SMARTER HEALTH

EXPLORING eHEALTH IN KENYA

TUNDRA FOCUS

PROJECT SPONSORED BY KAROLINSKA INSTITUTET & TUNDRA FONDER
BY: MALIN ALMGREN & JENNIE CM AHRÉN
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ABOUT THE PROJECT

This report is as a result of a collaborative project exploring eHealth initiatives in Kenya undertaken by Tundra Fonder and Karolinska Institutet, based in Sweden. Malin Almgren (PhD.) is the lead researcher for the study.

From Tundra's perspective, as an investor, the development of health in our core markets stands as an important part of the economic progress. In a recent publication by the World Bank *The Changing Wealth of Nations*[1], the importance of Human capital development is emphasized as a strong pillar for future growth in any country. Education, gender equality and access to healthcare are three success factors for maximizing any country's long term growth potential

The United Nations has issued a call to action to all sectors of society in order to achieve the Sustainable Development Goals (SDGs)[2] by 2030. As a fund manager committed to employing a sustainability lens for all financial analyses and investment decisions, we appreciate the value of the United Nations Global Compact (UNGC) framework for promoting business leadership and creating a global culture of integrity and transparency. Tundra supports and aligns its work with several global initiatives that encourage organisations to integrate environmental, social and corporate governance (ESG) factors into their investment processes and strategies. We consider the SDGs both aspirational and a fundamental pillar in the efforts for sustainability. We further believe that partnerships and collaborations between business, academic institutions, civil society, government and other stakeholders are key to effecting a sustainable future.

INTRODUCTION

East Africa's market hub, Kenya is home to a sophisticated and vibrant media landscape (print, electronic and internet) supported by a sizable middle-income class. By regional standards, and indeed in comparison to some European countries[3], internet penetration and use is very high reaching 83% in March 2018 with smartphones and mobile devices as the primary means of access[4]. Mobile subscription rate surpassed 40 million in 2017 with a reach at 90.4% of the adult population[5]. Unsurprisingly, Kenya is also a tech innovation leader in the region. Taken together these factors are likely to drive the development of mobile technology solutions for development problems including health care, financial inclusion, access to social services etc.

In this context, eHealth initiatives allow for cheaper and accessible care for the entire population while promoting transparency, increasing efficiency through improved payment systems, record keeping and connecting remote users. According to the World Bank; Kenya has the potential to be one of Africa's success stories from its growing youthful population (median age 19), a dynamic private sector, a highly skilled workforce, improvements in infrastructure, a new constitutional framework, and its pivotal role as a flourishing democracy in East Africa. In an effort to investigate the Kenya's eHealth initiatives and ascertain commonly held views on digital health care services we interviewed stakeholders from academia, finance, business and service users in Nairobi.

This is summarised in this report.

HEALTH CARE SYSTEMS IN KENYA

Kenya is East Africa's most developed country with a population of nearly 50 million people. Nairobi is a modern city with a number of IT hubs and a growing middle-income class. However, despite Kenya's growing economy and bustling tech industry, most Kenyans have never seen a doctor. The proportion of Kenyans living below the international poverty line (US$1.90 per day) has declined from 46.8% in 2005/06 to 36.1% in 2015/16[6]. Classified as a lower, middle income country (LMIC) Kenya has made substantial progress in the implementation of the Millennium Development Goals. Significant improvements have been achieved in the areas of infant mortality, universal primary education, nutrition and access to clean water. However, progress is not uniform across Kenya's 47 counties nor across income groups or gender. For example 50% of maternal deaths in the country are attributable to six counties inhabited by 10% of the total population. Even though Kenya's overall ratio has dropped to 510/100,000 live births, Mandera county has one of the world's highest maternal mortality ratio with 3.795 maternal deaths per 100,000 live births in 2014.[7]

Kenya, much like the rest of Africa, is experiencing an acute shortage of health professionals (doctors, nurses and pharmacists), which is one of the main drivers of the development in eHealth. The WHO defines eHealth as "the use of information and communication technologies (ICT) for health." With a mobile penetration of 94% and at least 50% of population having access to internet (the actual number of users is unclear and is generally reported to be anywhere between 26% and 85% in various reports) according to the Communications Authority of Kenya, this is an effective method to reach a broad spectrum of people.

QUICK FACTS

GDP per capita: $1,455 (Sweden: $51,600)
(2016, World Bank Group)
Population Estimate: 48,466,928
(2017, according to US Census Bureau)
Literacy (ages 15 and above/youth 15-24): 78.7% / 86.5%
(2014, United Nations Educational, Scientific, and Cultural Organization, Institute for Statistics)
Mobile Subscriptions* (Millions): 42.8 (Dec 2017)
Mobile Penetration*: 94.4% (Dec 2017)
Number of Active Mobile Money Transfer Subscriptions* (Millions): 30

*Statistics according to CAK (Communications Authority of Kenya)

Kenya's health system involves three main types of health care providers: *public, not-for-profit organisations* (including faith-based and mission hospitals, local and international NGOs) and *private health care providers* (for-profit). Health care services tend to be disorganised. Patients frequently have to sit and wait for doctors to see them, often with very long waiting times. There is no "911" or emergency response system. While several private companies provide emergency services, most people drive themselves to the hospital. Nearly one-third of the population makes less than $2 per day, which means most households cannot afford health care without facing serious economic constrains. Approximately four out of five people have no medical insurance, which leaves the majority of the population without quality health care.

VIEWS ON THE KENYAN HEALTH SYSTEM:

During an interview with Audrey Obara, Investment Manager at Swedfund (The Development Finance Institution of the Swedish state), she described her views health care in Kenya. Swedfund's office in Nairobi supports the Stockholm office with investments and analyses in Africa. "*Our goal is to eliminate poverty by creating sustainable business in some of the world's toughest and most promising growth markets."* Currently Swedfund has identified health care as a key area for investment, with three primary interests: medical out care centers, general hospitals, diagnostic and laboratory facilities. According to Ms. Obara "*Lots of doctors have their own private clinic and hence a need for collaboration with laboratories and diagnostic centers. National referral hospitals have long waiting time for care and private options are needed. However, it is important to regulate the private sector and get the crooked or fake doctors out of business.*" One endemic problem, in both private and public health care, is corruption. It is common practice to demand extra tests and x-rays which increase costs. Swedfund believes that by investing in several different health care givers, competition will increase and promote serious business practices. Their investments are preceded by thorough due diligence.

HEALTH STATISTICS
(Kenya/Sweden)

Life expectancy at birth (years): 61/82

Total health expenditure (% GDP): 4.5/9.7

Physician density (per 10,000 population): 0.20/3.93

Hospital bed density (per 10,000 population): 14/28

Mortality rate, under-5 (per 1,000 live births): 49.2/2.9

UNIVERSAL HEALTH CARE

Sustainable Development Goal 3 “Ensure healthy lives and promote well-being for all at all ages,” is one of the 17 global goals endorsed by all members of the UN in 2015[2]. One of the measurable targets within SDG3 is “Universal Health Care” i.e. achieving universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.

On April 7, 2018 celebrating World Health Day the Kenyan Ministry of Health declared that “the Government has prioritised attainment of Universal Health Coverage (UHC) to reduce the expenditure burden that a majority of Kenyans incur while seeking healthcare.” One way to implement this is via subsidised insurance through the National Health Insurance Fund (NHIF). NHIF is a parastatal that was established in 1966 as a department under the Ministry of Health. The Fund's core mandate is to provide medical insurance cover to all its members and their declared dependents (spouse and children). The NHIF membership is open to all Kenyans who are over 18 years and have a monthly income of more than Ksh 1000 (approx. $10). The fees are deducted directly from salaried employees at source by all employers. Since a large proportion of the population is “self-employed” and does not pay tax, the NHIF has open up an option for this group to pay as little as 500Ksh/month (approximately $5). However, this option has been somewhat unsuccessful as $5 per month is still an exorbitant sum for many Kenyans. Finally, there is commonly held resistance towards putting money away for insurance when you are not sick and striving to put food on the table.

The Health Insurance Subsidy Program (HISP) currently being launched in Kenya, is an initiative of the NHIF together with the World Bank Group. A recent collaborative health insurance program aim to provide health care coverage for Kenya’s poorest. The first phase, launched April 2014, covered 125,000 Kenyans in 23,500 families across the country. The program is supported by the World Bank Group and other development partners such as the Bill & Melinda Gates Foundation. The pilot project aims to extend health insurance coverage to beneficiaries who belong to the lowest quintile, those classified as absolutely poor and vulnerable, working in Kenya’s informal sector.

The path to universal healthcare is not easy with nearly 50% of the population participating in the informal work force and not paying taxes. Other challenges include fraud, corruption, and the lack of trained staff. The government is supportive of Private-Public-Partnerships (PPP) to build sustainable business models to scale up public health services.

Another move in the right direction is the provision of free maternal health services at public facilities which has led to improved maternal and child health. One such programme is called *Linda Jama* (“protect mommy” in Swahili); and was rolled out by the NHIF covering maternal and child health care up to the age of six month. Based on a mobile platform this service is offered to all Kenyan women and their new-borns. The initiative’s goal is “to achieve universal cases to maternal and child health services and contributes to the country’s progress towards UHC.”

eHEALTH IN KENYA

As noted earlier, health systems in Kenya (and other low- and middle-income countries) face tremendous challenges in providing high-quality, affordable and accessible care. As a result the Ministry of Health and other stakeholders (donors, researchers and private companies) are searching for innovative approaches to eliminate the geographic and financial barriers to health care. This has resulted in a huge interest in eHealth solutions. To date there are over 70 different such initiatives in Kenya. The majority of these interventions have been developed by donor-funded NGOs. The problem is that many of these are executed in isolation and without endorsements from the Ministry of Health. There is also significant project overlap, with a majority focusing on maternity and child health and HIV/AIDS. Lack of government anchoring and sustainable funding has also led to projects being abandoned after the pilot phase. A systematic review[8] assessing eHealth and mHealth in Kenya found the adoption of ICT in health is increasingly being implemented in sub-Saharan Africa, including potential benefits to the health system such as efficient health care, improvements in quality of care, costs reduction, and enhanced health system governance structures. The myriad of eHealth projects identified in the review mainly occurred in the mHealth strategic area with a focus on primary care and HIV/AIDs. The analysis further showed that most of the projects were rarely evaluated and few of them were implemented in marginalised areas which experienced serious health care deficits. A study funded by the International Development Research Center (IDRC) in Canada discovered that although mobile penetration has led to a boom in eHealth projects, it has not, as yet, improved healthcare access across Kenya[9].

A report analyzing eHealth in low/mid income settings indicates that the of eHealth programs are used to extend geographic access to health care, to improve data management, and to facilitate communication between patients and physicians outside the physician's office. Supplementary purposes include improving diagnosis and treatment, mitigating fraud and abuse, and streamlining financial transactions. The majority (47%) of eHealth programs are funded by international donors according to the report [10].

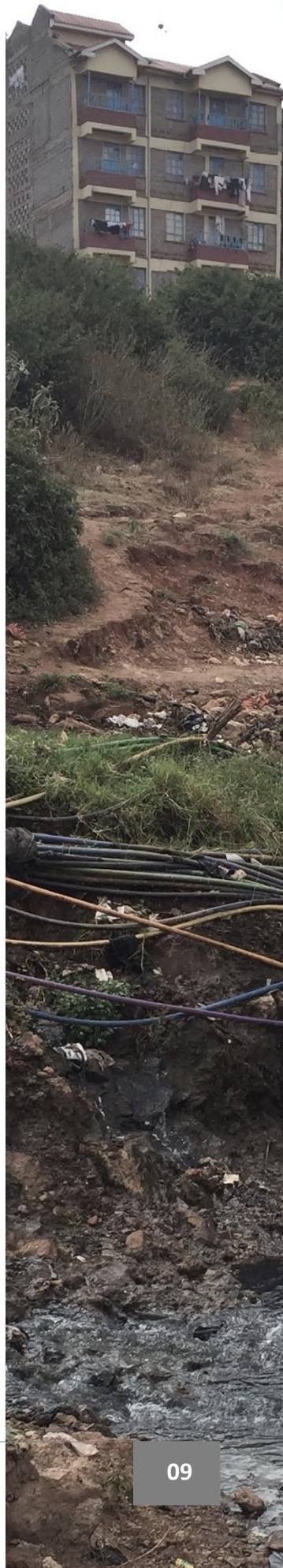
KENYA STANDARDS AND GUIDELINES FOR mHEALTH SYSTEMS – POLICY DOCUMENT FROM MINISTRY OF HEALTH

The Ministry of Health published some much needed guidelines 2017[11] recognising the crucial role played by the appropriate use of relevant standards and guidelines in the implementation of mobile health (mHealth) applications. The policy document reads: "*The overall goal of mHealth standards in Kenya is to ensure the design, development and implementation of interoperable, scalable, sustainable mHealth solutions that benefit clients and healthcare workers in a cohesive and holistic manner for better health outcomes*."

The standards provide a robust framework for implementation and coordination of mHealth solutions helping to move the mHealth sector from multiple pilot phases to full-scale-nationwide interoperable solutions. Further, the standards reinforce sustainable and desirable eHealth initiatives by reducing duplication, stimulating data and information sharing among systems, and in promoting the use of mobile technology as a tool to promote health and to provide efficient, affordable, accessible healthcare services. Achieving these ambitious goals will require: commitment by senior stakeholders, identification of resources and thorough audit procedures. Fines and penalties are part of a range of measures to encourage compliance.

An important section of the policy describes *Monitoring and Evaluation* of mHealth. The following elements will be used to measure the program's success:

1. Usability: Ease of use
2. Integration
3. Sustainability
4. Scalability
5. Data quality, integrity and governance
6. Service quality: improved service delivery
7. Informative/educational information
8. Rate of adoption; number of users
9. Financial cost of implementation and analysis of cost-benefit ratio
10. Health benefits and health equity considerations.



INTERVIEWS WITH STAKEHOLDERS

EQUITY BANK KENYA

BERNT MALAHAY GROUP DIRECTOR - STRATEGIC PARTNERSHIP, COLLABORATION & INVESTOR RELATIONS

Equity Bank, was founded in 1984 and was incorporated in Equity Group Holdings Limited in 2014, and is one of Africa's largest banks, with branches in neighbouring countries: Uganda, South Sudan, Tanzania, Rwanda and DRC (Congo). During a meeting, Bernt Malahay mentioned that Equity Bank is working strategically with new business lines, considers banking as an ecosystem surrounding each customer's life-work balance. One important pillar is Equitel, a mobile virtual network operator, which allows the customer to perform financial transactions as well as make calls, send SMS' and browse the internet. PesaLink is an interbank money transfer solution that enables the customer to receive and transfer funds from other banks straight into an Equity Bank account in real time. Importantly for the spread of users, the banking system works on 2G, 3G and 4G. To date Equitel has 2.9m subscribers and 1.9m active users. Their biggest competitor is Safaricom.

In an attempt to satisfy and help the user Equity bank offers insurance, micro mobile-loans, assists farmers access distribution networks, provides information on installation of solar systems, and disseminates tips on better yields and crops. One example of how Equity Bank helps is by providing financing so that customers can invest in *jiko-jikos (*small cooking stove using charcoal briquettes), which is more efficient than wood and biofuel, accounting for approximately 68% of the energy consumption. The bank is interested in eHealth and one service in its mobile banking universe is "My Life" which offers health advice and family oriented information. The Equity Group Foundation (EGF) was established in 2008 to serve as the social impact arm of Equity Group. Together with USAID in Kenya, EGF launched a network of outpatient health facilities called Equity Afia utilising Equity's Equitel mobile phone platform to disseminate free, useful and tailored health information to expectant women and their partners. Thereby increasing knowledge as well as addressing logistical barriers in preparing for safe deliveries and healthy child-rearing practices. In the next five years, EGF expects to support nearly 3 million Kenyans, particularly those living in peri-urban and rural areas, with a focus on HIV/AIDS and maternal care. Part of this initiative will utilise eHealth to reach remote patients in a hub-and-spokes model increasing healthcare and health insurance literacy across Kenya through social media marketing campaigns with specific activities aimed at outreach workers.

SAFARICOM

***SANDRA OJIAMBO* – HEAD OF CORPORATE RESPONSIBILITY**

Safaricom is Kenya's leading telecom company with over 29.5m mobile subscribers. It is by far the largest stakeholder when it comes to eHealth initiatives in Kenya. The M-pesa (m - for mobile, pesa means money in Swahili) mobile money transfer system built on Safaricom's platform is a vastly important economic motor. It functions like PayPal but without the need for a smartphone or a bank account and is the first mobile money platform in Africa. M-pesa runs like a nerve system through the country enabling savings, payments and businesses reaching even the poorest. The platform is used to transfer/wire money, to pay for food, to gamble on sporting events and to pay for health services. But more importantly this has opened up the possibility for poor people to invest in tools to increase productivity, start microenterprises and invest in education and health. According to an article in Science 2016[12], M-pesa has greatly influenced Kenya's economy, reducing poverty by 2% and enabling 185,000 people to move away from subsistence farming to business and sales. The number is most likely higher today.

Mobile money has transformed Kenya. It has the potential to similarly benefit the rest of sub-Saharan Africa. However the charge per transactions is still rather high for the poorest. Safaricom has a strong interest in eHealth and is running several projects concurrently. The company works with community health workers by providing updates on information and health guidance, some are SMS-based. In addition, community health workers receive education via " eLearning" with updates, information and health guidance. The eLearning platform is called HELP.

Some of its initiatives have failed, for instance one project by Safaricom to increase health insurance among the poorest, called “Linda Jamaa” (protect families in Swahili). The project was ultimately unsuccessful since the lower end user is very hesitant to spend money on insurances, but it provided a good learning lesson. Another positive initiative “Jamii Smart” (smart families in Swahili) is a mHealth platform with several stakeholders including the Kenyan Ministry of Health, World Vision, Safaricom, and Aga Khan University. Jamii Smart's goal is to establish mHealth for new mothers, new-borns and children under 5 on a national level. It is a mobile based platform which sends alerts and reminders to mothers and health workers about clinic visits, expected day of delivery, immunizations and other necessary information. The clinic module serves as eHealth records. In addition, it provides real time cloud based reporting on mother and child health indicators through integration with the Ministry’s District Health Information System. The program is designed to get demographic and household data, collected by community health workers as they run routine checks on clean water, malnourishment etc. Jamii Smart is being piloted in several counties and there are plans to roll it out nationwide.

Ms. Ojiambo says “Connectivity is not the hurdle! To date there are many online services. But solution is universal healthcare with skilled providers. The challenge is to get people into health systems – then digitalising.” A project she is optimistic about is M-TIBA, a health payment solution in collaboration with CarePay (see next page). This is a health e-wallet that connects provider, payer and insurer. It also offers micro loans to both users and providers.

TUNDRA FONDER

A SMART SOULUTION

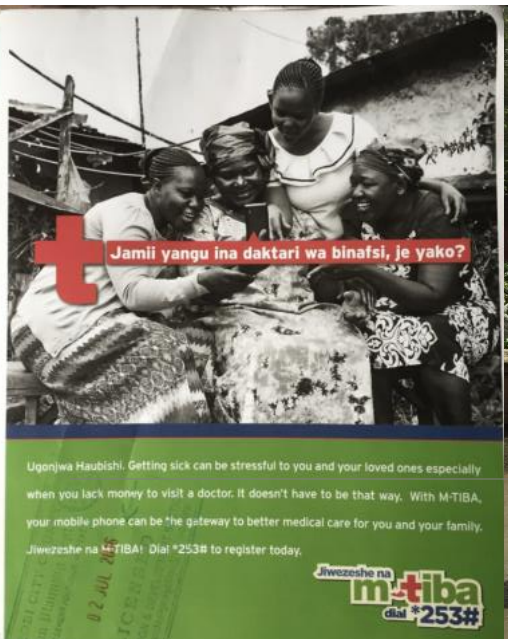
MEETING CARE PAY

MOSES KURIA **- FINANCE DIRECTOR**

MAARTEN RAS **- COMMERCIAL DIRECTOR**

CarePay is a Kenyan company that has developed a platform which administers conditional healthcare payments between funders, patients and healthcare providers. Together with PharmAccess and Safaricom, they launched an eHealth wallet in 2015 named M-TIBA (mobile treatment in Swahili).

M-TIBA is a mobile health-wallet, which allows users to save money for their own use and for others to use at accredited service providers/clinics. To date there are over 500 clinics (private) connected to this network and over 900,000 users. Numbers are growing rapidly, says Maarten Ras. With the mobile health wallet the users can save very small amounts towards healthcare, with no minimum limit, effectively targeting lower end users. Money stored in M-TIBA can only be used to pay for treatments and medications at registered clinics and hospitals enforcing much needed transparency among service providers. Besides the clear benefit for the user, the providers/clinics get a cost effective tool with real time data management. Less resourced clinics benefit from connectivity, updated patient registry and record keeping. Providers can get loans based on their patient statistics. Many small and medium-sized clinics in sub-Saharan Africa often lack a credit history, adequate bookkeeping and financial performance records. Consequently they are often unable to secure bank loans and struggle to find money to purchase modern equipment. Another smart option is the "Donor Fund Management" where donors and governments can distribute health benefits efficiently and securely to select populations. Funds can be channelled directly to the M-TIBA health wallet of beneficiaries. These beneficiaries are only able to utilise funds at accredited M-TIBA outlets for pre-agreed services at pre-agreed prices, minimising the risk of corruption.
CarePay is compliant with the European General Data Protection Regulation (GDPR), and hence subject to strong privacy regulations, audited by KPMG. Medical data is only shared with approved insurance companies. This versatile and promising platform is currently being piloted in Tanzania and Nigeria.



AGA KHAN DEVELOPMENT NETWORK EHEALTH RESOURCE CENTRE

***DR. SALEEM SAYANI* - DIRECTOR**

The Aga Khan Development Network (AKND) runs a vast array of programs in Africa and Central- and South-Asia. In Kenya the Aga Khan Health Services operates with high-quality ISO 9001 certified private hospitals in Mombasa and Kisumu. The Aga Khan University Hospital in Nairobi is a 280-bed tertiary and teaching hospital. It is not-for-profit but financially self-sustaining and was the first hospital in East and Central Africa to receive Joint Commission International accreditation. In other words, the only hospital compliant with Western standards in Kenya.

AKDN's health facilities in Kenya record more than 900,000 patient visits annually. AKDN also operates more than 60 health outreach centers that are closely linked to the three hospitals in a hub and spokes model. AKDN is anchored in the community through community health workers who in turn are connected and referred to the nearest first level healthcare facility (dispensary), health centers, sub-county and county hospitals, and finally to the secondary and tertiary hospitals in Mombasa, Kisumu and Nairobi. They are connected, as appropriate, by referrals, eHealth and telemedicine.

AKDN's health outreach centres utilise eHealth by connecting remote outreach health centers with the Mombasa and Kisumo clusters.

A new project in the offing is eLearning based to connect physicians in remote areas. By law Kenya requires clinicians to take at least 50 educational hours per year to keep their licenses, most clinical staff pays for their own time. The Aga Khan Education Services is planning to roll out an eLearning platform for their clinical staff. This will be a live web based forum, where clinical staff can meet and discuss medical topics. They also intend to invite staff from public hospitals for free in this eLearning initiative. This is in line with AKDN's vision: to build and boost the country's own capacity.

AKDN's work finds greatest traction through Public-Private Partnerships and works closely with the Kenyan Ministry of Health. They inform officials from the Ministry of Health on health indicators and needs.

THE AGA KHAN UNIVERSITY

WELCOME TO KIBERA

In order to find out more about the end user I spent a day in Kibera, an informal settlement in Nairobi. It is likely to be the largest slum in Africa, but there are no good official censuses and the population ranges from 200 000 -1 000 000 depending on source. *The Map Kibera Project*[13] seems the most trustworthy, predicting approximately 250 000 inhabitants as of 2009, a number that is likely to have increased a decade later. Kibera reminds of the favelas in Brazil with tin sheds and "borrowed" electricity, leaky water pipes and endless plies of trash. But at the same time this is home to many poor people, and constitutes a safety network with lots of compassion. It is like a self-sustained universe with small informal businesses like hair dresses, restaurants, tailors, mechanics, print services and artists. A lot of people work up the hill in the mid/high income neighborhoods residing close by. Never the less, many residents live under the poverty line, without health insurance, fearing the economic burden of an accident or disease. I had the opportunity to be guided by three gentlemen living in Kibera; Peter, David and Kevin. They are enthusiastically chatting in flawless English, and we started with a lunch at their favorite restaurant in Kibera. They are still annoyed that Madonna, who once visited Kibera, claimed that they drink sewage water, Peter says: "We are poor, not idiots!". Afterwards they walk me thru the small dirt roads, passing by a common shower facility (10 KSH), numerous M-pesa shacks, schools and community centers as well as small health clinics. We notice lot of curious faces an giggles as we pass by, both because I am a *mzungu* (a white person) but also because we are accompanied by Franco, a celebrity from the band *Dandora Music,* who recently recorded a video here in Kibera. None of the three young men have a smart phone, but one of them borrows his girlfriend's phone that she received from her work at an NGO organized community center. I get to visit their homes; it is cozy, well organized with a bed, a small TV, a cooking stow - all fitted in one room measuring 2.5x2.5m. I even get to hold David's newborn daughter, and sadly get to know that both the other guys have experience of loosing a baby. Even though maternal care is for free, one of the mothers payed 20000KSH ($200) for a cesarean section. Universal health care seems far away.

At the end of the visit I get to meet with two local clinics, one is the Ushirika medical clinic and maternity services, where I speak to the Facility in Charge. The small clinic offers basic medical aid including a delivery ward for the people in the Kibera slum quarters. Discussing eHealth, he tells me that he has experience of eHealth applications like WellTel, utilizing text reminders for medicine compliance to patients with HIV. His impression was that it was not structured as good and too time consuming. Systems needs to be more automated, currently staff needs to key in the messages themselves which is hard with long line of patients waiting.

The doctor tells me about KMRI – Kibera Medical Record Initiative, an electronic health records system connecting several care centers in Kibera. "*Great idea but not functional and one problem is that the developer is in Canada and not local. It is not possible with long line of patients to fix bugs later! Internet and power is not reliable and that causes problem too!*" I show him the M-TIBA brochure, and tell him about the small savings towards health care. With a tired smile he tells me that he is optimistic about M-TIBA!

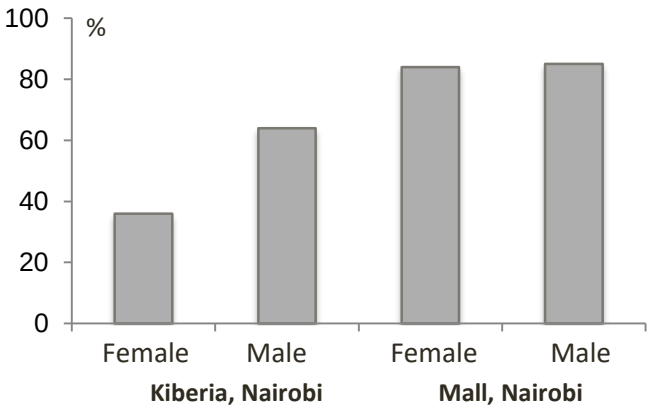
SURVEY

In order to get a broader and more systematic understanding of the users'/patients' opinions on eHealth/mHealth; we decided to conduct a small survey in Kibera and in a mid-income setting in Nairobi. The latter was conducted in two shopping malls, The Point and BuruBuru, east of the city center. In an attempt to engage and boost the three Kibera locals we asked if they were interested to volunteer to carry out the survey. Equipped with three smart phones and new m-tiba health wallets, for health insurance, they took on the task.

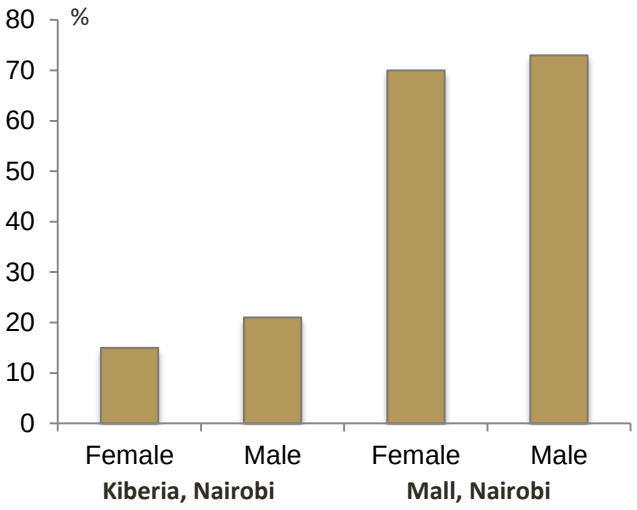
SURVEY DETAILS

The survey was created using the Artologik Survey&Report tool Version 4.2, and comprises eight questions concerning demographics and mHealth. This is to be interpreted as a small qualitative pilot study, utilizing an electronic survey to collect data. The sample size comprise in total 243 respondents, with 103 persons in Kibera (61 females, 42 males) and 140 in the two malls (67 females, 73 males). Out of the respondents in Kibera, 41% were under the age of 30, whereas in the two malls 55% were 30 years or younger, both samples displaying an even distribution between females and males.

Individuals with own smart phone



Individuals covered by National Health Insurance Fund



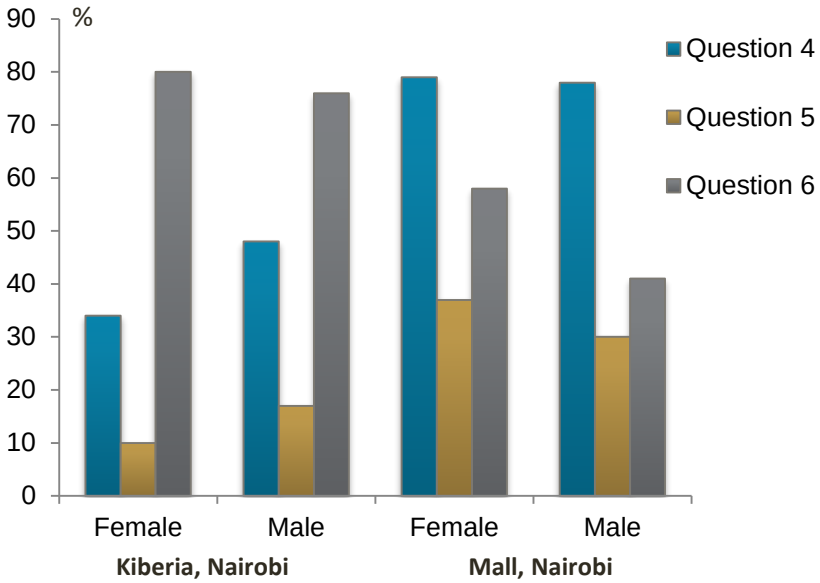
The number of individuals reporting that they have their own smart phone showed differences between the groups. In Kibera only 36% of females had their own smart phone, as compared to 84% of females in the malls. In Kibera there was also a marked difference between females and males; with 64% of males stating that they hade their own smart phone. There was no difference between sexes in the two malls (see Table to the left above).

The table to the right above visualises differences in National Health Insurance Fund (NHIF) coverage. In Kibera, only 15% of women were covered by the NHIF and 21% of males. Corresponding numbers for the two malls were 70 and 73% respectively.

SURVEY - CONTINUED

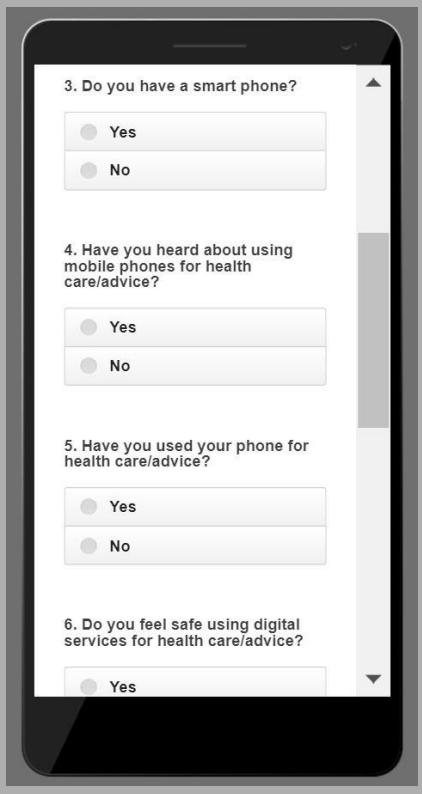
The table below displays answers for the three questions referring to the use of mobile phones for health. The questions if interview subjects have heard about using their phones for health care, if they have ever tried using their phone for this and if they feel safe using digital services for health.

It is hardly surprising to find that the proportion of both female and males that had heard of mobile phones for health services was lower in the poorer area of Kibera. The number of females that had knowledge on how phones can be used for health almost reached 35% in Kibera, compared to 79% in the malls. More males than females in Kibera had heard about these services (48%), but few had actually tried them (10 resp. 17%). In the malls 37% of females and 30% of males hade tried mobile health solutions.



An interesting finding from the survey was about trust in mobile health applications. 80% of females in Kibera stated that they feel safe using digital devices for health care and advice, and almost as high rate among males (76%). In the malls the number of females that felt they would be safe with digital health care only reached 58% and for males even lower (41%).

Only 13% of females in Kibera had heard of the Sustainable Development Goals (SDGs) and 21% of males. In the more affluent areas 49% of females and 37% of males recognized the colourful icons describing the SDGs.



SURVEY QUESTIONS

1. Are you a woman or a man?
2. Are you over 30 years old?
3. Do you have a smart phone?
4. Have you heard about using mobile phones for health care/advice?
5. Have you used your phone for health care/advice?
6. Do you feel safe using digital services for health care/advice?
7. Are you covered by the NHIF (National Health Insurance Fund)?
8. Have you heard about the UN Sustainable Development Goals (SDGs)?

CONCLUDING REMARKS

In addition to above mentioned initiatives there are an endless amount of programs and not the least health applications. These include information on health care providers, health information, call-a-doctor, e-pharmacies and more. The privacy policies are in general poor and the new mHealth policies needs to be implemented. In addition larger eHealth initiatives need to be endorsed by the ministry of health to increase variety and have an economic driving force to ensure sustainability. The Ministry of Health's current focus to reach "universal health care" depends on public-private partnerships and e-Health solutions to reach the poorest and rural population. In general the initiatives need to have local developers, to facilitate support but also in order to stimulate the local growth of the economy and education. Finally eHealth initiatives drives transparency which is much needed in this region, with corrupt doctors, unfair pricing and fake medicines. The mobile phone is likely one of the biggest equalizer in Africa and offers a unique role to tackle the UN sustainable development goals.

KEY IMPRESSIONS

- Africa's shortage of health professionals is driving development in eHealth.
- eHealth initiatives need to be endorsed by the Ministry of Health and have an economic driving force.
- The new mHealth policy is important to create sustainable initiatives and implement data protection.
- Majority of initiatives is on HIV and maternal/child care, little focus on chronic diseases.
- M-pesa is key in expanding initiatives nationwide. But too expensive charges!
- Health insurance is not very popular among the poorest but NHIF is part of government's solution to universal health care.
- The M-TIBA eHealth wallet may be a good solution to increase insurance to reach universal health care.
- Local developers are needed. This is important for support and growth of the economy.
- Important to consider gender differences and socioeconomic status in smartphone usage when designing projects.
- Transparency is needed and gained with eHealth – a fight against corruption.

REFERENCES

1. United Nations. The Sustainable Developmental Goals. https://bit.ly/2jHjQmD
2. The World Bank. World Bank. *The Changing Wealth of Nations.* (2017). https://bit.ly/2BG9Dz7
3. Internet Worlds Stats – Usage and Population statistics. (2017) https://bit.ly/2GV1RQh
4. Standard Digital "Smartphone usage drives Kenya's Internet penetration," March 17, 2018. https://bit.ly/2FXFaeF
5. Business Daily Africa. "Kenya tops in internet traffic globally," March 20, 2018. https://bit.ly/2GAwr6u
6. World Bank Group. 17th edition of the Kenya Economic Update, (2018). https://bit.ly/2qnSQsq
7. United Nations Population Funds, UNFPA, (2017). https://bit.ly/2LxbGX9
8. Njoroge M, Zurovac D, Ogare EA, Chuma J & Kirigia D. (2017). Assessing the feasibility of eHealth and mHealth: A systematic review and analysis of initiatives implemented in Kenya. *BMC Res Notes,* doi. 10.1186/s13104-017-2416-0
9. International Development Research Center (IDRC), Developing eHealth policies for greater equity in Kenya (2018). https://bit.ly/2JlBWHt
10. Trevor Lewis et al., E-health in low- and middle-income countries: findings from the Center for Health Market Innovations, Bull World Health Organ 2012;90:332–340
11. Kenya Standards and Guidelines for mHealth Systems (2017). https://bit.ly/2JEGQ1q
12. Suri T. and Jack W. The long-run poverty and gender impacts of mobile money. Science. 2016 Dec 9;354(6317):1288-1292
13. The map Kibera project (2009). https://bit.ly/2kU1SLD

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