11TH WORLD TELECOMMUNICATION/ICT INDICATORS SYMPOSIUM (WTIS)
4-6 December 2013
Mexico City, Mexico

Final Report

1. The 11th World Telecommunication/ICT Indicators Symposium (WTIS), organized by the International Telecommunication Union (ITU), took place in Mexico City, Mexico, from 4 to 6 December 2013. It was hosted by the Federal Institute of Communications (Instituto Federal de Comunicaciones – IFT) of Mexico.

2. The Meeting attracted 300 participants from 66 Member States, 35 public and private organizations (including academia) and 13 regional and international organizations.

3. The work of WTIS was conducted under the chairmanship of Mr Luis Lucatero, Chief of Regulatory Policy, Federal Institute of Communications of Mexico. The high-level panels and technical sessions were moderated by selected leaders and experts from governments, international organizations, academia and the private sector.

4. The WTIS 2013 featured three international high-level panels focusing on ICTs, MDGs, and the post-2015 development agenda; innovative ICT strategies for the information society, and the role of monitoring; and national coordination and enhancing dialogue between data producers and data users.

5. The WTIS 2013 technical sessions focused on emerging issues in measuring telecommunication infrastructure, gender and ICT, data quality assurance and big data in telecommunications. Reports by the Expert Group on Telecommunication/ICT Indicators (EGTI) and the Expert Group on ICT Household Indicators (EGH) were also presented.

6. This report summarizes the interventions, presentations and discussions of each session and presents the final conclusions and recommendations of the meeting. Further information, such as the agenda, the presentation slides, contributing documents and the list of participants, is available at http://www.itu.int/ITU-D/ict/wtis13/index.html.

Opening Session

7. The 11th WTIS was opened by high-level representatives from the Government of Mexico and the ITU and featured a keynote speech by Sam Pitroda, Advisor to the Prime Minister of India.

8. The welcome address for the 11th WTIS was given by **Dr Hamadoun Touré, Secretary-General of the ITU**, who thanked the Mexican Government for hosting WTIS. He mentioned the incredible progress that governments and industry had made in terms of ICTs over the past decade. There were almost as many mobile-cellular subscriptions as people on the planet – 6.8 billion subscriptions – and some 2.75 billion individuals were using the Internet. At the same time, almost two thirds of the world's population were still excluded from the extraordinary benefits brought by the online world. Dr Touré was confident, however, that over the next decade almost every household, village, school, and hospital would be fully connected to the Internet, at affordable prices. This was also in line with the targets set by the Broadband Commission for Digital Development. In this context, he stressed the importance of measuring the information society: without measurement we cannot track progress or identify gaps which require our attention. ITU relied on the cooperation of Member States, industry, and experts to ensure the production of comparable, adequate and reliable ICT statistics. He emphasized the vital role of ICTs for the post-2015 sustainable development framework, to ensure that all countries – developed and developing alike – were empowered to participate in the global digital economy. ICTs should therefore be given great prominence in the UN's post-2015 development agenda as catalysts of social and economic development, which will require setting new goals and new targets, and measuring these with new indicators. In closing, he asked the participants to actively engage with this issue here in Mexico, and to send a strong message to the world, and to those who are directly involved in setting the post-2015 development agenda.

9. In his opening speech, **Mr Gabriel Contreras Saldivar, President, Federal Institute of Telecommunications (IFT), Mexico**, thanked ITU for choosing Mexico as the venue for WTIS 2013. He pointed to the arrival of mobile telephony over 20 years ago, which brought so many changes. Now the world was making a great step forward with the arrival of mobile Internet, which has the potential to connect everyone, everywhere. He stressed the need for investments and at the same time pointed to the importance of measurement and statistics to provide input to investors, who require precise and updated information. He highlighted that the work of this audience and the Symposium was fundamental, and contributed to delivering new policies and new investments. For IFT to adequately regulate a new telecommunication era in Mexico, it was also counting on the work and outcomes of the WTIS.

10. **H.E. Mr José Ignacio Peralta, Undersecretary of Communications of Mexico,** welcomed the participants in WTIS 2013 on behalf of the Secretary of Communications and Transport of Mexico, Mr Gerardo Ruiz Esparza. He mentioned that ICTs have become basic tools for countries' economic development and essential to social participation. Reliable data were key to public policy planning and implementation. ITU is considered the most reliable and impartial source of information as for example published in the latest edition of the ITU

Measuring the Information Society report. Mr Peralta stressed the importance of ICTs for the economic and social development of nations, and highlighted the profound telecommunications reforms undertaken by Mexico with the aim of strengthening economic growth in the country. He mentioned two basic components of the Mexican telecommunications reform: to fortify the essential rights of freedom of expression, and to guarantee broadband access as a constitutional right. The telecommunications reform will create a new legal framework for the sector, autonomous regulatory institutions and boost competition by opening the market to foreign capital. The objective is to connect 70 per cent of households and 85 per cent of micro enterprises and small- and medium-size enterprises. In order to undertake such an ambitious programme, Mr Peralta acknowledged the need to cooperate with national and international institutions, such as INEGI and ITU, in order to obtain the data necessary to monitor progress and inform the public policies guiding ICT development. Mr Peralta closed his intervention by stating that it was a pleasure for Mexico to host the WTIS 2013, a meeting that addressed many of the current challenges that Mexico was facing. He formally inaugurated the 11th World Telecommunication/ICT Indicators Symposium at 9.54 a.m. local time.

11. **Dr Eduardo Sojo Garza Aldape, President, National Institute of Statistics and Geography (INEGI), Mexico** thanked the organizers for having invited him to participate in the WTIS opening ceremony. He mentioned that INEGI as an institution was unique, for two reasons: firstly, INEGI had two main responsibilities: statistics and geography. In a world where everything was being geo-referenced, this was a huge advantage; secondly, INEGI was constitutionally independent, which strengthened its credibility. INEGI also had the mandate to coordinate the national system of statistics, an important topic that would be addressed later in the Symposium. Dr Sojo praised the importance of this event given that we lived in an information era where everything was being measured and access to data and information was abundant. In this context, ICT indicators were particularly important in order to know where we stood as a country and how we had progressed compared to the rest of the world. This meeting was also very important, especially in the light of the post-2015 agenda and the so-called data revolution. Dr Sojo referred to the need for coordination of statistical activities worldwide. In this context, he mentioned that Mexico chaired a group of the UN Statistical Commission, which aims to improve the coordination of information flows among member countries and UN agencies. A number of recommendations that had been developed would also be important for the discussions in this Symposium and in the UN post-2015 statistical process. He therefore suggested that all agencies and statistical offices continue improving their work, adopt best practices, and work closely together in terms of data sharing and coordination.

12. **The Chair of the WTIS, Luis Lucatero, Chief of Regulatory Policy, IFT,** delivered his opening statement. He mentioned that data gathering and metrics had been around for a long time, starting with Caesar Augustus, who 2,000 years ago measured the roads and communication networks of the Roman Empire, down to the mail traffic exchanged by citizens. This was the first historic link between data gathering and policy making. But we needed to be aware of the dangers of looking at metrics alone: a good example was what happened after the fall of the Berlin Wall in 1989. This had allowed Germany to look at the state of East and West Germany for the first time – the data were the same on both sides,

with a similar number of cars, households, etc., but the reality in East and West had been very different. So metrics alone, or at least as we used them today, were not enough. He mentioned that, today, the networks were no longer the core of telecommunications; the core was now the human being. Therefore, there was a need to balance the connectivity demand with the connectivity supply and new metrics were necessary that recognize this.

13. Following the welcome and opening remarks, a keynote speech was delivered by **Mr Sam Pitroda, Advisor to the Prime Minister of India.** He pointed out that the first phase of the ICT revolution – connecting people – was almost over, and the second phase of the ICT revolution was just beginning: creating a whole new world as people talk to machines, and machines talk to machines. Referring to India, a country with 1.3 billion people, democracy was the key. India had 400 million people living in poverty - the largest number in the world – and India also had the largest number of young people in the world, with 550 million. Mr Pitroda stated that it was now time to deliver information democracy. A first step was to provide the right to information; and to assure that people had access to information. The Indian Government was spending US$20 billion to address this challenge, building two major networks. One, to connect all universities with high-speed networks, with 1,100 nodes already connected. The second network involved building optical fibre to connect 250,000 local governments by adding 500,000km to the existing one million km of fibre. The platforms were expected to be ready within two years, and to open up new ways of delivering government services. For example, it would allow the government to address the 32 million pending court cases, improving a system where it could take more than 10 years to come to trial. Mr Pitroda also stressed the importance of creating open data platforms, which was difficult in a world where people still had 19th century mindsets, 20th century processes, and 21st century needs. Over the next two decades significant changes would have to be made in government, education, health, agricultural productivity, and financial services. The big challenge was to address the needs of 25 million new, young people entering the workforce every year.

High-Level panel on ICT, MDGs, and the post-2015 development agenda

14. The first high-level panel on ICTs, MDGs, and the Post-2015 development agenda was moderated by **Mr Sam Pitroda, Advisor to the Prime Minister of India**, who stated that the first phase of the telecommunication revolution was over, with the world entering the second phase, where near ubiquitous access to ICTs was opening up new opportunities for development. To fully take advantage of the potential of ICTs, it was important to use ICTs to innovate and to create new ideas, and systems. Mr Pitroda highlighted that ITU, whose traditional role had been to connect people, must adapt to the second phase of the ICT revolution. ITU should promote the use of ICTs to achieve wider development goals, including achieving social inclusion and equality. Mr Pitroda called upon the WTIS to produce new ideas to promote the use of ICTs for development. He officially opened the high-level segment by introducing the panellists.

15. The keynote speech was delivered (via videoconference) by **Professor Jeffrey Sachs, Director of the Earth Institute at Columbia University.** Professor Sachs highlighted that ICTs

played an important role in the post-2015 development agenda since ICTs lay at the very centre of addressing the challenges that the world is facing: despite the important progress that had been made in reducing global poverty over the last decade, the world was witnessing an increasing level of inequality, social turmoil, as well as growing environmental threats. The main objective of the next set of development goals, which would be set in the post-Internet era, was to make economic, social and environmental progress. ICTs would play an important role in achieving these new goals since they were important development enablers, for example in the areas of health and education, and to deliver sustainable agriculture, smart energy systems and urban networks. Public-private partnerships would play an important role in realizing the link between ICTs and development. Professor Sachs also stressed the need to take advantage of the increasing ubiquity, speed and quality of ICTs to improve the monitoring of development goals. The current Millennium Development Framework often had to rely on outdated data, which made the evaluation of progress and existing policies difficult. More efforts had to be made to connect all people, and to produce real-time information to track development progress.

16. The moderator asked the first panellist, **Ms Alejandra Lagunes, the Coordinator of the National Digital Strategy of the President's Office in Mexico**, to talk about the link between Mexico's National Digital Strategy and the country's broader development goals, including those under discussion for the post-2015 development agenda; and to discuss the role of monitoring and official data for development and the coordination with the National Statistical Office (INEGI). Ms Lagunes began her statement by saying that the Mexican government was going through an important and fundamental transformation and that ICTs were an integral part of this transformation. Through its Digital Strategy, Mexico was taking advantage of ICTs to address every single development goal, including to create employment, boost the local economy, improve the quality and coverage of the national health care system, and to achieve gender equality. To ensure that all citizens were able to benefit from the potential of ICTs, the government was actively working towards a better, more widely available, accessible, and affordable ICT network, and services for all. Ms Lagunes highlighted that in all areas of governments, Mexico's policy makers were heavily relying on statistics and monitoring to set targets, to develop strategies and to evaluate policies. In addition, the national statistical office (INEGI) had a very important role to play. In terms of the development of the information society, INEGI provided important information on access to, and use and affordability of ICTs, which allowed the government to revise its policies. The government was also cooperating with INEGI in the area of open data to improve the availability of information and to increase the level of transparency and accountability.

17. The next panellist, **Mr Robert Kirkpatrick, Director of UN Global Pulse**, was asked to clarify the call by the UN High Level Panel of eminent persons on the post-2015 development agenda for the 'data revolution'. He was further asked to discuss the role of ICTs in driving the data revolution and in strengthening the post-2015 development agenda's monitoring process. Mr Kirkpatrick emphasized that the post-2015 development agenda required real-time monitoring. The reference to a data revolution was timely, given the sheer amount of new and available data and information, produced through social media, new ICT services and users, and other forms of online transactions. Mr Kirkpatrick discussed the challenge of

taking advantage of the raw material that was needed to create a measurement revolution, and to develop technologies and tools to deliver real-time monitoring and produce a better and faster picture of what was happening. Mr Kirkpatrick highlighted that data were a raw public good. The move towards open data was an important step that would allow policy makers to base their decisions on real data and facts. At the same time, it was indispensable to get privacy protection right and to build trust, in particular through public private partnerships. According to Mr Kirkpatrick, the UN could play an important role and create links between the private and the public sector. Mr Kirkpatrick further emphasized that national statistical offices had to adapt to the data revolution and take advantage of its potential.

18. **Ms Nagwa El Shennawy, Undersecretary for Information and Strategic Planning of the Ministry of Communications and Information Technology in Egypt**, was asked to share some of the lessons that Egypt had learnt from the MDG process and to highlight possible challenges in a future development agenda. Ms El Shennawy emphasized the importance that Egypt attributed to ICTs, and that ICTs had become an integral part and strong development enabler of all sectors of the country's economy. The government was supporting and actively developing the ICT industry to encourage investment and create employment. Egypt was also implementing specific projects to increase high-speed ICT access and use, and was taking advantage of ICTs to address social challenges. Specific goals, for example in the areas of education and government, were being attached to these projects so as to monitor progress, evaluate policies, and to spend scarce resources in the best possible way. At the same time, large amounts of data were produced to track these goals. Ms El Shennawy also highlighted that Egypt's specific ICT strategies and projects were helping achieve the WSIS Targets, as well as broader development goals, including the MDGs.

19. The moderator asked **Mr Alejandro Plater, Vice President of the Global Customer Unit for Latin America and Caribbean (RLAM) from Ericsson** to discuss the importance of broadband access and use for sustainable development and other global development goals. Mr Plater was also asked to highlight the role of the private sector in driving the information society. Mr Plater pointed to the new possibilities that advanced broadband platforms, the near ubiquity of mobile networks and the growth in smart phones offered for sustainable development. He described Ericsson's efforts to continuously improve network performances and enhance user experiences so as to provide the necessary infrastructure for increasingly data-centric services and applications. He also pointed to the need for governments to provide the right regulatory framework, and the need for more spectrum. Ericsson was working towards a greener and more sustainable world and Mr Plater highlighted the company's commitment towards the post-2015 development agenda, including through the development of innovative and transformative solutions. Examples of Ericsson's efforts to invest into the future include the development of smart cities, which addresses the increasing level of urbanization and the growth of megacities, and the need to address challenges in such areas as pollution, traffic and sanitation. Mr Plater mentioned that Ericsson was also investing in the development of m-health solutions, and creating new and better tools and services to address one of the world's most pressing development issues.

20. The final panellist, **Dr Hamadoun Touré, Secretary-General of ITU** was asked to comment on the importance of internationally set goals, targets and indicators for development and to talk about the role of ITU in the MDG framework. Dr Touré noted the impact that the growth in ICTs had had on the development of the knowledge society, in which information was easily created and shared. ICTs were part of the solution to global development challenges and they continued to play an important role in achieving broader development goals, including the MDGs. ICTs needed to be given due recognition in the post-2015 development debate and must be made accessible and affordable to everyone. Dr Touré highlighted that despite great progress in the spread of ICTs, 60 per cent of the world's population was not yet using the Internet. Dr Touré also emphasized the importance of monitoring and international benchmarking, which allowed countries to put their achievements into perspective, compare progress and set goals and targets. In an increasingly interconnected and rapidly changing world, ITU played an important role in measuring progress and identifying and tracking new challenges to the information society. This included addressing issues such as network security and privacy, but also monitoring the affordability of services and gender equality. Dr Touré also pointed to the important role of the WTIS, which ensured the harmonization of statistical information.

21. The moderator summarized some of the key statements made by the panellists, and in particular pointed to the high-level panel's agreement on the enabling role of ICTs to achieve broader development goals.

22. The high-level panel was followed by a number of questions from the audience. Mexico asked about the time lag between the moment a new service or technology emerged and the time it could be measured and tracked. It further inquired about the link between statistics and policies. Dr Touré responded by highlighting the need to constantly review and redefine indicators to track a rapidly changing information society. He further mentioned the example of Mexico, where the regulatory authority was tracking and analysing access to, and affordability to, the information society to ensure that consumers in all parts of the country had high-speed and affordable access.

23. India pointed to the increasing growth in Internet traffic – which often exited the originating country, simply to be re-routed back to the same country – and inquired about the impact on international Internet bandwidth. In response, Mr Pitroda pointed to countries' responsibility in providing adequate (physical as well as social) networks, including national exchange points, and to ensure that Internet traffic was channelled efficiently. Dr Touré supported this statement by adding that the efficiency of the Internet could be improved, and that new technical solutions must be found to further bring down prices and increase security. Ericsson added that further improvements in the network infrastructure and services, including through local caching, would be necessary to cope with an increasing amount of traffic generated by videos.

24. Pakistan mentioned the limited role that other UN agencies had given ICTs to achieve the MDGs and asked about ITU's efforts to promote the use of, and the investment in, ICTs. Dr Touré responded by mentioning a number of ITU efforts to increase the awareness about the importance of ICTs, and in particular the creation of the Broadband Commission for

Digital Development, which was launched in 2010, together with UNESCO. ITU also worked closely with other UN organisations, including WHO, UN WOMEN, and UNCTAD and ITU had taken a lead role in creating a UN system that is working as 'one'.

25. Following UNCTAD's question whether ICTs should be a goal in itself in the post-2015 development agenda, Dr Touré highlighted the importance of ICTs not only as a development enabler but as a goal itself, which should ensure the creation of an inclusive information society by making ICTs accessible and affordable to everyone. Mr Kirkpatrick from UN Global Pulse added that the importance of ICTs for peoples' lives must not be underestimated. He described information as aid, and a basic telephone as development. Egypt also supported the proposal to include an ICT goal in the post-2015 development agenda and to continue research on the impact of ICTs on other development areas.

26. Zimbabwe made an intervention to highlight the need for ITU to take advantage of the latest technologies to present and publish its data. The Democratic Republic of Congo suggested that when ITU published national data, penetration rates and international rankings, more information could be provided on countries' population size and development level to put achievements into context. It would further be helpful to have more information on the necessary level of investments that countries must make to achieve certain ICT levels.

27. When the moderator invited each panellist to make a final statement, Ms Lagunes highlighted the importance of increasing Mexico's level of competition so as to allow the country to fully benefit from the potential of ICTs. Mr Kirkpatrick pointed to the importance of recognizing big data as a massive public good, which needed to be adequately protected and used. Ms El Shennawy stressed the importance of integrating the national ICT strategy within the broader national development plans, while Mr Plater called upon governments to make available the necessary spectrum needed for development. Dr Touré congratulated the audience for its important work and highlighted ITU's intention to adapt to a rapidly changing environment.

28. The moderator thanked the panellists and handed back to the WTIS Chair who highlighted the important findings of the panel discussion. The Chair closed the high-level panel after thanking the panellists and the audience for their insightful comments and questions.

High-level panel on innovative ICT strategies for the information society, and the role of monitoring

29. The second high-level panel, on innovative ICT strategies for the information society, and the role of monitoring, was moderated by **Mr Brahima Sanou, Director of the ITU's Telecommunication Development Bureau.** In his introductory remarks, Mr Sanou made the link to the first high-level panel by highlighting the need for innovative ICT strategies and a growing and inclusive information society to address some of the world's pressing development challenges. ICTs were part of a much larger picture, and their importance for other development goals highlighted the human face of ICTs.

30. The moderator asked the first panellist, **Ms Vijayalakshmy Gupta, Board Member of the Telecommunication Regulatory Authority of India,** to share some recommendations on policies that had allowed India to make ICTs more widely available and affordable. Ms Gupta highlighted India's efforts to create a highly competitive regulatory environment and a high degree of privatization. To increase competition in the mobile-cellular market, additional spectrum was made available and today India had some 900 million mobile-cellular subscriptions and some of the lowest local mobile-cellular call prices in the world. Broadband Internet access, however, remained limited and Ms Gupta discussed some of the major challenges in expanding the country's high-speed Internet network. These included India's geographic and population size, its large pockets of poverty in rural areas, and the high costs for rolling out networks. To face these challenges, the Government adopted a new broadband policy in 2012 and was promoting the coordination between different levels of Government, and between the public and the private sector. Ms Gupta discussed the importance of using ICTs to empower people and to deliver innovative services in the areas of health, education and agriculture. As an example, she presented a video illustrating the work that the Government of India was carrying out to empower women with the help of mobile telephony. The project, which linked technologies and content, provided services that addressed the specific needs of the rural population.

31. Asked to elaborate on the impact of ICTs on social and economic development, and on the MDGs, **H.E. Mr Makame Mnyaa Mbarawa, Minister of Communications, Science and Technology in Tanzania**, highlighted the efforts that Tanzania had made in joining the global information society. Public-private partnerships and universal service funds had been used to expand mobile services to rural and remote areas, and broadband infrastructure deployment had been made a national priority. The Government has also provided an attractive regulatory environment for private sector investments, and increased the country's national backbone infrastructure and international Internet bandwidth, with the addition of two submarine cables. A key challenge the country was facing was the shortage of electricity, which the Government was addressing by closely cooperating and sharing resources with mobile operators and other institutions, such as schools. The panellist also pointed to the limited last mile connectivity and the lack of local content, which could be addressed through specific strategies, including by attracting new businesses and entrepreneurs, and by incentivizing investments.

32. When the moderator asked **Mr Carlos Raúl Gutiérrez, Vice-Chair of REGULATEL** to name some of the policies that had helped to connect the region's rural areas, Mr Gutiérrez underlined the importance of adapting regulation to the rapidly changing technological environment and services. The ICT landscape had changed and the boundaries between network and content providers, as well as between fixed- and mobile operators and networks, were blurred. Consequently, regulators needed new indicators and data to make informed policy decisions, to adapt their policies, and to make the right investment choices. To make services affordable, it was indispensable to increase competition but other factors also needed to be taken into consideration. In particular, Mr Gutiérrez called upon policy makers to focus on the ICT user, not the networks, and to develop indicators that helped analyse the user's behaviour and needs. For example, if home Internet access was unaffordable to large parts of the population, more efforts had to be made to understand

the potential benefits of public/shared Internet access, including through wireless networks. Mr Gutiérrez highlighted the importance of developing 'next generation' indicators that measured local content and participation in the information society.

33. The next panellist, **Ms Mónica Aspe Bernal, Coordinator for the Information Society within the Mexican Ministry of Communications and Transport**, addressed the question on synergies between the post WSIS and the post-2015 development agendas. Ms Aspe recognized the importance of international development goals and targets, such as the MDGs and the WSIS targets, to increase the awareness about international development challenges. While Ms Aspe welcomed the general agreement that ICTs had an important impact on the achievement of the MDGs, she remarked that there was insufficient knowledge on the exact impact that ICTs had on social and economic development. The WSIS would greatly benefit from better measures that could help quantify and fully understand the impact of greater access to, and more use of, ICTs. Policy-makers should also take into account global development goals when formulating the future WSIS goals, and move from ICT access towards ICT use. Ms Aspe also suggested looking into the possibilities of using big data to understand the impact of ICTs on development. While ITU had made important advances in terms of monitoring ICT developments, better indicators, data and metrics had to be developed to identify those investments, strategies and technologies that had the greatest impact.

34. Following the panellists' interventions, a keynote speech was delivered by **Mr Carlos Slim Helú, Chairman of the Carlos Slim Foundation**. Mr Slim provided a brief history of the telecommunication market and its key players, and highlighted the great advances in technology and regulatory policies over the last decade. He also recognized the important role that ITU had played in bringing broadband to the top of the policy agenda, in particular through the Broadband Commission for Digital Development, which identified a number of time-bound targets. Mr Slim stated that some of the greatest achievements in innovation had been made by the private sector, which had been able to deliver relatively affordable mobile-cellular services to large parts of the world's populations, particularly with the help of prepaid packages. Increased access to ICTs was helping address some of the major development challenges, for example in the area of education, government and health, and deliver new opportunities. Mr Slim highlighted that while the main role of the private sector was to invest, innovate and compete, the public sector's main role was to provide a stable and predictable regulatory environment, to create room for innovation, and to ensure universal access. Governments should also make available more spectrum. Mr Slim highlighted the need for governments to be active users of ICTs and to provide all public services online, so as to provide citizens with incentives to use the Internet. Governments should be innovative and develop new ways of making use of technologies to deliver existing services, and to allow everyone to be able to benefit from the information society. In very remote and rural areas, citizens would not only need access to the infrastructure but also access to hardware, content and services. Governments had to develop innovative ways of providing these, for example by allowing students to borrow computers, or to make public Internet access points available for free, at night, when they were not otherwise used. According to Mr Slim, further advances in high-speed mobile-broadband networks,

the drop in prices for smartphones, and the development of prepaid mobile-broadband services would help more people join the information society.

35. Following the keynote address by Mr Slim, the moderator thanked all panellists and Mr Slim, and gave the floor to the Chair, who closed the session.

High-level panel on national coordination and enhancing dialogue between data producers and data users

36. The third high-level panel, on national coordination and enhancing dialogue between data producers and data users, was moderated by **Ms Adriana Labardini**, **Commissioner, Federal Institute of Telecommunications (IFT), Mexico.** She welcomed the panellists and introduced the subject of the panel debate. In a first round of questions, Ms Labardini invited each panellist to share her/his views and experience in terms of national coordination of ICT statistics.

37. The first panellist, Ms **Marjo Bruun**, **Director General, National Statistical Office, Finland**, started by mentioning that communication among people had always been important in her country and this had been radically improved with the introduction of mobile phone communication in Finland. As far as national coordination of statistics was concerned, Statistics Finland was by law the coordinating body of all official statistics in the country. While more than 95 per cent of the data were from registry (administrative) sources, survey data were also collected and the NSO had an excellent sample frame for carrying out surveys. ICT household and enterprise surveys were conducted annually and before a decision was taken on what should be measured, special expert groups had discussed the matter, including ICT experts. When a new survey was being planned, the NSO was legally obliged to talk to the respondents or their representatives. Ms Bruun also mentioned that within the European Union, Finland had been active in defining ICT statistics in the policy context, for example in cooperation with the Directorate General (DG) Connect.

38. The second panellist, **Dr Eduardo Sojo, President of INEGI, Mexico's National Statistical Office**, mentioned that following a constitutional reform in 2006, INEGI became autonomous, which was key to ensuring independence in the statistical work of the country. Following legislation in 2008, coordination within the country was stipulated. Given that administrative registries in Mexico were not very good (compared to Finland), it was important to have a standard setting agency such as INEGI. In Mexico, there were 37 technical committees coordinating different types of statistics and with the participation of different stakeholders. Information society statistics was one of them and INEGI collaborated closely with other national agencies on this, including the President's office. Mr Sojo also stressed the importance of planning of the statistical work. Finally, he mentioned that international coordination was also important given that NSOs sent their data to many international organizations, which were not always using the same standards. In order to avoid duplication of efforts, standards such as SMDX should be used.

39. The third panellist, **Mr Jose Ramon Albert, Secretary General, National Statistical Coordination Board (NSCB), Philippines**, shared the experience of his country in terms of national coordination. The Philippines had a decentralized national statistical system and NSCB put in place the necessary mechanisms to coordinate and improve the production of statistics, including ICT statistics. In 2006, the Interagency Committee on ICT statistics was created, which served as a lobby group for ICT indicators and a forum for discussions of issues related to ICT statistics, including the review of concepts and methodologies, and monitoring of the overall development of ICT statistics in the country. He mentioned that NSCB technical staff served on this committee. Mr Albert also stressed the importance of including a chapter on ICT statistics in countries' National Statistical Development Strategies (NSDS), which was the case in the Philippines. Finally, he informed participants about ongoing structural changes in the Philippine statistical system, with the NSCB, the NSO and other statistical offices expected to be merged in 2014.

40. Following the panellists' interventions, a lively discussion emerged. The delegate from Egypt asked the panellists whether it was compulsory for respondents to reply to national surveys in their countries. Ghana inquired about how to overcome institutional challenges given the cross-cutting nature of ICT. Brazil was wondering about the promotion of stand-alone ICT surveys in cases where it was not possible to insert ICT modules into existing surveys, and the role of private entities to carry out surveys. Iran mentioned the importance of data usability and praised Finland for its high level of achievement on this. The moderator also raised the issue of big data that was mentioned in an earlier panel and asked the panellist to address this.

41. Responding to the questions, in the case of Finland, it was compulsory for businesses to reply to surveys from the NSO, but not for households, where response rates were dropping due to a large amount of surveys being implemented. Concerning ICT statistics, it was important to have experts both from the field of ICT and statistics. Ms Bruun mentioned that big data was a big competitor and that NSOs needed to work more on this topic. She mentioned a pilot study related to tourism currently being implemented in Finland using mobile data. One of the problems that needed to be addressed was the ownership of the data and which parts of the data could be used.

42. In Mexico, it was compulsory for both enterprises and households to respond to surveys by INEGI, but it was difficult to apply fines in the case on non-response. Concerning data dissemination, all government agencies were obliged to produce a calendar indicating their planned data releases. Dr Sojo also mentioned the importance of using the data collected to carry out impact analysis, for example productivity analysis in the case of business data. For ICT data collection, Mexico included an ICT module in existing surveys, which was much less costly than a stand-alone survey. INEGI cooperated closely with the Ministry and the Office of the Presidency concerning the questions included in the survey. Concerning the question from Brazil, Dr Sojo mentioned that since the private sector did not have the responsibility to produce official statistics, more care needed to be taken with respect to data produced by private companies. Concerning big data, Dr Sojo emphasized that the NSOs can bring a lot of expertise which could benefit the use of big data. Mexico is currently in discussion with Global Pulse concerning a pilot project using mobile data.

43. In the Philippines, Mr Albert mentioned that there was a small fine for non-response which was currently being increased. Concerning ICT data collection, regular surveys were being implemented in the country.

44. The moderator thanked the panellists and handed back to the WTIS Chair who closed the high-level panel after thanking the panellists and the audience for their insightful comments and questions.

Report of the Expert Group on Telecommunication/ICT Indicators (EGTI)

45. The session was moderated by **Mr Alexandre Barbosa from CETIC Brazil**, who introduced the main topics discussed by the ITU Expert Group on Telecommunication/ICT Indicators (EGTI) in 2013, and encouraged experts from all countries to take part in the EGTI discussions.

46. The first presentation was delivered by **Mr Iñigo Herguera, Deputy Director, Statistics Division, National Markets and Competition Commission, Spain, and current EGTI Chair**. He mentioned the unprecedented participation in the 4th EGTI Meeting held on 2-3 December 2013 in Mexico City, just before WTIS 2013, with 67 participants from 35 countries, including representatives from regulators, ministries, national statistical offices and operators.

47. Mr Herguera presented the outcomes of the 4th EGTI Meeting. As a complement to the definitions of the indicators on revenue and investment in telecommunications included in the ITU Handbook, EGTI endorsed the *Methodology for the collection of revenue and investment data on telecommunications*. Regarding foreign direct investment and revenue and investment for the entire ICT sector, EGTI concluded that data were collected from very heterogeneous sources, and suggested continuing the discussion in the framework of the Partnership on Measuring ICT for Development.

48. Mr Herguera reported on the progress made in the ITU Interactive Online Transmission maps: data for most regions had been collected by the ITU consultants in collaboration with Governments and operators. Countries were encouraged to participate by validating the data and submitting additional information.

49. Regarding mobile-broadband prices, EGTI agreed to collect data for the following four plans: (i) handset-based, prepaid, 500 MB; (ii) handset-based, postpaid, 500 MB; (iii) computer-based, prepaid, 1 GB; (iv) computer-based, postpaid, 1 GB. In countries with less than 2 per cent of prepaid mobile-broadband subscriptions, postpaid prices were going to be considered.

50. EGTI also agreed on a common proposal for the revision of the Partnership core indicators on ICT infrastructure and access. EGTI proposed to update the definitions to match those of the ITU Handbook, and agreed on the following indicators: (i) Fixed telephone subscriptions per 100 inhabitants; (ii) Mobile-cellular telephone subscriptions per 100 inhabitants; (iii) Fixed (wired)-broadband Internet subscriptions per 100 inhabitants, broken down by speed;

(iv) Wireless-broadband subscriptions per 100 inhabitants; (v) International Internet bandwidth per inhabitant (bits/second/inhabitant); (vi) Percentage of the population covered by a at least a 3G mobile network; (vii) Fixed broadband Internet prices per month; (viii) Mobile cellular telephone prepaid prices per month; (ix) Mobile broadband Internet prices per month; (x) TV broadcasting subscriptions per 100 inhabitants .

51. Concerning TV broadcasting indicators, EGTI agreed to collect data for the following indicators: (i) IPTV subscriptions; (ii) cable TV subscriptions; (iii) satellite TV subscriptions; other (MMDS, pay DTT, etc.).

52. Mr Herguera also reported on the discussions that took place in EGTI regarding the ICT development Index (IDI). He highlighted that data availability remained an issue for integrating new indicators, such as those related to ICT usage in schools and high-speed broadband uptake. EGTI agreed to review these proposals once data became available. Mr Herguera explained that ITU would review the IDI methodology for 'mobile-cellular subscriptions' and 'international Internet bandwidth', and that the discussion on the IDI would continue in the EGTI forum.

53. Mr Herguera finished his presentation by listing the topics proposed by EGTI for future work: a review of the classification of wireless-broadband subscriptions; a revision of the list of indicators included in the ITU Long Questionnaire; indicators on bundled telecommunication services; whether to separate subscription data on (a) individuals and (b) public and private organizations; and emerging technologies in telecommunication infrastructure.

54. The second presentation was given **by Mr Rati Skhirtladze, Head of Information and Analysis Department, National Communications Commission, Georgia**, who provided more details on the EGTI conclusions regarding revenue and investment indicators and presented the Georgian experience in this field. Mr Skhirtladze explained that data on foreign direct investment (FDI) in telecommunications/ICT were collected by central banks, national statistical offices, specific investment authorities, ministries and regulators. Due to the diversity of sources, the discussion should be addressed in fora that involved all relevant stakeholders. He also noted that data were often not disaggregated enough to produce figures for the entire ICT sector. The conclusions reached for revenue and investment for the entire ICT sector were the same as those for FDI in telecommunications/ICT.

55. Regarding revenue and investment data in telecommunications, Mr Skhirtladze highlighted that despite the good data availability, important harmonization issues remained in view of international comparisons. With the objective of improving international data comparability, EGTI agreed on a methodological note (Methodology for the collection of revenue and investment data on telecommunications) to refine the definitions included in the ITU Handbook.

56. Mr Skhirtladze presented the main sources of error for international comparisons of revenue and investment in telecommunications. He highlighted that the definition of the sector should include resellers and the transmission of TV signals, but exclude activities

related to content creation. For revenue indicators, wholesale revenues – such as interconnection revenues – should be excluded from the data reported to ITU. For investment, the definition of the indicator had been adjusted to the concept of gross fixed capital formation (as defined in the System of National Accounts 2008), and in consequence licence fees should be excluded.

57. Mr Skhirtladze finished his presentation by sharing Georgia's experience in the collection of revenue and investment data from telecommunication operators and broadcasters. He showcased Georgia's online data collection system and analytical portal where revenue data were going to be published on a monthly basis (in almost real-time reporting) and investment data on a yearly basis.

58. The third presentation was delivered by **Mr Ivan Vallejo, Analyst, ITU/BDT,** who provided an overview of ITU's recent work on TV broadcasting indicators. He highlighted that the transmission of TV signals had long since been considered under telecommunication services and that ITU had been collecting data on TV broadcasting since the 1960s. Moreover, target 8 of the World Summit on the Information Society was devoted to broadcasting services, which stressed the importance of data on TV services also in the context of global development targets.

59. Mr Vallejo presented some findings from the report Measuring the Information Society 2013 which were relevant for the revision of TV broadcasting indicators: (i) the enduring pervasiveness of TV services (almost 80 per cent household penetration); (ii) the progress made in the digital transition (halfway mark passed in 2012); (iii) increasing cross-platform competition and convergence of telecommunication and broadcasting markets; (iv) the growth of pay TV (more than 40 per cent of households subscribed to pay-TV services in 2012).

60. Lastly, Mr Vallejo mentioned the different sources for data on TV broadcasting (i.e. administrative records and survey data) and explained how the new indictors agreed by EGTI would allow for a finer breakdown of TV subscriptions by type of TV platform, thus helping to better monitor the TV broadcasting trends previously mentioned.

61. The round of questions from the floor was opened by the delegate from the Russian Federation who inquired about the adjustments that would be made in the IDI. ITU clarified that the reference values for the indicators 'Mobile-cellular subscriptions per 100 inhabitants' and 'International Internet bandwidth (bit/s) per Internet user' would be revised.

62. Pakistan highlighted the importance of collecting investment data from operators based on the terminology used in their accounting, and advocated continuing with the data collection of investment only for telecommunications until it would be clear that data for the entire ICT sector could be collected. The delegate from Pakistan also mentioned the relevance of collecting data on the repatriation of profits and on the taxation of telecommunications. The EGTI chair clarified that the definition of investment proposed closely matched the concept of CAPEX as used in operators' annual reports, and that for the time being data would be collected only for investment in telecommunications and not for the entire ICT

sector. Regarding the discussion of financial issues regarding telecommunication services, the EGTI Chair proposed to address the discussion in other more specialized fora. Egypt pointed out that data currently collected on revenue and investment focused only on telecommunication operators and broadcasters, and asked how data could be collected from other telecommunication companies, such as big network providers, such as Ericsson. The EGTI Chair acknowledged that these companies were indeed outside the scope of most telecommunication regulators and ministries, and that obtaining data on them would require cooperation with other institutions (e.g. tax authorities).

63. Mexico intervened to request ITU to raise awareness among governments of the importance of committing resources to adapt to the new ICT indicators internationally agreed. In addition, Mexico expressed some concerns on the discontinuity in the series of revenue and investment owing to the changes in the definition, and highlighted the importance of clarifying in the ITU methodological documents the differences between subscriptions, subscribers, users and households. ITU acknowledged the importance of communicating in advance the changes in the indicators so that countries would have more time to adapt to them. Regarding the discontinuity in the revenue and investment series, ITU explained that a majority of countries were yet not reporting data according to the ITU Handbook definitions, and that any break in comparability in the time series would be clarified in the notes. ITU agreed on the importance of clarifying the units of each indicator (e.g. subscription, user), and highlighted that this was already addressed in the ITU methodological publications.

64. Brazil took the floor to ask Georgia how they managed to produce almost real-time data on a monthly basis taking into account the time-lag needed for validation. Ghana requested Georgia to explain their experience in coordinating with other agencies for the collection of revenue and investment data. Mr Skhirtladze explained that the Georgian regulator had needed two years of training with operators in order to obtain reliable data through the online platform, so that the validation process time could be reduced. Mr Skhirtladze specified that in those cases where data looked wrong (but operators insisted on their accuracy), a legal confirmation was asked, and that the data for annual reporting followed a more thorough validation process. Regarding Ghana's question, Mr Skhirtladze explained that the regulator approached the NSO to ensure the consistency of the data collection on revenue and investment, but that most data on telecommunications and broadcasting were collected by the regulator.

65. Cameroun closed the round of questions by inquiring whether the transition to IP technologies would affect TV services in the same way it had affected telephony services, and how that could be tracked. ITU replied that separate data were already collected for VoIP subscriptions and VoIP traffic, but that it was difficult to capture over-the-top traffic data, such as minutes of Skype calls. Likewise, part of the TV services were already being offered online (e.g. Netflix), but it was not possible at the moment to monitor these trends based on administrative records.

66. The moderator closed the session by highlighting the relevance of the EGTI forum for policymaking and international comparability, and encouraging experts in ICT statistics to actively participate in the EGTI online discussions and future face-to-face meetings.

Report of the Expert Group on ICT Household Indicators (EGH)

67. The session was moderated by **Mr Koay Hock Eng from the Malaysian Communications and Multimedia Commission (MCMC).** He highlighted that the objective of the session was to present the outcomes of the work of the EGH carried out during the past year.

68. The first presentation was delivered by the **EGH Chair, Mr Alexandre Barbosa from CETIC, Brazil**. He thanked ITU for allowing him to chair the EGH which he called "the younger brother of EGTI". He highlighted that the EGH was launched in May 2012 to review the core ICT household indicators and to revise the ITU Manual for Measuring ICT Access and Use by Households and Individuals. The EGH discussed for more than one year, through the online forum, the revision of the ICT household indicators and the ITU Manual. The first EGH face-to-face meeting was held in June 2013 in Sao Paulo, Brazil, and was attended by 38 participants.

69. Mr Barbosa mentioned that the number of registered members of the EGH had more than doubled in a period of one year, to 176 members in November 2013. He emphasized that member countries found the work of the EGH very important, shown by the current number of countries (76 countries) that are represented in the group.

70. During his presentation, he provided details on the revisions made to the core list of ICT household indicators, which included updates to the definition of radio, TV, and computer; the addition of four new indicators on multi-channel television, barriers to household Internet access, ICT skills by individuals using the Internet, and household expenditure on ICT; and revisions to cross-cutting issues such as the concept of household access, age scope and reference period. The revised concept of household access specified that the device or service should be available for use of any member of the household at any time. For the age scope related to the ICT usage indicators, such as the use of Internet and mobile phones, it was recommended that the data be collected for the total population, without minimum or maximum age. Lastly, the reference period was changed from twelve months to three months.

71. Mr Barbosa informed participants that a number of indicators were left for discussion in the forum. These included the indicators of individuals using the Internet by type of portable device and network used to access the Internet, Internet security, and children and youth online protection. He mentioned that the EGH proposed other relevant topics that could be discussed in the future, which include green ICT, mobile phone activities, gender-relevant ICT indicators, revenue and investment for the ICT sector, and ICT for people with disabilities.

72. He emphasized that the core list was a minimum list that should be used by countries when collecting ICT household statistics. He mentioned that the ITU Manual was also discussed by

the EGH but he was leaving the details to the next presenter. He concluded by inviting the participants to join the EGH and to participate actively in its discussions.

73. The second presentation was delivered by **Ms Susan Teltscher, Head, ICT Data and Statistics Division, ITU/BDT.** She started by acknowledging the important and excellent work that Alexandre Barbosa had done in chairing the EGH. She also thanked countries that participated in the discussions and provided comments in the EGH, both on the core ICT household indicators and the revision of the ITU Manual.

74. She presented and launched the 2014 edition of the ITU Manual on Measuring ICT Access and Use by Households and Individuals. She highlighted that the revisions made to the 2009 edition of the Manual had been necessary due to the rapid changes in technologies and devices, revisions of the Partnership core ICT household indicators as presented by the EGH chair, feedback from NSOs and other users of the ITU Manual, inputs received during the delivery of the ICT household training courses, and the revisions made in the indicators included in the ITU Handbook for the Collection of Administrative Data on Telecommunications/ ICT (2011).

75. The Manual aimed to help countries to produce internationally comparable ICT data and should serve as a practical tool to collect the ICT household data that are collected through household surveys. Main users of the Manual included official ICT data producers, statisticians and national statistics offices. Ms Teltscher highlighted that WTIM2012 provided the mandate to the ITU to revise the Manual through the EGH. She provided an overview of the revision process and mentioned that several consultants had helped in revising the Manual. The draft Manual was discussed in the in the EGH forum and the EGH face-to-face meeting in Brazil in 2013, and the comments were integrated by another consultant. The final draft of the Manual had been made available in the EGH forum before the WTIS.

76. She highlighted that the revised Manual included 10 chapters. One of the new features of the revised Manual was the way the 16 ICT household indicators were presented. Each of the indicators had its own table that included definition, methodological information and the policy relevance of the indicator. The policy relevance was requested in several of the trainings conducted on ICT household statistics. Ms Teltscher also emphasized that the conceptual framework of the information society was expanded and a chapter on national coordination was added. Other changes to the Manual included revisions to better reflect sampling design, data collection and dissemination. The Manual also included annexes on the core list of ICT indicators, a model questionnaire, examples of imputation and weighting, the ITU ICT household questionnaire and a glossary. The Manual would be printed in early 2014 and copies sent to countries. It would also be translated into the official ITU languages. A soft copy of the Manual would be distributed to all WTIS participants on the last day of WTIS, together with other ITU statistical publications.

77. The moderator of the session thanked the presenter for the timely revision of the 2009 version of the Manual. He emphasized that regulators and national statistics offices should use the Manual when collecting ICT household data to ensure that surveys are harmonized and the data collected were internationally comparable.

78. The third presentation was delivered by **Mr Daniel Ewerdahl, Statistician, Statistics Sweden,** on the topic of measuring ICT skills, which was one of the new core ICT household indicators agreed by the EGH. He mentioned that an ICT household survey has been conducted annually in Sweden since 2002, covering the population between 16 and 74, based on the EU-harmonized ICT household survey. In 2013, Sweden expanded the survey to include the population up to 85 years. Sweden was one of the eight members of the Task Force that developed the EU ICT household model questionnaires. The ICT household survey collected information on individual use of computers and Internet, as well as frequency of Internet use and different kinds of activities undertaken while on the Internet. E-skills was the topic of the last question included in the questionnaire and covered computer and Internet skills, which were collected every other year.

79. Sweden defined a computer as desktop computers, laptops and tablets, but not smart phones. He mentioned that it is appropriate to have a narrow definition of the computer, since the categories included in the e-skills indicator refer to traditional computer usage. He noted that computer skills could be more technical than Internet skills, as it included questions related to handling the different types of hardware and software while Internet skills included searching for information or handling a specific web service.

80. Mr Ewerdahl provided some statistics collected for both computer and Internet skills. He noted that the share of individuals who used the computer and Internet daily in Sweden was higher than the average for the European Union. The results also showed information on e-skills broken down by age and gender. He concluded the presentation by mentioning that quality improvements to their survey were achieved when they started collecting the data using stand-alone surveys. This provided Statistics Sweden an opportunity to deliver dedicated ICT-specific trainings to interviewers and helped to clarify complicated terminologies that were used in the survey. He mentioned that the definition of computer should be reviewed to ensure that it served the purpose of measuring an inclusive information society. He mentioned that today most consider computers as desktop or laptop computer and not a tablet (which is included in the current definition). However, some people might only use the smart phone and their needs of being part of the information society are fulfilled. He encouraged participants to be forward-looking and see how computers would behave in five years. He closed by informing the audience that the 2015 Eurostat model questionnaire would be finished by spring 2014.

81. Following the three presentations the delegate from Egypt mentioned that the question included in the ICT household questionnaire on ICT expenditure did not correspond correctly to income and that Egypt was creating a wealth indicator. Egypt indicated that the new indicators on green ICT and e-government were very timely and appropriate and highlighted that individual data were sometimes not accurate since the responses may not be provided directly by the individuals concerned. The delegate from Brazil replied that data on ICT expenditure were collected but that challenges remained. However, he mentioned that the experience and type of indicators collected in Brazil may not apply to other countries since they had questions that were very specific to the Brazilian case.

82. The delegate from Iran asked whether it was possible to capture the frequency of Internet use. Ms Teltscher replied that there was a core indicator on frequency of use but not on the time spent on the Internet. The delegate from the Dominican Republic requested how the data could be standardized so that they could be comparable across countries. She provided the example of gender statistics, which should be compared to the proportion of men and women in the country. There were also some issues related to the data collection as respondents were not selected properly. For example, gender questions should be asked directly to the individuals. The moderator suggested postponing this question to the next session, which was going to deal with data quality.

83. Ms Teltscher highlighted that the training of enumerators was one of the topics included in the Manual. She further explained that the timing of interviews should be considered when planning the survey, to ensure that the right respondents were available to reply directly to the relevant questions. In addition, the EGH Chair mentioned that interviewers' training was fundamental in the conduct of a survey and that it could be done in two steps, to see how the respondents reply, and a pre-test to see how the questionnaire could be implemented. Training of interviewers should also be part of every survey planning.

84. The delegate from Zimbabwe mentioned that they had been waiting for the revised Manual since they are planning their ICT household survey, to be funded by the regulator. He highlighted the importance of having the revised Manual and that the launch of the Manual was very timely. He was wondering why the revised Manual put more emphasis on adding ICT questions to existing household surveys as opposed to stand-alone ICT surveys. He said stand-alone surveys should be the first option and modules to existing surveys should be the second option. ITU explained that a stand-alone survey was still the preferred option but that the Manual also elaborates on the use of existing surveys if countries had limited resources to conduct a stand-alone survey.

85. The moderator summarized the session and acknowledged the important work carried out by the ITU Expert Group on ICT Household Indicators (EGH) in revising the core ICT indicators on household access to, and individual use of, ICTs, and the ITU Manual on Measuring ICT Access and Use by Households and Individuals. He particularly acknowledged the excellent work done in revising the core ICT household indicators which were presented during the meeting. He emphasized that since there had been no objection to the revised core list of ICT household indicators, the list was considered as endorsed by the meeting. He then encouraged countries to use the revised list as a minimum list when collecting ICT household data.

86. He thanked the EGH and ITU for revising the ITU Manual on Measuring ICT Access and Use by Households and Individuals. He mentioned that the Manual was considered adopted by the WTIS, and asked participants if there were any objections but there were none. He further encouraged countries to use the Manual when designing and implementing ICT household surveys.

Measuring gender and ICT (joint session with the Partnership on Measuring ICT for Development)

87. The session was moderated by **Ms Vanessa Gray, Senior Analyst, ITU/BDT.** The main objective of the session was to present the ongoing work of the Partnership Task Group on Measuring Gender and ICT (TGG) and the "Stocktaking and Assessment on Measuring ICT and Gender" report prepared by Nancy Hafkin of WISAT and UNCTAD consultant on behalf of the Partnership.

88. The first presentation was delivered by **Ms Scarlett Fondeur Gil, Economic Affairs Officer, UNCTAD.** She provided an overview of the TGG, which was currently composed of ITU, UNCTAD, UIS, UNESCAP and UNESCWA, a co-chaired by ITU and UNCTAD. She presented the outcomes of the Gender Expert Meeting that took place on 3 December 2013 in which selected country and international experts had participated. The meeting had acknowledged the work done by the consultant whose report assessed the availability of sex-disaggregated and gender-specific ICT indicators, as well as new areas where there was demand for data. Further, the meeting highlighted the importance of collecting sex-disaggregated data and requested the Partnership to build on the report to examine the feasibility of collecting more sex-disaggregated data for the indicators included on its core list. Ms Fondeur Gil mentioned that the Partnership could conduct a data availability inventory to check on the feasibility of collecting more sex-disaggregated data at the international level.

89. Ms Fondeur Gil emphasized that the outcome of the report would feed into the second phase of the work of the TGG, which included a consultation process with experts and countries. The meeting highlighted that the work on ICT indicators and gender should raise awareness about the importance of gender-related ICT statistics, and build a bridge between the ICT statistics and the gender statistics communities. The expert meeting further agreed that the priority areas where sex-disaggregated data should be collected included the following: Household access and individual use of ICT, education and ICT indicators, ICT employment, ICT business and entrepreneurship, and e-Government. Participants were invited to comment on the report until 10 January 2014.

90. The second presentation was delivered by **Ms Nancy Hafkin from Women in Global Science and Technology (WISAT)** and an UNCTAD consultant on behalf of the Partnership. Ms Hafkin presented the "Stocktaking and Assessment on Measuring ICT and Gender" report she had prepared and highlighted that there was still an important gender divide in terms of ICT access and use. Given the role of ICTs for social and economic development, it was particularly important for all women and girls –who often faced lower income and education levels - to join the information society, and to fully benefit from the potential of ICTs. She emphasized the importance of having sex-disaggregated ICT data by highlighting that "without data, there is no visibility, without visibility, there is no priority".

91. She presented the report which built on earlier Partnership work on gender-related statistics. The main objectives of the report were to take stock of existing ICT and gender statistics work by the members of the Partnership and other stakeholder, to assess the demand for gender-related ICT indicators, and to propose new areas for measurement. Ms

Hafkin mentioned that out of the existing 57 core indicators of the Partnership, only 12 could be disaggregated by sex. These included seven indicators on ICT access and use by household and individuals, three education indicators and two indicators on e-government. Ms Hafkin listed some additional indicators where sex-disaggregated data could be collected, including on mobile phone ownership and type of activity, barriers to Internet use and several ICT in education indicators collected by UNESCO. She added that for the existing core indicators that could be broken down by sex, data availability remained a problem and only very few countries, except in Europe, actually collected these data.

92. While there was strong demand for sex-disaggregated data on employment, none of the existing core indicators on ICT and employment could be disaggregated by sex and more methodological work in this area was necessary.

93. Ms Hafkin emphasized that there were a number of criteria for identifying additional indicators. First, indicators should have a high degree of policy relevance at the national, regional and international level. Additionally, indicators should be simple, realistic and measurable, and there should be a high response rate, and a minimum additional burden on data producers.

94. She concluded with some recommendations to help improve the availability of sex-disaggregated data. These included increased efforts in countries to collect sex-disaggregated ICT data for the current core indicators of the Partnership, training managerial and field personnel on the sensitivity to gender bias, and increasing communication channels between ICT statistics and gender statistics at the international, regional and national level.

95. The third presentation was delivered by **Mr David Hunter, Senior Statistician, ILO,** on indicators on gender and ICT employment Indicators. Mr Hunter mentioned that there was a need for indicators on employment in ICT due to the massive revolution in the labour market brought by ICT. However, he mentioned that there is no unified international definition of ICT employment.

96. He highlighted three main areas of measuring ICT employment. These include employment in ICT occupations (in jobs that require skills in the production of ICT goods and services), employment using ICT skills and tools (in jobs that require skills in the use of ICT), and employment in the ICT Sector (in jobs in establishments that mainly produce ICT goods and services). Mr Hunter provided some guidelines on how sex-disaggregated data could be collected in the ICT sector and the possible sources of data. For employment in the ICT sector a disaggregation in the existing core indicator could be added. To capture the gender perspective in employment in ICT occupations, there was a need to update ISCO, and to specifically develop a thematic classification that would include ICT. He mentioned that currently, ISCO-08 identified two ICT occupations at 2-digit levels, both of which could be included in the thematic view. The four level of ISCO, which would give more details of ICT occupations, should be explored. He emphasized that there was a need to agree on which occupations to include or not to include in the thematic view.

97. According to Mr Hunter, the best data sources for employment in ICT occupations data were household surveys, labour force surveys and the census. He added that the quality of administrative data varied between countries.

98. He concluded that there was a need to define indicators on employment in the ICT sector that could be disaggregated by sex and that it was important to have an agreement on occupations to be included in proposed new indicator on 'Employment in ICT Occupations'. He proposed to circulate a discussion paper among practitioners in the field and national experts in occupation classification. Finally, he mentioned that further investigation of the viability of including indicators on 'Employment using ICT skills and tools' was necessary.

99. The last presentation was delivered by Ernestina Hope Turkson from the Ghana Statistical Service (GSS). Ms Turkson provided an overview of the different surveys conducted in the country and mentioned that Ghana collect ICT data using multi-purpose surveys. The living standard survey conducted in 2013 collected a number of indicators covering ICT in business, education, government, agriculture and health. The 2010 census collected included ICT household indicators on mobile phone ownership and location of Internet use, both of which were disaggregated by sex. The data collection results provided important guidelines to policy makers and highlighted areas where improvements had to be made. In particular, gender-discrepancies in ICT access and use continue to exist in Ghana's rural areas and in the three northern regions.

100. Following the presentations, the delegate from Brazil acknowledged the Partnership's initiative for defining a framework for collecting sex-disaggregated ICT data and its efforts to prepare the report. Brazil highlighted that some of the sex-disaggregated data were easy to collect, particularly for the ICT household indicators included in the stocktaking report. However, other gender-specific indicators, particularly in the area of entrepreneurship, were more difficult to collect and he requested UNCTAD to provide guidance on those indicators. UNCTAD mentioned that it has noted that small business owners are different from other entrepreneurs and that the TGG will look into those issues when defining the indicators.

101. The delegate from Egypt acknowledged the work done by the TGG and the report prepared by the consultant. Some of the indicators included in the report were already collected in Egypt and showed major differences in gender-equality in terms of ICT access and use within the country. Egypt highlighted that for women to benefit from ICTs, examples of the positive impact of ICTs on women have to be provided. Cultural differences between countries would also have to be taken into account. In addition Egypt requested ILO to provide some clarifications as to the difference between ICT occupations and the ICT sector. David Hunter (ILO) clarified that the ICT sector included the manufacturing of goods and equipment, and the provision of ICT services to other companies. ICT surveys and business registers were usually the main sources of data in this area, which could be compiled from existing data collections, as long as the classification were defined.

102. The delegate from Iran requested some clarifications on the classification of occupation and the required ICT skills for those occupations. He mentioned that every country had its own classification and asked if proxy indicators could be used since gathering the information on

occupation with ICT skills was difficult. The ILO responded that this issue would be included in the future discussion that they plan to initiate.

103. The moderator summarized the session by emphasizing the importance of the work on gender ICT statistics, the work of the Partnership on Measuring ICT for Development, and the important role carried out by ITU and UNCTAD in leading the Task Group on Gender and ICT. Countries were encouraged to collect and disseminate sex-disaggregated ICT data, in particular for indicators currently collected by Partnership. ITU, in cooperation with the Partnership, was invited to continue work on monitoring ICTs and gender. The moderator highlighted that discussions were taking place in parallel to ongoing discussion in the UN Inter-Agency Expert Group on Gender Statistics and would certainly be important in the post-2015 development agenda. The moderator also emphasized that the lack of statistics were often reflected in the lack of appropriate policies.

104. The session was closed after the moderator thanked the presenters and participants for their contributions.

Data quality assurance in ICT statistics

105. The session was moderated by **Mr Jose Ramon Albert, Secretary General, National Statistical Coordination Board (NSCB), Philippines** who introduced the topic and the speakers.

106. An introductory presentation on a data quality assessment framework for ICT statistics was given by **Ms Esperanza Magpantay, Senior Statistician, ITU/BDT**. She provided background information on ITU's data collection, validation, processing and dissemination and recalled the work on developing methodologies (published in the manuals) and working with member states through the two Expert Groups. Data quality assessment (DQA) was important given the work on estimation and imputation of missing data, the variety of country sources and the diversity in scope. Developing a DQA framework for ICT statistics both at the national and international level could therefore be an important step forward in enhancing data availability and quality for ICT statistics.

107. **Mr Ralf Becker, Chief, Industrial and Energy Statistics Section, United Nations Statistics Division (UNSD),** presented the template for a National Quality Assurance Framework (NQAF) that was developed recently by a UNSD Expert Group. He started by giving an overview of what was meant by data quality in the NSO context, which was vaguely defined by "fitness for use" in terms of user needs, i.e. are the data fit (have the necessary quality) for the purpose for which they are to be used (by decision makers from governments, business and the public in general). Data quality does not only refer to accuracy, but is a multidimensional concept and good quality data should also consider the aspect of timeliness, be accessible and from known and verifiable sources, provided regularly and show what is needed.

108. The NQAF template, which comes with concrete guidelines, could be used by countries to build their own national frameworks and adapt to local circumstances. Key components

when assessing product quality are: relevance; accuracy and reliability; timeliness and punctuality; accessibility and clarity; and coherence and comparability. The template and guidelines also include a range of useful tools and checklists which can be applied and customized to a particular use. What is important to keep in mind is that data quality is not only about outputs but that the quality of inputs and processes have to be considered equally and will impact on the quality of the data output. The NQAF template can and should be tailored to ICT statistics which could help improve data quality in this area and ITU would be best placed to take the lead on this. The presenter also mentioned that quality assurance frameworks are discussed at the international level as well and that coordination among UN agencies and harmonization of quality frameworks is carried out through the UN Statistical Commission and the Committee for the Coordination of Statistical Activities (CCSA) among international organizations.

109. The next speaker was **Mr Antonio Galicia-Escotto, Senior Economist, Statistics Department, International Monetary Fund (IMF)** who presented the Data Quality Assessment Framework (DQAF) developed by the IMF. In line with the previous speakers, he introduced the topic by stressing that data quality was not only about accuracy but also timeliness, periodicity and consistency and that it was important to also look at the statistical institutions, processes and output. DQAF, which focused mostly on macroeconomic statistics, considered five dimensions of data quality, including integrity, methodological soundness, accuracy and reliability, serviceability and accessibility. IMF applies the DQAF in its country work and also provides technical assistance and training to countries in this regard. The DQAF can also be applied to other areas of statistics, such as ICT statistics, at both the national and international levels, and it can be used as a self-assessment tool. Finally, the speaker pointed to the potential risks if no QAF was applied, such as inconsistency of data among providers of statistics.

110. The final presentation on data quality was shared among two speakers from **INEGI, Mexico, Gerardo Durand, Deputy Director General of Economic Surveys and Administrative Records, and Mr Eduardo Ríos, Assistant Director General for Socio-Demographic Surveys and Administrative Records**. Their presentation focused on data quality in household surveys, with particular reference to the ICT module included in their annual household survey since 2001 (except for 2003). They explained the importance of a sampling design and its statistical accuracy, with a series of guiding questions and checklists to ensure good quality design. Equally important was the planning phase, conceptual design, and the appropriate use of existing standards, definitions and classifications. Another key component of ensuring data quality from surveys was to establish and implement a thorough training strategy for all involved in the survey, including enumerators. Finally, during the data processing phase, careful attention needs to be paid to data entering, verification and the validation process.

111. The presenters also shared some of their lessons learned to ensure the quality of the information. The best investments that could be made were investments in time and financial resources in the process of design, data collection, monitoring and control of each stage of the statistical production. Quality control, monitoring and supervision during field work (or data collection) were also essential. They also mentioned that institutional

arrangements were important, in particular consultation with data users, such as Ministries and other institutions, which in the case of Mexico was done through their Committee on Statistics for the Information Society.

112. During the subsequent discussion, questions were raised concerning the coordination at the national level with respect to developing national quality assessment frameworks, whether the generic frameworks could be applied to ICT statistics, whether standards such as SDMX were a prerequisite for applying the frameworks, the importance of data usability, as well as more details on ITU procedures when it comes to data imputation for missing values.

113. The presenters explained that the different components of the NQAF could be customized and used for different purposes, such as the overall organization of the statistical work or the data production more specifically. While the use of SDMX was not a requirement, it could help in improving the overall statistical output. The aspect of data usability was important and was included in several of the components of the QAFs. Finally, it was possible to apply the generic QAFs to different types of statistics, such as ICT statistics, and a good model of national cooperation on this matter was the case of Mexico with its established institutional arrangements bringing together different producers and users of ICT statistics.

Emerging issues in measuring telecommunication infrastructure

114. The session was moderated by **Mr Cosmas Zavazava, Chief of ITU/BDT Project Support and Knowledge Management Department.** He introduced the two topics to be discussed in the session: LTE and other advanced mobile technologies, and M2M communications. Before giving the floor to the panelists, he announced that Kathryn O'Brien from the Federal Communications Commission, United States, could not be present because of an emergency.

115. The first presentation was delivered by **Mr Joaquín Restrepo, Head, Outreach and Publications Division, ITU/BR.** He described the evolution of mobile technologies: it took ten years to pass from the 1st generation (analogue) to the 2nd generation (first all digital); 7 years to advance from the 2nd generation to the 3rd generation (first allowing for mobile broadband); and five years to reach the 4th generation (IMT-Advanced, first all-IP mobile platform).

116. Mr Restrepo explained the differences between the acronyms used to define mobile technologies. IMT are a unique set of specifications defined by ITU-R and valid globally, including both IMT-2000 and IMT-Advanced. The terms xG (e.g. 2G, 2.75G, 3G, 3.5G, etc.) have no unique set of specifications, and operators may use them to refer to different types of technologies. For 3G and IMT-2000 a consensus was achieved so that both definitions matched, but for 4G and IMT-Advanced no consensus had yet been achieved: in some cases regulators allowed only the use of the term 4G to mean IMT-Advanced, in other cases it was used for all technologies above 3G.

117. Mr Restrepo highlighted the importance of collecting data on mobile-broadband subscriptions broken down by technology, as well as information on the implementation/commercial status and the frequency bands (and bandwidth) used for each technology. All this information except the number of subscriptions was already collected by the ITU Regulatory and Market Environment Division, which also collects information concerning the spectrum auctions, including the prices paid for the licenses.

118. The second presentation was given by **Mr Soichiro Seki, Director-General, International Affairs, Ministry of Internal Affairs and Communications, Japan**. He presented the experience of Japan in the collection of data on LTE. LTE services were launched in Japan in December 2010 and in September 2013 they had already achieved 25 per cent penetration (or 30 per cent the number of 3G subscriptions). Fixed (wired)–broadband had also experienced profound technological changes in Japan: FTTH subscriptions overtook the number of DSL subscriptions in 2006, and CATV subscriptions in 2008.

119. Mr Seki summed up the Japanese experience: once new broadband technologies were put in the market, they grew very fast. In addition, he stressed the importance of data on new broadband technologies for consumer protection and operators' accountability. Regarding mobile-broadband technologies, operators had the obligation to report subscription data and other information to ensure the accountability of the terms and conditions for the service provision. Regarding LTE subscriptions, reporting had been mandatory since January 2010, some months in advance of the launch of the services. Since April 2013, data on mobile-broadband subscriptions were requested for: (i) data only and/or voice usable (USB keys and smartphones); (ii) data communications modules (M2M); (iii) flat-rate packages (smartphones).

120. Mr Seki finished the presentation by explaining how coverage data were obtained based on the tessellation of the country in 500m x 500m squares. For each square, if more than 50 per cent was covered, then the entire square was considered as covered.

121. The third presentation was delivered by **Mr Matt Hatton, Director, Machina Research**, who provided an overview of the challenges associated with the collection of statistics on M2M services. He defined M2M as "Connections to remote sensing, monitoring and actuating devices, together with associated aggregation devices", noting that the definition was broad and that there was not a consensus on it. Mr. Hatton pointed out that, according to Machina Research's definition, M2M cellular services were only a fraction of the total, but that he would focus on the issues related to the collection of data on M2M cellular subscriptions because they were the most feasible to collect by telecommunication regulators and ministries.

122. Mr Hatton noted that there were large discrepancies in the data on M2M cellular services published by some operators and data from regulators. He presented the main statistical issues explaining these disparities: (i) M2M services cannot be defined by the type of device (many different devices could be considered); (ii) it is difficult to define them by type of subscription (many M2M SIMs have the M2M Form Factor, but not all); (iii) many M2M cellular subscriptions may be used at an aggregation point, but not in each device; (iv) activity criteria cannot be applied as in the case of regular mobile-cellular subscriptions (i.e.

used in the last three months), because many M2M devices only generate traffic for very specific events. A possible solution for the activity criteria would be to count only those subscriptions that are maintained by operators in their home location register (HLR), or those that generate revenues. Mr Hatton also mentioned the fact that many M2M cellular subscriptions were sold at the regional or global level, so it would be difficult to identify in which countries they should be counted. Mr Hatton finished his presentation by stressing that M2M would remain a critical growth area and that ITU needed to track its development.

123. Following the presentations, the moderator opened the floor for questions. ITU/BDT asked how it was possible to determine to which technology a mobile-broadband subscription should be assigned, and also on the activity criteria that Japan applied to count as active mobile-broadband subscription packages including voice and data services. Japan clarified that LTE subscribers paid a specific fee for using high-speed mobile-broadband, and therefore they could be discriminated from the rest by the type of contract. ITU/BR mentioned that double-counting of subscriptions could be an issue (i.e. one subscription counted both as 3G and 4G). Japan further explained that postpaid subscriptions were largely dominant in the country, so the activity criteria were not an issue because there were few pay-as-you-go subscriptions. Regarding M2M services, ITU/BDT inquired whether it was not possible to distinguish M2M subscriptions by the type of contract/pricing, and whether there was any major problem in counting M2M subscriptions in the country they had been registered. Machina Research acknowledged that most M2M subscriptions followed different pricing schemes than usual mobile-cellular subscriptions, but there was a fraction of M2M subscriptions that followed conventional pricing and could not be distinguished based on this. As for the counting of M2M subscriptions in each country, Machina Research noted that in many cases M2M subscriptions crossed borders (e.g. moving containers or Amazon's Kindle) and operated based on international roaming fees. This was more common in M2M because data consumption was small and therefore higher roaming prices had less of an impact in M2M services.

124. Algeria Telecom took the floor to highlight the importance of LTE to provide high-speed broadband in rural and remote areas and asked Japan to provide some recommendations on the collection of data on LTE. Japan replied that it was important to start the data collection (i.e. have the questionnaires and the system ready) in the early stages, even before the launch of services in the country. Togo asked more details on how the coverage of mobile-cellular network was calculated in Japan and whether that was used to track coverage commitments by operators. Japan answered that the mesh was designed for national purposes and that it was indeed used to track coverage obligations. Japan further highlighted that their methodology to calculate mobile coverage could be applied to other countries. ITU/BR added that in large uninhabited areas, larger tessellation could be used.

125. Finland took the floor to inquire about the uses of LTE statistics. Japan explained that data were collected for market analysis and consumer protection, and that they had been used for instance to monitor the coverage obligations tied to the licensing of LTE (50 per cent coverage by the launch of the service). ITU/BR suggested naming the technologies/specifications included in each indictor to improve international comparability,

and stressed the importance of collecting information on the frequency bands used to deploy each technology. ITU/BR mentioned that ITU/BR and ITU/BDT were working to avoid duplication of data requests concerning mobile-broadband technologies.

126. Brazil requested ITU to engage in the measurement of LTE, and suggested addressing the subject in the context of EGTI. Brazil also asked whether M2M metrics were being discussed in other ITU expert groups. The moderator welcomed the proposals from Brazil and suggested a series of conclusions for the session, including the discussion of LTE and M2M indicators in the EGTI forum.

Big data in telecommunications

127. The session on Big Data in the Telecommunications Industry was moderated by **Mr Ralf Becker, Chief of the Industrial and Energy Statistics Section of the United Nations Statistic Division (UNSD).** Mr Becker briefly introduced the topic and highlighted its relevance. Big Data was a recent topic of the United Nations Statistical Commission (UNSC), which during its 2013 session, organized a side event on Big Data. In addition, the 2014 UNSC session would discuss a report of the Secretary-General on big data and modernization of statistical systems.

128. The first presentation, Big Data in Real Time: Toward a New Evidence Base for Impact was made by **Mr Robert Kirkpatrick, Director of UN Global Pulse**, the UN initiative to use new, digital data sources and real-time analytics for sustainable development and humanitarian action. The presentation highlighted the potential of big data for development and presented a number of concrete examples, including different maps generated based on real-time information from Twitter, credit card transactions and online search terms.

129. One of the key assumptions of the big data-for-development debate is that peoples' changing reality and needs modify their digital behaviour, which in turn leaves recognizable (collective) patterns in big data. By identifying and interpreting these patterns, policy makers could gain valuable and real-time insights that would allow them to adapt immediately and optimize their policies. The mining of online news, social media, and retail advertising, and the tracking of mobile-phone patterns and financial transactions, in particular, had proven to produce great amounts of information that could be used to help policy makers understand new, current trends, identify early warning systems, but also evaluate the effectiveness of policies.

130. Work carried out by Global Pulse had shown that it was possible to predict the outbreak of different illnesses by identifying recurring Google search terms, or keywords on Twitter. Similar big data mining techniques had been used to improve and customize public awareness campaigns, for example, in countries where parents had specific (cultural or religious) concerns about vaccinating their children. Also, information on the size and frequency of mobile-prepaid airtime purchases had been used to predict economic stress situations and as a proxy indicator for household income, as well as to produce real-time poverty maps. Comparisons with official poverty maps have confirmed the accuracy of the

information based on big data sources from operators, which could provide more details and up-to-date information than maps based on survey data since data could be produced down to the cell-tower level. Similar mobile-phone network information has been used to evaluate the impact of efforts to limit the use of public transportation during the outbreak of disease, or to track displacements during natural disasters.

131. In his presentation, Mr Kirkpatrick listed a number of operating principles that need to be followed when handling big data. These include the need for transparency, strict anonymization of data, and the adherence to national and international data protection laws. Mr Kirkpatrick highlighted the importance of addressing privacy and confidentiality issues so as not to jeopardize the tremendous opportunity to leverage big data for development. He described big data as a raw public good, which needed to be used safely. He further called for the move to a risk-based approach that, while acknowledging the impossibility of guaranteeing non-zero risk, recognized the obligation to take advantage of big data. Policy makers were encouraged to strike a balance between guaranteeing privacy but also other human rights, such as the right to food, water, health, and education. He highlighted that policy makers could be held accountable for their failure to take advantage of big data.

132. Mr Kirkpatrick further presented a number of data sources and ways of sharing information. This included access to publicly available (for example social media) data, aggregated data provided through non-disclosure agreements and the provision of aggregated data made available for free by one or several companies in the same industry. The presentation ended with the question of the role of ITU in examining and exploiting big data. In particular, ITU could become an important link in big data public-private partnerships.

133. The second presentation, on Leveraging Mobile Network Big Data for Development in Sri Lanka, was presented (via remote participation) by **Mr Sriganesh Lokanathan, Senior Research Manager at LIRNEasia.** Through this big data project, LIRNEasia has used customers' telecommunication service records to understand social and economic behaviour and ties. By combining telecommunication services meta-data from multiple operators in Sri Lanka, including call detail and Internet access records, SMS, and airtime top-up records, it has been possible to analyze user behaviour in the areas of employment, migration and social ties. For example, the project has used mobile-phone data to identify population densities and to improve transportation planning by increasing bus routes in highly populated areas and on busy bus routes, and to track intra-day migration within Colombo. Mr Lokanathan mentioned that in the context of this transportation project big data has been able to provide needed insights in a more cost-effective and timely manner than survey data. As long as access to big data sources is available, the overall process of producing information about the transportation system could also be easier with big data, compared to survey data.

134. Regarding the storage and use of data, Mr Lokanathan highlighted that LIRNEasia did not have access to any Personally Identifiable Information (PII) and that all phone numbers were anonymized. At times, regulatory rules remained ambiguous and the definition and understanding of privacy required detailed discussions. Based on its work with big data

LIRNEasia has started to develop a framework on privacy and self-regulatory guidelines for the collection, use and sharing of mobile phone data.

135. The presentation also addressed the reliability of the data and the analysis. To understand how representative the results were, and to understand how big data could complement existing official data, results were being matched to Sri Lanka's census and household survey data. The presentation highlighted that current research was still in its early stages and that more work had to be carried out to understand the full potential of big data for development.

136. The presentation revealed that the main challenge of the project has been to gain access to telecommunication network meta-data from multiple operators in the country. While in principle it was relatively easy to get agreement from management to access the (anonymous) customer information, the negotiating process was lengthy due to concerns from different departments, including legal and regulatory affairs, marketing, business intelligence and network operations. Strict non-disclosure agreements had to be signed with each operator. Also, LIRNEasia highlighted the methodological challenges in mining big data and the lack of people with the necessary (computer and analytical) skills.

137. The third presentation on big data was made by **Mr Carlos Jiménez Riestra, from Telefónica**, who highlighted the great changes that digital technologies have made on the way people live their lives, the large amounts of data they produce, and how they allow us to store and share this information. Newly available information and data were produced through call details, Internet user details, social networks and also sensors.

138. Mr Jiménez demonstrated how big data could be used by telecommunication companies like Telefónica to become a 'Digital Telco' and to improve customer relationships and experiences. Big data could help operators to move towards a level of customer segmentation that would allow them to optimize their networks, create new knowledge and adapt to the needs of their customers. Analysis was carried out in the area of sentiment analysis, text mining and web-profiling and new insights into customers' activities and needs could help reduce or manage churn and eventually increase operators' revenues. One example is Telefónica's dual tariffs, which take into account customers' mobility patterns to offer them customized tariffs. At the same time, there was a great need to protect clients' privacy, to ensure confidentiality, while allowing them to benefit from personalized services. The way governments regulate record anonymization and aggregated information varied greatly between countries and operators needed to adapt to national circumstances and be informed about legal and regulatory environments.

139. The presentation was followed by a short video on Telefónica Dynamic Insights, Telefónica's big data business division, which collects, aggregates and anonymizes mobile data to analyze collective behaviour, and to develop new and better public and private business models.

140. The moderator of the session thanked the presenters and highlighted the importance of data sustainability in the discussion on big data: in order to monitor trends, and effectively use the data, it must be produced regularly and in a harmonized and sustainable way.

141. The discussion following the presentations was very much focused on the issues of data privacy, reliability and confidentiality and highlighted the audience's concern around these issues. The Republic of Korea, Egypt, Chad, Iran and Ghana inquired about big data producers' and users' ability to guarantee privacy protection, and how to distinguish between fake and real information that was produced through big data and social media, for example via Twitter. Telefónica inquired about operators' options when asked to provide confidential information by public authorities.

142. The presenters responded to these concerns by highlighting the need to balance between minimizing the risks of big data on the one hand, and the need to retain some of the information necessary for analysis, on the other hand. They pointed to the fact that the techniques to make big data analysis safe (so as to ensure data privacy and confidentiality) already existed and that they were improving, constantly. Mr Kirkpatrick highlighted that the mis-use of data was possible – with or without big data – and that only strict regulation and public awareness could help create the necessary protection and trust. Finland took the floor to highlight the important role that national statistical offices (NSOs) had in the area of big data. Finland's NSO was looking into the opportunities of big data, while applying the same data privacy and confidentiality principles that it applied to its official statistical data collections and analysis.

143. ITU asked how current big data projects accounted for those parts of the population that were not yet part of the global information society, for example those without a digital footprint. While the presenters acknowledged that the information produced through big data did not take into account those who were not connected and not online, the number of people with access to and use of ICTs was increasing constantly, thus increasing the scope and relevance of big data.

144. The moderator summarized the main findings of the session and highlighted in particular the important role that technological changes and ICT uptake had played in driving the data revolution. Big data had tremendous potential for development by providing real-time information, at often lower cost, and within less time. More work was needed to fully understand the potential of big data and ITU should further examine the challenges and opportunities of big data, in particular data coming from ICT companies. At the same time, data privacy and confidentiality remained a major issue and policy makers and operators needed to explore the development of guidelines on how to produce, exploit, and store big data. National statistical offices were encouraged to look into the opportunities of big data and to address current challenges in terms of big data quality and veracity; and to look into using prevailing official principles that exist for official statistics to understand, analyze and evaluate big data.

Conclusions and recommendations

145. During the concluding session, the Chair of WTIS, **Mr Luis Lucatero, Chief of Regulatory Policy of IFT, Mexico**, presented the draft conclusions and recommendations of the Symposium. During the debate, delegates provided constructive comments on various parts

of the text. The Annex to this report presents the final version of the conclusions and recommendations as agreed by the meeting.

146. The discussion of the Chair's conclusions and recommendations was followed by the closing ceremony. Closing statements were delivered by the **Secretary-General of ITU, Dr Hamadoun Touré; Mr Gabriel Contreras Salivdar, President of IFT; Mr Brahima Sanou, Director of the ITU Telecommunication Development Bureau; and H.E. Mr José Ignacio Peralta, Undersecretary of Communications, Mexico**.

11TH WORLD TELECOMMUNICATION/ICT INDICATORS SYMPOSIUM (WTIS)
4-6 December 2013
Mexico City, Mexico

Conclusions and recommendations

Presented by the Chair

147. The 11th World Telecommunication/ICT Indicators Symposium (WTIS) featured three international high-level panels focusing on ICTs, MDGs, and the post-2015 development agenda; innovative ICT strategies for the information society, and the role of monitoring; and national coordination and enhancing dialogue between data producers and data users.

148. The WTIS technical sessions focused on emerging issues in measuring telecommunication infrastructure, gender and ICT, data quality assurance and big data in telecommunications. Reports by the Expert Group on Telecommunication/ICT Indicators (EGTI) and the Expert Group on ICT Household Indicators (EGH) were also presented.

149. Based on the WTIS presentations and discussions, the following conclusions and recommendations are made.

1. ICT, MDGs, and the post-2015 development agenda

150. The panel recognized that information and communication technologies (ICTs) lie at the very center in addressing the challenges related to the achievement of development goals, such as the Millennium Development Goals (MDGs) and the future Sustainable Development Goals (SDGs). While the world is entering the second phase of the ICT revolution, there are still 60 per cent of the world's population who are not yet using the Internet, many of which living in rural areas of developing countries. Therefore, high priority should be given to increase access and use of ICTs as a key enabler for future sustainable development. The high-level panel emphasized the important role of ICTs as a development enabler in such areas as employment, education, health, governance and peace-building, women empowerment, and their ability to accelerate progress towards the achievement of broader development goals. ICTs are also needed to ensure sustainable agriculture, and to develop smart energy systems and smart urban networks.

151. In recognition of the important role of ICTs, the WTIS highlighted that the debate on the post-2015 development agenda must not only recognize ICTs as a development enabler but should also consider the inclusion of an ICT goal, to ensure its role for economic growth and development and the creation of an inclusive information society by making ICTs accessible and affordable to everyone.

152. The high-level panel discussion drew attention to the potential that ICTs have in improving monitoring, including in the post-2015 development process. Technological changes and ICT uptake are driving the "data revolution" since they are changing the amount and type of

data that can be produced, the way it may be stored, exploited and analyzed. Open and real-time data could complement official data sources and help guide policy decisions.

2. High-level panel on innovative ICT strategies for the information society, and the role of monitoring

153. The panel considered a variety of national strategies and measures that could be taken to develop the information society and increase access to, and use of ICTs. Policy initiative and public-private partnerships are important to bring ICT infrastructure to rural and underserved areas. At the same time, the Symposium stressed the role of the private sector in driving the information society and in developing and spreading new and innovative technologies.

154. During the high-level segment, a number of new and innovative ways of making use of technologies to deliver any kind of service, such as education, health or culture, were explored. Governments need to help realize the full advantage of the potential of ICTs, and provide access to everyone, so that every person will be able to benefit from the information society.

155. Panellists recognized the importance of ICT data and monitoring to track and benchmark progress, and evaluate policies. Identifying and setting measurable goals and time-bound targets, based on quantitative indicators, are important tools to set objectives, track progress and evaluate and set the right policies. The identification of international goals and targets, including those of the MDGs, the WSIS and the Broadband Commission for Development also direct global attention to pressing development challenges.

156. Panellists identified a number of key emerging ICT trends as well as challenges which could be addressed in the future and which require measurement, including the changing user behaviour, the increasing availability of Internet access through wireless networks, the need to measure how ICTs affect development in terms of labour productivity, and, more generally, the need to measure ICT usage, in addition to infrastructure access. While the role of ICTs as an enabler of the MDGs is well recognized, there is also a need to measure the impact of ICT on social and economic development.

3. High-level panel on national coordination enhancing dialogue between data producers and data users

157. Due to the cross-cutting nature of ICTs, there are a number of actors involved in the monitoring and collection of statistics and indicators, including Ministries, telecommunication regulatory authorities, national statistical offices (NSOs) and other relevant authorities. This requires coordination and cooperation among national data producers and users, to ensure the efficient and timely production of high-quality official statistics.

158. Panellists recognized the importance of national coordination and international cooperation of ICT statistics and presented different models and best practices of coordination, bringing together national stakeholders to discuss issues related to the collection, dissemination and analysis of ICT statistics.

159. The meeting emphasizes the need to include ICT statistics in the National Strategy for the Development of Statistics (NSDS), which could foster not only the sustainable production of ICT statistics but also national coordination. Similarly, ICT measurement should also be part of any national ICT strategy.

160. A national coordination mechanism should involve all stakeholders at the national level, such as regulators, operators, Ministries and NSOs. Panellists suggested that the NSO should play an active role in coordinating the collection and dissemination of ICT statistics and indicators and put in place appropriate institutional arrangements. Good practices include consultation with data users and providers before planning and/or carrying out new surveys. National coordination of ICT statistics and future advances in ICT statistics should emphasize and promote the use of agreed statistical standards, concepts and classifications at all levels of the statistical production process, by all stakeholders.

161. NSOs are often best placed to take on the role of coordination and are sometimes even mandated by law. In this context, the importance of providing a legal basis for the national coordination of statistics was emphasized.

162. Looking towards the future, coordination will become even more important. The emergence of big data will require enhanced coordination given the number of new data sources, especially from ICT sector companies.

4. Report of the Expert Group on Telecommunication/ICT Indicators (EGTI)

163. The meeting reaffirms the importance of the Expert Group on Telecommunication/ICT Indicators (EGTI) as a unique global forum to discuss ICT statistics collected from administrative sources, and further encourages experts in ICT statistics to actively take part in the EGTI discussions.

164. The meeting supports the work carried out by EGTI in 2013 under the chairmanship of Iñigo Herguera, from Spain, and endorses the outcomes of the EGTI meeting held on 2-3 December 2013 at the same venue. The meeting recognizes the need to update the Partnership's core indicators on ICT infrastructure and access in order to adapt the definitions to those of the ITU Handbook, and supports the addition of two new indicators: 'mobile-broadband prices' and 'TV broadcasting subscriptions'.

165. Following the extensive discussions carried out in EGTI and in previous WTIS on revenue and investment indicators, the meeting endorses the ITU document nym*Methodology for the collection of revenue and investment data on telecommunications* and encourages countries to collect revenue and investment data on telecommunications based on these guidelines. Regarding data on foreign direct investment and revenue and investment for the entire ICT sector, the meeting agrees to the EGTI proposal of closing these items in the EGTI forum and exploring the possibility of continuing the discussions in the context of the Partnership on Measuring ICT for Development.

166. In view of the results of the 2012 ITU data collection on mobile-broadband prices and the discussions in EGTI, the meeting agrees to the changes proposed by EGTI to the ITU data collection of mobile-broadband prices.

167. The meeting acknowledges the importance of collecting infrastructure and access data on TV broadcasting in order to monitor the evolution of broadcasting technologies from analogue to digital, and keep track of the convergence of telecommunications and broadcasting. The meeting agrees to the changes in the administrative indicators to measure TV broadcasting proposed by EGTI, and to incorporate these revisions in the 2014 ITU data collection.

168. Taking into consideration the items for future discussion proposed by EGTI, the meeting agrees to the proposed topics for future work by the EGTI: a review of the classification of wireless-broadband subscriptions and international bandwidth; a revision of the list of indicators included in the ITU Long Questionnaire; indicators on bundled telecommunication services; whether to separate subscription data on (a) individuals and (b) public and private organizations; emerging technologies in telecommunication infrastructure. The meeting agrees that the discussion on the ICT Development Index, including on its structure and methodology, should continue in the EGTI forum.

5. Report of the Expert Group on ICT Household Indicators (EGH)

169. The meeting acknowledges the important work carried out by the ITU Expert Group on ICT Household Indicators (EGH), under the chairmanship of Alexandre Barbosa from Brazil, in revising the Partnership core ICT indicators on ICT household access and individual use of ICTs, and the ITU Manual on Measuring ICT Access and Use by Households and Individuals.

170. The meeting endorses the revisions made to the core ICT indicators on ICT household access and individual use of ICTs and encourages countries to use the revised list as a minimum list when collecting ICT household data.

171. The revised 2014 edition of the ITU Manual on Measuring ICT Access and Use by households and individuals was adopted by the meeting. The Manual, which aims to help countries to produce internationally comparable data, will be a useful tool for countries in their production of ICT household statistics. Countries should use the revised Manual when designing and implementing ICT household surveys, or collecting ICT indicators through stand-alone surveys, existing surveys or censuses.

172. The meeting endorses the proposed future work by the EGH including indicators related to gender, green ICT, mobile phone activities, revenue and investment for the ICT sector and ICT for people with disabilities. Experts in the area of ICT household statistics are invited to join the EGH online discussion forum and provide inputs and share experience with regard to the new indicators currently under discussions.

6. Measuring gender and ICT

173. The meeting welcomes the progress made by ITU and the Partnership on Measuring ICT for Development in measuring gender and ICT, and the creation of a new Task Group on this topic to help policy makers to set adequate policies. The meeting acknowledges the work done in assessing the current status of indicators on the use of ICTs by gender, and welcomes the assessment report produced by the Partnership and presented to the WTIS. Countries are invited to submit written comments on the report by January 10, 2014.

174. Participants highlighted the need for further consultation with countries, as well as with ICT and gender experts, in order to develop sex-disaggregated data and to assess what is already available. Countries are encouraged to collect and disseminate sex-disaggregated ICT data for the indicators included in the Partnership core list of ICT indicators.

175. The meeting highlighted that there is a lack of statistical information related to ICT sector employment and ICT occupations and stressed the need for internationally agreed definitions that could be used when collecting the data. The Partnership should engage in further work on this issue, in collaboration with the International Labour Organization (ILO), including clarifying key methodological and definitional issues related to ICT and employment.

176. The meeting recommends that ITU, in cooperation with members of the Partnership on Measuring ICT for Development and its Task Group on Gender, continue to work on the suggestions outlined in the assessment document. Discussions should take place in expert groups, such as the EGH and the relevant ILO expert group.

7. Data quality assurance in ICT statistics

177. The meeting acknowledges the importance of data quality to ensure good evidence-based policy making, including in the area of ICT statistics. To this effect, more attention should be paid to data quality assurance/assessment frameworks (QAFs) and their application by national and international data producers.

178. There are particular issues related to data quality and ICT statistics production that need to be considered, including the variety of producers at the national level, the rapid changes in technologies and indicators definitions and related statistical standards and methodologies.

179. The meeting recommends ITU to consider developing a quality assessment framework for its work on statistics, including examples of best practices, data quality dimensions, statistical quality guidelines, and a quality assessment plan.

180. The meeting also recommends that countries should consider developing national QAFs in their statistical work; these could be applied by all ICT data producers at the national level. Discussions on the development and implementation of QAFs could be part of the national coordination of ICT statistics. NSOs should share their QAFs (if available) with other ICT data producers in the country. Existing international standards and guidelines, such as those developed by the International Monetary Fund (DQAF) and the United Nations Statistics Division (NQAF), should be used as a basis.

8. Emerging issues in measuring telecommunication infrastructure

181. LTE and other advanced mobile technologies are gaining momentum, which implies a change in the supply-side of connectivity. These technologies are called to play an important role in coping with the need of faster and more efficient mobile broadband connections, thus catering for the capacity needs of current and future mobile-broadband users. LTE and other advanced mobile networks are being deployed in several countries

worldwide, and data to monitor these networks are important for regulators and policy makers, for instance for evidenced-based market regulation and consumer protection.

182. The meeting recognizes the importance of developing internationally agreed indicators to measure coverage and uptake of LTE and other advanced mobile technologies. To this end, the meeting recommends that EGTI should discuss these indicators in the EGTI online forum and report the outcome of discussions in the next WTIS.

183. M2M communications are becoming ubiquitous, which implies a change in the demand-side of connectivity. M2M services are key enablers for the Internet of Things. In order to measure the progress made towards connecting an increasing number of devices to the Internet in both the developed and the developing world, there is a need for internationally harmonized data on M2M. Moreover, since M2M services are often offered across borders, it is important to discuss M2M indicators at the international level.

184. The meeting acknowledges the importance of measuring M2M services, and agrees that the M2M indicators should be discussed in the EGTI online forum. The results of the discussions should be reported back to the next WTIS, including some proposals on the definition of new indicator(s) on M2M services.

9. Big data in telecommunications

185. Big data has tremendous potential for fostering development by providing real-time information, at low cost, compared with data from other sources. Information from mobile-cellular networks and social networking services, in particular, are an important source of new data, and could complement official statistics. More work is needed to fully understand the potential of big data and ITU should further examine the challenges and opportunities related to big data in the ICT sector.

186. The WTIS pointed to a number of confidentiality and privacy issues related to the use of big data. Regulatory authorities need to explore the development of guidelines on how big data could be produced, exploited and stored.

187. National statistical offices, in cooperation with other relevant agencies, are encouraged to look into the opportunities of big data, and to address current challenges in terms of big data quality and veracity and privacy within the framework of the fundamental principles of official statistics