A06	NA	NA	NA	A05	A05
Ethiopia	A06	A06	A05	A06	A05	A05	NA	A06	A06	A06	A06	NA	NA	NA
Gambia	A06	A06	A05	NA	A05	A05	NA	A06	A06	NA	NA	NA	NA	NA
Guinea	A05	A05	A05	NA	A04	A06	NA	A06	A06	A06	A06	NA	A02/3	A04
Guinea Bissau	A05	A05	A05	NA	A04	A06	NA	A06	A06	A06	A06	NA	A02/3	NA
Lesotho	A05	A05	A05	NA	A05	A05	A05	A06	A06	A06	A06	NA	A02/3	NA
Liberia	NA	A05	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA
Madagascar	A06	A06	A05	A06	A04	A06	NA	A06	A06	A06	A06	NA	A02/3	A05
Malawi	A05	A05	A05	A04	A05	A05	NA	A06	A06	A06	A06	NA	A02/3	A05
Mali	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	A06	A02/3	A04
Mauritania	A06	A06	A05	A06	A06	A06	NA	A06	A06	NA	NA	NA	A02/3	A04
Mozambique	A06	A06	A05	NA	A04	A05	NA	A06	A06	A06	A06	NA	NA	NA
Niger	A05	A05	A05	A04	A05	A05	A05	A06	A06	A06	A06	NA	A02/3	A05
Rwanda	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	A02/3	A04
Sao Tome and Principe	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	A06	A02/3	NA
Senegal	A06	A06	A05	A06	A06	A06	A04	A06	A06	A06	A06	NA	A04	A04
Sierra Leone	NA	NA	NA	NA	NA	A05	NA	A06	A06	A06	A06	NA	NA	NA
Somalia	A05	A05	A05	A04	A04	A05	NA	NA	NA	A06	NA	NA	NA	NA
Sudan	A06	A06	A05	A06	A06	A06	NA	A06	A06	A06	A06	NA	A02/3	NA
Togo	A06	A06	A05	NA	A04	A06	A05	A06	A06	A06	A06	NA	A02/3	A06
Uganda	A06	A06	A05	A04	A06	A06	A06	A06	A06	A06	A06	NA	A02/3	A06
United Republic of Tanzania	A06	A06	A05	NA	A04	A05	NA	A06	A06	A06	A06	NA	A02/3	NA
Zambia	A06	A06	A05	A06	A06	A06	A05	A06	A06	A06	A06	NA	A02/3	NA
<i>Asia</i>														
Afghanistan	A06	A06	A05	A06	A06	A06	NA	NA	NA	A06	A06	NA	A05	A06
Bangladesh	A06	A06	A05	A06	A04	A06	A06	A06	A06	A06	A06	A04	NA	A06
Bhutan	A05	A05	A05	A04	A04	A05	A06	A06	A06	A06	A06	A04	A04	A04
Cambodia	A06	A06	A05	A06	A05	A05	NA	A06	A06	A06	A06	NA	NA	NA
Lao People's Democratic Republic	A05	A05	A05	A04	A05	A05	A05	A06	A06	A06	A06	NA	NA	NA
Maldives	A06	A06	A04	A06	A06	A04	A06	A06	A06	A06	A06	NA	NA	NA
Myanmar	A05	A06	A05	A06	A06	A06	NA	NA	NA	NA	NA	NA	A04	A04
Nepal	A06	A06	A05	A06	A04	A06	A06	A06	A06	A06	A06	A04	NA	NA
Timor-Leste	A06	A06	NA	A06	A06	A06	A06	NA	NA	NA	NA	A06	NA	NA
Yemen	A05	A05	A05	A04	NA	A05	A05	A06	A06	A06	A06	NA	NA	NA

Level of development, region and economy	A1	A2	A3	A4	A5	A6	A7	A8a	A8b	A9a	A9b	A10	A11	A12
<i>Latin America and the Caribbean</i>														
Haiti	A05	A05	A05	A04	A04	A05	NA	A06	A06	A06	A06	NA	NA	NA
<i>Oceania</i>														
Kiribati	NA	A04	A04	NA	NA	A05	NA	NA	NA	A06	A06	NA	A02/3	NA
Samoa	A05	A05	A05	NA	A05	A05	NA	A06	A06	A06	A06	NA	A02/3	A05
Solomon Islands	A05	A05	A05	NA	A05	A05	NA	A06	A06	A06	A06	NA	A02/3	A05
Tuvalu	A05	A05	A05	NA	A04	A05	NA	NA	NA	NA	NA	NA	NA	NA
Vanuatu	A05	A05	A05	A04	A05	A05	A05	A06	A06	A06	A06	NA	NA	A05

Source: ITU

Availability of the core indicators on access to, and use of, ICT by households and individuals

Level of development, region and economy	HH1. Proportion of households with a radio	HH2. Proportion of households with a TV	HH3. Proportion of households with a fixed line telephone	HH4. Proportion of households with a mobile cellular telephone	HH5. Proportion of households with a computer	HH6. Proportion of individuals who used a computer (from any location) in the last 12 months	HH7. Proportion of households with internet access at home	HH8. Proportion of individuals who used the internet (from any location) in the last 12 months	HH9. Location of internet use of the individual in the last 12 months	HH10. Internet activities undertaken by individuals in the last 12 months	HH11. Proportion of individuals with use of a mobile telephone	HH12. Proportion of households with access to the internet, by type of access	HH13. Frequency of individual access to the internet in the last 12 months (from any location)	HR1. Proportion of households with electricity
<b>Developed economies</b>														
<i>Asia</i>														
Japan	NA	A04	A05	A05	A05	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
<i>Europe</i>														
Åland Islands	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Andorra	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Austria	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Belgium	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Channel Islands	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Croatia	A04	A04	A04	NA	A04	NA	NA	NA	NA	NA	NA	NA	NA	A04
Czech Republic	NA	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Denmark	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Estonia	A04	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Faeroe Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Finland	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
France	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Germany	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Gibraltar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Greece	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Guernsey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Holy See	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Hungary	A05	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Iceland	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Ireland	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Isle of Man	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Italy	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Jersey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Latvia	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Liechtenstein	NA	NA	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lithuania	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A04
Luxembourg	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Malta	NA	NA	NA	NA	A02/3	NA	A02/3	NA	NA	NA	NA	NA	NA	NA
Monaco	NA	A02/3	A02/3	A02/3	A02/3	NA	A02/3	NA	NA	NA	NA	NA	NA	A02/3
Netherlands	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Norway	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA

Level of development, region and economy	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10	HH11	HH12	HH13	HR1
Poland	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Portugal	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
San Marino	NA	NA	NA	NA	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	A05	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Slovenia	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Spain	A05	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Svalbard and Jan Mayen Islands	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Sweden	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Switzerland	NA	NA	NA	NA	A06/7	NA	A06/7	A06/7	NA	NA	NA	NA	NA	NA
United Kingdom of Great Britain and Northern Ireland	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
<i>Northern America</i>														
Bermuda	A04	A04	A04	A04	A04	A02/3	A04	A02/3	NA	A02/3	A02/3	NA	A02/3	A04
Canada	A05	A05	A05	A05	A05	NA	A05	A05	A05	A05	NA	A05	A05	NA
Greenland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Pierre and Miquelon	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United States of America	NA	NA	NA	NA	A02/3	A05	A02/3	A05	A02/3	A02/3	NA	NA	NA	A02/3
<i>Oceania</i>														
Australia	NA	NA	NA	A02/3	A06/7	A02/3	A06/7	A06/7	A06/7	A06/7	NA	A06/7	A06/7	NA
New Zealand	NA	A04	A04	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A04
<b>Transition economies</b>														
<i>Asia</i>														
Armenia	A05	A04	A05	A04	A04	NA	A04	NA	NA	NA	NA	NA	NA	NA
Azerbaijan	A05	A02/3	NA	A02/3	A05	A06/7	A02/3	A06/7	A06/7	A06/7	NA	A06/7	A06/7	NA
Georgia	A04	A04	A04	NA	A04	NA	NA	NA	NA	NA	NA	NA	NA	A04
Kazakhstan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kyrgyzstan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tajikistan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turkmenistan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uzbekistan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Europe</i>														
Albania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belarus	NA	A06/7	A06/7	NA	A06/7	NA	A06/7	NA	NA	NA	NA	NA	NA	NA
Bosnia and Herzegovina	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Montenegro	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Republic of Moldova	NA	A04	A04	NA	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA
Romania	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Russian Federation	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Serbia	NA	NA	NA	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
The former Yugoslav Republic of Macedonia	A04	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA

## Annex 1 Availability of core ICT indicators

Level of development, region and economy	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10	HH11	HH12	HH13	HR1
Ukraine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Developing economies</b>														
<i>Africa</i>														
Algeria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Botswana	A04	NA	A04	NA	A04	NA	A04	A04	NA	NA	A04	NA	NA	NA
Cameroon	A04	A04	A04	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Congo	A05	A05	A05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cote d'Ivoire	NA	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Egypt	A05	A05	A05	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gabon	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ghana	A02/3	A02/3	A02/3	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kenya	A02/3	A02/3	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Libyan Arab Jamahiriya	A02/3	A02/3	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mauritius	NA	NA	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA	A06/7	A06/7	A02/3
Mayotte	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Morocco	A05	A05	A05	A05	A05	A05	A05	A06/7	A06/7	A06/7	A06/7	NA	A06/7	NA
Namibia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nigeria	A04	A04	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Reunion	NA	NA	NA	NA	A04	NA	A04	NA	NA	NA	NA	NA	NA	NA
Saint Helena	NA	NA	NA	NA	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA
Seychelles	NA	A05	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA	NA
South Africa	A04	A04	A04	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA	A04
Swaziland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tunisia	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Western Sahara	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Zimbabwe	NA	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Asia</i>														
Bahrain	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Brunei Darussalam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
China	NA	NA	NA	NA	NA	NA	NA	A06/7	A06/7	A06/7	NA	A06/7	NA	NA
Cyprus	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Democratic People's Republic of Korea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hong Kong Special Administrative Region	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
of China	NA	NA	NA	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA	NA	A06/7	NA
India	A05	A05	NA	A05	A05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indonesia	A04	A04	A04	NA	A04	NA	NA	NA	NA	NA	NA	NA	NA	A02/3
Iran, Islamic Republic of	NA	NA	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iraq	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Israel	NA	A04	A04	A04	A04	A04	A04	A04	NA	NA	A04	NA	NA	NA
Jordan	NA	A02/3	A02/3	A02/3	A02/3	NA	A02/3	NA	NA	NA	NA	NA	NA	A02/3
Kuwait	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lebanon	NA	A04	A04	A04	A04	NA	NA	NA	NA	NA	NA	NA	NA	A04
Macao Special Administrative Region	NA	NA	NA	NA	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA
of China	NA	NA	NA	NA	A02/3	A06/7	A02/3	A06/7	A06/7	A06/7	NA	NA	NA	A02/3

Level of development, region and economy	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10	HH11	HH12	HH13	HR1
Malaysia	NA	NA	NA	NA	A04	NA	NA	NA	NA	A06/7	A04	NA	NA	NA
Mongolia	A06/7	A06/7	A06/7	A06/7	A06/7	NA	A06/7	NA	NA	NA	NA	NA	A06/7	A06/7
Occupied Palestinian Territory	NA	A04	A04	A04	A04	A06/7	A04	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Oman	A02/3	A02/3	A02/3	A02/3	A02/3	A02/3	A02/3	A02/3	NA	NA	A05	NA	NA	A02/3
Pakistan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Philippines	A02/3	A02/3	A02/3	A02/3	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	A02/3
Qatar	NA	NA	NA	NA	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA
Republic of Korea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saudi Arabia	NA	NA	NA	NA	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA	NA	NA
Singapore	NA	A02/3	NA	A02/3	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA	A06/7	NA
Sri Lanka	NA	NA	NA	NA	A04	NA	A04	NA	NA	NA	NA	NA	NA	NA
Syrian Arab Republic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Taiwan, China	NA	A02/3	A02/3	A02/3	A04	NA	A06/7	A05	A06/7	NA	NA	A06/7	NA	NA
Thailand	NA	NA	A05	NA	A05	A06/7	A05	A04	A06/7	NA	A04	A06/7	NA	NA
Turkey	NA	A05	NA	A05	A05	A05	NA	NA	NA	NA	NA	NA	NA	NA
United Arab Emirates	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Viet Nam	A02/3	A02/3	A04	A04	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	A02/3
<i>Latin America and the Caribbean</i>														
Anguilla	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antigua and Barbuda	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Argentina	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aruba	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bahamas	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barbados	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belize	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bolivia	A05	A05	A05	A05	A05	NA	A05	NA	NA	NA	NA	NA	NA	A05
Brazil	A05	A05	NA	NA	A05	NA	A05	NA	NA	NA	NA	A05	A05	A05
British Virgin Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cayman Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chile	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA	NA	NA
Colombia	A05	A05	A05	NA	NA	NA	A04	NA	NA	NA	NA	NA	NA	NA
Costa Rica	A05	A05	A05	A05	A05	NA	A05	A05	A05	A05	A05	NA	NA	A05
Cuba	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA	A06/7	A06/7
Dominica	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dominican Republic	A05	A05	A05	A05	A05	A05	A05	A05	A05	A05	A06/7	NA	NA	NA
Ecuador	A06/7	A06/7	A06/7	A06/7	A06/7	NA	NA	A06/7	NA	NA	A06/7	NA	NA	NA
El Salvador	A04	A04	A05	A05	A05	NA	A05	NA	NA	NA	NA	NA	NA	A05
Falkland Islands (Malvinas)	NA	NA	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	A02/3
French Guiana	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Grenada	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guadeloupe	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guatemala	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guyana	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Honduras	A06/7	A06/7	A06/7	A06/7	A06/7	NA	A06/7	A06/7	A06/7	A06/7	A06/7	NA	NA	A06/7
Jamaica	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



## Annex 1 Availability of core ICT indicators

Level of development, region and economy	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10	HH11	HH12	HH13	HR1
Martinique	NA	NA	NA	NA	A02/3	NA	A02/3	NA	NA	NA	NA	NA	NA	NA
Mexico	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A05	NA	A06/7	NA
Montserrat	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Netherlands Antilles	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nicaragua	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Panama	A06/7	A06/7	A06/7	A06/7	A06/7	NA	A06/7	A06/7	A06/7	A06/7	A06/7	NA	NA	A06/7
Paraguay	A06/7	A06/7	A06/7	A06/7	A06/7	NA	A06/7	A06/7	A06/7	A06/7	NA	NA	NA	A06/7
Peru	A06/7	A06/7	A06/7	A06/7	A06/7	NA	A06/7	A02/3	NA	NA	NA	NA	NA	A06/7
Puerto Rico	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Kitts and Nevis	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Lucia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Martin (French part)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Saint Vincent and the Grenadines	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint-Barthélemy	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Suriname	NA	NA	A04	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA	A04
Trinidad and Tobago	NA	NA	NA	A05	A05	A02/3	A05	A05	NA	NA	A05	NA	NA	NA
Turks and Caicos Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United States Virgin Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uruguay	A06/7	A06/7	A06/7	A06/7	A06/7	NA	A06/7	A06/7	A06/7	A06/7	NA	NA	A06/7	NA
Venezuela (Bolivarian Republic of)	A05	A05	A06/7	A05	A05	NA	A06/7	NA	NA	NA	NA	NA	NA	A06/7
<i>Oceania</i>														
American Samoa	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cook Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fiji	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
French Polynesia	NA	NA	NA	NA	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Marshall Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Micronesia, Federated States of	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nauru	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Caledonia	NA	NA	A02/3	A02/3	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA
Niue	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Norfolk Island	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Northern Mariana Islands	A02/3	NA	A02/3	NA	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA
Palau	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Papua New Guinea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pitcairn	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Tokelau	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tonga	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wallis and Futuna Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Least developed economies</b>														
<i>Africa</i>														
Angola	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Level of development, region and economy	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10	HH11	HH12	HH13	HR1
Benin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Burkina Faso	A02/3	A02/3	A02/3	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Burundi	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cape Verde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Central African Republic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chad	A04	A04	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Comoros	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Democratic Republic of the Congo	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Djibouti	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Equatorial Guinea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Eritrea	A02/3	A02/3	A02/3	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethiopia	A05	A05	A05	NA	NA	NA	A04	NA	NA	NA	NA	NA	NA	NA
Gambia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guinea	A05	A05	A05	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guinea Bissau	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lesotho	A04	A04	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liberia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Madagascar	A02/3	A02/3	A02/3	NA	A04	NA	A04	NA	NA	NA	NA	NA	NA	NA
Malawi	A04	A04	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mali	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mauritania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mauritius	A02/3	A02/3	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mozambique	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Niger	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rwanda	A05	A05	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sao Tome and Principe	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Senegal	A05	A05	A05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sierra Leone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Somalia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sudan	A05	A05	NA	NA	A05	NA	NA	NA	NA	NA	NA	NA	NA	NA
Togo	NA	NA	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uganda	A02/3	A02/3	A02/3	A02/3	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA
United Republic of Tanzania	A04	A04	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	A04
Zambia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Asia</i>														
Afghanistan	NA	NA	NA	NA	NA	NA	NA	A05	NA	NA	NA	NA	NA	NA
Bangladesh	A04	A04	A04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	A04
Bhutan	A02/3	A02/3	NA	NA	A04	NA	A02/3	A02/3	NA	NA	NA	NA	NA	NA
Cambodia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lao People's Democratic Republic	NA	NA	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Maldives	A05	A06/7	A05	A06/7	A06/7	NA	A06/7	NA	NA	NA	NA	NA	NA	NA
Myanmar	NA	NA	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nepal	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	A02/3
Timor-Leste	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Yemen	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Level of development, region and economy	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10	HH11	HH12	HH13	HR1
<i>Latin America and the Caribbean</i>														
Haiti	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Oceania</i>														
Kiribati	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Samoa	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Solomon Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tuvalu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanuatu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source: ITU and Eurostat (extracted from 30 November 2007 version).

Availability of the core indicators on use of ICT by businesses

Level of development, region and economy	B1. Proportion of businesses using computers	B2. Proportion of employees using computers	B3. Proportion of businesses using the Internet	B4. Proportion of employees using the Internet	B5. Proportion of businesses with a Web presence	B6. Proportion of businesses with an intranet	B7. Proportion of businesses receiving orders over the Internet	B8. Proportion of businesses placing orders over the Internet	B9. Proportion of businesses using the Internet by type of access	B10. Proportion of businesses with a Local Area Network (LAN)	B11. Proportion of businesses with an extranet	B12. Proportion of businesses using the Internet by type of activity
<b>Developed economies</b>												
<i>Asia</i>												
Japan	NA	NA	A05	NA	A05	A05	A05	A05	A05	A05	A05	NA
<i>Europe</i>												
Åland Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Andorra	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Austria	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Belgium	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Channel Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Croatia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Czech Republic	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Denmark	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Estonia	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Faeroe Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Finland	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
France	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Germany	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Gibraltar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Greece	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Guernsey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Holy See	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hungary	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Iceland	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Ireland	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Isle of Man	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Italy	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Jersey	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Latvia	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Liechtenstein	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lithuania	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Luxembourg	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Malta	A05	NA	A06/7	NA	A06/7	A05	A05	A05	A05	NA	A05	A05
Monaco	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Netherlands	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Norway	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7

## Annex 1 Availability of core ICT indicators

Level of development, region and economy	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Poland	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Portugal	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
San Marino	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Slovakia	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Slovenia	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Spain	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Svalbard and Jan Mayen Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sweden	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Switzerland	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
United Kingdom of Great Britain and Northern Ireland	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
<i>Northern America</i>												
Bermuda	A05	A05	A05	A05	A05	NA	A05	A05	NA	NA	NA	NA
Canada	NA	NA	A06/7	NA	A06/7	NA	A06/7	A06/7	A06/7	NA	A06/7	A06/7
Greenland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Pierre and Miquelon	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United States of America	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Oceania</i>												
Australia	A05	NA	A05	NA	A05	NA	A05	A05	A05	NA	NA	A05
New Zealand	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
<b>Transition economies</b>												
<i>Asia</i>												
Armenia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Azerbaijan	A06/7	A06/7	A06/7	A06/7	A06/7	A05	NA	NA	A06/7	A06/7	A05	A06/7
Georgia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kazakhstan	A05	NA	A05	NA	A05	NA	A05	A05	NA	A05	NA	A05
Kyrgyzstan	NA	NA	A05	NA	A05	NA	NA	NA	NA	NA	NA	NA
Tajikistan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turkmenistan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uzbekistan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Europe</i>												
Albania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belarus	A05	NA	A05	NA	A05	NA	NA	NA	NA	A05	NA	NA
Bosnia and Herzegovina	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bulgaria	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Montenegro	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Republic of Moldova	NA	NA	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA
Romania	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Russian Federation	A05	A05	A05	A05	A05	NA	A05	A05	NA	A05	NA	A05
Serbia	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
The former Yugoslav Republic of Macedonia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ukraine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Level of development, region and economy	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
<b>Developing economies</b>												
<i>Africa</i>												
Algeria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Botswana	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cameroon	A05	NA	A05	NA	A05	NA	NA	NA	A05	NA	A05	A05
Congo	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cote d'Ivoire	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Egypt	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Gabon	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ghana	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kenya	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Libyan Arab Jamahiriya	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mauritius	A06/7	NA	A06/7	NA	A06/7	A06/7	A06/7	A06/7	A06/7	NA	NA	NA
Mayotte	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Morocco	NA	NA	A05	A05	A05	A05	A05	A05	A05	NA	NA	A05
Namibia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nigeria	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Réunion	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Helena	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Seychelles	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
South Africa	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Swaziland	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tunisia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Western Sahara	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Zimbabwe	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Asia</i>												
Bahrain	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Brunei Darussalam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
China	NA	NA	A05	NA	A05	NA	A05	A05	A05	A05	NA	NA
Cyprus	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Democratic People's Republic of Korea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hong Kong Special Administrative Region	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
of China	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
India	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indonesia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iran, Islamic Republic of	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iraq	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Israel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Jordan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kuwait	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lebanon	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Macao Special Administrative Region of China	A02/3	NA	A02/3	NA	A02/3	NA	A02/3	A02/3	A02/3	NA	NA	A02/3
Malaysia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

## Annex 1 Availability of core ICT indicators

Level of development, region and economy	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Mongolia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Occupied Palestinian Territory	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oman	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pakistan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Philippines	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Qatar	A05	A05	A05	A05	A05	A05	A05	A05	A05	A05	NA	A05
Republic of Korea	A05	NA	A05	NA	A05	A05	A05	A05	NA	NA	NA	NA
Saudi Arabia	NA	NA	A06/7	NA	NA	A06/7	A06/7	NA	NA	A06/7	A06/7	A06/7
Singapore	A06/7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sri Lanka	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Syrian Arab Republic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Taiwan, China	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Thailand	A06/7	NA	A06/7	NA	A06/7	NA	A06/7	A06/7	A06/7	NA	NA	A06/7
Turkey	A05	A05	A05	A05	A05	A05	NA	NA	A05	NA	NA	A05
United Arab Emirates	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Viet Nam	A06/7	A06/7	A06/7	A06/7	NA	NA	NA	NA	NA	A06/7	NA	NA
<i>Latin America and the Caribbean</i>												
Anguilla	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antigua and Barbuda	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Argentina	PA05	PA05	PA05	A05	A05	A05	A05	A05	A05	A05	A05	A05
Aruba	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bahamas	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barbados	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Belize	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bolivia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Brazil	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
British Virgin Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cayman Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chile	PA05	NA	PA05	NA	A05	NA	A05	A05	A05	A05	A05	A05
Colombia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Costa Rica	A04	NA	A04	NA	A04	NA	NA	NA	NA	NA	NA	A04
Cuba	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	NA	NA	NA
Dominica	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dominican Republic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ecuador	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
El Salvador	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Falkland Islands (Malvinas)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
French Guiana	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Grenada	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guadeloupe	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guatemala	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guyana	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Honduras	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Jamaica	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Martinique	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mexico	A02/3	NA	A02/3	NA	A02/3	NA	NA	NA	NA	A02/3	NA	NA

Level of development, region and economy	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Montserrat	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Netherlands Antilles	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nicaragua	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Panama	A06/7	A06/7	A06/7	A06/7	NA	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7	A06/7
Paraguay	NA	NA	A02/3	NA	NA	NA	NA	NA	NA	NA	NA	A02
Peru	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Puerto Rico	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Kitts and Nevis	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Lucia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Martin (French part)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint Vincent and the Grenadines	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saint-Barthélemy	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Suriname	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trinidad and Tobago	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turks and Caicos Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United States Virgin Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uruguay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Venezuela (Bolivarian Republic of)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Oceania</i>												
American Samoa	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cook Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fiji	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
French Polynesia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Marshall Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Micronesia, Federated States of	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nauru	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
New Caledonia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Niue	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Norfolk Island	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Northern Mariana Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Palau	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Papua New Guinea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pitcairn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tokelau	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tonga	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wallis and Futuna Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Least developed economies</b>												
<i>Africa</i>												
Angola	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Burkina Faso	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Burundi	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cape Verde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



## Annex 1 Availability of core ICT indicators

Level of development, region and economy	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Central African Republic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chad	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Comoros	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Democratic Republic of the Congo	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Djibouti	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Equatorial Guinea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Eritrea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethiopia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gambia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guinea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guinea Bissau	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lesotho	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Liberia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Madagascar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Malawi	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mali	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mauritania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mozambique	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Niger	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rwanda	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sao Tome and Principe	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Senegal	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sierra Leone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Somalia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sudan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Togo	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uganda	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
United Republic of Tanzania	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zambia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Asia</i>												
Afghanistan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bangladesh	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bhutan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cambodia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lao People's Democratic Republic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Maldives	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Myanmar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nepal	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Timor-Leste	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Yemen	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Latin America and the Caribbean</i>												
Haiti	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Oceania</i>												
Kiribati	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Level of development, region and economy	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
Samoa	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Solomon Islands	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tuvalu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanuatu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source: UNCTAD and Eurostat (extracted from 7 December 2007 version).

## Availability of the core indicators on the ICT sector and trade in ICT goods

Level of development, region and economy	ICT1. Proportion of total business sector workforce involved in the ICT sector	ICT2. Value added in the ICT sector (as a percentage of total business sector value added).	ICT3. ICT goods imports as a percentage of total imports	ICT4. ICT goods exports as a percentage of total exports
<b>Developed economies</b>				
<i>Asia</i>				
Japan	A05	A05	A06	A06
<i>Europe</i>				
Åland Islands	NA	NA	NC	NC
Andorra	NA	NA	A04	A04
Austria	A04	A04	A06	A06
Belgium	A04	A04	A06	A06
Channel Islands	NA	NA	NC	NC
Croatia	PA04	NA	A06	A06
Czech Republic	A04	A04	A06	A06
Denmark	A04	A04	A06	A06
Estonia	A04	A04	A06	A06
Faeroe Islands	NA	NA	A06	A06
Finland	A04	A04	A06	A06
France	A04	A04	A06	A06
Germany	A04	A04	A06	A06
Gibraltar	NA	NA	NC	NC
Greece	A04	A04	A06	A06
Guernsey	NA	NA	NC	NC
Holy See	NA	NA	NC	NC
Hungary	A04	A04	A06	A06
Iceland	A05	A05	A06	A06
Ireland	A04	A04	A06	A06
Isle of Man	NA	NA	NC	NC
Italy	A04	A04	A06	A06
Jersey	NA	NA	NC	NC
Latvia	A05	A05	A06	A06
Liechtenstein	NA	NA	NC	NC
Lithuania	A04	A04	A06	A06
Luxembourg	A02/3	A02/3	A06	A06
Malta	A02/3	A02/3	A06	A06
Monaco	NA	NA	NC	NC
Netherlands	A04	A04	A06	A06
Norway	A04	A04	A06	A06
Poland	A04	A04	A06	A06
Portugal	A04	A04	A06	A06
San Marino	NA	NA	NC	NC
Slovakia	A04	A04	A06	A06
Slovenia	A04	A04	A06	A06
Spain	A04	A05	A06	A06
Svalbard and Jan Mayen Islands	NA	NA	NC	NC
Sweden	A04	A04	A06	A06
Switzerland	NA	NA	A06	A06
United Kingdom of Great Britain and Northern Ireland	A04	A05	A06	A06
<i>Northern America</i>				
Bermuda	A05	A05	NA	NA
Canada	A05	A02/3	A06	A06
Greenland	NA	NA	A02/3	A02/3
Saint Pierre and Miquelon	NA	NA	NA	NA
United States of America	A06	A06	A06	A06
<i>Oceania</i>				
Australia	A05	A05	A06	A06
New Zealand	A06	A05	A06	A06
<b>Transition economies</b>				
<i>Asia</i>				
Armenia	NA	NA	A06	A06
Azerbaijan	PA04	NA	A06	A06
Georgia	NA	NA	A06	A06
Kazakhstan	A05	NA	A06	A06

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Level of development, region and economy	ICT1	ICT2	ICT3	ICT4
Kyrgyzstan	PA04	NA	A06	A06
Tajikistan	NA	NA	NA	NA
Turkmenistan	NA	NA	NA	NA
Uzbekistan	NA	NA	NA	NA
<i>Europe</i>				
Albania	NA	NA	A06	A06
Belarus	NA	NA	A06	A06
Bosnia and Herzegovina	NA	NA	A06	A06
Bulgaria	PA04	PA04	A06	A06
Montenegro	NA	NA	NC	NC
Republic of Moldova	NA	NA	A06	A06
Romania	A05	A05	A06	A06
Russian Federation	A05	A05	A06	A06
Serbia	NA	NA	A06	A06
The former Yugoslav Republic of Macedonia	NA	NA	A06	A06
Ukraine	PA02/3	NA	A06	A06
<b>Developing economies</b>				
<i>Africa</i>				
Algeria	NA	NA	A06	A06
Botswana	NA	NA	A06	A06
Cameroon	NA	NA	A06	A06
Congo	NA	NA	NA	NA
Cote d'Ivoire	NA	NA	A06	A06
Egypt	PA02/3	NA	A05	A05
Gabon	NA	NA	A06	A06
Ghana	NA	NA	A06	A06
Kenya	NA	NA	A04	A04
Libyan Arab Jamahiriya	NA	NA	NA	NA
Mauritius	A06	A06	A06	A06
Mayotte	NA	NA	A06	A06
Morocco	PA04	PA04	A06	A06
Namibia	NA	NA	A06	A06
Nigeria	NA	NA	A02/3	A02/3
Réunion	NA	NA	NC	NC
Saint Helena	NA	NA	NC	NC
Seychelles	NA	NA	A06	A06
South Africa	PA02/3	NA	A06	A06
Swaziland	NA	NA	A05	A05
Tunisia	NA	NA	A05	A05
Western Sahara	NC	NC	NC	NC
Zimbabwe	NA	NA	A05	A05
<i>Asia</i>				
Bahrain	NA	NA	A06	A06
Brunei Darussalam	NA	NA	A06	A06
China	NA	NA	A06	A06
Cyprus	A05	A05	A06	A06
Democratic People's Republic of Korea	NA	NA	NA	NA
Hong Kong Special Administrative Region of China	A04	A04	A06	A06
India	PA02/3	PA02/3	A06	A06
Indonesia	PA02/3	PA02/3	A06	A06
Iran, Islamic Republic of	PA02/3	PA02/3	A06	A06
Iraq	NA	NA	NA	NA
Israel	A06	A06	A06	A06
Jordan	NA	NA	A06	A06
Kuwait	NA	NA	NA	NA
Lebanon	NA	NA	A04	A04
Macao Special Administrative Region of China	NA	NA	A06	A06
Malaysia	A04	NA	A06	A06
Mongolia	NA	NA	A06	A06
Occupied Palestinian Territory	NA	NA	NC	NC
Oman	NA	NA	A06	A06
Pakistan	NA	NA	A06	A06
Philippines	NA	NA	A06	A06
Qatar	NA	NA	A06	A06

## Annex 1 Availability of core ICT indicators

Level of development, region and economy	ICT1	ICT2	ICT3	ICT4
Republic of Korea	A02/3	PA02/3	A06	A06
Saudi Arabia	NA	NA	A06	A06
Singapore	PA02/3	PA02/3	A06	A06
Sri Lanka	NA	NA	A05	A05
Syrian Arab Republic	NA	NA	A06	A06
Taiwan, China	NC	NC	A06	A06
Thailand	A06	NA	A06	A06
Turkey	NA	NA	A06	A06
United Arab Emirates	NA	NA	NA	NA
Viet Nam	NA	NA	A05	A05
<i>Latin America and the Caribbean</i>				
Anguilla	NA	NA	A04	A04
Antigua and Barbuda	NA	NA	A05	A05
Argentina	NA	NA	A06	A06
Aruba	NA	NA	A04	A04
Bahamas	NA	NA	NA	NA
Barbados	NA	NA	A06	A06
Belize	NA	NA	A06	A06
Bolivia	NA	NA	A06	A06
Brazil	A04	NA	A06	A06
British Virgin Islands	NA	NA	NC	NC
Cayman Islands	NA	NA	NC	NC
Chile	A05	A05	A06	A06
Colombia	NA	NA	A06	A06
Costa Rica	NA	NA	A06	A06
Cuba	A06	A06	A04	A04
Dominica	NA	NA	A06	A06
Dominican Republic	NA	NA	NA	NA
Ecuador	NA	NA	A06	A06
El Salvador	NA	NA	A06	A06
Falkland Islands (Malvinas)	NA	NA	NC	NC
French Guiana	NA	NA	NC	NC
Grenada	NA	NA	A05	A05
Guadeloupe	NA	NA	NC	NC
Guatemala	NA	NA	A06	A06
Guyana	NA	NA	A06	A06
Honduras	NA	NA	A06	A06
Jamaica	NA	NA	A06	A06
Martinique	NA	NA	NC	NC
Mexico	NA	NA	A06	A06
Montserrat	NA	NA	A06	A06
Netherlands Antilles	NA	NA	NA	NA
Nicaragua	NA	NA	A06	A06
Panama	A06	NA	A06	A06
Paraguay	NA	NA	A06	A06
Peru	NA	NA	A06	A06
Puerto Rico	NA	NA	NC	NC
Saint Kitts and Nevis	NA	NA	A06	A06
Saint Lucia	NA	NA	A05	A05
Saint Martin (French part)	NA	NA	NC	NC
Saint Vincent and the Grenadines	NA	NA	A06	A06
Saint-Barthélemy	NA	NA	NC	NC
Suriname	NA	NA	A05	NA
Trinidad and Tobago	NA	NA	A06	A06
Turks and Caicos Islands	NA	NA	A04	A04
United States Virgin Islands	NA	NA	NC	NC
Uruguay	NA	NA	A06	A06
Venezuela (Bolivarian Republic of)	NA	NA	A06	A06
<i>Oceania</i>				
American Samoa	NA	NA	NA	NA
Cook Islands	NA	NA	A05	NA
Fiji	NA	NA	A06	A06
French Polynesia	NA	NA	A06	A06
Guam	NA	NA	NA	NA
Marshall Islands	NA	NA	NA	NA
Micronesia, Federated States of	NA	NA	NA	NA
Nauru	NA	NA	NA	NA
New Caledonia	NA	NA	A06	A06

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Level of development, region and economy	ICT1	ICT2	ICT3	ICT4
Niue	NA	NA	NA	NC
Norfolk Island	NA	NA	NC	NC
Northern Mariana Islands	NA	NA	NC	NC
Palau	NA	NA	NC	NC
Papua New Guinea	NA	NA	A02/3	A02/3
Pitcairn	NA	NA	NC	NC
Tokelau	NA	NA	NA	NA
Tonga	NA	NA	NA	NA
Wallis and Futuna Islands	NA	NA	A02/3	NA
<b>Least developed economies</b>				
<i>Africa</i>				
Angola	NA	NA	NA	NA
Benin	NA	NA	A05	A05
Burkina Faso	NA	NA	A04	A04
Burundi	NA	NA	A05	A05
Cape Verde	NA	NA	A06	A06
Central African Republic	NA	NA	A05	A05
Chad	NA	NA	NA	NA
Comoros	NA	NA	NA	NA
Democratic Republic of the Congo	NA	NA	NA	NA
Djibouti	NA	NA	NA	NA
Equatorial Guinea	NA	NA	NA	NA
Eritrea	NA	NA	A02/3	A02/3
Ethiopia	NA	NA	A06	A06
Gambia	NA	NA	A06	A06
Guinea	NA	NA	A02/3	A02/3
Guinea Bissau	NA	NA	NA	NA
Lesotho	NA	NA	A02/3	A02/3
Liberia	NA	NA	NA	NA
Madagascar	NA	NA	A06	A06
Malawi	NA	NA	A06	A06
Mali	NA	NA	A04	A04
Mauritania	NA	NA	A06	NA
Mozambique	NA	NA	A06	A06
Niger	NA	NA	A05	A05
Rwanda	NA	NA	A02/3	A02/3
Sao Tome and Principe	NA	NA	A06	A06
Senegal	NA	NA	A06	A06
Sierra Leone	NA	NA	A02/3	A02/3
Somalia	NA	NA	NA	NA
Sudan	NA	NA	A06	A06
Togo	NA	NA	A05	A05
Uganda	NA	NA	A06	A06
United Republic of Tanzania	NA	NA	A06	A06
Zambia	NA	NA	A06	A06
<i>Asia</i>				
Afghanistan	NA	NA	NA	NA
Bangladesh	NA	NA	A04	A04
Bhutan	NA	NA	NA	NA
Cambodia	NA	NA	A04	A04
Lao People's Democratic Republic	NA	NA	NA	NA
Maldives	NA	NA	A06	A05
Myanmar	NA	NA	NA	NA
Nepal	NA	NA	A02/3	A02/3
Timor-Leste	NA	NA	A05	A05
Yemen	NA	NA	A06	A06
<i>Latin America and the Caribbean</i>				
Haiti	NA	NA	NA	NA
<i>Oceania</i>				
Kiribati	NA	NA	A05	NA
Samoa	NA	NA	A04	A04
Solomon Islands	NA	NA	NA	NA
Tuvalu	NA	NA	NA	NA
Vanuatu	NA	NA	NA	NA

Source: UNCTAD, UNIDO, OECD and UN COMTRADE.

## Annex 2. Core indicators on ICT infrastructure and access

Indicator		Definitions
Basic core indicators		
A1	Fixed telephone lines per 100 inhabitants	<p><i>Fixed telephone lines per 100 inhabitants</i> is calculated by dividing the number of fixed telephone lines by the population and then multiplying by 100.</p> <p><i>Fixed telephone lines</i> refer to telephone lines connecting a subscriber's terminal equipment to the public switched telephone network (PSTN) and which have a dedicated port on a telephone exchange.</p>
A2	Mobile cellular telephone subscribers per 100 inhabitants	<p><i>Mobile cellular telephone subscribers per 100 inhabitants</i> is obtained by dividing the number of mobile cellular subscribers by the population and then multiplying by 100.</p> <p><i>Mobile cellular telephone subscribers</i> refer to users of portable telephones subscribing to a public mobile telephone service using cellular technology, which provides access to the PSTN. This can include analogue and digital cellular systems. This should also include subscribers to IMT-2000 (Third Generation, 3G). Users of both post-paid subscriptions and pre-paid accounts are included.</p>
A3	Computers per 100 inhabitants	<p><i>Computers per 100 inhabitants</i> is obtained by dividing the estimated number of computers installed in a country by the population and then multiplying by 100.</p> <p><i>Computers</i> measures the number of computers installed in a country. The statistic includes PCs, laptops, notebooks etc, but excludes terminals connected to mainframe and mini-computers that are primarily intended for shared use, and devices such as smart-phones that have only some, but not all, of the components of a PC (e.g. they may lack a full-sized keyboard, a large screen, an Internet connection, drives etc.).</p>
A4	Internet subscribers per 100 inhabitants	<p><i>Internet subscribers per 100 inhabitants</i> is obtained by dividing the number of Internet subscribers by the population and then multiplying by 100.</p> <p><i>Internet subscribers</i> refer to users of the Internet subscribing to paid fixed access to the public Internet (a TCP/IP connection), including dial-up and fixed broadband. It excludes subscribers with access to data communications (including the Internet) via mobile cellular networks. Only active subscribers that have used the system within a reasonable period of time are included.</p>

A5	Broadband Internet subscribers per 100 inhabitants	<p><i>Broadband Internet subscribers per 100 inhabitants</i> is obtained by dividing the number of broadband Internet subscribers by the population and then multiplying by 100.</p> <p><i>Broadband Internet subscribers</i> refer to users of the Internet subscribing to paid high-speed fixed access to the public Internet (a TCP/IP connection), at speeds equal to, or greater than, 256 Kbit/s, in one or both directions. It excludes subscribers with access to data communications (including the Internet) via mobile cellular networks.</p>
A6	International Internet bandwidth per inhabitant (bits)	<p><i>International Internet bandwidth per inhabitant</i> is obtained by dividing the amount of bandwidth by the population.</p> <p><i>International Internet bandwidth</i> refers to the total capacity of international Internet bandwidth. If capacity is asymmetric (i.e. more incoming than outgoing), the incoming capacity is used.</p>
A7	Percentage of population covered by mobile cellular telephony	<p><i>Percentage of population covered by mobile cellular telephony</i> refers to the percentage of a country's inhabitants that live within areas served by a mobile cellular signal, irrespective of whether or not they are subscribers. Note that this measures the theoretical ability to use mobile cellular services if one has a cellular telephone and a subscription.</p>
A8	Internet access tariffs (20 hours per month), in US\$, and as a percentage of per capita income	<p><i>The Internet access tariff</i> includes the tariff components of monthly line rental, line usage charge and Internet access charge, plus any tax that may be levied (as this is a service used by both residential and business consumers). The tariff chosen for a particular country would be the package for 20 hours per month that is the cheapest, that is widely available (or, in the case of regional service providers, is available in the capital city) and is available to the general public without restriction (e.g. excluding in-company or limited time offers, and excluding offers that are bundled with some other service). The price comparison is expressed in US\$. The indicator should be compared, as far as possible, for the same date between countries.</p> <p><i>As a percentage of per capita income</i> involves dividing the Internet access tariff by the average monthly gross national income per capita of the country.</p>
A9	Mobile cellular tariffs (100 minutes of use per month), in US\$, and as a percentage of per capita income	<p>The <i>Mobile cellular tariff</i> includes the tariff components of monthly service rental (if relevant), 50 minutes of local peak time calling and 50 minutes of local off-peak calling, plus tax. Differences in the distance of calls, which may be applicable in some countries, are not taken into account, nor are international calls or SMS messages. The possible one-time charge for connection is not taken into account, except where this is bundled into the costs of a pre-paid account. Countries should calculate the tariff either on a post-paid or a pre-paid service, whichever one is more popularly used. If more than 50% of the mobile cellular subscribers use pre-paid, then the tariff should also be based on the pre-paid service, and vice versa. The price comparison is expressed in US\$. The indicator should be compared, as far as possible, for the same date between countries.</p> <p><i>As a percentage of per capita income</i> involves dividing the mobile cellular tariff by the average monthly gross national income per capita of the country.</p>
A10	Percentage of localities with public Internet access centres (PIACs)	<p><i>Percentage of localities with public Internet access centres (PIACs)</i> is computed by dividing the number of localities with at least one PIAC by the total number of the country's localities and then multiplying by 100. The indicator may be broken down by rural/urban.</p> <p><i>A public Internet access centre (PIAC)</i> is a site, location, or centre of instruction at which Internet access is made available to the public, on a full-time or part-time basis. This may include telecentres, digital community centres, Internet cafés, libraries, education centres and other similar establishments, whenever they offer Internet access to the general public. All such centres should have at least one public computer for Internet access. Localities refer to a country's villages, towns and cities.</p> <p>Note that this indicator is used to measure the WSIS target "to connect villages with ICTs and establish community access points" by 2015.</p>



## Annex 2. Core indicators on ICT infrastructure and access

Extended core indicators		
A11	Radio sets per 100 inhabitants	<p><i>Radio sets per 100 inhabitants</i> is obtained by dividing the number of radio sets in use by the population and then multiplying by 100.</p> <p>A <i>radio set</i> is a device capable of receiving broadcast radio signals, using popular frequencies, such as FM, AM, LW and SW. A radio set may be a stand-alone device, or it may be integrated into another device, such as a Walkman, a car, or an alarm clock.</p>
A12	Television sets per 100 inhabitants	<p><i>Television sets per 100 inhabitants</i> is obtained by dividing the number of sets in use by the population and then multiplying by 100.</p> <p>A <i>television set</i> is a device capable of receiving broadcast television signals, using popular access means such as over-the-air, cable and satellite. A television set may be a stand-alone device, or it may be integrated into another device, such as a computer or a mobile phone.</p>

Source: Core ICT Indicators (*Partnership*, 2005c) and Telecommunication Indicators Handbook (ITU, 2007a).



## Annex 3. Core indicators on access to, and use of, ICT by households and individuals

Indicator		Definitions
Basic core indicators		
HH1	Proportion of households with a radio	<p>The <i>proportion of households with a radio</i> is calculated by dividing the number of in-scope households with a radio by the total number of in-scope households.</p> <p>A <i>radio</i> is a device capable of receiving broadcast radio signals, using popular frequencies, such as FM, AM, LW and SW. A radio set may be a stand-alone device, or it may be integrated into another device, such as a ‘Walkman’, a car or an alarm clock.</p>
HH2	Proportion of households with a TV	<p>The <i>proportion of households with a TV</i> is calculated by dividing the number of in-scope households with a TV by the total number of in-scope households.</p> <p>A <i>TV</i> (television) is a device capable of receiving broadcast television signals, using popular access means such as over-the-air, cable and satellite. A television set may be a stand-alone device, or it may be integrated into another device, such as a computer or a mobile phone.</p>
HH3	Proportion of households with a fixed line telephone	<p>The <i>proportion of households with a fixed line telephone</i> is calculated by dividing the number of in-scope households with a fixed line telephone by the total number of in-scope households.</p> <p>A <i>fixed telephone line</i> refers to a telephone line connecting a customer’s terminal equipment (e.g. telephone set, facsimile machine) to the public switched telephone network (PSTN) and which has a dedicated port on a telephone exchange.</p>
HH4	Proportion of households with a mobile cellular telephone	<p>The <i>proportion of households with a mobile cellular telephone</i> is calculated by dividing the number of in-scope households with a mobile cellular telephone by the total number of in-scope households.</p> <p>A <i>mobile cellular telephone</i> refers to a portable telephone subscribing to a public mobile telephone service using cellular technology, which provides access to the PSTN. This includes analogue and digital cellular systems, as well as IMT-2000 (3G). Users of both post-paid subscriptions and pre-paid accounts are included.</p>

HH5	Proportion of households with a computer	<p>The <i>proportion of households with a computer</i> is calculated by dividing the number of in-scope households with a computer by the total number of in-scope households.</p> <p>A <i>computer</i> includes: a desktop, portable or handheld computer (e.g. a personal digital assistant). It does not include equipment with some embedded computing abilities such as mobile phones or TV sets.<sup>1</sup></p>
HH6	Proportion of individuals who used a computer (from any location) in the last 12 months	<p>The <i>proportion of individuals who used a computer</i> is calculated by dividing the total number of in-scope individuals who used a computer from any location in the last 12 months by the total number of in-scope individuals.</p>
HH7	Proportion of households with Internet access at home	<p>The <i>proportion of households with Internet access at home</i> is calculated by dividing the number of in-scope households with Internet access by the total number of in-scope households.</p> <p>The <i>Internet</i> is a world-wide public computer network. It provides access to a number of communication services including the World Wide Web and carries email, news, entertainment and data files. Access is not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.</p>
HH8	Proportion of individuals who used the Internet (from any location) in the last 12 months	<p>The <i>proportion of individuals who used the Internet</i> is calculated by dividing the total number of in-scope individuals who used the Internet (from any location) in the last 12 months by the total number of in-scope individuals.</p>
HH9	Location of individual use of the Internet in the last 12 months	<p>For international comparability, output is most simply presented as the proportion of in-scope individuals using the Internet at each location, for instance, the proportion of individuals using the Internet at home, at work etc. An alternative presentation is the proportion of Internet users using the Internet from each location. Individuals can respond in respect of more than one location.</p>
	At home	
	At work	Where a person's workplace is located at his/her home, then he/she would answer yes to the home category only.
	Place of education	
	At another person's home	
	Community Internet access facility	Includes access at community facilities such as public libraries, publicly provided Internet kiosks, digital community centres, other government agencies; access is typically free or low cost and is available to the general public.
	Commercial Internet access facility	Includes publicly available access at Internet or cyber cafés, hotels, airports etc; even though the venue is commercial, the cost is not necessarily at full market price.
	Other places	
HH10	Internet activities undertaken by individuals in the last 12 months	<p>For international comparability, output is most simply presented as the proportion of in-scope individuals undertaking each activity, for instance, the proportion of individuals using the Internet to get information about goods or services. An alternative presentation is the proportion of Internet users undertaking each activity.</p> <p>Note that these activities are restricted to private purposes and therefore exclude activities such as purchasing over the Internet undertaken as part of a person's job. Individuals can respond in respect of more than one activity and activities are not mutually exclusive.</p>

### Annex 3. Core indicators on access to, and use of, ICT by households and individuals

	For getting information:	
	About goods or services	
	Related to health or health services	Health information covers injury, disease, nutrition and improving health generally.
	From government organizations/public authorities via websites or email	Government organizations/public authorities are preferably defined per the SNA93 ( <a href="http://unstats.un.org/unsd/sna1993/glossform.asp?getitem=219">http://unstats.un.org/unsd/sna1993/glossform.asp?getitem=219</a> ). They include government organizations at local, regional and national level.
	Other information searches or general web browsing	
	For communicating	Includes sending or receiving email, using chat rooms/sites, message boards, instant messaging, telephoning via Internet.
	For purchasing or ordering goods or services	Includes purchasing and downloading of digitized products, such as music, from the Internet.
	For Internet banking	
	For education or learning activities	This refers to formal learning activities such as study associated with school or tertiary education courses as well as distance education involving on-line activities. (A more narrow interpretation is likely to be less meaningful as it could include a range of activities such as using the Internet to search for information.)
	For dealing with government organizations/public authorities	Government organizations/public authorities are preferably defined per the SNA93 ( <a href="http://unstats.un.org/unsd/sna1993/glossform.asp?getitem=219">http://unstats.un.org/unsd/sna1993/glossform.asp?getitem=219</a> ). They include government organizations at local, regional and national level.
	For leisure activities:	
	Playing/downloading video or computer games	Includes file sharing games and playing games on line.
	Internet activities undertaken by individuals in the last 12 months	
	Downloading movies, music or software	Includes file sharing and using web radio or web television. For software, includes downloading of patches and upgrades.
	Reading/downloading electronic books, newspapers or magazines	Includes accessing news websites.
	Other leisure activities	Includes gambling.
Extended core indicators		
HH11	Proportion of individuals with use of a mobile cellular telephone	<p>The <i>proportion of individuals with use of a mobile cellular telephone</i> is calculated by dividing the total number of in-scope individuals with use of a mobile telephone by the total number of in-scope individuals.</p> <p><i>Use of a mobile telephone</i> does not mean that the telephone is owned or paid for by the person but should be reasonably available through work, a friend or family member, etc. It excludes occasional use, for instance, borrowing a mobile phone to make a call.</p>

HH12	Proportion of households with access to the Internet by type of access	<p>For international comparability, output is most simply presented as the proportion of in-scope households using each type of access service, for instance, the proportion of households accessing the Internet by DSL. Additionally, output should be available for the aggregations, the proportion of households with broadband/narrowband access to the Internet. Alternatively, output can be presented as a proportion of households with Internet access.</p> <p>Categories should allow aggregation to narrowband and broadband. As households can use more than one type of access service, multiple responses are possible.</p>
	Analogue modem (dial-up via standard phone line)	Dial-up is a connection to the Internet via an analogue modem and telephone line, which requires that the modem dial a phone number when Internet access is needed. The modem converts a digital signal into analogue for transmission by traditional (copper) telephone lines. It also converts analogue transmissions back to digital.
	ISDN (Integrated Services Digital Network)	ISDN is a telecommunication service that turns a traditional (copper) telephone line into a higher speed digital link. ISDN is usually considered to be narrowband.
	DSL (Digital Subscriber Line, includes ADSL, SDSL, VDSL, etc.)	DSL (digital subscriber line) line is a technology for bringing high-bandwidth information to homes and small businesses over ordinary copper telephone lines. Speed should be equal to, or greater than, 256 Kbit/s, in one or both directions.
	Cable modem	A cable modem uses cable TV lines for connecting to the Internet.
	Other narrowband	Includes mobile phone and other forms of access with an advertised download speed of less than 256 Kbit/s, in one or both directions. Narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and i-mode.
	Other broadband	Includes high speed leased lines, fibre-to-the-home, some mobile phone access (3G and 3.5G), powerline, satellite, fixed wireless, WiMAX etc with an advertised download speed of equal to, or greater than, 256 Kbit/s, in one or both directions. Broadband mobile phone access services include Wideband CDMA (W-CDMA), known as Universal Mobile Telecommunications System (UMTS) in Europe; High-speed Downlink Packet Access (HSDPA), complemented by High-Speed Uplink Packet Access (HSUPA); CDMA2000 1xEV-DO and CDMA 200 1xEV-DV.
HH13	Frequency of individual access to the Internet in the last 12 months (from any location)	<p>For international comparability, output is most simply presented as the proportion of in-scope individuals using the Internet with each frequency, for instance, the proportion of individuals using the Internet at least once a day. An alternative presentation is the proportion of Internet users using the Internet with each frequency.</p> <p>It is recommended that countries collect this information in respect of a typical period; therefore, respondents should ignore weekends (if they only access the Internet from work) and breaks from their usual routine, such as holidays.</p>
	At least once a day	
	At least once a week but not every day	
	At least once a month but not every week	
	Less than once a month	

### Annex 3. Core indicators on access to, and use of, ICT by households and individuals

Reference indicator		
HHR1	Proportion of households with electricity	Electricity is not an ICT commodity, but is an important prerequisite for using many ICTs. It is therefore included in the core list as a reference indicator.

Source: Core ICT Indicators (*Partnership*, 2005c). Updates have been applied to some definitions (radios, community Internet access facilities, mobile phone and Internet access service technologies) based on the Telecommunication Indicators Handbook (ITU, 2007a). The updates are not expected to affect statistical time series.

#### *Classificatory variables*

For the household access indicators (HH1, HH2, HH3, HH4, HH5 and HH7) sub-indicators may be constructed using the household classificatory variables, *household composition* and *household size*. These are defined in *Partnership* (2005c) as follows:

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

For the individual use indicators (HH6, HH8, HH9, HH10, HH11, HH12 and HH13), sub-indicators may be constructed using the individual classificatory variables, age, gender, highest education level, employment status and occupation. These are defined in *Partnership* (2005c) as follows:

- Age: to show the differences between age groupings, reasonably fine and equal-sized ranges are proposed: 16 to 24; 25 to 34; 35 to 44; 45 to 54; 55 to 64; 65 to 74;
- Gender;
- Highest education level received: a four-way classification is proposed: No formal education or primary education (ISCED 0,1); Lower secondary education (ISCED 2); Upper secondary or post-secondary non-tertiary (ISCED 3,4); Tertiary (ISCED 5,6);
- Employment status (four-way classification: paid employee; self-employed, unemployed; not in the labour force); and
- Occupation (using ISCO88 major groups where possible).

<sup>1</sup> Note that this is a different definition of a computer from the one used for indicator A3, with the main difference being that personal digital assistants (PDA) are included here but excluded from A3. There are practical and historical reasons for this difference but, for the purposes of indicators HH5 and HH6, the functionality of PDAs, which may include Internet connectivity, is of interest.





## Annex 4. Core indicators on the use of ICT by businesses

Indicator		Definitions
Basic core indicators		
B1	Proportion of businesses using computers	<p>The <i>proportion of businesses using computers</i> is calculated by dividing the number of in-scope businesses using computers during the 12-month reference period by the total number of in-scope businesses.</p> <p>A <i>computer</i> includes: a desktop, portable or handheld computer (e.g. a personal digital assistant), minicomputer and mainframe. A computer does not include equipment with some embedded computing abilities, such as mobile phones or TV sets, nor does it include computer-controlled machinery or electronic tills.</p>
B2	Proportion of employees using computers	<p>The <i>proportion of employees using computers</i> is calculated by dividing the number of employees using computers (in all in-scope businesses) by the total number of employees (in all in-scope businesses).</p> <p><i>Employees</i> refer to all persons working for the business, not only those working in clerical jobs. They include working proprietors and partners, as well as employees.</p>
B3	Proportion of businesses using the Internet	<p>The <i>proportion of businesses using the Internet</i> is calculated by dividing the number of in-scope businesses using the Internet by the total number of in-scope businesses.</p> <p>The <i>Internet</i> refers to Internet protocol (IP) based networks: WWW (the World Wide Web), an extranet over the Internet, EDI over the Internet, Internet accessed by mobile phones and Internet email.</p>
B4	Proportion of employees using the Internet	<p>The <i>proportion of employees using the Internet</i> is calculated by dividing the number of employees using the Internet (in all in-scope businesses) by the total number of employees (in all in-scope businesses).</p>

B5	Proportion of businesses with a web presence	<p>The <i>proportion of businesses with a web presence</i> is calculated by dividing the number of in-scope businesses with a web presence by the total number of in-scope businesses.</p> <p>A <i>web presence</i> includes a website, home page or presence on another entity's website (including a related business). It excludes inclusion in an on-line directory and any other web pages where the business does not have substantial control over the content of the page.</p>
B6	Proportion of businesses with an intranet	<p>The <i>proportion of businesses with an intranet</i> is calculated by dividing the number of in-scope businesses with an intranet by the total number of in-scope businesses.</p> <p>An <i>intranet</i> refers to an internal company communications network using Internet protocol allowing communication within the organization. It is typically set up behind a firewall to control access.</p>
B7	Proportion of businesses receiving orders over the Internet	<p>For international comparability, the <i>proportion of businesses receiving orders over the Internet</i> is most simply calculated by dividing the number of in-scope businesses receiving orders over the Internet by the total number of in-scope businesses. Alternatively, output can be presented as the proportion of in-scope businesses using the Internet.</p> <p><i>Orders received</i> include orders received via the Internet whether or not payment was made on line. They include orders received via websites, specialized Internet marketplaces, extranets, EDI over the Internet, Internet-enabled mobile phones and email. They also include orders received on behalf of other organizations – and orders received by other organizations on behalf of the business.</p> <p><i>Orders received</i> exclude orders that were cancelled or not completed.</p>
B8	Proportion of businesses placing orders over the Internet	<p>For international comparability, the <i>proportion of businesses placing orders over the Internet</i> is most simply calculated by dividing the number of in-scope businesses placing orders over the Internet by the total number of in-scope businesses. Alternatively, output can be presented as the proportion of in-scope businesses using the Internet.</p> <p><i>Orders placed</i> include orders placed via the Internet whether or not payment was made on line. They include orders placed via websites, specialized Internet marketplaces, extranets, EDI over the Internet, Internet-enabled mobile phones and email.</p> <p><i>Orders placed</i> exclude orders that were cancelled or not completed.</p>
Extended core indicators		
B9	Proportion of businesses using the Internet by type of access	<p>For international comparability, output is most simply presented as the proportion of in-scope businesses using each type of access service, for instance, the proportion of businesses accessing the Internet by DSL. Additionally, output should be available for the aggregations, the proportion of businesses with broadband and narrowband access to the Internet. Alternatively, output can be presented as a proportion of businesses using the Internet.</p> <p>Categories should allow aggregation to narrowband and broadband, where broadband excludes slower technologies, such as dial-up, ISDN and most 2G mobile phone access. Broadband will usually have an advertised download speed of at least 256 Kbit/s, in one or both directions. As businesses can use more than one type of access service, multiple responses are possible.</p>

## Annex 4. Core indicators on the use of ICT by businesses

	Analogue modem (dial-up via standard phone line)	<i>Dial-up</i> is a connection to the Internet via an analogue modem and telephone line, which requires that the modem dial a phone number when Internet access is needed. The modem converts a digital signal into analogue for transmission by traditional (copper) telephone lines. It also converts analogue transmissions back to digital.
	ISDN (Integrated Services Digital Network)	<i>ISDN</i> is a telecommunication service that turns a traditional (copper) telephone line into a higher speed digital link. ISDN is usually considered to be narrowband.
	DSL (Digital Subscriber Line, including ADSL, SDSL, VDSL, etc.)	<i>DSL</i> (digital subscriber line) line is a technology for bringing high-bandwidth information to homes and small businesses over ordinary copper telephone lines. Speed should be equal to, or greater than, 256 Kbit/s, in one or both directions.
	Cable modem	A <i>cable modem</i> uses cable TV lines for connecting to the Internet.
	Other narrowband	Includes mobile phone and other forms of access with an advertised download speed of less than 256 Kbit/s, in one or both directions. Narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and <i>i-mode</i> .
	Other broadband	Includes high speed leased lines, fibre-to-the-home, some mobile phone access (3G and 3.5G), powerline, satellite, fixed wireless, WiMAX etc with an advertised download speed of equal to, or greater than, 256 Kbit/s, in one or both directions.  Broadband mobile phone access services include <i>Wideband CDMA</i> (W-CDMA), known as <i>Universal Mobile Telecommunications System</i> (UMTS) in Europe; High-speed Downlink Packet Access (HSDPA), complemented by High-Speed Uplink Packet Access (HSUPA); CDMA2000 1xEV-DO and CDMA 200 1xEV-DV.
B10	Proportion of businesses with a local area network (LAN)	The <i>proportion of businesses with a LAN</i> is calculated by dividing the number of in-scope businesses with a LAN by the total number of in-scope businesses.  A <i>local area network</i> (LAN) refers to a network connecting computers within a localized area such as a single building, department or site; it may be wireless.
B11	Proportion of businesses with an extranet	The <i>proportion of businesses with an extranet</i> is calculated by dividing the number of in-scope businesses with an extranet by the total number of in-scope businesses.  An <i>extranet</i> is a closed network that uses Internet protocols to securely share a business' information with suppliers, vendors, customers or other businesses partners. It can take the form of a secure extension of an Intranet that allows external users to access some parts of the business' Intranet. It can also be a private part of the business' website, where business partners can navigate after being authenticated in a login page. <sup>1</sup>
B12	Proportion of businesses using the Internet by type of activity	For international comparability, output is most simply presented as the proportion of in-scope businesses undertaking each activity, for instance, the proportion of businesses using the Internet for sending or receiving emails. An alternative presentation is the proportion of business Internet users undertaking each activity.
	For getting information about goods or services:	

	For getting information from government organizations/public authorities via websites or email	<i>Government organizations/public authorities</i> are preferably defined per the SNA93 ( <a href="http://unstats.un.org/unsd/sna1993/glossform.asp?getitem=219">http://unstats.un.org/unsd/sna1993/glossform.asp?getitem=219</a> ). They include government organizations at local, regional and national level.
	For sending or receiving email	
	For performing Internet banking or accessing other financial services	
	For interacting with government organizations/public authorities	Interacting with government organizations includes downloading/requesting forms, completing/lodging forms on line, making on-line payments and purchasing from, or selling to, government organizations. It does not include getting information from government organizations. <sup>2</sup>  <i>Government organizations/public authorities</i> are preferably defined per the SNA93 ( <a href="http://unstats.un.org/unsd/sna1993/glossform.asp?getitem=219">http://unstats.un.org/unsd/sna1993/glossform.asp?getitem=219</a> ). They include government organizations at local, regional and national level.
	For providing customer services	Customer services include providing on-line or emailed product catalogues or price lists, product specification or configuration on line, after sales support, and order tracking on line.
	For delivering products on line	Delivering products on line refers to products delivered over the Internet in digitized form, e.g. reports, software, music, videos, computer games; and on-line services, such as computer-related services, information services, travel bookings or financial services.
	For other information searches or research activities	

Source: Core ICT Indicators (*Partnership*, 2005c). Updates have been applied to definitions of Internet access service technologies based on the Telecommunication Indicators Handbook (ITU, 2007a). Other changes have been made based on the UNCTAD Manual for the Production of Statistics on the Information Economy (UNCTAD, 2007a) and are shown in the endnotes. The updates are not expected to affect statistical time series.

<sup>1</sup> The definition of an extranet has changed since originally published in *Core ICT Indicators (Partnership, 2005c)*.

<sup>2</sup> Note that the response category and definition relating to dealing with government organizations have changed slightly since originally published in *Core ICT Indicators (Partnership, 2005c)*.

### *Classificatory variables*

Sub-indicators may be constructed for the business use indicators using the classificatory variables, employment size and industry (often referred to as *economic activity*). These are defined in *Partnership (2005c)* as follows:

- A minimal proposed broad industry output classification based on ISIC Rev. 3.1 is: manufacturing (ISIC D), construction (ISIC F), wholesale and retail trade (including repair of motor vehicles, motorcycles and personal and household goods) (ISIC G), hotels and restaurants (ISIC H), transport, storage and communications (ISIC I), and real estate, renting and business services (ISIC K). Note that many economies collect data for a broader industry scope than this; and
- The size classification proposed is: *10-49 employees*; *50-249 employees* and *250 or more employees*. As with industry, many economies collect information for a broader scope than this (commonly including smaller businesses).



## Annex 5. Core indicators for the ICT sector and trade in ICT goods

Indicator		Definitions
ICT1	Proportion of total business sector workforce involved in the ICT sector (usually expressed as a percentage)	<i>ICT workforce</i> (or ICT employment) consists of those persons employed in businesses that are classified as belonging to the ICT sector. Total business workforce represents all persons engaged in domestic production in the business sector. In a national accounts framework, employment can be measured in terms of headcounts, jobs, full-time equivalents (FTE) or hours worked. Currently, total headcounts or jobs are used for most countries.
ICT2	Value added in the ICT sector (as a percentage of total business sector value added).	<i>Value added</i> for a particular industry represents its contribution to national GDP. It is sometimes referred to as GDP by industry and is not directly measured (but is estimated in a national accounts framework). In general, it is calculated as the difference between production (gross output) and intermediate inputs (the energy, materials and services required to produce final output). See also Table 19.
ICT3	ICT goods imports as a percentage of total imports	<i>ICT goods</i> are defined by the OECD's ICT goods classification in terms of the 1996 and 2002 HS classification (see Annex 6).
ICT4	ICT goods exports as a percentage of total exports	Other concepts are per the <i>UN COMTRADE</i> database e.g. re-exports and re-imports are not netted out, and data are presented in US dollars (converted by the UN from country currencies).

Source: Core ICT Indicators (*Partnership*, 2005c).





## Annex 6. OECD list of ICT goods (2003)

HS 2002	HS 1996	Telecommunications equipment	Notes
851711	851711	Line telephone sets with cordless handsets	
851719	851719	Other telephone sets, video phones	
851721	851721	Facsimile machines	
851722	851722	Teleprinters	
851730	851730	Telephonic or telegraphic switching apparatus	
851750	851750	Other apparatus, for carrier-current line systems or for digital line systems	
851780	851780	Other electrical apparatus for line telephony or line telegraphy	
851790	851790	Parts for other electrical apparatus for line telephony or line telegraphy	
852020	852020	Telephone answering machines	
852510	852510	Transmission apparatus for radio-telephony, radio-telegraphy, radio-broadcasting or television not incorporating reception apparatus	
852520	852520	Transmission apparatus for radio-telephony, radio-telegraphy, radio-broadcasting or television incorporating reception apparatus	
852530	852530	Television cameras	
852610	852610	Radar apparatus	
852790	852790	Reception apparatus for radio-telephony, radio-telegraphy or radio-broadcasting, whether or not combined, in the same housing, with sound recording or reproducing apparatus or a clock, n.e.s	
852910	852910	Aerials and aerial reflectors of all kinds; parts suitable for use therewith	
853110	853110	Burglar or fire alarms and similar apparatus	(1)
854420	854420	Co-axial cable and other co-axial electric conductors	
854470	854470	Optical fibre cables	
HS 2002	HS 1996	Computer and related equipment	
847110	847110	Analogue or hybrid automatic data processing machines	
847130	847130	Portable digital automatic data processing machines, weighing not more than 10 kg, consisting of at least a central processing unit, a keyboard and a display	
847141	847141	Digital automatic data processing machines comprising in the same housing at least a central processing unit and an input and output unit, whether or not combined	
847149	847149	Other digital automatic data processing machines, presented in the form of systems	
847150	847150	Digital processing units other than those of subheadings 8471.41 and 8471.49, whether or not containing in the same housing one or two of the following types of unit : storage units, input units, output units	
847160	847160	Automatic data processing machines, input or output units, whether or not containing storage units in the same housing	

HS 2002	HS 1996	Telecommunications equipment	Notes
847170	847170	Automatic data processing machines, storage units	
847180	847180	Other units of automatic data processing machines	
847190	847190	Magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included	
847330	847330	Parts and accessories of the machines of heading No. 84.71	
HS 2002	HS 1996	Electronic components	Notes
850431	850431	Electrical transformers having a power handling capacity not exceeding 1 kVA	(1)
850450	850450	Inductors	(1)
850490	850490	Parts of: electrical transformers, static converters (for example, rectifiers) and inductors	(1)
852330	852330	Cards incorporating a magnetic stripe, unrecorded	(1)
852460	852460	Cards incorporating a magnetic stripe, recorded	(1)
852990	852990	Parts suitable for use solely or principally with the apparatus of headings Nos. 85.25 to 85.28 except aerials and aerials reflectors	
853221	853221	Capacitors, fixed, tantalum having a reactive power handling capacity of less than 0.5 kvar	
853224	853224	Capacitors, fixed, ceramic dielectric, multilayer having a reactive power handling capacity of less than 0.5 kvar	
853230	853230	Variable or adjustable (pre-set) capacitors	
853310	853310	Fixed carbon resistors, composition or film types	
853321	853321	Electrical resistors, fixed, (including rheostats and potentiometers), other than heating resistors, for a power handling capacity $\leq 20$ W	
853329	853329	Electrical resistors, fixed, (including rheostats and potentiometers), other than heating resistors, n.e.s.	
853331	853331	Wirewound variable resistors, for a power handling capacity $\leq 20$ W	
853339	853339	Resistors, wirewound, variable, n.e.s.	
853340	853340	Other variable resistors, including rheostats and potentiometers	
853390	853390	Parts for electrical resistors (including rheostats and potentiometers), other than heating resistors	
853400	853400	Printed circuits	
854011	854011	Cathode-ray television picture tubes, including video monitor tubes, colour	
854012	854012	Cathode-ray television picture tubes, including video monitor tubes, black and white or other monochrome	
854020	854020	Television camera tubes; image converters and intensifiers; other photo-cathode tubes	
854040	854040	Data/graphic display tubes, colour, with a phosphor dot screen pitch smaller than 0.4 mm	
854050	854050	Data/graphic display tubes, black and white or other monochrome	
854060	854060	Other cathode-ray tubes	
854071	854071	Microwave tubes, magnetrons, excluding grid-controlled tubes	
854072	854072	Microwave tubes – klystrons, excluding grid-controlled tubes	
854079	854079	Microwave tubes, other, excluding grid-controlled tubes	
854081	854081	Receiver or amplifier valves and tubes	
854089	854089	Valve and tubes, n.e.s.	
854091	854091	Parts of cathode-ray tubes	
854099	854099	Parts of thermionic or photo-cathode, valve and tubes, other than cathode-ray tubes	
854110	854110	Diodes, other than photosensitive or light emitting diodes	
854121	854121	Transistors, other than photosensitive, dissipation rate $< 1$ W	
854129	854129	Transistors, other than photosensitive transistors, n.e.s.	
854130	854130	Thyristors, diacs and triacs, other than photosensitive devices	
854140	854140	Photosensitive semiconductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; light emitting diodes	
854150	854150	Other semiconductor devices	
854160	854160	Mounted piezo-electric crystals	
854190	854190	Parts for semiconductor devices	

**Annex 6. OECD list of ICT goods (2003)**

<b>HS 2002</b>	<b>HS 1996</b>	<b>Electronic components</b>	<b>Notes</b>
854210	854212	Cards incorporating electronic integrated circuits ('smart' cards)	(2)
854221	854213-19	Digital monolithic integrated circuits	(2)
854229	854230	Other monolithic integrated circuits	(2)
854260	854240	Hybrid integrated circuits	(2)
854270	854250	Electronic microassemblies	(2)
854290	854290	Parts for electronic integrated circuits and microassemblies	
<b>HS 2002</b>	<b>HS 1996</b>	<b>Audio and video equipment</b>	<b>Notes</b>
851810	851810	Microphones and stands therefor	
851821	851821	Single loudspeakers, mounted in their enclosures	
851822	851822	Multiple loudspeakers, mounted in the same enclosure	
851829	851829	Other loudspeakers, n.e.s	
851830	851830	Headphones and earphones, whether or not combined with a microphone, and sets consisting of a microphone and one or more loudspeakers	
851840	851840	Audio-frequency electric amplifiers	
851850	851850	Electric sound amplifier sets	
851890	851890	Parts of microphones, loudspeakers, headphones, earphones, combined microphone/loudspeaker sets, audio-frequency electric amplifiers and electric sound amplifier sets	
851910	851910	Coin- or disc-operated record-players	
851921	851921	Record-players, without loudspeaker	
851929	851929	Record-players, n.e.s.	
851931	851931	Turntables with automatic record changing mechanism	
851939	851939	Turntables, n.e.s.	
851940	851940	Transcribing machines	
851992	851992	Pocket-size cassette-players	
851993	851993	Other sound reproducing apparatus, cassette-type	
851999	851999	Sound reproducing apparatus, not incorporating a sound recording device, n.e.s.	
852010	852010	Dictating machines not capable of operating without an external source of power	
852032	852032	Other magnetic tape recorders incorporating sound reproducing apparatus, Digital audio type	
852033	852033	Other magnetic tape recorders incorporating sound reproducing apparatus, cassette-type	
852039	852039	Other magnetic tape recorders incorporating sound reproducing apparatus	
852090	852090	Magnetic tape recorders and other sound recording apparatus, whether or not incorporating a sound reproducing device, n.e.s.	
852110	852110	Video recording or reproducing apparatus, whether or not incorporating a video tuner – magnetic tape-type	
852190	852190	Video recording or reproducing apparatus, whether or not incorporating a video tuner – other type	
852210	852210	Parts and accessories suitable for use solely or principally with the apparatus of headings Nos. 85.19 to 85.21 – pick-up cartridges	
852290	852290	Parts and accessories suitable for use solely or principally with the apparatus of headings Nos. 85.19 to 85.21 – other	
852311	852311	Magnetic tapes, unrecorded, width <= 4 mm (1/6 in.)	(1)
852312	852312	Magnetic tapes, unrecorded, width > 4 mm (1/6 in.) but <= 6.5 mm (1/4 in.)	(1)
852313	852313	Magnetic tapes, unrecorded, width > 6.5 mm (1/4 in.)	(1)
852320	852320	Magnetic discs, unrecorded	(1)
852390	852390	Other prepared unrecorded media for sound recording or similar recording of other phenomena, other than products of Chapter 37	(1)
852540	852540	Still image video cameras and other video camera recorders, digital cameras	
852712	852712	Pocket-size radio cassette-players capable of operating without an external source of power	
852713	852713	Radio-broadcast receivers, capable of operating without an external source of power, combined with sound recording or reproducing apparatus	
852719	852719	Other radio-broadcast receivers, capable of operating without an external source of power, not combined with sound recording or reproducing apparatus	
852721	852721	Radio-broadcast receivers with sound recording or reproducing apparatus, for motor vehicles, requiring external source of power	
852729	852729	Other radio-broadcast receivers for motor vehicles, not combined with sound recording or reproducing apparatus	

HS 2002	HS 1996	Audio and video equipment	Notes
852731	852731	Other radio-broadcast receivers, including apparatus capable of receiving also radio-telephony or radio-telegraphy, combined with sound recording or reproducing apparatus	
852732	852732	Other radio-broadcast receivers, including apparatus capable of receiving also radio-telephony or radio-telegraphy, not combined with sound recording or reproducing apparatus but combined with a clock	
852739	852739	Other radio-broadcast receivers, including apparatus capable of receiving radio-telephony or radio-telegraphy, n.e.s.	
852812	852812	Reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus, colour	
852813	852813	Reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus, black and white or other monochrome	
852821	852821	Video monitors, colour	
852822	852822	Video monitors, black and white or other monochrome	
852830	852830	Video projectors	
HS 2002	HS 1996	Other ICT goods	Notes
846911	846911	Word-processing machines	
847010	847010	Electronic calculators capable of operation without an external source of electric power and pocket-size data recording, reproducing and displaying machines with calculating functions	
847021	847021	Other electronic calculating machines incorporating a printing device	
847029	847029	Other electronic calculating machines	
847040	847040	Accounting machines	
847050	847050	Cash registers	
847310	847310	Parts and accessories (other than covers, carrying cases and the like) suitable for use solely or principally with machines of heading No. 84.69	
847321	847321	Parts and accessories of the electronic calculating machines of subheading No. 8470.10, 8470.21 or 8470.29	
847350	847350	Parts and accessories equally suitable for use with machines of two or more of the headings Nos. 84.69 to 84.72	
852691	852691	Radio navigational aid apparatus	
852692	852692	Radio remote control apparatus	
901041	901041	Apparatus for the projection or drawing of circuit patterns on sensitised semiconductor materials – direct write-on-wafer apparatus	(1)
901042	901042	Apparatus for the projection or drawing of circuit patterns on sensitised semiconductor materials – step and repeat aligners	(1)
901049	901049	Apparatus for the projection or drawing of circuit patterns on sensitised semiconductor materials – other	(1)
901410	901410	Direction finding compasses	
901420	901420	Instruments and appliances for aeronautical or space navigation (other than compasses)	
901480	901480	Other navigational instruments and appliances	
901490	901490	Parts and accessories of direction finding compasses, other navigational instruments and appliances	
901540	901540	Photogrammetrical surveying instruments and appliances	
901580	901580	Other surveying instruments and appliances	
901811	901811	Electro-cardiographs	(1)
901812	901812	Ultrasonic scanning apparatus	(1)
901813	901813	Magnetic resonance imaging apparatus	(1)
901814	901814	Scintigraphic apparatus	(1)
901819	901819	Other electro-diagnostic apparatus (including apparatus for functional exploratory examination or for checking physiological parameters)	(1)
902212	902212	Computed tomography apparatus	(1)
902213	902213	Other apparatus based on the use of X-rays, for dental uses	(1)
902214	902214	Other apparatus based on the use of X-rays, for medical, surgical or veterinary uses	(1)

## Annex 6. OECD list of ICT goods (2003)

HS 2002	HS 1996	Other ICT goods	Notes
902219	902219	Other apparatus based on the use of X-rays, for other uses	(1)
902410	902410	Machines and appliances for testing the hardness, strength, compressibility, elasticity or other mechanical properties of materials, metals	
902480	902480	Other machines and appliances for testing the hardness, strength, compressibility, elasticity or other mechanical properties of materials	
902490	902490	Parts and accessories for machines and appliances for testing the hardness, strength, compressibility, elasticity or other mechanical properties of materials	
902620	902620	Instruments and apparatus for measuring or checking the pressure of liquids or gases, excluding instruments and apparatus of heading Nos. 9014, 9015, 9028 or 9032	
902710	902710	Instruments and apparatus for physical or chemical analysis, gas or smoke analysis apparatus	
902730	902730	Spectrometers, spectrophotometers and spectrographs using optical radiations (UV, visible, IR)	
902740	902740	Instruments and apparatus for measuring or checking quantities of heat, sound or light, exposure meters	
902750	902750	Other instruments and apparatus using optical radiations (UV, visible, IR)	
902780	902780	Other instruments and apparatus for physical or chemical analysis	
902810	902810	Gas meters	
902820	902820	Liquid meters	
902830	902830	Electricity meters	
902890	902890	Parts for gas, liquid or electricity supply or production meters, including calibrating meters therefor	
902910	902910	Revolution counters, production counters, taximeters, mileometers, pedometers and the like	
902920	902920	Speed indicators and tachometers; stroboscopes	
902990	902990	Parts and accessories for revolution counters, production counters, taximeters, mileometers, pedometers and the like; speed indicators and tachometers, other than those of heading No. 90.14 or 90.15; stroboscopes	
903010	903010	Instruments and apparatus for measuring or detecting ionising radiations	
903020	903020	Cathode-ray oscilloscopes and cathode-ray oscillographs	
903031	903031	Multimeters without a recording device	
903039	903039	Other instruments and apparatus for measuring or checking voltage, current, etc. without a recording device	
903040	903040	Other instruments and apparatus, specially designed for telecommunications (for example, cross-talk meters, gain measuring instruments, distortion factor meters, psophometers)	
903082	903082	Other instruments for measuring or checking semiconductor wafers or devices	
903083	903083	Other instruments for measuring or checking semiconductor wafers or devices with a recording device	
903110	903110	Measuring or checking instruments, appliances and machines n.e.s, machines for balancing mechanical parts	
903120	903120	Measuring or checking instruments, appliances and machines n.e.s, test benches	
903130	903130	Measuring or checking instruments, appliances and machines n.e.s, profile projectors	
903141	903141	Other optical instruments and appliances, for inspecting semiconductor wafers or devices or for inspecting photomasks or reticles used in manufacturing semiconductor devices	
903180	903180	Other measuring or checking instruments, appliances and machines, n.e.s.	
903190	903190	Parts and accessories for measuring or checking instruments, appliances and machines, n.e.s.	
903210	903210	Thermostats	
903220	903220	Manostats	
903289	903289	Other automatic regulating or controlling instruments and apparatus, n.e.s.	
903290	903290	Parts and accessories for automatic regulating or controlling instruments and apparatus	

Source: Guide to Measuring the Information Society 2005 (OECD, 2005b).

Notes: Titles are according to the 2002 Harmonized System. Some have been changed slightly in the interests of clarity and space.

(1) Industry of origin not in the OECD ICT sector (2002).

(2) HS 1996 and HS 2002 codes differ.

