Mobile Data for Public and Personal Health

Big Data and AI for Achieving UHC
An International Consultation on Ethics

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Mobile data for public and personal health

- A global perspective of producers and users of mobile data, as contributors to the growth of big data
- How countries are leveraging mobile technologies for health – overview from WHO Global Observatory for eHealth
- Who plays a role, and who pays attention in the field
- What questions do we need to address

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Mobile phones – primary generators of mobile data

Photography by John Stanmeyer – photo of the year – Signals from Djibouti

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A global view

- Over 7.7 billion mobile telephone subscriptions across the world by the end of 2017 (http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx)
- Over half of the mobile connections are through smart phones in all regions except Sub-Saharan Africa (https://www.gsma.com/gsmaeurope/gsma-europe-blog/gsma-intelligence-smartphones-now-account-half-worlds-mobile-connections/)
- Mobile-broadband subscriptions is expected to reach 4.3 billion globally by the end of 2017
- In some developing countries, a mobile phone is being shared
- Over 70% of the Internet users are between 15-24 years old

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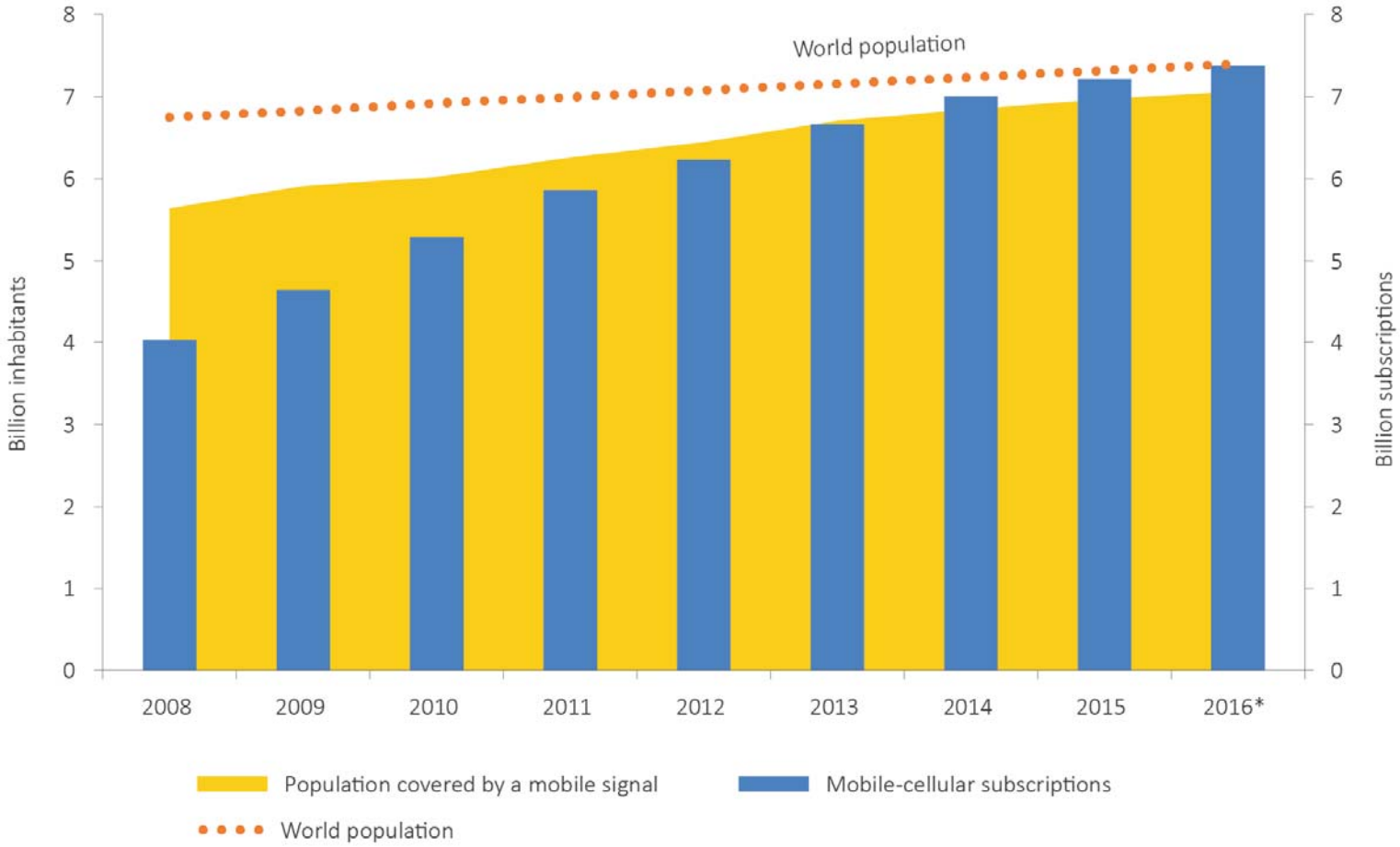
Global mobile-cellular subscriptions (2008-2016)

(source ITU . Measuring the information Society Report 2016)



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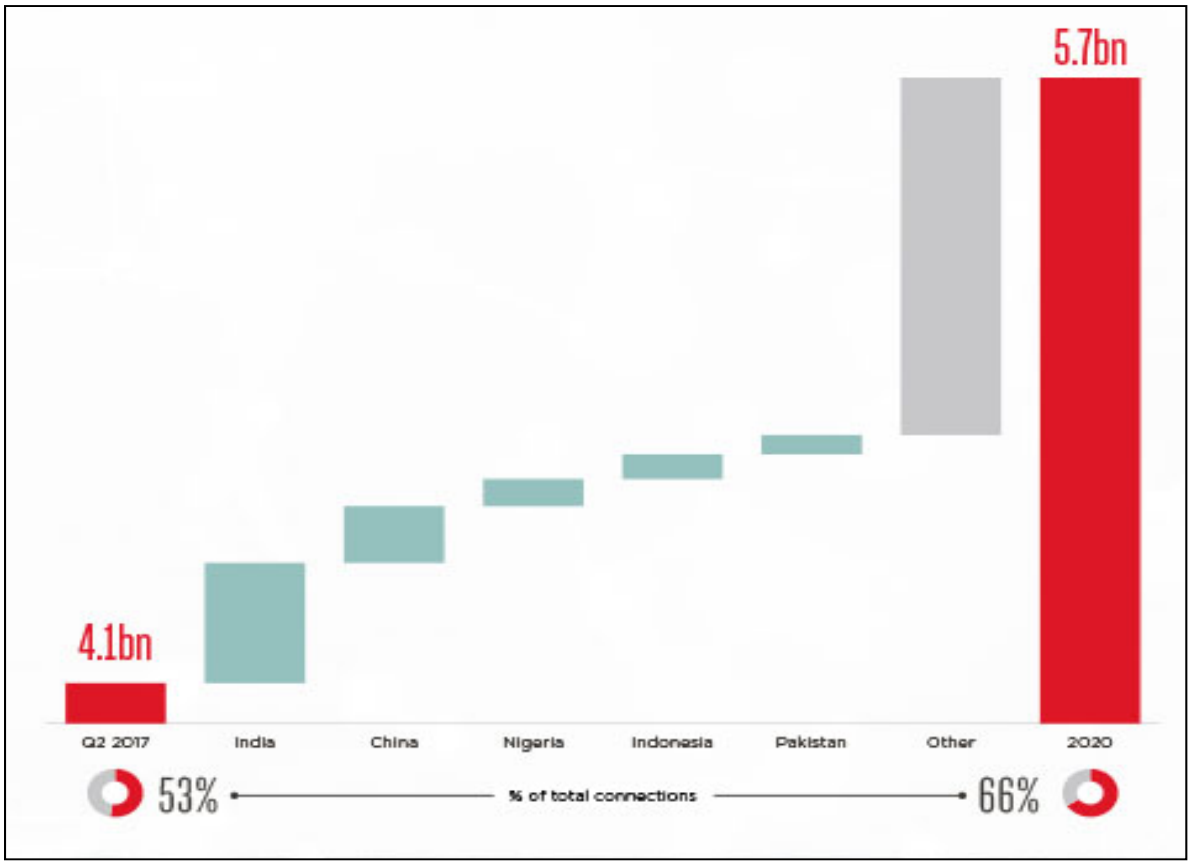
Smart phones are driving a new generation of data



Source: GSMA: global mobile trends 2017

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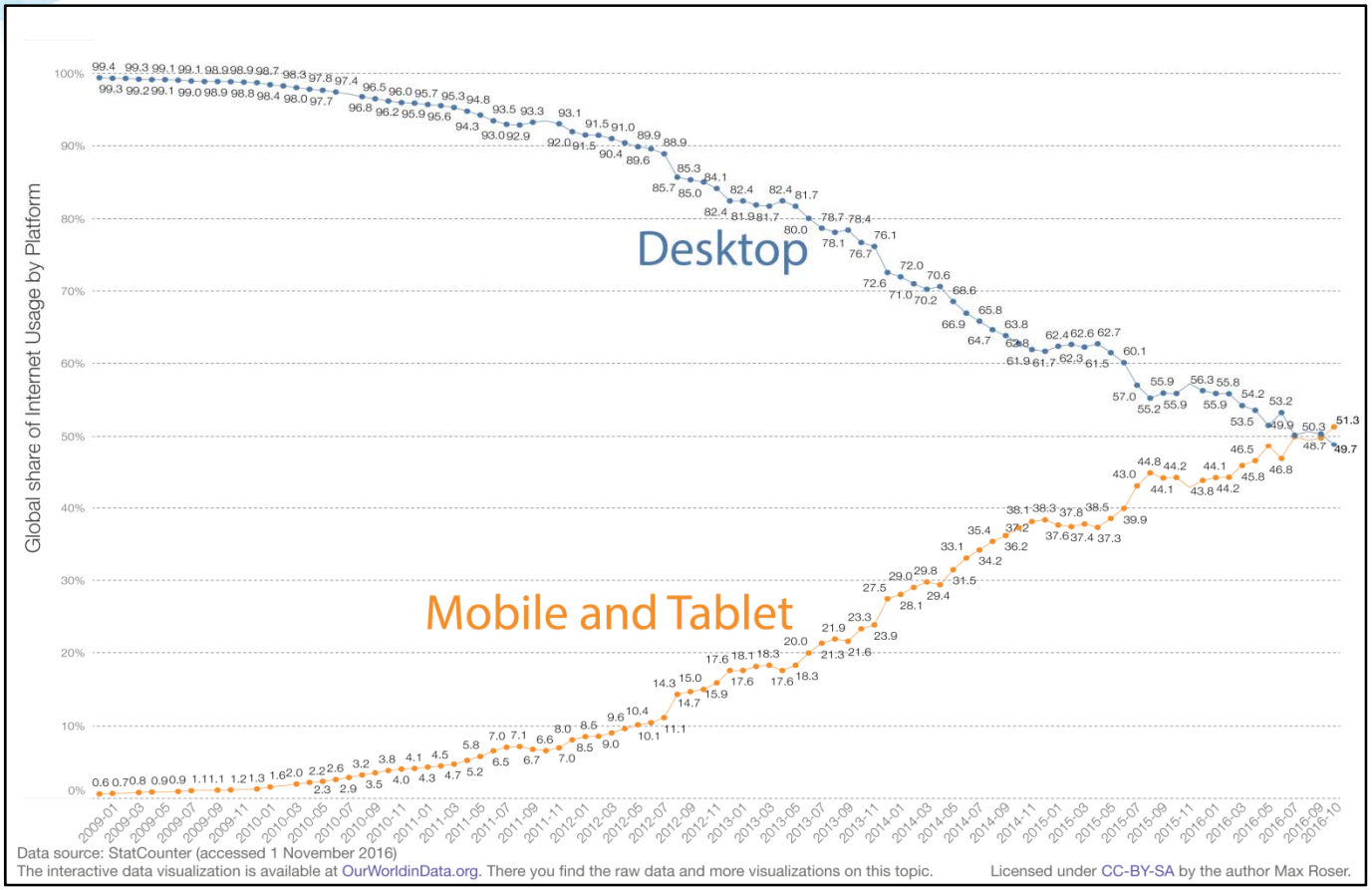
Global Internet use by platform, 2009-2016

(source ITU . Measuring the information Society Report 2016)



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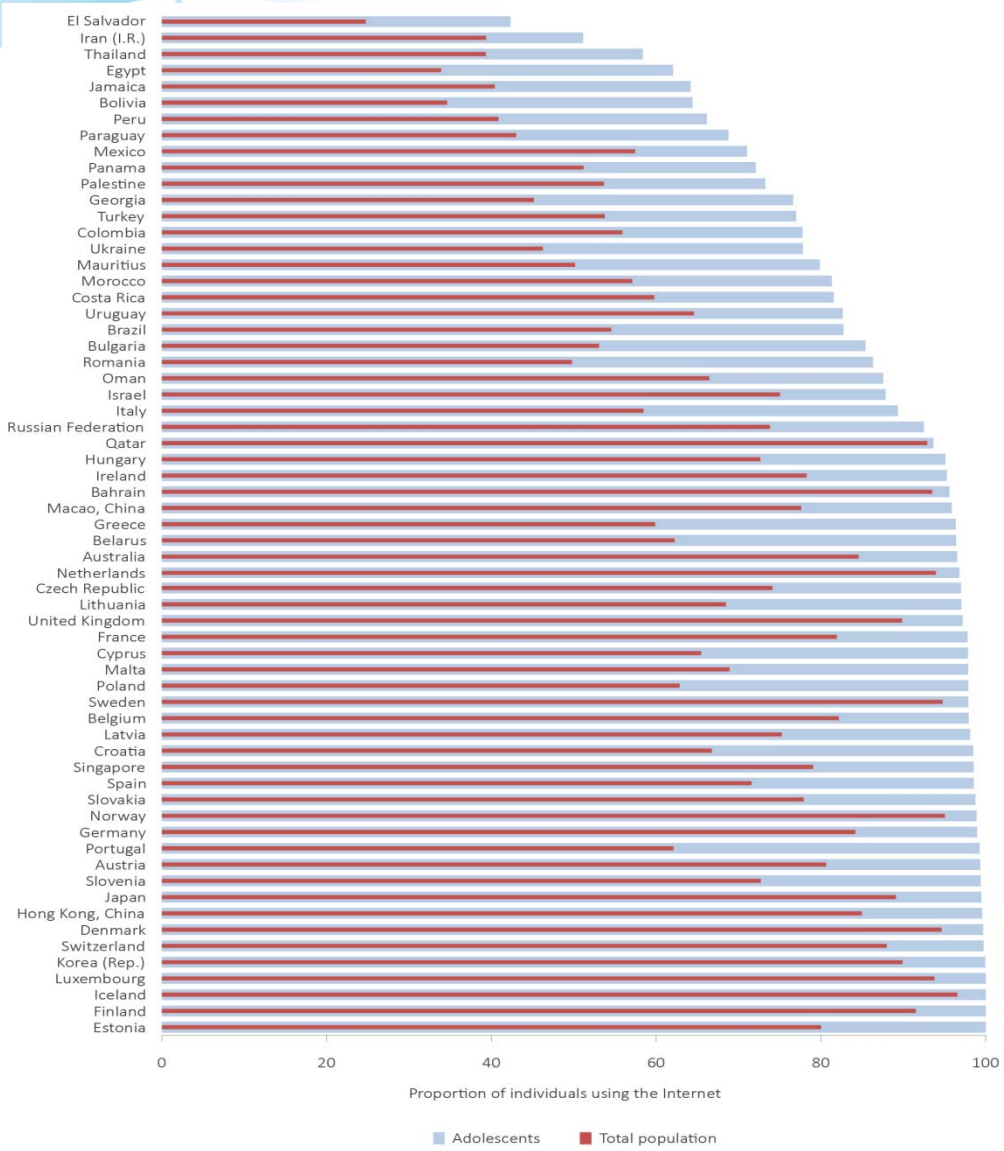
Adolescents'(15-24) use of the Internet

source ITU Measuring the information Society Report 2016



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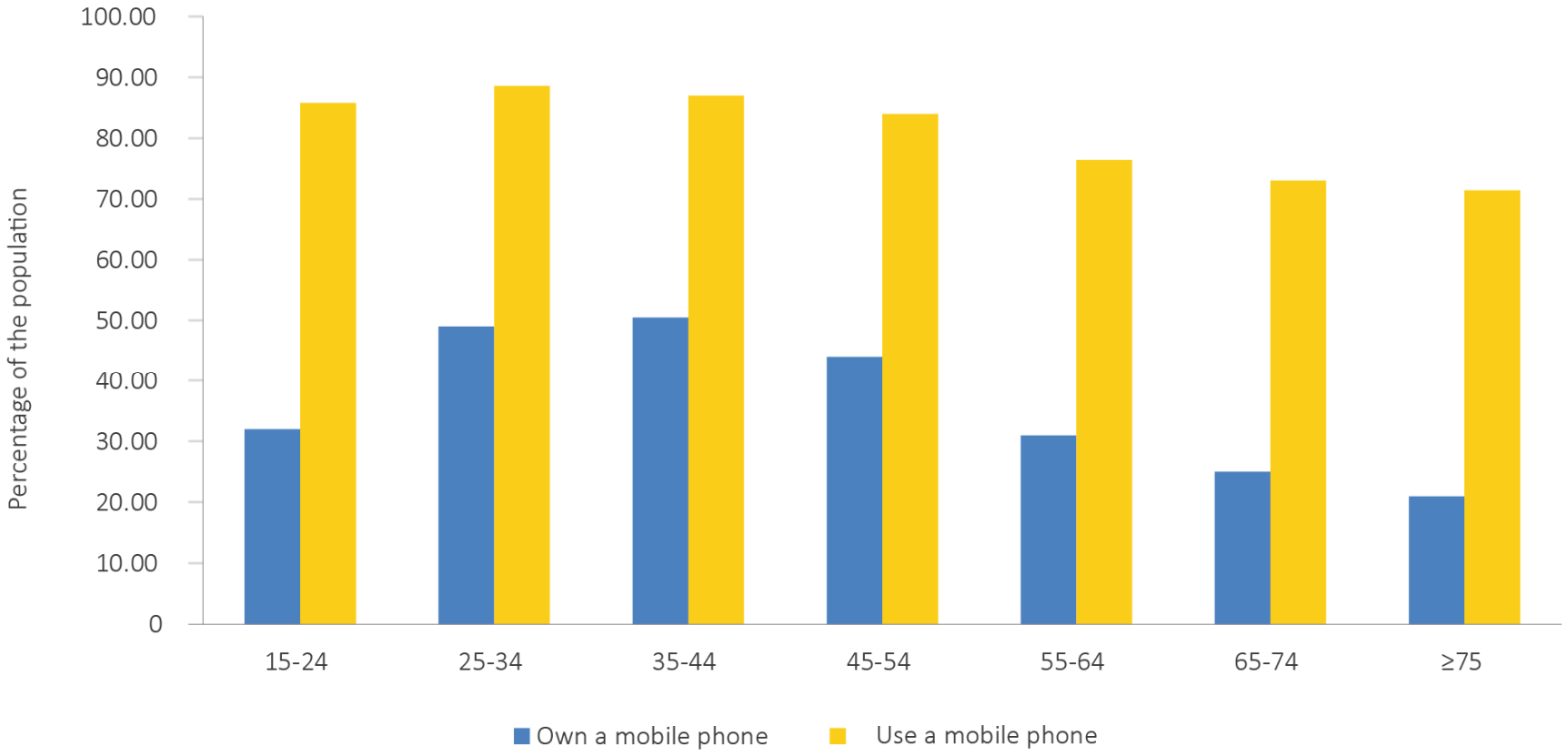
Mobile phone ownership/use by age group, India, 2015

(source ITU . Measuring the information Society Report 2016)



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mHealth

- Use of mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants and wireless devices for medical and public health practice

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mHealth

Use of mobile and wireless technologies for health

- mHealth popularity is growing due to its potential outreach and accessibility
- Over 87% of the countries participated in our latest GOe survey have reported using at least one mHealth service at the national level (government-sponsored)
- mHealth programs are primarily guided by eHealth and telehealth policies (60%)
- Most common uses reported: emergency, appointment reminders, providing information, community mobilisation and health promotion campaign
- Other areas on the rise: home or remote care through sensors and remote monitoring devices, management of chronic diseases and mental health interventions
- Gaps include policies on data ownership, regulation of devices, oversight of mobile health apps and evaluation

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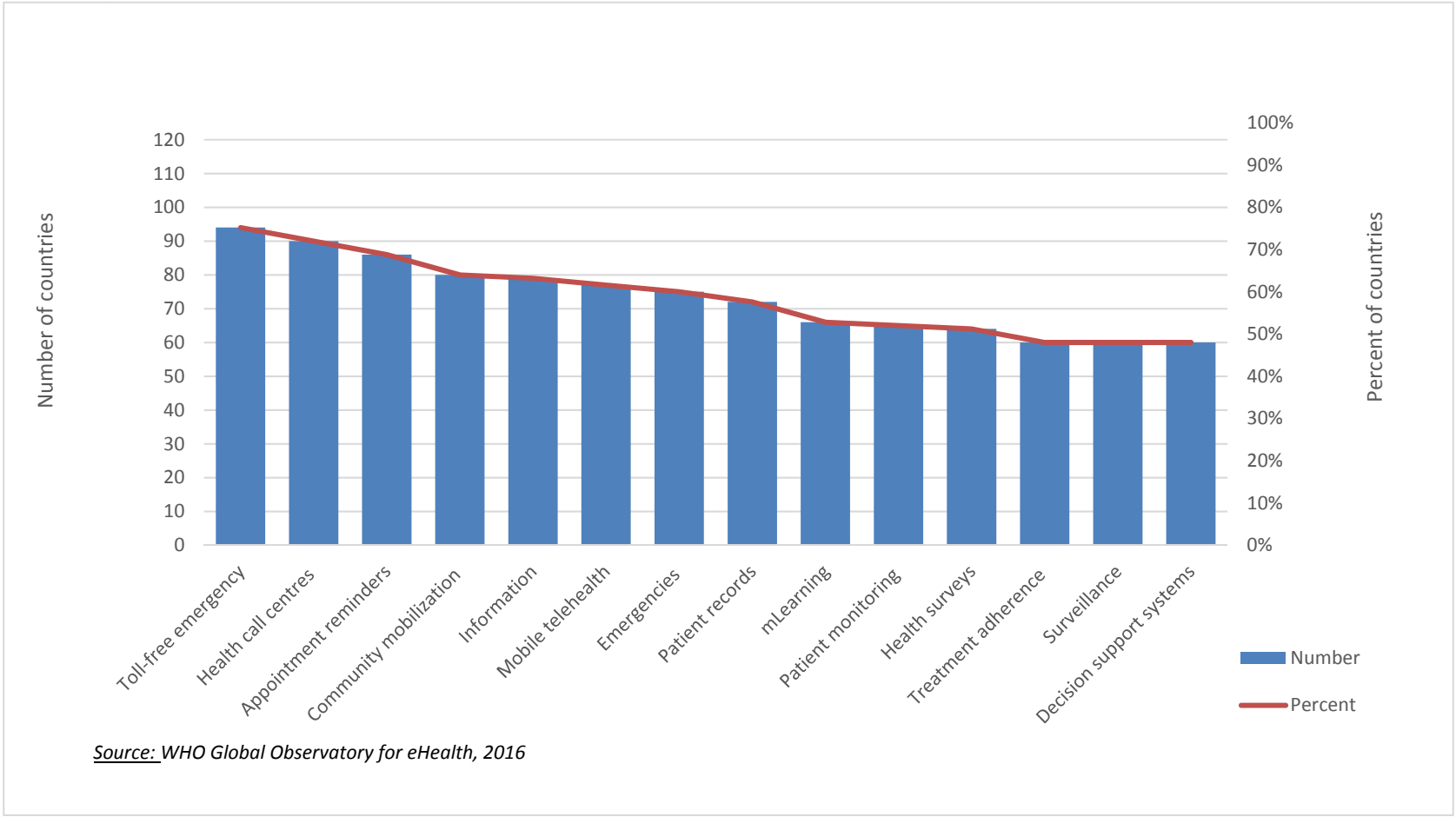
Adoption of mHealth programmes



Source: WHO Global Observatory for eHealth, 2016

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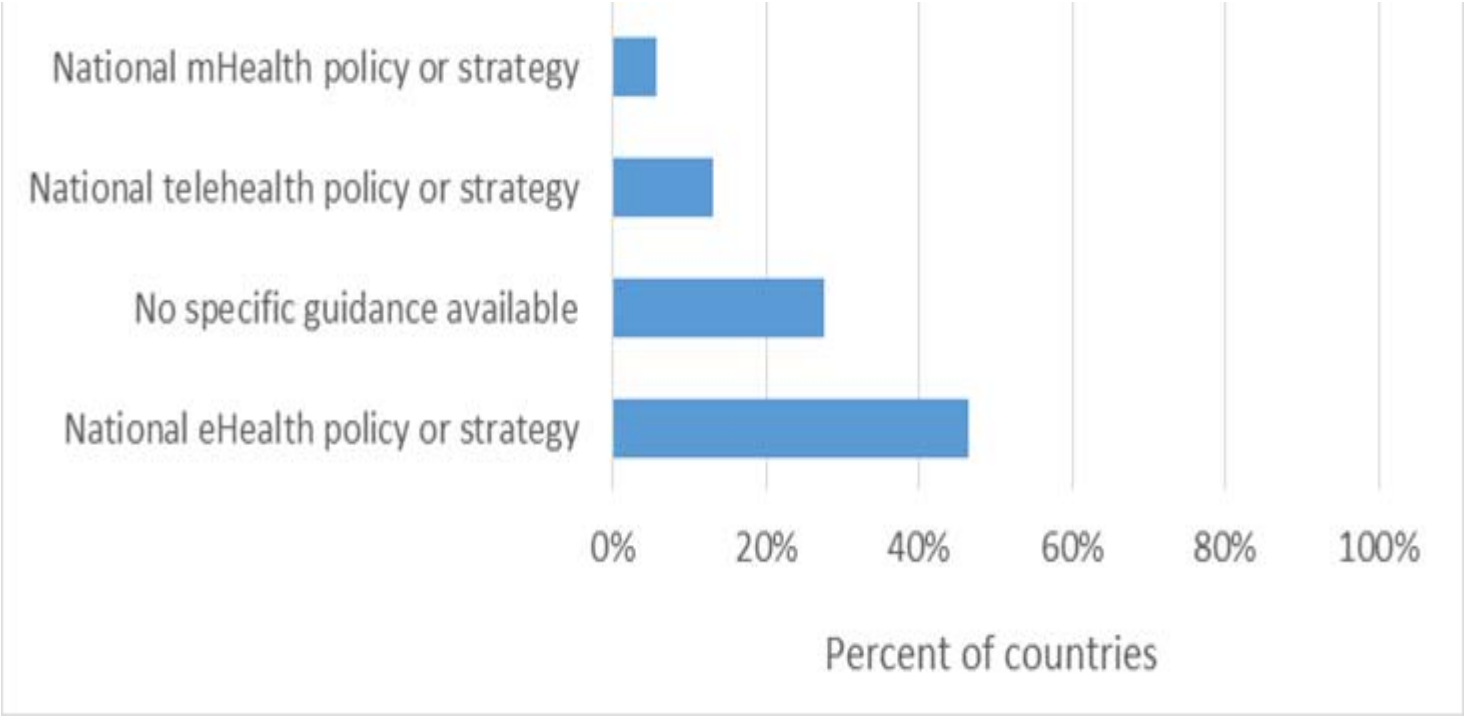
Types of policies guiding government-sponsored mHealth programmes, globally, 2015



Source: WHO Global Observatory for eHealth, 2016

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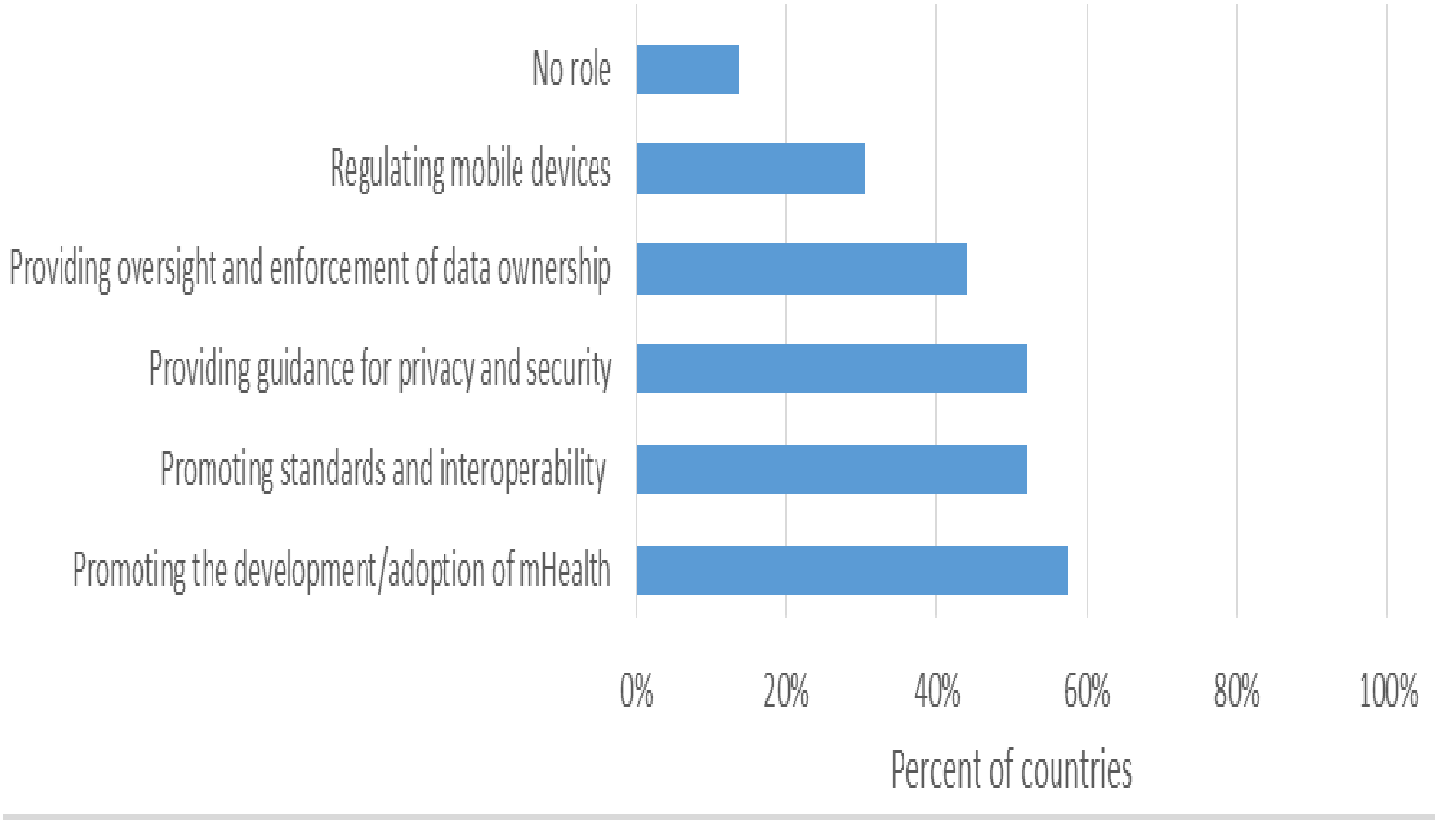
Role of national health authorities in mHealth, globally, 2015



Source: WHO Global Observatory for eHealth, 2016

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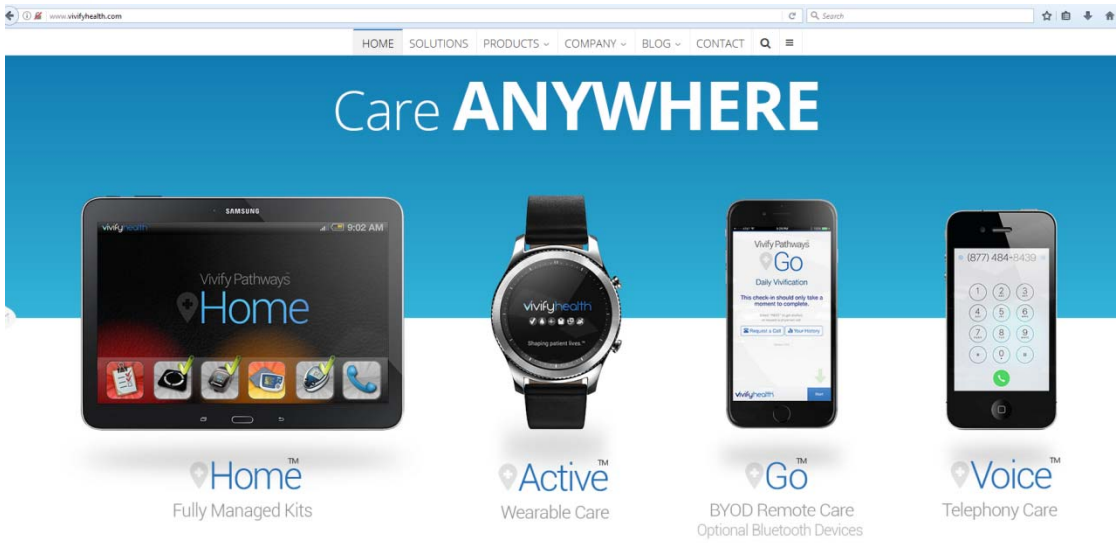
Benefits of mobile for personal health and wellbeing

Blood Pressure/Oxygen Health Rate Monitor Fitness Tracker (Pro M5)



Home fully managed kits: www.vivifyhealth.com

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Benefits of mobile data for public health emergencies and outbreaks

- Analysing mobile data use by population in emergencies – Examples: Cholera epidemics after Haiti earthquake, ebola outbreak in west Africa
- Predicting the possibility of epidemics and outbreaks: malaria outbreak in Kenya

How is it done:

- By tracking individual use of mobile phones, and tracing their movement
- And overlapping with other relevant data such as weather pattern, public transport, etc.

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Benefits of mobile for personal health and wellbeing

- Self-health monitoring, disease prevention
- Chronic disease monitoring
- Remote/home care (connect patient with provider)
- Tracking individual's characteristics and/or behavioural pattern (mood, sleep, etc.)
- Delivering targeted information for behavioural changes or self help therapies
- Social connection and support

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Who are the stakeholders?

- Individuals using the services – producers of data
- Population collectively when individual data is aggregated
- Service providers such as telecom; cloud services; medical, insurance or healthcare providers; data service providers
- Researchers/institutions
- App developers
- Hardware/device and software developers
- Private companies, eg marketing
- Government, social services or agencies providing service based on provided data
- Others ?

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What happens to the mobile data?

- From our use of devices through telecom providers: We are being tracked by our subscriber identity module (SIM) cards

  They capture our:

  - Usage ---> track our consumption (voice and data)
  - Location --- > track our mobility (via their com towers)
  - Social activities --- > track the social networks we access
  - Personal interest --- > track websites we visit

- From other sources such as off-the-shelf wellness apps and wearable sensors – deployed or accessed via cloud-services, data being stored in various databases, and on occasions sent back to the device manufacturer or app developer

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What or who is at risk?

At some point many of the stakeholders have access to all or part of the data for their specific use. Who is in charge and at what level regarding:

- Data ownership and control (short-term, long-term, deletion)
- Data privacy
- Data security
- Data protection from loss, or selling to the 3rd party
- Data sharing (authorised)
- Data reliability and liability for use

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What should be addressed in support of e/mHealth policies at national and international levels

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Some questions to consider…

- What laws and ethical codes of conduct are in place?
- How can we address ownership and disclosure of personal data?
- How should telecom companies and Apps disclose what and how they collect data and what is being shared?
- What about vulnerable populations (migrants and refugees)? Should different age groups be treated differently?
- Which ethical issues do we need to raise? For which target audience?
- How should we communicate and/or re-inforce these ethical issues?

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