



وزارة المواصلات والاتصالات

Ministry of Transportation
and Telecommunications

ITU Regional Workshop on ICT Statistics



Manama, Bahrain

26-27 March 2018

Telecommunication indicators

Ivan Vallejo Vall

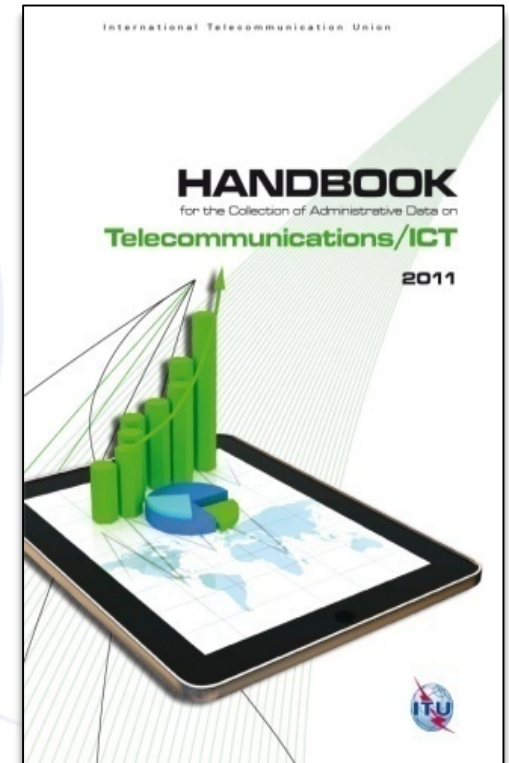
ICT Data and Statistics Division

International Telecommunication Union

ITU Handbook

- Covers **81 indicators** on telecommunication/ICT services
- Covers data collected from **administrative sources** (e.g. telecom operators)
- Discussed in the ITU Expert Group on Telecom/ICT Indicators (**EGTI**)
- Available at:

http://www.itu.int/pub/D-IND-ITC_IND_HBK-2011



ITU Handbook (cont.)

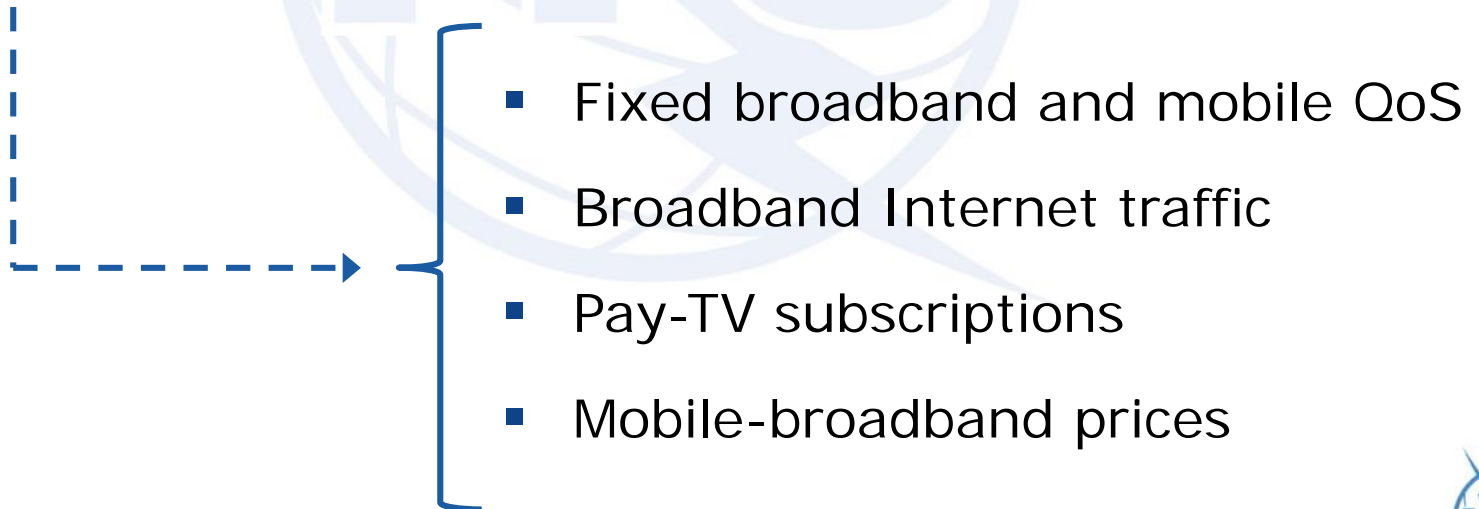
Groupings:

- Fixed-telephone networks
- Mobile-cellular networks
- Internet
- Traffic
- Tariffs
- Quality of service
- Persons employed
- Revenue
- Investment
- Public access
- Broadcasting and other indicators

- Definition
- Clarifications and scope
- Method of collection
- Relationship with other indicators
- Methodological issues
- Examples

ITU Handbook – additions

- Revision of revenue and investment indicators
- New indicators from administrative sources 2011-2013

- 
- Fixed broadband and mobile QoS
 - Broadband Internet traffic
 - Pay-TV subscriptions
 - Mobile-broadband prices

ITU Handbook – additions (ii)

- New indicators from administrative data sources added in 2015:

- M2M mobile-network subscriptions
- Fixed-broadband subscriptions for organizations
- Percentage of the population covered by at least an LTE/WiMAX mobile network
- Subscriptions to bundled telecommunication services

ITU Handbook – additions (iii)

- New indicators from 2016:

- Active subscriptions to LTE/WiMAX mobile-broadband networks
- Change in mobile-bb sub-categories

- New indicators from 2017:

- Fixed wired network coverage
- Extension fixed-broadband speed tiers
- Modification price baskets

ITU Handbook – additions (iv)

- Methodological note on the indicator “Fixed-broadband Internet traffic”

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Handbook <https://www.itu.int/en/ITU-D/Statistics/Pages/publications/handbook.aspx>

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ITU Handbook for the Collection of Administrative Data on Telecommunications/ICT, 2011

The ITU Handbook for the Collection of Administrative Data on Telecommunications/ICT (2011) is a key reference document for the collection of internationally comparable indicators on telecommunications/ICT based on administrative sources (i.e. supply-side data mainly from operators). The Handbook includes definitions and methodological clarifications for 81 internationally agreed indicators and corresponding sub-indicators, discussed by the Expert Group on Telecommunication/ICT Indicators (EGTI). The Handbook was released at the 9th ITU World Telecommunication/ICT Indicators Meeting, in December 2011.

Since the publication of the Handbook in 2011, there have been some additions and revisions to the indicators included in the Handbook. These modifications reflect the outcomes of the Expert Group on Telecommunication/ICT Indicators (EGTI), as endorsed by the World Telecommunication/ICT Indicators Symposium. The new ITU indicators from administrative data sources developed between 2011 and 2013 are available in a separate document that complements the Handbook. In addition, specific guidelines were developed to update the methodology for the collection of revenue and investment data on telecommunications.

Download the ITU Handbook, its additions and revisions in [Arabic](#), [Chinese](#), [English](#), [French](#), [Russian](#) and [Spanish](#) (pdf format).

[Methodological note on the indicator "Fixed-broadband Internet traffic"](#)

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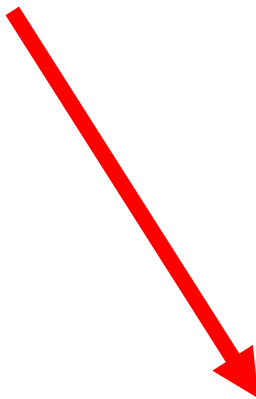
As the UN specialized agency for ICTs, ITU is the official source for global ICT statistics. Find out more about how we produce and disseminate data, our main events and products. [More>](#)

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New March 2018



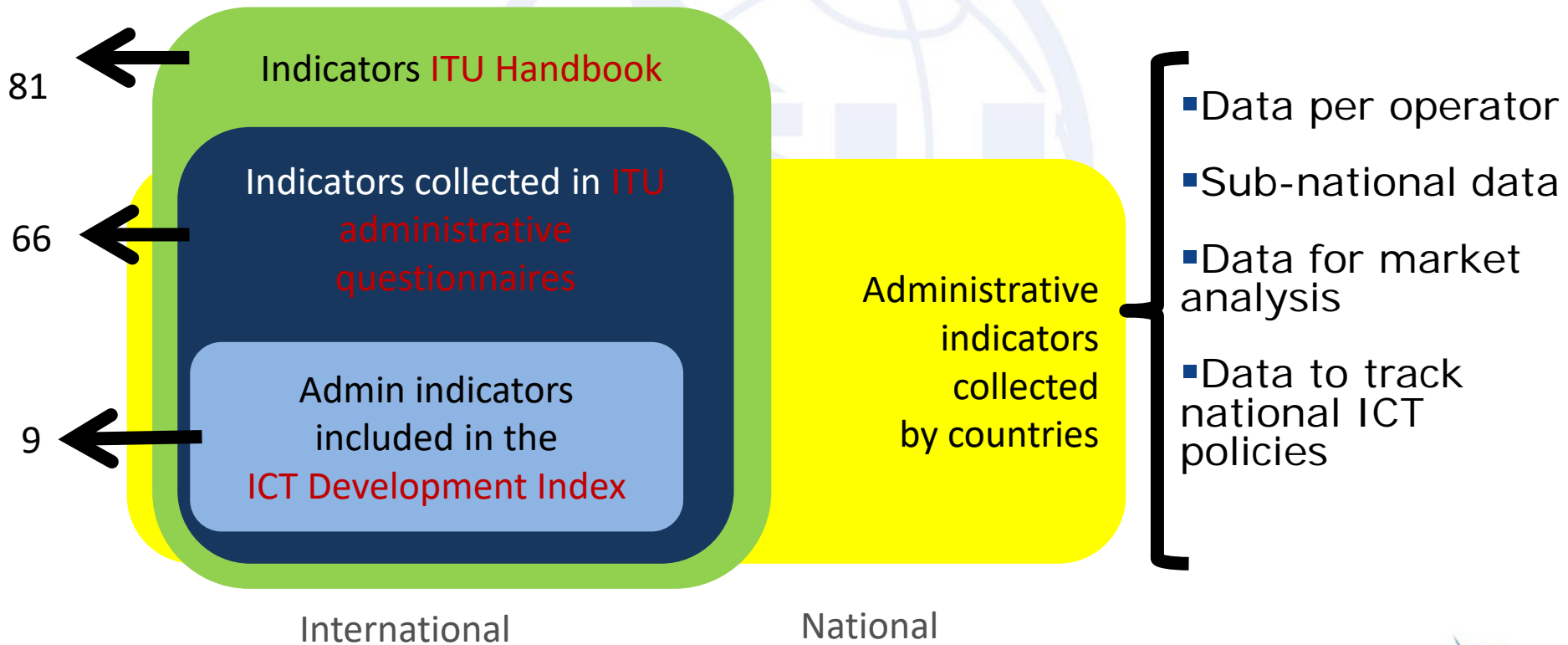
ITU questionnaires

<i>Annual Questionnaires</i>	<i>Short WTI</i>	<i>Long WTI</i>	<i>ICT Price Basket</i>
<i>Addressee</i>	Regulators and Ministries		
<i>Format</i>	Online	Online	Online
<i>Date</i>	March/April	July/September	October
<i># indicators</i>	14	66	mobile cellular, mobile broadband and fixed broadband prices
<i>Response Rate</i> <i>(Arab States)</i>	19/22 replies 65% data	16/22 replies 49% data	15/22 replies 68% data

<http://www.itu.int/en/ITU-D/Statistics/Pages/datacollection/default.aspx#questionnaires>



Context: indicators from administrative sources



Main ITU indicators from administrative sources

1. Mobile-cellular network

Indicator 11: Mobile-cellular telephone subscriptions

Number of subscriptions to a public mobile telephone service that provide **access to the PSTN using cellular technology**.

The indicator includes:





(i) postpaid subscriptions; and
(ii) prepaid accounts that are active, i.e. used during the last three months.

The indicator applies to all mobile-cellular subscriptions that offer voice communications.

It excludes subscriptions via data cards or USB modems, subscriptions to public mobile data services, private trunked mobile radio, telepoint, radio paging and **M2M**.

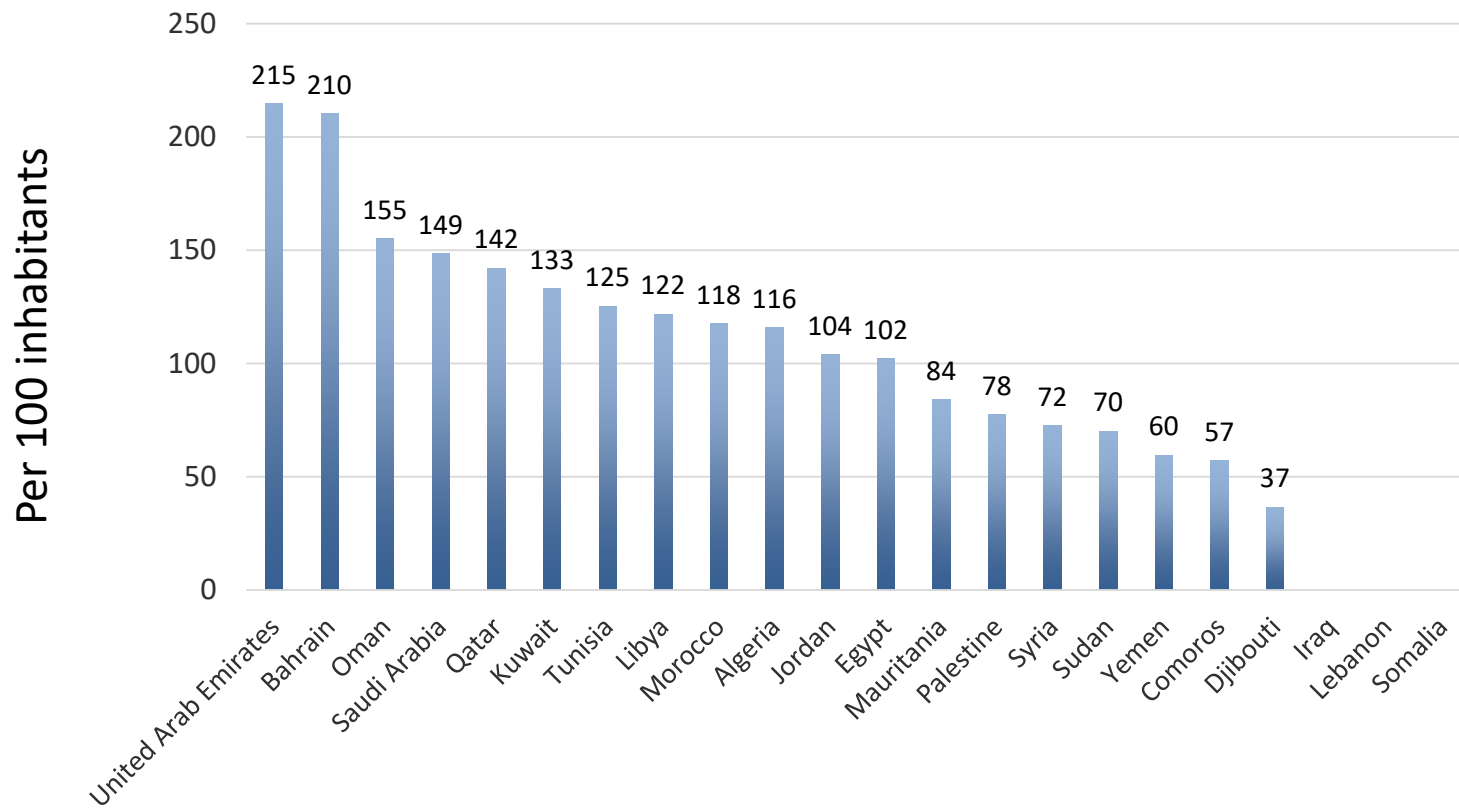
What do we actually measure?

Mobile-cellular...

- Subscriptions →  ✓ operator data
- Users →  household survey data
- Handsets →  ✗
- Subscribers →  ✗

Mobile cellular

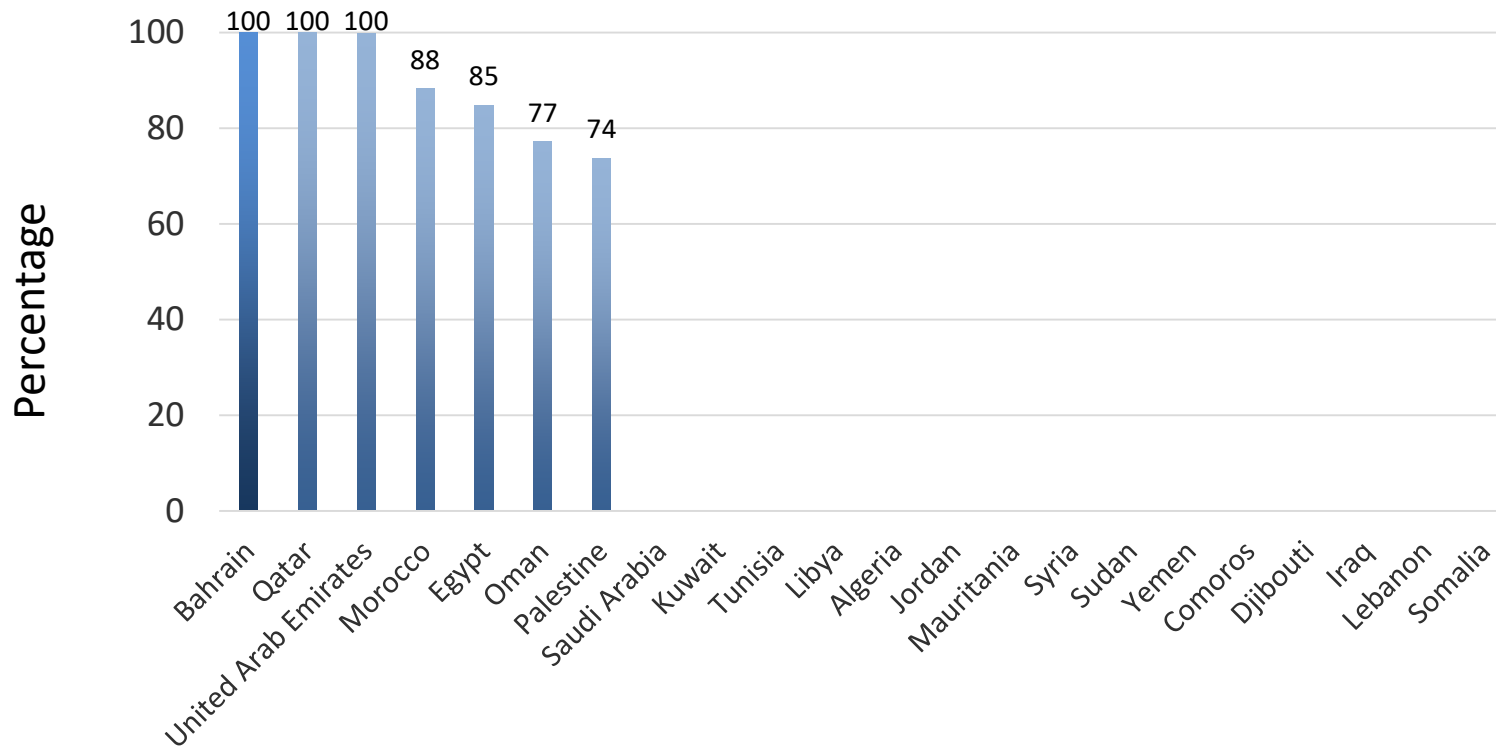
Mobile-cellular subscriptions, end 2016



subscriptions \neq mobile uptake



Individuals owning a mobile phone, 2016

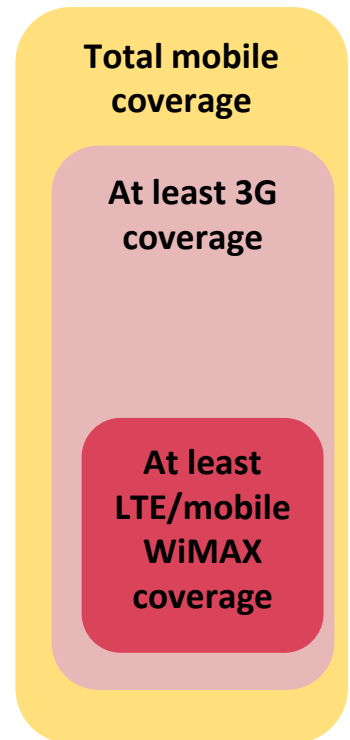


Mobile coverage indicators



*irrespective of whether or not they are subscribers,
% of inhabitants that live within range of:*

1. Any mobile-cellular signal
2. At least a 3G mobile network
(excl. EDGE, GPRS, CDMA 1xRTT)
3. At least an LTE/WiMAX mobile network
(excl. HSPA, UMTS, EV-DO)



Mobile coverage – methodology



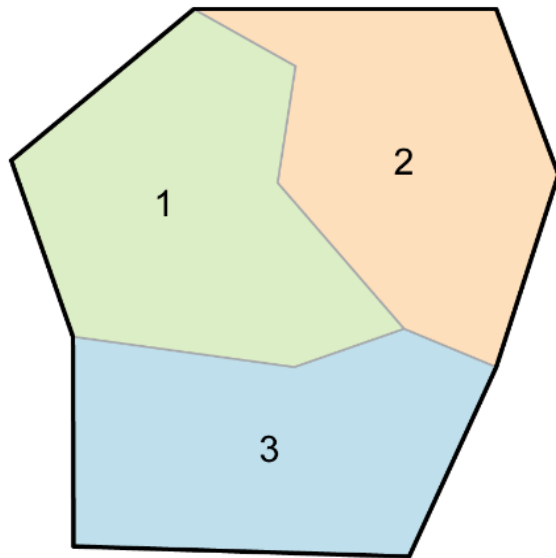
Possible ways of collecting the data:

1. Each operator reports total country coverage
⇒ Max value of all reported
2. Each operator reports total per admin unit
⇒ Max value of all reported per admin unit
⇒ Aggregation according to population/admin unit

Mobile coverage – methodology



Example:



	Op 1	Op 2	Op 3
Region 1 (25% pop)	70%	80%	70%
Region 2 (25% pop)	50%	60%	70%
Region 3 (50% pop)	80%	70%	70%

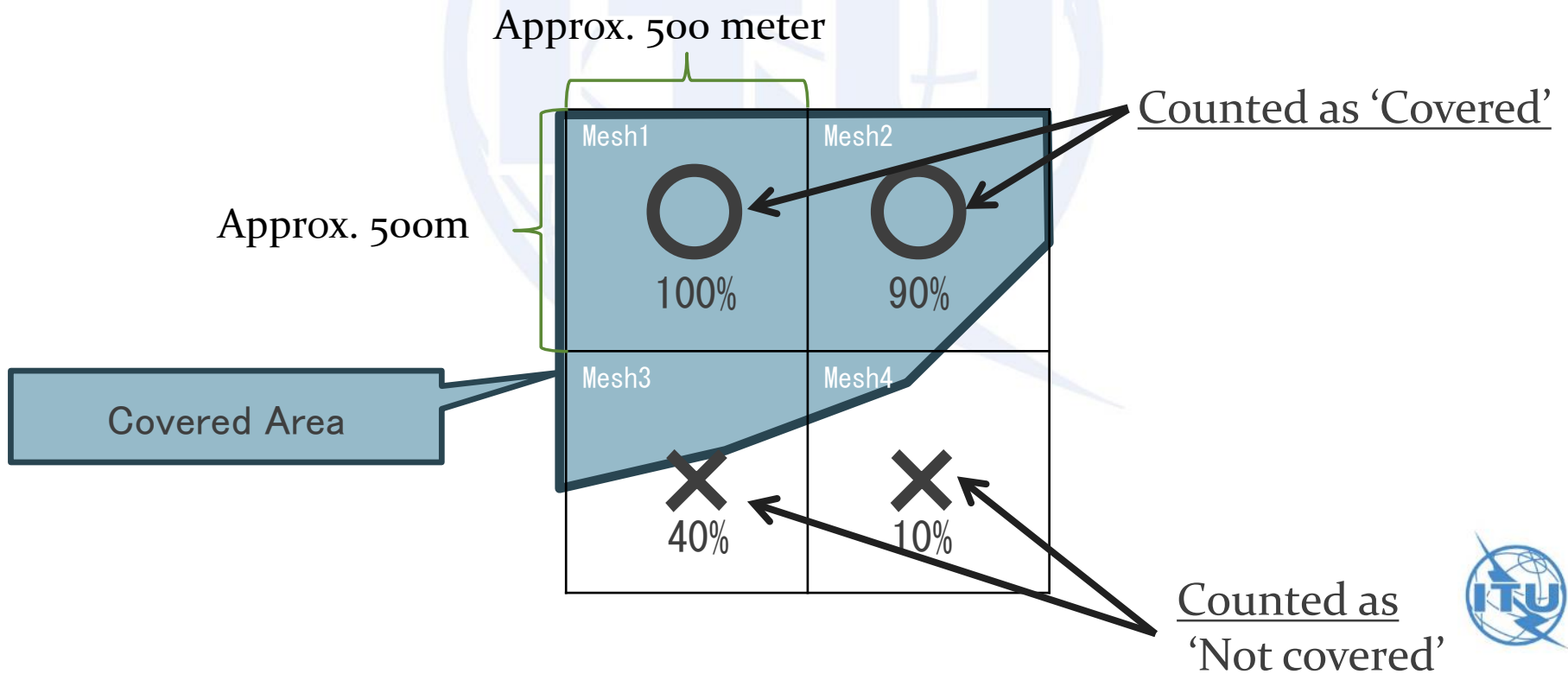
Total coverage: $80\% * 25\% + 70\% * 25\% + 80\% * 50\% = 77.5\%$

Mobile coverage – methodology



3. Ask each operator to report coverage according to a given division of the land area

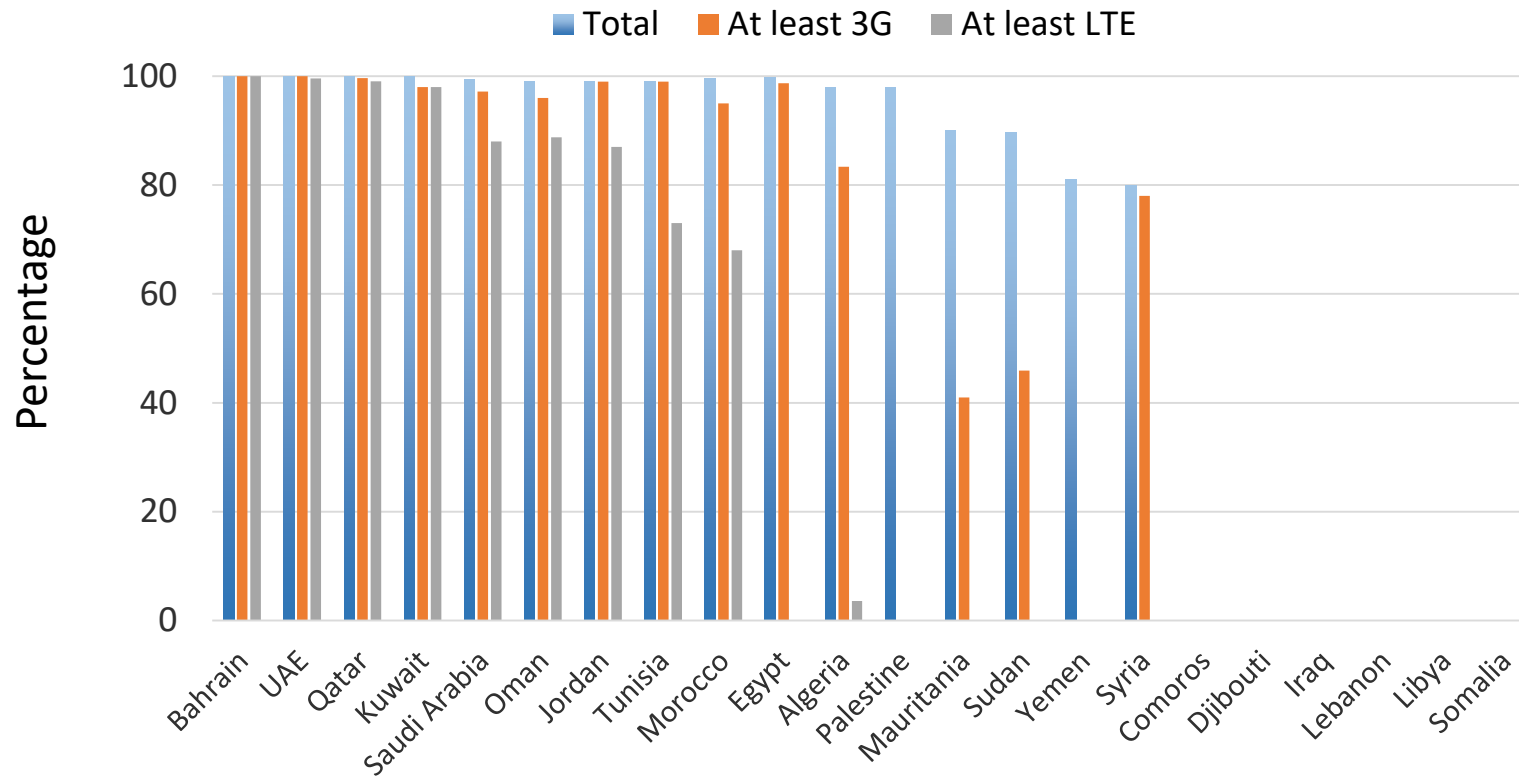
Example of Japan:



Mobile-cellular coverage



Mobile-cellular coverage, by technology, end 2016





Machine to machine subscriptions

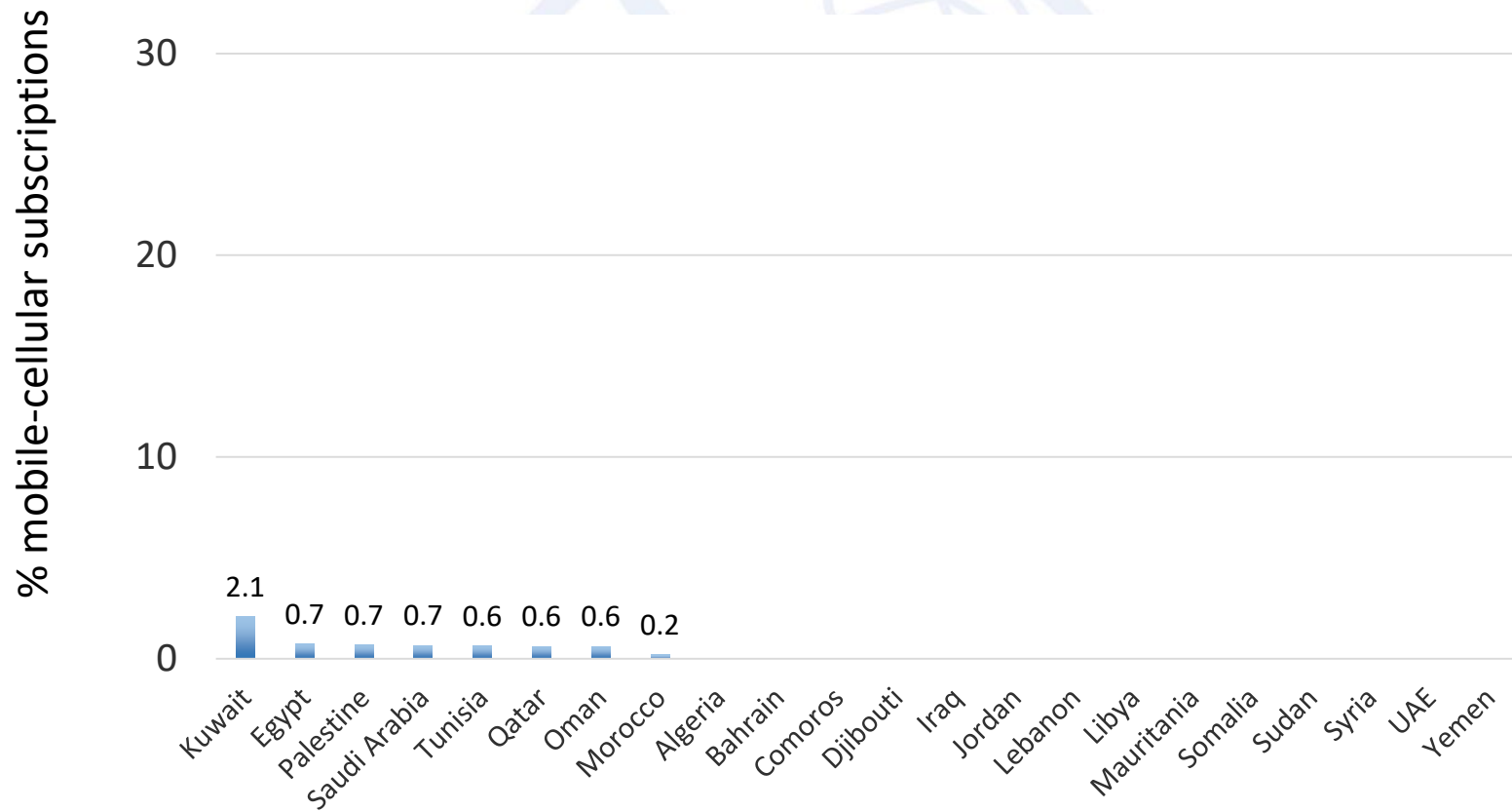
- Indicator collected from 2016:

mobile-cellular machine-to-machine subscriptions that are assigned for use in machines and devices (cars, smart meters, consumer electronics) for the exchange of data between networked devices, and are not part of a consumer subscription.

For instance, SIM-cards in personal navigation devices, smart meters, trains and automobiles should be included. Mobile dongles and tablet subscriptions should be excluded.

M2M subscriptions

Mobile-cellular M2M subscriptions, end 2016



Other mobile-cellular indicators

- Prepaid mobile-cellular telephone subscriptions
 - 16/22 countries reported data in 2016
- Mobile-cellular numbers ported
 - 11/22 countries reported data in 2016

2. Fixed-telephone network

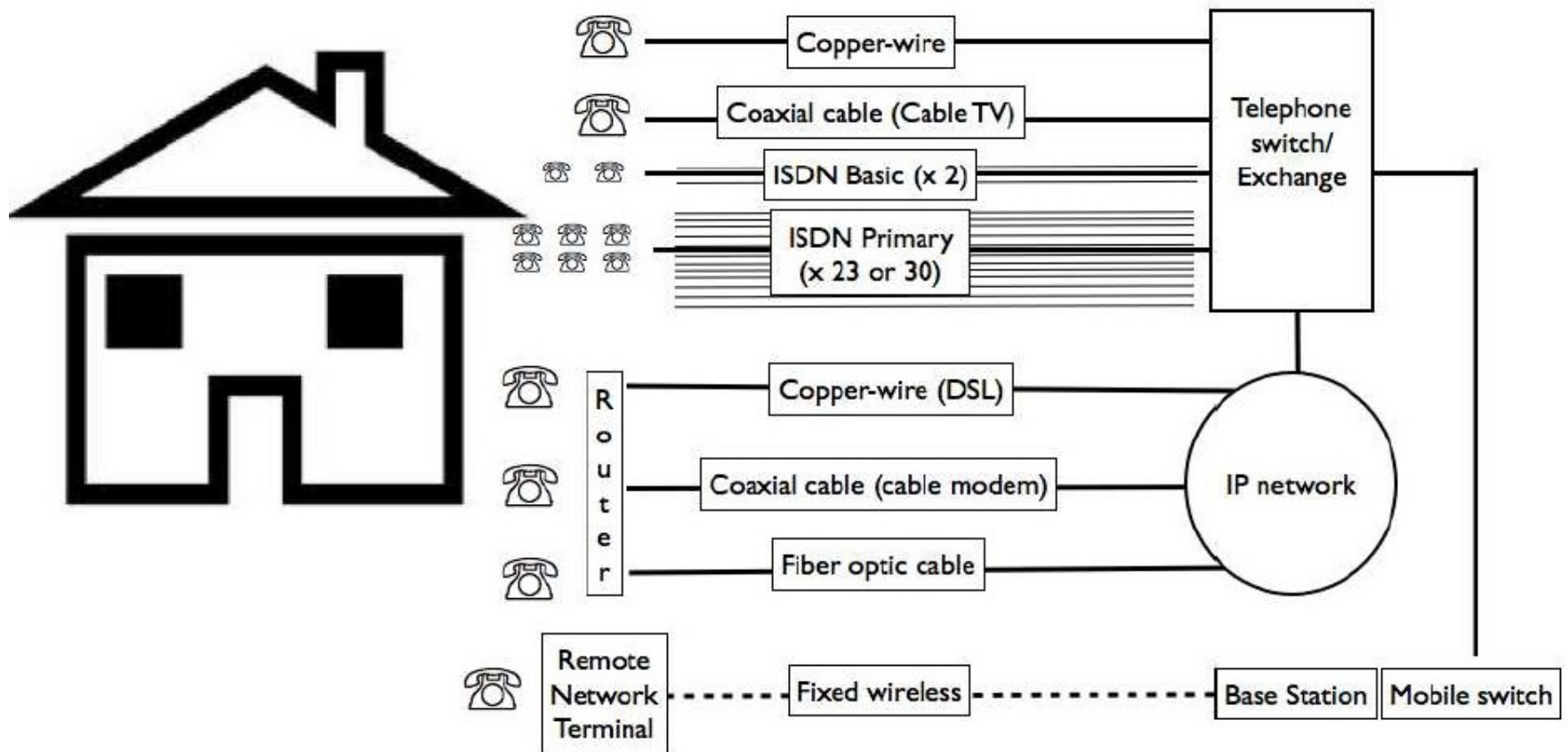
Indicator 2: Fixed-telephone subscriptions

The sum of (active) number of:

- (i) **analogue fixed-telephone** lines
- (ii) Voice-over-IP (**VoIP**) subscriptions
- (iii) fixed wireless local loop (**WLL**) subscriptions
- (iv) integrated services digital network (**ISDN**) voice channel equivalents
- (v) fixed **public payphones**

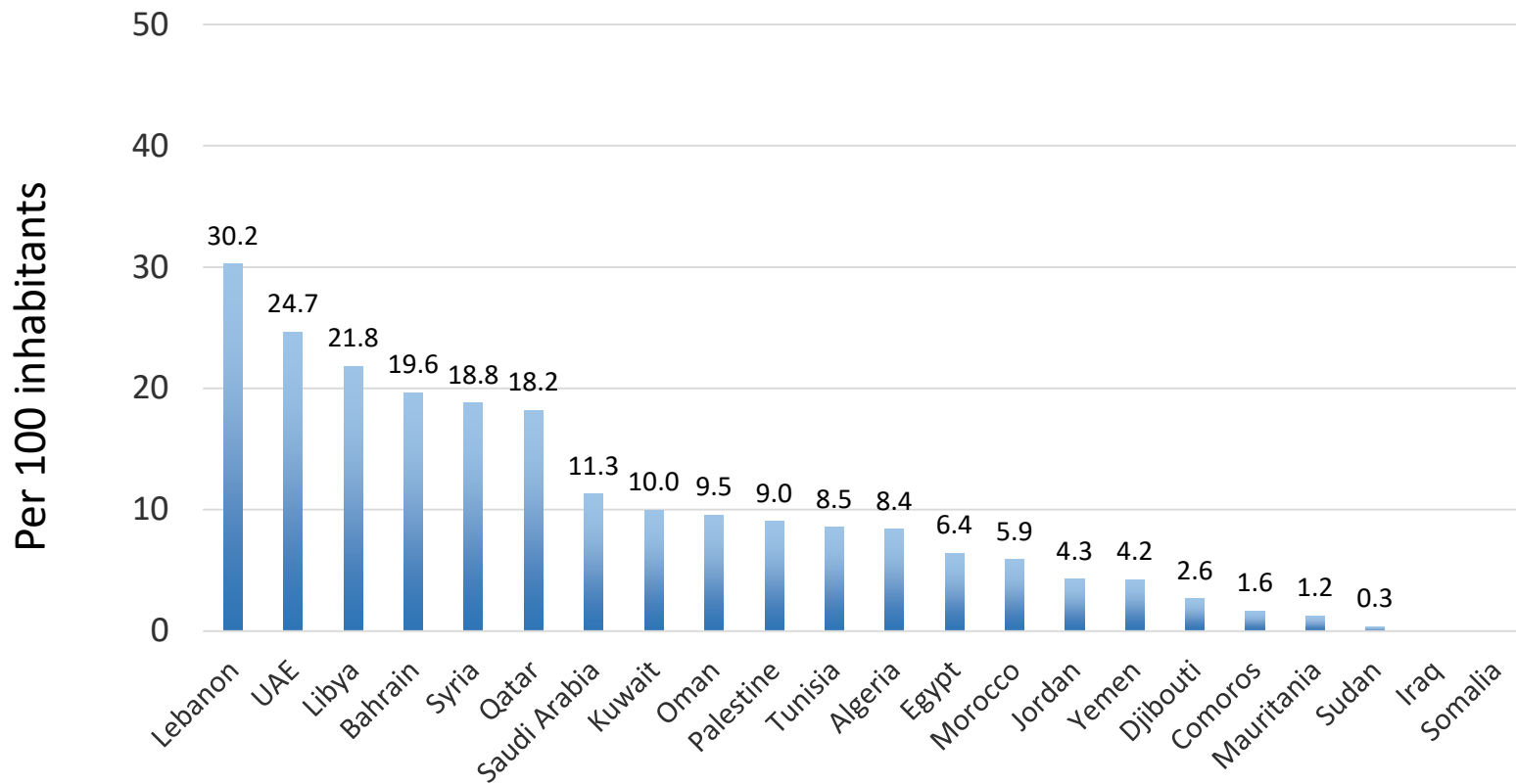
This indicator was previously called Main telephone lines in operation.

Fixed-telephone subscriptions



Fixed telephone

Fixed-telephone subscriptions, end 2016



Other fixed-telephone indicators

- % fixed-telephone subscriptions that are residential – 13/22 countries reported data in 2016 (range: 32%-88%)
- VoIP subscriptions – 9/22 countries reported data in 2016
- Fixed-telephone numbers ported – 11/22 countries reported data in 2016 (only available in Bahrain, Comoros, Morocco, Oman, Syria and UAE)

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3. Broadband

Classification of broadband subscriptions

Fixed broadband

- (1) xDSL
- (2) Cable modem
- (3) FTTH/FTTB
- (4) Other fixed wired

- (5) Satellite broadband
- (6) Fixed wireless broadband

Fixed wired



Fixed wireless

Active mobile broadband

- (1) Data and voice
- (2) Data only

3a. Fixed broadband

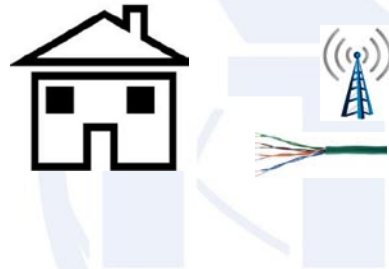
Fixed-broadband subscriptions

Main features:

- advertised ≥ 256 kbit/s



- fixed



From July 2018

Breakdowns:

- by speed



- ≥ 10 Mbit/s
- 2 – 10 Mbit/s
- 0.256 – 2 Mbit/s

- ≥ 100 Mbit/s
- 30 – 100 Mbit/s
- 10 – 30 Mbit/s

Fixed wireless broadband

Indicator 23: Satellite-broadband subscriptions

Indicator 24: Terrestrial fixed wireless broadband subscriptions

Includes: fixed WiMAX and fixed-wireless with an advertised download speed of at least 256 kbit/s.

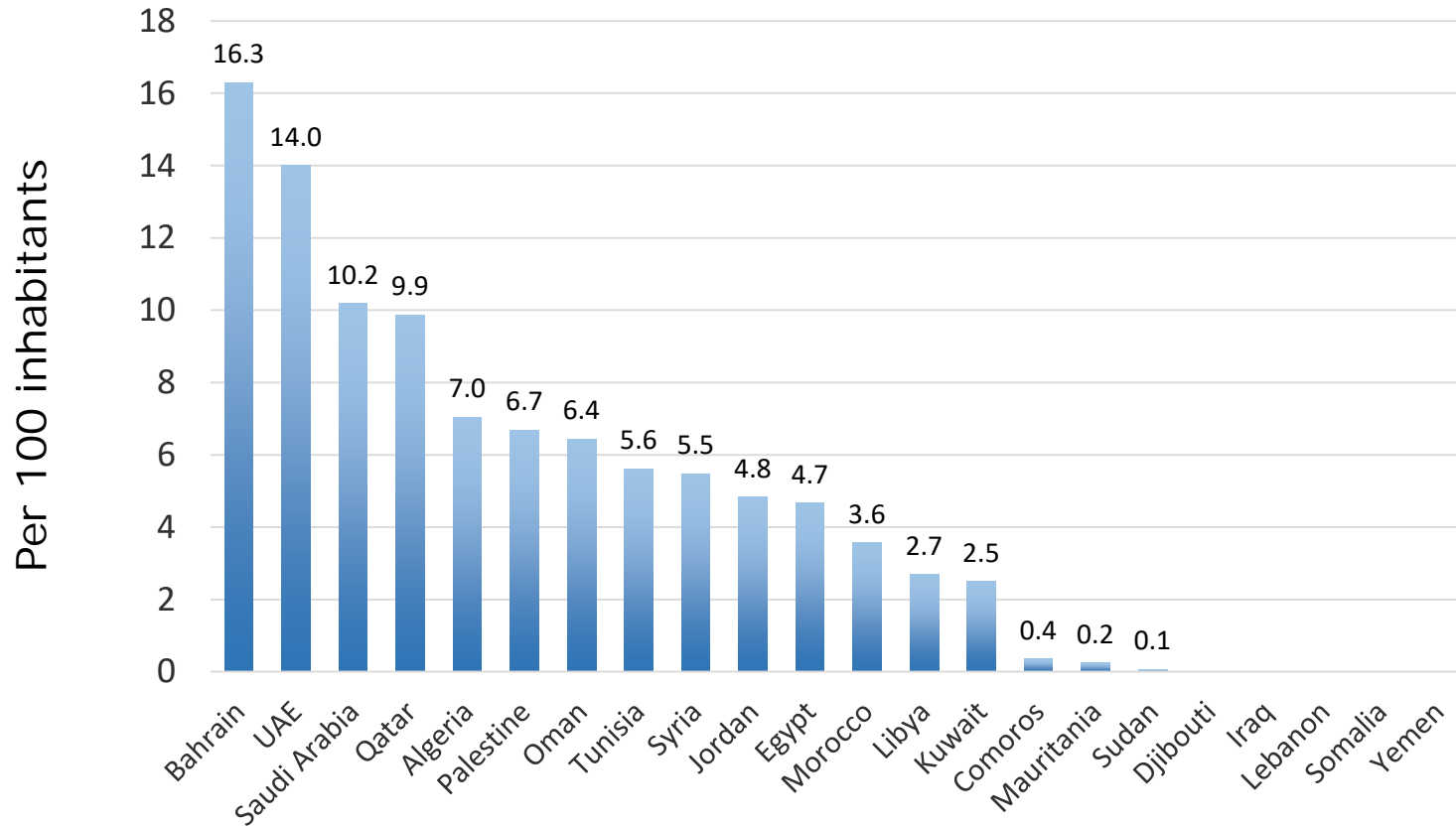
Excludes:

- 1- Occasional users at hotspots and subscribers of Wi-Fi hotspots
- 2- Mobile-broadband subscriptions where users can access a service throughout the country wherever coverage is available.



Fixed broadband

Fixed broadband subscriptions, end 2016



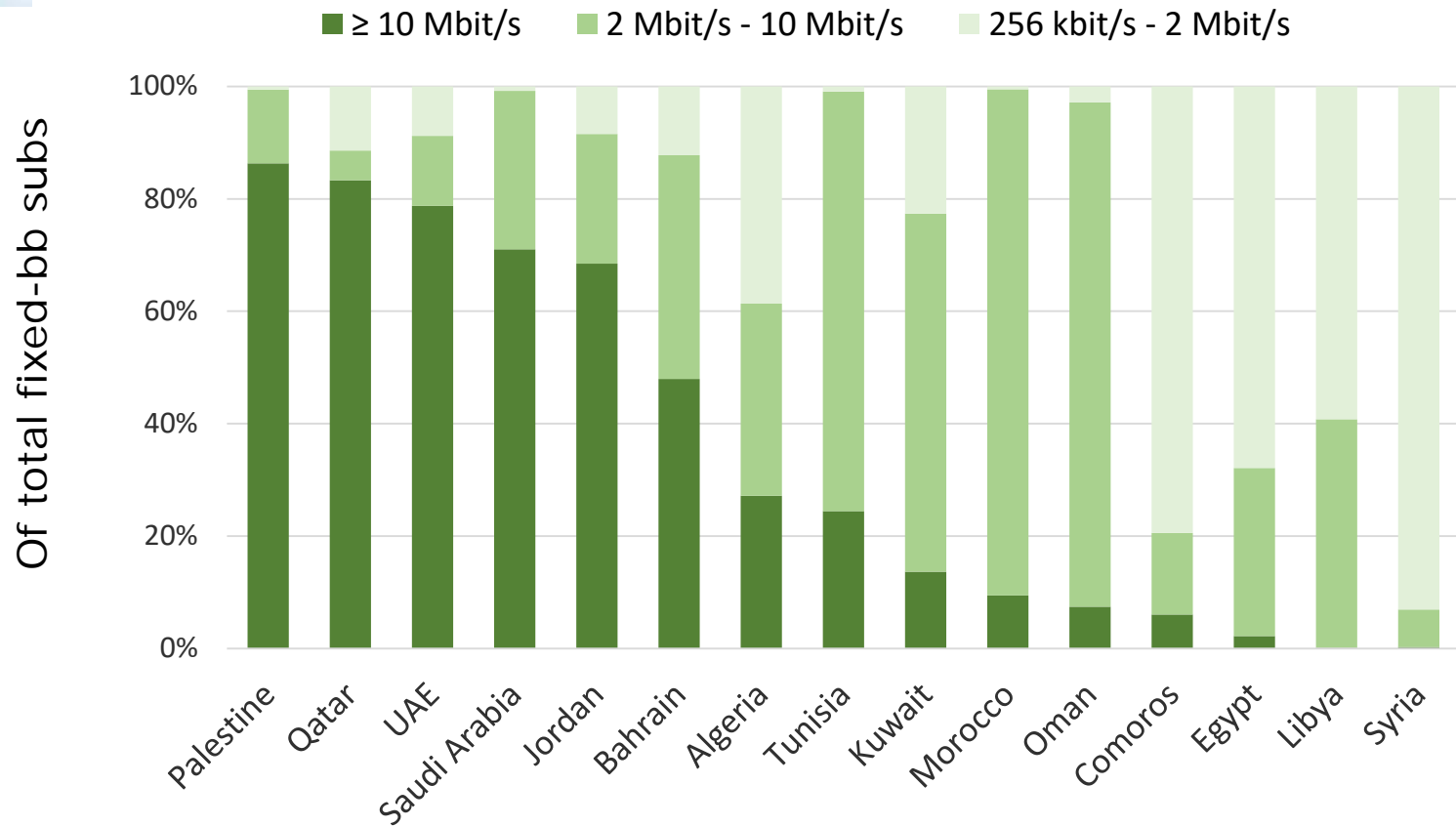
Breakdown by tech available for 11 out of 22 countries



Fixed-broadband speed

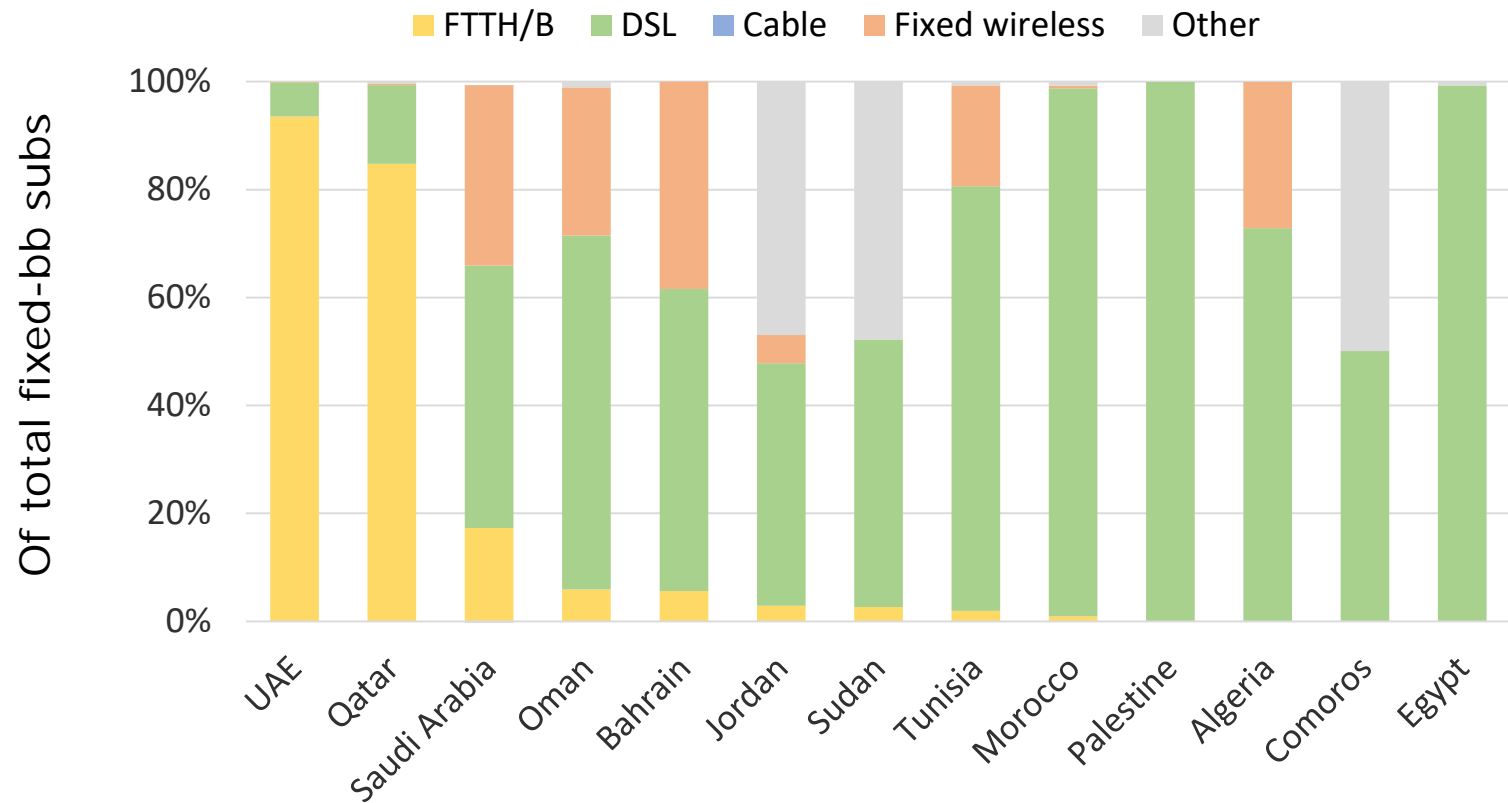


Fixed broadband subscriptions, breakdown by speed, end 2016



Fixed-broadband technology

Fixed broadband subscriptions, breakdown by technology, end 2016





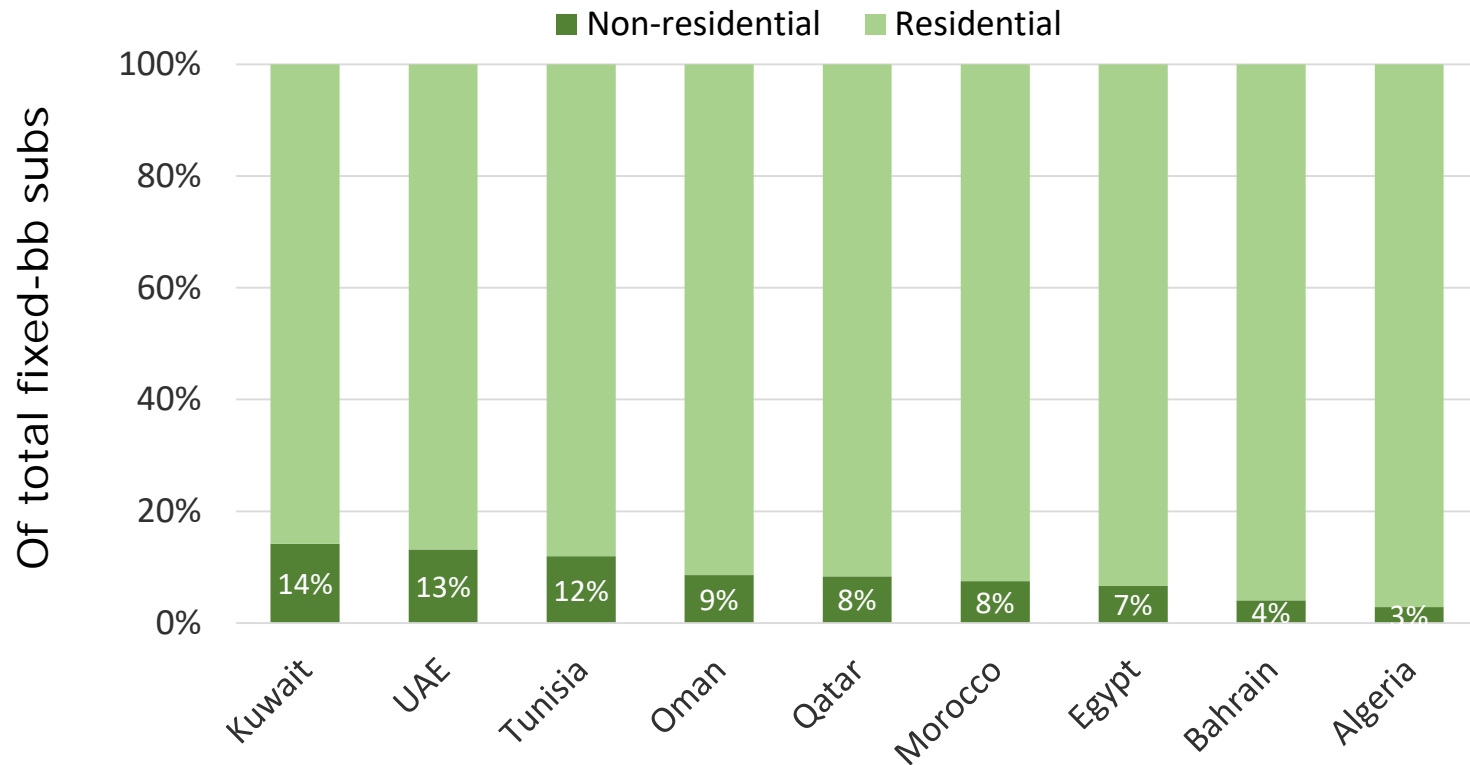
Fixed-broadband subscriptions for organizations

subscriptions contracted by public and private organizations (i.e. non-residential customers) to access the public Internet at a fixed location at downstream speeds greater than, or equal to, 256 kbit/s. This includes cable modem, DSL, fibre-to-the-home/building and fixed wireless broadband technologies.

It excludes residential subscriptions and subscriptions that have access to data communications (including the Internet) via mobile networks.

Fixed broadband organizations

Fixed broadband subscriptions, breakdown by type, end 2016





3b. Mobile broadband

Active mobile-broadband subscriptions

Main features:

- advertised ≥ 256 kbit/s

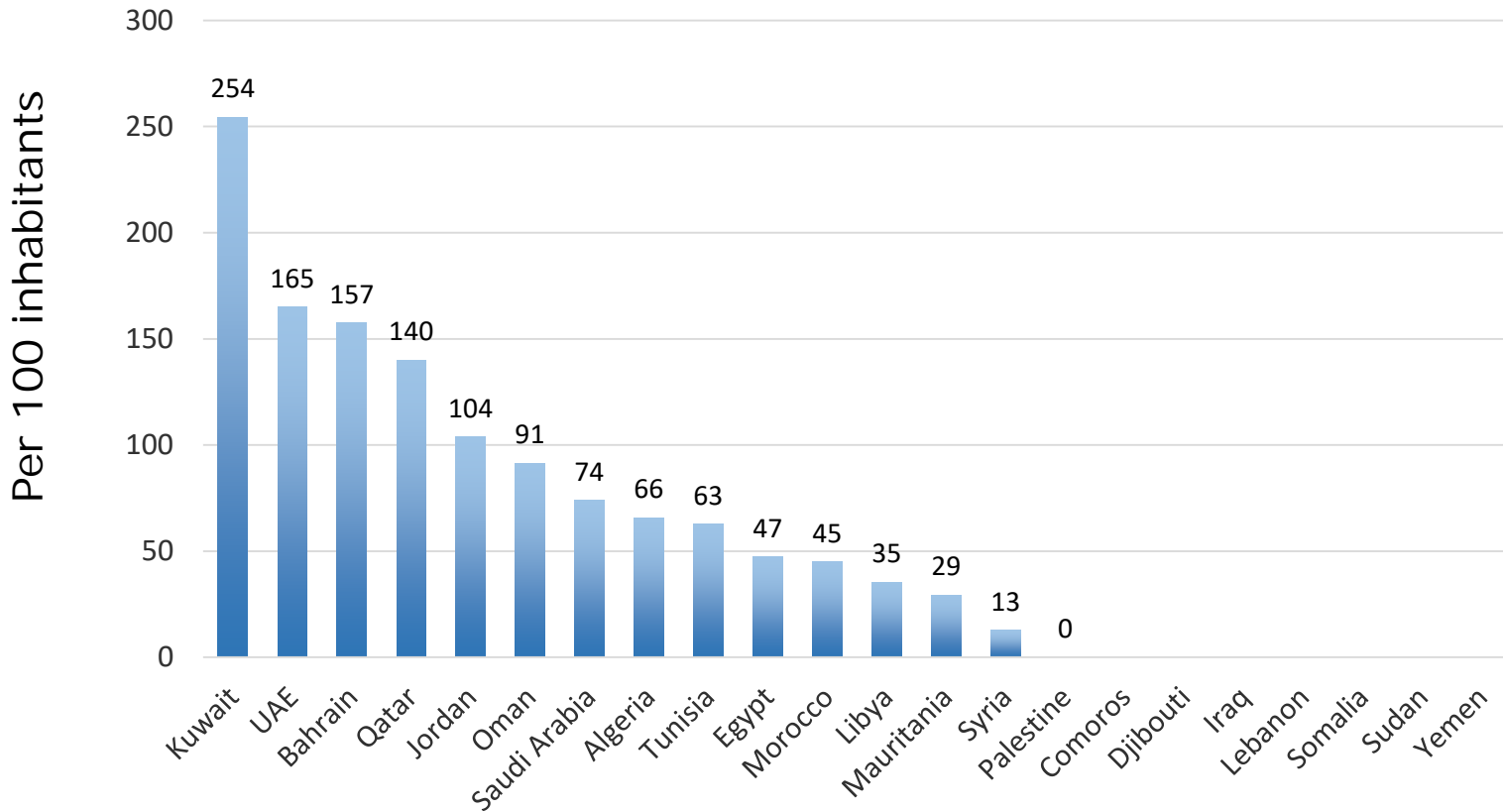


 GPRS and EDGE **excluded**

- active
 - 1. Monthly fee paid only for Internet access
 - OR
 - 2. Accessed the Internet in the previous three months
- allows access to the open Internet

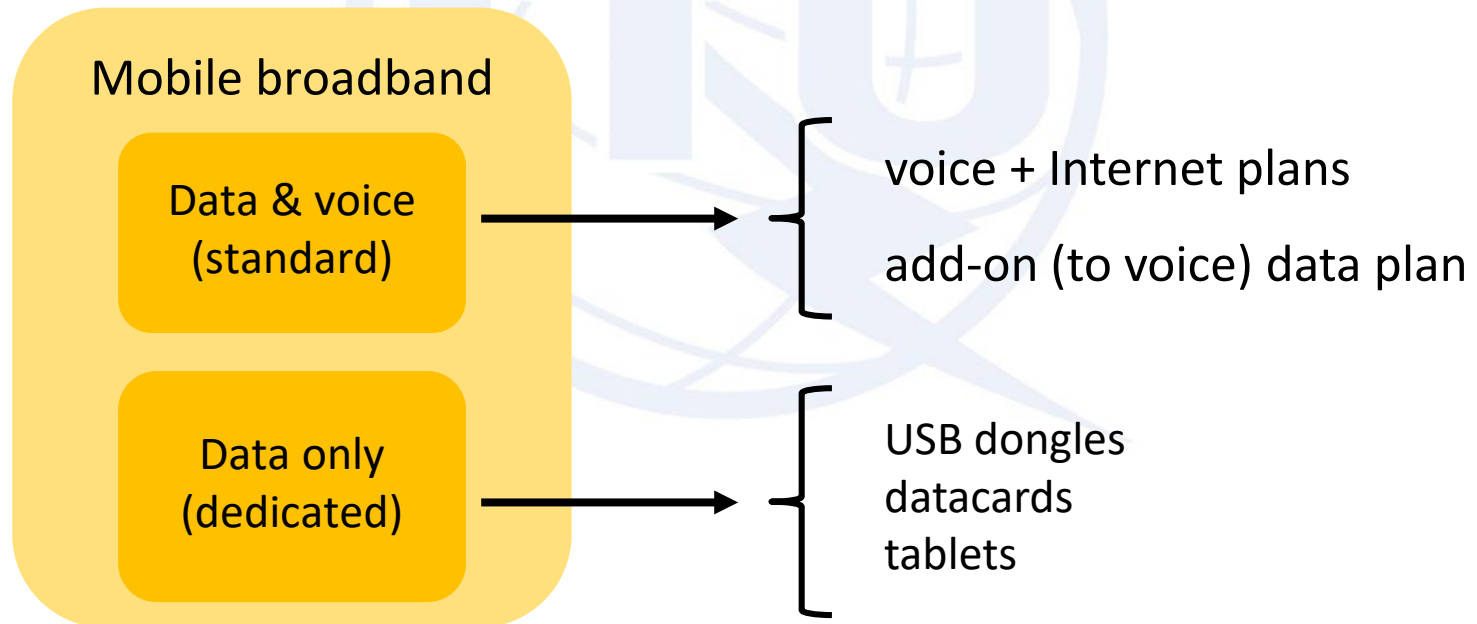
Mobile broadband

Active mobile-broadband subscriptions, end 2016



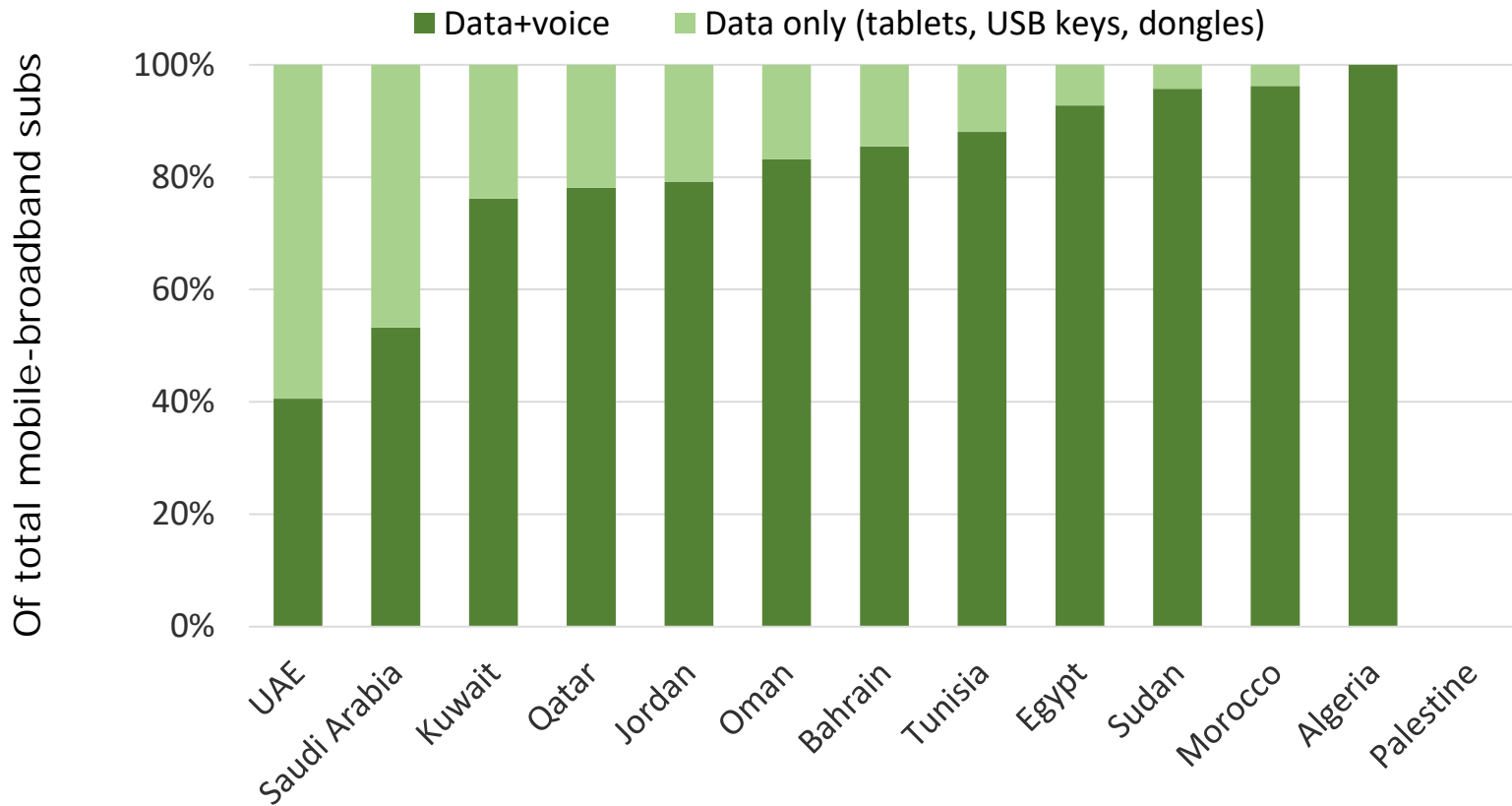
Mobile broadband subcategories

Following the agreement in the 6th EGTI Meeting (September 2015, Geneva) mobile broadband subcategories are as follows:



Mobile broadband

Active mobile-broadband subscriptions, by type of contract, end 2016



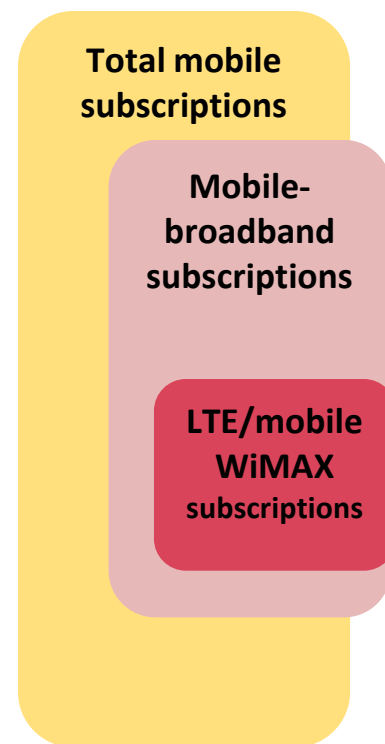


Active subscriptions to LTE/WiMAX mobile-broadband networks

Collected from 2016:

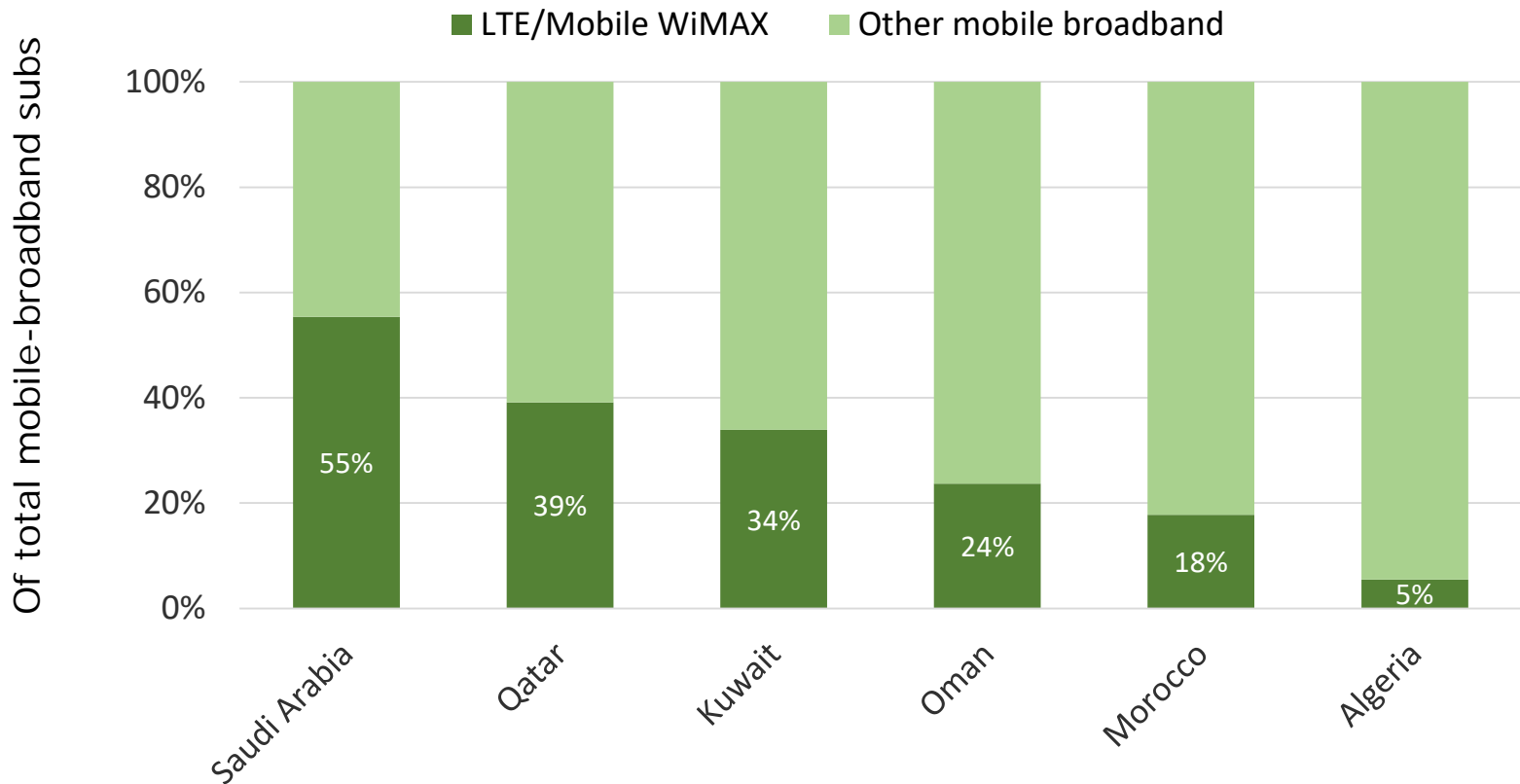
subscriptions that have generated Internet traffic in the last 90 days in LTE/mobile WiMAX and other advanced mobile-broadband networks, such as LTE-Advanced and WirelessMAN.

It excludes subscriptions having generated Internet traffic only in HSPA, UMTS, EV-DO and previous 3G networks, and also excludes fixed WiMAX subscriptions.



Mobile broadband

LTE/mobile WiMAX broadband subscriptions, end 2016

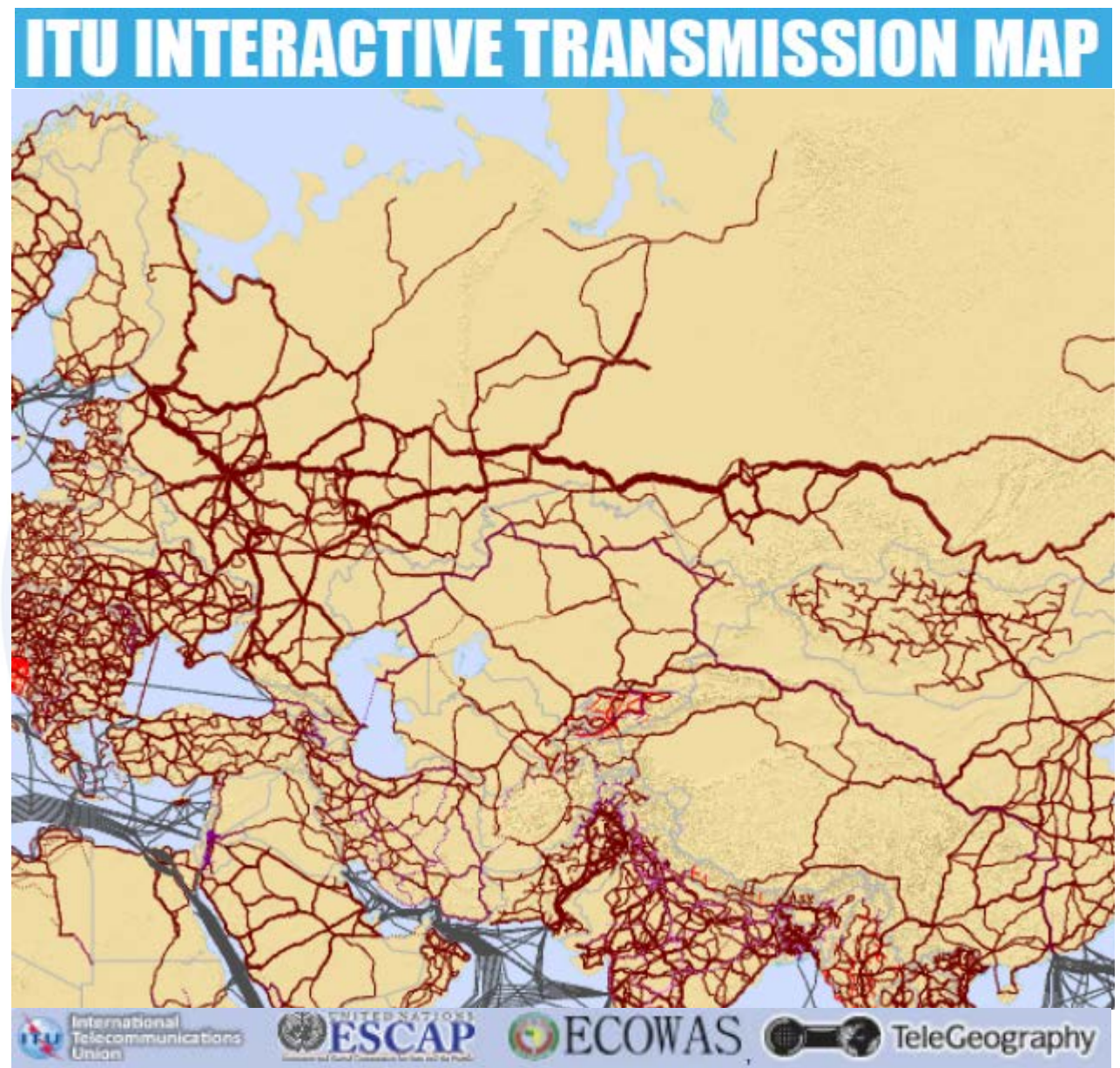


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3c. Bandwidth

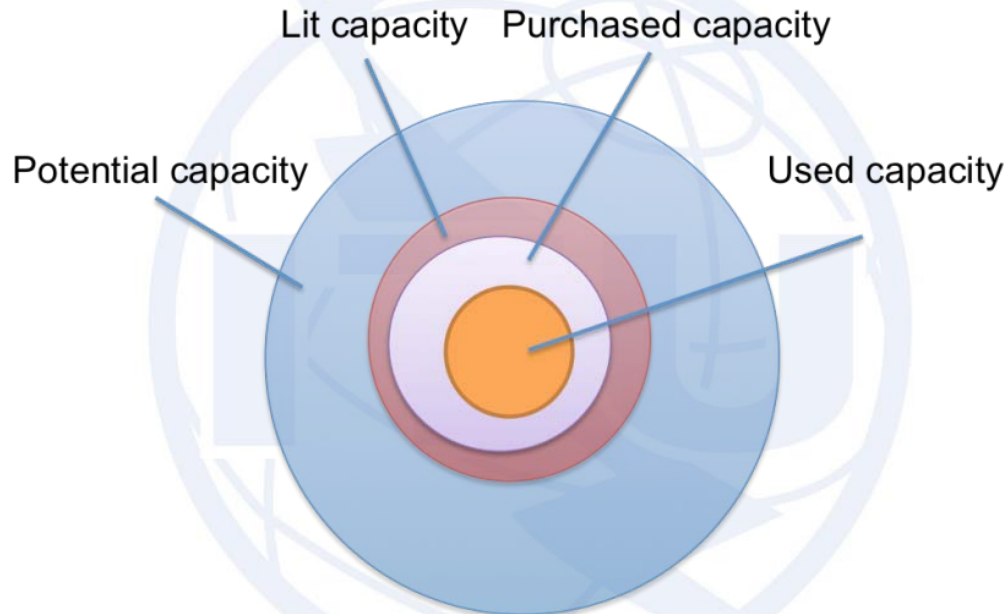
Mapping international connectivity

More information at:



<https://www.itu.int/en/ITU-D/Technology/Pages/InteractiveTransmissionMaps.aspx>

International Internet bandwidth



ITU collects data on two indicators:

1. Lit/equipped capacity

2. Used capacity

Lit/equipped international bandwidth capacity, in Mbit/s

total lit/equipped capacity of international links, namely **fiber-optic cables, international radio links and satellite uplinks** to orbital satellites **in the end of the reference year** (expressed in Mbit/s).

If the traffic is asymmetric (i.e. incoming traffic and outgoing traffic is not equal), then the higher value out of the two should be provided.

International bandwidth usage, in Mbit/s

Average usage of all international links including fiber-optic cables, radio links and traffic processed by satellite ground stations and teleports to orbital satellites (expressed in Mbit/s).

All international links used by all types of operators, namely fixed, mobile and satellite operators should be taken into account.

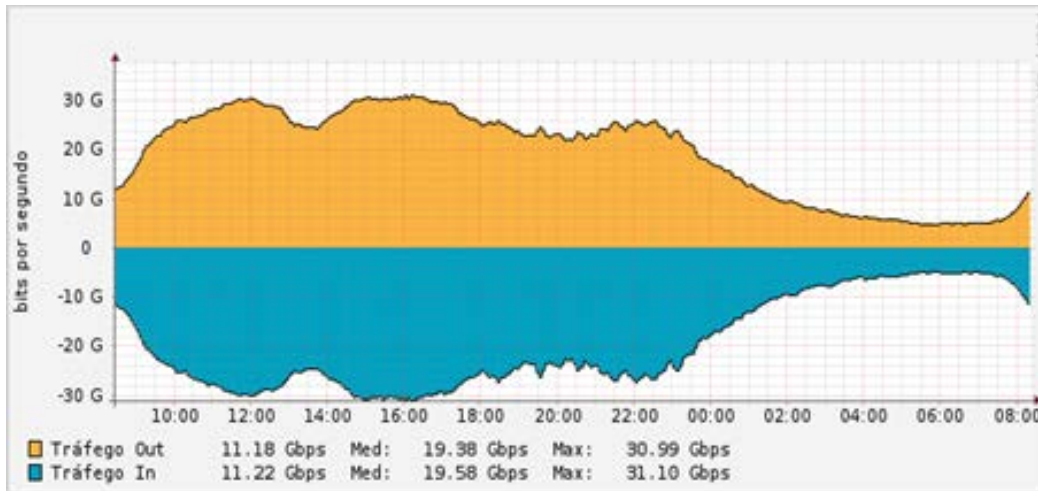
The average should be calculated over the 12-month period of the reference year.

For each individual international link, if the traffic is asymmetric, i.e. incoming traffic is not equal to outgoing traffic, then the higher value out of the two should be provided.

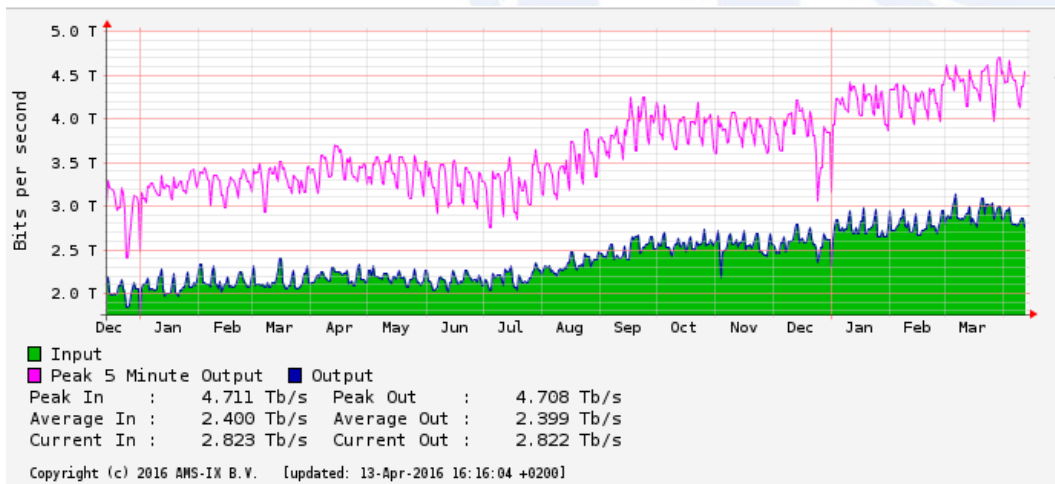
The combined average usage of all international links can be reported as the sum of the average usage of each individual link



Intl Internet bandwidth – methodology



Source: Gigapix.



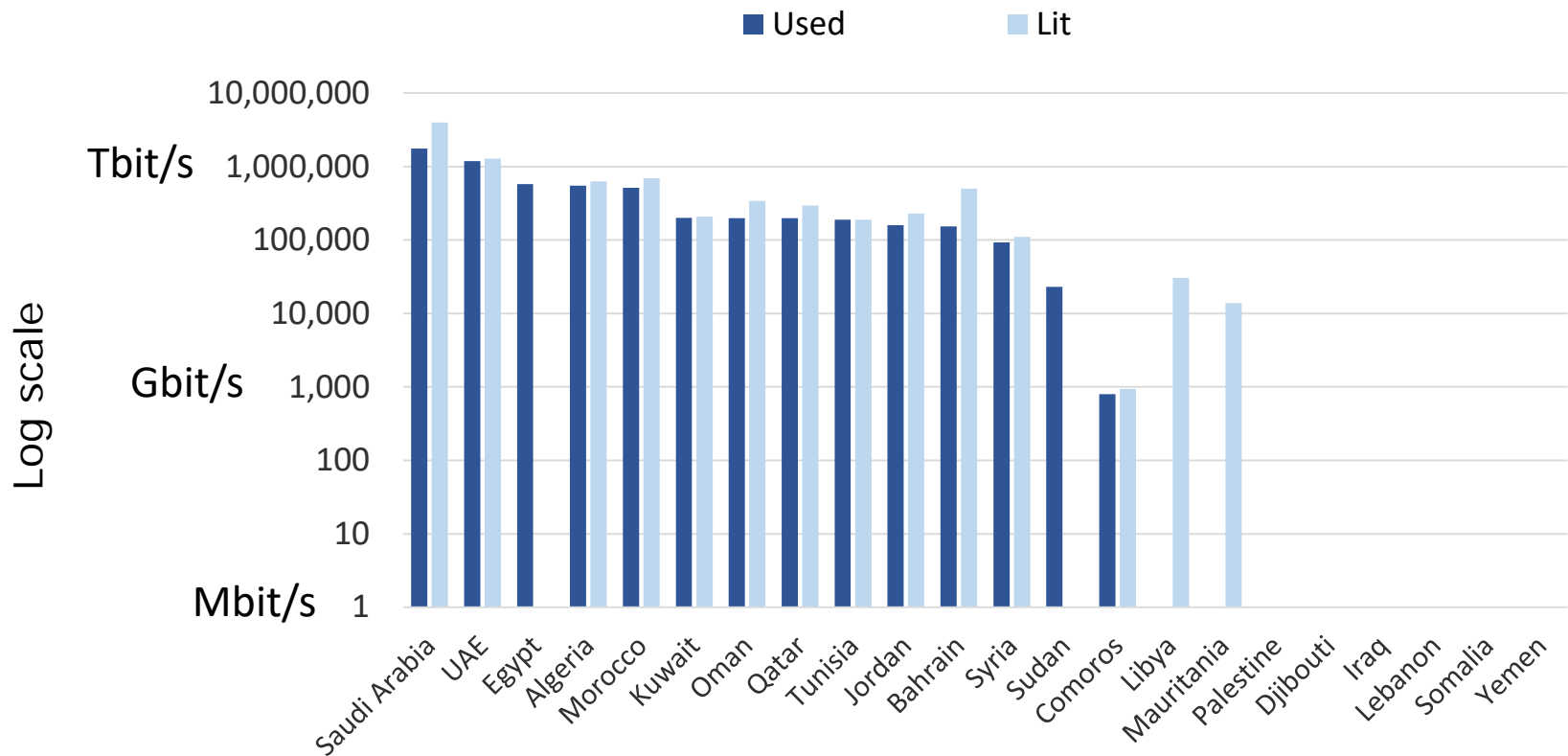
Source: <https://ams-ix.net/>

- Data collected from facilities-based ISPs based on links crossing borders
- Source data: network monitoring tools (e.g. MRTG-Multi Router Traffic Grapher)
- Aspirational: OTTs, CDNs included



Intl Internet bandwidth

International Internet bandwidth, end 2016





3d. Fixed wired network coverage

Households covered by a fixed wired network

To be reported
from July 2018



1. Also known as cabled households or homes passed
2. Measures availability of but not necessarily the subscription to or usage of fixed network services
3. A household is covered if the service provider already provisions or could provision a wired connection within a short period of time (i.e. a few days) and without an extraordinary commitment of resources

Households covered by a fixed wired network (ii)

Examples of extraordinary commitment:

- installing or extending cable from local switching center, a DSLAM, CMTS, OLT, fiber node, optical splitter, FTTC cabinet, HFC node,
- building a duct
- installing poles
- leasing a line

EXCL. Fixed wireless, mobile nomadic and satellite networks



Households covered by a fixed wired network (iii)

Broken down by:

- Traditional public switched telephone network
- DSL (excl. VDSL)
- VDSL, VDSL vectoring
- CATV networks
- FTTP
- Other

The total indicator is not the sum of the sub-indicators



Households covered by a fixed wired network (iv)

Method of collection 1:

	PSTN	ADSL	VDSL	CATV	FTTP	OTHER	TOTAL
Municipality 1				5000	10000		10000
Municipality 2	100	400		1000	600		1000
Municipality 3	500			500			500

Perfect overlap in all municipalities =>

Max (PSTN; ADSL; VDSL; CATV; FTTP; Others)

11500
COUNTRY

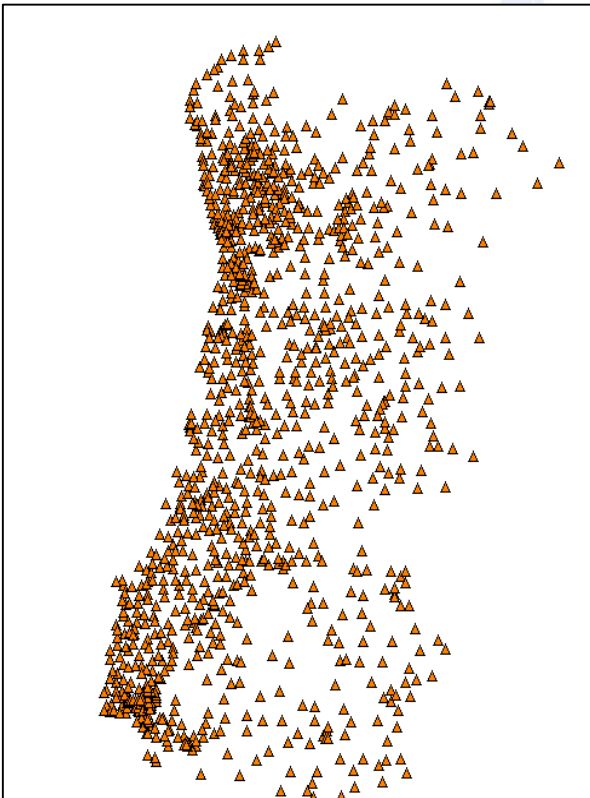
By default, assume perfect overlap



Households covered by a fixed wired network (v)

Method of collection 2:

I. Collect database of geolocated network elements



Code	LON	LAT	Network_Element	Cabled_HH
ALM	-9,14835549	37,90923906	01AA01	2120
ABO	-9,32315451	38,14457720	01AB01	1741
ABD	-9,39788471	38,14878173	01AD01	1836
ALF	-9,19675004	38,15196493	01AF01	2306
ALG	-9,21847829	38,11731024	01AG01	8062
ALH	-8,99445754	38,34385497	01AH01	1908
ALH3	-9,04404091	38,37313211	01AH03	2
ABI	-9,26383689	38,26011188	01AI01	3014
AJU	-9,24821257	38,14686610	01AJ01	49
AMA	-9,04330270	38,17409563	01AM01	2580
ALO	-8,77286899	38,17343871	01AO01	191
ALB	-9,15038204	38,18092789	01AQ01	0
AGU	-9,09744643	38,18817379	01AU01	1
ALV	-8,84618192	38,31722327	01AV01	24
AZE	-8,82465719	37,94089791	01AZ01	1
AZE4	-8,82915579	37,96486249	01AZ04	4418
BAR	-8,88386147	38,08200256	01BA01	0
BBA	-8,85619240	38,07935318	01BB01	745
BCH2	-8,81567762	38,02078216	01BC01	1230
BCH3	-8,82467187	38,01989378	01BC03	881
BOB	-8,90590214	38,22665975	01BO01	2145
BUC	-8,92747876	38,31805748	01BU01	1202
BUC2	-8,93095233	38,36864293	01BU02	835
CAP	-9,00474107	38,08274813	01CA01	9
CAC	-9,09629804	38,18285139	01CC01	974
CCA	-9,00011617	38,03660162	01CH01	3919
CCA2	-8,97642095	38,00291016	01CH02	2192
CCA3	-8,96405397	38,00203951	01CH03	0
CLR	-9,24756348	38,22408620	01CL01	34

Households covered by a fixed wired network (vi)

Method of collection 2:

II. Obtain a digital map of the country/database with number of households at the lowest possible level of granularity

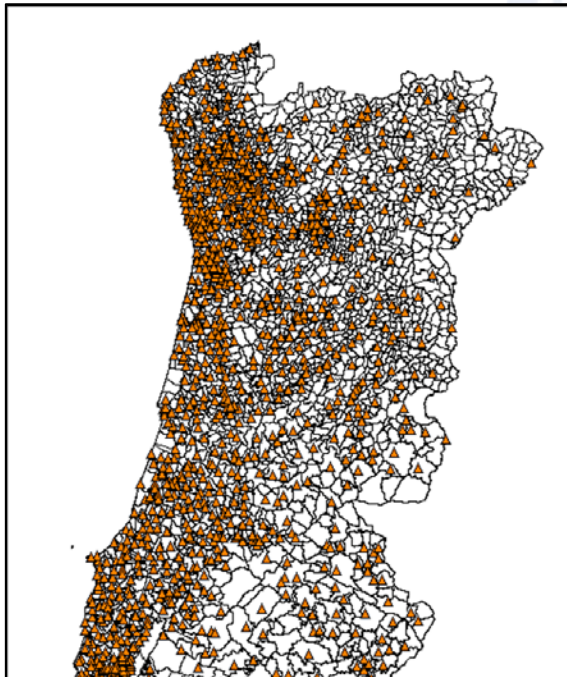


Parish_Code	Parish_name	AREA_T_HA	Populatio	Households
10103	Aguada de Cima	2839.310000	4013	2014
10109	Fermentelos	858.200000	3258	1463
10112	Macinhata do Vouga	3195.440000	3406	1727
10119	Valongo do Vouga	4320.110000	4877	2155
10121	Águeda e Borralha	3602.930000	13576	6900
10122	Barrô e Aguada de Baixo	1019.010000	3209	1462
10123	Belazaima do Chão, Castanheira do Vouga e Agadão	8809.030000	1611	783
10124	Recardães e Espinhel	1991.780000	6036	2751
10125	Travassô e Óis da Ribeira	1112.190000	2305	1034
10126	Trofa, Segadães e Lamas do Vouga	1606.810000	4630	2018
10127	Préstimo e Macieira de Alcoba	4172.640000	808	494
10202	Alquerubim	1535.860000	2381	1074
10203	Angeja	2125.170000	2073	979
10204	Branca	3028.860000	5621	2558
10206	Ribeira de Fráguas	2674.540000	1713	753
10209	Albergaria-a-Velha e Valmaior	4699.640000	10568	5487
10210	S. João de Loure e Frossos	1818.420000	2896	1443
10304	Avelãs de Caminho	644.870000	1252	621
10305	Avelãs de Cima	4057.800000	2185	977
10307	Moita	3417.610000	2484	1215
10309	Sangalhos	1690.420000	4068	1959
10310	S. Lourenço do Bairro	1538.310000	2414	1252
10312	Vila Nova de Monsarros	2372.040000	1713	857
10313	Vilarinho do Bairro	2556.330000	2764	1582

Households covered by a fixed wired network (vii)

Method of collection 2:

III. Overlay the two sets of data for each operator and technology using GIS tool



Parish_Code	Parish_name	AREA_T_HA	Population	Households	Cabled_HH
10103	Aguada de Cima	2839.310000	4013	2014	2120
10109	Fermentelos	858.200000	3258	1463	1741
10112	Macinhata do Vouga	3195.440000	3406	1727	1836
10119	Valongo do Vouga	4320.110000	4877	2155	2306
10121	Águeda e Borralha	3602.930000	13576	6900	8062
10122	Barrô e Aguada de Baixo	1019.010000	3209	1462	1908
10123	Belazaima do Chão, Castanheira do Vouga e Agadão	8809.030000	1611	783	2
10124	Recardães e Espinhel	1991.780000	6036	2751	3014
10125	Travassô e Óis da Ribeira	1112.190000	2305	1034	49
10126	Trofa, Segadães e Lamas do Vouga	1606.810000	4630	2018	2580
10127	Préstimo e Macieira de Alcoba	4172.640000	808	494	191
10202	Alquerubim	1535.860000	2381	1074	0
10203	Angeja	2125.170000	2073	979	1
10204	Branca	3028.860000	5621	2558	24
10206	Ribeira de Fráguas	2674.540000	1713	753	1
10209	Albergaria-a-Velha e Valmaior	4699.640000	10568	5487	4418
10210	S. João de Loure e Frossos	1818.420000	2896	1443	0
10304	Avelãs de Caminho	644.870000	1252	621	745
10305	Avelãs de Cima	4057.800000	2185	977	1230
10307	Moita	3417.610000	2484	1215	881
10309	Sangalhos	1690.420000	4068	1959	2145
10310	S. Lourenço do Bairro	1538.310000	2414	1252	1202
10312	Vila Nova de Monsarros	2372.040000	1713	857	835

IV. Aggregate among operators as in method 1



4. Bundled telecommunication services

Definition of bundle

- A bundle is a commercial offer meeting all of the following conditions:
 1. A commercial offer that includes two or more of the following services: fixed telephone, mobile voice, fixed broadband, mobile broadband, pay TV
 2. marketed as a single offer, with a single invoice and with a single price for the set of services included in the bundle
 3. subscribed under conditions that cannot be obtained by adding single play offers together

ITU indicators on bundles

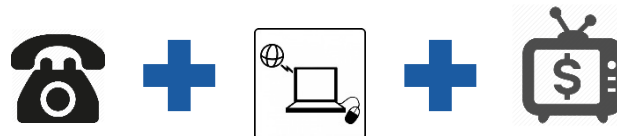
Collected from 2015:



1. Subscriptions to fixed-broadband and fixed-telephone bundles

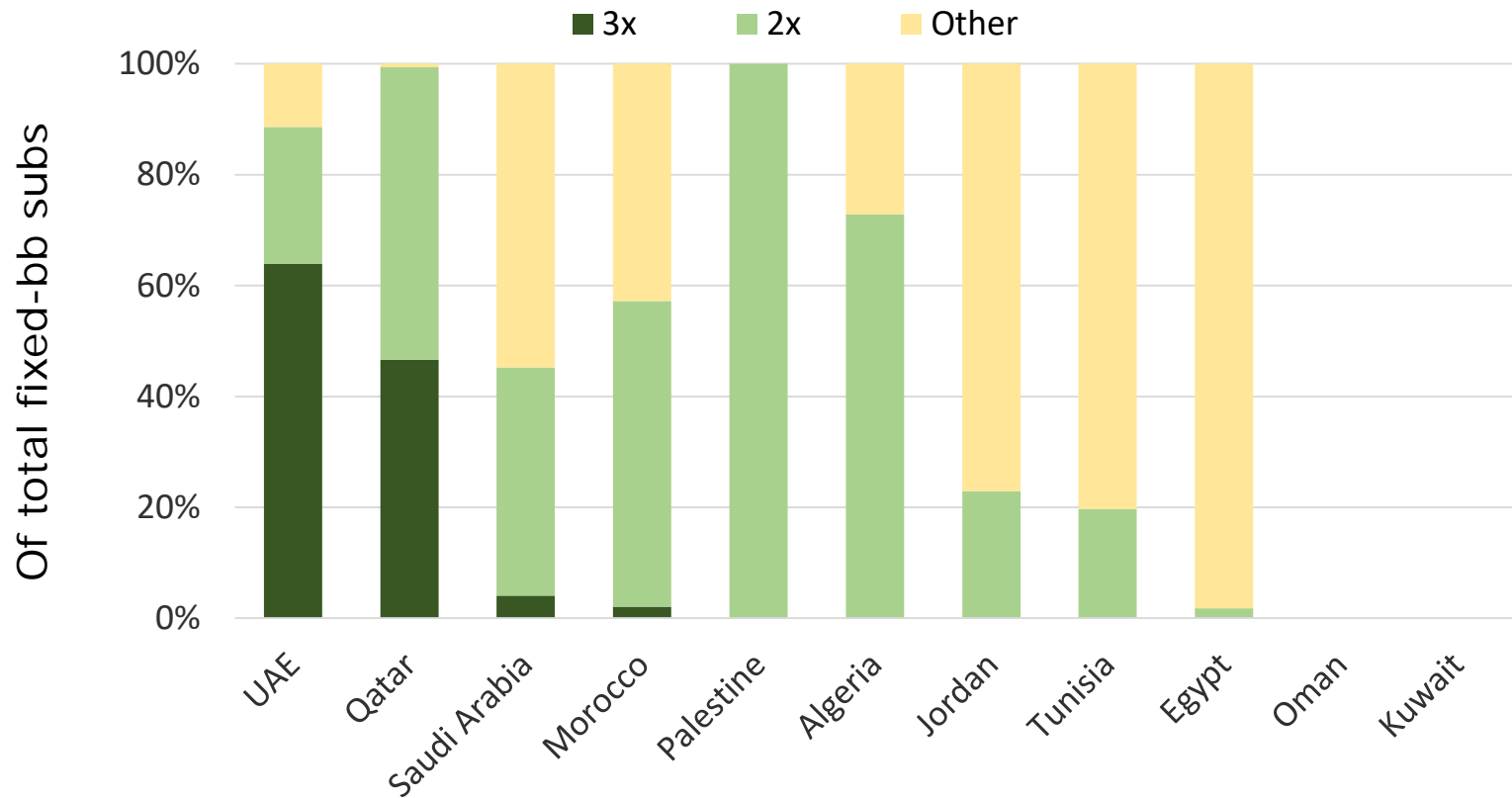
Subscriptions that include additional telecommunication services – such as triple play subscriptions including fixed telephony, fixed broadband and pay TV – should be excluded

2. Subscriptions to fixed-broadband, fixed-telephone and pay-TV bundles



Bundled subscriptions

Bundled fixed-broadband subscriptions, end 2016



5. QoS and traffic indicators

Quality of service (QoS)

- Mobile-cellular services:
 - Mobile-cellular unsuccessful call ratio – 11/22 countries reported data in 2016 (ranges from 0.3% to 2.3%)
 - Mobile-cellular dropped call ratio – 12/22 countries reported data in 2016 (ranges from 0.1% to 1.9%)
- Fixed broadband
 - Service activation time for fixed-broadband service – 10/22 countries reported data in 2016 (ranges from 1 to 43 days)

Traffic

- Fixed telephone: domestic, international minutes
- Mobile cellular: domestic, international minutes and SMS
- Data traffic:
 - **Fixed-broadband Internet traffic (exabytes)**
 - **Mobile-broadband Internet traffic (inside country)**
 - Mobile-broadband Internet traffic (outside, roaming out)

Fixed and mobile data traffic – methodology

- Collected by ITU since 2013

Measured at the end-user access point

Excl. walled-garden (e.g. zero-rated), wholesale traffic, IPTV/CATV

- Source data: ISPs Internet access log records / IPDRs

Fixed and mobile data traffic – methodology (ii)

- Units:

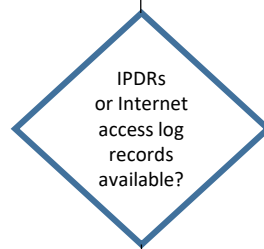


10^{12}	EB	Exabyte
10^9	PB	Petabyte
10^6	TB	Terabyte
10^3	GB	Gigabyte
1	MB	Megabyte

- References:

- Fixed: 0.05 – 140 EB
- Mobile (domestic): 0.04 – 10 EB
- Mobile (roaming): 10^{-6} – 10^{-2} EB

Telecommunication operator

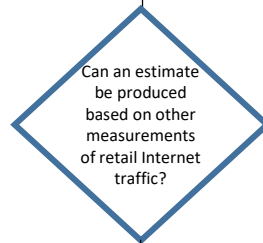


Example 1

YES

NO

Aggregate per year and report data



YES

NO

Report estimate



Report estimate based on traffic exchanged with wholesalers

Report estimate based on load of international Internet channels

Example 2

Example 3

The portion of on-net Internet traffic should be considered in the estimate

The portion of on-net Internet traffic should be considered in the estimate

Fixed and mobile data traffic – examples

- Example 1: Internet log records

ID	TYPE_COMMERCIAL_PRIVATE	TYPE_TECHNOLOGY	TYPE_SPEED	TYPE_IP_ACCESS	LAU3_CODE	DATETIME	DURATION	DATA_VOLUME
50000001	1	1	1	1	636732	1460590789	21021	19544
50000001	1	1	1	1	636732	1460624755	19544	19544
50000001	1	1	1	2	636732	1460667621	52585	52585
50000002	1	1	2	2	736283	1463600670	37146	37146
50000002	1	1	2	2	736283	1463655957	6527	6527
50000002	1	1	2	2	736283	1463670975	78445	78445
50000003	1	1	3	1	226398	1463201560	30617	30617
50000003	1	1	3	1	226398	1463256930	43324	43324
50000003	1	1	3	2	226398	1463302871	60706	60706
50000004	1	1	4	2	109399	1460986631	72621	72621
50000004	1	1	4	1	109399	1461087020	62676	62676
50000004	1	1	4	2	109399	1461150692	1057	1057
50000005	1	2	1	2	860843	1463270886	76957	76957
50000005	1	2	1	1	860843	1463380473	39007	39007
50000005	1	2	1	1	860843	1463436321	29605	29605
50000006	1	2	2	1	448844	1460148452	61626	61626
50000006	1	2	2	1	448844	1460249825	8365	8365
50000006	1	2	2	2	448844	1460271473	4632	4632

Source: ITU Big Data for Measuring the Information Society: Country Report – United Arab Emirates.



Fixed and mobile data traffic – examples

- Example 2: traffic data at IXPs

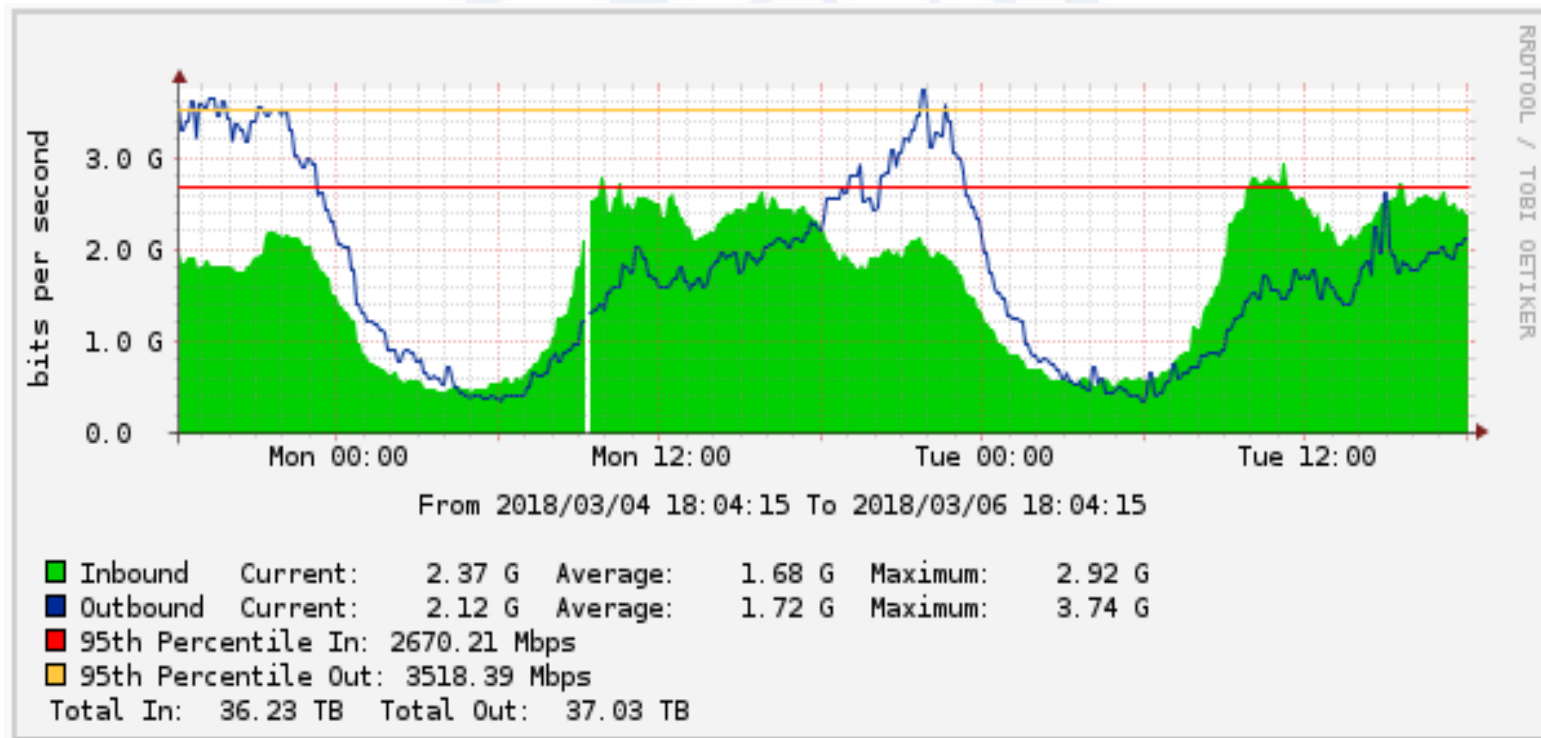
Nodeid	Ip Address	Operator	Downstream/Upstream traffic	Date	Daily traffic volume	Value 8 20	Max day
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.01	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.01	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.02	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.02	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.03	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.03	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.04	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.04	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.05	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.05	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.06	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.06	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.07	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.07	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.08	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.08	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.09	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.09	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.10	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.10	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.11	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.11	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCOctets	17.10.12	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX
XXXX	XX.XX.X.XX	XXX	ifHCInOctets	17.10.12	XXXXXXXXXX.XX	XXXXXXXXXX.XX	XXXX.XX

Source: Autoridade Nacional de Comunicações (ANACOM), Portugal.



Fixed and mobile data traffic – examples

- Example 3: load international channels

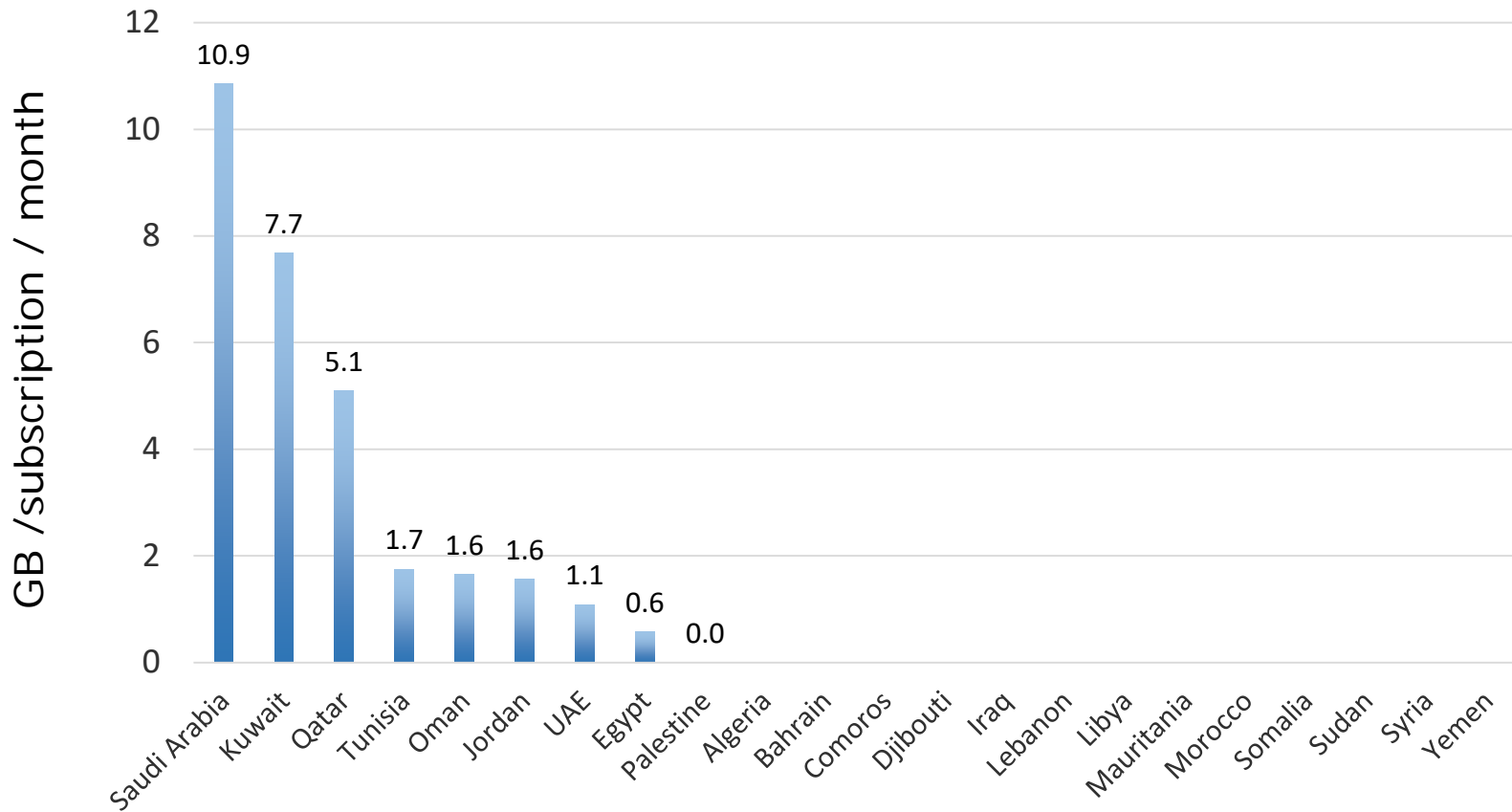


Source: Autoridade Nacional de Comunicações (ANACOM), Portugal.



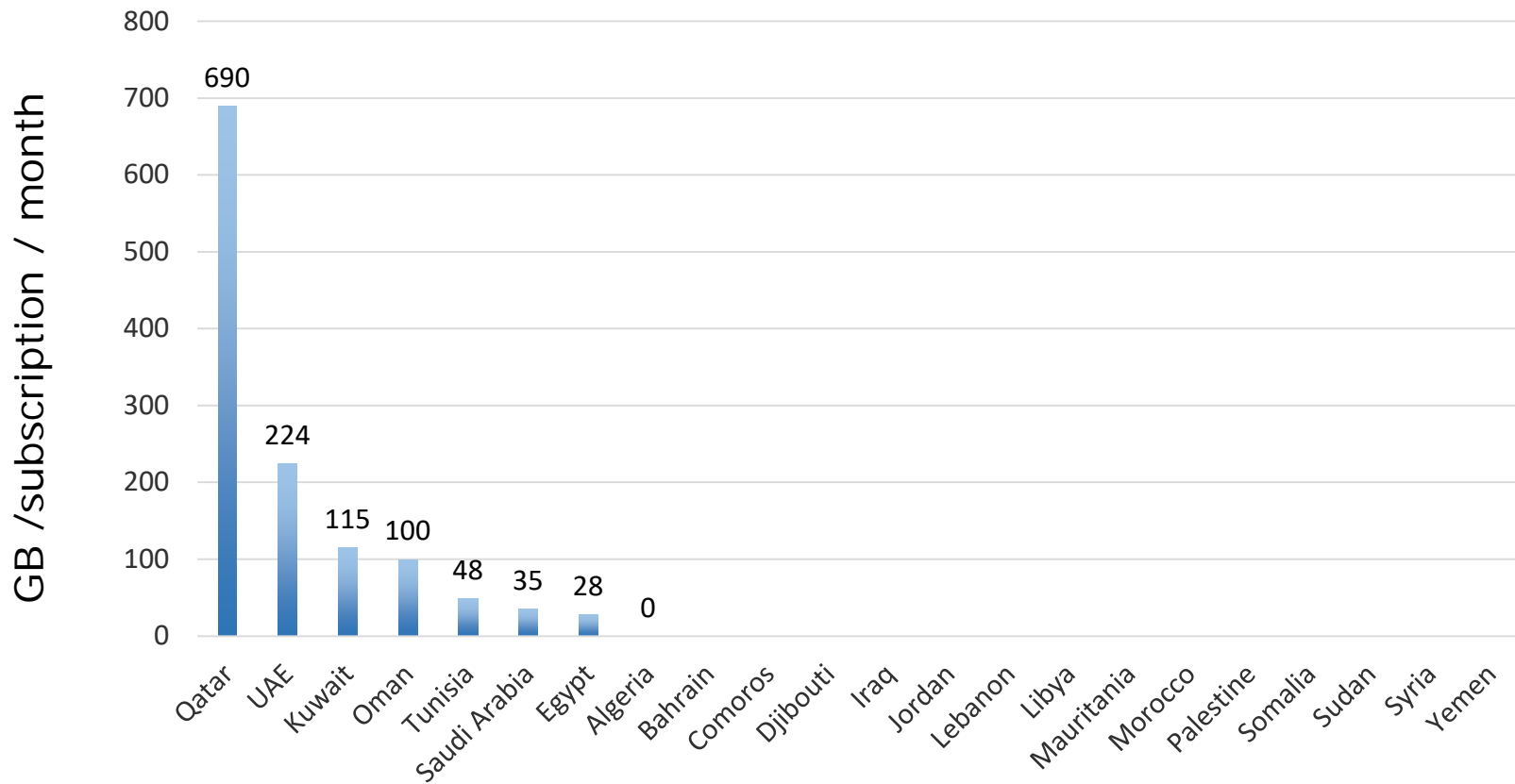
Mobile broadband data traffic

Mobile-broadband traffic per mobile-broadband subscription, end 2016



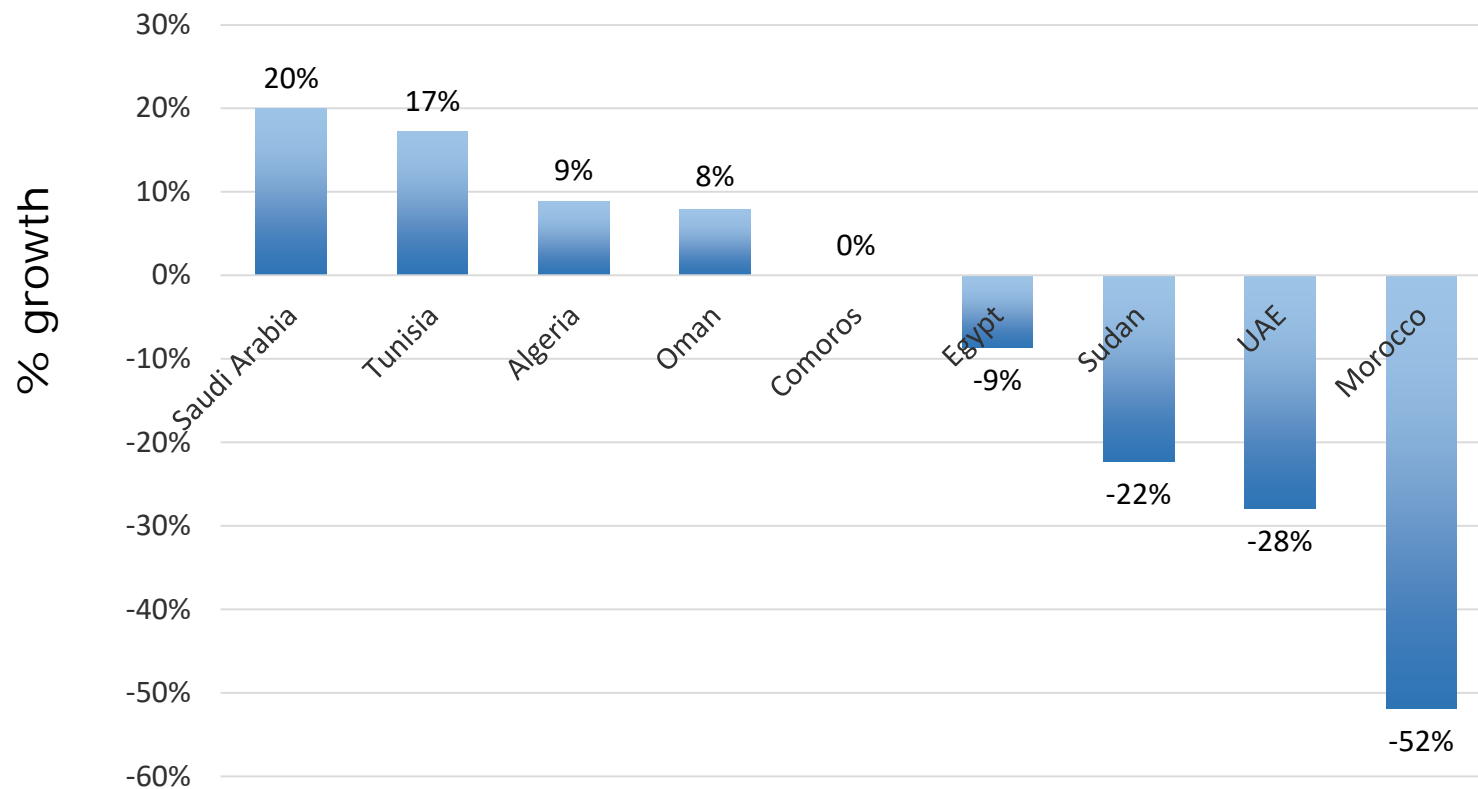
Fixed broadband data traffic

Fixed-broadband traffic per fixed-broadband subscription, end 2016



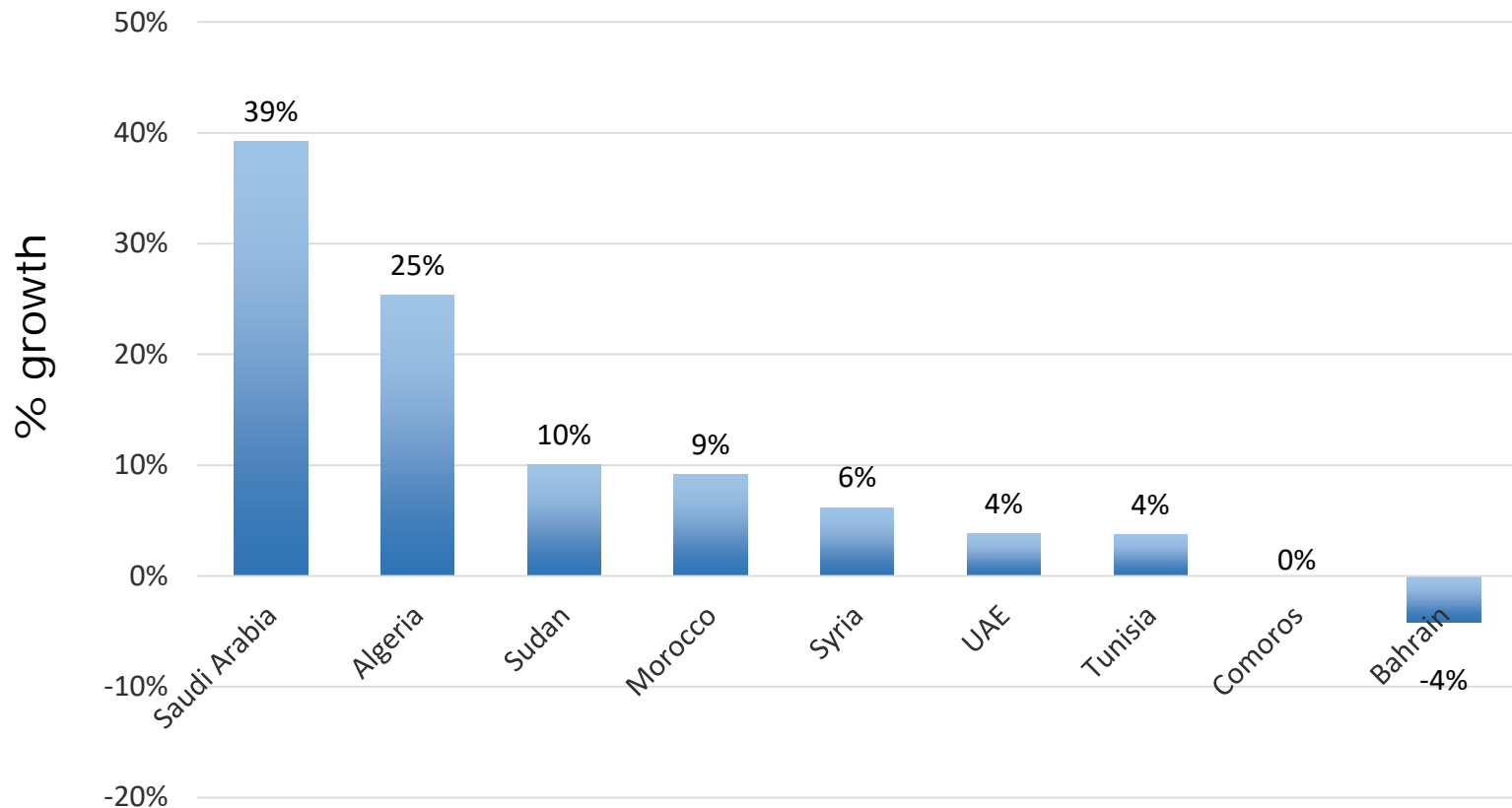
Traffic trends – SMS

Evolution of SMS sent, 2015-2016



Traffic trends – domestic mobile voice

Evolution of domestic mobile voice minutes, 2015-2016



6. Revenue and investment

Methodology

- ITU Handbook
- EGTI reviewed the definitions in 2012
- Chapter 4 in MIS 2012 analysed revenue and investment data
- Input from international organizations



Methodological note

Methodology for the collection of revenue and investment data on telecommunications



Background

This methodological note provides detailed guidelines for the collection of internationally comparable data on revenue from, and investment in telecommunication services.¹ It covers three main indicators: (i) Revenue from all telecommunication services; (ii) Revenue from mobile services; and (iii) Annual investment in telecommunication services. The methodology provided receives and complements the information on these indicators included in the ITU Handbook for the Collection of Administrative Data on Telecommunications/ICT by integrating the guidelines of the discussion paper in 2012 within the ITU Expert Group on Telecommunications/ICT Indicators (EGTI),² as well as additional contributions from international organizations.³ It also benefits from the agreement signed from 1992, 2012 global data collection of these indicators from operators' annual reports⁴ and the lessons learned about the international harmonization of these data.⁵

ITU has been collecting data on revenue from telecommunication services since 1962⁶ and on investment in telecommunication services since 1985.⁷ ITU data are collected through annual questionnaires sent to national administrations, and collect these indicators from operators, and aggregate the data at national level. Revenue and investment data provide an overview of the economic dimension of the telecommunication sector, its structure and the capital expenditure flows that underpin telecommunication development.

Revenue and investment data from telecommunication operators are widely available through operators' annual reports. In addition, data for the telecommunication sector aggregated at a national level are often collected by regulators or collected as part of their regular data collection exercises, and also made public. Even if not published, data are usually available internally through administrative records. Confidentiality issues will in most cases overcome by ensuring data confidentiality at an operator level and publishing only aggregate values for the sector. In those countries where unquoted

¹ Throughout the document, the terms 'telecommunication' and 'telecommunication services' are used interchangeably.

² Available at <http://www.itu.int/pub/D-ICT-IND-2011>

³ EGTI is ITU's expert group on indicators for the collection of administrative data on telecommunication/ICT (i.e. data collected from operators). It is open to all ITU Member and experts in the field of ICT statistics and data collection. It works through an online discussion forum (<http://www.itu.int/ITU-T/WorkshopsandSeminars/EGTI/>) and reports periodically back to the World Telecommunication/ICT Indicators Symposium (WTIS).

⁴ The following international organizations provided comments on this note: the European Commission, IMF, OECD and UNCTAD.

⁵ In the case of revenue from mobile services, ITU has been collecting data since the mid 1990s, whereas previously mobile services had little relevance in terms of revenues.

⁶ In 1962, ITU started collecting data on revenue from telecommunication services.

⁷ In 1985, ITU started collecting data on investment in telecommunication services.



1. Definition of the sector

- International Standard Industrial Classification of All Economic Activities, Rev 4

The sector includes businesses that operate, maintain and provide access to telecommunication networks. Resellers of telecommunication services are also included.

- But ... *activities related to the creation of content are excluded* → Content&media sector



TV broadcasting

- Telecommunications or content and media sector?

Rule:

If a business engages both in the creation of content and its distribution through telecommunication networks, revenue and investment data should be reported only for those activities that relate to the distribution of content, and exclude those that relate to the creation of content

TV broadcasting (cont.)

- Proposed practical approach:

	INCLUDED	EXCLUDED
Free-to-air TV	NO	YES
Pay DTT channels	NO	YES
IPTV	YES	NO
Cable TV	- Internet/PSTN access - Multichannel distribution	PARTIALLY - Content creation
Satellite	- Internet access - Multichannel distribution	PARTIALLY - Content creation

2. Revenues

- Breakdowns: Total / mobile →
- Main issues:

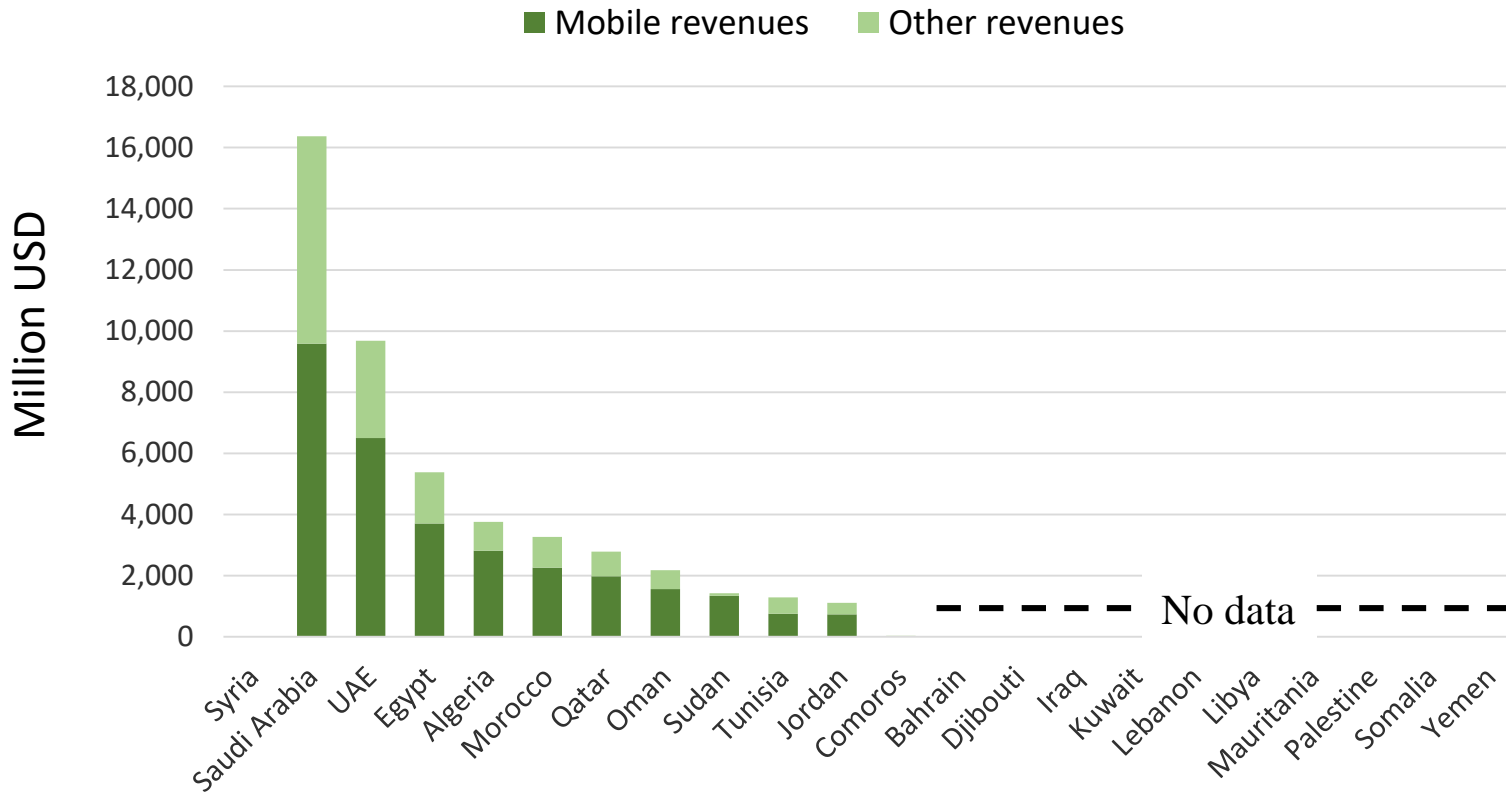
Additional breakdowns not comparable because of ≠ revenue allocation

	INCLUDED
Retail revenues from residential customers	YES
Retail revenues from business customers	YES
Wholesale revenues, e.g. interconnection revenues	NO
Revenues from resellers and mobile virtual operators	YES
VAT and excise taxes	NO
Corporate taxes and administrative fees, e.g. numbering fees	YES (not to be deducted from total revenues)
Revenues from device sales and rents	NO
Revenues from added value services, e.g. premium SMS	YES



2. Revenues

Total telecommunication revenues, end 2016



3. Investment

- Only total investment →
- Definition of investment
≈ gross fixed capital formation (as in SNA)

Difficult to allocate investment to services

investment made by entities providing telecommunication networks and/or services (including fixed, mobile and Internet services, as well as the transmission of TV signals) for acquiring or upgrading fixed assets (usually referred to as CAPEX) less disinvestment owing to disposals of fixed assets

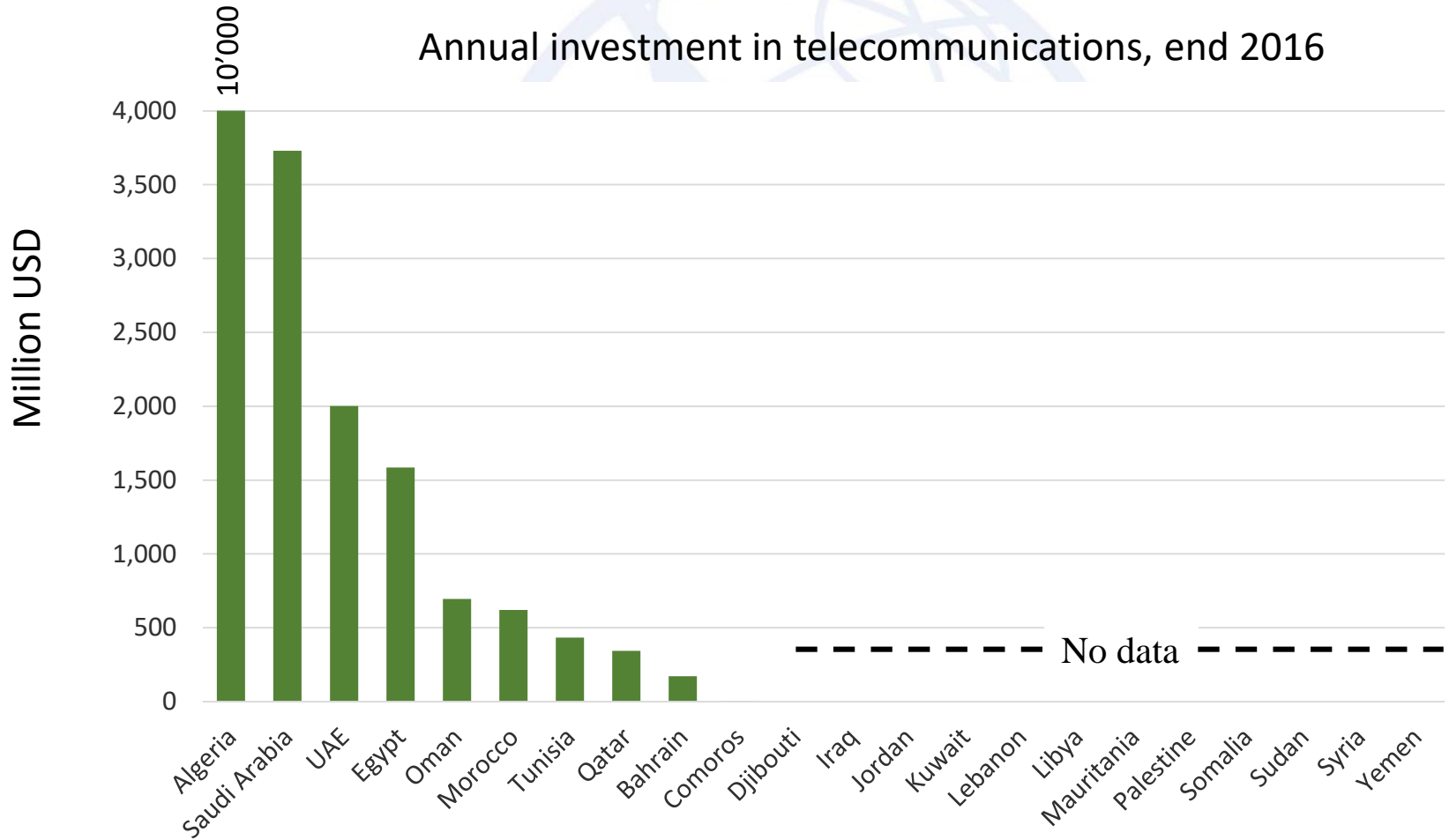
3. Investment (cont.)

- Main issues:

	INCLUDED
Additions less disposals of tangible fixed assets	YES
Additions less disposals of intangible fixed assets	YES
Investment from national-owned operators in the country	YES
Investment from foreign-owned operators in the country	YES
Investment from national-owned operators outside the country	NO
Licence fees	NO
R&D expenditures	YES

3. Investment

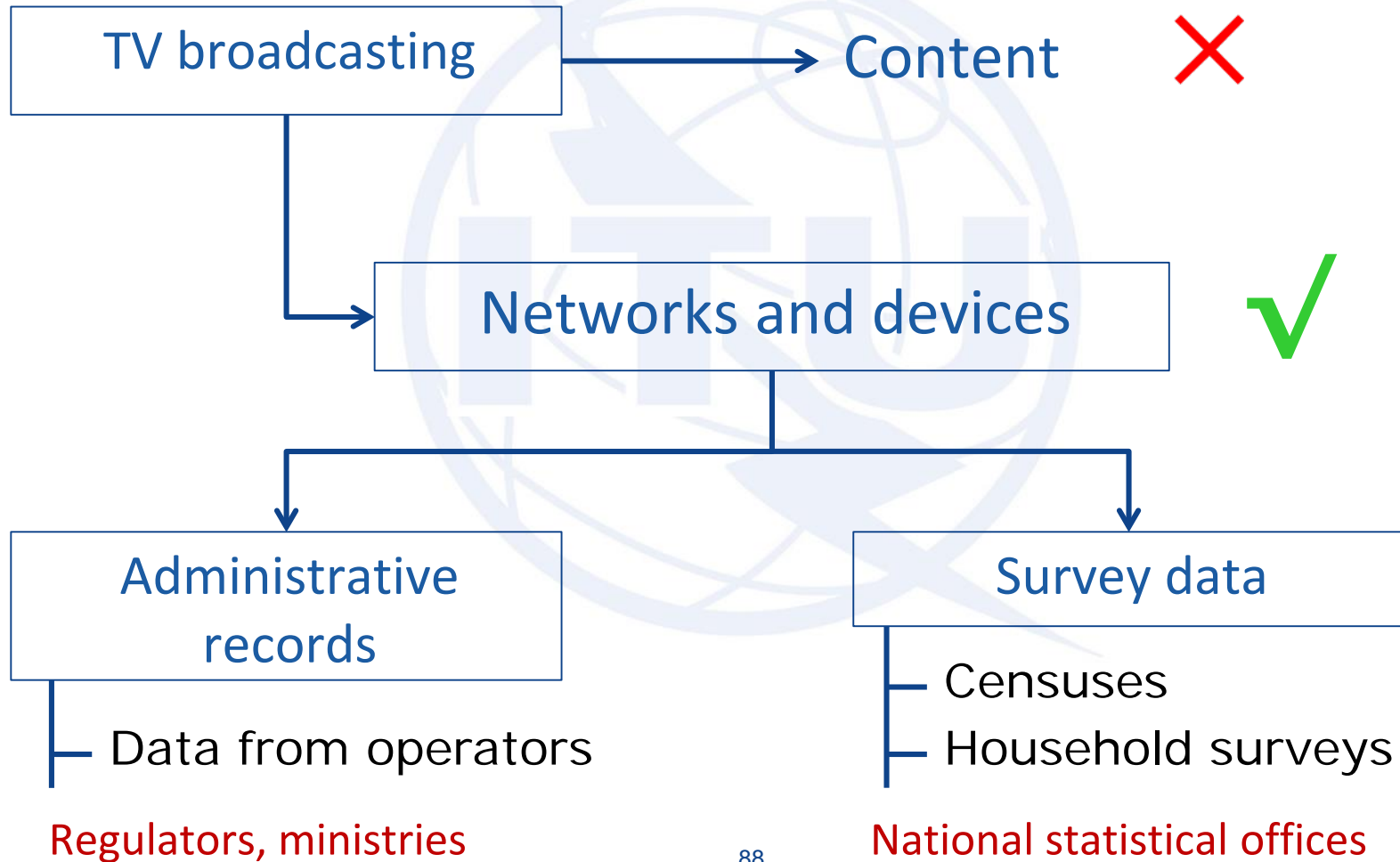
Annual investment in telecommunications, end 2016





7. Broadcasting

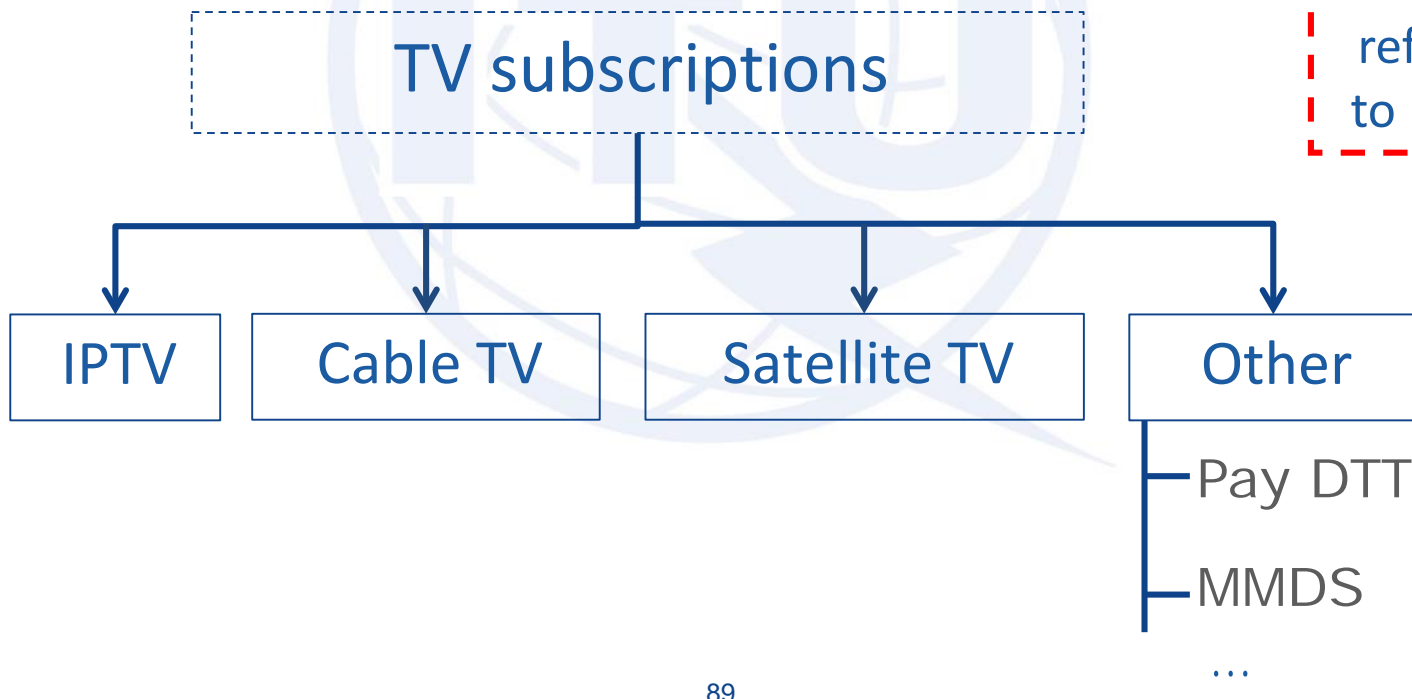
ITU data on TV broadcasting



ITU indicators on TV broadcasting

- EGTI proposed changes to administrative indicators on TV broadcasting:

TV platform



We are referring to pay TV



Future work

Expert Group on Telecommunication/ICT Indicators

Work programme 2018

1. Indicators on spectrum allocation/assignment
→ sub-group will be created within EGTI
2. Indicators on Quality of Service (QoS)
3. 5G related indicators and indicators on IoT availability
4. Indicators on convergence: fixed-mobile bundles
5. For experience sharing: indicators on OTT services (carry-over) and cybersecurity (supply side)

EGTI online forum

International Telecommunication Union

Home **All Subscriptions** | My Subscriptions | UserGroups

Home • Discussion Boards • Last Messages • Search • Members • Calendar • What's new • FAQ

Welcome Back Vallejo!

[Display my profile](#)
[Edit my Profile](#)
[Manage my Files](#)
[LOGOFF](#)

[Admin Options](#)

Events Calendar

February 2014

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	

Monday, February 24, 2014

- There are no events for this date.

Upcoming Events

- There are no Upcoming Events.

Discussion Boards	Topics	Posts	Last Post	Moderator(s)
ICT/telecommunication indicators				
Ongoing discussions	1	27	Today 08:28:36 by: kolalwen →	Maqoantay Nathalie Vallejo
Previous discussions	33	258	02 Dec 2013 04:55:34 by: jmaclewj →	Maqoantay Nathalie Vallejo
ITU Handbook	2	16	14 May 2012 15:30:54 by: Vallejo →	Maqoantay Nathalie Vallejo
EGTI meetings				
4th EGTI meeting - 2013	5	9	20 Dec 2013 16:25:11 by: Vallejo →	Maqoantay Nathalie Vallejo
3rd EGTI meeting - 2012	3	16	25 Jan 2013 17:27:44 by: Vallejo →	Maqoantay Nathalie Vallejo
2nd EGTI meeting - 2011	2	6	16 Dec 2011 16:28:33 by: Vallejo →	Maqoantay Nathalie Vallejo
1st EGTI meeting - 2010	12	21	03 May 2010 14:45:41 by: Maqoantay →	Maqoantay Nathalie Vallejo
Information on the EGTI				
Welcome to the EGTI Forum	1	10	31 Jul 2009 16:02:14 by: NB →	Maqoantay Nathalie Vallejo
ToR of the EGTI	1	3	31 Jul 2009 15:57:05 by: NB →	Maqoantay Nathalie Vallejo
EGTI planning	3	7	Today 12:06:05 by: cmtindicators →	Maqoantay Nathalie Vallejo
EGTI Chair	1	2	25 Jul 2012 10:30:43 by: Maqoantay →	Maqoantay Nathalie Vallejo

<http://www.itu.int/ITU-D/ict/ExpertGroup>



Participation in EGTI

	Registered forum	Active forum	Participation meeting
Algeria			
Bahrain			
Comoros			
Djibouti			
Egypt			
Iraq			
Jordan			
Kuwait			
Lebanon			
Libya			
Mauritania			
Morocco			
Oman			
Palestine			
Qatar			
Saudi Arabia			
Somalia			
Sudan			
Syria			
Tunisia			
UAE			
Yemen			





More information:

<http://www.itu.int/ict>
indicators@itu.int