The Future of Digital Health in Africa

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Presentation Agenda

1. **Background: Health / Digital Health**

2. **Current state of digital health trends in Africa**

3. **Case Studies – Kenya**

4. **Innovative approaches to accelerate growth**
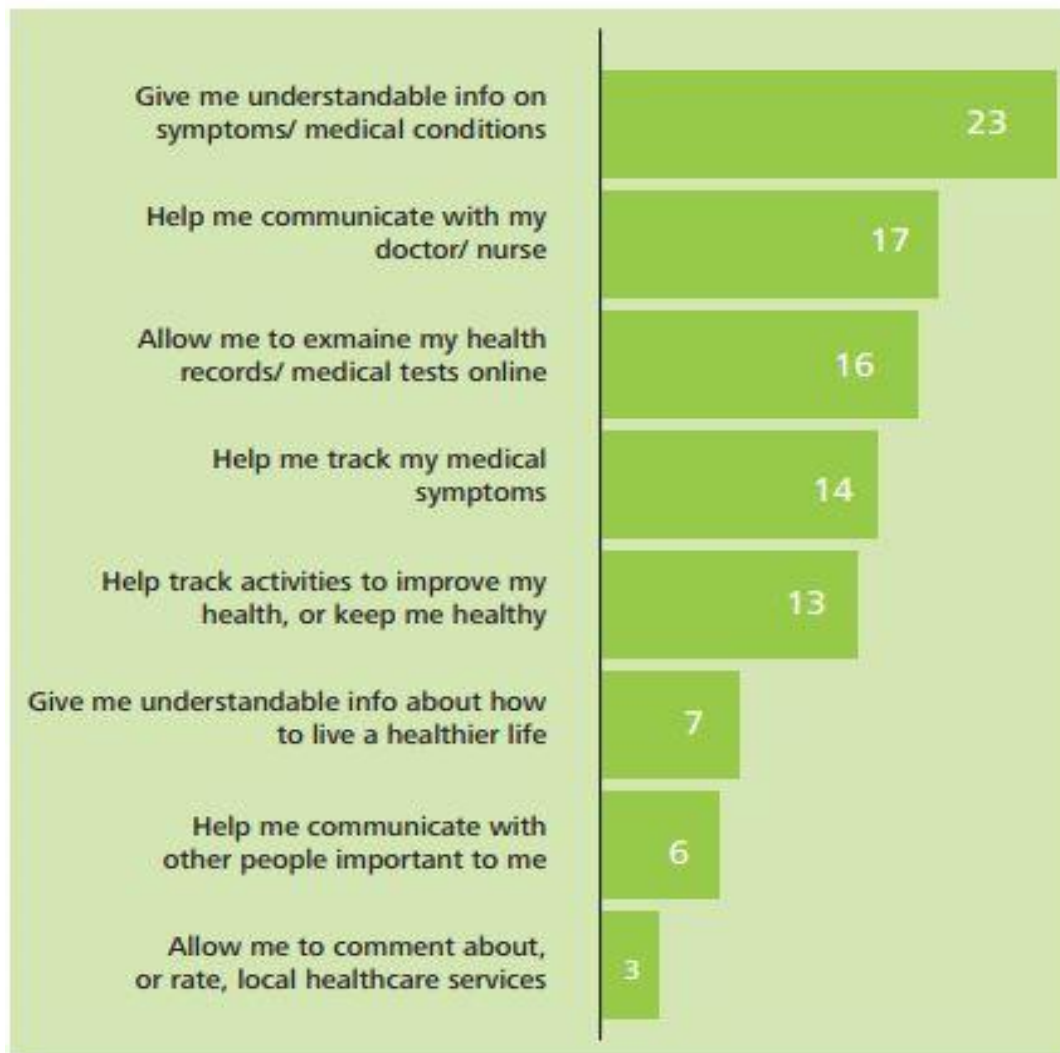
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QUIZ

1. How many of us have health related app installed on our mobile phone, e.g. a step tracker, weight or sleep monitor

2. How often do you use those apps? On every daily basis ? Couple time each week?

3. Has your health provider ever used a mobile phone for your health screening e.g. vision, hearing, cervix, malaria etc.

Question Poll for Audience

- What is the single most important service you think health app should provide?

a.   Give me understandable info on symptoms / medical conditions

b.   Help me communicate with my doctor / nurse

c.   Allow me examine my health records / medical test online

d.   Help me track my medical symptoms

e.   Help track activities to improve my health and keep me healthy

f.   Give me understandable info about how to live a healthier life

g.   Help me communicate with other people important to me

h.   Allow me to comment about or rate local health services

Answer poll (%) from 1130 people with long term conditions

What is the single most important service you think health apps should provide? (per cent)
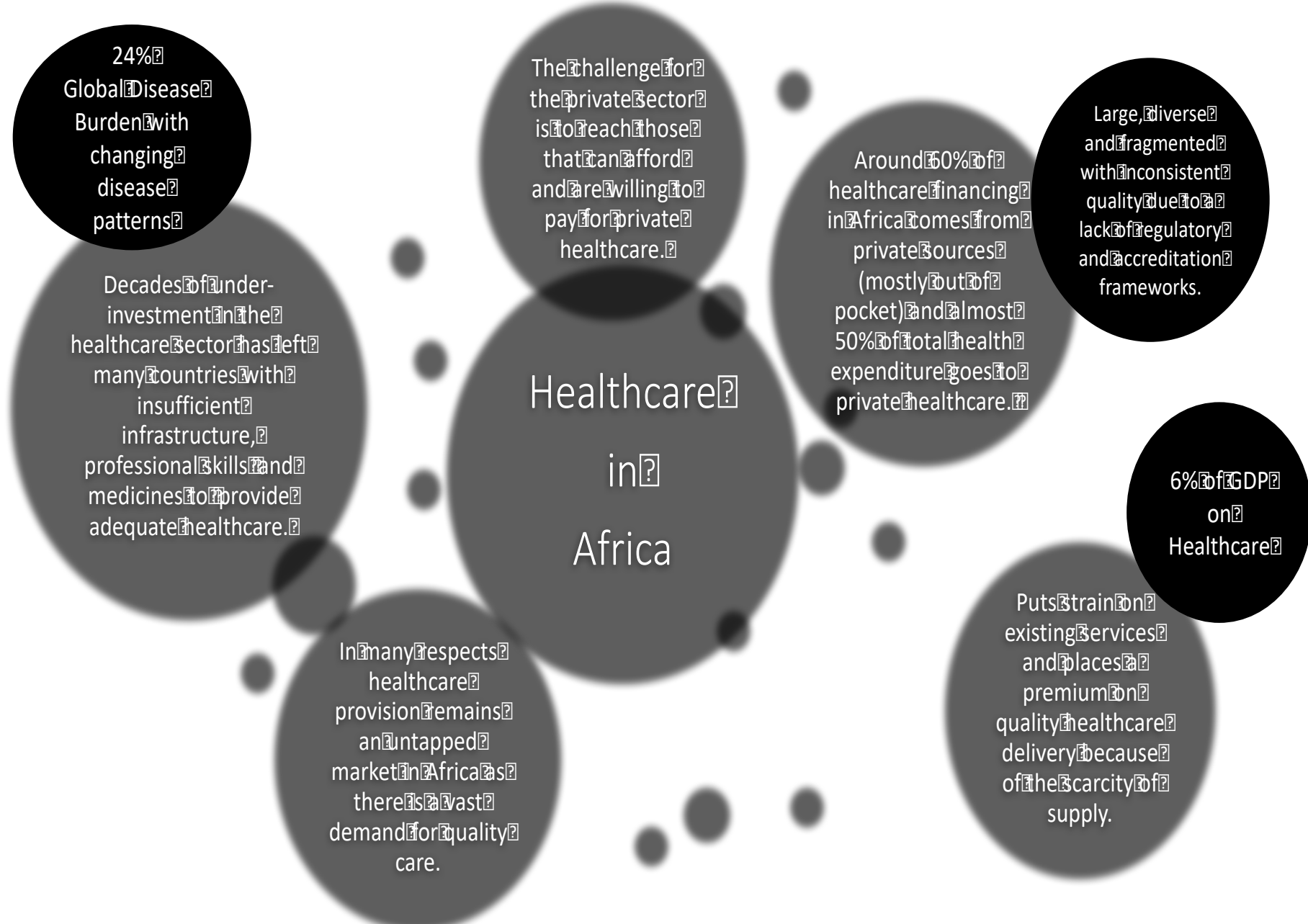
Service	Per cent
Give me understandable info on symptoms/ medical conditions	23
Help me communicate with my doctor/ nurse	17
Allow me to exmaine my health records/ medical tests online	16
Help me track my medical symptoms	14
Help track activities to improve my health, or keep me healthy	13
Give me understandable info about how to live a healthier life	7
Help me communicate with other people important to me	6
Allow me to comment about, or rate, local healthcare services	3

AIM

- ## Problem Statement

  ➢ Is there a clear health need which Digital Health can address?

 ➢ Is there a defined population who could benefit from Digital Health?

- ## Learning Objectives

  ➢ Understanding how Digital Health can support better healthcare for Africans

  ➢ Provide suggestions on what can be done to accelerate Digital health innovations in Africa.

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24%
Global Disease Burden with changing disease patterns

The challenge for the private sector is to reach those that can afford and are willing to pay for private healthcare.

Large, diverse and fragmented with inconsistent quality due to a lack of regulatory and accreditation frameworks.

Around 60% of healthcare financing in Africa comes from private sources (mostly out of pocket) and almost 50% of total health expenditure goes to private healthcare.

Decades of under-investment in the healthcare sector has left many countries with insufficient infrastructure, professional skills and medicines to provide adequate healthcare.

Healthcare

in

Africa

6% of GDP on Healthcare

In many respects healthcare provision remains an untapped market in Africa as there is a vast demand for quality care.

Puts strain on existing services and places a premium on quality healthcare delivery because of the scarcity of supply.

Sources: Clausen L.B. (2015) Taking on the challenges of healthcare in Africa. KPMG (2012) State of healthcare in Africa . Siemens (2015) Healthcare in Emerging Markets: Challenges and Opportunities; IFC (2008) The Business of Health in Africa

Working Analytic Framework for Health – understanding especially financial flows is key to success

Source: Ngoye, Alade andS Osifo-Dawodu (work in progress)
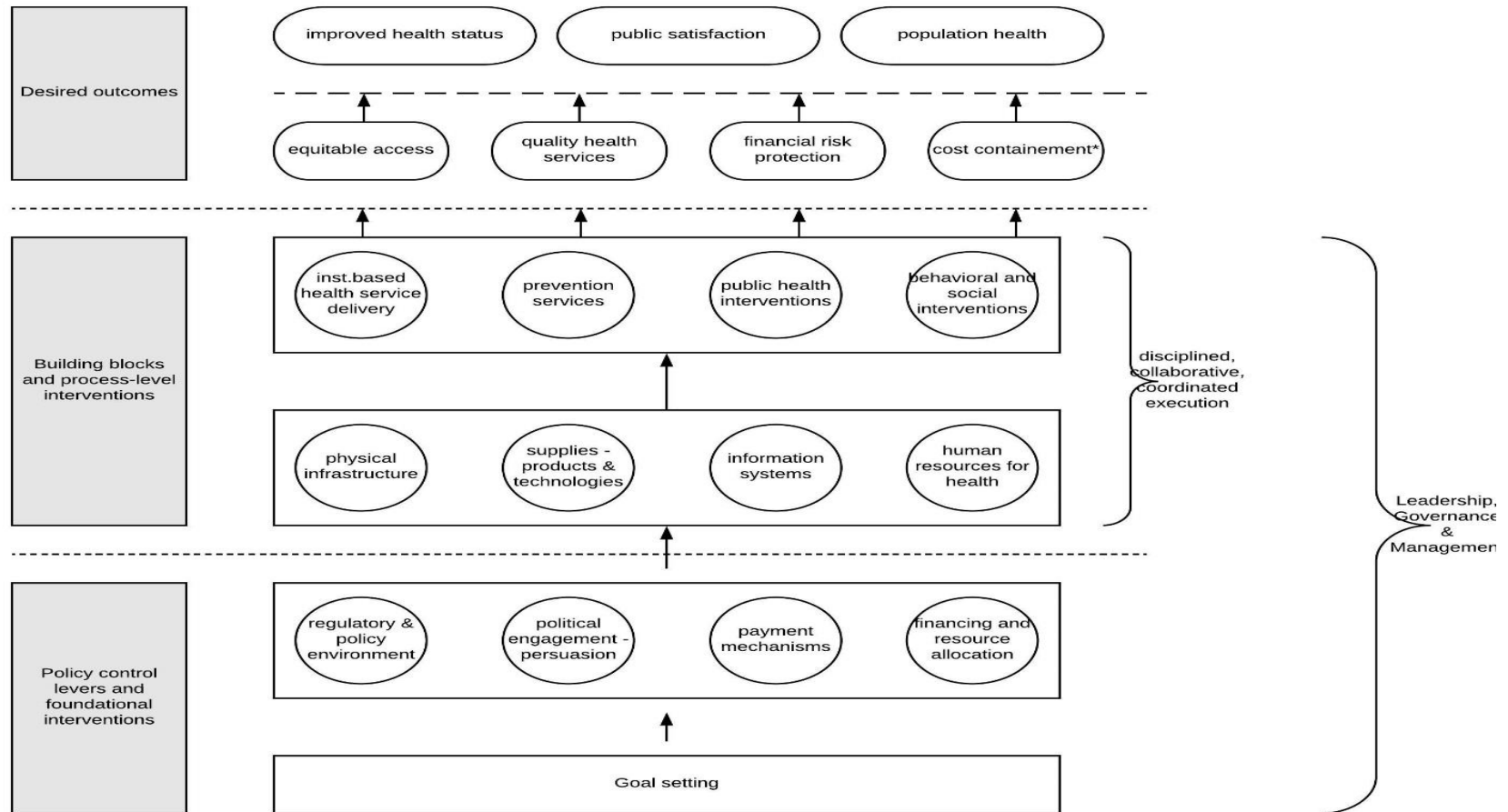
Summary of patient pathway
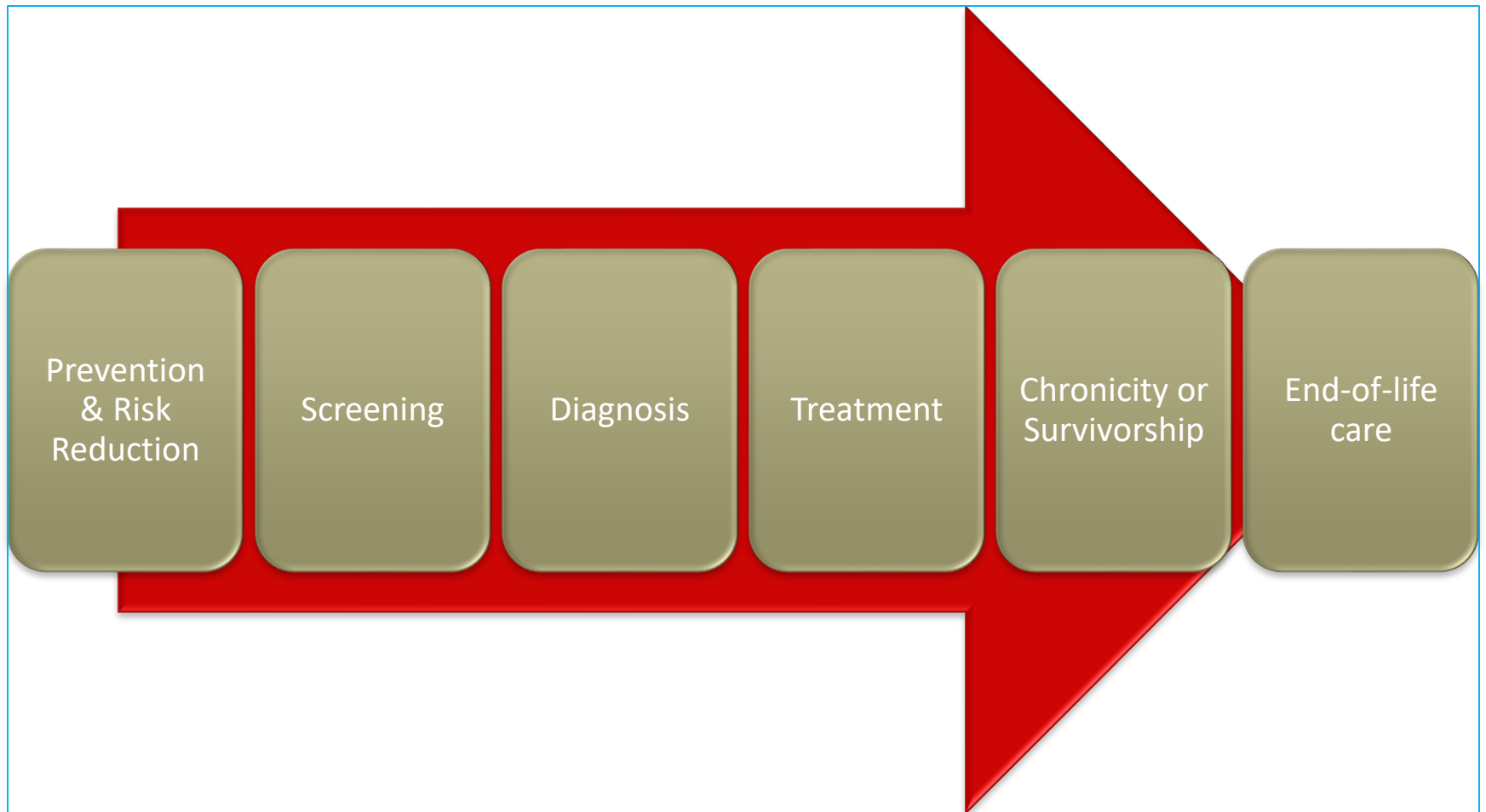
WHAT IS DIGITAL HEALTH?

- Is the convergence of digital technologies with health, healthcare, living, and society to enhance the efficiency of healthcare delivery and make medicines more personalized and precise.

- Digital Health as know Previously = mhealth + EHR/EMR

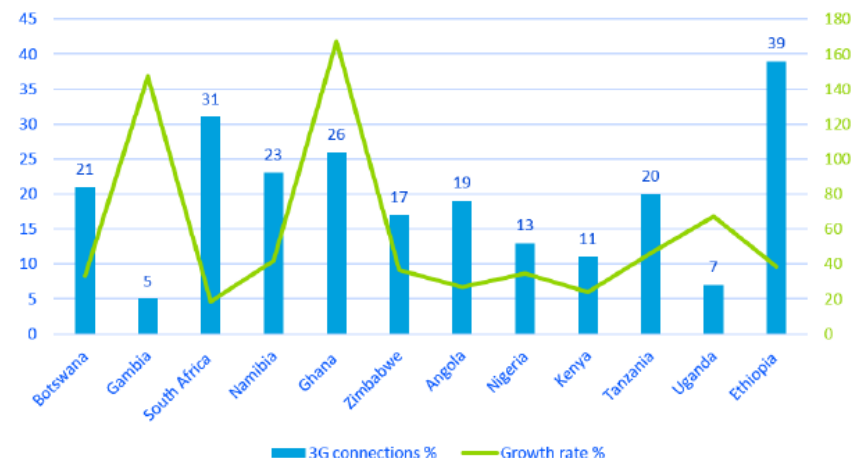- Digital Health Evolution = mHealth + EHR/EMR + eHealth + TeleHealth + Big Data + Others
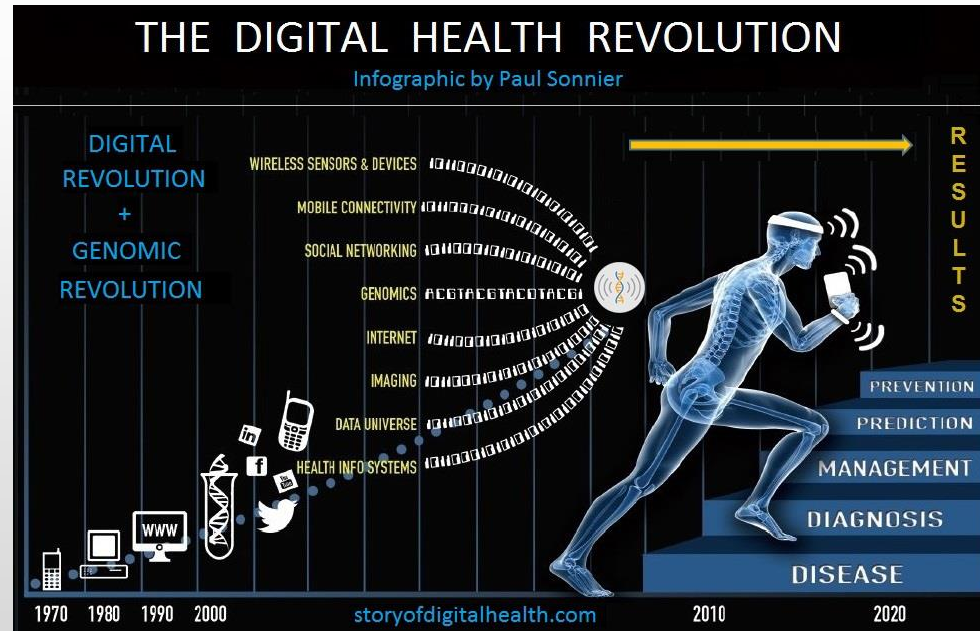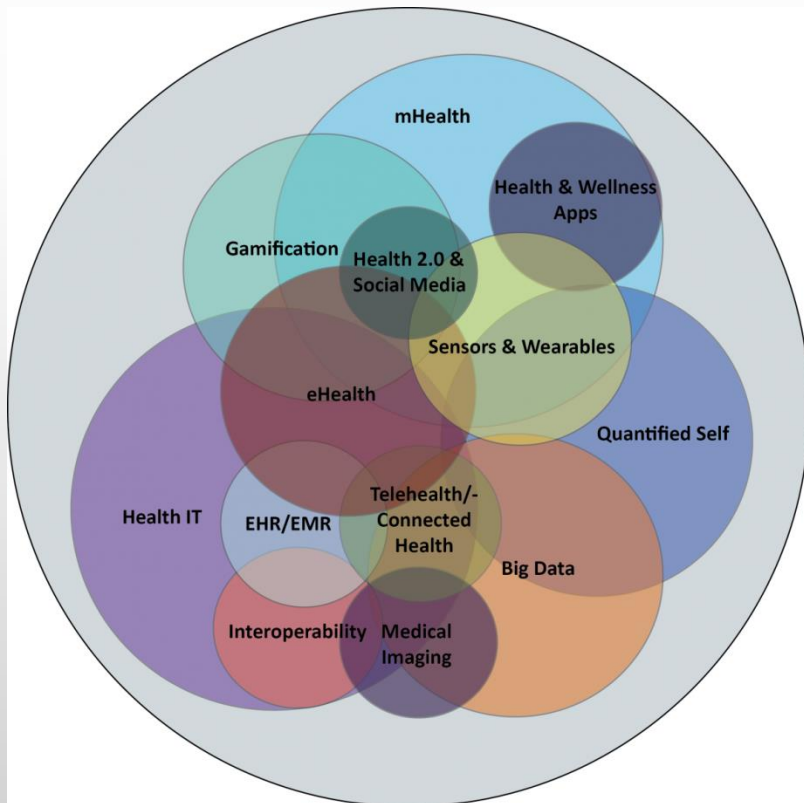
The Digital Health drivers in Africa
## Increase in internet connectivity and developments in technology

SIM penetration %
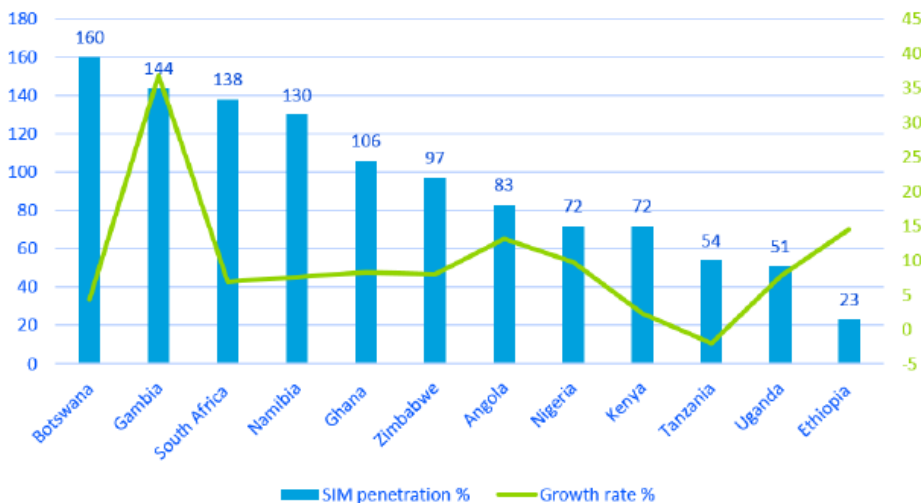
3G connections %

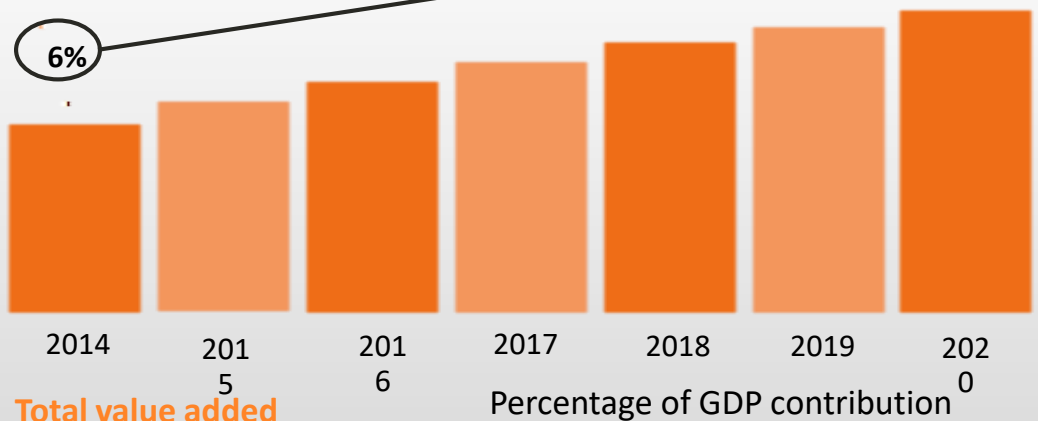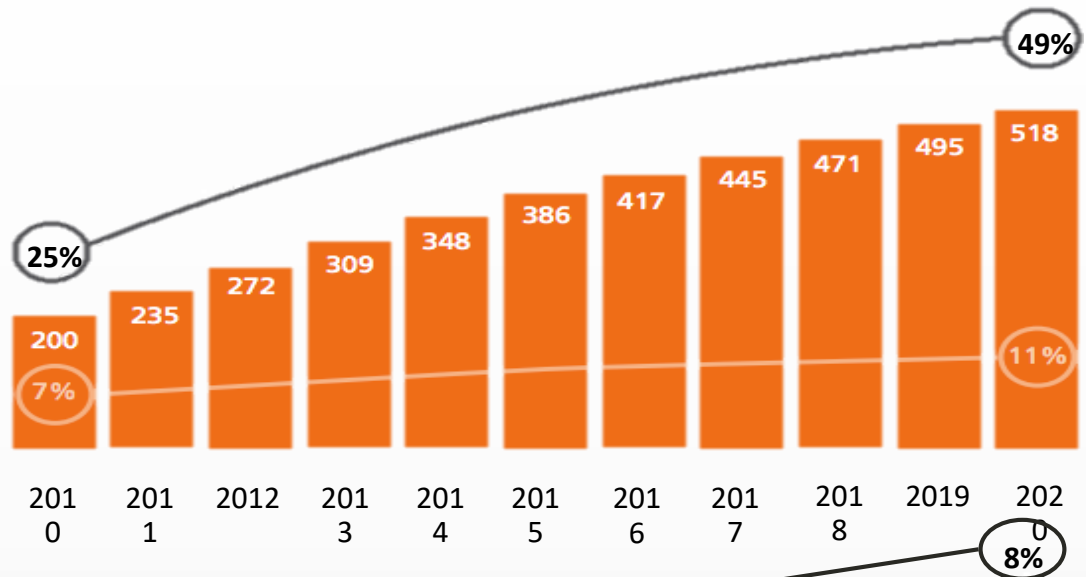| Country	Population (2017 Est.)	Internet Users 30-June-2017	Penetration (% Population)	Internet Growth % 2000 - 2017
Morocco	36,191,805	22567154	62.5 %	22,467 %
Ethiopia	107,534,882	16,037,811	15.3 %	164,278 %
Kenya	48,466,928	43,329,434	85 %	21,564.%
Nigeria	191,875,237	98,391,456	50.2 %	49,096 %
South Africa	57,398,421	30,815,634	53.7 %	1,184 %
Tanzania	59,091,392	23,000,00	38.9 %	19,900 %
Rwanda	12,501,156	3,724,678	29.8 %	74,993 %
Mali	19.107,706	12,480.176	65.3 %	66,283%
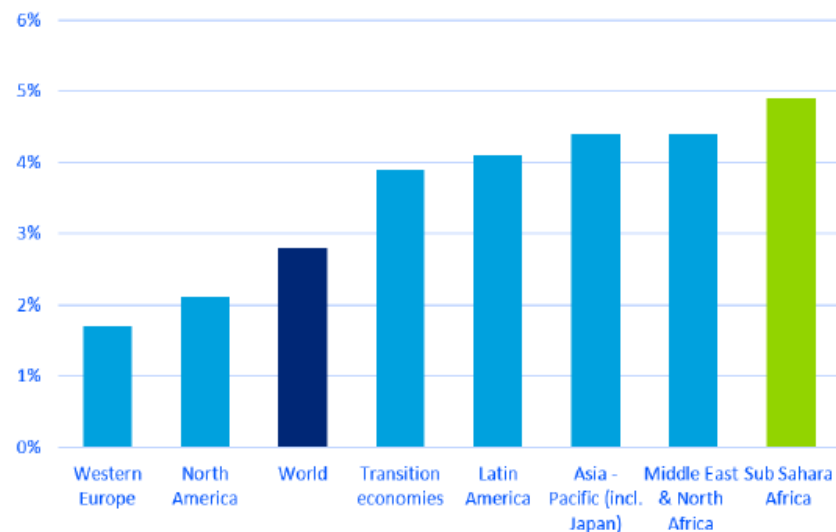
Figures. SIM penetration and 3G connections (%) in selected African countries (2013)

Africa's Increasing Connectivity

The mobile penetration rate in sub-Saharan Africa is predicted to increase to 49% by 2020. In analyzing these statistics, however, regional and national differences throughout the continent must be taken into account.

The economic contributions of the mobile industry as a percentage of GDP in sub-Saharan Africa is predicted to grow significantly to more than $160 billion by 2020

Total value added

Percentage of GDP contribution

Sources; Africa 2030: How Africa Can Achieve Sustainable Developmental Goals

Africa's Rising Middle Class – so what happens to the poor?

- A fast-growing middle class.

- Increased consumerism.

- Rapid urbanization
  - Africa is the second-fastest urbanising continent, second only to Asia.
  - Increasing divide between the rural poor who often have low levels of healthcare literacy and;
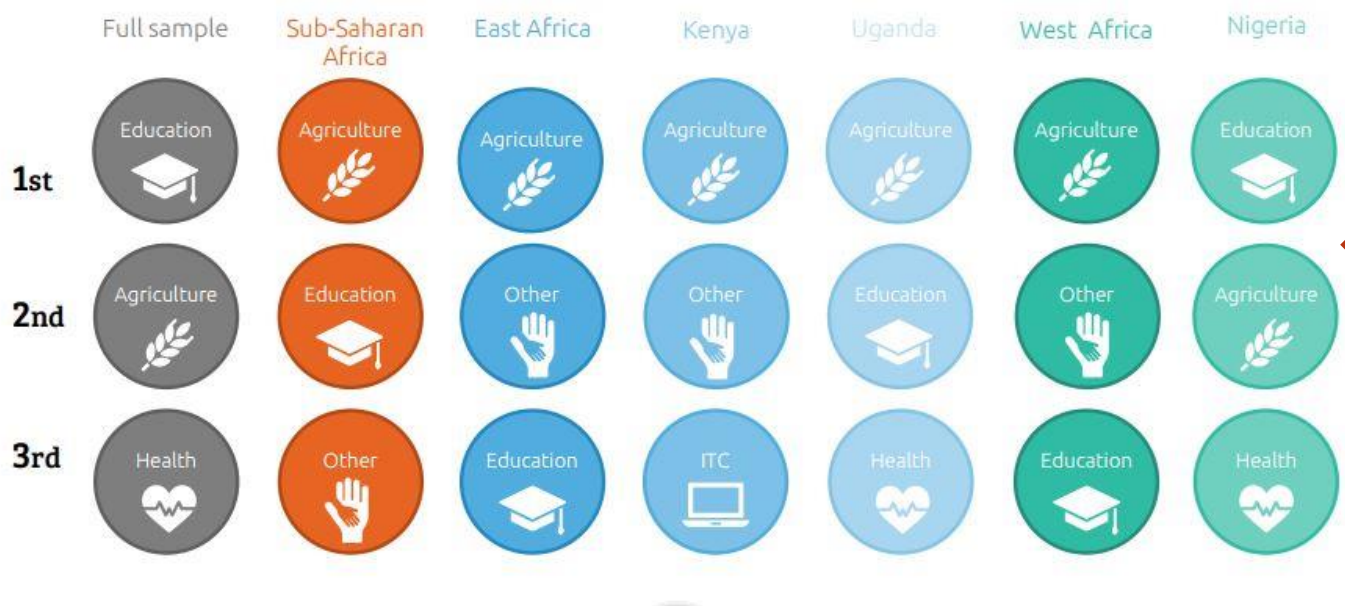 - minimal access to care

By 2025 the number of African households with discretionary households will rise by 50 percent.

Source: Economist

Aspirational Africa
Africa's middle class, % of population

Middle income† $10-20; Upper-middle income‡ $20-50, per person per day at purchasing-power parity

2004: Middle income / Upper-middle income
2014: Middle income / Upper-middle income

Source: EIU Canback *Excluding South Africa

Countries listed: South Africa, Nigeria, Cameroon, Ghana, Kenya, Sudan, Sub-Saharan Africa*, Uganda, Madagascar, Mozambique, Tanzania, Congo, Ethiopia

Top sectors

More than 25% of ventures are in the agriculture sector.

	Full sample	Sub-Saharan Africa	East Africa	Kenya	Uganda	West Africa	Nigeria
1st	Education	Agriculture	Agriculture	Agriculture	Agriculture	Agriculture	Education
2nd	Agriculture	Education	Other	Other	Education	Other	Agriculture
3rd	Health	Other	Education	ITC	Health	Education	Health

More Than 25% Of The Ventures in Africa Are In The Agriculture Sector!!!

Global Digital Health Market Revenue
By Region, 2017 (US$ Mn)

US$ 80,028.6 Mn
North America

XX.X
XX.X
XX.X
XX.X
XX.X

- Europe
- Asia Pacific
- Latin America
- Middle East
- Africa

CAGR **13.4%** (2017 – 2025)
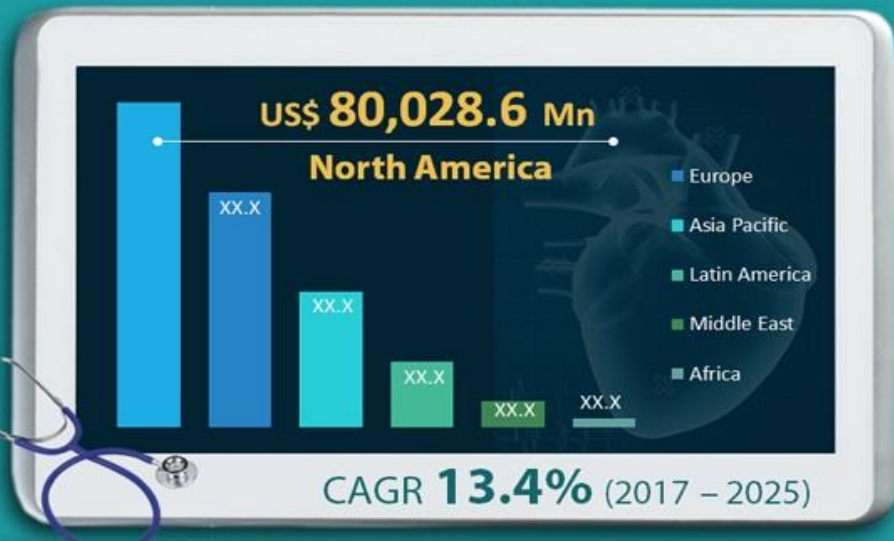
In 2016, the global digital health market was at $179.6 billion, according to Transparency Market Research (TMR). With Africa having the smallest compared to other continents

https://www.galidata.org/publications/acceleration-in-sub-saharan-africa/

Current Status of mobile health projects in Africa, split by countries where they are implemented

	Number of Projects
■ Live	106
■ In Pilot	45
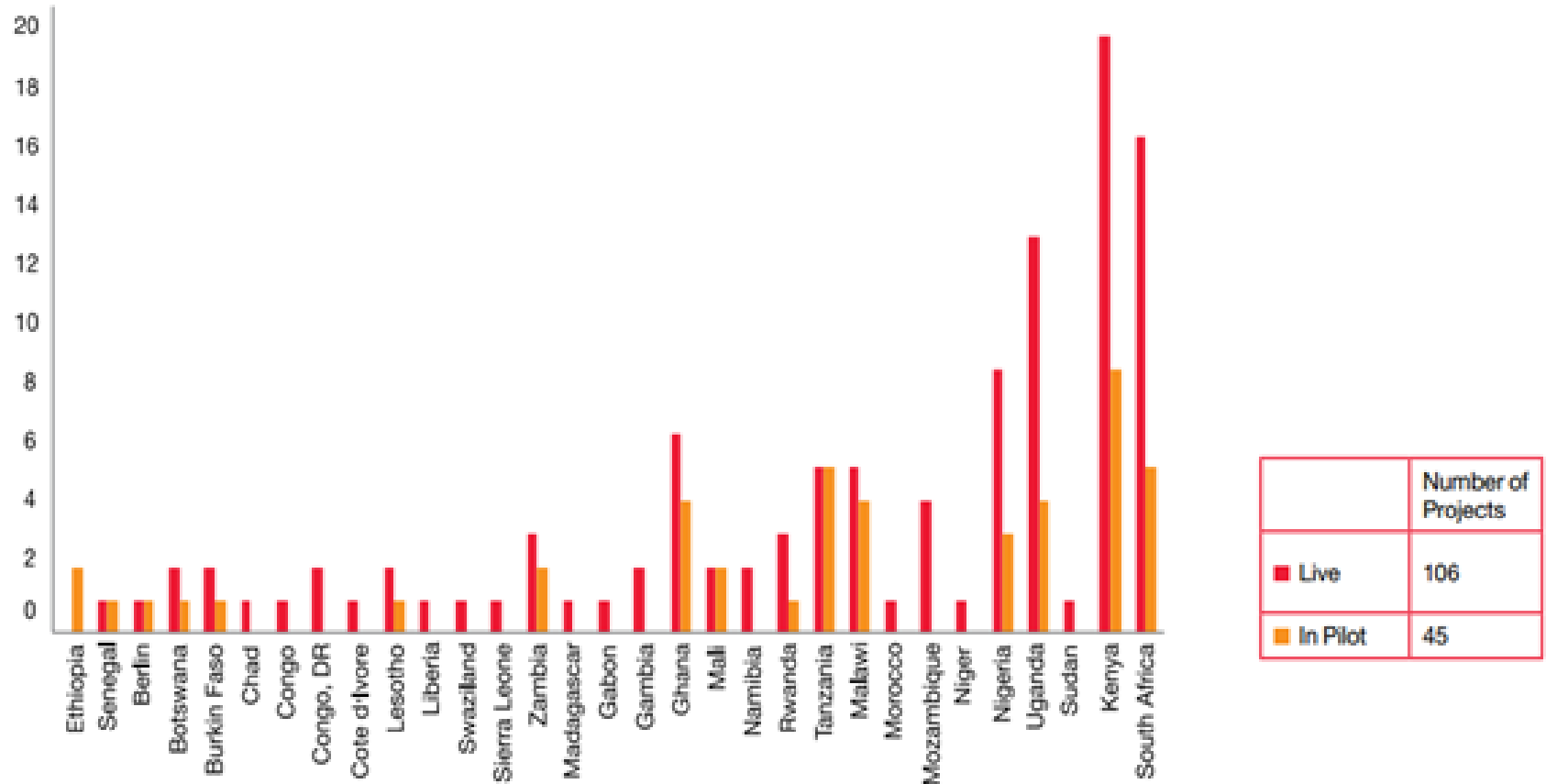
Source: wireless intelligence 2016 PWC analysis

SOME HEALTH IT START-UPS IN NIGERIA

Landscape Snapshot Feb '18

www.digitalhealth.com.ng
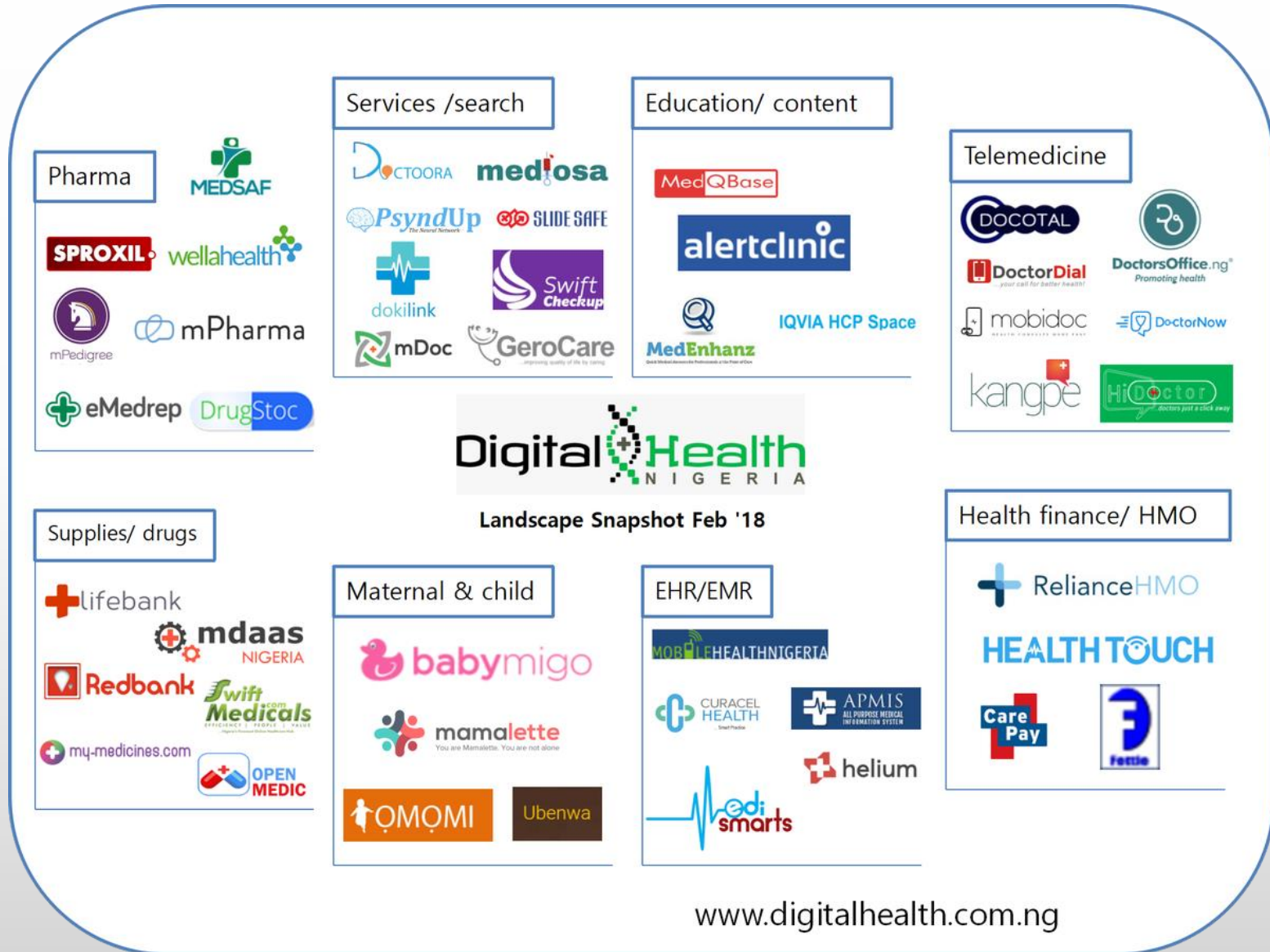
Random Use Cases in Africa out of many possibilities

Orange Healthcare

Orange Healthcare is a subsidiary of Orange Business Services, a global provider of ICT services and solutions across multiple industries. It operates in France and internationally across the Orange footprint, including African markets such as Botswana, Cameroon, Kenya and Mali.

Orange has a portfolio of B2G, B2B and B2C healthcare services across several African markets as a result of its own activities and partnerships.

An example is My Healthline in Cameroon – a SMS-based advice/ information hotline jointly launched with the Ministry of Health. It was initially designed in cooperation with local doctors to allow people to anonymously access information and advice on contraception, HIV/AIDS and sexually transmitted infections. The service was then extended to other medical topics.

Spotlight on Rwanda

Rwanda has more than 10 years' experience in national digital health plans; the first strategy was launched in 2006. Between 2010 and 2020, the government of Rwanda has committed to invest more than $50 million in e-health.

In 2009, the government committed $32 million to e-health for the period 2010–2015, including $7 million allocated to ICT infrastructure development and $4.5 million to internet-enabled e-health services. The latest e-health plan includes a further $21 million to be invested up to 2020.

Results achieved by 2015 include: 96% of health facilities connected to the internet; 27% of hospitals using telemedicine; and nearly 200,000 patients tracked using RapidSMS (a mobile solution that tracks the first 1,000 days of life, helping prevent deaths among mothers and newborns).

Vodacom Healthcare

Examples of Vodacom Healthcare solutions in Africa

AitaHealth

Smartphone-based application that allows health workers to deliver preventative care to households

Stock Visibility

A solution that allows clinics, dispensaries and pharmacies to manage medicine stock levels

Workforce Management

A solution that manages schedules and evaluates the performance of healthcare workers in remote, rural areas

Pharmaceutical cold chain tracking

A solution that enables clients to monitor the cold chain of delivered goods. It allows risk management during and at handover, and follows the protocols set by the Medicines Control Council

mVaccination

A mobile solution that allows health workers to increase the coverage of immunisation programmes

HearScreen

Smartphone-based screening solution that allows clinical hearing tests to be conducted via mobile

Vodacom Group is majority owned by Vodafone Group (65% holding) and provides mobile services across five African markets (South Africa, Tanzania, DRC, Mozambique and Lesotho) with a total of 65 million mobile customers at the end of 2016. Through a dedicated enterprise-focused ICT subsidiary – Vodacom Business Africa (VBA) – Vodacom also offers managed services to enterprises in around 30 countries in Africa.
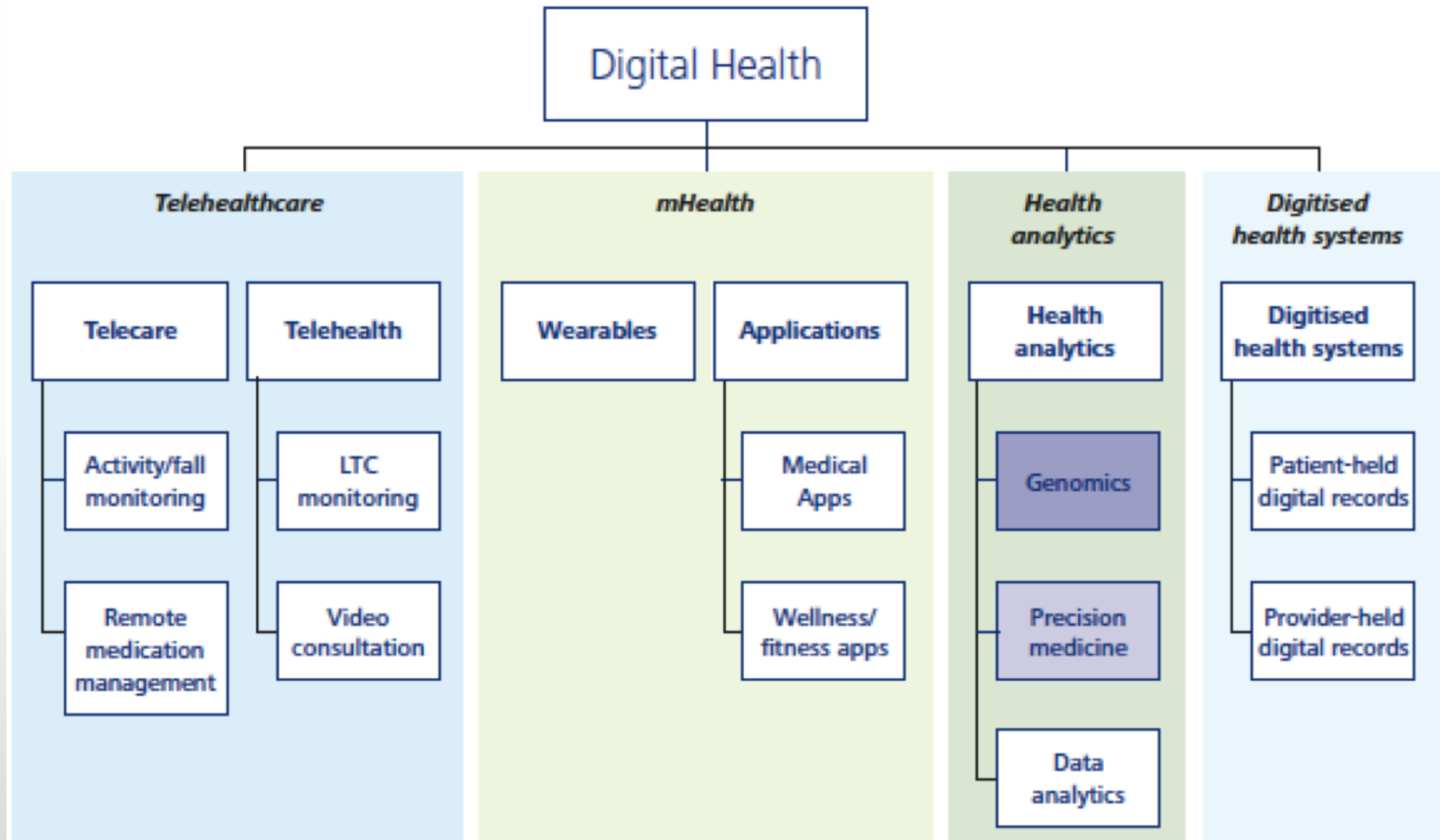
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Digital Health is complex and involves
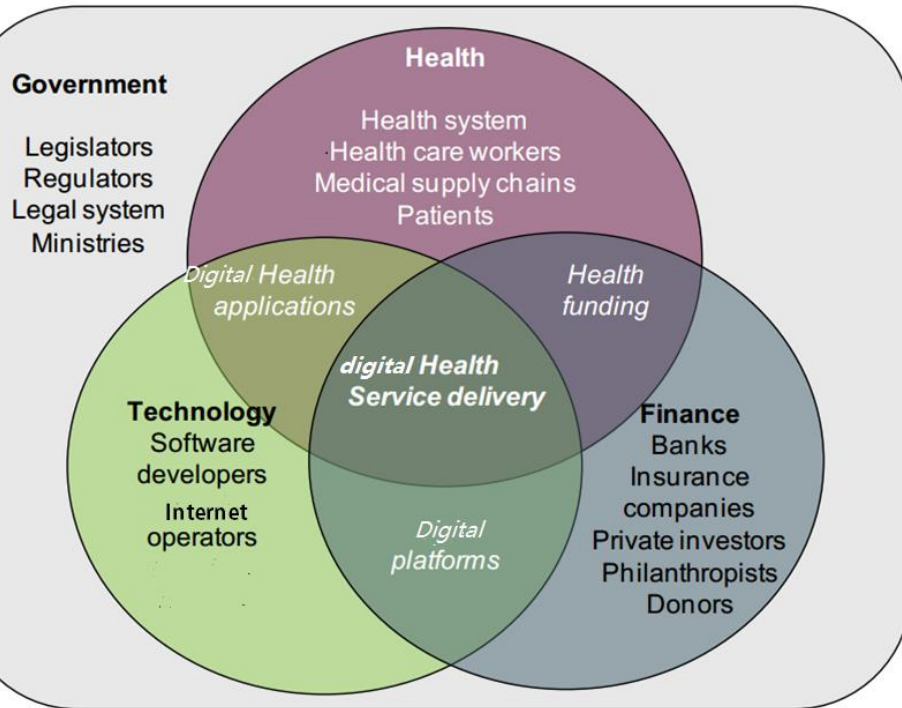
Multi-Players

Envisioning Digital Healthcare In Africa

Kenya

Country context*		
Population (000s)	44,354	
GNI per capita (PPP Int $)	2,250	
Physician density (per 10 000 population)	0.20	
Nurse & midwife density (per 10 000 population)	0.86	
Hospital bed density (per 10 000 population)	14	

Life expectancy at birth (years)	61
Total health expenditure (% GDP)	4.5
ICT Development Index rank	116
Mobile-cellular subscriptions (% population)	—
Internet users (% population)	32.1

1. eHealth foundations

National policies or strategies

	Country response	Global "yes" response[s]	Year adopted
National universal health coverage policy or strategy	—	75%	N/A
National eHealth policy or strategy	Yes	58%	2011
National health information system (HIS) policy or strategy	Yes	66%	2009
National telehealth policy or strategy	No	22%	N/A

Funding sources for eHealth

	Country response	Global "yes" response[s]	Funding source %**
Public funding	No	77%	Zero
Private or commercial funding	No	40%	Zero
Donor/non-public funding	Yes	63%	<25%
Public-private partnerships	No	42%	Zero

Multilingualism in eHealth

	Country response	Global "yes" response[s]	Year adopted
Policy or strategy on multilingualism	No	28%	N/A
Government-supported Internet sites in multiple languages	No	48%	

eHealth capacity building

	Country response	Global "yes" response[s]	Proportion**
Health sciences students – Pre-service training in eHealth	No	74%	N/A
Health professionals – In-service training in eHealth	Yes	77%	<25%

Telehealth

Telehealth programmes country overview

	Health system level**	Programme type**
Teleradiology	Local	Informal
Teledermatology	‡	‡
Telepathology	‡	‡
Telepsychiatry	‡	‡
Remote patient monitoring	‡	‡

Electronic Health Records (EHRs)

EHR country overview

	Country response	Year introduced
National EHR system	No	N/A
Legislation governing the use of the national EHR system	‡	
Health facilities with EHR	**Use EHR**	**Facilities with EHR %****
Primary care facilities (e.g. clinics and health care centres)	N/A	‡
Secondary care facilities (e.g. hospitals, emergency care)	N/A	‡
Tertiary care facilities (e.g. specialized care, referral from primary/secondary care)	N/A	‡
Other electronic systems	**Country response**	**Global "yes" response[§]**
Laboratory information systems	N/A	35%
Pathology information systems	N/A	18%
Pharmacy information systems	N/A	33%
PACS	N/A	26%
Automatic vaccination alerting system	N/A	10%
ICT-assisted functions	**Country response**	**Global "yes" response[§]**
Electronic medical billing systems	No	58%
Supply chain management information systems	Yes	58%
Human resources for health information systems	Yes	69%

mHealth

mHealth programmes country overview

Accessing/providing health services	Health system level**	Programme type**
Toll-free emergency	‡	Informal
Health call centres	‡	Informal
Appointment reminders	‡	Pilot
Mobile telehealth	‡	Informal
Management of disasters and emergencies	‡	Informal
Treatment adherence	‡	Informal
Accessing/providing health information	Health system level**	Programme type**
Community mobilization	‡	Informal
Access to information, databases and tools	‡	Informal
Patient records	‡	Informal
mLearning	‡	Informal
Decision support systems	‡	Informal
Collecting health information	Health system level**	Programme type**
Patient monitoring	‡	Informal
Health surveys	‡	Pilot
Disease surveillance	‡	‡

Big data

Policy or strategy – purpose	Country response	Global "yes" response§	Year adopted
Governing the use of big data in the health sector	No	17%	N/A
Governing the use of big data by private companies	No	8%	N/A

LEGEND

* Country context indicators
ICT Development Index Rank. 2015 - https://www.itu.int/net4/ITU-D/idi/2015/
All other country indicators. Global Health Observatory. 2012-2014 -
http://www.who.int/gho

** Glossary
§ Indicates the percentage of participating Member States responding "Yes"
— Don't know
N/A Not applicable
‡ Indicates question was unanswered
☐ Question not asked
Zero No funding

International level: Health entities in different geographic regions
Regional level: Health entities in countries in the same geographic region
National level: Referral hospitals, laboratories and health institutes (mainly public, but also private)
Intermediate level: District or provincial facilities: public and private hospitals and health centres
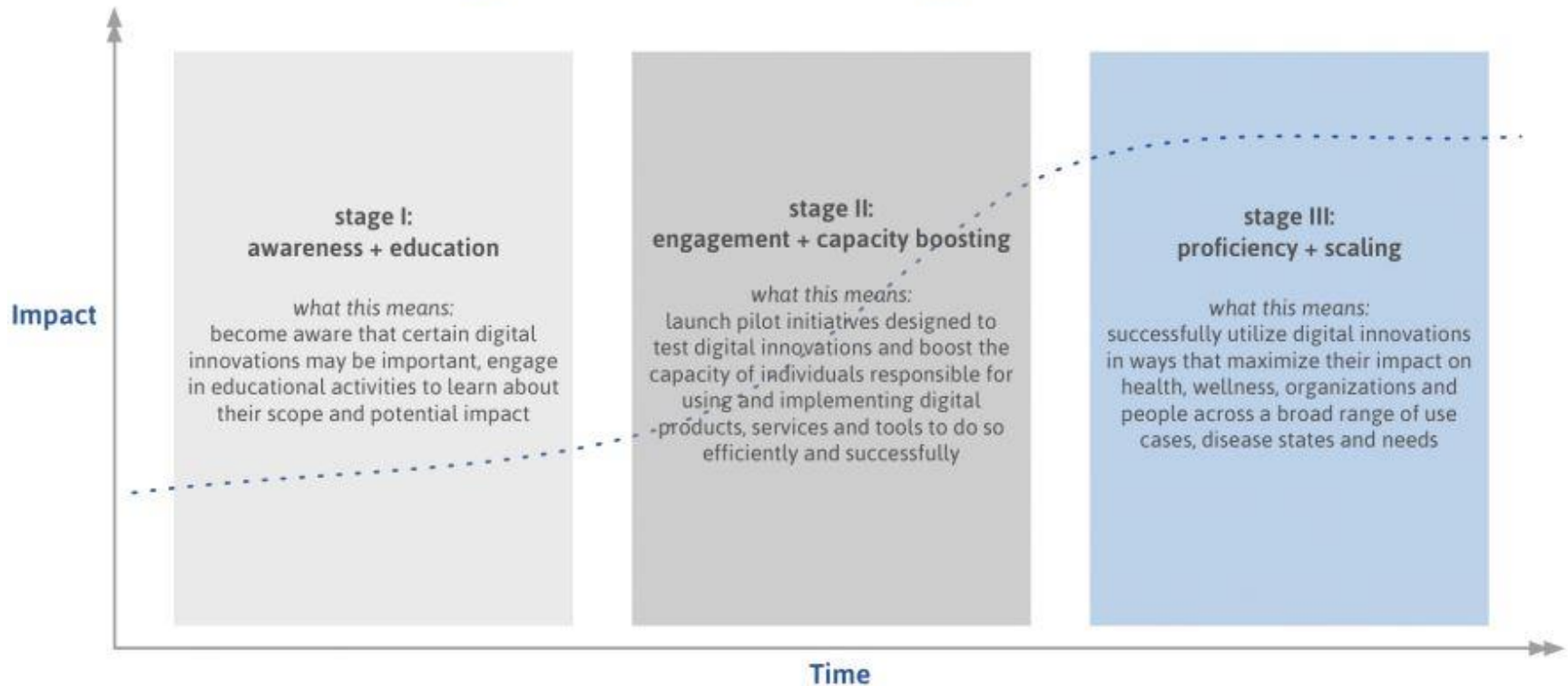**Local or peripheral level:** Health posts, health centres providing basic level of care
Informal: Use of ICT for health purposes in the absence of formal processes and policies
Pilot: Testing and evaluating a programme
Established: An ongoing programme that has been conducted for a minimum of 2 years and is planned to continue

http://www.who.int/goe/publications/atlas/2015/ken.pdf?ua=1

We seem to be stuck in stage 2

Digital Health Innovation Integration Curve

Impact (vertical axis) / Time (horizontal axis)

stage I:
awareness + education

what this means:
become aware that certain digital innovations may be important, engage in educational activities to learn about their scope and potential impact

stage II:
engagement + capacity boosting

what this means:
launch pilot initiatives designed to test digital innovations and boost the capacity of individuals responsible for using and implementing digital products, services and tools to do so efficiently and successfully

stage III:
proficiency + scaling

what this means:
successfully utilize digital innovations in ways that maximize their impact on health, wellness, organizations and people across a broad range of use cases, disease states and needs

| Physician Refers Patient to SuperCare Health | Coordination of Care Transition to Home | Comprehensive In-Home Clinical Assessment | Patient Provider Portal for Daily Clinical Management | Remote Monitoring and Care Team Intervention | Telehealth Appointment and Clinical Education | Medical Device Management |

Moving to Stage 3…..

Four Forces Shaping Digital Health Innovation

Human

Level of Leadership Support
Level of Education About Innovation

Policy

Internal Processes and Policies
Legal/Regulatory Environment

Economic

Can Innovation Drive Profits?
Can Innovation Help Reduce Spending?

Technological

Technical Ability/Know-How to
Develop and Implement Innovations

Source: Enspektos, LLC, 2015

Approaches

Health Education Content, Videos, Webinars

Survey and Feedback

Tracking Apps, Websites

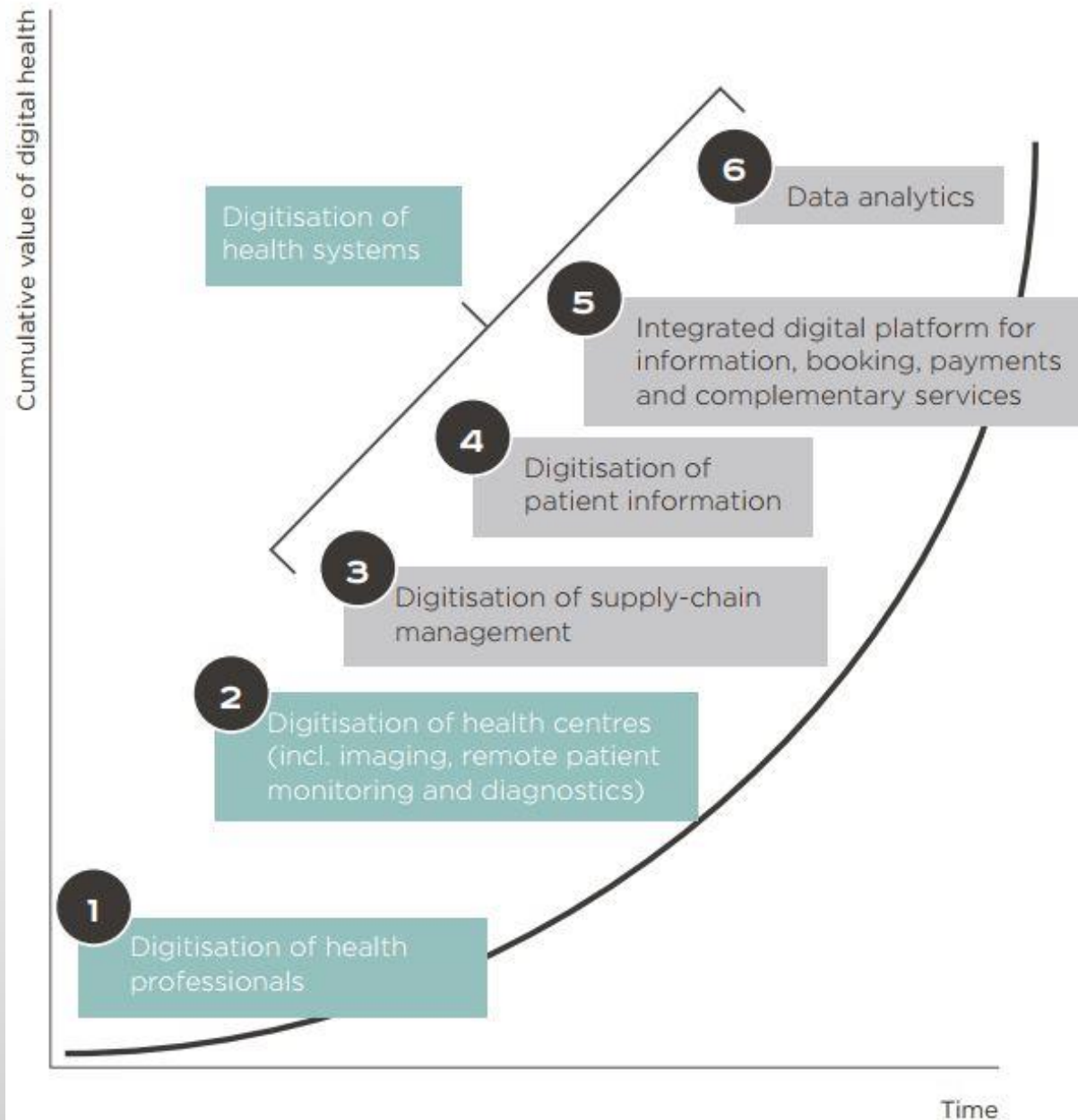Wearables

Telemedicine

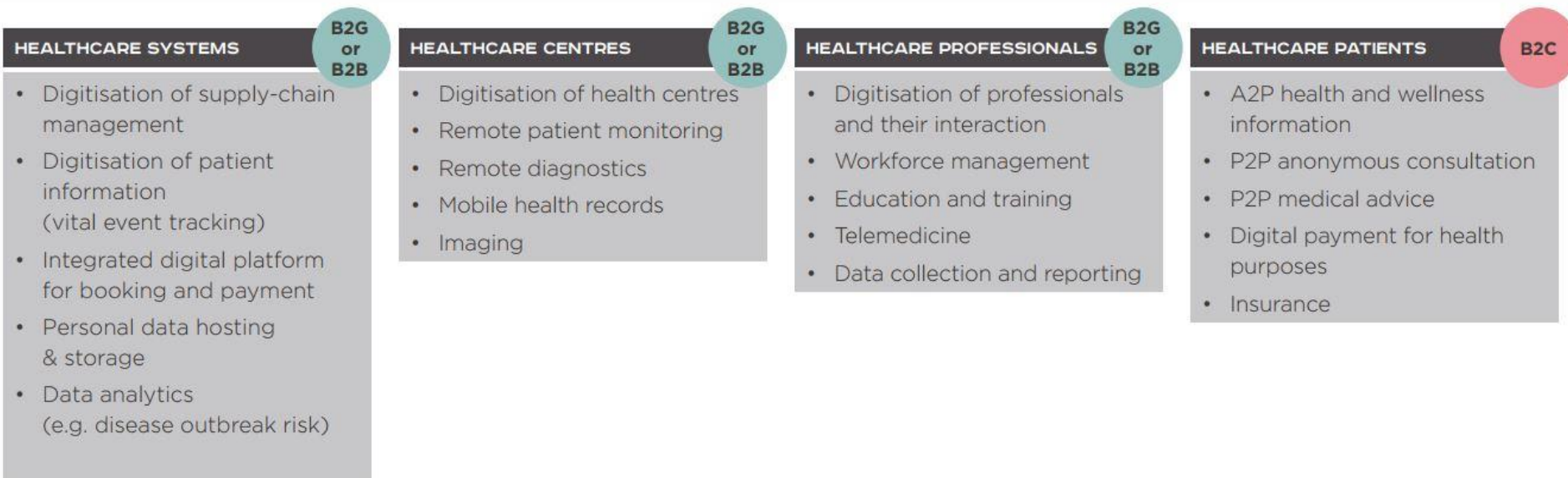Appointment Scheduling

Social Patient Engagement

Clinical Trials

What do we need to do ? A Strategy for Africa??

Cumulative value of digital health (y-axis) vs Time (x-axis)

6 — Data analytics

Digitisation of health systems

5 — Integrated digital platform for information, booking, payments and complementary services

4 — Digitisation of patient information

3 — Digitisation of supply-chain management

2 — Digitisation of health centres (incl. imaging, remote patient monitoring and diagnostics)

1 — Digitisation of health professionals

Not really, it needs to be country specific, and even regional specific

HEALTHCARE SYSTEMS	B2G or B2B

- Digitisation of supply-chain management
- Digitisation of patient information (vital event tracking)
- Integrated digital platform for booking and payment
- Personal data hosting & storage
- Data analytics (e.g. disease outbreak risk)

HEALTHCARE CENTRES	B2G or B2B

- Digitisation of health centres
- Remote patient monitoring
- Remote diagnostics
- Mobile health records
- Imaging

HEALTHCARE PROFESSIONALS	B2G or B2B

- Digitisation of professionals and their interaction
- Workforce management
- Education and training
- Telemedicine
- Data collection and reporting

HEALTHCARE PATIENTS	B2C

- A2P health and wellness information
- P2P anonymous consultation
- P2P medical advice
- Digital payment for health purposes
- Insurance

Some Suggestions To Think About

How to Scale Digital Health – the telco's perspective (1/3)

(1) Digital health stakeholders need to demonstrate the value of digital solutions to drive greater government investment

Government is likely to be the largest funder of digital health initiatives in developing countries. Venture-capital activity is limited and the private sector healthcare provision is at a low scale. Greater and more stable government investment in digital health – as opposed to cyclical/individual initiatives – is key to help drive scale. Digital health stakeholders need to stimulate government investment by demonstrating how digital health solutions help address national healthcare issues. A key difference compared to developed countries is that digital health can not only improve quality and reduce costs but also increase access.

International organisations and donors	**Develop and update monitoring and evaluation (M&E) programmes.** Comprehensive M&E programmes will increasingly be needed to demonstrate digital health outcomes on access, quality and cost of healthcare. Global organisations (such as the WHO and the UN) and donors must continue to work together to develop common guidelines, indicators and tools for M&E on digital health. Social impact investors and donors can also play a vital role in financing and de-risking implementation.
Health providers and digital health providers	**Provide greater visibility of the positive health outcomes** – on access, quality and cost – associated with the use of digital health. Greater visibility of successful deployments at scale with digital health service providers could lead to an increase in investments, as well as a spill-over effect into other markets.
Ministries of health	**Encourage and support the implementation of national digital health plans aligned with ICT and broadband plans.** Setting outcome-based objectives is key to driving execution and tracking progress. Policy and regulation that promote investment and facilitate faster time-to-market of digital health solutions are a further enabler to adoption and scale.

How to Scale Digital Health – the telco's perspective (2/3)

② Ecosystem collaboration is needed to address current fragmentation and create a holistic digital health model

Wider collaboration between digital health stakeholders is needed as individual companies do not own the full set of resources and capabilities required. In Africa, public-private partnerships will serve to share resources, capabilities, opportunities and risks among individual stakeholders. This collaboration is required to move from a currently fragmented approach to a holistic digital health model, with the potential for greater social and economic value for all stakeholders in the ecosystem.

All stakeholders	**Create digital health working groups for cross-industry education and collaboration.** Governments, international organisations, donors, social impact investors, healthcare providers, technology companies and operators have a limited history of collaboration. Working groups are a platform for exchanging experiences and best practices, and facilitating common standards and approaches.
Digital health providers, including operators	**Move from "fragmented service" to "platform" business model.** A transition from individual and fragmented digital health solutions (the current model for most companies in developing countries) to holistic digital health platforms can facilitate ecosystem collaboration, reduce risks for individual companies and accelerate time-to-market for new solutions. A platform model can also leverage synergies from different technologies available (IoT, mobile money, content channels, identity and others). In a holistic platform model, new core and complementary services can be more easily integrated and packaged for B2B clients. This requires more strategic enterprise mind-sets and capabilities within digital health companies.

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How to Scale Digital Health – the telco's perspective (3/3)
And the health sector perspective is…...

③ **Industry collaboration is needed to address current interoperability issues and drive healthcare data integration**

Limited interoperability and integration between different IT systems is a barrier to scalable and more effective digital health. This is mostly due to the use of proprietary elements, slow adoption and inconsistent use of existing standards and common interfaces, rather than a lack of standards. Data integration also improves healthcare worker and patient trust in the health system and increases the overall value of data collected, dramatically increasing the potential for AI and other advanced technologies in the longer term.

All stakeholders	**Drive awareness of technology integration benefits through collaborative initiatives.** Education is needed to demonstrate the benefits of interoperability such as faster access to integrated patient data, better and more coordinated quality of care, and cost efficiencies.
Digital health providers, including operators	**Engage with industry organisations at an early stage.** Some organisations such as the Personal Connected Health Alliance and Integrating the Healthcare Enterprise (IHE), work on the development of standards for healthcare. Early engagement during the digital health service design process and across all solutions can drive adoption of open standards and interoperability.
Mobile operator community	**Play an active role in defining standards.** The mobile industry can help by advising on the application of standards and by working with healthcare industry partners to deliver services based on the principle of semantic interoperability (the ability of two or more systems to exchange information), which is key to enable digital health to scale. This level of interoperability is possible via potentially disparate EHR systems, business-related information systems, medical devices, mobile technologies and other systems.

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More Public financing key but other methods of financing include

- **Encouraging Local Innovators**

➤ Imagine a world where African countries, initiatives and laboratories are contributing significantly in the discovery, development and delivery of the health products that they need the most. Local regulatory and policy frameworks that support such efforts should be fast-tracked, including through capacity building, and preparing the students for the future

- **Innovative Financing**

➤ Financial instruments like Social Impact Bonds that are able to leverage global private capital investments into results-based health programs offer exciting opportunities to ensure multisector support for sustainable and impactful programs.

- **The Power of Private Sector and Partnerships**

➤ In addition to providing capital investment, businesses can share strategic logistics and marketing know-how, source from local distributors and assess the scalability of projects e.g. Private Sector Health Alliance of Nigeria etc. The private sector also drives other stakeholders to advocate for sound policies, tailored solutions, improved infrastructure and relevant research. To ensure solutions are scalable, sustainable and impactful, governments, businesses, academics and NGOs must all bring their respective strengths to the table.

Just in case you thought things were now all wonderful, there are tough

Barriers to be addressed

- Education and Engaging health providers - now/future on possibilities digital health provides to provide health care
- Lack of rigorous evaluations
- Siloed relationship with other digital Services (e.g., digital Money, digital Education)
- Lack of effective dissemination platform for knowledge and learning
- Weak technology, finance support markets that affect the African digital space in general

- Nascent financing markets (primarily philanthropic; limited second-phase funding to scale pilots
- Limited understanding of full cost of implementation
- Low engagement of major health funders (GAVI, Global Fund etc)
- Challenges in negotiations and brokering relationships with MNOs
- Lack of interoperability with enabling systems or technologies
- Lack of evidence-based studies to support business case

- Lack of digital Health policy or alignment with digital Health policy in some countries
- Low levels of cross-sectoral understanding between health and digital communities
- Lack of standards to enable interoperability
- Limited connection between within Africa and other regions especially Asia or Latin America with somewhat similar issues
- Low levels of coordination between players at national level

FINAL THOUGHTS

Digital medicine is where technology converges with health – the result of which will inevitably change our current approach to managing healthcare as technology changed our approach to banking.
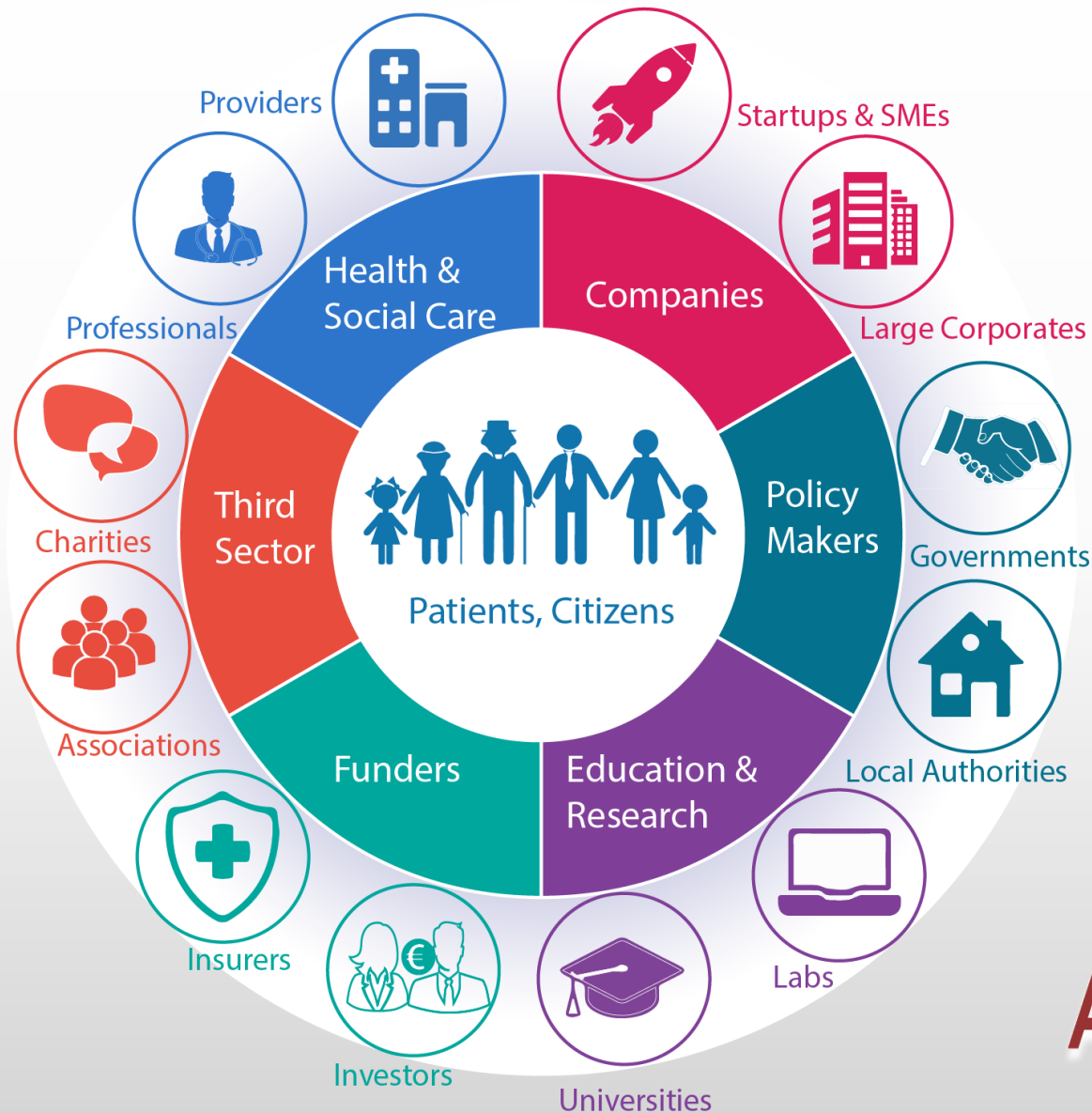

- Putting the right digital health policies and governance structures in place

- Developing digital health strategic plans and corresponding resources.

- Building an "info structure" that can support existing and future digital health systems.

- Implementing information systems that are cost-effective and scalable.

- Evaluating and documenting achievements in digital health

- Developing better algorithms for disease detection and intervention

- Smart therapeutic interventions

- Platforms to connect teams, patients, and providers, creating a balanced digital ecosystem

We are optimistic about the future of Digital Health

- Global digital health market size will reach USD 379.3 billion by 2024, with over 25% growth from 2016 to 2024.

- mHealth industry could witness remarkable growth in excess of 35%, to surpass USD 200 billion by 2024. Increasing use of smartphones, improved distribution of diagnostic health services and growing trend towards use of cost effective services will stimulate segment growth.

- Digital health systems market share was over USD 32 billion in 2015 with more than USD 130 billion by 2024. Growing investments in interoperability and increasing awareness regarding usage of EHR platforms will drive business growth.

- South Africa digital healthcare market share was over 15% of regional revenue in 2015 and expected to surpass USD 1.2 billion by 2024.

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Balanced Digital Ecosystem: Every party plays a role

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Some current health innovations in Nigeria

- **Safermom**: addresses the high maternal and infant mortality crises in Nigeria. The platform works to deliver vital health information to new and expectant mothers using interactive, personalized and low cost mobile technologies, including SMS and voice calls in local languages.

- **Omomi:** helps parents keep their children healthy by enabling them easily monitor their children's health. Parents can track their child's immunization status, manage diarrhea at home with an interactive do-it-yourself platform and get access to doctors as well as other parents. It also provides a fun and very educating quiz which gives parents simple health education knowledge.

- **Kangpe**: is an interactive platform which encourages users to ask real doctors their health questions and get answers in less than 10 minutes. It also has "Find a Doctor" and "Book Appointment" features, as well as health tips and featured questions.

- **Lifebank**: is a platform that makes blood available when and where it is needed in Nigeria to save lives. The company mobilizes blood donations, takes inventory of all blood available in the country, and delivers blood to where it is needed.

Some current health innovations in South Africa

Source: http://ehealthnews.co.za/

- **DMC-MALVEC**
  This project, running from 2016 until 2020, wants to improve the control of malaria. The system, a platform called LabDisk, will monitor the mosquito species' ID, the infection status of the mosquitoes and their insecticide resistance

- **mHealth4Afrika**
  With a budget of nearly €2 million, mHealth4Afrika addresses the quality of maternal and newborn healthcare delivery in Southern Africa

- **hearZA App**
  Launched on World Hearing Day in 2016 as the world's first clinically valid hearing test on a smartphone in under three minutes.

- **MyTherapy**
  A free to use medication reminder app, is helping over 500,000 global patients with medication adherence.