

Africa Regional Meeting on Digital Health for Overcoming Barriers to Ending Preventable Child and Maternal Deaths and Achieving Universal Health Coverage

Meeting Report



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Health
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African Strategies for Health (ASH) is a five-year project funded by the United States Agency for International Development (USAID) and implemented by Management Sciences for Health (MSH). ASH works to improve the health status of populations across Africa through identifying and advocating for best practices, enhancing technical capacity, and engaging African regional institutions to address health issues in a sustainable manner. ASH provides information on trends and developments on the continent to USAID and other development partners to enhance decision-making regarding investments in health.

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Overview



Participants
Over 150

Countries represented
8

Angola | Kenya | Madagascar | Malawi

Niger | Nigeria | Senegal | Uganda

**Donor & Regional
Organizations**

CHAI | NORAD | USAID | UNICEF
UN Foundation | WAHO | WHO

Partnerships across the
public and private sectors
are key to scaling digital
health

Africa's rapid expansion of information and communications systems, coupled with an increase in access to mobile technology, has set the stage for new and innovative approaches in health service delivery and financing. A simultaneous focus on achieving universal health coverage (UHC) and growing interest from the private sector in developing and scaling up the application of new technologies for improved health, has opened opportunities for successful public-private partnerships in digital health. Early stage, small-scale pilot projects in digital health taking place across the continent have given way to broader expansion, increased attention to interoperability, and a greater understanding of the role that governments and private sector partners have in enabling a digital health ecosystem.

From May 12-15th 2015, over 150 government, private sector, and donor participants came together in Lilongwe, Malawi at the “Africa Regional Meeting on Digital Health for Overcoming Barriers to Ending Preventable Child and Maternal Deaths and Achieving Universal Health Coverage” to exchange ideas and information on how to adopt and expand digital health technology. Co-hosted in collaboration with the Government of Malawi by the United States Agency for International Development (USAID) and the United Nations Foundation (UNF), the meeting brought together country teams led by government representatives with a goal of strengthening and expanding opportunities for public-private partnerships in digital health across Africa. The event achieved **unprecedented participation by the private sector**.

Meeting Objectives

- Provide space for countries to share lessons from leading programs using digital technologies to improve reproductive, maternal, newborn and child health.
- Share the latest developments in mobile technology through state of the art presentations from the private sector and from key organizations working in digital health in Africa.
- Facilitate the development of partnership skills to enable more effective working relationships across the public and private sectors.
- Bring the private sector and public sector together to discuss partnership opportunities.

Welcome and Introduction

Noting the great potential for mHealth across Africa, Mission Director of USAID/Malawi, Doug Arbuckle, welcomed and encouraged attendees to engage in dynamic discussions on the implementation of strong public-private partnerships aimed at expanding the access and reach of successful digital health programs. The Malawi Ministry of Health highlighted opportunities for mobile technology to play a critical role post the Millennium Development Goals. At the policy level, countries continue to make progress in enabling digital health solutions through national eHealth and information, communication and technology (ICT) policies.

USAID's Africa Bureau Senior Health Advisor, Ishrat Husain, noted that the path to this meeting in Lilongwe began in Kigali in 2010. The third in a series convened on mobile technology applications for health and family planning¹, these meetings provided a platform for country teams to discuss common problems and collaborate on local solutions, using expertise and wisdom from participants in the room. Africa is home to rapidly expanding technology innovations. Progress in digital technology for health must include four "C's": country commitment, conditions conducive for private sector engagement, community focus, and cost effective interventions.

Key areas of interest and highlights from the event

- Digital finance for health has grown rapidly in Africa and remains a large area of opportunity.
- Digital health tools exist and new tools are emerging with the potential to strengthen various aspects of health systems and advance efforts to achieve UHC.
- Interoperability is critical to make data available for decision-makers.
- Public-private partnerships are needed and can be attained with focused commitment from stakeholders.
- Governments have facilitated the growth of digital health technology, but accelerated action is needed to scale up innovations that improve health and save lives.

Country Updates on Use of Digital Health Technologies:

Progress and experiences since the November 2013 meeting in Ethiopia

Over the course of the meeting, country teams shared their progress, challenges, and experiences related to the adoption and expansion of digital health in their countries.²

Angola - developing a framework and legislation for the expansion of digital health

The Angolan government has invested in mobile communications development. Access remains a challenge in rural areas – where only 28% of families have access to a mobile network, compared to 91% in urban areas. Angola recently commissioned an analysis of business opportunities in mobile health, included an ICT for health project in the national health development plan, and passed legislation to protect data and create a framework for electronic communications and information services.

Kenya – supporting innovative solutions and successful public-private partnerships

The government of Kenya actively supports digital health and e-governance, with an eHealth strategy and a national

mHealth task force. A number of enabling factors have encouraged growth in mobile applications including the establishment of innovation centers, government investment in increasing internet bandwidth, robust e-commerce and e-banking markets, increased use of ICT in education, and high access to and use of mobile phones.

Kenya succeeded in implementing its national health information system (HIS) policy through strong partnerships between the government, private sector, development partners, and research and training institutions. The country's partnership model allowed growth and strengthening of HIS, and increased ownership and support for the development of local ICT capacity through Kenyan higher education institutions.

¹"Using Mobile Technology to Improve Family Planning and Health Programs" was held in Dar es Salaam, Tanzania in November 2012. "Scaling Up Mobile Technology Applications for Accelerating Progress on Ending Preventable Maternal and Child Deaths" held November 2013 in Addis Ababa, Ethiopia. Reports from the proceedings at these regional meetings are available on the ASH project website at: www.africanstrategies4health.org/.

²While frequently used interchangeably, mHealth or mobile health is generally seen as a component of digital health/electronic health (eHealth), the use of information and communication technologies (ICT) for health. "mHealth is generally understood as medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices." WHO Global Observatory for eHealth. 2011.

Country Updates on Use of Digital Health Technologies

Madagascar – adopting digital health to strengthen key components of the health system

In Madagascar, a number of digital health programs are in place including community level e-reporting, mobile money payment systems, and voice and SMS information services for a range of health and development issues. Real-time disease surveillance programs have been operated to monitor death and disease and prevent health commodity stock outs. A village phone project was used to extend network availability in rural areas, while solar energy and phone power banks were utilized to address limited electrification.

Utilize technology to strengthen existing processes in the health system

Malawi – rapid progress in developing a supportive digital health policy

During the two years since the Addis Ababa meeting, Malawi adopted a national ICT policy and moved forward in operationalizing HIS and eHealth strategies. The country held a national ICT innovation fair targeting the health sector, and organizes quarterly mHealth stakeholder meetings. Malawi has adopted a number of mHealth applications that have contributed to improved access and quality of service delivery. However, a number of challenges were identified including: a lack of standards and guidelines for deployment and interoperability; implementation limited to small-scale projects, mostly driven by implementing partners; a low mobile phone penetration rate at approximately 35%; and one of the highest tariffs on mobile services in Africa.

Niger – partnering to launch new mHealth platform

Niger is one of the participating countries in the launch phase of a new public private partnership program with Orange and USAID to create a platform for reproductive health and family planning in West Africa. Planned next steps for Niger include conducting a needs assessment, establishing a national working group, and developing a sustainable financial plan for the design, testing and deployment of the digital health platform.

Nigeria – using mobile technology to strengthen a range of health system components

With over two-thirds of Africa's most populous country having a mobile phone subscription, Nigeria holds large potential to expand mobile health applications. Government buy-in and political will has been essential for

the roll out of a number of initiatives. The MAMA Nigeria program is designed to increase the uptake of maternal, newborn and child health (MNCH) services through the delivery of targeted messages by SMS. Furthermore, mobile phones are also being used to increase enrolment in Nigeria's National Health Insurance Scheme with a pilot test of an SMS-based system that uses existing data from the national Communications Commission and Identity Management Commission. Mobile biometric devices are used to capture enrollee data, which are aggregated to a mobile health information exchange.

The Ministry of Health and Ministry of Communication Technology are developing a National Health ICT Strategic Framework; the review process is currently underway as the plans for operationalization are finalized.

Rwanda – scaling up digital health solutions

In Rwanda, three major digital health systems are being implemented. The first, Rapid SMS, empowers community health workers with the mobile platform to improve maternal and child health. The second, Rwanda's Health Management Information System (HMIS), aggregates data for improved decision-making. The electronic medical record system – Rwanda Health Information Exchange (RHIE) – creates an interoperability layer, sharing information between various points in the health system. Patients are currently registered into the system at hospitals with plans for roll-out to other facilities.

Senegal – improving access to maternal and child health services

In Senegal, a money transfer program was used to improve MCH in difficult-to-reach areas. The program reimbursed transportation costs in addition to providing incentives for women to seek pre- and post-natal care and other services such as childhood immunizations. The Ministry of Health is in the process of developing an eHealth strategy.

Uganda – streamlining scale up of digital health technology

After an inventory found over 100 independent digital health initiatives in the country, the government of Uganda elected to place a hold on new mHealth programs. This allowed the government to define and implement a framework and criteria for new initiatives that focus on sustainability, encourage cooperation, and avoid duplication. The government led the implementation of mTrac – a SMS-based monitoring system that collects data submitted by health workers for surveillance reporting of deaths and disease, case management, and selected medicines. The mTrac program earned support in part because it had a clear strategy for national scale up with limited recurrent costs.

Quotes From the Presenters

A conducive environment is a critical component – and this can only be done by the government....The private sector can plan an important role in taking innovations to scale.... Partners must come together to create a common language and define a common goal. Let us save lives with a commitment to equity. – [Haitham El-noush, NORAD](#)

Have sustainability in mind from the beginning. Ensure activities are aligned with country goals. – [Kyle Moss, Qualcomm Wireless Reach](#)

A determining factor [in choosing programs to partner with] is if it can be upscaled at the national level. – [Ralph Ankri, Orange](#)

A focus on constant advocacy, finding the right partners, and bravery on the part of the ministry to move forward with a national program. – [Debbie Rogers, Praekelt Foundation](#) on how MomConnect was able to scale nationally in South Africa

I've seen the rise of a new type of private sector partners, social entrepreneurs who want to introduce a disruptive technology and change the world with something they're building in their garage. Smaller, more agile forward-thinking entrepreneurs who are out there, so think of them too. – [Bobby Jefferson, Futures Group](#)



Presentations on the state of the art, panel sessions, and discussion focused around the session topics below. A detailed agenda including speakers and presentation subjects is in Annex 1.

Digital Health Tools for Frontline Health Workers

Improving the skills and performance of frontline health workers is critical to eliminating preventable child and maternal deaths.

Mobile Training and Support

In Nigeria, a mobile phone-based service delivery training program, mTrain, provides training and supervision of healthcare workers. Another digital health program, CliniPAK, is being implemented in Nigeria through a public-private partnership to capture patient information and provide data for decision-making. The real-time data-sharing program can be used in emergency disease surveillance. For example, in a recent situation with deaths from unexplained causes, use of the real-time data-sharing system allowed identification of methanol-contaminated alcohol as the culprit, and quick action to reduce fatalities. In Rwanda, a mobile tool is being used by community health workers to track care of pregnant women and newborns.

Implementation Recommendations

The talk-show style discussion provided advice from the panelists on implementing digital health tools. Dimagi reminded the participants that digital tools should not be initiated without training and support, and that programs should have a project manager dedicated to conducting the necessary work to execute the program. Additionally, when considering open source versus proprietary software, associated fees should be evaluated as a potential barrier to implementation. The USAID Maternal Child Survival Project has learned through its frontline mHealth experience the importance of building the capacity of health workers at all levels to use data for decision-making. Medic Mobile discussed the importance of knowing who owns the data which will be generated from a program, how that information can be accessed, and if the program will have to pay additionally to access the data. Medic Mobile also noted the importance of systems which can work both on and offline, so that poor network connectivity will not interrupt use of the program. Train-the-trainer style programs can promote

decentralization of learning and expertise in new digital health programs among frontline health workers.

Digital Data for Decision-making and Results Monitoring

Digital Tools and Opportunities for Strengthening Decision-making throughout the Health System

A session on best practices in digital data for decision-making stimulated discussion on state-of-the-art tools and projects that catalyze effective coverage, affordability, measurement and accountability to achieve UHC. There is a need for an interoperability layer – data coming to the facility level should feed into the District Health Information Software (DHIS2)³ and other information systems. USAID discussed lessons learned on the use of digital technology in the response to the Ebola crisis. It emphasized the importance of stakeholder coordination and using existing data and ICT systems in a country if possible rather than introducing new systems. Bluesquare explained how results-based financing (RBF) systems can generate high-value data for multiple uses including better decision-making. Four ways to enhance the use of data were cited: 1) open data and transparency, 2) web data visualization, 3) benchmarking, and 4) targeted automated emails and SMS. Jembi emphasized the importance of integrating open source health information platforms. The Open Health Information Exchange Platform (OpenHIE), a community of practice that promotes sharing health data across many software products, can be a useful resource.

“Where should we start?”

In response to participant questions on where to begin, panelists noted that there are a lot of resources available to organizations and countries new to mHealth. Jembi recommended starting with “low-hanging fruit” to get results quickly but without taking shortcuts. Bluesquare suggested beginning with a web-based HMIS system, then focusing on interoperability to connect other systems. It is easier to begin with aggregated data rather than patient-level information due to privacy concerns.

³ DHIS2 is an open source software platform for the collection, management, and analysis of health program data. The platform is developed by a global team coordinated by the University of Oslo. Additional information can be found at www.dhis2.org.

Digital Data for Decision-making and Results Monitoring, cont.

Bluesquare also suggested that countries should have a single unique identification code for health care providers to better facilitate interoperability and sharing data across systems. Linking with the open health information community provides additional resources to implement interoperable systems. At the country level, improved data aggregation involves first identifying what data would be useful to flow from one system to another.

“Does open source mean free?”

This question was discussed throughout the meeting. Panelists noted that open source tools should be considered carefully. This should include examining the implications of licensing terms, and planning the technical assistance required for implementation. It should not be assumed that open source must be better, rather, the specific needs and timeframe of a project should be examined to compare the pros and cons of creating a custom tool or using “off-the shelf” tools.

Mobile Money for Reproductive, Maternal, Newborn and Child Health

Mobile Money Making a Difference at the community level

Panelists in this session described programs which incorporate mobile money systems to improve MNCH care. In Zanzibar, D-tree designed a comprehensive program to address the three primary factors reducing the receipt of quality care at birth: the decision to seek care, the ability to reach skilled care, and the provision of adequate care at the facility. D-tree reported an increase in the percentage of facility-based deliveries from 35% to 75% and a doubling of post-partum follow-up rates after implementing a community health worker program using mobile money payments and a safer deliveries screening application.

In Kenya, Changamka found that savings programs alone do not provide a sufficient means of health care financing, as people are not able to save enough to cover treatment costs. From this lesson, Changamka developed

a program which converts from savings to microinsurance. Changamka’s e-voucher program aims to address the issue of uncovered transportation costs. A randomized control trial demonstrated that a combination of transportation and maternity vouchers increased facility-based deliveries by over 50% and also increased antenatal care attendance.

In Nigeria, SURE-P MCH piloted mobile money as a delivery platform for a conditional cash transfer program to increase demand for RMNCH services. The mobile money program addresses the two major challenges of the cash system: 1) long wait times for payment to beneficiaries, and 2) logistical issues with the transfer of large amounts of cash to pay out locations.

Overcoming the Challenges of Using Mobile Money

Panelists and participants detailed a number of the challenges and lessons learned in using mobile money systems. These challenges included: receiving limited financial reports from the mobile network operator (MNO), creating a system for tracking transactions, and too few pay points in rural areas to withdraw mobile money transfers. Recommendations from the speakers include early and continuous engagement with banks and MNOs, although negotiating on transaction costs may be limited with MNOs. Changamka noted the opportunity for government to create an enabling environment to encourage discussion among banks, mobile operators, and regulatory bodies.

Additionally, when introducing mobile money a health program, significant sensitization may be required to familiarize end users with mobile money, leading to implementation delays. National scale-up may also require negotiations with multiple mobile money providers to achieve program coverage across the country, and there may still be difficulty in ensuring availability of accessible mobile money agent locations for recipients to make cash withdrawals. Despite challenges, the opportunities for utilizing mobile money in health programs are great. D-tree noted the ultimate goal of moving entirely away from cash transfers to mobile money to prevent fraud.

⁴ Mobile money – a service in which the mobile phone is used to access financial services. GMSA Mobile Money Definitions. 2010.

Mobile Platforms for Enabling Health Insurance and UHC

Digital Technology for Rapid Expansion of Health Insurance

MicroEnsure identified four main barriers to health insurance uptake in Africa: the cost to the individual, trust, access, and understanding of how insurance works. In 2014, MicroEnsure began a partnership with mobile network operator Airtel to offer mHealth insurance to Airtel customers in 17 African countries through mobile registration. By the end of 2014, over 15.5 million individuals were enrolled. A challenge of the original automatic registration method was that MicroEnsure found for example that it had provided coverage for over 16% of Zambia's population, however many individuals were unaware that they had insurance. This experience led to the conclusion that individuals should have to "opt in" to activate coverage. As experience and trust with insurance increases, the willingness to pay for more comprehensive coverage will also grow.

Mobile Wallet Use Expanding

PharmAccess' Mobile Health Research Lab in Kenya collects real-time client behavior data and user feedback. Small test groups are deployed to test multiple prototypes of health finance models quickly. The mobile health wallet platform is being tested in a large-scale pilot (10,000 users and 44 clinics in Nairobi) to administer a voucher program for health care for children under 5 years of age. The mobile health wallet is envisioned as a platform to unify health payments for an individual into a single stream, thereby allowing stakeholders including government, donors, insurers, employers and individuals to contribute to health care financing under a single digital platform. Payments, including remittances or vouchers can flow from the mobile health wallet to pay insurance contributions to the government or another insurer, or to pay a health care provider or reimburse a client for a claim. The wallet can also be used in savings and credit transactions. PharmAccess reports that initial experience suggests benefits including reduced administration costs, much faster payments to providers, and access to real-time medical data from remote locations.

Participants shared perceptions about insurance in various countries which could hinder demand for coverage. These include the idea that insurance is for the rich, that someone will not get sick and therefore should not pay for insurance, or that someone will help out those who do get sick. Additionally, individuals need confidence in the quality of the health services which the insurance covers. Participants encourage greater engagement between public and private sector players on health insurance, including the private health insurers and health care providers, and more public sector investment in raising awareness of the benefits of insurance.

Strong partnerships are critical in making mHealth a success, including early involvement with the private sector.

Public-Private Partnerships for Accelerating Digital Health

Scaling Rapidly

The MomConnect program in South Africa has scaled rapidly, registering over 400,000 women in less than 10 months. It was designed to create demand for, and improve the supply of, maternal health services at a national scale. The program created a central pregnancy registry, SMS helpdesk and feedback platform, and targeted SMS messaging. One use of the data gathered has been to determine which facilities are facing challenges. The three factors which have made the program's success possible are: 1) constant advocacy with the government, 2) finding "best of breed partners" – those who could do the best work in their roles of the public-private partnership, and 3) commitment on the part of the Ministry of Health to put resources forward to launch a national program rather than small pilot projects.

Public-Private Partnerships for Accelerating Digital Health, cont.

Supporting Scalability

Qualcomm Wireless Reach partners with organizations which can demonstrate alignment with how Qualcomm technology can improve lives. Programs selected for grant funding involve collaborating stakeholders including a third party research organization; must be aligned with local needs and government policy goals, and must be scalable and sustainable after two to three years of funding. Qualcomm Wireless Reach also involves Qualcomm staff to contribute technical expertise to grantees, and is looking for partners which meet these requirements.

Integrating Services

The GSMA mNutrition Initiative identified the fragmentation of the mHealth market and proliferation of small-scale pilots as a challenge to overcome to use mobile services to improve child nutrition. The program, launched in 2013, aims to provide pregnant women and women with children in 10 Sub-Saharan African countries free access to a suite of health and nutrition services through a single access point on their phones. The goal is to improve sustainability and scale by reducing the overload of individual services to the consumer with an aggregated model. This is facilitated through GSMA engagement of the public and private sectors, provision of technical assistance, and advocacy of mHealth nutrition services.

Engaging Across Sectors

Lively discussion with the audience brought out a number of points to consider in public-private partnership management. Presenters noted the importance of early and ongoing conversations with MNOs, as they can bring additional perspectives and insight, such as prioritizing certain areas for increased network access. Ensuring early on that each stakeholder understands its role in the project and expectations from it, as well as having people with backgrounds from various sectors can also facilitate partnership management.

“You can’t continue doing the same things and expect different results.”

Partnership Development

Partnerships for Regional Integration

Orange Labs is focused on local and collaborative innovation to understand country needs and offer new services that contribute to a healthy and comfortable life for customers. Orange and USAID entered a partnership in late 2014 to create a framework for mHealth services – for healthcare workers and the public – which can be scaled and replicated in countries across Africa. Orange is working in mHealth public private partnerships in Senegal and with local stakeholders in Niger, Sierra Leone, and Cameroon to integrate regional mHealth platforms and Orange mobile networks. Orange Labs is using existing technologies and conducting development research on regional platforms to quickly replicate mHealth projects and create sustainable business models. In response to an audience question on whether an MNO would work with an application that was developed or used by another network, Orange shared that the determining factor in choosing partners is if the program can be scaled up to the national level.

Developing the Next Health Innovations

BD Technologies develops early stage technologies and presented supply chain innovations that could reduce the time it takes to receive diagnostic results and improve access to testing. Examples include the use of unmanned aerial vehicles (UAVs) flying preprogrammed routes to hard-to-reach locations similar to their existing use in humanitarian relief efforts; smart RFID labels which could be used for temperature monitoring along the supply chain; as well as smart delivery devices to collect, analyze, and transmit information in vaccine or insulin delivery.

Partnership Development, cont.

Partnering to Expand Insurance Coverage

PharmAccess provides health insurance and improves quality of health care delivered to informal groups in Africa. After attempting to scale up a private health microinsurance initiative with coffee cooperatives in Tanzania, PharmAccess initiated a public private partnership with the National Health Insurance Fund (NHIF). The partnership merged district-level Community Health Funds (CHFs) – which provide insurance to informal sector households managed by the NHIF – with the PharmAccess plan and implemented changes to address supply and demand side challenges. The merged plan allows access to a network of public and private providers (CHFs only allow access to public providers). All contracted providers are being supported to meet quality standards. A 14-day waiting period has been introduced to reduce adverse selection observed when clients were allowed to enroll when being admitted to hospital. As per Tanzanian law, half of the USD 25 annual premium is subsidized by the government.

PharmAccess noted that an important driver of demand is the perceived quality of health services. They found that approximately 70% of their clients are choosing private providers. Challenges persist with medicine stock outs at public facilities and generally to inculcate a culture of accountability and quality with providers. PharmAccess is experimenting with payment mechanisms such as capitation or contracting with private pharmacies to mitigate this problem.

Costing Digital Health Interventions

Lungi Okoko from the USAID Global Development Lab and Bobby Jefferson, Director of the Center for Development Informatics at Futures Group, led an informal lunch session on costing digital health programs. The facilitators of the discussion and event participants highlighted a number of choices to be considered and points to keep in mind when planning digital health program implementation:

- Free and open-source (FOSS) versus proprietary software – experts suggest leaning towards open source software with the understanding that off-the-shelf proprietary software is sometimes needed. Remember that free software does not mean free software deployment. Use of FOSS will likely still require costs for training, consultant time, IT infrastructure and equipment, server hosting, etc.
- Consider initial development versus recurrent costs. Training is frequently the largest cost
- It is important to consider the cost of data transfer, and whether it can be negotiated down with the MNO.
- Deciding between basic or feature phones – including tradeoffs in replacement costs and functionality.
- Additional considerations include: staff time for the project manager, software development, as well as potential legal fees for negotiating with mobile network operators.

Highlighted Tools and Resources Available on Costing (Annex 4)

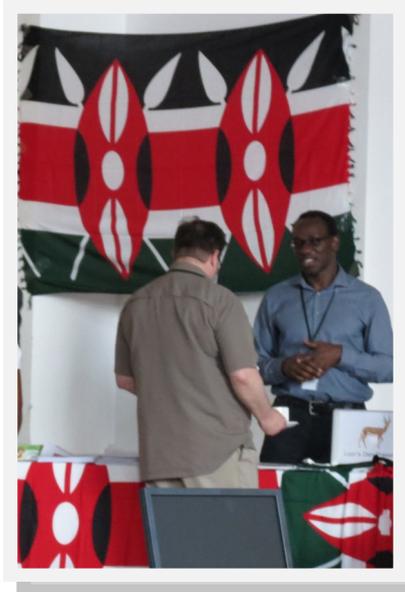
Interactive and Participatory Discussion

Across countries and sectors

Sessions were designed to facilitate interaction and provide space for participants to learn from other's experiences throughout the four-day meeting. These included a number of small-group learning activities for public and private sector attendees, a Gallery Walk, "Matchmaking" session, and a "Lion's Den" competition, featured below.

Gallery Walk

Country teams and digital health implementers showcased their use of technology for health and connected through one-on-one discussion across countries and sectors at the Gallery Walk presentation booths.



Nigeria and Medic Mobile were chosen by participants to receive awards for Best Gallery Walk Booths.



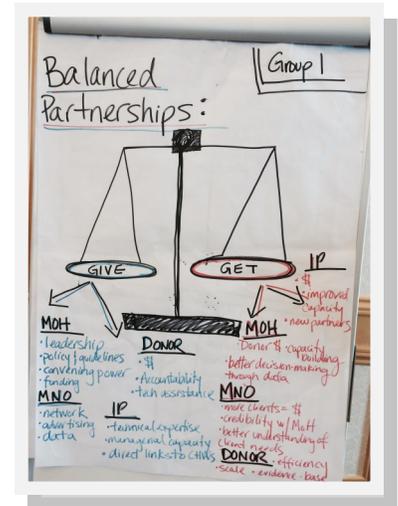
Matchmaking

A session was designed where private sector participants could schedule one-on-one time with country teams to discuss opportunities for future collaboration. During the closing session, many country teams reported plans to continue discussions with private sector partners.

Examples of Public-Private Matchmaking	
BD Technologies	Kenya, Malawi, Senegal, and Uganda
Dimagi	Angola and Uganda
Orange	Niger and Senegal
Jembi	Kenya and Rwanda
PharmAccess	Kenya and Nigeria
GSM	Malawi, Nigeria, Rwanda, and Uganda

Public-Private Partnership Case Studies

Small groups of public and private sector stakeholders participated in interactive small group sessions. Groups worked through an example digital health implementation scenario and potential problems, as well as discussed and reported out the benefits and opportunities for each party in a public-private digital health partnership.



Lion's Den

The “Lion’s Den” Pitch Competition presented a unique opportunity to showcase young entrepreneurs in health technology. Innovators, or ‘gazelles’, included (1) grantees from the Every Woman, Every Child Innovation Working Group (IWG) catalytic mHealth grants program hosted at the UN Foundation and (2) local Malawian organizations, who pitched their project ideas and received feedback from judges (the ‘lions’) with experience in digital health innovation. The lions represented organizations such as the Malawi Ministry of Health, GSMA, and USAID. The presenters had five minutes to articulate the value proposition of their innovative approach to solving a problem, detail the business model, and what is needed to achieve their goals. WAHA International, Village Reach, and KEMRI received presentation awards.

Baobab Health Trust Proposed an automated notification system to transfer lab results to technicians, reducing delays in notification and treatment.



KEMRI described an interactive two-way messaging system solution for postpartum follow-up on the prevention of mother-to-child transmission of HIV (PMTCT).

MAMA Nigeria discussed a program utilizing voice and SMS to generate demand for maternal health care through targeted messaging to women, husbands, community health workers and others.



MEDIC MOBILE

Medic Mobile presented on a free downloadable software available for frontline health workers to assist in antenatal care coordination.

mHub – Malawi’s first technology hub – nurturing and developing entrepreneurs to support homegrown technology solutions.



Addressing human resource constraints, limited infrastructure and information availability through a call-in health center.

WAHA International presented comprehensive referral network with motorbike ambulance service to increase access to and management of maternal care.



Knowledge Café: Strengthening Regional Programs to Accelerate Digital Health in Countries

Participants rotated through stations in small groups with the following discussants who shared information about their organization's role in mHealth or eHealth.

Participants were able to ask questions and discuss how these organizations could support them in their own work in digital health.

Sani Ali, WAHO

The West Africa Health Organization (WAHO) is a regional body with 15 member states in the region. While WAHO does not work directly in mobile health, it can serve as a convening body for its member states on issues, experiences and best practices related to the use of mobile technology for health. www.wahooas.org

Peter Nyasulu, African Network for Digital Health

The African Network for Digital Health (ANDH) promotes the use of ICT to achieve better health through peer-to-peer assistance and knowledge sharing and learning through a regional approach for greater country-level impact. ANDH works to enhance leadership, sustainable governance, and monitoring and evaluation; increase peer assistance and knowledge exchange and sharing through effective networking; promote standards and interoperability within and across countries; and build capacity for eHealth, Health Information Systems (HIS), and Civil Registration and Vital Statistics (CRVS). <http://andh.hingx.org/Home/About>

Peter Benjamin, HealthE Africa

HealthE Africa is a peer assistance network working to strengthen existing digital health partnerships and foster new collaborations in Africa. The community connects program needs with African technology experts and service providers, strengthening local and regional digital health. <http://healthenabled.org/en/>

James BonTempo, Knowledge for Health (K4Health)

As the flagship knowledge management project of USAID's Bureau for Global Health, Office of Population and Reproductive Health, K4Health provides a platform for sharing information and knowledge and for connecting people, institutions, and ideas. K4Health

maintains several key mHealth resources including: mHealth Knowledge (www.mhealthknowledge.org) – a portal providing access to tools and resources in mHealth; mHealth Evidence (www.mhealthevidence.org) – which brings together the world's literature on mHealth effectiveness, cost-effectiveness and program efficiency. It includes peer-reviewed and grey literature from high-, middle- and low-resource settings; and the mHealth Working Group website (www.mhealthworkinggroup.org) – an international community of over 1900 members representing more than 500 organizations in 78 countries.

Olasupo Oyedepo, ICT4SOML, UN Foundation

ICT for Saving One Million Lives (ICT4SOML) in Nigeria is a UN Foundation initiative working with the Nigeria Federal Ministry of Health and Federal Ministry of Communication Technology to develop a National Health ICT Strategic Framework to strategically and systematically integrate technology into the health system. The program is being implemented with support from Norad. Additionally, ICT4SOML focuses on the scale up of high-priority ICT-based programs, including demand generation of maternal-child health services through direct client messaging, mobile payments for conditional cash transfers, mobile inventory tracking of essential commodities, and the scale up of the National Health Management Information System. www.unfoundation.org/features/ICT4SOML.html

Chilunga Puta, Better Immunization Data Initiative Learning Network

The Better Immunization Data Initiative is led by PATH and funded by the Bill & Melinda Gates Foundation. Its goal is based on the belief that better data, plus better decisions, will lead to better health outcomes. Its vision is to empower countries to enhance immunization and overall health service delivery through improved data collection, quality, and use. bidinitiative.org

From Vision to Action

To conclude the four-day meeting, country and regional participants discussed actions for applying the knowledge gained and partnerships initiated during the event.

Country team key actions included:

- Creating and updating national strategies for eHealth to lay the foundation for successful use of technology for health in the country. Develop plans for the integration of mHealth initiatives and standards across mHealth activities. (Kenya, Madagascar, Malawi, Niger, Nigeria, Senegal) Planning for national scale-up. (Uganda)
- Pilot testing mobile health solutions in countries beginning to engage with digital health. (Angola)
- Following up on potential cross-sector partnerships initiated at the meeting and working in greater partnership with the private sector more broadly. (Kenya, Madagascar, Malawi, Senegal)
- Noting the importance of country ownership and governance, planning for strong leadership in digital health from the national government and building capacity within the government. (Malawi, Nigeria)
- Bringing together stakeholders from across relevant government agencies and ensuring collaborative discussion. (Kenya, Nigeria, Senegal)



Future Interaction

Private sector and government participants expressed strong interest in organizing an Africa-based mHealth summit to bring together public and private stakeholders to advance digital health on the continent.

Conclusion and Next Steps

Carolyn Florey of the UN Foundation noted on the final day the three key themes she saw emerge from discussion over the event: 1) partnerships are the foundation for mHealth; 2) exchange and communication – encouraging participants to continue the conversations started in the meeting forums; and 3) community – continue to share and learn from one another.

To officially close the event, Mrs. Fanny Kachale, Director of Reproductive Health at the Ministry of Health in Malawi expressed thanks for the opportunity to hold the meeting and to participate in the successful event. Adam Slote of USAID noted that going forward there is a need to work together to strengthen country ownership and develop national strategies and regulatory frameworks as well as further development of enterprise architecture and standards, and emphasizing interoperability. He encouraged attendees to work together to develop and implement a digital health learning agenda of: effectiveness at scale; cost-effectiveness; vertical health interventions; as well as cross-cutting health systems interventions.

The following country teams and organizations received awards for categories voted on by attendees: Kenya and Angola for Best Country Team Presentations, Nigeria and Medic Mobile for Best Gallery Walk Booths, and Malawi for the country with Best Overall Participation.

Government leadership working in collaboration with public and private stakeholders can enable a comprehensive and coordinated country digital health system and achieve economies of scale. Next steps include a discussion of potential future Africa-led meetings, including a potential high-level summit to establish national platforms for digital health through collaboration across ministries of health and science and technology, the private sector, regulators and entrepreneurs.

Annex I: Meeting Agenda

Africa Regional Meeting on Digital Health for Overcoming Barriers to Ending Preventable Child and Maternal Deaths and Achieving Universal Health Coverage	
Tuesday, 12 May 2015	
8:00-8:30	Registration
8:30-9:30	<p>Welcome and Introduction</p> <p>Chair: Lily Banda, USAID/Malawi</p> <p>Welcome: Adrian Chikumbe, Public Relations Officer, Ministry of Health</p> <p>Remarks: Doug Arbuckle, Mission Director, USAID/Malawi (10 minutes)</p> <p>The Road from Kigali to Malawi: Ishrat Husain, USAID (15 minutes)</p> <p>Introduction of the Honorable Minister of Health: Mac Phil Magwira, Permanent Secretary, Republic of Malawi</p> <p>Opening: Honorable Jean Kalilani, Honorable Minister of Health, Republic of Malawi (15 minutes)</p> <p>Facilitators Remarks (5 minutes)</p>
9:30-10:00	Coffee and Introduction of the Expectation Board / Question Wall
10:00-12:00	<p>Session 1: Digital Health Tools for Frontline Health Workers</p> <p>Chair: East Africa, Grace Miheso, USAID</p> <p>Country Sharing and Experiences (10 minutes each)</p> <p>Malawi: Mobile Technology to Improve RMNCH, Maganizo Monawe, Ministry of Health</p> <p>Uganda: The State of Mobile Technology for Health in Uganda, Carol Kyoziira</p> <p>Nigeria: Mobile Phone-Based Service Delivery Training Program</p> <p>State of the Art Discussion (Talk Show: 50 minutes)</p> <p>Quality Improvement: Marco Horta, Dimagi</p> <p>Continuity of Care: Olivia Velez, Maternal Child Survival Project (MCSP)</p> <p>Scale and Sustainability: Erick Gaju, Ministry of Health, Rwanda</p> <p>CHW Supervision, Monitoring, and Health Systems Strengthening: Maeghan Orton, MedicMobile</p> <p>Discussion: The Way Forward (30 minutes)</p>
12:00-13:30	Networking Lunch
13:30-14:30	<p>Session 2: Digital Data for Decision-making and Results Monitoring</p> <p>Chair: Uganda, Jesca Nsungwa, Ministry of Health</p> <p>Country Sharing and Experiences</p> <p>Kenya: Building Sustainable eHealth Systems for Improved Health Outcomes, Onesmus Kamau (10 minutes)</p> <p>Kenya: Embracing Mobile Health Solutions to Improve RMNCH, Wangui Muthigani (10 minutes)</p> <p>Angola: Mobile Health in Angola: Successes & Challenges (10 minutes)</p> <p>Nigeria: CliniPAK: Digital Data to Support Decision Making, (10 minutes)</p>
14:30-15:00	Coffee
15:00-16:00	<p>Session 2, continued: Digital Data for Decision-making and Results Monitoring</p> <p>State of the Art Discussion (40 minutes)</p> <p>The State of the Art in Digital Data for Decision Making: Garrett Mehl, WHO</p> <p>Response and Surveillance for Ebola: Lungi Okoko, USAID</p> <p>Digital Data for Results-based Financing: Nicolas de Borman, Bluesquare</p> <p>Integrated Open Source Platforms for Sharing Digital Data: Carl Fourie, Jembi</p> <p>Discussion: The Way Forward (20 minutes)</p>
16:00-18:00	Networking and Gallery Walk Preparation
16:00-16:15	Meeting of Wednesday session chairs and presenters (Mbidzi Room)

Wednesday, 13 May 2015	
8:30-9:00	Recap
9:00-10:30	<p>Session 3: Mobile Money for Reproductive, Maternal, Newborn and Child Health</p> <p>Chair: Nigeria</p> <p>Country Sharing and Experiences (10 minutes each)</p> <p>Madagascar Senegal</p> <p>State of the Art Discussion (30 minutes)</p> <p>Mobile Money for Improving Quality of Care in Tanzania: Erica Layer, D-Tree Improving Efficiency of Conditional Cash Transfer Programs in Nigeria: Jamila Ibiye Bello-Malabu, Mobile Health Savings Accounts Lessons Learned: Sam Agutu, Changamka</p> <p>Small Group Discussion (40 minutes)</p>
10:30-11:00	Coffee
11:00-12:00	<p>Session 4: Mobile Platforms for Enabling Health Insurance and Universal Health Coverage (UHC)</p> <p>Chair: Kenya: Anne Barsigo, Division of Informatics and M&E</p> <p>Country Sharing and Experiences</p> <p>Nigeria (10 minutes)</p> <p>State of the Art Discussion (10 minutes each)</p> <p>Mobile Platforms for Enabling Health Insurance and UHC, Gift Livata, MicroEnsure Mobile Health Wallets for Shared Contributions to UHC: Kees van Lede, PharmAccess</p> <p>Reverse Q&A (30 minutes)</p>
12:00-13:30	Networking Lunch
13:30-15:30	<p>Session 5: Strengthening Regional Programs to Accelerate Digital Health in Countries</p> <p>Chair: USAID/West Africa, Mbayi Kangudie</p> <p>Country Sharing and Experiences (10 minutes each)</p> <p>Niger</p> <p>Knowledge Café: Participants rotate through stations</p> <p>Odongo Odiyo, ECSA-HC Sani Ali, WAHO Peter Nyasulu, African Network for Digital Health (ANDH) Peter Benjamin, HealthE Africa James BonTempo, Knowledge for Health (K4H) Olasupo Ovedepo, ICT4SOML, UN Foundation Chilunga Puta, BID Learning Network, Better Immunization Data Initiative</p>
15:30-16:00	Coffee
16:00-18:00	Gallery Walk
16:00-16:15	Meeting of Thursday session chairs and presenters (Mbidzi Room)

Thursday, 14 May 2015	
8:30-9:00	Welcome and Introduction Ice-breaker (15 minutes) Keynote: Haitham El-noush, NORAD (15 minutes)
9:00-10:30	Session 6: Public-Private Partnerships for Accelerating Digital Health Chair: Angola: Maria Georgina Miguel Panzo, Public-Private Partnerships Panel (45minutes) PPPs for National Scale: A Maternal Health Case Study from South Africa: Debbie Rogers, Praekelt Foundation Pan-African Partnerships and Measuring Impact: Kyle Moss, Qualcomm Perspectives on Partnerships from a Global Mobile Network Operator Association: Willie Gichora Ngumi, GSMA Audience Q&A (60 minutes)
10:30-11:00	Coffee (distribution of ballots for conference awards)
11:00-12:30	Session 7: Partnerships Part I: Understanding and Aligning Partner Interests Chair: Bobby Jefferson, Futures Group Small Group Exercise: The “Gives and Gets” of Partnerships (75 minutes)
12:30-14:00	Networking Lunch
14:00-15:30	Session 8: Partnerships Part II: Challenges and Solutions Along the Partnership Lifecycle Chair: Bobby Jefferson, Futures Group Small Group Exercise: Partnership Lifecycle Case Study/Role Play, continued (45 minutes) Plenary: Results of Partnership Challenges Friendly Competition; Debrief and Wrap-up (20 minutes)
15:30-16:00	Coffee
16:00-17:30	Session 9: The Lion’s Den Digital health practitioners present their innovations to a panel of judges and the wider audience of meeting attendees. Presentations will be in a rapid pitch style, with constructive feedback from judges Each pitch will be evaluated on its innovative approach, quality of business plan and potential for large scale impact Awards will be presented to the top two projects, plus an audience favorite
17:30-19:00	Gallery Walk Note: Open sign up begins for Friday matchmaking (session 11)
17:30-17:45	Meeting of Friday session chairs and presenters (Mbidzi Room)

Friday, 15 May 2015	
8:30-9:00	Recap
9:00-10:00	<p>Session 10: Partnership Development Chair: Madagascar Emerging Public-Private Partnerships Panel (40 minutes) Ralph Ankri, Orange Adam Curry, BD Technologies Using PPPs to Scale Up Health Insurance Coverage Towards UHC, Ewout Irrgang, PharmAccess Discussion: Audience Q&A (20 minutes)</p>
10:00-10:30	<p>Coffee Note: Open sign up for Matchmaking (session 11) closes at 10:15</p>
10:30-12:00	<p>Session 11: Matchmaking for New Partnerships Chair: Senegal, Matar Camara, Ministry of Health Find Your Match Introduction to the Format: Purpose and Process Country teams assume designated stations and hold scheduled meetings with private companies Open networking continues in parallel for participants not attending a scheduled meeting.</p>
12:00-13:30	Networking Lunch
13:30-14:30	<p>Session 12: Digital Health for EPCMD and UHC – From Vision to Action Chair: Malawi Roundtable: <i>Presenting the Outcomes from the Meeting</i> Country Team & Organization Representatives Describe Key Takeaways and Next Steps (60 minutes; 2-3 minutes each) Country Team Representatives: Angola, Kenya, Madagascar, Malawi, Niger, Nigeria, Senegal, Uganda, East Africa & West Africa Regional Missions Regional Organization Representatives: WAHO, ANDH, WHO, NORAD, HealthEnabled, UN Foundation</p>
14:30-15:30	<p>Closing Ceremony Summing Up, USAID (10 minutes) Awards Cultural Dance</p>

Annex 2: Attendees

Participants: Private Sector

Participant	Organization	Participant	Organization
Jeanna Holtz	Abt Associates	Johnbosco Mwafilaso	Lighthouse Trust
Matar Camara	African Resources Group	Joe Gumulira	Lighthouse Trust
Sherri Haas	ASH Project, MSH	Thomasena O'Byrne	Malawi-Liverpool- Welcome Trust
Sarah Konopka	ASH Project, MSH	Justin Maly	MSH
Mairead Petersen	Banja la Mtsogolo	Tsara Andritiana	MSH Madagascar
Precious Bondwe	Baobab Health Trust	Rijalalaina Rasolofonirina	Marie Stopes Madagascar
Adam Curry	BD Technologies	Olivia Velez	MCSP
Nicolas De Borman	Bluesquare	Maeghan Orton	Medic Mobile
Mwai MakoKa	CHAM	Rachel Sibande	mHub
Tiwonge Manda	Chancellor College	Gift Livata	MicroEnsure
Samuel Agutu	Changamka MicroHealth Ltd	McHenry Makwelero	MMAP-FHI360
Jean Fotso	Concern Worldwide	Peter Nyasulu	Monash University, ANDH
Macbain Mkandawire	CONGOMA	Griphin Chirambo	Mzuzu University
Marco Horta	Dimagi	Aghali Abdou	Orange
Chris Kulanga	D-tree International	Ralph Ankri	Orange
Erica Layer	D-tree International	Chiyembekezo Kachimanga	Partners in Health
Erick Safori	D-tree International	Chilunga Puta	Path, BID Initiative
Killy Kanjo	FHI 360, Malawi	Habeeb Salami	Pathfinder International
Angela Akol	FHI360	Ewout Irrgang	PharmAccess
Gladys Someren	FHI360	Kees Van Lede	PharmAccess
Marsden Solomon	FHI360/CBHIPP	Debbie Rogers	Praekelt Foundation
Bobby Jefferson	Futures Group	Kyle Moss	Qualcomm
Olive Mtema	Futures Group	Julio Bonilla	SASH Project
Willie Gichora Ngumi	GSMA	Robert Oboko	University of Kenya
Peter Benjamin	Health Enabled	Patrick Gaparayi	SIAPS, MSH
Kundai Moyo	Howard Univ. Tech Assistance	Triza Hara	SSDI-Communication
Carol Porter	HUIAP	Livinia Kaunda	SSDI-Communication
Olasupo Oyedepo	ICT4SOML	Tamanda Masambuka	SSDI-Communication
Okey Okuzu	InStrat GHS	Grace Banda	SSDI-Systems
Richard Zulembewe	I-TECH Malawi	Jacob Kawonga	SSDI-Systems
Carl Fourie	Jembi Health Systems	Patricia Nankubuge	Thoughtworks
Steven Simkonda	Jhpiego	Patricia Mtungila	UbuntuNet Alliance
Dan Wendo	Jhpiego	Denis Ahairwe	Uganda Health Marketing Group
Kabango Malewezi	Jhpiego	Okello Mose	Uganda Health Marketing Group
Douglas Khumalo	JSI Deliver	Jodi-Ann Burey	VillageReach
Phidelis Suwedi	JSI Deliver	Zachariah Jezman	VillageReach
Aaron Kafakamoyo	JSI USAID/Deliver	Barbara Singer	VillageReach
Lovaso Hadriaupesonardo	JSI/Male Madagascar	Cheikh Mbaye	WAHA International
James BonTempo	K4Health Project	Panji Harawa	YONECO
Heather M. Finn	K4Health Project	Esnart Jere	YONECO
Amy Spadanuta	K4Health Project	Hughes Munthali	YONECO
Thomas Odeny	KEMRI	Esnart Priminta	YONECO
Dercio Mariote	LCTS	Susan Rae Ross	SR International

Participants: Government Officials

Participant	Organization
Maria Georgina Miguel Panzo	Angola HIUSA
Jose Kanauje	Angola MINSa
Onesmus Kamau	Ministry of Health/Kenya eHealth Unit
Anne Barsigo	Ministry of Health/Kenya
Wangui Muthigani	Ministry of Health/Kenya MNH
Harisoa Julie Norovoahangy	Ministry of Public Health/Madagascar
Pakwanja Twea	Ministry of Health/Malawi
Ruth Young	Ministry of Health/Malawi
Chris Moyo	Ministry of Health/Malawi
Moses Aroh	Ministry of Health/Malawi CMED
Emily Cerlone	Ministry of Health/Malawi Fulbright
Austin Gumbo	Ministry of Health/Malawi NMCP
Fannie Kachale	Ministry of Health/Malawi
Sandy Kachale	Ministry of Health/Malawi LIMS
Maganizo Monawe	Ministry of Health/Malawi
Chimwemwe Mvula	Ministry of Health/Malawi ADCS
Jean Mwalabu	Ministry of Health/Malawi
Henry Ndindi	Ministry of Health/Malawi DDCS
Tasokwa Nkhonjera	Ministry of Health/Malawi CMED
Billy Nyambalo	Ministry of Health/Malawi RH
Aboubacar Adakal	Ministry of Health/Niger
Segun Oyeniya	Ministry of Health/Nigeria
Ibrahim Souley	Ministry of Health/Niger MSP
Kenneth Okerefor	Nigeria, National Health Insurance Scheme
Chi Chi Aigbe	Nigeria, SURE-P MCH MAMA
Jamila Bello-Malabu	Nigeria, SURE-PMCH
Steve Felix-Uduh	Nigeria, National Primary Health Care Development
Erick Gaju	Ministry of Health/Rwanda
Carol Kyoziya	Ministry of Health/Uganda
Placid Mihamo	Ministry of Health/Uganda
Jessica Nsungwa Sabiiti	Ministry of Health/Uganda

Participants: Donor Organizations

Participant	Organization
Lucius Mwalwanda	CDC
Christopher Mwase	CHAI
Haitham El-noush	Norad
Carolyn Florey	United Nations Foundation
Francis Gonzales	United Nations Foundation
Chris Oyeyipo	UNFPA
Titus Angi	UNICEF
Gisele Guimaraes	USAID/Angola
Grace Miheso	USAID/East Africa
Jerusha Karuthira	USAID/Kenya
Peter Yegen	USAID/Kenya
Rahajarison Andry Nirina	USAID/Madagascar
Lilly Banda	USAID/Malawi
Ellen Chipompho	USAID/Malawi
Veronica Chirwa	USAID/Malawi
Chimwemwe Chitsulo	USAID/Malawi
Violet Orchardson	USAID/Malawi
Gertrude Odezugo	USAID/Nigeria
James Tanu Duworko	USAID/Uganda
Margaret D'Adamo	USAID/Washington
Ishrat Husain	USAID/Washington
Lungi Okoko	USAID/Washington
Adam Slote	USAID/Washington
Jennifer Schneider	USAID/Washington
William Weiss	USAID/Washington
Didier Mbayi Kangudie	USAID /West Africa
Sani Ali	WAHO
Harriet Chanza	WHO
Francis Magombo	WHO
Garrett Mehl	WHO
Leslie Mgalula	WHO
Tigest Tamrat	WHO
Jessica Rothstein	WHO
Fekadu Lemma	WHO/Angola

* Participant lists were compiled from event registration records.

Annex 3: ICT4D Principles for Digital Development

The following set of principles represents a concerted effort by donors to capture the most important lessons learned by the development community in the implementation of technology-enabled programs. Having evolved from a previous set of implementer precepts endorsed by over 300 organizations, these principles seek to serve as a set of living guidelines that are meant to inform, but not dictate, the design of technology-enabled development programs.

ONE: DESIGN WITH THE USER

- › Develop context-appropriate solutions informed by user needs.
- › Include all user groups in planning, development, implementation, and assessment.
- › Develop projects in an incremental and iterative manner.
- › Design solutions that learn from and enhance existing workflows, and plan for organizational adaptation.
- › Ensure solutions are sensitive to, and useful for, the most marginalized populations: women, children, those with disabilities, and those affected by conflict and disaster.

TWO: UNDERSTAND THE ECOSYSTEM

- › Participate in networks and communities of like-minded practitioners.
- › Align to existing technological, legal, and regulatory policies.

THREE: DESIGN FOR SCALE

- › Design for scale from the start, and assess and mitigate dependencies that might limit ability to scale.
- › Employ a “systems” approach to design, considering implications of design beyond an immediate project.
- › Be replicable and customizable in other countries and contexts.
- › Demonstrate impact before scaling a solution.
- › Analyze all technology choices through the lens of national and regional scale.
- › Factor in partnerships from the beginning, and start early negotiations.

FOUR: BUILD FOR SUSTAINABILITY

- › Plan for sustainability from the start, including planning for long-term financial health, e.g., assessing total cost of ownership.
- › Utilize and invest in local communities and developers by default, and help catalyze their growth.
- › Engage with local governments to ensure integration into national strategy, and identify high-level government advocates.

FIVE: BE DATA DRIVEN

- › Design projects so that impact can be measured at discrete milestones with a focus on outcomes rather than outputs.
- › Evaluate innovative solutions and areas where there are gaps in data and evidence.
- › Use real-time information to monitor and inform management decisions at all levels.
- › When possible, leverage data as a by-product of user actions and transactions for assessments.

SIX: USE OPEN DATA, OPEN STANDARDS, OPEN SOURCE, OPEN INNOVATION

- › Adopt and expand existing open standards.
- › Open data and functionalities, and expose them in documented APIs (Application Programming Interfaces) where use by a larger community is possible.
- › Invest in software as a public good.
- › Develop software to be open source by default with the code made available in public repositories and supported through developer communities.

SEVEN: REUSE AND IMPROVE

- › Use, modify, and extend existing tools, platforms, and frameworks when possible.
- › Develop in modular ways favoring approaches that are interoperable over those that are monolithic by design.

EIGHT: ADDRESS PRIVACY & SECURITY

- › Assess and mitigate risks to the security of users and their data.
- › Consider the context and needs for privacy of personally identifiable information when designing solutions and mitigate accordingly.
- › Ensure equity and fairness in co-creation, and protect the best interests of the end-users.

NINE: BE COLLABORATIVE

- › Engage diverse expertise across disciplines and industries at all stages.
- › Work across sector silos to create coordinated and more holistic approaches.
- › Document work, results, processes, and best practices, and share them widely.
- › Publish materials under a Creative Commons license by default, with strong rationale if another licensing approach is taken.

For more information, visit
[DIGITALPRINCIPLES.ORG](https://digitalprinciples.org)

Annex 4:

Tools and Resources Available on Costing

Resources highlighted in the Digital Health Costing Side-Session

- CommCare Total Cost of Ownership tool (Dimagi)
confluence.dimagi.com/display/commcarepublic/Budgeting+for+a+Project
- K4Health's mHealth Planning Guide Tools
www.k4health.org/toolkits/mHealth-planning-guide/planning-tools
- Health, Development and Informatics Blogs on The Cost of Free Software and Non-free
healthdevinfo.blogspot.com/2013_06_01_archive.html
- NetHope Webinar: Cost Analysis of mHealth with Intel and Futures Group
solutionscenter.nethope.org/webinars/view/nethope-webinar-cost-analysis-of-mhealth-with-intel-and-futures-group
- Show me the money!: Where mHealth and Finance Collide (Global mHealth Summit presentation session)
exhibitionfloor.himss.org/mhealth2014/public/SessionDetails.aspxFromPage=Calendar.aspx&SessionID=160
- Youngji Jo - Costing mHealth Strategies
www.gfmer.ch/mhealth/coursefiles2013/Youngji-Jo-costing.pdf



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