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TITLE: Measuring WSIS target 10: Estimating internet users

Measuring WSIS target 10: Estimating internet users

When only less-than-ideal data is available

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WSIS target 10: bringing ICTs within reach of a majority of the world's population

- Four indicators:
 - Mobile subscriptions
 - Mobile use
 - Internet use by household
 - Internet use by individuals
 - [Note: 3 more business indicators added later (since WDTR 2010)]
- Data collected and reported for all
- Our Focus: Indicator 4 (Internet Use by Individuals)
 - Can the method for estimating be improved?

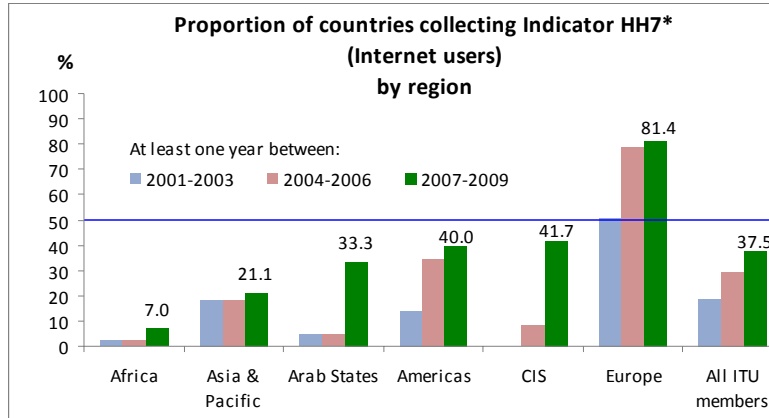
Focus of this presentation

The ideal way to measure

Surveys (household and individual), carried out by NSO

- Best method – collect HH7 through surveys
 - HH7: Proportion of Individuals who use the internet (from any location) in the last 12 months
 - Special survey, using ITU model questionnaire or other
 - Include question in multi-purpose household survey, HHIES (HH income-expenditure survey), ALS (Agriculture & Labor survey) or similar
- Second best - at least collect HH6 through survey
 - HH6: proportion of households with internet access
 - through official survey
 - Use this to estimate number of individual users

Not all countries collect HH7 through surveys. But an increasing number do

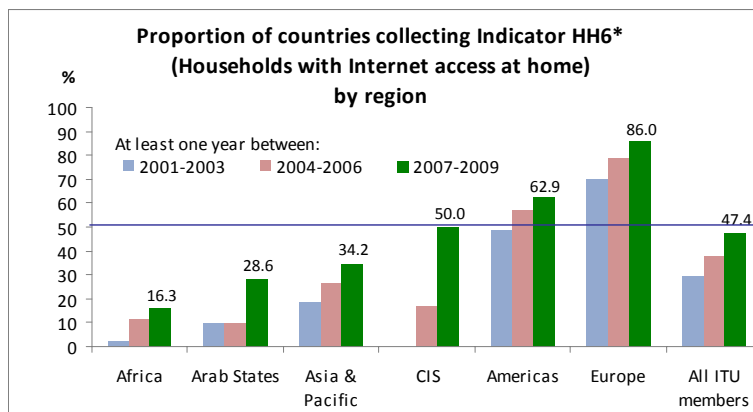


Source: ITU World Telecommunication/ICT Indicators database.



Note: * Data in this chart refer to countries that have collected data on the number of households with Internet access at home through official national surveys

Slightly more countries collect HH6 through surveys, and the number is increasing



Source: ITU World Telecommunication/ICT Indicators database.



Note: * Data in this chart refer to countries that have collected data on the number of households with Internet access at home through official national surveys

**In the absence of survey data,
estimate based on supply-side data**

**Various methods can be used to estimate the
number of Internet users**

• Internet Users = Multiplier x Internet Subscriptions

Where

- The multiplier = a number used to reflect that each subscription is used by more than one individual (e.g. at kiosks)
- Internet subscriptions = internet subscription of all types (speeds, technologies etc.)
 - Wired, wireless etc.
- Above then cross checked with other evidence to report (e.g. if HH access data available, Users > HH access number must be true, etc.)

But counting total subscriptions (specially wireless) is not straightforward

- Difficulties in counting wireless Internet subscriptions
 - Over-counting (counting all “internet-capable” SIMs, irrespective of use)
 - Under-counting (being able to only count SIMs that have subscribed to a data package; SIMs with only voice packages may use internet, but operators cannot count; impossible for pre-paid)
- General difficulty with multiple ownership (one user with fixed and many SIM connections) leading to questionable multipliers
- Therefore, **for now**, rely on fixed internet subscriptions only



Difficult to find rationale for current multipliers

Country	GNI per capita (Atlas Method) Ranking	Population (000s) (from ITU data)	Fixed Internet Subscriptions (000s), 2009	Fixed Internet Subs per 100 inhabitants 2009	Internet Users (000s), 2009, current method	Internet users per 100 inhabitants 2009 (current method)	Current multiplier
Russia	77	140,864	88,068	62.52	...	...	...
Mauritius	88	1,288	...	...	...	...	...
Liberia	211	...	...	...	...	...	...
Liechtenstein	...	...	...	...	...	...	1.42
...
...
Cote d'Ivoire	167	20,000	18	0.09	968	4.84	53.78
Sudan	160	40,091	44	0.11	4,200	10.48	95.24
Iraq	146	31,000	3	0.01	325	1.05	104.84
Uganda	193	33,333	30	0.09	3,200	9.6	106.67
Kenya	180	42,000	8	0.02	3,996	9.51	475.65
Afghanistan	202	28,169	2	0.01	1,000	3.55	500

• Huge variance in Multipliers: 0.68 (Russia) to 500 (Afghanistan)
 • “Similar” countries with very different multipliers
 • Afghanistan - 2,000 fixed subscriptions; 202nd GNI ranking; Multiplier=500
 • Burundi - 5,000 fixed subscriptions; 213th GNI ranking; Multiplier=13

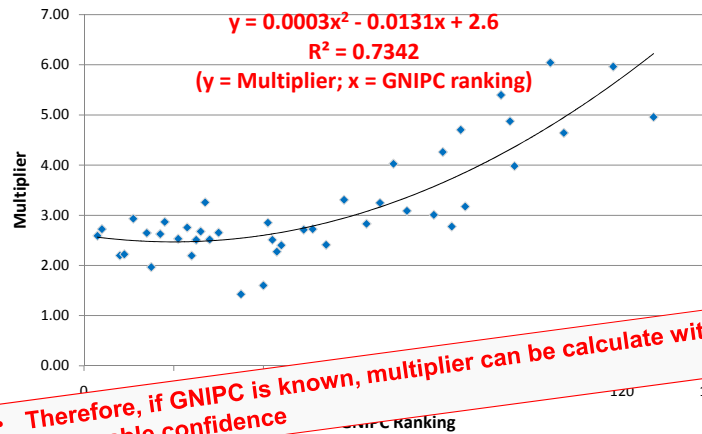


**Proposed modest improvement: a
“more rational” way to determine
the multiplier**

**Hypothesis: Multiplier (M) is inversely
correlated to income**

- More people in developing countries likely to access the Internet at tele-kiosks, schools, places of work
 - All with one subscription → multiple users features
 - $M > 1$ and large
- In more developed countries, most households likely to have internet access at home
 - $M > 1$, but smaller than low income countries
- In developed countries, one user can have many subscriptions (mobile phone, even two fixed broadband etc.)
 - M positive, by could be $M < 1$

Using available data (mostly high income countries), hypothesis appears valid



Source: Data from ITU (as reported by the NSO in each country)
 Note: Two outliers Croatia and Slovak Republic taken out

Recommendation: Step 1: If survey is available, use it since surveys produce most reliable data

- If survey from current year is not available, use previous year's data with adjustment
 - Adjust by average growth for country grouping (e.g. middle income countries etc.)



Step2: If survey data is not available, use formula to calculate multiplier and use multiplier as a ceiling

- Formula: $y = 0.0003x^2 - 0.0131x + 2.6$
Where
 - y = M, the multiplier
 - x is GNI per capita ranking
- As more and more countries (specially low income countries) conduct surveys, formula can be fine-tuned → better estimates for everyone
 - Current data yields $M > 1$
- Most recent available data to be used always
- If current multiplier > formula-derived one
 - Use formula derived multiplier to calculate num. of users
- If current multiplier < formula-derived one
 - Use current multiplier to calculate num. of users



Results: minor adjustments in a few high income countries

Country	GNI per capita (Atlas Method) Ranking	Current Internet Users (000s)	Current Multiplier	Multiplier using new methodology	Internet users with new methodology	Variance of number of Internet users (000)	Actual Survey Results where available	Internet Users that can be reported (000s)
Monaco	1	23	1.84	2.59	32.34	9		23.0
Liechtenstein	2	23	1.38	2.58	43.01	20		23.0
Norway	3	4,431	2.59	2.56	4,383.93	-47	4,431.0	4,431.0
Luxembourg	4	425	2.72	2.55	398.49	-26	425.0	425.0
Bermuda	7	54	1.42	2.52	95.65	42		54.0
Denmark	8	4,751	2.20	2.52	5,437.86	687	4,751.0	4,751.0
Switzerland	9	5,480	1.98	2.51	6,950.24	1,470	6,158.0	6,158.0
Kuwait	10	1,100	3.89	2.50	707.50	-393		707.5
San Marino	12	17	2.62	2.49	16.17	-1		16.2
United Arab Emirates	13	3,778	2.68	2.48	3,495.23	-283		3,430.8
Netherlands	14	14,872	2.65	2.48	13,914.66	-958	14,872.0	14,872.0
Sweden	15	8,398	1.97	2.47	10,560.05	2,162	8,398.0	8,398.0
United States	17	239,894	2.93	2.47	202,036.99	-37,857	215,208.0	215,208.0
Austria	18	6,144	2.87	2.46	5,276.17	-867	6,144.0	6,144.0
Belgium	21	8,113	2.53	2.46	7,882.30	-231	8,113.0	8,113.0
Ireland	23	3,043	2.76	2.46	2,715.75	-327	3,043.0	3,043.0
France	24	44,625	2.19	2.46	50,047.75	5,422	44,625.0	44,625.0
Australia	25	15,757	2.50	2.46	15,513.75	-243	15,809.0	15,809.0
Iceland	26	302	2.67	2.46	278.03	-24	302.0	302.0
Germany	27	65,124	3.26	2.47	49,354.00	-15,770	65,124.0	65,124.0
Canada	28	26,225	2.45	2.47	26,475.45	251	26,960.0	26,960.0

Results: adjustments in all low income countries; some significant

Country	GNI per capita (Atlas Method) Ranking	Current Internet Users (000s)	Current Multiplier	Multiplier using new methodology	Internet users with new methodology	Variance of number of Internet users (000)	Actual Survey Results where available	Internet Users that can be reported (000s)
Mali	184	250	24.75	10.36	104.68	-145		104.7
Cambodia	185	78	4.33	10.46	188.33	110		78.0
Bangladesh	188	617	4.12	10.76	1,613.88	997		617.3
Burkina Faso	190	178	10.48	10.96	186.32	8		178.2
Guinea-Bissau	190	37	53.00	10.96	7.67	-29		7.7
Rwanda	193	450	3.04	11.27	1,665.07	1,215		450.0
Uganda	193	3,200	106.67	11.27	337.97	-2,862		338.0
Central African Rep.	195	23	9.04	11.47	28.68	6		22.6
Gambia	196	130	37.17	11.58	40.52	-90		40.5
Mozambique	196	613	45.37	11.58	156.29	-456		156.3
Nepal	196	626	6.05	11.58	1,198.20	572		625.8
Togo	196	356	5.98	11.58	689.98	334		356.3
Madagascar	200	320	38.55	12.00	99.60	-220		99.6
Afghanistan	202	1,000	500.00	12.22	24.43	-976		24.4
Niger	204	116	32.19	12.43	44.76	-71		44.8
Ethiopia	206	445	6.26	12.65	899.61	454		445.4
Eritrea	207	250	35.71	12.76	89.35	-161		89.3
Malawi	209	716	6.82	12.99	1,363.67	647		716.4
Liberia	211	20	1.33	13.21	198.20	178		20.0
Burundi	213	65	13.00	13.44	67.21	2		65.0

Result: overall 8% reduction in the number of Internet users across reporting countries; small increase in digital divide

- Brings down the numbers for many developing countries that used very high multipliers
 - E.g. Afghanistan (500 → 12.22); Kenya (475 → 9.98); Uganda (106 → 11.27)

- Small increase in the digital divide

	Internet users/100 (current methods), 2009	Internet users/100 (new method), 2009
Developed countries	65.46	61.92
Developing countries	20.64	15.57
Digital divide (Internet users)	3.17: 1	3.98:1

- But when wireless Internet subscriptions grow, and data are included in future iterations, an increase in the calculated total user numbers and a reduction in the digital divide can be expected (since new wireless users are expected to come disproportionately from developing countries)

Drawbacks of proposed method

- Does not account for wireless subscriptions
 - Should yield smaller multipliers over time as wireless is included in the future.
- Leaves out most unreliable (wireless subs) but still assumes fixed subscriptions data is reliable
 - Further tests required (next iteration)
- Nearly all data used to derive formula is from developed countries (few developing countries have conducted surveys)
 - Possibly skews the multiplier (mobile a lion's share of developing country Internet subscriptions)
 - Only solution is for more developing countries to conduct surveys
- Still only an estimate, albeit one grounded on plausible logic
 - Not a substitute for survey data
- Multipliers always greater than 1
 - Because wireless data is left out ?
 - And because double counting occurs when wireless is included?



Thank you.

> Work in progress

> Feedback to improve methodology requested. To: helani@lirneasia.net

> Draft of paper containing individual country calculations available at

www.lirneasia.net

