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Importance of differentiating telecommunication/ICT statistics by gender

To inform policy: without data, there is no visibility

The major reason for collecting and disseminating ICT and telecommunications statistics and indicators by gender is to inform national policy and to set international policy goals. Without data, there is no visibility; without visibility, there is no priority. From both observation and anecdotal evidence, we "know" that there is a gender gap in the digital divide in several developed and many more developing countries, but there is virtually no data to establish it. Without such data, it is difficult, if not impossible to make the case for the inclusion of gender issues in ICT policies, plans and strategies to policy makers. Sweeping generalisations based on identified trends and simplistic conclusions are of little value. Influencing global policy is particularly urgent now, with the World Summits on the Information Society approaching rapidly (December 2003 and 2005).

Why special attention to women

Project-level data has well established that telecommunication and ICT are not gender-neutral. They impact men and women differentially, and, in almost all cases, women have lesser access to and use of the media and lesser representation in the power and decision making positions related to telecommunications and ICT.[1] If ICT and telecommunication were gender-neutral, affecting men and women equitably, then special attention to women would not be necessary. As they are not, such special attention is needed. Without it, women will have fewer opportunities to benefit from the myriad possibilities of the information age.

Which gender statistics are important in telecommunication/ICT?

Within the broad topic of gender and telecommunication/ICT, there are a number of areas where sex-disaggregated statistics and indicators would be useful.

- ? Access and usage
- ? Content
- ? Employment

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[1] See, e.g. Nancy Hafkin, "Is ICT gender-neutral? A gender analysis of six case studies of multi-donor ICT projects." Paper presented to United Nations INSTRAW Virtual Seminar on Gender and ICT, June-July 2002. Available at: http://www.un-instraw.org/Docs'Hafkin.doc; and Sonia Jorge and Nancy Hafkin, "Get in and Get in Early: Ensuring Women's Access to and Participation in ICT Projects," *Women in Action,* 2-2002, [ISIS International-Manila]. Special issue on "Women and Communications." http://www.isiswomen.org/pub/wia/wia202/getin.htm.

- ? Education
- ? ICT telecommunication/policy
- ? Representation in telecommunication/ICT decision making
- ? Impact of telecommunication/ICT on men/women.

Internet access and usage
The one telecommunication/ICT indicator that is found disaggregated by sex with increasing frequency (although without any standardization in data collection) is Internet usage by country and region. This is the most important indicator on which to establish regular and standardized data collection internationally. Some examples of countries and private sector firms engaged in data collection in this area are given below.

In addition to usage, gender access data is very important. Among other reasons, its availability can inform regulators in the application of universal access. To date, most universal access strategies have been based on geographical factors (e.g. rural/urban) or income data (with low income areas being underserved). It is important to add gender as an important variable in determining universal service obligations and enabling the universal right to communicate.

Telecommunications access
This is especially important in relation to the right to communicate. To date I have not seen any telecommunications access statistics or indicators disaggregated by sex, except for mobile phone subscribers in some countries.

Content
Are there differences in the kinds of material on the Internet that men and women access? want? This data is available in sex-disaggregated form for many developed countries as market research firms are interested in sex-differentiated content access patterns. For developing countries, content access data is completely unavailable. The data could be in the form of specific sites or types of sites most commonly accessed, differentiated by sex.

Employment
Valuable statistics and indicators in employment include gender-related employment differentials within ICT and telecommunications industries and employment by sex and level in the IT field, in jobs using IT and in the IT manufacturing industry. This is the only area where ITU currently collects sex-disaggregated telecommunications/ICT statistics, on the employment of women in the telecommunications service providers by country. However, this data is not very significant because it simply reveals that in most countries the majority of positions within the traditional PTOs –that of telephone operators- are held by women. It says nothing about the level of employment. The fact that women dominate the ranks of telephone operators and data entry personnel is not an indicator of gender equity in the telecommunication industry. Useful statistics would show level of employment in telecommunications, including telecommunications manufacturing and ICT industries (both ICT manufacturing and ICT-using).

Little data is available on women's participation in computer science and engineering research and employment in the private sector as well as in research institutions. However, the data that does exist indicates that the participation of women in higher-skilled, higher-ranking and higher-paid positions remains very low. This data is now available for a number of countries, including some developing ones. It shows a progressive decline of the number of women in ICT-related employment at increasing levels of complexity. Many women operate computers, largely for word processing and related office programmes,

and enter data. Many fewer are programmers and systems analysts, and the smallest number of women is found in North America, Europe and Asia in software and hardware engineering.

Some statistics from recent data show:
- ? If the current number of women computer programmers in Western Europe were to double to 94,000, women would still constitute only 7 percent of the total workforce[2]
- ? No European Union member state has more than 1/3 women researchers in engineering and technology, while the average is 10 percent[3]
- ? In the US, women make up:
  > 9 percent of mid- to upper-level IT engineers
  > 28.5 percent of computer programmers
  > 26.9 percent of systems analysts
  > *85 percent of data entry workers*[4]
- ? In Asia, women constitute 20 percent of programmers (mostly in lower-skilled, low-value-added positions), while making up the majority of workers in data processing (especially outsourced work).[5]

In particular, the participation of women in information technology design and development is generally low. Concentrated in the low or unskilled end of employment, women are not getting the training that the new jobs require. This is leading to fears of the global feminization of labour, whereby occupations in which women predominate see a drop in salaries, status and working conditions. Readily-available statistics and indicators in this area would help make the case for encouraging girls women's education in science and technology in order to make them eligible for higher level positions using IT.

Education

These questions of women's technical education and their participation in S&T professions are important ones for national sustainable development. While more governments are collecting data on the use of information technology in public education, it is still not possible to obtain data on the number of men and women studying information technology and computer science in both formal and non-formal educational settings. Although very little sex-disaggregated data is collected concerning women's participation in science and technology education, the data we do have indicates consistently low participation by women and girls, with exceptions in some developing countries. This data on differential access to and participation in education for use of and employment in telecommunication and ICT is very significant in determining the future of the gender digital gap. Some very interesting corrective actions took place at Carnegie-Mellon University in the US, in response to data on continuing and increasing declines in the numbers of women studying computer science.[6]

ICT telecommunication/policy

A gender indicator in ICT/telecommunication policy could be the consideration of gender issues in the country's ICT/telecommunications plan, policy or strategy. To date, few

[2] http://news.bbc.co.uk/hi/english/sci/tech/newsid_1679000/1679106.stm.

[3] http://www.cordis.lu/improving/women/documents.htm.

[4] United Nations Development Fund for Women (UNIFEM). (2000). *Progress of the World's Women.* New York: United Nations.

[5] Swasti Mitter (2001), *Asian Women in the Digital Economy: Policies for Participation.* Kuala Lumpur: UNDP.

[6] Jane Margolis and Alan Fisher (2002), *Unlocking the Clubhouse: Women in Computing.* Cambridge, MA: The MIT Press.

developing countries have done this. Korea is a notable exception, with a well-developed gender strategy in the national ICT plan. In Africa, Cote d'Ivoire makes passing mention of gender issues, while Guinea has developed it well. While South Africa's White Paper on communication dealt with gender issues, critics feel that implementation has not lived up to intentions.

Participation in telecommunication and ICT decision making
An examination of the extent to which women are represented in decision-making in information technology reflects the progress of women in the field and the possibility that women in positions of power would serve as role models for others, facilitate the entry of other women, and alleviate some of the negative impacts of new technologies of women. Available data indicates that women are conspicuously absent from decision-making structure in information technology in both developed and developing countries. These structures includes boards and senior management of IT companies, senior management and advisors of policy and regulatory organizations, technical standards setting organizations, industry and professional organizations such as the Internet society, national policy and regulatory organizations, line ministries responsible for the IT sector, and international development organizations and agencies. Indicators in this regard could include numbers of women in senior management positions at selected ICT firms, in ministries of communication and information technology (or their equivalent), in ICANN and in ITU study groups.

Differential impact of information technology on men and men
Very little data is available on the impact of information technology on persons outside the OECD countries. Given the project-level indications of the differential impact of information technology on men and women, both quantitative and qualitative data on this area would be highly useful.

The current state of gender disaggregated statistics for telecommunication/ICT

Who collects it
The major sources of gender differentiated statistics and indicators on telecommunications/ICT presently available are official government statistics, for a few countries, and market research surveys, for a larger number of countries where Internet commerce is already significant or expected to be so shortly.

Among the major market research firms involved in sex-differentiated data collection are Ipsos-Reid, Nielsen, and Media Metrix/Jupiter Communications. The market research firm Ipsos-Reid, does annual surveys of Internet use, with emphasis on consumer behavior, for the following 12 countries.[7]

Brazil	France	Japan	Russia
Canada	Germany	Korea	UK
China	India	Mexico	USA

For the U.S., their data is sex-disaggregated. According to Brian Cruikshank, their Managing Director, gender data is available for the other countries as well but has not

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[7] Ipsos-Reid (2002). The U.S. Internet Fact Page. http://www.ipsos-reid.com/us/services/dsp_little_net_book.cfm#.

been included in all their reports.[8](The U.S. data is freely available. Data for other countries is not). Their breakdown by sex for US Internet users is as follows:

Percent of American adults with Internet access	
All American Adults	69
Men	73
Women	65

Nielsen Net/Ratings provides weekly and monthly Internet use surveys, based on monitoring at home and work level, of Internet usage for some 10 high usage, high income countries. Nielsen specializes in demographic profiles of Internet users, which presumably are all sex disaggregated.[9] Nielsen publishes weekly and monthly Internet usage data for the following countries, but the publicly available data is not sex disaggregated:

Austria	Israel
Australia	Japan
Belgium	Netherlands
Brazil	New Zealand
Canada	Norway
Denmark	Singapore
Finland	Spain
France	Sweden
Germany	Switzerland
Hong Kong	United Kingdom
Ireland	

Media Metrix/Jupiter Communications, a NASDAQ-listed Internet and new technology analysis and measurement consultancy firm, also collects sex-disaggregated data on Internet usage for the U.S. and other major developed countries (including four in Latin America). In April 2002 Jupiter began the regular publication of a series called "Demographic Profile: Women Online."[10] This report, which deals only with the US, examines female Web users segmented by income level and presence of children in the household, including the size of the user base, the most popular online activities and sites, womens' attitudes toward online advertising, and online shopping patterns.

Official statistics
Some countries collect and disseminate Internet usage statistics as a part of official government statistics collection efforts. Among these are Finland, Korea, and Thailand. A number of countries are doing also collecting data in the use of ICT in education in public institutions, with many of these statistics sex disaggregated.

The Korean case
Korea is doing substantial and interesting work on gender and ICT statistics. Since the first quarter of 2000, the Korean Network Information Center (KRNIC) (http://www.krnic.or.kr) has undertaken and published quarterly surveys of Internet use, averaging 5700 users, with some 20 categories of data collected and disaggregated by sex,

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[8] E-mail from Brian Cruikshank, 12 December 2002.

[9] "Hot Off the Net - Nielsen'Net Ratings." (2002). http://www.nielsen-netratings.com/hot_off_the_net_i.jsp. Accessed 12 December 2002.

[10] Jupiter Research. "Internet Usage Cannibalizes TV Watching For Women With Children, Reports Jupiter Media Metrix." http://www.jmm.com/xp/jmm/press/2002/pr_041802.xml.

and in addition in most cases, age. KRNIC's categories for which data is available by sex are:

KRNIC categories of Internet statistics disaggregated by sex are:

> Rates of Internet usage (by sex and age)
> Main reasons for Internet usage (10 reasons cited)
> Age of first Internet usage
> Frequency of Internet usage
> Average duration of Internet use
> Anticipated (projected one year) Internet use
> Modes of Internet access (e.g. LAN, IDSN, DSL)
> Time of main Internet usage
> Places of primary, secondary, tertiary Internet usage
> Average cost of Internet connection
> Main purpose of usage
> Main purpose of Internet surfing
> Rate of possession of e-mail address
> Numbers of e-mail addresses
> Rate of possession of homepage
> Problems with using Internet
> No. hours weekly reading newspapers, watching television
> Reasons for not using Internet

In 2001 the Ministry of Gender Equality released a research report on "Women's Informatization survey and index development" in order to document and examine the gender digital divide in Korea. The Ministry based their research on five categories, from which they developed an index of women's "informatization" defined as the process by which information technologies have transformed economy and society. In contructing the index, the designers were well aware of other indicators and indices, such as that of the ITU and the Information Society Index of the IDC/World Times and of Eurostat. The Korea index uses the categories of *awareness, access, utilization, skill* and *effects*. The index measured involvement of men and women according to the categories and then measured the comparative informatization by sex. The results showed that women's informatization measured 88 percent that of men's. Although women scored very high on awareness, skills and effect, in terms of access and usage, the situation of women was particularly deficient, with women having only 22.9 percent the access of men and using the Internet of 28.2 percent as much as men.[11] In November 2001 the development of the index was followed by 2600 face-to-face interviews, equally divided between men and women, to compare their situation with regard to informatization. Among the findings was that there is a serious digital divide by age, with women's scores on all categories in the index dropping with age (measured in decades, starting with those in their twenties) and a series gap apparent for those in their fifties and older. Not surprisingly, higher income women had a higher rate of informatization than those with lower incomes.[12]

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[11] Korea, Ministry of Gender Equality (2001) "Study of Women's Informatization survey and index development." Cited in Republic of Korea. 2002. *APEC 2nd Ministerial Meeting on Women*. Seoul. The study does not appear to be available electronically in English.

[12] Soon-Ae Yang, "Women Informatization Indicators in the Republic of Korea," Appendix II, Report of the United Nations Department for Advancement of Women Expert Group Meeting on ICTs and women. Aviailable at http://www.un.org/womenwatch/daw/egm/ict2002/reports/EGMFinalReport.pdf. [Accessed 28 December 2002].

In February 2002 the Asian Pacific Women's Information Network Center of The Sookmyung Women's University, the leader in this work, organized a workshop entitled "Survey of Women's Informatization in Asia and the Pacific," in an effort to develop indicators for a survey on women's involvement in computerization to be conducted throughout the Asian region.[13] In cooperation with the Korean National Commission for UNESCO, APWINC has been carrying out a survey on the situation of women's informatization in seven countries: China, Indonesia, Japan, Korea, Nepal, Philippines and Sri Lanka from March-October 2002.

Other interesting work
Bruce Bimber at the University of California, Santa Barbara, wrote one of the few scholarly pieces on gender ICT statistics.[14] He collected survey data (in the U.S.) in 1996, 1998 and 1999 that shows trends in Internet use. Prof. Bimber presented regression models of Internet access and use that showed two statistically significant gender gaps on the Internet – in access and in use. He found that the access gap was not the product of gender-specific factors, but rather was explainable by socioeconomic differences between men and women. The use gap, however, he found was the result of socioeconomic as well as gender-related phenomena.

Examples from current statistics-Asia

Statistics available from both commercial, industry and government sources present an interesting picture of sex-differentiation in Internet access and usage in a number of Asian and Pacific countries. It is notable, however, that the statistics do not go beyond Internet access and usage to some of the other areas detailed above as important areas for the collection and dissemination of telecommunication/ICT statistics.

Australia
According to the Australian government in May 2000 (http://www.noie.gov.au/) there were 920,0000 computers in the country, and 67 percent of adults used computers. Forty-seven percent use computers at home, 43 percent use them at the work place and 38 percent in other places. Forty-five percent of Internet users were women in the government survey, while NeilsenNet put the figure at 48 percent in 2002.

China
According to CNNIC (http://www.cnnic.net/) in 2001, the number of Internet users in China increased from 10,000 in December 1999 to 22,500,000 in January 2001, with 61,000,000 users expected by the end of 2002. The gender proportion of Internet users appeared was men 79 percent and women, 21 percent in July 1999, and 69.6 percent of men. By 2001 CCNIC put the figure of women Internet users at 39.8 percent. The proportion of men and women using the Internet shows that there are more men who are heavy users by the ratio of 65:35, and more women who are light users by that of 49:51.

Hong Kong
Netvalue's research of September 2000 shows men heavy users outnumbering women by 58 to 42 percent, while women light users outnumber men by 38 to 62 percent. More

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[13]"Survey on Women's Informatization in Asia and the Pacific." 2002.
http://www.apolc.org/news/con_index.html?con_no=40.
[14] Bruce Bimber (2000), "Measuring the gender gap on the Internet," *Social Science Quarterly* (81, 3, pp. 868-876).

women in Hong Kong were using the Internet as compared to women in Taiwan, Singapore and South Korea. By 2002 NielsenNet put the figure of women users at 45 percent.

India
According to the report researched by NASSCOM (National Association of Software and Service Compamies-http://www.women.or.kr/apwin/www.nasscom.org) researched in June-July 2000, the number of Internet users in India is 3,700,000, and the proportion of males to females was 77:23. The percentage of women users women increased as compared to 18 percent in June 1999 (APWINC).

Indonesia
Twenty percent of Internet users are women. The number of Internet users in Indonesia overall is very small: 4 million people (0.715 percent of the population) in 2001(Indonesian Association of Internet Service Providers (APJII) http://www.apjji.or.id).

Korea
According to the survey conducted by Internet Matrix and KRNIC (Korea Network Information Center, March 2001), the proportion of males to females was 57.1:42.9 indicating women's ratio was lower than men's. However, with regards to the figures of 33.1 percent in October 1999, and 43.2 percent in December 2000, the gap had lessened.

In September 2000 NetValue found that the Korean Internet heavy users proportion of males to females was 64:36. On the other hand, women predominated among light users at 44:56. By 2002 Neilsen put the figure of women users at 47 percent.

Thailand
NECTEC, a specialised national centre under government auspices, has done three annual Internet user surveys, with sex disaggregated data. Data shows that women have now achieved and slightly exceeded parity. However, this excellent survey is currently available only in Thai (an English version is due in February 2003).

Difficulties with currently available data

Many sources are using data that is highly questionable. I was the research coordinator on a 1993-1995 study of Fido-based e-mail (and later, Internet) usage in four African countries. Despite the small sample size in these four countries and the fact that some of the data reflected store-and-forward e-mail and not Internet, this data is still used as authoritative source for gender Internet usage figures for these countries. "Zambia (36 percent of users are women) . . . shows better parity than France (33.4 percent), Germany (31.7 percent) and the United Kingdom (35.9)."[15]

There is also wide variation between the private firms data collection of gender statistics for Internet use. For Japan, Goldman Sachs reports that 20 percent of Internet users are female, while Nielsen puts the figure at 43 percent for the same period (April-May 2001).

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[15] S. Nanthikesan, "Trends in Digital Divide." (2000).
http://www.undp.org/hdro/papers/backpapers/backgroundpapers/nanthikesan.doc Accessed 12 December 2002.

Some observations from currently available data
Given the caveats about the use of currently available data on Internet use, it is still interesting to attempt to discern some patterns and relationships between women's Internet use and a number of other readily available indicators.

Table 1: Relationship between women's Internet usage and development indicators in selected countries

Country	Female home Internet users	UNDP Human Development Index	Gender Empowerment Index	Gender Empowerment Index	UNDP Technology Achievement Index	Source
USA	52	6	4	6	2	Nielsen NetRatings, 5/0
Canada	52	3	3	3	8	Nielsen NetRatings, 5/0
Thailand	51	66	58			NECTEC
New Zealand	49	19	19	6	15	Nielsen NetRatings, 5/0
South Africa	49	94	85		39	Webchek, NUA (1/02)
Australia	48	2	2	2	9	Nielsen NetRatings, 5/0
Finland	48	10	10	4	1	Nielsen NetRatings, 5/0
South Korea	47	27	29	61	5	Nielsen NetRatings, 5/0
Sweden	46	4	5	3	3	Nielsen NetRatings, 5/0
Denmark	45	15	13	12		Nielsen NetRatings, 5/0
Ireland	45	18	18	18	13	Nielsen NetRatings, 5/0
Hong Kong	45	24	23		24	Nielsen NetRatings, 5/0
UK	45	14	12	16	7	Nielsen NetRatings, 5/0
Norway	44	1	1	1	12	Nielsen NetRatings, 5/0
Taiwan	44					Nielsen NetRatings, 5/0
Brazil	44	42	69	69		Nielsen NetRatings, 5/0
Israel	44	22	22	24	18	Nielsen NetRatings, 5/0
Singapore	44	26	26	35		Nielsen NetRatings, 5/0
Switzerland	44	11	14	13		Nielsen NetRatings, 5/0
Austria	44	16	16	11	16	Nielsen NetRatings, 5/0
Japan	43	9	11	31	4	Nielsen NetRatings, 5/0
Singapore	42	26	26	35		Nielsen NetRatings, 5/0
Brazil	42	69	69			Nielsen NetRatings, 5/0
Croatia	42	46	44	30	31	IDC CEMA
Mexico	42	51	49	37	32	Nielsen NetRatings,5/02
Netherlands	41	8	8	7	6	Nielsen NetRatings, 5/0
France	41	13	10		17	Nielsen NetRatings, 5/0
Belgium	41	5	7	14	14	Nielsen NetRatings, 5/0
China	40	87	76		45	CCNIC, 2001
Spain	40	21	21	15	19	Nielsen NetRatings, 5/0
Philippines	40	70	62	46	44	ACNielsen Netwatch, 1
Germany	38	17	15	8	11	Nielsen NetRatings, 5/0
Italy	38	20	20	29	20	Nielsen NetRatings, 5/0
Estonia	38	44		25		IDC CEMA
Russia	38	55	52	53		CommerceNet
India	23	115	105		63	NAASCOM, 2000
Indonesia	20	102	92		60	Indonesian Association Providers

Country	Female home Internet users	UNDP Human Development Index	Gender Empowerment Index	Gender Empowerment Index	UNDP Technology Achievement Index	Source
Poland	19	38	36	32	29	IYP Poland
Belarus	18	53	51			EuroIntellitech
Slovakia	12	35	34	27	25	EuroIntellitech
Czech Republic	12	33	32	26	21	EuroIntellitech
Lithuania	10	47	43	45		EuroIntellitech
Jordan	6	88	81			DIT Group

As shown above, there are at least 43 countries for which data is available on female Internet use. In most cases the data refers to home use. The source of the data reflects the nature of the sources. Most of the data is from surveys of market research firms in countries that are of interest to Internet marketers. In some cases the data comes from national surveys of countries that have a clear policy of using ICT to accelerate development. In the available data the percent of female userss range from 6 to 52 as a percent of Internet users. However, we can not project this data to other countries, because the countries for which data is available are the more highly developed; there are no least developed countries in the list at all. Of those countries for which data was available the median percentage of female home Internet use was 29, with a mean of 38.6.

Using this data with caution because it has been gathered with widely varying standards and definitions, it is interesting to pose the question of the relationship between female home Internet use and some standard indicators such as the UNDP Gender Equality Index, the UNDP Gender Empowerment Index, the UNDP Human Development Index, and the UNDP Technology Index. Examination of this relationship showed a statistically significant correlation (at the 0.01 level) between female Internet users and, respectively, the UNDP Gender Equality Index, the UNDP Human Development Index and the UNDP Technology Achievement Index. Based on these results, one could expect female Internet usage to be higher in countries where gender-based differences and discrimination between men and women are fewer, in countries where human development indicators are high, and in countries that have achieved a high level of technology development. The fact that there is no correlation between percentage of female Internet users and Gender Empowerment (reflecting high percentages of women officeholders) is interesting. However, a number of countries with high Gender Empowerment Indices do not rate highly on the other indicators enumerated.

Challenges in collecting gender statistics/indicators
The major challenges in regard to sex-differentiated statistics and indicators on ICT/telecommunications remain that few sources are collecting this data and that there is no systematic approach or coordinated method to its collection. Not many government organizations collect national ICT statistics in a consistent and regular manner; of those that do, very few provide a breakdown by gender. This has been well documented by Michael Minges. As Minges writes, "until primary ICT data collections see market value in obtaining gender disaggregated statistics, the data will not be widely available."[16] This is unfortunate since it is likely that many of the world's countries, particularly those in Africa, are likely to remain outside global market interest in the foreseeable future. The

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[16] Michael Minges (2001), "Gender and ICT statistics." Draft.

penetration of telecommunications/ICT in these countries is of vital importance to their sustainable development, as is the full participation of their population. Thus, it will be important for the ITU to assume leadership in bringing all member States to an awareness of sex-differentiated data in all their telecommunications/ICT data collection efforts, particularly in household and enterprise surveys. The upcoming World Summit on the Information Society will be an important forum at which to emphasize this concern.