CONCEPT NOTE ON A STIAS-WALLENBERG ROUNDTABLE -

MHEALTH FOR IMPROVED ACCESS AND EQUITY IN HEALTH CARE

Compiled from notes by Lucie Laflamme[a], Marie Hasselberg[a], Sean Broomhead[b], T Jones[b] and Johann Groenewald[c].

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mHealth and clinical support

Over the past decades, all over the world, the health sector has been exposed to the introduction of a large variety of projects aiming, in general terms, at improving health care delivery. Information Communication Technologies (ICT) have been immensely instrumental to that aim, in particular through mobile smartphone devices and internet connectivity (mHealth)[1][2][3][4][5][6]. A variety of systems are now running in many countries and in environments ranging from standard out-patient follow up and rapid diagnostic to disaster management situations. Beyond the obvious intention to ultimately improve patient management options and outcomes, secondary potential benefits like less referrals, reduced costs and time saved have been suggested. Professional isolation is diminished and recruitment and retention to rural areas is promoted. This, in turn can contribute to a more equitable system in global health care through large-scale support into resource poor settings in both high-income (HICs) and low- and middle-income countries (LMICs)[7].

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[1] Can Mobile Health Technologies Transform Health Care? http://jama.jamanetwork.com/article.aspx?articleID=1762473

[2] Developing a Framework for Evaluating the Patient Engagement, Quality, and Safety of Mobile Health Applications http://www.commonwealthfund.org/publications/issue-briefs/2016/feb/evaluating-mobile-health-apps?utm_content=bufferc6daf&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer?utm_medium=nl&utm_source=internal&mkt_tok=3RkMMJWWfF9wsRokuqvLcO%2FhmjTEU5z17e8pXaa0lMI%2F0ER3fOvrPUfGjI4FRMBnPK%2BTFAwTG5toziV8R7LMKM1ty9MQWxTk

[3] 5 reasons why mobile health apps fail http://www.kevinmd.com/blog/2013/02/5-reasons-mobile-health-apps-fail.html

[4] Top Failures With Mobile Health Apps http://www.intertek.com/blog/2015-05-27-mhealth/

[5] How Mobile Devices are Transforming Healthcare https://vacloud.us/sandbox/groups/5069/wiki/a69cb/attachments/1ddb8/Brookings%20-%20How%20Mobile%20Devices%20are%20Transforming%20Healthcare.pdf

[6] mHealth in an mWorld How mobile technology is transforming health care https://www2.deloitte.com/content/dam/Deloitte/us/Documents/life-sciences-health-care/us-lhsc-mhealth-in-an-mworld-103014.pdf

[7] Aranda-Jan CB, Mohutsiwa-Dibe N, Loukanova S. Systematic review on what works, what does not work and why of implementation of mobile health (mHealth) projects in Africa. *Bmc Public Health.* Feb 21 **2014**;14.

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[a] Karolinska Institutet, Sweden
[b] African Centre for eHealth Excellence, South Africa
[c] Stellenbosch Institute for Advanced Study, South Africa

Global and regional trends

The WHO's Global Observatory for eHealth showed in 2011 that many countries had started to introduce mHealth initiatives into their health services,[8] and the trend has continued. Since then, new trends have emerged. A forecast up to 2017[9] says that the mHealth market will develop along some ten trends:

1.	Smartphone user penetration will be the main driver for the mHealth uptake
2.	mHealth applications will be tailored specifically for smartphones or tablets
3.	mHealth applications will be native rather than web-based applications
4.	mHealth niche stores will become the home of the second generation of mHealth apps
5.	Missing regulations are the main market barrier during the commercialization phase
6.	Buyers will continue to drive the market
7.	Applications will enter traditional health distribution channels
8.	mHealth market will grow mainly in countries with high Smartphone penetration and health expenditure
9.	Second generation mHealth applications will focus on chronic diseases
10.	mHealth business models will broaden.

Alongside these ten themes, mHealth's diversity makes its direction a bit more complicated to grasp. An example is the USA where application is distributed[10] across twelve mHealth categories:

Fitness	30%
Medical reference: drugs, disease and symptoms information	17%
Wellness apps	15%
Nutrition	7%
Medical conditions	7%
Personal health record	3%
CME	2%
Diagnostics	2%
Compliance	1%
Reminders	1%
Remote consultation	1%
Others	14%

Taking both findings together shows that mHealth investment decisions are taken in a setting of moving and expanding opportunities, priorities and targets. Challenges and opportunities shaping the evolving eHealth landscape for African countries cover a range of perspectives.

Perspective	African Challenge	African eHealth Opportunity
1 Health	Increasing burden of curative care with high levels of communicable disease and injuries and increasing NCDs	More health promotion to reduce care burden New diagnostic technologies New, more mobile devices for healthcare intervention
2 ICT	Infrastructure limitations, including connectivity, remain serious obstacles Cybercrime is increasing	Mobile solutions can reach remote communities Innovative options for improved infrastructure are emerging, including for better connectivity

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[8] mHealth New horizons for health through mobile technologies WHO Global Observatory for eHealth series - Volume 3 http://www.who.int/goe/publications/goe_mhealth_web.pdf

[9] Mobile Health Trends and Figures 2013-2017 Research and Markets http://www.researchandmarkets.com/research/nhc8j7/mobile_health July 2013

[10] mHealth App Developer Economics 2014 The State of the Art of mHealth App Publishing research2guidance www.mHealthEconomics.com

Perspective	African Challenge	African eHealth Opportunity
3 People	People are sensitive to usability issues and are highly resistant to using ICT solutions that are seen as cumbersome or wasteful of time or money	People readily embrace ICT solutions that have good usability and meet their needs
4 Investment	Affordability is a significant limiting factor	Describing value for money with cost-benefit and socio-economic return methods, and matching these with affordability, helps to expand investment choices and support decisions
5 eHealth	Numerous long-standing challenges remain, such as interoperability and regulation	Emerging innovations such as IoT, Big Data and predictive analytics provide new promise

At Acfee's African eHealth Forum in July 2015, participants pointed out that most mHealth initiatives are random, introduced by enthusiasts. Converting to a more strategic and structured approach needs incorporating alongside considerable demands for resources to fix the numerous long-standing eHealth challenges identified in *Advancing eHealth in Africa[11]*, the report of the forum proceedings. Assigning priorities to fixing challenges for mHealth and other eHealth advancement results in thinly dispersed resources for each, slowing the rate of expansion needed. If the challenges are not fixed, the benefits of new initiatives are constrained and diminished. Finding a good balance is a constant theme for African countries' eHealth decisions.

A closer look into the key role of image-based mHealth

mHealth can be applied in a large variety of domains within the health care sector, including data collection and surveillance, staff training, patient follow up, and clinical support. In this latter case, image-based communication through smartphone cameras facilitates the modernization and up-scaling of procedures already in place within more traditional forms of telemedicine (e.g., dermatology and radiology) and also, most remarkably, extra-laboratory microscopy ("lab-on-a-chip") in medical fields up to recently very dependent on the laboratory environment (e.g. pathology or ophthalmology).[12]

In spite of this tremendous potential, reports from domains of application other than "image-based " call for cautious enthusiasm, indicating that many mHealth projects that start promisingly often are not sustained, leading to loss in both potential and set-up outlay. In fact, the general conditions of implementation and the perspective of the users themselves are often overlooked and the technologies are not used to their full potential, impeding successful implementation, sustainability and expansion.

The above applies to a large extent to the SSA (Sub-Saharan Africa) context where many of the known image-based applications can play a considerable role for the reduction of the burden of disease in the region, including rapid diagnostic of diseases like HIV, TB, and malaria, but also clinical assistance in injury emergency care.[13]

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[11] Advancing eHealth in Africa African eHealth Forum. African Centre for eHealth Excellence 2015 www.acfee.org/resources

[12] Breslauer DN, Maamari RN, Switz NA, Lam WA, Fletcher DA. Mobile Phone Based Clinical Microscopy for Global Health Applications. *Plos One.* Jul **2009**;4(7).

[13] Hasselberg M, Beer N, Blom L, Wallis LA, Laflamme L. Image-Based Medical Expert Teleconsultation in Acute Care of Injuries. A Systematic Review of Effects on Information Accuracy, Diagnostic Validity, Clinical Outcome, and User Satisfaction. *Plos One.* **2014**;9(6).

A Roundtable to further develop an mHealth agenda for the SSA region

Rapid diagnosis is considered key to health care response to the burden of disease in many parts of the world, not least in the SSA region. Image-based mHealth is a promising means of achieving rapid diagnosis, with significant benefits to be expected for both individuals and health care systems. But a road map to progress development and implementation in the region remains to be determined where clear targets are set for the research, policy and practice agenda.

The objective of the Stellenbosch Institute for Advanced Study (STIAS) is to advance the cause of science and scholarship and invest in the intellectual future of the country; to focus on Africa; and, to provide an independent space where innovative ideas and original thinking can thrive.

STIAS facilitates the dissemination of research results and insights obtained in its research programme to the wider public. This includes creating platforms for dialogue amongst academia, policy makers, professionals and practitioners, business and industry, and civil society structures.

The theme of the 2017 STIAS-Wallenberg Roundtable will be *mHealth for improved access and equity in health care.* The aim is to provide a forum for a variety of stakeholders to discuss the possibilities that current developments in image-based mobile technology offer for timely, accurate and equitable healthcare delivery; and, the challenges that their development and implementation may entail for potential users/beneficiaries.

Specific questions are:

- The state of knowledge and foreseeable developments in clinical diagnosis in mHealth domains of particular relevance for the region (e.g. malaria and trauma care).
- Organisational and professional prerequisites.
- Technological and technical prerequisites.

The expected outcomes of the Roundtable could be the following:

- A special issue of the journal *Global Health Action* will be devoted to mHealth. Contributions to this issue have been solicited by members of the COC, who are also responsible for the peer-review processes and the final editing of the accepted contributions. The production time-line is being managed carefully to ensure that the special issue will be available at the Roundtable in February 2017.
- Prerequisites for the development of mHealth will be discussed during the course of the Roundtable with a view to develop a *roadmap*, or possibly overlaying *roadmaps*, for implementation, expansion and up-scaling in resource-poor settings such as SSA. The *roadmap(s)*, together with ideas, comments and criticisms from the Roundtable will inform the final editorial overview of the contributions in the special issue of *Global Health Action*.

The Roundtable is scheduled to take place over two days from 20 to 21 February 2017. The number of participants will be limited at around forty in order to facilitate frank exchange and discussions. The venue will be the Wallenberg Research Centre in Stellenbosch.