Landscape Analysis and Business Case for mHealth Investment in Angola

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ACRONYMS

AIDS Acquired Immune Deficiency Syndrome
ARPU Average revenue per user
CCBRT Comprehensive Community-Based Rehabilitation hospital in Tanzania
CNDTI Centro Nacional de Tecnologia de Informacion e Communicacion
DHIS2 District health information system 2
DHS Demographic Health Survey
DNME Direccão Nacional de Medicamentos e Equipamentos (National Directorate of Medicines and Equipment)
DNRH Direccão Nacional de Recursos Humanos (National Directorate of Human Resources)
DNSP Direccão Nacional de Saúde Pública (National Directorate of Public Health)
DPS Direccão Provincial de Saúde (Provincial Health Directorate)
EU European Union
EUV End Use Verification
GEPE Gabinete de Estudos, Planeamento e Estatistica (MOH Department of Planning Studies and Statistics)
GNI Gross National Income
GNTIC Gabinete Nacional de Tecnologia de Informacion e Communicacion (Cabinet of Information and Communication Technology)
GPS Global Positioning System
GSM Global System for Mobile
GSMA Groupe Speciale Mobile Association
ICT Information and communication technology
ITU International Telecommunications Union
HIV Human Immunodeficiency Virus
HMIS/HIS Health management information system or health information system
iHRIS Human Resource Information Solutions
INACOM Instituto Angolano das Comunicacoes
IRS Indoor Residual Spraying
LTE Long-term Evolution – as it relates to 4G (4th generation mobile networks)
MICS Multiple Indicator Cluster Survey
MINSA Ministério da Saúde (Ministry of Health)
MNO Mobile network operator
MOF Ministry of Finance
MOH Ministry of Health
MNO Mobile Network Operator
MTTI Ministry of Telecommunications and Information Technology
NGO Non-governmental organization
OD Organizational development
PASSII Support Programme to the Health Sector
PESIS Plano Estratégico do Sistema Informática da Saúde
PHC Primary Health Care
PNDS Plano Nacional de Desenvolvimento Sanitário
PNME Programa Nacional de Medicamentos Esenciáis (Essential Drug Program)
ROI Return on investment
SIM Subscriber Identity Module
UHC Universal Health Coverage
UNDP United Nations Development Program
UNFPA United Nations Family Planning Agency
UNICEF United Nations Children Fund
USAID United States Agency for International Development
USF Universal Service Fund
WACS West African Cable System
WHO World Health Organization
WHO-ITU World Health Organization-International Telecommunications Union
# CONTENTS

**GLOSSARY of TERMS** .......................................................................................................................... 5

**EXECUTIVE SUMMARY** .................................................................................................................... 6

**BRIEF COUNTRY CONTEXT** ................................................................................................................ 8

**ASSESSMENT METHODOLOGY** ......................................................................................................... 9

**KEY FINDINGS** ..................................................................................................................................... 10

  - Ministry of Health (MINSA) ................................................................................................................. 10
  - Health Information System ..................................................................................................................... 10
  - Telemedicine ........................................................................................................................................ 12
  - Ministry of Telecommunications and Information Technology ...................................................... 12
  - ICT Policy and Regulatory Environment ............................................................................................. 13
  - Mobile Network Operators .................................................................................................................. 14
  - Telecommunications Infrastructure ..................................................................................................... 15
  - Mobile Phone Use among Angola’s General Population ..................................................................... 16
  - International Organizations ................................................................................................................... 18
  - Stakeholder Mapping and Strength of Working Relationships ........................................................... 19
  - Human Capital ....................................................................................................................................... 20
  - mHealth Implementation in Angola (Past and Current) .................................................................... 21
  - Key Challenges and Opportunities for mHealth Implementation in Angola ......................................... 23

**BUSINESS CASE for mHEALTH in ANGOLA** ................................................................................... 26

  - Added Value of eHealth for Improving Health Outcomes ................................................................ 26
  - Mobile Network Operators .................................................................................................................. 27

**CONCLUSIONS and RECOMMENDATIONS** ...................................................................................... 28

  - Annex 1: Consultant Scope of Work .................................................................................................... 31
  - Annex 3: Stakeholder Mapping Matrix Template ................................................................................. 36
  - Annex 4: Focus Group Discussion Method ............................................................................................ 37
  - Annex 5: List of Contacts ........................................................................................................................ 39
**GLOSSARY of TERMS**

**eHealth**
eHealth is defined by the World Health Organization (WHO) as the use of information and communications technologies in support of health and health-related fields, including health care services, health surveillance, health literature, health education, knowledge, and research. eHealth is a general term which includes four distinct but related components.

Mobile Health (mHealth): Provision of health services and information via mobile and wireless technologies.

Health Information Systems (HIS): Systems to gather, aggregate, analyze, and synthesize data from multiple sources to report on health; can include information related to patient records, disease surveillance, human resources, management of commodities, financial management, service delivery, and other data needed for reporting and planning purposes.

Telemedicine: Provision of health care services at a distance; can be used for inter-professional communication, patient communication, and remote consultation.

Distance Learning (eLearning): Education and training in electronic form for health professionals.

**Interoperability**
Interoperability is the ability for diverse health information systems and technologies to communicate, exchange data, and use/interpret exchanged data. For two systems to be interoperable, they must be able to exchange data and subsequently present that data such that it can be understood by a user.
With more than 13.3 million mobile users in Angola, there are unparalleled opportunities to use mHealth solutions to improve quality of care, access to health services, and health outcomes. USAID/Angola commissioned the USAID-funded African Strategies for Health Project to conduct a landscape analysis of mHealth in Angola and develop a business case to determine opportunities and barriers for USAID investment. This report lays a foundation for the development of a national mHealth strategy. Key informant interviews and one focus group discussion were conducted to map stakeholders, describe existing mHealth initiatives in Angola, and explore opportunities to integrate mHealth to strengthen the health system toward the aim of universal health coverage.

Mobile phone usage is increasingly widespread in Angola with a SIM penetration rate of 61 percent, though disparities exist between urban areas (91% usage) and rural areas (28% usage). The Angolan government is prioritizing the use of information technology to ameliorate provision of government services. The Universal Service Fund (USF) was established to improve the accessibility and affordability of broadband services. Angola’s Ministry of Health (MINSA), through its Cabinet of Planning Studies and Statistics (GEPE) and its Cabinet of Information and Communication Technology (GNTIC), understands the value of mobile health and has piloted several solutions, though these solutions have not been sustained. Angola does not have a multi-stakeholder working group for mHealth, nor an overarching mHealth strategy and framework. In the assessment, only a limited number of key informants were familiar with the concept of mHealth; this presents an opportunity to familiarize Angolans to this concept.

Conditions are ripe for expanded mHealth investment. Between 2013 and 2017, there will be an expected $1.6 billion investment in Angola’s telecommunications infrastructure. There are already two major telecommunications companies in Angola – Movitel and UNITEL. High speed (4G) connectivity exists. Upcoming construction of a fiber optic cable that connects Angola directly to Brazil, bypassing the current route through Europe and the United States, will result in decreased data traffic costs. Bilateral and multinational donors and partners such as the European Union, World Bank, and USAID have already begun to invest in the nascent mHealth environment.

There is an emerging pool of domestic resources to draw upon for mHealth implementation, including software developers, entrepreneurs, and the technology hub at the Instituto Nacional do Emprego e Formação Profissional. Other sub-Saharan African countries such as Kenya, Nigeria, Rwanda, and Uganda also offer promising examples of mHealth solutions in practice that can be applied to the Angolan context.

There are important steps that Angolan leaders and health sector stakeholders can take to advance mHealth in Angola. The recommendations that result from this assessment are as follows. A more detailed description of each recommendation is provided at the end of the report.

Recommendation #1: Establish a national mHealth working group or taskforce. This body will be responsible for coordination, overseeing implementation, and securing resources for the national mHealth strategy and policy framework and health sector information and communication technology deployments (see Annex 2 for draft Terms of Reference). This working group will
create an enabling environment for mHealth, maximize use of existing services, and limit duplicative efforts.

Recommendation #2: Collaborate closely with MINSA and the Ministry of Telecommunications (MTTI) to support the development of a National mHealth Strategy and Policy Framework for Angola. This strategy will provide the roadmap and standards for harmonized mHealth implementation.

Recommendation #3: Support MINSA to pilot a mobile data platform with an existing mobile network operator and the MTTI. MINSA and development partners have begun planning for the deployment of interoperable, open-source platforms that have demonstrated effectiveness when implemented in other sub-Saharan African countries (such as DHIS 2.0, iHRIS, and RapidSMS). If implemented in Angola, these could provide proof-of-concept for deeper and broader mHealth implementation.

Recommendation #4: Encourage USAID/Angola partners and those of other donors implementing health facility or community-based projects to work with MINSA to transition to mobile data collection for their service delivery and monitoring and evaluation efforts.

Recommendation #5: Evaluate mHealth pilots once implemented and refine the mHealth business case so that resources from private sector partners and international donor agencies can be leveraged. An updated business case should include Angola-specific results, statement of continuing needs, and investment opportunities with an expected return on investment in terms of revenue and/or public good.

Recommendation #6: Enhance the operational capacity of GEPE and GNTIC. Sustainability of mHealth investments hinges on the leadership, change management, and health informatics capacities of these two key government agencies.

The current environment in Angola holds much promise for greater investment and research into mHealth opportunities. The stakeholder mapping contained herein, in complement with internationally-tested resources from donor agencies and implementers, are valuable resources at an especially critical moment in time for Angola’s digital healthcare revolution.
USAID/Angola requested short-term technical assistance from USAID/Washington to perform a landscape analysis and develop a business case and strategy for private and public sector investment in mHealth in Angola. Based on this request, the USAID-funded African Strategies for Health (ASH) project performed a desk review of the eHealth landscape in Angola and recruited an international consultant to travel to Angola to gather information from key stakeholders; the Scope of Work for this consultancy is attached as Annex 1. The following report provides key findings, conclusions, and recommendations from the desk review and the information collected in Angola.

**BACKGROUND**

Angola at a glance

<table>
<thead>
<tr>
<th>24 million population</th>
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<tbody>
<tr>
<td>13.3 million mobile cellular connections</td>
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<tr>
<td>98% prepaid mobile services</td>
</tr>
<tr>
<td>61% SIM penetration</td>
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<tr>
<td>$6,323 Gross National Income per capita</td>
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</tbody>
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Angola has an estimated total population of 24.4 million people; 63 percent of the population is urbanized. Luanda Province with a total population of approximately 6.5 million incorporates the capital city, Luanda (preliminary results from Angola’s Census 2014). The most recent (2014) estimates of Gross National Income per capita for Angola is $6,323. Independent studies suggest that poverty levels in Angola have fallen considerably in recent years and that the percentage of the local population living on less than $2 per day (or $60 per month) declined from 92 percent in 2000 to 54 percent in 2014.

The maternal mortality rate continues to be high in Angola (20th worst rate in Africa). The country also faces high rates of child mortality (167 deaths per 1,000 births) and has one of the lowest life expectancies at 51.5 years (10th worst in Africa).

Angola is still recovering from nearly three decades of war and the Government of the Republic of Angola is focusing on the rebuilding of the health system. As a result of these efforts, human resources for health have improved (the number of doctors tripled from 2005 to 2009) while the number of health facilities increased from 952 in 2003 to 2,356 in 2011. Despite these efforts, critical staff shortages exist with inequitable distribution of health workers; for example, in 2009 there were an estimated 18

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4 World Bank, 2009-2013
doctors per 100,000 population and 85 percent of health workers worked in urban areas, contributing to notable disparities between urban and rural inhabitants’ access to care.\textsuperscript{6} Disparities are further confirmed by studies such as a 2011 study in Angola\textsuperscript{7} that showed that young people experienced difficulties travelling long distances to access clinics and that distance from a provider can limit access to reproductive health services and impede contraceptive use.

mHealth and telemedicine as a solution for time and distance challenges to health care has sparked interest from the Ministério da Saúde (MINSA – ministry of health), donors, and private sector partners. With 13.3 million mobile connections and a 61 percent SIM penetration rate, although largely urban-focused, the use of mobile phones is becoming increasingly widespread in Angola. MINSA believes there may be value gained in using mobile technology for health, but has not yet articulated a vision for how this could be done in Angola.

**ASSESSMENT METHODOLOGY**

This assessment reviewed the digital landscape in Angola to determine prospects for mobile technology for health. The purpose was to develop a business case for private and public sector investment, as well as a roadmap for the eventual development of a national eHealth strategy. The assessment was conducted in two phases – (1) desk research and (2) key informant interviews, focus group discussions, and observational visits in Angola.

The assessment approach was guided by reviewing essential elements required to constitute a national “eHealth” framework. These include the following 7 pillars: governance, legislation, workforce, strategic visioning, standards, infrastructure, and applications. Tools were developed that included a Stakeholder Mapping Matrix (Annex 3) and Focus Group Discussion Outline (Annex 4) aimed at developing a baseline of understanding and identifying points of convergence among individuals holding the same functional roles across multiple sectors who will be impacted by a given mHealth solution.

Multiple sources of information (e.g. technical reports, news articles, etc.) on the overall health system, the information and communication technology (ICT) policy and regulatory framework, and eHealth in Angola were gathered and reviewed in advance of, during, and after the assessment. A focus group discussion and individual key informant interviews were conducted with government officials and donors, as well as private sector and non-governmental organization representatives to comprehend the level of understanding of the eHealth ecosystem in Angola and the potential roles stakeholders could play in mHealth deployments. Not all informants scheduled for interviews were available as planned, limiting the number of individuals reached. One field visit was conducted in Operario, a neighborhood of Luanda, to observe smartphone usage using Magpi (formerly EpiSurveyor from DataDyne) to capture information from mothers as part of a follow-up survey of the recent polio and measles vaccination campaign.

MINSA appointed the Director of Informatics from GEPE (the MOH Department of Planning Studies and Statistics) to join the assessment team as a focal point person, a confirmation of MINSA’s high level of interest in mHealth.


Williamson, Jessica. "SMS 4 SRH: Using Mobile Phones to Reduce Barriers to Youth Access to Sexual and Reproductive Health Services and Information."
KEY FINDINGS

This section presents findings from key informant interviews, focus group discussions and a desk review of key documents on eHealth (and especially mHealth) and information and communication technologies (ICT) in Angola.

Ministry of Health (MINSA)

MINSA, through Project 53 of the Plano Nacional de Desenvolvimento Sanitário (National Health Development Plan - PNDS), called for the creation of the Gabinete Nacional de Tecnologia de Informação e Comunicação (GNTIC) housed in the Ministry. GNTIC was assigned the responsibility of preparing a strategic plan for health information systems (Plano Estratégico do Sistema Informática da Saúde - PESIS), which will include plans for recruitment and training of technicians with expertise in ICT for health. The intention of PESIS is to update existing legislation and draft legal instruments to regulate ICT in health. These are indicators of progress and may serve as opportunities for USAID to provide assistance to MINSA.

According to Angola’s National Directorate of Public Health (or Direcção Nacional de Saúde Pública - DNSP), the PNDS was recently amended to emphasize the importance of working alongside the Ministry of Telecommunications and Information Technology (MTTI). Close collaboration between these two government agencies and private sector mobile network operators (MNO) is essential to establishing sustainable and impactful mHealth solutions.

Health Information System

mHealth solutions that collect and transmit data should integrate with the national health information system (HIS). For instance, a pregnant woman registered via mobile upon triage at a health facility should be automatically accounted for in the maternal health and child module of the HIS to ensure she can be followed throughout her antenatal care at the nearest health facility. mHealth technologies, such as the mHero platform supported by USAID and UNICEF, can leverage data standards to connect with health workers using data from the national HIS. The long term viability of mHealth applications is doubtful if implemented as externally-funded subsystems to the HIS or as independent vertical systems because there is substantial risk of collapse if donors significantly draw down funding.

HIS Plan and Implementation: Angola is developing an HIS that focuses on surveillance and basic service delivery. The Plano Estratégico do Sistema Informática da Saúde (PESIS) or HIS plan consists of eight subsystems: (1) management information services; (2) epidemiological surveillance; (3) early warning epidemiological surveillance; (4) primary health care information; (5) budget information; (6) "integrated" subsystem; (7) linkages for private sector; and (8) mortality statistics. Implications and prospects for use of mobile technology are applicable to all eight subsystems and suggest in-roads for mHealth.

Most informants interviewed within and outside MINSA believe the HIS is not functioning well enough to adequately inform decision-making, program planning, and resource allocation. According to a UNICEF key informant, “the dearth of information on almost all public health indicators has prevented recognition and response to the issues in the country”.

The PNDS, 2012-2015, states that the national HIS “does not integrate the subsystems, causing a deficiency in the management of health services and timely response to disease control, and response to

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8 PNDS 2012-2015, Project 53, as amended, and informational interview with Secretariat.
epidemics... [and] local gathering, processing, and transmission of data is not done adequately and in a timely manner”. Developing an operational framework for eHealth that defines policy, standards, governance, and user guidelines would strengthen the integration of health information systems. MINSA’s strategy calls for a unified HIS across vertical programs that consolidates data collection and aggregation; current evidence suggests weaknesses in implementation. As Angola embarks on the process of integrating its HIS, the most important benefits are anticipated to include:

1. Enabling the generation of more accurately calculated indicators (e.g. mortality, immunization rates) based on actual, instead of estimated, numerators and denominators;
2. Reducing manual processing and entering of data;
3. Expanding and professionalizing GNTIC by centralizing data management in a single unit of MINSA with the accompanying development of specialized skills and capacity.

**Transition from paper to digital:** MINSA plans to transition from paper to digital data collection and transmission. Currently, data entry into electronic (Microsoft Excel) spreadsheets is a parallel task conducted after handwritten entries in the health facility registries. This duplicative data entry (by hand and typed into Microsoft Excel) doubles labor output requirements. This situation poses a unique opportunity for mHealth as electronic systems can be effectively used to facilitate the transition from paper to digital through mobile-based data collection at community and health facility levels with automated transmission of data into databases.

According to a 2014 assessment, MINSA has recently taken strides towards better understanding potential open-source applications supported by USAID in many other countries, namely the District Health Information System (DHIS 2) and Human Resource Information Solutions (iHRIS). A 12-person Angolan delegation participated in the first Lusophone DHIS 2 Training Academy in Mozambique in May 2014 and an iHRIS assessment was conducted in June 2014. MINSA is collaborating with other development partners, including the Cuban Cooperation and Support Programme to the Health Sector (PASSII), that provide additional technical assistance related to HIS.

**Data use:** Angola is transitioning to provincial and municipal level health care. Data aggregation begins at the lower health centers in the form of cumulative weekly or monthly service reports taken from hand-written registries. There are often multiple registries at each location for each program area. The data move up the ladder from the local municipal level to provincial level and then to the central level. In theory, the data is analyzed, reports are generated, and information is used to inform decision-making at all levels. The data gathered is often imprecise, inaccurate, late, incorrect, and not immediately used, if ever used. One interviewee believes that only 25 percent of the data collected is ever reviewed, much less used. According to other sources interviewed, the above description of data flow is only theoretical and in actuality there is no health information system or system backbone that supports routine data flow. Without a working HIS architecture, the prospects for mHealth or expansion of electronic records systems is limited to those program areas operating in vertical silos supported by donors.

**HIS technical assistance:** As part the USAID-funded Strengthening Angolan Systems for Health (SASH) project, JHPIEGO has seconded a position within GEPE to work on the PESIS and is charged with helping MINSA develop a HIS coordination group. Through the work of the consultant, health center data records found in handwritten registries are being migrated to electronic spreadsheets (Microsoft Excel) in a staged roll out. The USAID/SASH project supports the Government of Angola’s

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9 [http://www.mindbank.info/download_file/3460/aee0ecf8ad1bc582e2ea2c5eb5967023236f6773](http://www.mindbank.info/download_file/3460/aee0ecf8ad1bc582e2ea2c5eb5967023236f6773) PNDS Volume II, P.292 Accessed 02OCT14
10 “Review of Developing Country Health Information Systems A high level review to identify Health Enterprise Architecture assets in ten African countries”, Dr. Rosemary Foster, May 2012
Revitalization of Municipal Health Services Strategy to ensure that the Essential Package of Health Services is available in every health facility in Luanda and Huambo Provinces.

Telemedicine

mHealth and telemedicine (terms often used interchangeably among some informants) fall within the constructs of eHealth—the use of digital technology for health.11

There are instances of telemedicine deployments in Angola. In 2007, a telemedicine system linked David Bernardino Pediatric Hospital (HPDB) in Luanda to a counterpart facility in Coimbra, Portugal, and to other international institutions, to observe pediatric patients with heart problems. One example is the use of real-time echocardiography that is conducted onsite in Angola and is supported by expert inputs from Portugal to assist with diagnosis and further clinical management. Peditel has reportedly increased telemedicine consultations from 9 to 236 between Coimbra, Portugal and pediatric hospitals in Luanda and Benguela between 2007 and 2008.

Within the World Bank-funded Municipal Health Service Strengthening Project,12 MINSA initiated a similar telemedicine project in 2014, which includes virtual consultations between a limited number of Angolan municipal and provincial hospitals and experts in Portugal. The project seeks to establish a national telemedicine network with SMS alert system (for the discussion of patient cases) in Angola using low-bandwidth technologies—namely Dudal for distance education and Bogou for tele-expertise—developed by the RAFT network (Réseau en Afrique Francophone pour la Télémédecine). Hospital Américo Boavida serves as the pilot hospital. While none of the hospitals where telemedicine is reported to be operational were visited in this assessment, the team reviewed the project documents which report that structured journals of activities (logbooks) for recording education and tele-expertise sessions and questionnaires were developed in order to measure the impact of the activities and evaluate the services provided in the pilot phase and the local coordinators in each pilot site were trained in the use of the RAFT tools. The impact of telemedicine consultations requires further detailed review that will include an assessment by an experienced clinician of the types of services requested, indications for specialist consultation and the contribution to the clinical decision-making process.

Depending on the richness of the data and information being shared, bandwidth issues will pose a barrier to more extensive use of the technology outside of Luanda and larger municipalities. Mobile devices are used to share visual data from high definition photography such as X-rays, sonograms, and other rich media transmissions such as teleconferencing and video or multimedia content (MMC). These platforms typically require high bandwidth and reliable connectivity on devices capable of broadcasting on 3G or 4G networks. Currently, telemedicine would be most viable in highly urban areas with existing specialized hospital-based services, such as Luanda province, where there is full 4G coverage.

Ministry of Telecommunications and Information Technology

Ministério das Telecomunicações e Tecnologias de Informação (MTTI) is the organ of the Angolan government’s central administration responsible for the definition of strategies and policies in the fields of telecommunications and Information Technology (IT) and the coordination of actions needed for its execution for macro-economic development. MINSA approached the MTTI to provide implementation support to Project 53 of the PNDS, which includes ICT and data issues in the health sector. The plan was amended to reflect and enhance development in ICT. However, as of this writing, the amended PNDS has not yet been officially approved. Once approved, the MTTI assistance to MINSA is expected

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be provided on all technical matters in conjunction with Nacional de Tecnologia de Informacion e Comunicacion (CNDTI), a branch of MTTI. All ICT development within MINSA will pass through this body. The MTTI spokesperson interviewed indicated that MTTI will lead the ICT development in MINSA.

Additionally, it was suggested that any mobile services such as mHealth would have to pass through Instituto Angolano das Comunicações (Angolan National Institute of Telecommunication or INACOM). This semi-autonomous regulatory agency is under the purview of MTTI and controls access and right to the telecommunications network. These additional layers of bureaucracy are likely to slow the best development efforts.

**ICT Policy and Regulatory Environment**

Angola has developed basic ICT policies and regulations. The two main policy documents are the ICT Whitepaper and the Information Society National Plan (PNSI or Plano Nacional da Sociedade da Informação). Together with the Basic Telecommunications Law (2001), the “Whitepaper for ICT” defines the guidelines for the development of the ICT sector in Angola. Of particular interest:

- The ICT Whitepaper recognizes the need to license a third mobile operator (beyond UNITEL and Movicel) to boost competition, promote increased coverage, and drive down cost.
- The ICT Whitepaper makes the case that increased Internet and broadband penetration rate will produce economic growth (based on World Bank estimates). The Information Society National Plan 2013-2017 defines the objectives and programs leading to the information society and is structured on six pillars including health, connectivity and access, e-governance, and other social sectors. The Plan outlines Angola’s blueprint for digital inclusion (equal opportunities to all Angolans, regardless of their living region) and e-government, including for public health and education institutions at municipal levels.

According to a 2010 report from the Southern Africa Development Community, “Angola has made tremendous strides in the development of its legal and regulatory framework considering its political history in the last ten years. However, more work still needs to be done to level the playing field for the [telecommunication] operators and to strengthen regulatory independence.” This comment is based on the fact that the regulatory agency is not adequately insulated from the influence of the MTTI.

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13 Interview with MTTI Secretariat advisor on 17 October.
17 Angola is a member of SADC, which has been active in promoting a digital economy throughout the sub-region with support by the EU and International Telecommunications Union (ITU).
**Universal Service Fund:** In order to guarantee universal access and the development of telecommunications (especially in rural areas), Angola has established a Universal Service Fund (USF) overseen by INACOM (the Fundo de compensação do serviço universal de comunicações eletrónicas). Mobile network providers and other telecommunication public network carriers and service providers make financial contribution using a percentage of their revenues.\(^{19}\)\(^{20}\)\(^{21}\) The USF is the principal means to offer access to those who can least afford it. The Angolan government currently provides little information on how the national USF is financed and used.\(^{22}\) However, if rendered functional, this Fund could be a viable source of funding for the deployment of eHealth systems.

**Mobile Network Operators**
There are two main mobile network operators (MNOs) in Angola: UNITEL and Movicel. UNITEL dominates the market with 72 percent of market share.

UNITEL offers a variety of communications and Internet services. It advertises that it serves over 95 percent of Angola’s population. Working in partnership with Swedish technology corporation Ericsson, UNITEL is also one of the first operators to commercially launch a 4G (for highest speed connectivity) network in Africa. However, Angola Telecom holds a privileged position above UNITEL as it is wholly owned by the Government. Angola Telecom owns the network but is required to allow access to mobile network operators such as UNITEL, Movicel, MSTelcom, and other contenders. If MINSA fully embraces mHealth solutions as a public good for health system strengthening, UNITEL would be the MNO partner of choice since it provides greater network coverage and because the company is partly government-owned and may thus be more likely to subsidize features like data, SMS shortcodes, and airtime.

![UNITEL Coverage Map 2012](image1)
![MOVICEL Coverage Map 2012](image2)

Movicel, like other MNOs in developing countries, adopted CDMA, a channel access system developed in the USA but one that failed to gain worldwide acceptance. Movicel is now migrating from a CDMA transmission platform to the more universally used Global System for Mobile communications (GSM).
They now operate full 4G LTE coverage throughout Luanda and, through agreements with Huawei, a Chinese multinational telecommunications corporation, national coverage will be rolled out soon. Most mobile phones rely on the GSM platform for data, information, and voice communications. Movicel made the decision to massively support two initiatives in Angola: education and public health.23 In a brief and informal interview with Movicel, the company expressed interest in corporate social responsibility within the health sector without further details except that health investments are on the “short list” of priorities as the company seeks to gain a competitive edge against UNITEL.

In January 2014, the Angolan Government announced that it will award new licenses for exploration of networks of mobile and fixed phones in the coming year.24

“Movicel has shown the role that mobile operators can play in vaccination campaigns and disease prevention. In Angola, the value of operators and the importance of their significant reach into rural geographic areas have allowed them to deploy mHealth services to otherwise unreach people”.

- Movicel, former CEO, Yon Moreira, 2012

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Angolan Mobile Subscribers (Million)

Source: Angolan authorities (National Development Plan) and Eaglestone Securities

Telecommunications Infrastructure

Angola’s National Development Plan 2013-2017 identifies eight major national projects in ICT supported by an investment of $1.6 billion.

Angola’s ICT tariffs remain above the Sub-Saharan African averages, partly due to Angola Telecom’s monopoly over the fiber-optic cable SAT-3.25 The West African Cable System (WACS) is also live in

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25 Angola Cables is an operator of fiber optic telecommunication systems formed in 2009 by the major Angolan telecommunication companies, Angola Telecom (51%), Unitel (31%), MSTelcom (9%), Movicel (6%), and Mundo Startel (3%).
Angola and the South Atlantic Cable System (SACS) is scheduled to come online in 2016. Fiber-optic cables serve as the medium (i.e. the “pipes”) for the national internet (including mobile) backbone and are the principal data routes. The first phase of a national fiber-optic backbone linking 18 provincial capitals through 6,000 kilometers of fiber-optic cable was scheduled to be completed in 2011, but has yet to be completed. ADONES (Angola Domestic Network System) consists of 1,800 kilometers of fiber-optic submarine cable linking eight Angolan coastal cities. Fixed and mobile internet coverage and overall speed will change dramatically when Angola connects to Europe and South America via the SACS, which is now scheduled to come online in 2015. SACS will span 10,000 kilometers and directly connect two Portuguese-speaking nations: Angola and Brazil. This $100 million investment from Google Inc., Angola Cables, and Brazil’s Algar Telecom is expected to increase mobile coverage to Internet by 20 percent in 2015. It aims to sustain the current needs of Internet users in Africa and prepare for increased demands in the future. Four companies - Angola Telcom, MS Telcom, Snet, and Multitel - operate the Angola Internet Exchange Point.

Increased Internet coverage will allow for more people to benefit from mHealth solutions (e.g. mass dissemination of family planning information; pregnant women and new mothers receiving health information and appointment reminders) especially in rural areas where access to health information can be limited. Increased connection speeds offer many opportunities for all sectors, including health, and especially for mHealth and telemedicine, distance learning education (connecting Angolan institutions with world renowned health facilities and universities), and other applications that require high speed Internet and broader bandwidth.

Mobile Phone Use among Angola’s General Population

Affordability and Mobile Phone Ownership: The cost of telecommunications in Angola is relatively high. UNITEL’s average revenue per user (ARPU)—the method used in the industry to measure consumer spending on mobile services—was $20.7; this is a significantly higher amount than the average for Sub-Saharan Africa ($13.6), based on latest figures available from 2012. ARPU is negatively impacted by multiple SIM ownership.

https://gsmaintelligence.com/markets/93/dashboard/
https://gsmaintelligence.com/analysis/2014/05/measuring-mobile-penetration/430/
Based on estimates (2014), average mobile users in Angola spend around $11 per month to own and use voice, SMS, and data on a mobile handset (based on a 2011 total-cost-of-ownership analysis from Nokia). For the 43 percent of the population living on less than $1.25 per day (or $37.5 per month), expenditures related to owning and using a mobile phone can take up a sizable portion (at least 29%) of monthly income.33

Despite the high cost of mobile services, key informants interviewed as part of this assessment believe that mobile phone use is fairly widespread. This finding is backed by industry data from the Groupe Speciale Mobile Association (GSMA). As of 2013, there were an estimated 13.3 million mobile cellular connections, which is 50 connections per 100 persons.34 In 2013, GSMA estimated the rate of SIM penetration to be at 61 percent. It is safe to assume that more than half of the population has access to a mobile phone given that people often share a device within a household.35 This is despite an element of double counting brought about the use of two SIM cards (UNITEL and Movitel) by individuals when traveling in a geographic zone where one operator has better coverage. The 2011 Malaria Indicator Survey found that more than half of all households have at least one member with a mobile telephone—91 percent in urban areas and 28 percent in rural areas.

The business incentive for UNITEL and Movitel to expand coverage is not obvious. They will have to make further investments to reach lower revenue (ARPU) subscribers in areas with much lower population densities. The potential return on investments is lower, more uncertain, and, consequently, riskier, meaning that operators will tend to avoid or delay them. However, nationwide coverage, crucial for the socio-economic development of those populations and of the country, is one of the priorities of the Angolan government.36 If a third operator is allowed in the market, the increased competition will likely decrease the cost. Although Angola was one of the first African countries to roll-out higher speed 4G connectivity, which requires more expensive smartphones, most of the population still uses basic feature phones (e.g. basic Nokia phones). Until smartphones become more affordable, it is necessary that mHealth services targeting the poor are also available on phones with simpler features.

Nearly all Angolans (98%) use pre-paid mobile phones with top-ups for their voice, SMS, and data services. The remaining 2 percent of users are very likely to be in the highest wealth quintile and can afford to pay the $27 plus data costs required for a monthly plan.

35 https://gsmaintelligence.com/analysis/2014/05/measuring-mobile-penetration/430/
36 http://www.eaglestone.eu/xms/files/The_Telecoms_Sector_in_Angola_Eaglestone_Securities_050514.pdf
**Mobile Money:** Angola currently does not have live, nor planned, mobile money services. However, the National Bank of Angola (BNA), in partnership with UNITEL and Movicele, is reportedly expected to allow mobile banking payments in the coming months. Mobile payments offer tremendous opportunities to strengthen the health system by increasing transparency, efficiency, and security of financial transactions throughout the sector. Mobile money enables individuals to mobilize and save funds for treatment (via mobile health insurance schemes, for example). By sending money to health workers via SMS instead of making cash transactions, health program managers can reduce leakages, facilitate accountability, and increase physical security. Since trust is an important barrier to the adoption of mobile money services, USAID and other development partners should consider engaging with MNOs early, as operators prepare to launch this service, in order to explore the potential option of having community health workers serve as part-time mobile money agents. The Digital Finance team (formerly named Mobile Money team) with the USAID/Lab and its Better Than Cash Alliance can be a useful source of technical assistance for MINSA and USAID/Angola to explore the feasibility of transitioning from cash to mobile payments.

**Aggregators:** One key challenge in implementing mHealth at scale in a country where network coverage varies widely from one geographic zone to another is providing the same service (e.g. sending health data and/or receiving health information via SMS) regardless of whether the user is a Movicele or UNITEL client (i.e. the ability to transmit data/SMS across networks is critical). Mobile aggregators are companies that facilitate the connection between mobile carriers, including by routing SMS messages confirming transactions to or from mobile networks. While no Angolan aggregators were found as part of this assessment, South Africa’s biggest mobile services aggregator, FoneWorx, has live operations in Angola. This company has run massive SMS-based services for retailers, mobile devices manufacturers, digital TV providers, brewery companies, and many others.

**International Organizations**

Key development partners have either begun funding eHealth, HIS, or ICT-related projects or have plans to do so in the future. The World Bank (WB) and European Union (EU) provide direct funding to MINSA for health systems strengthening. WHO/Angola has pursued the use of mobile technology for epidemiological surveillance, entertaining a prototype model for implementation, but was unable to get buy-in to implement. The organization is still keen on supporting such an intervention and is open to supporting other pilots as well. The European Union is also releasing a request for proposals for implementing partners to provide technical assistance to MINSA in the development of the national HIS for the creation, deployment, and transfer of an IT integration platform which is able to

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38 The Better Than Cash Alliance is a PPP between USAID, the Gates Foundation, VISA, Mastercard and other partners that provides expertise in the transition to digital payments
incorporate, integrate, store, format, use, and disseminate PNDS indicators or other indicators that MINSA considers to be a priority.

Under the African Development Bank-funded (AfDB) Institutional Capacity Building for Poverty Reduction project for Angola, a tripartite agreement between AfDB, the Angolan government, and Microsoft is designed to have the corporation provide “free of charge” technical support in developing a knowledge and results management framework for Angola.

**Stakeholder Mapping and Strength of Working Relationships**

Implementation of mHealth activities requires a network of partners and deep collaborative efforts. An enabling environment for mHealth consists of collaboration between ministries of health and telecommunications, regulatory bodies such as INACOM, funders, mobile network operators, and program implementers.

A survey of focus group participants was conducted as part of this assessment to gauge the likely strength of working relationships among key players if a mHealth activity were to be undertaken. Participants were asked to (1) list organizations essential to the success of using mobile phones for health (mHealth); (2) rank those organizations from 1 to 5 on their importance to mHealth; and (3) rank the strength of their own organization’s working relationship with the brainstormed organizations that would be essential to mHealth success. The individual responses to the analysis are likely biased by the program area in which the respondents were working.

Key findings from the analysis include:

- MINSA and MNOs are identified as the most important mHealth stakeholder with which to engage. However, focus group participants reported that they have not worked closely enough with the MNOs (i.e. the working relationships are either very weak or non-existent among the majority of stakeholders).
- MTTI is indicated as a lower priority suggesting that “the big picture” may be missing in the understanding of what entities are required in an mHealth implementation. Without support from the MTTI, progress in mHealth implementation will be slowed.
- USAID’s rating is high and is attributable to its influential role in the health sector and the existing relationship with participants in the focus group who might receive funding from the Agency.
- Donors (e.g. EU, UNFPA, and multinational corporations) were not mentioned by focus
A stakeholder mapping diagram was developed which relates the current and potential role and perceived level of influence of each stakeholder. A more detailed stakeholder mapping matrix template was also assembled. As one of its first activities, the National eHealth Working Group should prioritize completion of this matrix by adding any missing stakeholders and organizing each entity by pillar, with budgeting figures, if appropriate (see Annex 3 for template). Each of these stakeholders can potentially contribute human, technical, and financial resources to the eHealth ecosystem. It will therefore be important for MINSA, USAID, and other members of the Working Group to continuously engage with them with the goal of determining potential contributions (local incentive structures) as well as limitations for each stakeholder throughout the process of developing the national eHealth framework.

**Human Capital**

While more than two-thirds (71%) of adults in Angola can read and write, only 46 percent of the population complete primary school and only 35 percent enroll in secondary school. According to recent estimates, only 29 percent of government workers completed secondary school. These proxy indicators of human capital are especially evident at the low and middle tier of the civil service structure as confirmed by most informants.

Angola has a number of tertiary institutions that offer training in information and communication technology (ICT) and career training is available for health professionals at a number of private institutions. The extent or quality of training and education was not reviewed in this assessment. The e-Government component of the Information Society National Plan 2013-2017 prioritizes ICT training for public employees and institutions to improve the provision of government services. As part of this national ICT plan, the MTTI is in the process of establishing a national ICT training program for public administration employees.

Given the likely low literacy and numeracy rate among the poor, mHealth solutions aiming to shift responsibility for personal health care to the lower wealth quintile consumers in a market-driven approach will require some type of interactive voice response (IVR) interface in order to limit the need for reading and writing SMS messages. The enthusiastic reaction of the DNSP on the prospects of a voice query that could return statistics on health facility surveys or disease counts suggest high interest in the technology if it can meet certain use-case thresholds of usefulness. Use-cases will need to be conducted for each class of mHealth users from front-line workers to upper management. Each class has its own data and information demands depending on its functional role. An IVR interface would also be an advantageous feature for health workers who often have limited time to type text messages while treating patients.

There is a small pool of software developers who specialize in mobile applications (“apps”) development in Angola. Startup Angola is an association of 15 members which constitute an available talent pool of young entrepreneurs; ten of these entrepreneurs have small software development companies. To scale up ICT-enabled innovation and entrepreneurship, the World Bank’s InfoDev program established a technology hub within the National Institute of Entrepreneurship and Vocational Training’s (Instituto Nacional do Emprego e Formacao Profissional) business incubator unit. This unit has also received support from UNDP, Chevron, and the Spanish Cooperation under the public-private partnership “Angola Enterprise Program”, which offers assistance for young entrepreneurs to start up their own

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business. Moreover, under the Microsoft/World Learning initiative, the corporation recently launched a "Microsoft YouthSpark" in Luanda to build capacity of Angolan youth, providing training and tools to tackle high unemployment by improving youth marketability in the tech industry. Scaling up country-owned eHealth systems in Angola will require a critical mass of local ICT experts to support the development, customization, and maintenance of the system. Networked organizations such as Startup Angola and YouthSpark, and government agencies and universities, can also be viable partners to source local talent, ideas, and innovation. This type of engagement would also address the developmental goal of engaging youth and building local capacity (aligned with the objectives of USAID Forward).

mHealth Implementation in Angola (Past and Current)

A limited number of partners have experimented with the piloting of mobile applications in Angola’s health sector. In this assessment, key informants had an incomplete understanding of what mHealth entails and needed to be sensitized to mHealth concepts and solutions. The Portuguese version of the “USAID mHealth Compendium, Volume 3” proved to be a valuable resource for this portion of the assessment. The Compendium was used to stimulate discussions and conversations on the topic of mHealth and its potential use in Angola.

A concern expressed repeatedly among informants, especially those in MINSA who were aware of current and past implementations in Angola, was the number of failed mHealth pilots that the donor community supported in the past. None of these attempts have been institutionalized within MINSA, nor have they been integrated into the HIS within a clearly defined eHealth framework. Examples of past and current mHealth implementation in Angola include:

USAID/Angola’s Malaria IRS Mobile Data Pilot (2013): Lessons Learned and Recommendations

Lesson #1: Low literacy prolonged training and hands-on supervision

Recommendations:
• Pilot in AIRS countries with higher education levels and capacity.
• Employ basic mobile phones with SIM card application versus touchscreen smartphones.
• Budget for longer training and more hands-on exercises.
• Use an alphabetical keyboard versus QWERTY keyboard.

Lesson #2: Piloted in a new IRS area and with seasonal personnel new to IRS

Recommendation:
• Implement in target area(s) with a history of IRS.

Lesson #3: Data submitted by spray operator after each form (village) versus each structure

Recommendations:
• Program software to allow spray operators to submit data after every structure. Team leaders can then validate data throughout the day, instead of at the end of each day.
• Collect GPS units at the structure level compared to spray form (or village) level, to more closely monitor refusals and spray coverage.

Lesson #4: Technological “bugs” in team leader verification system the first week of spray (i.e. filtering and sorting difficulties)

Recommendations:
• Task team leaders to validate data on basic mobile phones with a SIM card application system.
• Develop and test a new, functional data aggregate and cleaning system, incorporating lessons learned with the current system.
• Include the AIRS Angola IT specialist on the development of the system earlier in the process.

• **Mobile Polio Campaign**: Follow-up survey to a recent MINSA Polio Campaign, conducted by the CORE group, a USAID implementer. CORE group’s partner, Catholic Relief Services, as part of its ICT4Development initiative, trained more than 20 volunteer focal points to use the mobile phones to collect and send monthly polio data. In addition, to increase coverage, Movicel provided support for MINSA’s polio vaccination campaign in 2012 by offering participants a mobile top-up for each vaccinated child.

• **SMS Mulher (SMS Woman) initiative**: MINSA reportedly launched a system designed for sending maternal and child health information to women via SMS. This initiative was announced by the Minister of Health in 2012.

• **Population Services International** reportedly launched a mobile solution for HIV prevention developed by TIMWE—a Portuguese multinational company that offers mobile monetization solutions. Using TIMWE’s commercial SMS and agent chat tools (allowing citizens to receive answers to HIV-related questions in real time), PSI created a new channel to communicate with people at risk of HIV.

• **GSMA/Mobile Enabled Community Services**: Innovation Fund grantee Development Workshop Angola, in partnership with SeeSaw, developed a suite of mobile-enabled tools to evaluate the effectiveness of peri-urban water delivery for the Luanda Water Company (EPAL). The seed grant will test the use of mobile technology to report service delivery issues in informal settlements and whether the suggested business model of field-level generated data is valuable enough that local organizations self-finance the system beyond the pilot stage.

• **USAID/Angola’s Malaria IRS Mobile Data Pilot**: As part of the U.S. Presidential Malaria Initiative/Africa Indoor Residual Spraying project’s 2013 spraying campaign, Abt Associates piloted the use of an Open Data Kit software-based mobile system for IRS spray data collection and verification as an alternative to the standard, paper-based data collection tools and quality assurance tools in Bailundo Capital, a commune in Huambo province, Bailundo Municipality. Specifically, spray operators were trained to collect household real-time spray data with smartphones. Lessons learned are presented in the box on the previous page.

• **RapidSMS**: In 2013, UNICEF, in collaboration with Maria Futi of the Serviço Nacional da Nutrição, developed the ‘Mensagem Rapida’ system for the monitoring and evaluation of management of acute malnutrition. UNICEF secured a toll-free short code from the ministry of telecommunications, hosted the RapidSMS application (used in dozens of African countries), mapped all implementation sites in-country, and developed and validated training materials at implementation sites in Kwanza Sul. The project was put on hold when the UNICEF nutritionist was sent to South Sudan on an emergency mission and then was assigned to a post in Zambia. Since then, the RapidSMS tool has been upgraded to RapidPro. The UNICEF office is still interested in reigniting this project and plans to provide technical support in 2015.

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42 Angola, CORE Group Polio Project Quarterly Report. April to June 2013
43 http://www.coregroup.org/storage/Polio_Initiative/Angola/CORE_ANGOLA_PROGRESS_REPORT_APRIL_TO_JUNE_2013.pdf
45 http://www.portalanop.co.ao/angola/qt_pt/noticias/saude/2012/5/26/Ministerio-lanca-projeto-SMS-Mulher-ebf0aba9-4dd0-4f98-a8b7-14c8204c6111.html
**Mobiles for End-Use Verification:** Under the USAID/Strengthening Pharmaceutical Systems Program, Management Sciences for Health piloted the use of mobile phones in collecting data for the End Use Verification (EUV) in two provinces in Bengo and Luanda. The EUV mobile data collection pilot used DataDyne’s EpiSurveyor (now called Magpi) software to collect, analyze, and transmit health facility medicines availability and use data in collaboration with the National Essential Medicines Program and the National Malaria Control Program as well as provincial health offices from the two provinces. Due to unforeseen issues with the telecommunication provider (UNITEL) and government counterpart which was to manage the database, the program decided to stop using these mobile phones (as the team was also having some connection issues in the field) and has returned to using paper-based questionnaires in semi-annual EUV data collection.

Key informants report other instances of one-off pilots that started but gained little traction and failed. No documentation was made available for this report on these other efforts.

**Key Challenges and Opportunities for mHealth Implementation in Angola**

The mHealth implementations piloted in the past provide an early glimpse into what a national mHealth system could look like in Angola. MINSA believes there may be value gained in using mobile technology for health but has not yet articulated a vision (i.e. a policy framework) for what that might look like for

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Angola. Key opportunities for mHealth in Angola include: 1) the presence of donors such as the World Bank, EU, and USAID with an interest in supporting HIS development, 2) the existence of Luanda-based implementing partners with mHealth experience in other countries, 3) the arrival of mobile money solutions, and 4) plans and initial groundwork for the implementation of open-source platforms (RapidSMS and iHRIS). An analysis of the mHealth-related strengths, opportunities, challenges, and threats is outlined below. A more detailed discussion on key challenges and opportunities is presented following the analysis table.

### Strengths, Challenges, Opportunities and Threats Analysis

#### Strengths
- About half a dozen mHealth projects have been piloted
- National ICT policy documents prioritize e-government, including for public health
- Relatively high mobile network coverage rates
- A Universal Service Fund (USF) for telecommunications has been established
- Private sector interest in supporting mHealth as part of CSR, including from mobile network operators and extractive industries

#### Opportunities
- A number of mHealth projects have been piloted
- SACS fiber optic cable will lead to increased connection speeds
- National fiber-optic backbone linking 18 provincial capitals will increase internet coverage and allow for more people to benefit from mHealth solutions in rural areas
- The arrival of a third MNO will increase competition and drive down cost
- National Bank of Angola (BNA), in partnership with UNITEL and Movicel, will reportedly allow mobile banking payments in the coming months
- The existence of a USF potentially presents a viable source of funding for the deployment of eHealth systems, if the Fund is rendered functional
- Plans and initial groundwork for proven, open-source platforms for community-based (RapidSMS by UNICEF) and human resource information system (iHRIS by IntraHealth)
- Population-based surveys present an opportunity for MINSA and its partners to socialize mHealth concept and gain experience with mobile data collection

#### Challenges
- No overarching national eHealth strategy or framework
- No existing standards for data exchange
- Limited human and institutional capacity in health informatics, change management, and IT governance
- mHealth not integrated with the health information systems
- HIS sub-systems functioning in silos
- Multiple stakeholders involved but no clear consistent mode of engagement and communication
- Low harmonization across projects resulting in missed opportunity for synergies and capturing data in national information systems

#### Threats
- Donor dependency of HIS subsystems for vertical disease programs (e.g. HIV and Malaria)

#### Overarching eHealth Framework
Angola does not yet have an operational framework or standards for eHealth (or data exchange protocols) that allow for various systems (electronic or mobile) to share information and communicate with one another. Agencies and organizations that facilitate mHealth functions require a defined eHealth strategy and policy framework to operate. A national eHealth framework should include the following 7 pillars: governance, legislation, workforce, strategic visioning, standards, infrastructure, and applications. The operational framework should define roles and responsibilities. A common framework of data standards and defined means for

### Seven Pillars of a National eHealth Strategy

<table>
<thead>
<tr>
<th>Leadership and governance</th>
<th>Services and applications</th>
<th>Legislation, policy and compliance</th>
<th>Workforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy and investment</td>
<td>Standards &amp; interoperability</td>
<td>Infrastructure</td>
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data exchange allows the integration of health information systems regardless of the technology or the implementing partner. Common goals and a predictable ICT environment enable coordinated actions such as building consensus on policy, facilitating better use of shared resources, involving the private sector, and investing in ICT skills and infrastructure to improve health outcomes.

**National multi-stakeholder coordination body:** Angola does not yet have a national coordination mechanism to guide eHealth and/or mHealth implementation. The country has seen a number of pilot mHealth projects implemented in isolation without leveraging what the health and ICT sectors have to offer in terms of human, technical, and financial resources.

**Learning from failures:** Failure is a necessary part of the innovation process because learning, iteration, adaptation, and building new conceptual and physical models result from failed attempts. GEPE/GNTIC indicated that they are interested in learning why past mHealth implementations have failed before embarking on new pilots. Prior to future mHealth deployments, USAID should consider providing assistance to GEPE/GNTIC to conduct an in-depth assessment of systems issues (socio-cultural dynamics, human capacity, institutional arrangements, etc.) that have stymied past attempts.

**Institutional capacity development:** The opportunity to introduce and leverage mHealth in Angola will require capacity building for technical skills (health informatics, public health, software development) and non-technical skills (leadership, change management, coordination). Given that MINSA will now have to interface with MTTI (and this collaboration will add complexities), USAID and other partners should invest in strengthening the unit responsible for eHealth within the health ministry by providing technical assistance in leadership and change management practices. It is advisable to second a technically-savvy organizational development professional to work internally within MINSA and alongside GNTIC, to provide assistance in executing the HIS strategy laid out in Project 53 of the PNDS.

**Using existing USAID mechanisms and partners:** USAID/Angola and its implementing partners could use existing projects to test proof-of-concept ideas, monitor effects and outcomes, and build MINSA confidence in mHealth solutions and USAID technical capacity. As part of this approach, it would be important to collaborate closely with technical counterparts in MINSA and other donors (i.e. UNICEF and the EU) in the design and implementation of this system. The USAID Washington Global Development Lab’s Mobile Data Team can be a helpful resource for guidance and support if USAID/Angola begins to transition to mobile technology for project monitoring and evaluation.

**Building off proven, open-source mHealth platforms supported by USAID and other partners:** The USAID Washington Global Development Lab, UNICEF, and IntraHealth are in the initial planning phase for the roll-out of two proven, open-source platforms used in more than a dozen countries: 1) RapidSMS, the UNICEF-backed SMS messaging system for real-time data collection and transmission, and 2) iHRIS, the IntraHealth-backed health workforce information system which helps 19 countries track and manage data about their health workers. Recently endorsed by USAID, WHO, UNICEF, and other partners, these open-source software platforms are interoperable and are easily modified to serve multiple purposes and can be tailored to country context. Moreover, because they adhere to open standards, they can be integrated with other data systems (e.g. DHIS2, OpenLMIS, OpenMRS, etc.) which will be especially critical when Angola begins its digital healthcare revolution.

**Population-based surveys:** Population-based surveys present an opportunity for countries and partners to gain time-bound experience with using mobile technology (preferably tablets) for data collection. There are some preliminary discussions for a Demographic Health Survey (DHS) to be undertaken. This will be the first DHS in the country and the WHO would like to see mobile technology used in its implementation, like has already been done in Brazil, Bolivia, Mozambique,
Tanzania, and Nepal. There are many benefits in using mobile devices for surveys including: (1) improved data collection with fewer invalid data entries, (2) capturing of true locations using GPS, (3) exposing and sensitizing surveyors, health workers, and the general population to the use of mobile technology, and (4) speed and efficiency of data collection. USAID’s MEASURE DHS project provides information on using mobile technology for DHS surveys in the section on using Tablets for Computer-Assisted Interviewing (page 19) of its “Survey Organization Manual”.48 The Nepal experience is documented in the Global Health Science and Practice journal article “Successful use of tablet personal computers and wireless technologies for the 2011 Nepal Demographic and Health Survey”.49 In addition to the DHS, Angola could consider using mobile technology for other population-based surveys, including the Malaria Indicator Surveys and Multiple Indicator Cluster Surveys. Before developing new mobile platforms for surveys, partners should investigate existing data collection mobile services, such as DataWinners and Magpi. The World Bank ICT blog titled “Using mobile phones in data collection: Opportunities, issues and challenges” presents a summary of critical issues to account for in the use of mobile technology for surveys, including cost, accuracy, training needs, speed, and data security. The blog can be found at http://blogs.worldbank.org/edutech/using-mobile-phones-data-collection-opportunities-issues-and-challenges.50

**BUSINESS CASE for mHEALTH in ANGOLA**

In addition to performing a landscape analysis of the mHealth ecosystem in Angola, this assessment sought to develop an early-stage business case for public and private sector investments in mobile technology for health service delivery. This preliminary business case was developed using insights from in-country interviews combined with evidence from other countries. The business case emphasizes the value proposition for health and non-health sectors to provide talking points for USAID to use when make the pitch for mHealth to potential investors (public and private).

**Added Value of eHealth for Improving Health Outcomes**

Public health programs need cost-effective ways to train health workers, as well as better diagnostic tools and data to inform program planning and resource allocation decisions. Mobile phone technology can facilitate on-the-job training of health workers in remote areas, enable more accurate and faster diagnostics, and improve access to real-time health information and data. Mobile money services benefit health systems by reducing the amount of money providers and patients have to carry for health-related transactions, expediting the payments from patients to healthcare providers, and making it easier for patients to contribute to health insurance plans. Refer to the following website for examples of effective mHealth applications in the health sector: [http://www.africanstrategies4health.org/resources/](http://www.africanstrategies4health.org/resources/).

Mobile technology can be used to help countries achieve Universal Health Coverage (UHC). WHO and Johns Hopkins University mHealth experts developed “A cascading model to prioritize and select integrated mHealth strategies for achieving UHC”. In this model, a suite of mHealth strategies exist that could contribute to strengthening accountability, supply, demand, quality, and cost in efforts to achieve UHC.51

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51 Garrett Mehl and Alain Labrique. Prioritizing integrated mHealth strategies for universal health coverage. *Science* 345, 1284 (2014);
Mobile Network Operators

For MNOs like UNITEL and Movice, value-added services such as mobile money and mHealth offer a cheaper, more convenient solution for people to access information and financial and health services. MNOs are typically driven by the need to increase revenue per customer and decrease churn (customers changing networks). By developing a partnership that is a “win” for both sides, development partners can benefit from the MNO’s vast reach into mass markets through distribution channels, market research, and consumer trust as a transaction partner of choice. The potential incentive for MNOs to partner with development partners on mHealth solutions is that they may be able to reduce churn and build brand loyalty by creating incentives for customers (e.g. subsidized health insurance). MNOs can also generate health-related content that attracts and retains users, while tapping into networks of trusted champions such as community health workers.
CONCLUSIONS and RECOMMENDATIONS

USAID and its partners can use mHealth as a game-changing tool to strengthen health systems and optimize existing efforts towards UHC in Angola. All informants interviewed agree that the use of mobile technology can benefit public health. The primary concern is MINSA’s ability to sustain projects beyond inception. Data access across siloed vertical programs continues to be a challenge because of paper-based systems. The multiplicity of disconnected vertical data systems, scarce human and financial resources, and duplicate efforts in data collection and analysis gives an incomplete picture of health issues and limits program managers’ ability to use data for decision-making. The challenges resulting from siloed, paper-based systems present an opportunity for integrated HIS and mHealth platforms to be introduced. Following the recommendations below, this integrated mHealth platform (or combination of platforms) could address critical health system challenges (e.g. disease surveillance and access to care) while adding minimal workload to its users, and would offer actionable data that all use-points could access within one to two years.

- **Recommendation #1: Assist the MOH in the establishment of a National eHealth Working Group or Task Force.** As a first step in developing the enabling environment for mHealth, Angola urgently needs a national coordinating body for eHealth in order to maximize the use of existing resources and to limit the duplication of efforts. This national body should be country-led and managed, ideally with MINSA as a main driver. The coordinating body will have the mandate and decision-making authority to guide, coordinate, oversee implementation, and secure resources for the national eHealth strategy and policy framework and health sector ICT deployments in the country (see Annex 2 for draft Terms of Reference). Since mHealth implementation ideally uses a multi-sectoral approach, the committee guiding the implementation process should have representation from all concerned national agencies and development partners. The group should also have representation from the sub-national level. Two key complementary resources that can help guide the national eHealth working group (once it is formally established) in the development of a national eHealth Strategy and Policy Framework are the World Health Organization - International Telecommunications Union (WHO-ITU) National eHealth Strategy Development Toolkit and the Open Health Information Exchange community.

- **Recommendation #2: Working in close collaboration with health and telecommunication ministries, support the development of a National eHealth Strategy and Policy Framework for Angola.** To effectively deploy an integrated mHealth system at scale that accelerates the reduction of morbidity and mortality, Angola needs a contextually-based overarching strategy that includes a clear vision for eHealth as well as objectives, plans, roles, and responsibilities. The most critical eHealth strategic planning step is the development of data standards and an overall eHealth architecture. Agreeing on data exchange standards requires communication and advocacy focused on promoting the use of internationally recognized standards, such as those certified by the Integrating the Healthcare Enterprise initiative. Interoperability can be maximized with a common framework of data standards and defined means for data exchange.

- **Recommendation #3: Guide and assist MINSA to implement at least one viable mobile data platform in close collaboration with UNITEL or other MNO and the MTTI to address core health system challenges while strengthening the overall health information system.** The Mission should consider investing in one or both of the following two proven, interoperable, open-source platforms that have been implemented at scale in dozens of African countries and are currently being planned for deployment in Angola: 1) RapidSMS, the UNICEF-backed SMS messaging system for real-time data collection and transmission, and 2) iHRIS,
the IntraHealth-backed health workforce information system which helps countries track and manage data on their health workers and is currently used in 19 countries. These two solutions, along with the DHIS2, are prioritized by USAID/Washington’s Global Development Lab and Bureau for Global Health among the panoply of eHealth solutions available. USAID should engage with UNICEF, IntraHealth, and the Lab jointly to further discuss their plans for pilots in Angola and explore ways to support these efforts in close collaboration with MINSA.

- **Recommendation #4:** Strongly encourage USAID/Angola partners implementing health facility or community-based projects to work with MINSA to transition to mobile data collection for monitoring and evaluation (M&E) and service delivery, whenever appropriate. The Angola Mission should promote the use of the Principles for Digital Development (the set of best practices recently endorsed by USAID Administrator Shah), as well as the integration and adaption of interoperable, open-source mobile technology into their implementing partners’ annual work plans and budgets. As part of this effort, the Mission should require publication of data schemas and access control methods for sharing data across siloed database systems.

- **Recommendation #5:** Evaluate the pilot and refine the mHealth business case for Angola to leverage resources from private sector partners and international donor agencies. Once the pilot mobile data platform begins to demonstrate positive results, the national eHealth working group (once established) should expand upon the preliminary business case included in this report. The updated business case should include Angola-specific results, needs, and investment opportunities with expected return on investment in terms of revenue and/or public good. The working group should commission an independent evaluation of the mHealth pilot to evaluate the process and outcomes of mHealth implementation. The evaluation should include a costing component (using the Total Cost of Ownership Model). Findings from this evaluation will strengthen the business case, which will serve as tool for attracting investors and partners to scale up the mHealth pilot.

- **Recommendation #6:** Enhance the operational capacity of two key government agencies: GEPE and GNTIC. Leading the development and implementation of eHealth solutions requires technical and managerial skills. To ensure the sustainability of investments in eHealth platforms, USAID/Angola and other partners should strengthen the institutional capacity of GEPE and GNTIC in the areas of leadership, change management, and health informatics (especially systems architecture). This capacity development effort could be accomplished using a range of organizational development (OD) approaches, including seconding OD and technical experts for longer term on-the-job coaching and mentoring, short-term technical assistance in identified needs areas, virtual capacity development, and self-guided courses using exiting training resources. Any OD effort in support of these two government agencies should start with an in-depth institutional capacity assessment.

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52 **Change Management:** Technology innovations result in a constantly evolving business environment. Within the context of large-scale information technology projects, Organizational Change Management skills enables managers to align group expectations, communicate, integrate teams and manage people. Change management makes use of performance metrics, such as financial results, operational efficiency, leadership commitment, communication effectiveness, and the perceived need for change, to design appropriate strategies, in order to avoid change failures or resolve troubled change projects.

53 **Health Informatics:** Health informatics is an evolving specialization that links computer science, social science, behavioral science, management science, communications and healthcare to improve the quality of patient care. It is a multidisciplinary field that uses health information technology (HIT) to improve health care via any combination of higher quality, higher efficiency (spurring lower cost and thus greater availability), and new opportunities.
Next Steps and Timeline

USAID should provide MINSA a translated version of this report for review and feedback. Once MINSA has provided feedback/comments on findings and recommendations, USAID should assist MINSA in convening a stakeholders meeting with all key informants interviewed from government agencies, donors, private sector partners, and NGOs. The purpose of this meeting would be to disseminate findings and recommendations and establish the National eHealth Working Group. Many of the subsequent recommendations can be implemented concurrently. The table below provides a proposed timeline (for the first 12 months) for implementing the recommendations outlined in this report:

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<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
<th>Months (year 1)</th>
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<tbody>
<tr>
<td>Provide MINSA a translated version of this report for review and feedback</td>
<td>1 month</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12</td>
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<tr>
<td>Debrief MINSA</td>
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<td>Organize a stakeholders meeting to disseminate findings and establish the National eHealth Working Group</td>
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<tr>
<td>Provide organizational development technical assistance to MINSA/GEPE and GNTIC</td>
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<td>Actively participate in National eHealth Working Group meetings</td>
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<td>Support the development of a National eHealth Framework for Angola</td>
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<tr>
<td>Encourage USAID/Angola implementing partners to transition to mobile data collection</td>
<td>12 months (continuous)</td>
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<tr>
<td>Guide and assist MINSA to roll-out a viable mobile data platform</td>
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<td>- Concept development (incl. define the problem, logic model, landscape analysis)</td>
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<td>- Solution design and testing (using human-centered design/agile approach)</td>
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<td>- Planning for pilot implementation with scale focus (incl. partnership development, M&amp;E design, etc.)</td>
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<td>- Implementation (with ongoing evaluation of cost and outcomes)</td>
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<tr>
<td>Evaluate the pilot and further develop the mHealth business case</td>
<td>18-24 months</td>
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Annex 1: Consultant Scope of Work

African Strategies for Health

Consultant Scope of Work

Senior mHealth Strategy Consultant

Activity

Technical assistance to USAID/Angola in developing the mHealth business case and strategy

Dates

September 3, 2014 – October 31, 2014

Number of Days

40 days

Principal Work Location

Angola and home-base

Travel Required

Yes (unless the consultant is based in Angola)

1) Purpose

The USAID-funded African Strategies for Health (ASH) project is recruiting a consultant to provide technical assistance in developing the business case and strategy for private and public sector investment in mobile technology for health.

2) Background

The Republic of Angola’s 18.1 million mobile connections and an 83 percent SIM penetration\(^{54}\) (measured as connections divided by total population) present significant opportunities for improving the quality of health care and access to health services. Experience from other African countries has shown that successfully incorporating ICT, including mobile technology, as a priority for health system development necessitates strategic and integrated action at the national level, to make optimal use of existing capacity while providing a robust foundation for investment and innovation. Establishing the main directions and planning the steps needed are key to attaining longer-term goals such as health sector efficiency and improved health outcomes. Collaboration between the health and ICT sectors, both public and private, is central to this effort.\(^{55}\)

In Angola, the Ministry of Health, USAID and other key stakeholders have held discussions on policy and systems for mobile technology and health programming and several mobile technology platforms are

\(^{54}\) GSMA Intelligence 2014

\(^{55}\) WHO-ITU National eHealth Strategy Toolkit
being piloted for social development (i.e. not just mHealth) including the National Malaria Control Program’s mobile data collection initiative.

USAID Angola and its partners also participated in two regional mHealth meetings held in Tanzania in 2012 and Ethiopia in 2013. Participants included representatives from Angola’s Ministry of Health and local implementing partners.

3) Consultancy Objectives
The ASH consultant will provide support to the USAID Angola Health Office in conducting an analysis of the mHealth landscape. In addition, USAID is interested in investigating efficiencies that could be gained in the future from integrating mobile data collection methods into standard surveys (such as MICS and DHS) and in using mobile solutions to support smaller scale validation of survey trends between larger population level surveys. The consultant will collect and analyze information to explore how mobile technology can support and strengthen the health system, including possible future universal health coverage. To present a strong value proposition for mHealth, stakeholder mapping and value chain analysis are also required in order to generate an in-depth understanding of the local incentive structures and limitations faced by each key stakeholders. The consultant will identify opportunities for private sector engagement along with suggestions follow-up.

4) Specific Activities
The consultant will provide technical support to the USAID Angola Health Office by carrying activities to include:

a) Landscape and Value Chain Analysis
   - Review documents and generate a synoptic overview of mobile services, coverage, operators, aggregators, ICT literacy, access (by overall population, by geographic region, by income levels, by gender and age) in Angola
   - Identify, interview and map key stakeholders within the eHealth/mHealth ecosystem in Angola. Key informants will include donors, MOH, service providers, private sector/corporate CSR programs, other relevant government players (Ministry of Social Communication, Finance or Telecoms, independent regulatory agencies).
   - Catalogue and describe existing mHealth activities in Angola funded by donors or by the private sector.
   - Determine opportunities and barriers (policies, programs, partners) including both short and longer term possibilities for USAID engagement, in particular with the Ministry of Health for better alignment in the National Health Development Plan (PNDS), but also with other sectors, including non-health sector (Ministry of Communication, Finance…) and the private sector.
   - Investigate efficiencies that could be gained in the future from integrating mobile data collection methods into standard surveys such as MICS, DHS and in using mobile data collection to support smaller scale validation of survey trends between larger population level surveys.
• Map and analyze the mHealth value chain to generate an in-depth understanding of the local incentive structures and limitations faced by each key stakeholder.

b) **Initial Planning for Strategy and Working Group Development**
• Propose a multi-stakeholder consultation roadmap (using the National eHealth Strategy Toolkit as a guide) for:
  o the development of a national eHealth/mHealth strategy
  o the establishment of national-level coordinating body—an mHealth working group—which will lead the implementation of the strategy.

• Propose draft terms of reference for the national mHealth Working Group

c) **Other activities**
• Document regional and global resources that could support further engagement.
• Develop a draft and later a final report documenting the process used for stakeholder mapping, value chain analysis and strategy development.

5) **Deliverables**
• Initial workplan with proposed activities and timelines
• Final report documenting the process used for stakeholder mapping, value chain analysis and planning strategy development, with recommendations for future actions.
• Debrief meeting with key actors to share the consultancy findings and share the Portuguese version of mHealth Compendium as Best Practices.

6) **Qualifications**
• Strong expertise in strategic planning, stakeholder mapping and/or organizational development
• Experience with or knowledgeable of the use of mobile in the health sector, preferable
• Ability to identify, design, and broker successful PPPs
• Skill in interviewing senior management, high level government officials
• Analytical ability to synthesize key data, messages and recommendations
• Excellent communication skills (writing and presenting) in Portuguese (or Spanish) and English
7) Estimated Level of Effort

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<tr>
<th>Task/Activity</th>
<th>LOE Estimates (in days)</th>
<th>% LOE</th>
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<td><strong>Landscape and Value Chain Analysis</strong></td>
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<td>1. Review documents and generate a synoptic overview of mobile services,</td>
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<td>coverage, operators, aggregators, ICT literacy, access (by overall</td>
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<td>population, by geographic region, by income levels, by gender and age)</td>
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<td>2. Identify, interview and map key stakeholders within the eHealth/mHealth</td>
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<td>ecosystem in Angola. Key informants will include donors, MOH, service</td>
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<td>providers, private sector/corporate CSR programs, other relevant</td>
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<td>agencies).</td>
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<td>3. Catalogue and describe existing mHealth activities in Angola funded by</td>
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<td>donors or by the private sector</td>
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<td>4. Determine opportunities and barriers (policies, programs, partners)</td>
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<td>related including both short and longer term possibilities for USAID</td>
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<td>engagement, in particular with the Ministry of Health, but also with</td>
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<td>other sectors, including the private sector.</td>
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<td>5. Investigate efficiencies that could be gained in the future from</td>
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<td>integrating mobile data collection methods into standard surveys such</td>
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<td>6. Map and analyze the mHealth value chain to generate an in-depth</td>
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<td>understanding of the local incentive structures and limitations faced by</td>
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<td>each key stakeholders.</td>
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<td><strong>Strategy and Working Group Development</strong></td>
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<td>7. Propose a multi-stakeholder consultation roadmap (using the National</td>
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<td>eHealth Strategy Toolkit as a guide) for:</td>
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<tr>
<td>a. the development of a national eHealth/mHealth strategy</td>
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<td>b. the establishment of national-level coordinating body—an mHealth</td>
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<td>working group—which will lead the implementation of the strategy</td>
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<td>8. Propose draft terms of reference for the national mHealth Working Group</td>
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<td><strong>Other activities</strong></td>
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<td>9. Document regional and global resources that could support further</td>
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<td>engagement.</td>
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<td>10. Develop a final report documenting the process used for stakeholder</td>
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<td>mapping, value chain analysis and strategy development.</td>
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<td><strong>Total Estimated LOE</strong></td>
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Annex 2: Draft Terms of Reference for National eHealth Working Group

1. **Scope and Objective**
The National eHealth Working Group is a coordination mechanism with technical and advisory functions related to the field of eHealth (including mHealth, health information systems, and telemedicine). The objective of the working group is to provide guidance for the development of an eHealth Framework for Angola.

2. **Functions**
The working group will:
- review ongoing eHealth initiatives and projects
- identify key stakeholders and potential partners from various sectors
- champion the application of the Principles for Digital Development in all eHealth initiatives
- identify successful pilots that can be replicated and scaled-up
- carry out a gap analysis
- develop recommendations for senior representatives from MINSA and donor agencies

3. **Membership**
Members of the working group will include representatives from MINSA, MINSA/GEPE, MTTI, GNTIC, donor agencies (USAID, UNICEF, UNFPA, World Bank, EU, WHO), and implementing partners (PSI, JHPIEGO, MSH, Abt Associates). The group can also invite third parties to join their work, based on their potential contribution to the group’s activities.

4. **Structure**
The working group will divide into sub-teams of 2-3 individuals each:
- **Technical Team**: to assess and define eHealth tools following standard Principles of Digital Development
- **Use-Case Team**: to develop a “minimum” level of technical standards that will demonstrate interoperability on defined use cases which have potential for national scale (e.g. registration of mothers and subscription plans to receive SMS communications). Define use case analysis for each data access point along the communication channel (e.g., health posts, clinics, hospital, national data bureaus, etc.).
- **Policy Team**: to develop a minimal set of business rules that direct data and information inflows and outflows based on user credentials and query type. Dissect data sets and map against use classes. Test the applicability of those standards from the set of use cases constructed earlier.
- **Financing Team**: to develop a business and financial plan based on model specifications that demonstrate a ROI based using commonalities between mobile network operators and health sectors to attract funding/investment and justify the roll out of services at scale.

4. **Methods of Work**
The working group will determine its own methods of work, including time for consideration of requests, and preparation and conduct of its tasks. The activities of the group will be coordinated and led by MINSA’s GEPE. In principle, the working group will carry out its work via monthly meetings and by electronic means, using conference calls, and e-mail.

5. **Secretariat and Administrative Support**
Within available resources, MINSA will provide the administrative and secretariat support required by the working group, including record keeping, and distribution of documents.

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56 Adapted from the ITU/mPowering Development Initiative Terms of Reference for the Working Group on mHealth https://www.itu.int/en/ITU-D/Initiatives/m-Powering/Documents/TERMS%20OF%20REFERENCE%20FOR%20WG%20m-health.pdf
## Annex 3: Stakeholder Mapping Matrix Template

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Leadership and Governance</th>
<th>Strategy and Investment</th>
<th>Services and Applications</th>
<th>Standards &amp; Interoperability</th>
<th>Infrastructure</th>
<th>Legislation, policy and compliance</th>
<th>Workforce</th>
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Current Engagement (C); Future Engagement (F)
Level of Engagement in eHealth: 0 - Unknown; 1 - Little; 2 - Moderate; 3 - High

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Annex 4: Focus Group Discussion Method

This exercise is part of the consultant’s scheduled activities on 6 & 7 October. Location: TBD

Purpose

The purpose of conducting the mHealth Focus Group Discussions (FGD) is to identify a baseline of understanding and points of convergence among like individuals holding the same functional roles across multiple sectors who will be impacted by a given mHealth solution. The activity will help USAID and its partners properly identify at least one salable mHealth solution that has a likelihood of success given the current digital ecology and e-readiness of Angola.

Categories of mHealth applications

There are a wide variety of mHealth solutions being applied to the health sector throughout sub-Saharan Africa and elsewhere. There are 6 general areas of public health programming where mobile technology has shown utility:

- Routine monitoring and survey data collection and reporting.
- Service delivery for outreach, treatment, client (patient) management.
- Monetary transactions for services or insurance payments.
- Behavioral Change Communications.
- Knowledge, Information, and Learning,
- Remote sensing.

Any one or more of these types of mobile solutions are viable given the right set of conditions. The focus group moderator will elicit opinions, reactions, feedback from the study participants on one or more mHealth solutions depending on the option chosen for FGD as detailed below.

Composition of Focus Groups

Each focus group will be exposed to the same process with discussions revolving specific functional roles. Discussions will be contextualized to their areas of expertise and scoped to their roles within their respective organizations, either public or private, within the health care system. Combined inputs from all three FGDs will provide a fairly representative and truthful response to the focus topic. The number of participants in the FGD are envisioned to be either 10 to 15 participants if no mHealth solution(s) is provided in advance of the sessions (Option #1 below); or 6-8 participants if USAID has already identified a viable mHealth solution (Option #2). Both options will test receptiveness and viability of the proposed mobile application(s) among development partners.

1. Group #1 Front-line Workers: Drawn from select target areas individuals working directly (non-managerial) with the public in community health posts, health centers, pubic and private clinics, district hospitals to include physicians, nurses and community health workers.

2. Group #2 Program Managers, Directors and [large] Private Sector Employers: Include among others Implementing partners, CSOs, USAID, World Bank, UNICEF, UNFPA, government agencies and ministry, and corporate members of the private sector.

3. Group #3 Policy, Regulatory, and Technical Operations: Data analysts, representatives from regulatory commissions and policy groups, and technical systems

Methodology

Session Topic: Use of Mobile Technology for Health Services in Angola – Case [Option1, or Option 2]

Option #1: Select 3 mHealth solutions among the plethora of examples in Appendix A which may appear viable in the context of Angola as test hypotheticals.

Option #2: Present 1 Conceptualize mHealth solution of interest as a test hypothetical. The hypothetical(s) selected will be treated by each of the 3 Focus groups facilitated by the moderator (consultant) and a recorded by 2 rapporteurs (TBD) 58, and translator.

Length of Sessions: Option #1: 3.5 hours with 1 refreshment break; Option #2: 2 hours – one stretch break.

58 In the HIS Leadership Forum-Country Ownership Strategies held in Ethiopia (2009), two university students health journalists were given this opportunity to capture notes and observation while providing them exposure to important process in public health programming.
The following sequence of events are anticipated, however; it is important the group drives the process to the extent possible while staying within the time frame allotted and treating the most relevant thematic areas of discussion. The moderator will insert themes suggested by USAID and MINSA should the group not uncover those on their own.

(Icebreaking) Members introduce themselves to the group and provide a topical area of interest in Use of Mobile Technology for Health Services in Angola and concerns they have in implementation. Group responses are written on white board under two categories: (1) interests (2) concerns. Additional areas of interests or concerns are solicited openly from the group.

[by option]
Option #1: Groups are exposed to 3 hypothetical mHealth solutions selected in advance by USAID and MINSA. They are provided a PPT overview and a one-page handout sheet with the particulars.
Option #2: Groups are exposed to the hypothetical mHealth solution selected by USAID and MINSA. They receive a one-page handout sheet with the particulars and PPT overview if available.

1. The group is divided randomly into 3 or 4 smaller groups [option #1] or in half [Option #2] where they discuss the hypothetical(s) as possible mHealth solutions for Angola. Each group prepares a 10 minute presentation to the entire group with group discussions centering on:
   - What health system performance issue/problem would the mHealth solution solve?
   - What root causes or drivers and conditions suggest the mHealth solution discussed?
   - How will the solution address the health issue.
   - What functionality would the solution require to be useful?
   - What constraints or challenges would be encountered if implemented?
2. The white board “(1) interests and (2) concerns”, is updated now with issues revolving around (3) functionality, and (4) challenges. For each function and challenge noted a correlation is drawn to align those with the group’s initial interests and concerns, checking off each presented.
3. <BREAK Option #1: 20 minute refreshment; Option #2: 10 minute stretch.>
4. A three minute review of the last 2 hours is presented by rapporteur.
5. Key thematic areas are drawn out from the 4 emerging thematic areas on the white board.
6. A moderated open discussion among the entire group on the key thematic areas ensues. Opinions and reactions are logged and discussion is allowed to follow its own thread.
7. A “vote” is held among the group for the single most viable mHealth solution applicable to the Angolan context. Notes are taken on all contending solutions and participants’ reactions to each.
8. The moderator leads a group discussion to identify the discrete components and actors required of such a system.
9. Subgroups are reformed in a different mix from the first subgroups and reconvened for 15 minutes to discuss what resources each development partner may need in order to perform optimally would such a solution be rolled out. (Depending on the state of mobile technology and mHealth uptake presently in Angola, the group will identify other programs or systems with similar goals; what these programs do well; what are the gaps, i.e., human resource, capacity, financing, policy or regulatory reform, and governance).
10. The collection of results are put on the white board and prioritized in a group process.
11. The Cohesion Survey will be administered where each group represented will (a) list other groups critical to the success of the solution; (b) rank in order of importance groups they feel are essential to the success of the chosen solution, and (c) the perceived strength of their working relationship with those entities.
12. A 3 minute review of the last 2 hours is presented by rapporteur.
13. Hearty “thank you” extended to all.
14. Consultant prepares a draft report on the FGD results with a final version included in Final Report.
## Annex 5: List of Contacts

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<th>Name</th>
<th>Institution</th>
<th>Function</th>
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<td>Mwentec</td>
<td>President</td>
<td><a href="mailto:mwentice@hotmail.com">mwentice@hotmail.com</a></td>
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<td>Udete Fesaunides</td>
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For more information, please visit
http://www.africanstrategies4health.com/resources.aspx