12th World Telecommunication/ICT Indicators Symposium (WTIS-14)

Tbilisi, Georgia, 24-26 November 2014

Presentation

SOURCE: ITU

TITLE: Measuring the Information Society Report 2014

Measuring the Information Society Report 2014

26 November 2014, Tbilisi, Georgia

ICT Data and Statistics Division
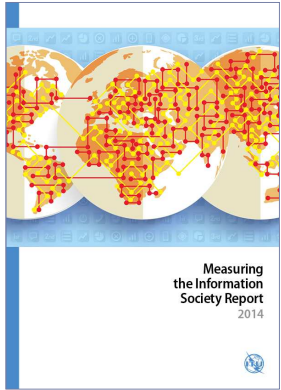International Telecommunication Union

24 November 2014

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- **Recent information society developments**

- The ICT Development Index (IDI)

- ICT prices and the role of competition

- The role of big data for ICT monitoring and for development

Measuring the Information Society Report 2014

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- ☐ Latest trends in ICT developments worldwide
  - ◘ Fixed/mobile market, Internet usage, revenue, investment, ICT in schools, e-government, e-business
- ☐ ICT Development Index (IDI)
  - ◘ Digital divide, regional analysis, top and dynamic performers, IDI and MDGs, IDI and geography
- ☐ ICT prices and the role of competition
  - ◘ ICT Price Basket (IPB) and income distribution
  - ◘ Impact of competition/regulation on prices and affordability
- ☐ Big data from the telecommunication/ICT industry
  - ◘ Big data as a source of real-time information
  - ◘ Challenges and opportunities

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Society Report
2014
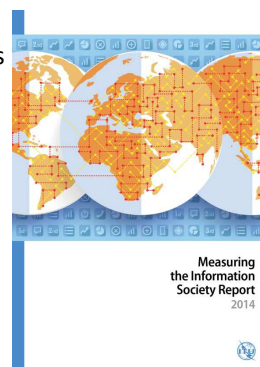
Full report available online (except for Annex 4)
Executive Summaries in 6 languages (available shortly)

Measuring the Information Society Report 2014
statistical highlights

- ❑ **Mobile broadband is driving ICT growth**
  - ◘ Global mobile-broadband penetration increased from 9% to 32% in the last five years
  - ◘ Africa stands out with a mobile-broadband growth rate of over 40% in 2014
  - ◘ 3G progressing in developing countries, and mobile-broadband penetration 21%
  - ◘ 3G+ techs driving mobile-broadband penetration in developed countries: 84% in 2014

Measuring the Information Society Report 2014
statistical highlights

□ Internet access and use growing steadily

- Almost 44 per cent of the world's households have Internet access at home
- Growth driven by developing countries in 2014: 14% as against 4% in developed countries
- Internet users doubled in five years to reach 3 billion, 2/3 live in developing countries
- Globally, around 40% of the population is using the Internet (45% if excluding China and India)

Measuring the Information Society Report 2014
statistical highlights

□ Mobile-cellular and fixed-broadband uptake slowing down

- Growth in mobile penetration slows to a ten-year low of 2.6%
- Mobile markets have reached saturation with almost 7 billion subscriptions
- Fixed-broadband growth rates have dropped to 6% in developing countries, despite penetration remaining low (6%) in the developing world
- Fixed broadband has reached mature levels in developed countries: 27.5% penetration and continuous low growth (3.4%)

The digital divides

- 450 million people worldwide without access to mobile services
- <1% fixed-broadband penetration in least developed countries (LDCs)
- Rural-urban divide: lower 3G coverage, smaller proportion of households with Internet access and fewer enterprises and schools connected in rural areas.
- 4.3 billion people worldwide are not yet using the Internet, 90% live in the developing world

Fixed (wired)-broadband subscriptions, 2005-2014*

Individuals using the Internet, 2005-2014*
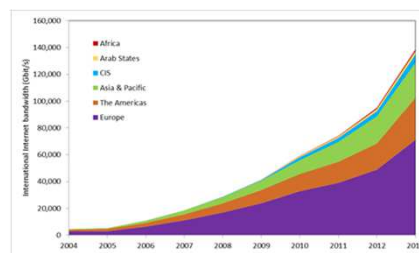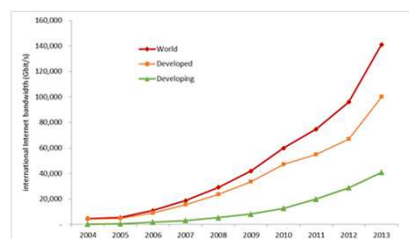
Source: ITU MIS Report 2014, * Estimate
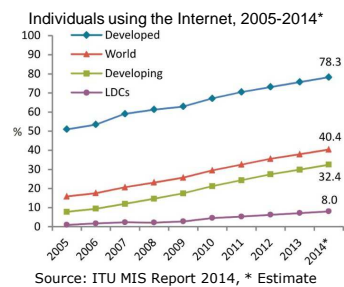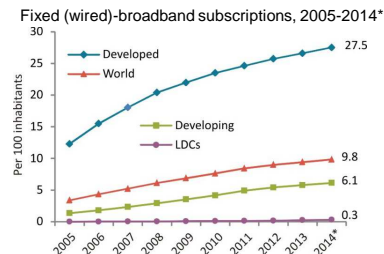
International bandwidth climbed sharply over the past decade

- Developing countries' share increased from 9% in 2004 to almost 30% in 2013

- Europe accounts for more than 50% of the world's total, compared with Africa's share of less than 1%

Total International Internet bandwidth (Gbit/s)

Investment and revenue trends

- Total telecommunication revenues have stagnated at USD 1.88 trillion, 2.7% of world GDP
- The sector returned to negative growth in developed countries, whereas revenues in developing countries increased by 4% in 2012
- Global investment in telecommunications grew by 4% to reach USD 307 billion in 2012
- The developing countries' share in total investment reached almost 40% and an all-time high value of USD 121 billion

Telecommunication revenues, 2007-2012

Investment by telecommunication operators, 2007-2012

Source: ITU MIS Report 2014

Connect 2020 - ITU strategic goals and targets

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Global ICT goals

1 GROWTH
Enable and foster access to and increased use of telecommunications/ICTs

2 INCLUSIVENESS
Bridge the digital divide and provide broadband for all

3 SUSTAINABILITY
Manage challenges resulting from the telecommunication/ ICT development

4 INNOVATION & PARTNERSHIP
Lead, improve and adapt to the changing telecommunication/ICT environment

- Approved by the ITU Plenipotentiary Conference (PP-14): Resolution on *Connect 2020 Agenda*
- Measurable targets – ICT indicators
- Report on progress in MIS Report

Connect 2020 ITU strategic goals and targets

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Goal 1 Growth – Enable and foster access to and increased use of telecommunications/ICTs

- **Target 1.1**: Worldwide, 55% of households should have access to the Internet by 2020
- **Target 1.2**: Worldwide, 60% of individuals should be using the Internet by 2020
- **Target 1.3**: Worldwide, telecommunication/ICTs should be 40% more affordable by 2020

Goal 2 Inclusiveness –Bridge the digital divide and provide broadband for all

- **Target 2.1.A**: In the developing world, 50% of households should have access to the Internet by 2020
- **Target 2.1.B**: In the least developed countries (LDCs), 15% of households should have access to the Internet by 2020
- **Target 2.2.A**: In the developing world, 50% of individuals should be using the Internet by 2020
- **Target 2.2.B**: In the least developed countries (LDCs), 20% of individuals should be using the Internet by 2020
- **Target 2.3.A**: The affordability gap between developed and developing countries should be reduced by 40% by 2020
- **Target 2.3.B**: Broadband services should cost no more than 5% of average monthly income in developing countries by 2020
- **Target 2.4**: Worldwide, 90% of the rural population should be covered by broadband services by 2020
- **Target 2.5.A**: Gender equality among Internet users should be reached by 2020
- **Target 2.5.B**: Enabling environments ensuring accessible telecommunications/ICTs for persons with disabilities should be established in all countries by 2020

Goal 3 Sustainability – Manage challenges resulting from the telecommunication/ICT development

- **Target 3.1**: Cybersecurity readiness should be improved by 40% by 2020
- **Target 3.2**: Volume of redundant e-waste to be reduced by 50% by 2020
- **Target 3.3**: Green House Gas emissions generated by the telecommunication/ICT sector to be decreased per device by 30% by 2020

Goal 4 Innovation and partnership – [Lead,] shape and adapt [the Union] to the changing telecommunication/ICT environment

- **Target 4.1**: Telecommunication/ICT environment conducive to innovation
- **Target 4.2**: Effective partnerships of stakeholders in telecommunication/ICT environment

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- ☐ Recent information society developments

- ☐ **The ICT Development Index (IDI)**

- ☐ ICT prices and the role of competition

- ☐ The role of big data for ICT monitoring and for development

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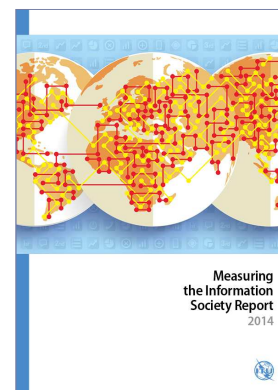
The ICT Development Index (IDI)

- 11 indicators, covering 3 areas:
  - ICT access, use and skills
- 166 economies
- Comparison of data from 2013 and 2012
- Regional analysis
- Assessment of the relationship between geography and population and IDI performance
- Analysis of the link between IDI and the MDGs

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Almost all countries improved in the IDI but Least Connected Countries lag behind

IDI 2013 top ten	Key findings
1. Denmark 2. Korea (Rep.) 3. Sweden 4. Iceland 5. United Kingdom 6. Norway 7. Netherlands 8. Finland 9. Hong Kong, China 10. Luxembourg	□ Top IDI performers have high income levels, competitive markets and a skilled population □ Effective implementation of policies to achieve ambitious ICT targets help drive national information economies □ Some 2.5 billion people living in the world's least connected countries (LCCs) need targeted policies for improved access to ICTs

Slide 15

Wireless broadband drives IDI progress in dynamic countries, most of which are from the developing world

Most dynamic countries - changes between IDI 2013 and 2012

| Change in IDI ranking			Change in access ranking			Change in use ranking		
IDI rank 2013	Country	IDI rank change	Access rank 2013	Country	Access rank change	Use rank 2013	Country	Use rank change
32	United Arab Emirates	14	47	Oman	16	71	Thailand	34
91	Fiji	12	101	Cape Verde	7	72	Fiji	24
93	Cape Verde	11	124	Gambia	7	142	Burkina Faso	13
81	Thailand	10	22	Qatar	6	79	Cape Verde	12
52	Oman	9	28	Estonia	5	24	United Arab Emirates	12
34	Qatar	8	64	Seychelles	5	134	Congo (Rep.)	11
38	Belarus	5	97	Albania	4*	111	Bhutan	8
69	Bosnia and Herzegovina	5	38	Belarus	4*	30	Qatar	8
78	Georgia	5	112	Bolivia	4*	61	Antigua & Barbuda	7**

Note: * In the access sub-index, Mali, Mexico, Nepal, Nigeria, the Russian Federation and Uruguay also went up four places between 2012 and 2013. **In the use sub-index, Belarus and Oman also went up seven places.
Source: ITU MIS Report 2014

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Slide 16

Regional IDI

IDI ranges and averages, by region and compared to world average, 2013
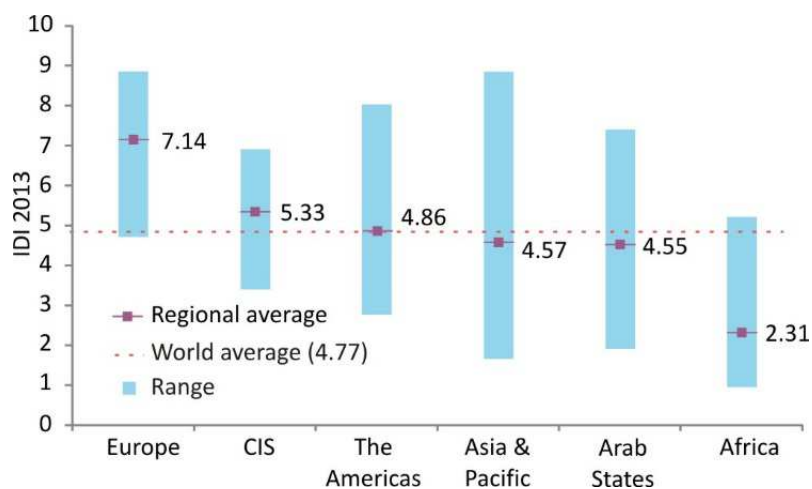
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Top five per region

The top five economies in each region and their ranking in the global IDI, 2013

Regional IDI rank	Europe	Global IDI rank	Asia & Pacific	Global IDI rank	The Americas	Global IDI rank	Arab States	Global IDI rank	CIS	Global IDI rank	Africa	Global IDI rank
1	Denmark	1	Korea (Rep.)	2	United States	14	Bahrain	27	Belarus	38	Mauritius	70
2	Sweden	3	Hong Kong, China	9	Canada	23	United Arab Emirates	32	Russian Federation	42	Seychelles	75
3	Iceland	4	Japan	11	Barbados	35	Qatar	34	Kazakhstan	53	South Africa	90
4	United Kingdom	5	Australia	12	Uruguay	48	Saudi Arabia	47	Moldova	61	Cape Verde	93
5	Norway	6	Singapore	16	St. Kitts and Nevis	54	Oman	52	Azerbaijan	64	Botswana	104

Source: ITU MIS Report 2014

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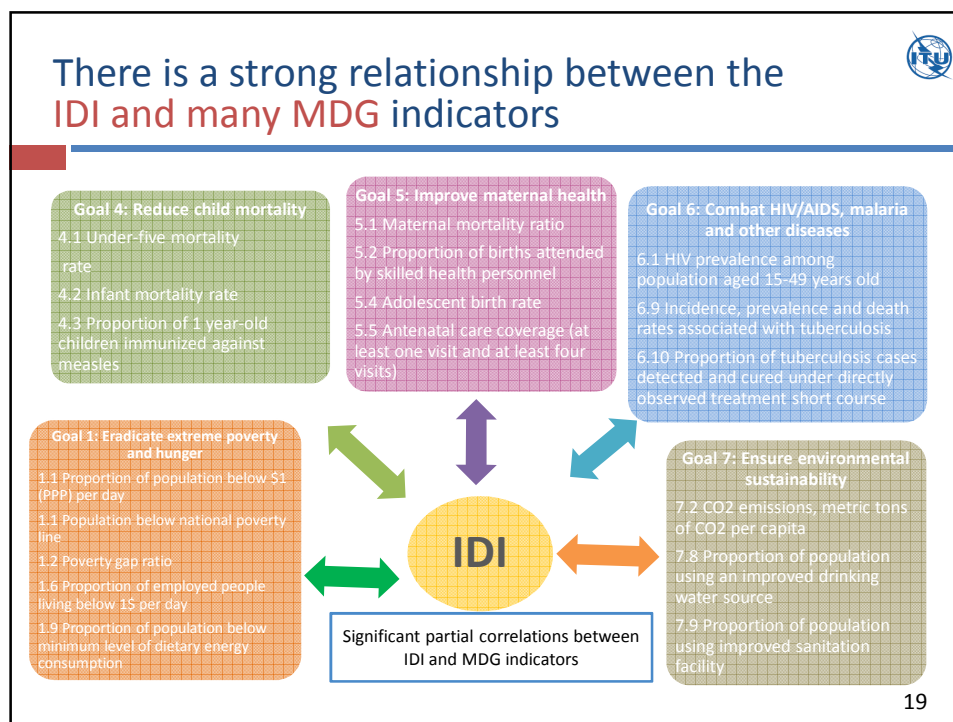## The higher a country's share of population living in urban areas, the higher the values reached on the IDI

IDI and the percentage of population living in rural areas

r = 0.501
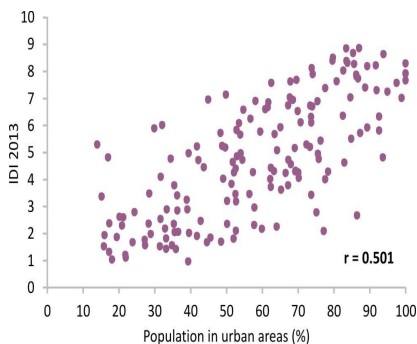
□ Strong correlation between IDI and GNI p. c. levels

□ Strong correlation between IDI and % population living in urban areas

□ No correlation between IDI and population density, population size and geographic size

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There is a strong relationship between the IDI and many MDG indicators

Goal 4: Reduce child mortality
4.1 Under-five mortality rate
4.2 Infant mortality rate
4.3 Proportion of 1 year-old children immunized against measles

Goal 5: Improve maternal health
5.1 Maternal mortality ratio
5.2 Proportion of births attended by skilled health personnel
5.4 Adolescent birth rate
5.5 Antenatal care coverage (at least one visit and at least four visits)

Goal 6: Combat HIV/AIDS, malaria and other diseases
6.1 HIV prevalence among population aged 15-49 years old
6.9 Incidence, prevalence and death rates associated with tuberculosis
6.10 Proportion of tuberculosis cases detected and cured under directly observed treatment short course

Goal 1: Eradicate extreme poverty and hunger
1.1 Proportion of population below $1 (PPP) per day
1.1 Population below national poverty line
1.2 Poverty gap ratio
1.6 Proportion of employed people living below 1$ per day
1.9 Proportion of population below minimum level of dietary energy consumption

IDI

Goal 7: Ensure environmental sustainability
7.2 CO2 emissions, metric tons of CO2 per capita
7.8 Proportion of population using an improved drinking water source
7.9 Proportion of population using improved sanitation facility

Significant partial correlations between IDI and MDG indicators

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## Fixed-broadband prices continue to decrease and entry-level speeds are increasing

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- 2008-2012: entry-level fixed-broadband prices decreased by 20% per year on average in developing countries

- In 2013, there was a slowdown: price in developing countries decreased by only 4%

- 1 Mbit/s was the most common entry-level speed in 2013, compared with 256 kbit/s in 2008

Fixed-broadband prices as a % of GNI p.c.
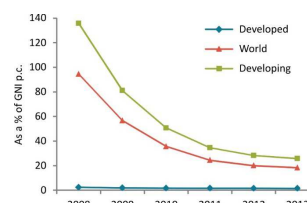
Most common entry-level fixed-broadband speed
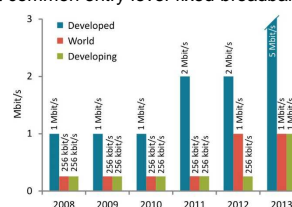
Source: ITU MIS Report 2014

A basic fixed-broadband plan >5% GNI p.c. in most developing countries

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- On average, fixed-broadband prices corresponded to 26% of GNI p.c. in the developing world compared with 1.5% in the developed world

- Major differences in the affordability of fixed broadband persist across regions and within some regions

Fixed-broadband prices as a percentage of GNI p.c., by region, 2013

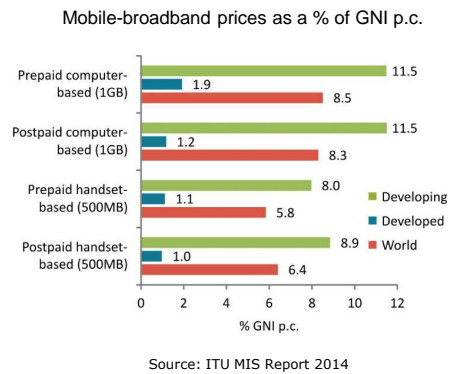| Region	Average	Standard deviation	Minimum	Maximum	Median
Europe	1.4	0.8	0.5	3.8	1.1
CIS	3.8	3.4	0.5	11.9	2.8
Arab States	4.1	5.9	0.4	23.7	2.0
The Americas	9.0	17.5	0.7	85.8	4.6
Asia & Pacific	23.7	56.7	0.3	266.0	5.0
Africa	135.8	382.1	0.8	2'193.6	42.1

Source: ITU MIS Report 2014

Mobile broadband in developed countries six times more affordable than in developing countries

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- The number of developing countries offering mobile-broadband plans increased by 20% from 2012 to 2013

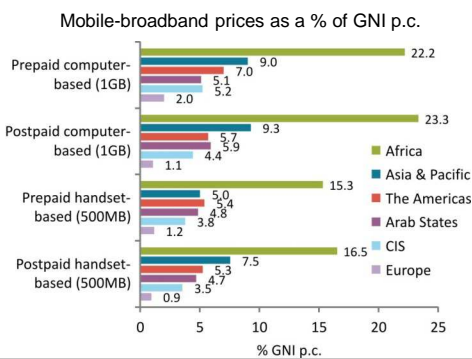- The price of mobile-broadband plans corresponds on average to >5% of GNI p.c. in the developing world

Mobile-broadband prices as a % of GNI p.c.

Prepaid computer-based (1GB): 11.5 / 1.9 / 8.5
Postpaid computer-based (1GB): 11.5 / 1.2 / 8.3
Prepaid handset-based (500MB): 8.0 / 1.1 / 5.8
Postpaid handset-based (500MB): 8.9 / 1.0 / 6.4

Legend: Developing / Developed / World

% GNI p.c.

Source: ITU MIS Report 2014

Entry-level mobile broadband is cheaper than fixed broadband in many countries

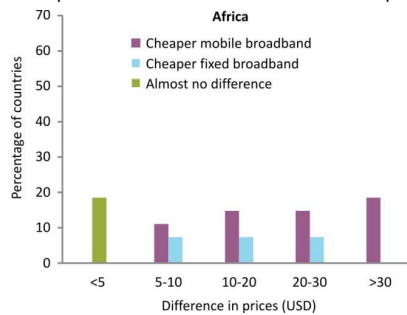**24**

- Mobile broadband is the only affordable alternative for broadband access in some countries

Mobile-broadband prices as a % of GNI p.c.

Prepaid computer-based (1GB): 22.2 / 9.0 / 7.0 / 5.1 / 5.2 / 2.0
Postpaid computer-based (1GB): 23.3 / 9.3 / 5.7 / 5.9 / 4.4 / 1.1
Prepaid handset-based (500MB): 15.3 / 5.0 / 5.4 / 4.8 / 3.8 / 1.2
Postpaid handset-based (500MB): 16.5 / 7.5 / 5.3 / 4.7 / 3.5 / 0.9

Legend: Africa / Asia & Pacific / The Americas / Arab States / CIS / Europe

% GNI p.c.

Comparison of fixed- and mobile-broadband prices

Africa

Percentage of countries

Legend: Cheaper mobile broadband / Cheaper fixed broadband / Almost no difference

<5 / 5-10 / 10-20 / 20-30 / >30

Difference in prices (USD)

- … but there are major regional differences in the affordability of mobile broadband
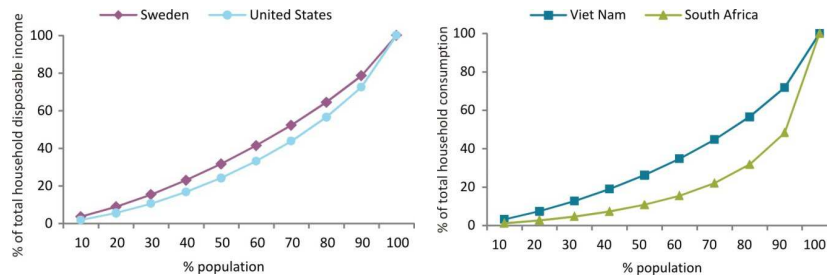
Source: ITU MIS Report 2014

Affordability of broadband services in view of income inequalities

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☐ Data on household disposable income and expenditure:
  ◻ Reflect people's economic welfare
  ◻ Provide insights into differences in affordability within countries

Distribution of household disposable income (left) and household consumption (right)


Source: Data for the United States and Sweden are sourced from the OECD Database on Income Distribution and refer to 2011. Data for South Africa and Viet Nam are sourced from the World Bank's PovcalNet and refer to 2008.

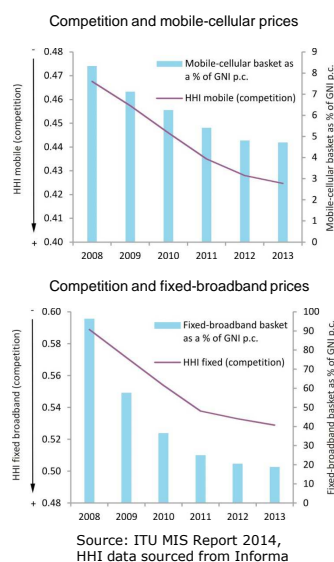## Households income inequalities greatly influence the affordability of mobile broadband

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Prepaid handset-based mobile-broadband prices, 500MB/month, as % of

Source: ITU MIS Report 2014
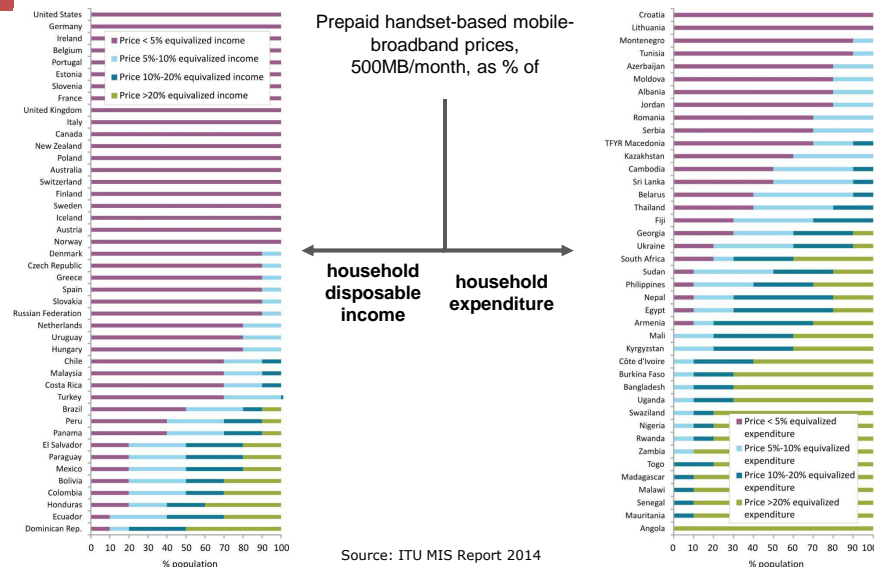
Impact of competition and regulation on ICT prices – Quantitative assessment

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- ☐ Descriptive statistics suggest a link between competition and ICT prices

- ☐ Econometric model to assess the impact of regulation and competition:
    - ☐ Data for up to 144 economies
    - ☐ 2008-2013 period
    - ☐ ITU data on prices and regulation
   - ☐ Mobile cellular and fixed broadband

Competition and mobile-cellular prices

Competition and fixed-broadband prices

Source: ITU MIS Report 2014, HHI data sourced from Informa

Competition and regulation could help reduce fixed-broadband prices by 10% in developing countries

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- ☐ Factors that are purely attributable to the ICT sector are together the main determinant of fixed broadband prices

- ☐ An increase in competition in developing countries could lead to a 5% reduction in mobile-cellular prices

Variation in fixed-brodband prices explained by each factor

Source: ITU MIS Report 2014,

- ☐ International regulatory best practices, such as the ones adopted at the ITU Global Symposium for Regulators, may serve as guidelines for effective regulatory frameworks
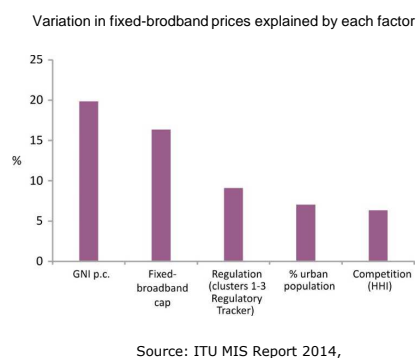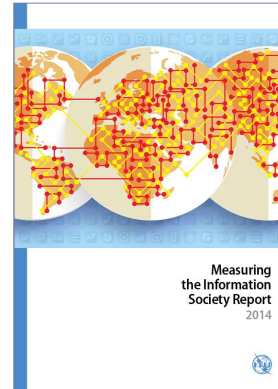
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30 **Behind big data…**

Rapid transformation of ICT sector and advances in technology
- Capture, store, and process more data from more sources

An increasingly digitized world
- Datafication & digitization of human activity into digital footprints

What is 'big data'?

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| VELOCITY | Different types and forms of data, including large amounts of unstructured data | VALUE | Level of quality, accuracy and uncertainty of data and data sources | VOLUME |
| Speed at which data are generated and analyzed | VARIETY | Potential of big data for socio-economic development | VERACITY | Vast amounts of data generated through large-scale datafication and digitization of information |

Big data to complement official statistics

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A WORLD THAT COUNTS

❖ Improve timeliness and completeness of official statistics
  ❖ Complement, not replace!
❖ Formulate social and economic development policy
❖ An important element in the data revolution and part of the post 2015 development agenda

Big data from the ICT industry for social and economic development

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Data captured through the use of ICTs are one of the richest sources of big data & producing development insights for better policy making

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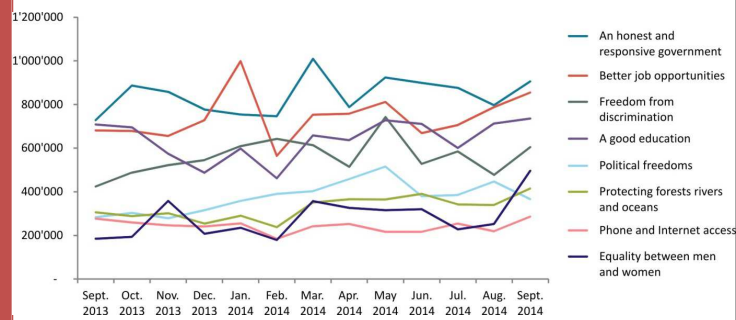# ICT sector big data

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Using Twitter to visualize trends in global development topics

Legend:
- An honest and responsive government
- Better job opportunities
- Freedom from discrimination
- A good education
- Political freedoms
- Protecting forests rivers and oceans
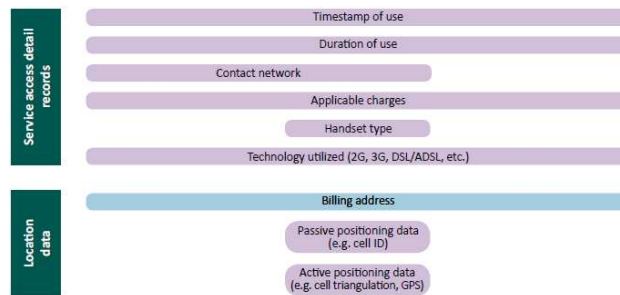- Phone and Internet access
- Equality between men and women

Source: UN Global Pulse

Mobile operator data

- ❖ Real-time and low-cost
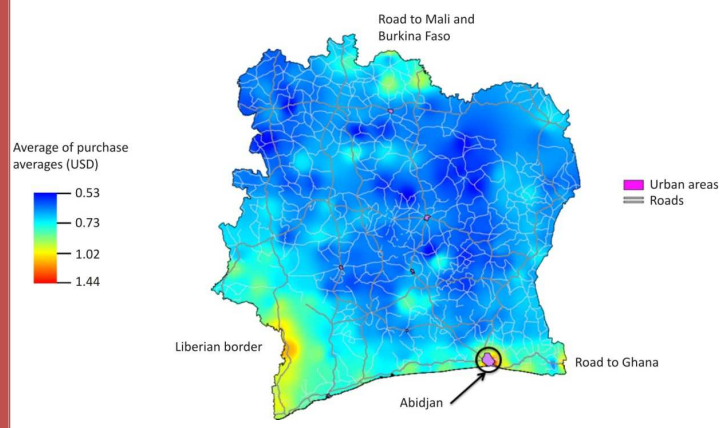- ❖ Huge development potential, also because of its high representativeness

Mobile data for poverty mapping

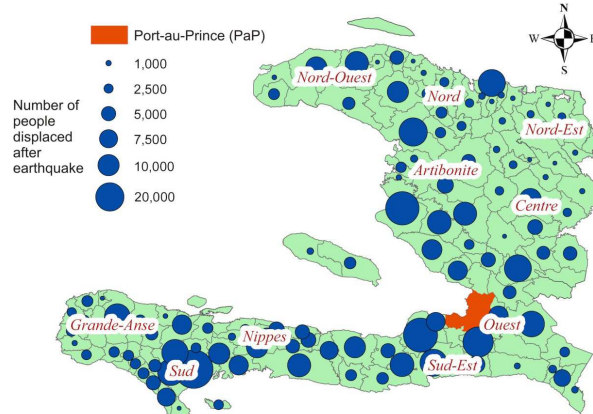Poverty mapping in Côte d'Ivoire

Source: Gutierrez et al. (2013)

Mobile data in emergencies

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Tracking mobility through mobile phones

Source: Bengtsson et al. (2011)

Port-au-Prince (PaP)

Number of people displaced after earthquake

- 1,000
- 2,500
- 5,000
- 7,500
- 10,000
- 20,000

Nord-Ouest
Nord
Nord-Est
Artibonite
Centre
Grande-Anse
Nippes
Sud
Sud-Est
Ouest

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Big data to monitor the information society

To analyze the digital divide

To understand uptake and access and usage patterns by pooling data from different sources

39 Challenges

Privacy
Security
Standardization
Continuity
Data curation etc…

40 How to maximize potential of big data

Cooperation among international stakeholders

Public private partnerships

Bring proof of concept studies to replicable scale

Thank you

For more information and data:
www.itu.int/en/ITU-D/statistics