Mobile for Development

mHealth Country Feasibility Report

Malawi

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Background

The GSMA Mobile for Development mHealth programme connects the mobile and health industries, with the aim of developing commercially sustainable mHealth services that meet public health needs.

In June 2012, the GSMA mHealth programme launched the Pan-African mHealth Initiative (PAMI). PAMI has been funded by UK Aid and Norad to support the scale-up of mHealth in nutrition and maternal and child health, in support of the Millennium Development Goals 4, 5 and 6. PAMI is closely aligned to the UN's Every Woman Every Child Initiative, Scaling Up Nutrition (SUN) and the Global Nutrition for Growth Compact.

For more information on GSMA Mobile for Development mHealth, please contact mhealth@gsma.com or visit www.gsma.com/mobilefordevelopment/programmes/mhealth

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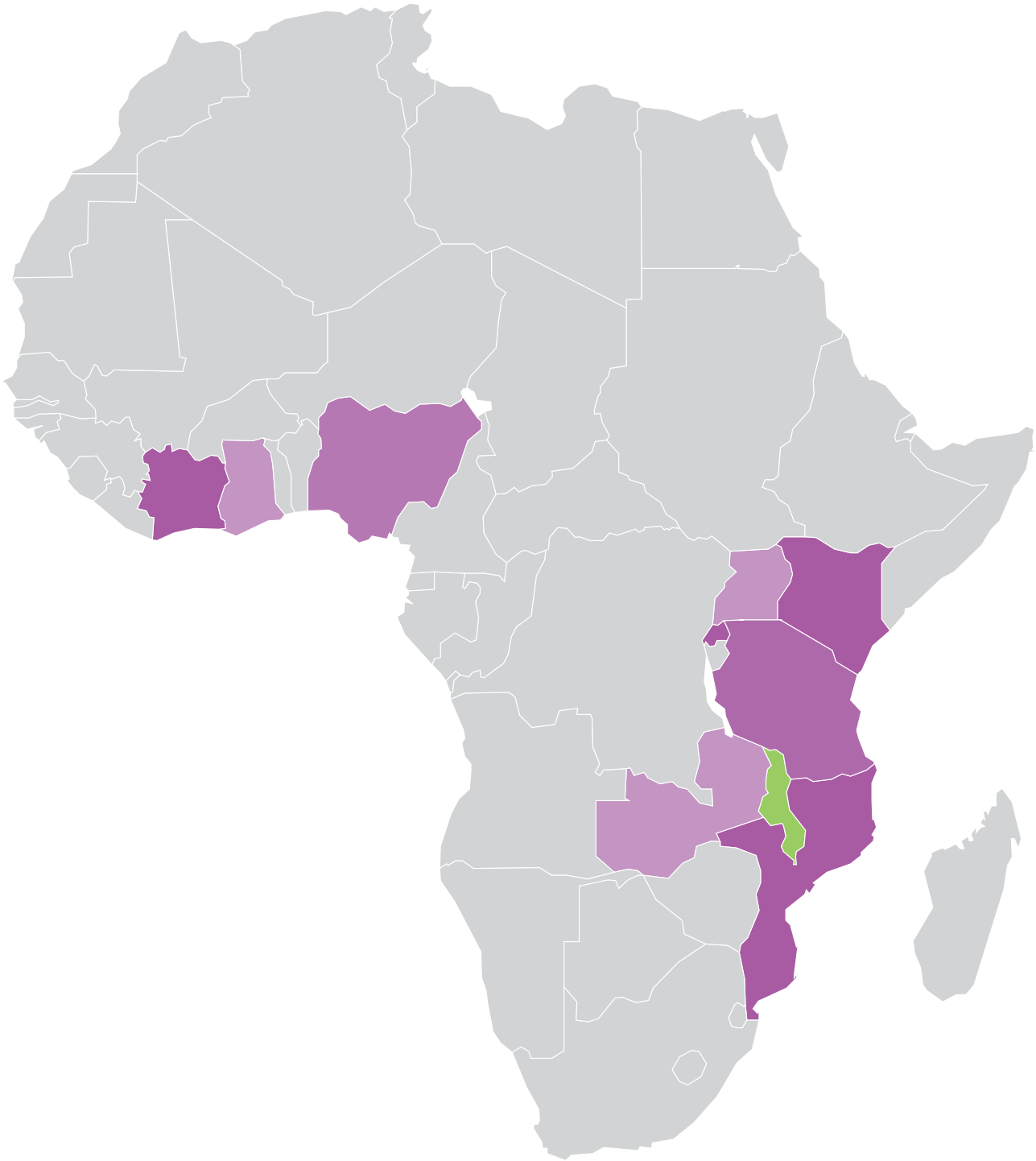


Under the auspices of PAMI, a 3-year 10-country nutrition initiative aims to develop mHealth services in the area of maternal and child health, specifically demand generation, registration and data surveillance, in Sub-Saharan Africa:

- Côte d'Ivoire
- Ghana
- Kenya
- Malawi
- Mozambique
- Nigeria
- Rwanda
- Tanzania
- Uganda
- Zambia

Executive Summary

This report aims to carry out a comprehensive analysis of the current state of mHealth in Malawi. Information has been gathered and presented in the context of the GSMA Pan-African mHealth Initiative and more specifically is aligned to the aim of the 10-country nutrition initiative – to develop commercially sustainable mHealth services that meet public health needs, in the areas of demand generation, registration and data surveillance.

Within the context of mHealth feasibility, this report focuses on 4 specific areas:

1 The Case for Nutrition and Maternal and Child Health in Malawi

Malawi has significant issues in maternal and child health (MCH), particularly in terms of stunting for children. 47% of children under five are stunted and 20% are severely stunted.

As a result, there is significant alignment between government health priorities and MCH. 21 out of 28 indicators in the Malawi Health Sector Strategic Plan are aligned to these areas.

The country's southern regions are the most populated and have the highest incidence of malnutrition and maternal/child mortality.

2 The Opportunity for mHealth to Support Nutrition and Maternal and Child Health

mHealth use cases align well under specific programme indicators in the Malawi Health Sector Strategic Plan.

The potential reach of mHealth in MCH and nutrition is approximately 400,000 pregnant women and new mothers. However, the deployment of IVR technologies (along with SMS or USSD based services) and the widespread use of phone access sharing can widen the reach by 3 times, to around 1.3m pregnant women and new mothers.

However, there are significant issues with the source of commercial sustainability of potential services due to the economic situation in Malawi. Relative mobile access cost is one of the highest in Africa, with consumers already paying an average of 20% of their monthly income on mobile.

3 The Readiness of the Players in Malawi to Support mHealth

44% of the 45 mHealth services in Malawi, which are monitored by the GSMA mHealth Tracker, are focused on maternal and child health, with 16 services featuring demand generation, registration and data surveillance. The majority of services are donor-funded. There is one known health messaging service operated by AirTel.

There is a wealth of experience in the mHealth sector and a number of services have scaled impressively across the country. Commercial models for mHealth have however been rare, due to the economic conditions in Malawi.

Aggregator interest in Malawi is limited and focuses more on high value commercial VAS such as ringtones and call ringback tones, both reflecting the nascent state of the VAS market.

Operators are increasingly targeting rural customers in order to increase their subscribership, as the urban market is increasingly saturated. mHealth can be an important component of rural targeting for mobile operators.

Feedback from operators however suggests that mHealth at present is not a high priority area, unless they can see clear, short term, commercial potential and partners with market-ready products.

There have been recent moves by the national regulator to liberalize the market and drive down mobile costs for the consumer. There is also an opportunity at the moment to define mHealth-friendly regulations in the health sector to enable the mobile sector to participate positively in mHealth.

4 The Potential for mHealth Partnerships

There is potential for a multi-partner approach to present a compelling product map to operators in Malawi, as a complete solution for mHealth management. However, the business model for these products will be, for the time being, heavily reliant on government and donor funding for sustainability.

The immediate outlook for commercial, direct-to-consumer mHealth services in the near term may be limited. Therefore, the near term focus is to demonstrate the relative efficiency of mHealth interventions to government, to reach and impact beneficiaries, and work with the mobile operators to minimize the cost of mobile access while the market for mobile VAS matures over time.

The Case for Nutrition and Maternal and Child Health in Malawi

Maternal Mortality
per 100,000 births

2010 460

Infant Mortality
per 1,000 births

2012 46

Child Mortality <5
per 1,000 births

2012 71

Children aged <5 stunted

2010 48%

Geographical Health Burden

Child malnutrition percentile weight of Children under 5

- 20.97~22.31
- 16.94~18.28

Infant mortality rate per 1000 live births

- 94.86~98.05
- 88.51~91.68
- 82.16~85.33

Infant mortality rate per 1000 live births

- 52.06~54.93
- 60.67~63.55
- 63.55~66.43

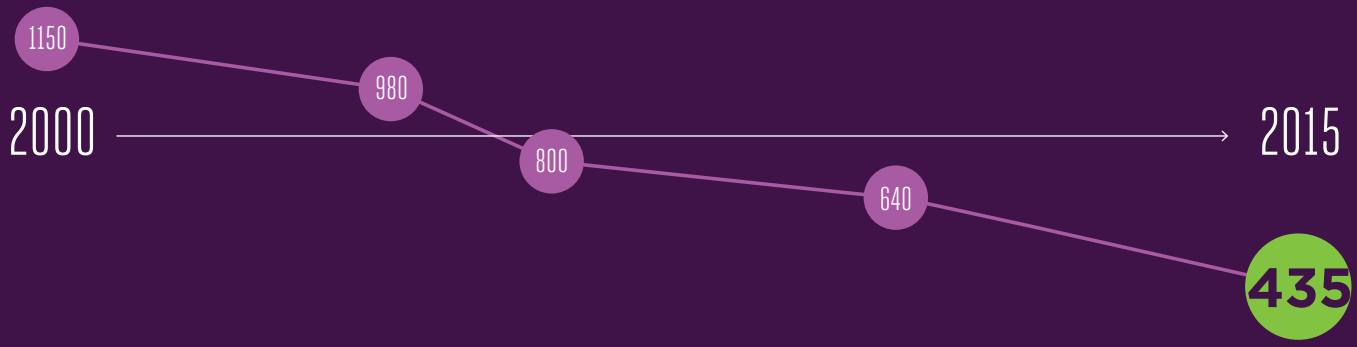
Children under 5 underweight - trend & projection

Under 5 child mortality rate in Malawi - trend & projection

Deaths per 1000 births

Maternal Mortality in Malawi - trend & projection

Per 1000,000 live births



The Case for Nutrition and Maternal and Child Health in Malawi

Key Observations

There is a strong case for addressing Maternal and Child Health and nutrition in Malawi.

- Malawi has significant issues in maternal and child health, particularly in terms of stunting for children.
- 21 out of the 28 indicators in the Malawi Health Sector Strategic Plan is aligned to these areas.
- The country's southern regions are the most populated and have the highest incidence of malnutrition and maternal/child mortality.

Relative to the other GSMA priority countries, Malawi has a lower maternal and child mortality rate, but incidence of stunting is relatively high.

	Value	Rank*
Maternal mortality / 100,000 births (2010)	460	#7
Infant mortality / 1,000 births (2012)	46	#7
Child mortality <5 / 1000 births (2012)	71	#7
Children aged <5 stunted (2011)	48%	#2

* Rank relates to 10 GSMA focus countries, within the Pan-African mHealth Initiative, indicated on page 5 of this report.

Figure 1 Source: WHO statistics. Note: The WHO statistics defer from those published in the Malawi Health Sector Strategic Plan (2011-2016)

Alignment of Health Sector Strategic Plan

21 out of the 28 targets in the Malawi Health Sector Strategic Plan are aligned to MCH and nutrition.

Health Impact (4/4) / Coverage of Health Services (10/16)
Coverage of Health Determinants (4/4) / Coverage of Risk Factors (1/1)
Health Systems Outputs (2/8) / Health Investment (0/4)

No	INDICATOR	BASELINE (2010-11)	TARGET (2015-16)
	HEALTH IMPACT		
1	Maternal Mortality Ratio (MMR)	675/100000	115/100000
2	Neonatal Mortality Rate (NMR)	31/1000	12/1000
3	Infant Mortality Rate (IMR)	66/1000	45/1000
4	Under five Mortality Rate (U5MR)	112/1000	78/1000
	COVERAGE OF HEALTH SERVICES		
5	EHP coverage (% Facilities able to deliver EHP services)	74%	90%
6	% of pregnant women starting antenatal care during the first trimester	9%	20%
7	% of pregnant women completing 4 ANC visits	46%	65%
8	% of eligible pregnant women receiving at least two doses of intermittent preventative therapy	60%	90%
9	Proportion of births attended by skilled health personnel	58% (HMIS) 75% (WMS)	80% 80%
10	Penta III coverage	89%	94%
11	Proportion of 1 year-old children immunized against measles	88%	90%
12	Proportion of 1 year-old children fully immunized	80,90%	86
13	% of pregnant women who slept under an insecticide net (ITN) the previous night	49,40%	80%
14	% of under 5 children who slept under an insecticide net (ITN) the previous night	55,40%	80%
15	Neonatal postnatal care (PNC) within 48 hours for deliveries outside the health facility	baseline to be established	
16	% of women who received postpartum care after delivery by skilled health worker within seven days	10%	30%
17	Prevalence of HIV among 15-24 year old pregnant women attending ANC	12%	6%
18	% of HIV+ pregnant women who were on ART at the end of their pregnancy (to reduce mother to child transmission and for their own health)	35%	82%
19	% of health facilities satisfying health centre waste management standards	35%	55%
20	% surveyed population satisfied with health services (by gender and rural/ urban)	83.5% (urban) 76.4% (rural)	90% (urban) 90% (rural)
	COVERAGE OF HEALTH DETERMINANTS		
21	% of households with an improved toilet	46%	60%
22	% of households with access to safe water supply	79.7% (DHS 2010)	TBA
23	% of children that are stunted	47.1% (DHS 2010)	TBA
24	% of children that are wasted	4.0% (DHS 2010)	TBA 3
	COVERAGE OF RISK FACTORS		
25	Contraceptive Prevalence Rate (modern methods)	42% (DHS 2010)	60%
	HEALTH SYSTEMS OUTPUTS (AVAILABILITY, ACCESS, QUALITY, SAFETY)		
26	OPD service utilization (OPD visits per 1000 population)	1316/1000 pop	>1000/1000 pop
27	% of fully functional health centres offering basic EmOC services	98 90%	134 100%
28	% of non public providers in hand to staff/ serve areas signed SLAs with DHOs		
29	% of monthly drug deliveries monitored by health facility committees	85%	95%
30	% of health facilities with stock outs of tracer medicines in last 7 days (TT vaccine, LA, Oxytocin(oxy), ORS, Cortimoxazole, (cotrim) Diazepam Inj., All Rapid HIV Test kits, TB drugs, Magnesium Sulphate, (Mag sulph) Gentamicin, Metronidazole, Ampicillin, Benzyl penicillin, Safe Blood, RDTs)	TT vaccine=98% / LA=98% / Oxy=95% ORS=97% / Cotrim=99% All Rapid HIV test kits=89% TB drugs=99% / Mag sulph= / Gent= / Metro= / Ampicillin= Benzyl penicillin= Safe blood= / RDTs=	All tracer drugs 100%
31	% of health facilities supervised and written feedback provided	63%	100%
32	% facilities reporting data (according to national guidelines)	96%	99%
33	% districts reporting timely data	52%	90%
34	Bed occupancy rate	50%	80%
	HEALTH INVESTMENT		
35	% health facilities with functioning equipment in line with standard equipment list at time of visit	baseline to be established	
36	% health facilities with functioning water, electricity & communication at time of visit	79% w 81% e 90% c	100% w 100% e 100% c
37	% health centres with minimum staff norms to offer EHP services	Clinician=30% / Nurses/Mws=50% EHO/HA=48% / Composite=19%	Clinician=80% / Nurses/Mws=75% EHO/HA=70% / Composite=45%
38	% GoM budget allocated to health sector	12,40%	15%

Figure 2 Source: Malawi Health Sector Strategic Plan (2011-2016)

Priority Areas in Nutrition and Maternal and Child Health

The incidence of malnutrition and infant mortality is greater in the south where there is a relatively higher population.

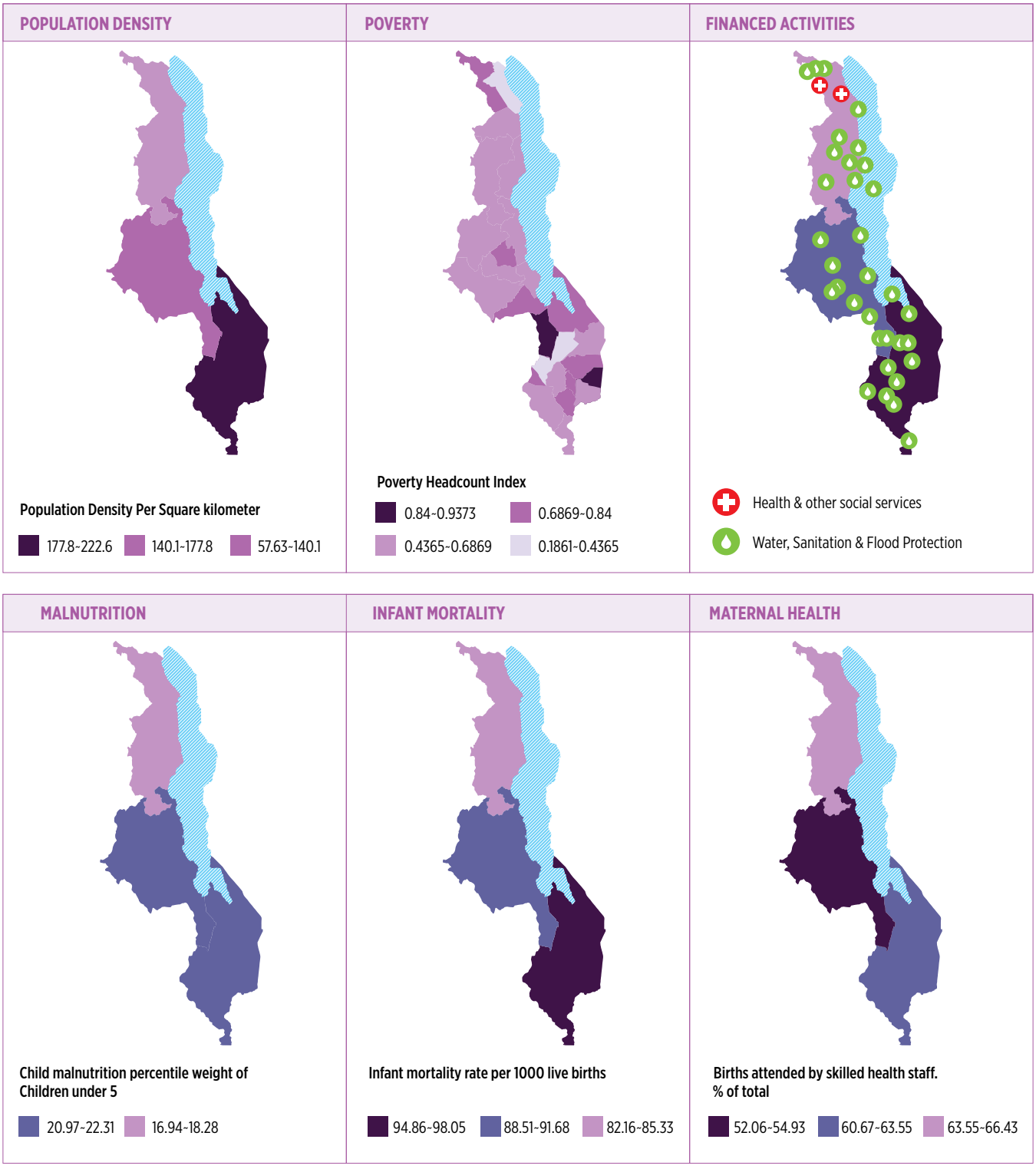
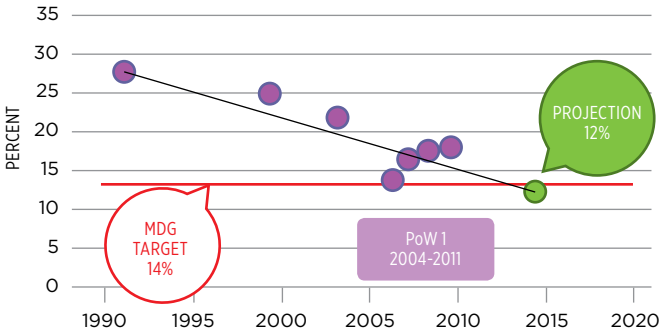


Figure 3&4 Source: http://maps.worldbank.org/afr/malawi

Trends in Malnutrition and Mortality in Children

Strategies in managing malnutrition and infant mortality place the country on track to hit the MDG targets.

CHILDREN UNDER 5 UNDERWEIGHT - TREND & PROJECTION



UNDER 5 CHILD MORTALITY RATE IN MALAWI - TREND & PROJECTION

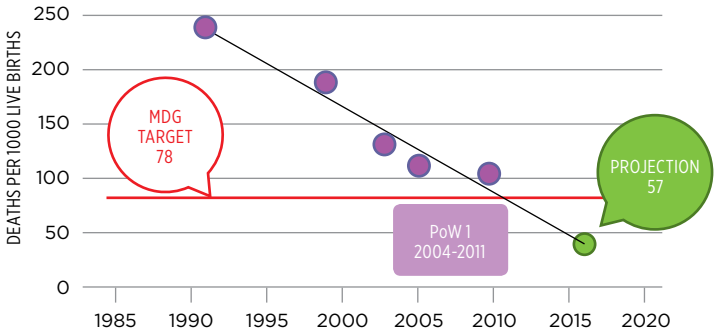


Figure 5&6 Source: Malawi Health Sector Strategic Plan (2011-2016)

Vaccines for various diseases, effective treatment of pneumonia at community level and effective prevention and treatment of malaria and diarrhoeal diseases have contributed to success in this area.

Trends in Maternal Mortality

Significant challenges still exist in reaching targets in maternal mortality. Sepsis and post-partum haemorrhage are cited as key causes of death. Access to emergency obstetric care and information on family planning, to reduce fertility rate, are identified as the key strategies to manage this trend.

MATERNAL MORTALITY IN MALAWI - TREND & PROJECTION

Figure 7 Source: Malawi Health Sector Strategic Plan (2011-2016)

The Opportunity for mHealth to Support Nutrition and Maternal and Child Health

Unique Subscribers Penetration vs Geographical Coverage

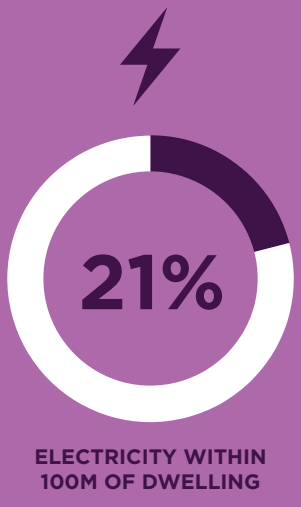
Unique mobile subscribers penetration

20%

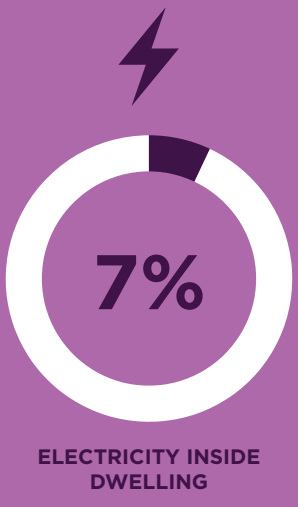
Geographical coverage

80%

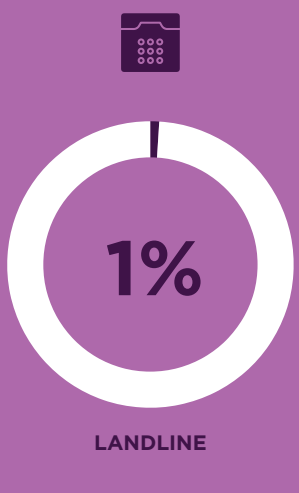
Reach of mobile phone vs landline and electricity



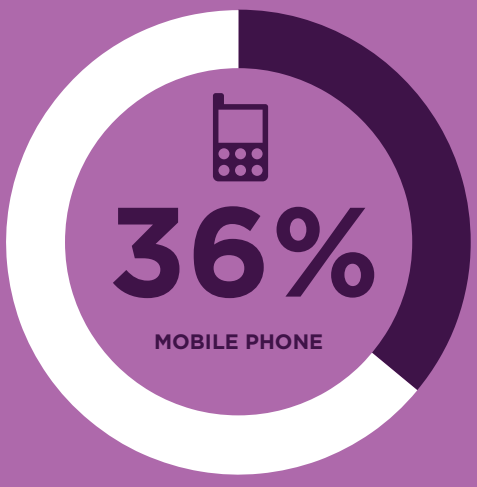
ELECTRICITY WITHIN 100M OF DWELLING



ELECTRICITY INSIDE DWELLING

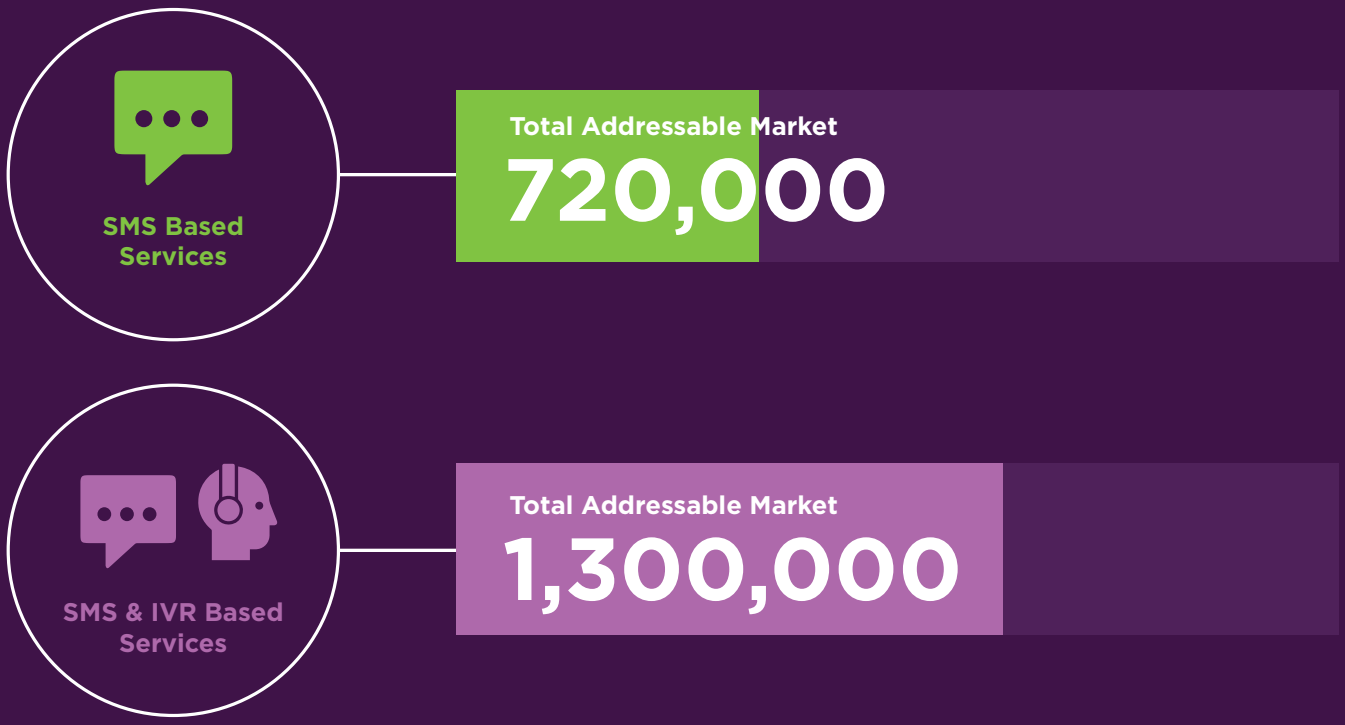


LANDLINE

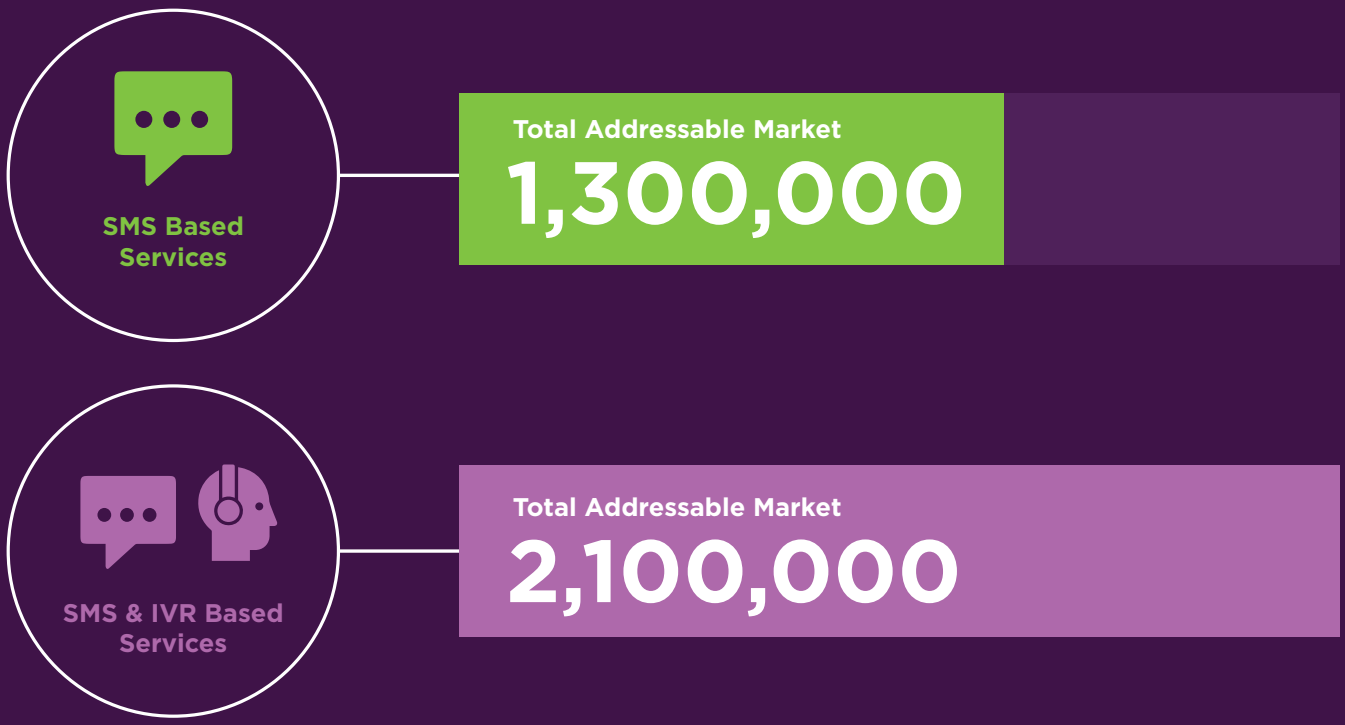


SMS based services can reach up to 400,000 pregnant women and new mothers, but have the potential to reach almost twice that size if IVR based services are used:

The Opportunity in 2015



The Opportunity in 2020



The Opportunity for mHealth to Support Nutrition and Maternal and Child Health

Key Observations

mHealth has been identified as a key area to support these health areas, both in terms of the reach and relative affordability of mobile access.

- mHealth use cases align well under specific programme indicators in the Malawi Health Sector Strategic Plan (2011-2016).
- The potential reach of mHealth in MCH and nutrition is approximately 400,000 pregnant women and new mothers. However, the deployment of IVR technologies (along with SMS or USSD based services) and the widespread use of phone access sharing could widen that reach by 3 times, to around 1.3m pregnant women and new mothers.
- However, there are significant issues with the source of commercial sustainability of potential services due to the economic situation in Malawi. Relative mobile access costs is one of the highest in Africa with consumers already paying an average of 20% of their monthly income on mobile.

Alignment to the Health Sector Strategic Plan

mHealth aligns well to a number of programme aims within the Health Sector Strategic Plan.

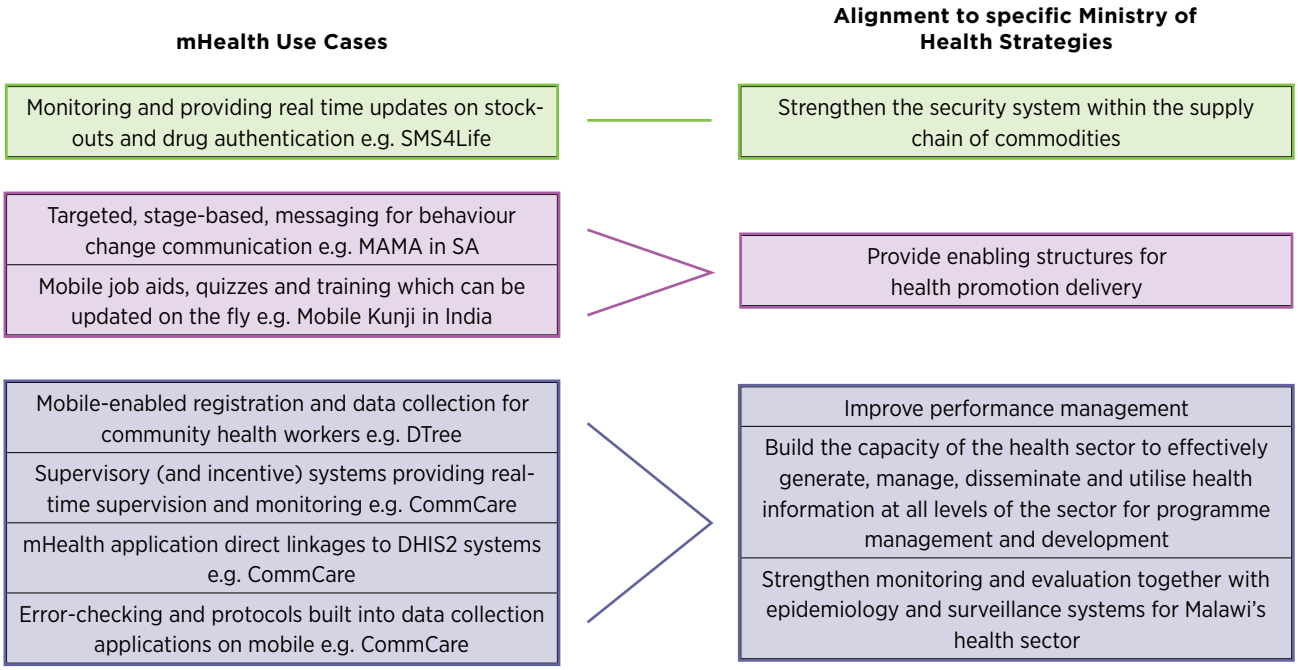


Figure 8

The Reach of mHealth

There is a relatively small base population in Malawi that can directly access phones and messages.

	Value	Rank*	
Population, 2012	**16m**	**#8**	Relatively smaller population
No. of pregnant mothers, 2012	**0.5m**	**#8**	
No. of mothers with children < 5y, 2012	**2.2m**	**#9**	
Unique mobile subscribers penetration 2013 (5-y growth)	**20.7% (15%)**	**#10 (#3)**	Very low % of unique subscribers, relatively high coverage
Geographical coverage, 2009	**79%**	**#1**	
% Rural, 2012	**84%**	**#1**	Primarily rural, relatively low levels of literacy
Literacy rate >15y Overall (Women), 2008	**61% (51%)**	**#7 (#7)**	

* Rank relates to 10 GSMA focus countries, within the Pan-African mHealth Initiative, indicated on page 5 of this report.

Figure 9 Source: WHO, World Bank, GSMA Intelligence, Mobile Development Intelligence (MDI), and GSMA estimates

Shared phone access, which has increased dramatically over the last 5 years, signals a promising trend for the potential for reach.

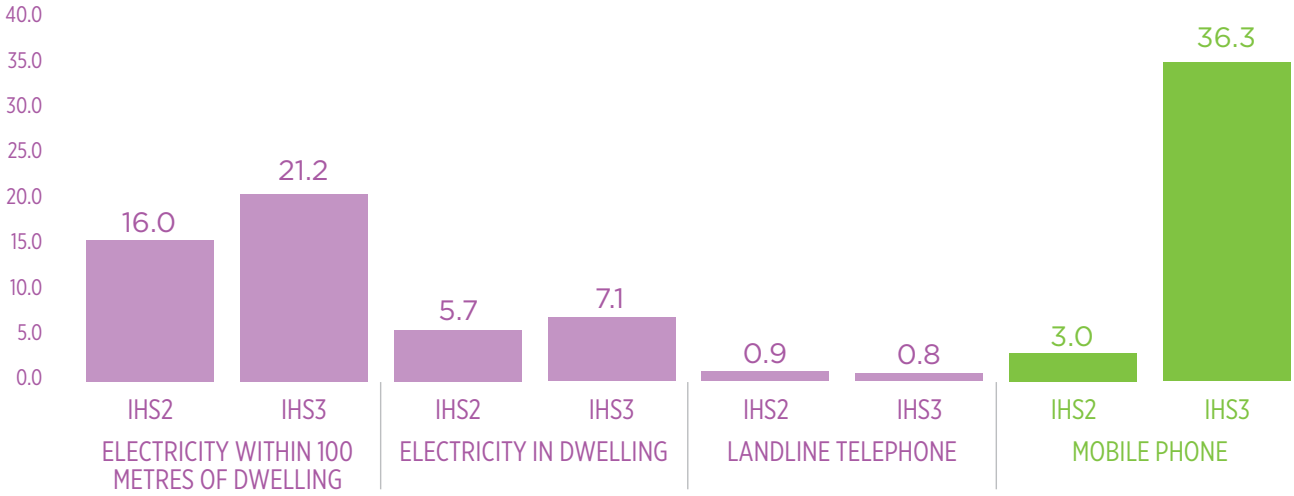


Figure 10 Source: Second / Third Integrated Household Survey, Malawi Department of Statistics (2005, 2011)

However, access by the very poor and rural remains relatively low.

BACKGROUND CHARACTERISTICS	LANDLINE TELEPHONE		MOBILE PHONE	
	IHS2	IHS3	IHS2	IHS3
PLACE OF RESIDENCE				
Urban	5,6	4,4	18,0	73,0
Rural	0,2	0,1	0,9	29,5
Rural North		0,0		35,1
Rural Centre		0,1		31,5
Rural South		0,2		26,3
SEX OF HOUSEHOLD HEAD				
Male	1,0	0,9	3,4	40,1
Female	0,5	0,5	1,4	24,3
CONSUMPTIVE QUINTILE				
1st (Lowest)	0,1	0,0	0,0	11,5
2nd	0,1	0,0	0,2	20,6
3rd	0,1	0,0	0,4	28,5
4th	0,1	0,1	1,5	42,7
5th (highest)	4,1	2,9	12,8	62,6

Overall, 36 percent of households reported having a mobile phone while only less than one percent of households reported having a landline telephone

Access to phones for the very poor still very low at 11.5%

Figure 11 Source: Second / Third Integrated Household Survey, Malawi Department of Statistics (2005, 2011)

Paying for mHealth

Malawi presents a challenge in commercial sustainability, as the majority of health spend relies on donor funding and mobile spend is already very high compared to personal income.

	Value	Rank*
Income per capita (USD), 2012	**268**	**#10**
Health expenditure per capita (USD), 2011	**31**	**#10**
% below poverty line, 2010	**51%**	**#8**
% out-of-pocket spend, 2011	**53%**	**#7**
% donor funding, 2011	**52%**	**#2**
% government funding, 2011	**73%**	**#1**
Monthly spend on mobile (USD), 2012	**4**	**#10**
% income spent on mobile, 2012	**18%**	**#2**

Lowest overall levels available for health spend, and one of the highest levels of poverty

The heavy reliance on donor funding presents a challenge for commercial sustainability without external intervention

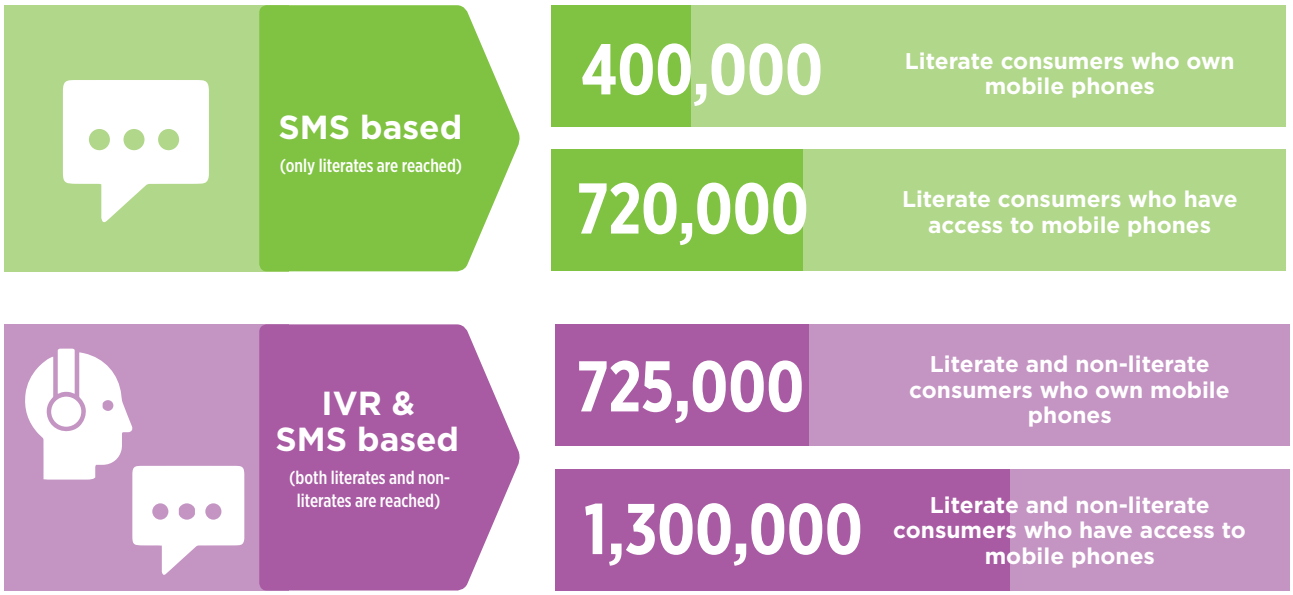
Even with the lowest spend on mobile, it already represents the largest % of overall consumption

* Rank relates to 10 GSMA focus countries, within the Pan-African mHealth Initiative, indicated on page 5 of this report.

Figure 12 Source: WHO, World Bank, GSMA Wireless Intelligence Statistics

The Opportunity in 2015

SMS based services can reach up to 400,000 pregnant women and new mothers, but have the potential to reach almost twice that size if IVR based services are used and as much as three times if overall access to mobile phones is taken into consideration.



The Opportunity in 2020

The addressable market will be 2.1 million by the end of the decade, growing by around 60% from 2015 to 2020.

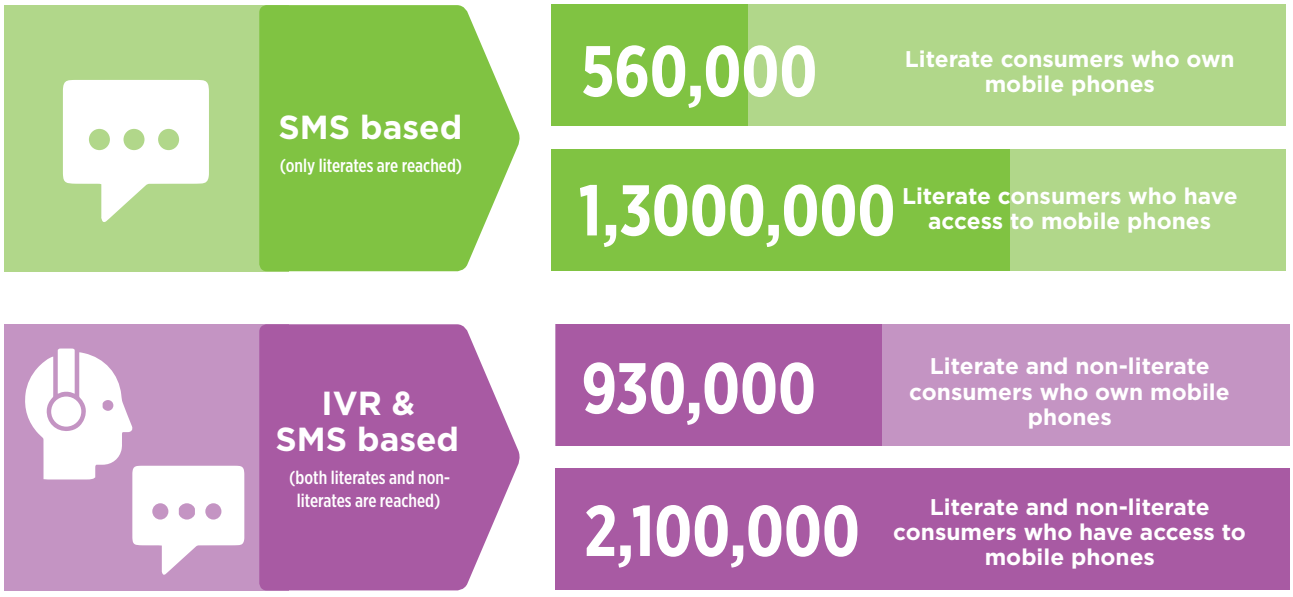


Figure 13&14

ISTRY OF HEALTH
DUCTIVE HEALTH UNIT
OX 30377
NGWE 3

The Readiness of the Players in Malawi to Support mHealth

Key Players in the mHealth Value Chain

There is a relatively small number of players in the value chain in Malawi and the market for VAS is underdeveloped

	Content Providers	mHealth Service Providers	Content Aggregators	Mobile Operators
Key Value	Create original, tagged, health content which is validated with national and international standards	Develop / implement mHealth solutions for messaging, data collection, distribution and management	Adapt, package content, work with multiple operators and distribution platforms, while tracking usage across different platforms	Provide the mobile connectivity for distributing content and data collection
Examples in Malawi	• VillageReach • DTree • Verse	• VillageReach • DTree • CHAI • C-Stock • Baobab • Golbal Hope Mobilization • Millenium Promise • Malawi MoH • UNICEF	• Verse • IT Dolls • ComViva • OnMobile	• AirTel • TNM • Access • MTL
Business Model	Open source Licensing	Subscription Freemium *(for consumer services)* Government / donor grant *(for registration, data collection services)*	Revenue share with operator	Voice, data, SMS revenue Revenue share with aggregator
Key Challenge	Most of the content in health is given away free because of the low ability to pay	Subscription services has been tried by AirTel/Verse with some success in the urban market. Government / donor funded registration services may not be sustainable in the long run	Interest in Malawi is relatively low from aggregators due to the relatively low commercial volumes	Operators currently focusing on improving infrastructure and service quality, and are on the early stage of marketing high value VAS (ringtones, CRBT)

Figure 15

mHealth Service Providers

Key Observations

There is good coverage of mHealth use cases, but almost all are reliant on donor funding as a future business model.

- 44% of the 45 mHealth services in Malawi, which are monitored by the GSMA mHealth Tracker, are focusing on maternal and child health. 16 of those services feature demand generation, registration and data surveillance. The majority of services are donor-funded. One known health messaging service is operated by AirTel.
- There is a wealth of experience in the mHealth sector. A number of services have scaled impressively across the country. Commercial models for mHealth have however been rare due to the economic conditions in Malawi.

mHealth Tracker

The GSMA mHealth Tracker is a customised tool which collates mobile health products and services around the globe, tracking solutions in both planning phase and those which have been commercially deployed.

There are 45 tracked mHealth services in Malawi.

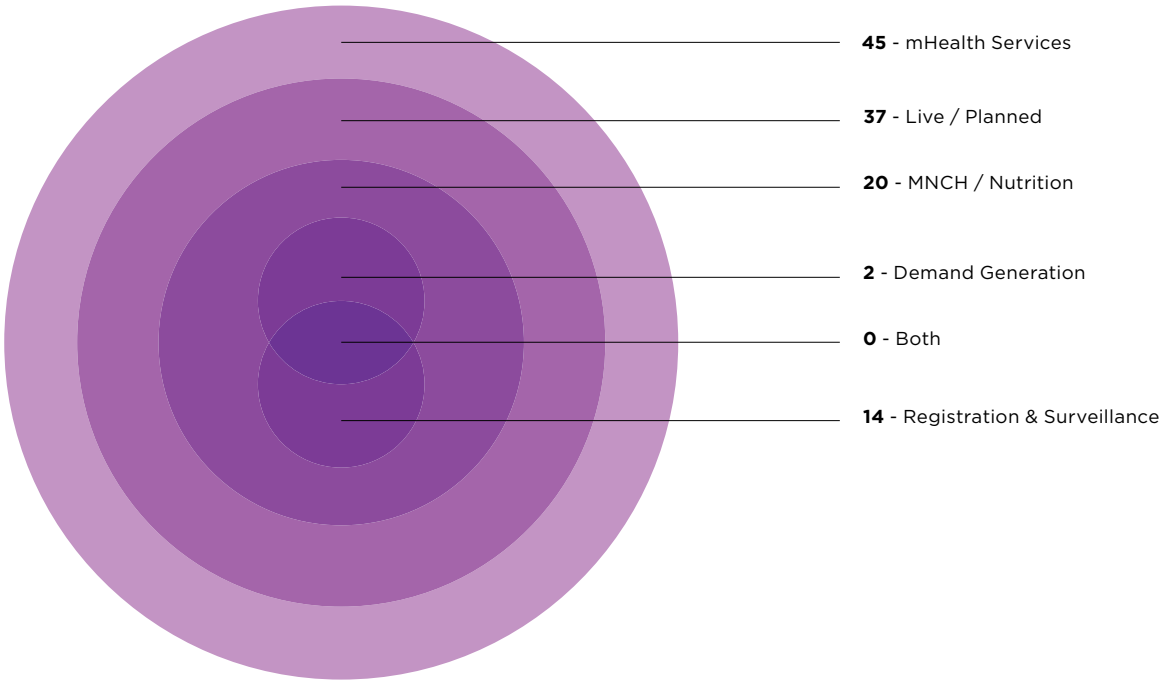


Figure 16

NGO-Led Case Study: Village Reach "Chipatala Cha Pa Foni"

PROFILE

mHealth Use Case: Integrated MCH service, featuring a toll-free case management hotline offering protocol-based health information, referrals and an automated and personalized tips and reminders service for pregnant women, guardians of young children and women of child bearing age

Delivery Channels: Voice, SMS, mobile apps

Health Focus: Reproductive, Maternal, Neonatal and child health

Target Users: CHWs, Pregnant women, caregivers of young children, women of child bearing age

Geographical Focus: Balaka, Ntcheu, Nkhotakota, and Mulanje

VALUE PROPOSITION

Source Of Content: Malawi Ministry of Health IMCI , Family Planning and Maternal and Newborn Health Community Case Management protocols, MAMA, Grameen Foundation, Baby Centre

Degree Of Localization: Translated and field tested by Village Reach, into Chichewa and Chiyao

Implementation Experience: Since 2011

Partner Coverage: MoH (standards ,protocols and implementation), Baobab (technology), AirTel (support for scale up), Concern Worldwide / Save the Children (for scale up in new districts), SSDI, and Presidential Initiative on Safe Motherhood (for scale up in new districts), Innovations Working Group (IWG)

Funding: IWG, Concern Worldwide, Seattle International Foundation

Business Model: Grant-funded and MoH in-kind support (Detailed cost estimate by district for national scale

Success To Date: Significant increase in maternal and child health knowledge and uptake of facility and home based MNCH services among users, high satisfaction among users and stakeholders, and decrease in health center workload due to advice provided on home based care. On average 600 calls per month

Reach: 15 000 callers, 8 000 of those registered into tips and reminders service; service spans across central and south Malawi (Balaka, Mulanje, Ntcheu and Nkhotakota)

Client Registration
A Mother is registered by a Hotline Worker
The Hotline Worker captures the mothers data into digital forms on an application on her feature phone/ tablet
Client Counselling
The Hotline Worker counsels the mother using job aids (decision support software) available on touch screens (J2 Monitors)
Client Referral
Protocol-based health centre referrals
Client Follow-up
The Hotline Worker follows up on clients who were referred to a healthcare facility
Client Subscription
Hotline Workers register clients into the Tips and Reminders service
Tips and Reminders Messaging
Clients receive and retrieve messages (SMS & voice recordings/ IVR) either using their mobile phone/ the mobile phone of a community volunteer

Figure 17

NGO-Led Case Study: DTree – Community Case Management

PROFILE

mHealth Use Case: Mobile decision support tool for community case management, for use by health surveillance assistants

Delivery Channels: Apps

Health Focus: Maternal and Child Health

Target Users: CHWs

Geographical Focus: Lilongwe, Ntcheu, Zomba

VALUE PROPOSITION

Source Of Content: Malawi Ministry of Health IMCI and Maternal and Newborn Health Community Case Management protocols

Degree Of Localization: Already localized (language & culture)

Implementation Experience: Since 2011

Partner Coverage: Catholic Relief Services, Dimagi, Malawi MoH

Funding: Catholic Relief Services - under USAID funded IMPACT project

Business Model: Donor funded

Success To Date:

- Better adherence to the sick child form
- Insight into deviations from the protocol
- Increased completeness (90% vs. 100% of visits)
- Increased referrals (5% vs. 11% of visits)
- Increased follow-up (0% vs. 26%) of visits
- Real-time service data
- Improved drug consumption and stock outs
- Increased satisfaction from caregivers about services

Reach: 146 registered CHWs (additional 447 registered CHWs across other DTree mHealth solutions)

Client Registration

HSAs in village clinics; register mothers using an application (Zenji) on their mobile phones

Client Counselling & Data Collection

The HSA Counsels the mother using job aids (decision support software) available on the application

Client related data are captured throughout this process

Sick Child Referral

Protocol-based health centre referrals for sick children

Client Follow-Up

The HSA follows up on clients who were referred to a healthcare facility

Stock Reporting

HSAs complete digital forms to report on stock levels at facilities

Supervisory Component

Senior HSAs review digital performance reports on their mobile phones; They also complete supervisory checklists

Figure 18

UN-Led Case Study: UNICEF – RemindMI

Scheduled SMS clinic appointment reminders for mother and infants

PROFILE

mHealth Use Case: Community agents register births or pregnancies. Agents and willing clients receive appointment reminders for mothers and infants. Health facilities can request for specific patient follow-up through community agents

Delivery Channels: SMS

Health Focus: Maternal and Child Health and Nutrition

Target Users: Health Surveillance Assistants (HSAs), mothers via HSAs
Target - infants exposed to HIV, but service extends to include all infants and their caretakers

Geographical Focus: 17 out of 28 districts in Malawi

VALUE PROPOSITION

Source Of Content: Standard Malawi MoH protocol for ANC and post-natal care, standard care guidelines built into system

Degree Of Localization: English only

Implementation Experience: Since 2010

Partner Coverage: RapidSMS; Government of Malawi, Clinton Health Access Initiative, Airtel, TNM

Funding: UNICEF

Business Model: Donor/ government

Success To Date: Reduction in missed or delayed client appointments, increase in timely attendance of hospital visits by patients

Reach: Reached 60% of all districts (1531 mothers, who agreed to reminders, and 15,523 births registered)

Client (& Pregnancy) Registration

HSAs can register mothers using their mobile phones

The HSA sends an SMS using a pre-determined format to the mobile system

Mother gets unique identification number. Unique identifier only used within the system

Client Counselling & Data Collection

The HSAs do regular check-ups with the mothers and their children:

- ANC
- Post-natal (Immunization & 1000 days nutrition tracking)

Data are captured throughout these check-ups

Birth Registrations

HSA registers the birth of a child using her mobile phone

Client & Early Infant Diagnosis Follow-Up

Health facilities can request for specific patient follow-up through HSAs

Appointment Reminders

SMS' are sent to HSAs and registered mothers to inform them of upcoming appointments for mothers

The HSA has the responsibility to inform the mother to go to the healthcare facility

Figure 19

UN-Led Case Study: UNICEF - Results160

Transmission of Early Infant Diagnosis (EID) of HIV test results with Rapid SMS

PROFILE

mHealth Use Case: EID, to identify HIV exposed infants who are in need of treatment. This process consists of sending an infants' Dry Blood Sample (DBS) to a dedicated laboratory and waiting for the result to be returned

Delivery Channels: SMS

Health Focus: Child health

Target Users: CHWs

Geographical Focus: All districts in Malawi

VALUE PROPOSITION

Source Of Content: -

Degree Of Localization: -

Implementation Experience: Since 2010

Partner Coverage: mHealth in Malawi since 2010

Funding: Donor funded (UNICEF)

Business Model: Donor/ government

Success To Date: Decrease in turnaround time for client laboratory results

Reach: 436 active sites receiving results, 92,000 EID samples processed at labs, 57,258 results delivered to clinics via SMS. Implemented in 4 out of 5 national laboratories

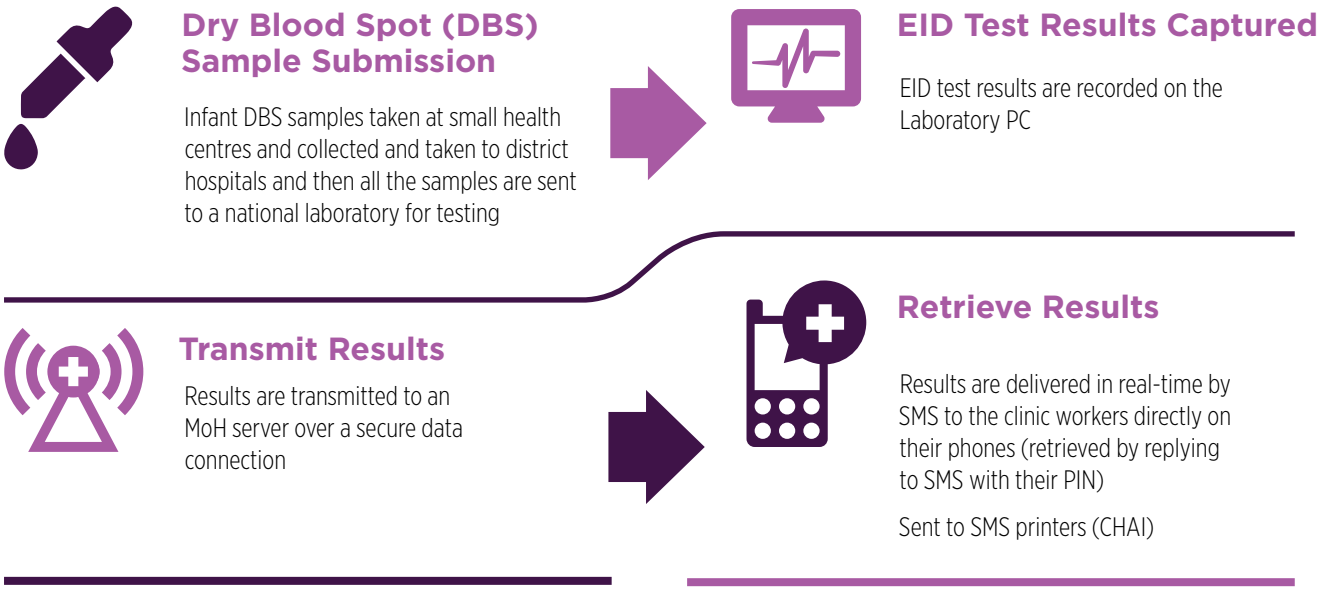


Figure 20

UN-Led Case Study: UNICEF - Anthrowatch

Nutrition status assessment – growth monitoring programme

PROFILE

mHealth Use Case: Service implemented at weekly nutrition clinics. Health workers enter a child's data, and through a feedback loop system, RapidSMS instantly alerts field monitors of their patients' nutritional status. Automated basic assessment tests identify children with malnutrition who were previously falling through the cracks

Delivery Channels: SMS, web

Health Focus: Child health and nutrition

Target Users: HSAs, Nutrition Programme Managers at district and national level

Geographical Focus: 16 districts

VALUE PROPOSITION

Source Of Content: Core nutrition/ growth monitoring indicators

Degree Of Localization: Only in English

Implementation Experience: Since 2009

Partner Coverage: RapidSMS, Government of Malawi, Airtel, TNM

Funding: UNICEF

Business Model: Donor/ government

Success To Date: Active & timely identification of acute malnutrition cases

Reach: 60% of districts (92,576 children assessed to date)

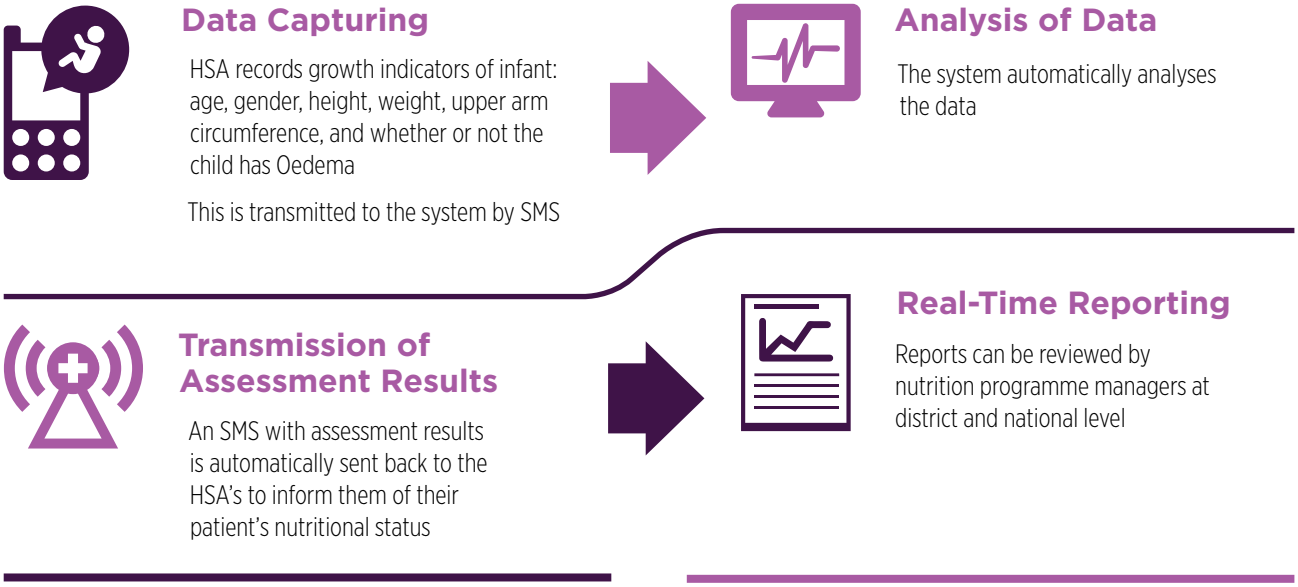


Figure 21

NGO-Led Case Study: CHAI – SMART

PROFILE

mHealth Use Case: SMART stands for 'SMS Printers to Accelerate Return of Test Results for Early Infant Diagnosis of HIV/AIDS'. One of the greatest barriers to infant initiation of ART is the receipt of a positive HIV test which can be attributed to logistical inefficiencies, poor compliance, difficulty in caregiver follow-up and complex system implementation. In 2010 Zambia started a pilot to use a RapidSMS based mobile health system to deliver the project results from reference labs back to the facility using SMS. Project was soon after replicated in Malawi

Delivery Channels: SMS

Health Focus: Child health

Target Users: HSAs

Geographical Focus: Nationwide

VALUE PROPOSITION

Source Of Content: -

Degree Of Localization: -

Implementation Experience: Since 2010

Partner Coverage: In Zambia, prior to deploying in Malawi (2010)

Funding: UNICEF

Business Model: Donor

Success To Date: -

Reach: 123 sites with SMS printers

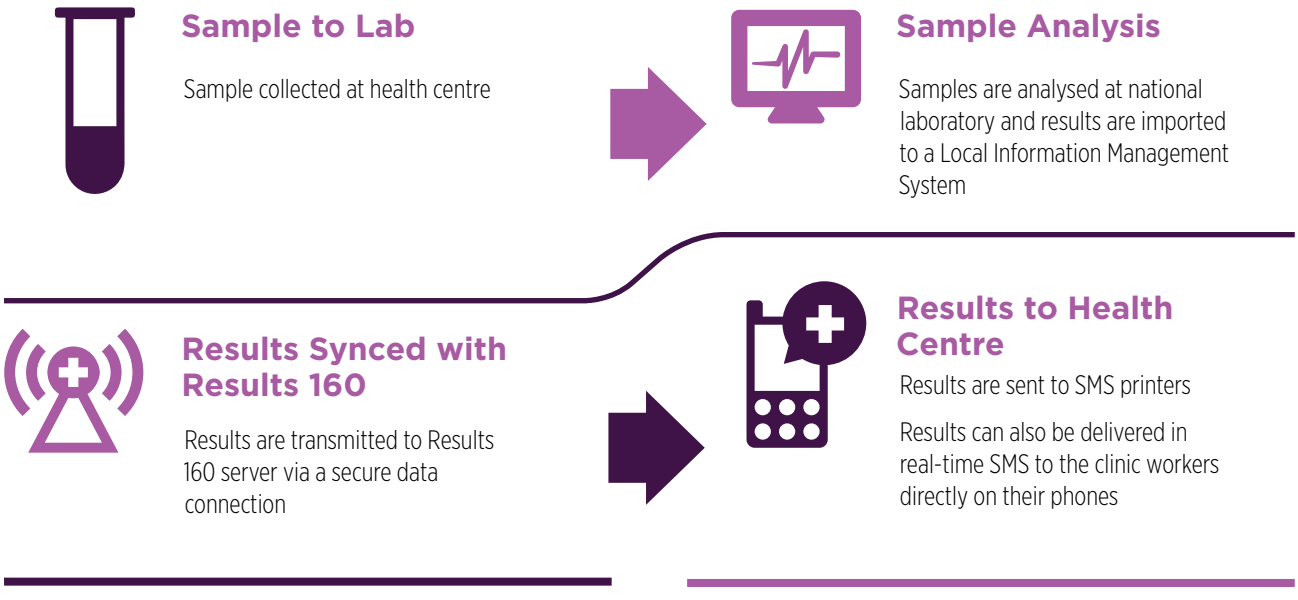


Figure 22

NGO-Led Case Study: CHAI – Patient Follow-up

Using an SMS system to manage patient follow-up

PROFILE

mHealth Use Case: Improving retention and accelerating follow-up of mother/infant pairs, using SMS mobile technology

Delivery Channels: SMS

Health Focus: MNCH

Target Users: HSAs

Geographical Focus: Mangochi and Salima districts

VALUE PROPOSITION

Source Of Content: -

Degree Of Localization: -

Implementation Experience: Piloted in Machinga District in 2012; MOU with Malawi MoH in 2006 to strengthen health systems in the most challenged districts (across a number of health areas)

Partner Coverage: Innovation Working Group, Frontline SMS, Malawi MoH

Funding: -

Business Model: -

Success To Date: 80% of 1522 patients registered in pilot returned to health facilities for services, increase in efficiency and reduction in workload associated with patient follow-up

Reach: 10 facilities in Mangochi and Salima districts

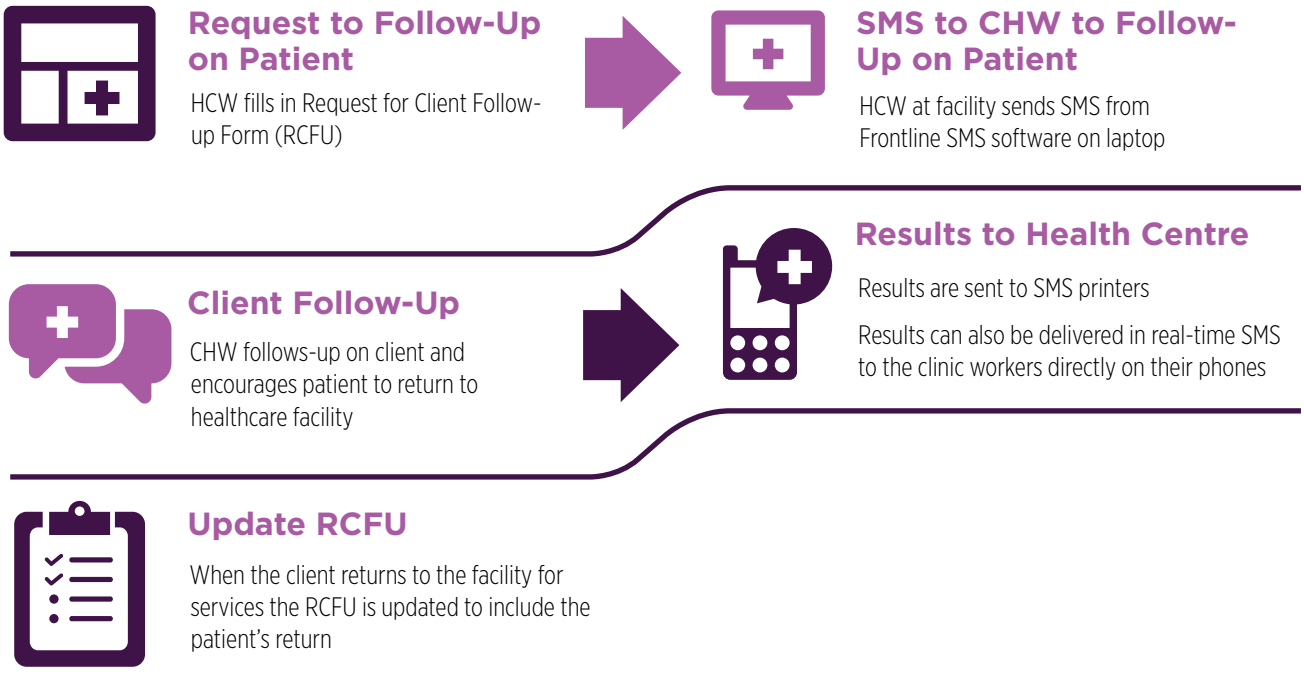


Figure 23

NGO-Led Case Study: JSI – cStock

Supply chain management via SMS

PROFILE

mHealth Use Case: Automated information system that includes transmission of logistics information via mobile phone text messaging (short message service, SMS) to a computer application that: responds with information for product resupply, displays product information on a web-based dashboard, and produces reports that can be used to monitor HSA product availability and supply chain performance

Delivery Channels: SMS

Health Focus: Supply chain management

Target Users: HSAs

Geographical Focus: Nkhotakota- deployed a 10 month pilot (in process of scaling nationally)

VALUE PROPOSITION

Source Of Content: -

Degree Of Localization: -

Implementation Experience: Implementing since 2010

Partner Coverage: Supply Chains 4 Community Case Management, Bill and Melinda Gates Foundation, Innovation Working Group, Malawi MoH.

Funding: Bill and Melinda Gates Foundation (pilot phase), IWG Grant for scaling

Business Model: Donor

Success To Date: Minister endorsed service for national scale up, funding approved for scale up, by April 2014 all scale up training across all districts should be rolled out

Reach: Nkhotakota

Figure 25

Stock On Hand Reporting
HSA sends Stock On Hand information for all products managed by SMS to cStock
Calculate Resupply Quantities
cStock calculates the quantity of each product required to bring the village clinic stock levels to maximum stock level
Order Resupply Quantities
Health Center HSA Supervisor enters data into a resupply quantity worksheet
Notify HSA of Resupply Quantities
cStock transmits an SMS message to the Health Center HSA Supervisor with the resupply quantities for the HSA
Notify HSA to Fetch Resupply Stock
cStock sends SMS message to HSA that products are ready for pick up
Package Resupply Quantities
Health Center HSA Supervisor and Drug Store In-Charge pick and pack the resupply quantities using the worksheet and send an SMS message to cStock indicating that the products are ready for pick up
Reporting
Produces reports that can be used to monitor HSA performance, product availability, and supply chain performance
Fetch Resupply Stock
HSA travels to Health Center, picks up products, and sends quantities of products received by SMS message to cStock

Figure 24

NGO-Led Case Study: Global Hope Mobilization – Project Tendai

PROFILE

mHealth Use Case: Project Tendai monitors the availability of medicines, their prices and stories relating to difficulties or successes in accessing medical help, as well as cost incurred and distances travelled to access medical attention

Delivery Channels: Apps, web

Health Focus: MNCH & supply chain

Target Users: CHWs

Geographical Focus: Dowa, Ntchisi and Lilongwe

VALUE PROPOSITION

Source Of Content: Global Hope Mobilization

Degree Of Localization: -

Implementation Experience: Implementing since 2011, Project Tendai is implemented in South Africa, Lesotho, Zimbabwe, Mozambique, Malawi, Zambia, DRC and Tanzania (by other organisations)

Partner Coverage: Sarpam (donor), Airtel, TNM

Funding: Sarpam

Business Model: Donor

Success To Date: -

Reach: 17 community health centres in the districts of Dowa, Ntchisi and Lilongwe

Stock Monitoring & Reporting

Tracking of commodities by Monitors/ HSAs (essential medicines package)

Application on smart phone

Figure 25

NGO-Led Case Study: Global Hope Mobilization – m-Mam

PROFILE

mHealth Use Case: Use of mobile phones to send reminders for taking medicines and notifications to CHW for missed appointments. Call center for clients

Delivery Channels: SMS, text-to-voice

Health Focus: MNCH

Target Users: CHWs - Mothers and children

Geographical Focus: Dowa, Ntchisi and Lilongwe

VALUE PROPOSITION

Source Of Content: Global Hope Mobilization

Degree Of Localization: -

Implementation Experience: Implementing other mHealth projects since 2011

Partner Coverage: Airtel, TNM

Funding: None

Business Model: Donor

Success To Date: Not fully launched yet

Reach: 2000 mothers enrolled to date

Registration

A mother is registered by a HSA at the HCF on a paper-based register

Upload Data to System

HSAs/ data capturers are trained to capture client information from paper-based records to electronic format on the system (excel format)

Reminders

Reminder messages are sent out to the HSAs and the mothers:

Missed/ upcoming ANC/ immunization appointment, and medication reminders

Client Follow-Up (& Counselling)

HSAs follow-up on a mother who has missed an ANC appointment or who has missed her EDD at the facility (call / visit)

Figure 26

NGO-Led Case Study: Millennium Promise

PROFILE

mHealth Use Case: CHWs use CommCare app to monitor and track mothers in terms of ANC visits and immunization (Health systems strengthening, health worker empowerment, monitoring)

Delivery Channels: SMS, voice, app

Health Focus: Maternal and Child Health

Target Users: Pregnant women and new mothers

Geographical Focus: Zomba district (Mwandama cluster is located in the southern region of Malawi's Zomba district)

VALUE PROPOSITION

Source Of Content: Earth Institute at Columbia University

Degree Of Localization: Earth Institute

Implementation Experience: Since 2006, with this programme, since 2006 with other countries (Ghana, Kenya, Malawi, Nigeria, Rwanda, Senegal, Tanzania, Uganda in progress) in other MCH areas

Partner Coverage: AirTel (all countries, to provide free SMS, data, voice to CHWs)

Sony Ericson (all countries), United Nations Development Programme, Earth Institute at Columbia University

Funding: Millennium Villages Project – multiple funders and donors

Business Model: Donor funded

Success To Date: -

Reach: 50 HSAs registered

Registration

A CHW profiles households on an app on her phone

Specific cases (linked to that household) are opened for pregnant women and children under 5

Data Collection

There are a number of digital forms which are updated on the application throughout this service

Pregnant mother (ANC and Post Natal- 6 weeks)

Children under 1 year (Immunization)

Client Follow-Up (& Counselling)

CHW uses her mobile phone to follow-up on a mothers and children

Birth Registration

After delivery, a new case is opened for the child (under the same household as the mother)

Figure 27

Aggregator-Led Case Study: VERSE – mWomen

VERSE
An ISO 27001:2005 Certified company

PROFILE

mHealth Use Case: A messaging service to empower women with information

Delivery Channels: SMS, USSD

Health Focus: Women's health, child care, and other content

Target Users: Women

Geographical Focus: National

VALUE PROPOSITION

Source Of Content: Avallain

Degree Of Localization: Localized (language) by VERSE

Implementation Experience: Implementing in 19 countries

Partner Coverage: Airtel

Funding: VERSE

Business Model: Consumer

Success To Date: -

Reach: -

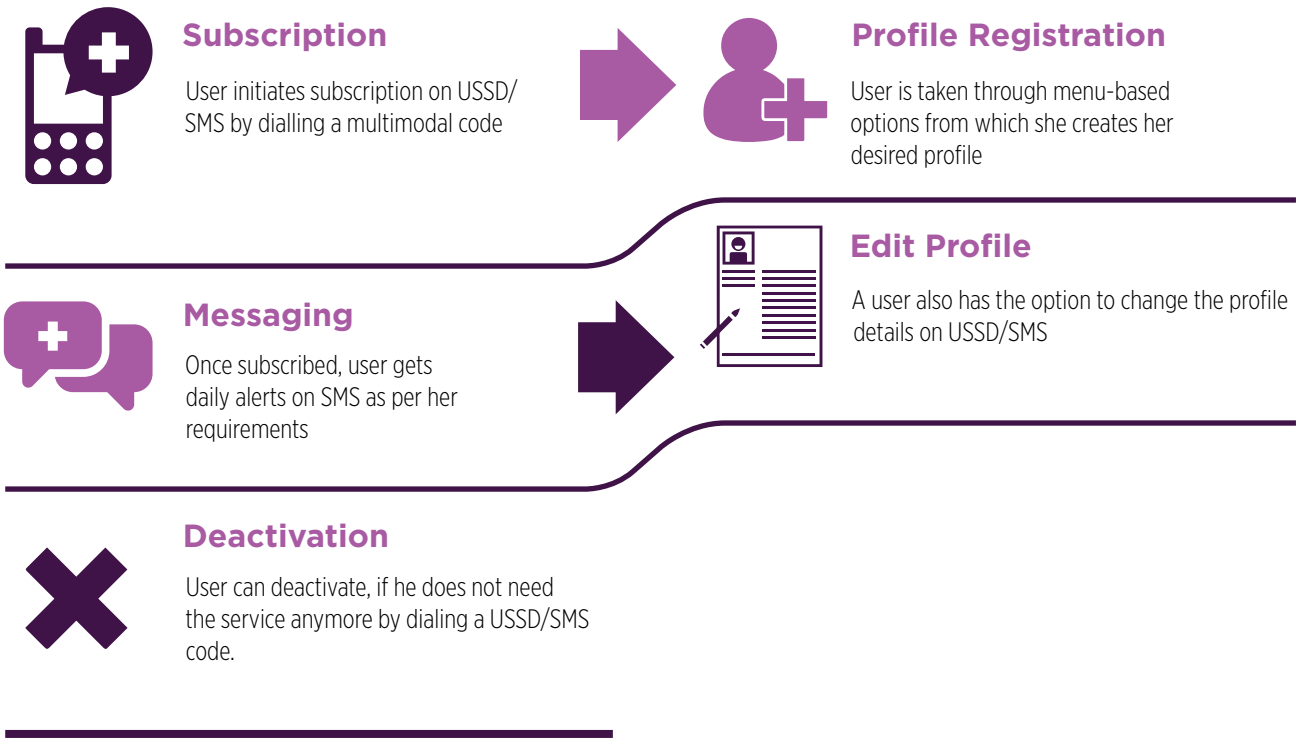


Figure 30

NGO-Led Case Study: Malawi MoH – DHIS2 Tracker

PROFILE

mHealth Use Case: DHIS 2 Tracker enables you to collect, manage and analyse transnational, case-based data records; Reminder messaging to patients for upcoming clinic appointment

Delivery Channels: SMS, calls, apps

Health Focus: MNCH

Target Users: HCWs updating patient information onto DHIS 2 system

Geographical Focus: Piloting in Dowa district

VALUE PROPOSITION

Source Of Content: Malawi MoH CCM protocol

Degree Of Localization: -

Implementation Experience: None

Partner Coverage: University of Oslo

Funding: -

Business Model: Donor/ government

Success To Date: -

Reach: 30 HCWs currently using service in Dowa district

MALAWI MOH – DHIS2 TRACKER

Registration

A mother is registered by a HCW (HSAs, nurses, hospital attendant) at a health facility. The mother's information is captured in a paper-based register

Data Collection (ANC)

Continual data collection takes place at the clinic when mothers come in for ANC service (paper-based medical records)

Data Entry into Electronic Format

HSAs are trained to capture client information from paper-based records to electronic format on the DHIS 2 system

They use J2 monitors (touch screens) to do this

Figure 28

MALAWI MOH – DHIS2 COMMUNITYTRACKER

Registration

A mother is registered by a HSA at the mother's home

The CHW captures the mothers data into digital forms on an application on her feature phone

Data Collection

There are a number of digital forms which are updated throughout this service by the HSA:

ANC & post-natal care follow-up for the mother (to be deployed)

Immunization tracking for the child

Clinic update form (tracking of visits)

Reminders

Reminder messages are sent out to the HSAs and the mothers:

Missed/ upcoming ANC/ immunization appointment

Client Follow-Up (& Counselling)

HSAs follow-up on a mother who has missed an ANC appointment or who has missed her EDD at the facility

She updates information on the status of the mother and child pair on her feature phone (linked to HCF)

Birth Registration

After delivery, a new case is opened for the child

Loaded into separate program for immunization (linked to mother)

Figure 29

Assessment Criteria for mHealth Service Providers

	STRONG ALIGNMENT	MEDIUM ALIGNMENT	LOW ALIGNMENT
Alignment to Health Area	Directly impacts maternal and child health or nutrition	Indirectly impacts maternal and child health	Does not impact maternal and child health
Alignment to Use Case	Has both demand generation as well as registration/ data collection use cases	Has either demand generation or registration/ data collection use cases	Does not have either use case
Alignment to Core Audience	Targeted at rural, poor, pregnant women or new mothers	Targeted at general audience	Little or no alignment to core audience
Strength of Content	Content validated by ministry and tested in the field	Content is from an approved source but not all formally validated or tested in the field	Content source not yet determined
Implementation Experience	Relevant deployment experience in named product in country	Relevant deployment experience in named solution in other countries	Relevant health experience but not in named solution
Breadth of Delivery Channels	Text and voice (can be IVR or call center), and data component in service	Single channel focus	Not determined yet
Business Model	Charging model in place which allows for some cost recovery from consumer	Funding strategy in place that is dependent on external sources (e.g. donors or government)	Not determined yet
Partner Coverage	Partnerships from government, health sector and private sector	Partnerships on either the health side or private sector side	Not determined yet
Availability of Funding	Funding sources to launch the service	Funding sources identified but not secured yet for launch of service	Not determined yet
Launch Readiness	Ready to launch service within 6 months	Ready to launch service within 12 months	Not determined yet

Figure 31

High Level Assessment of mHealth Service Providers

There is a wealth of useful mHealth experience in both messaging and registration / data surveillance, however business models are largely reliant on grant funding.

Figure 32

mHealth Content Aggregators

Key Observations

Aggregators are crucial to mHealth sustainability in Malawi, but the VAS market is at a relatively nascent stage.

- Operators are largely dependent on VAS providers to provide content and value-added services to drive interest and volume for connectivity.
- Due to the size of the market, aggregator interest in Malawi is limited and focusing more on high value commercial VAS such as ringtones and colour ringback tones.
- Market size and commercial sustainability, in the face of low ability to pay, are key concerns for aggregators to play in this space.

Aggregator Interest in Malawi

There is limited interest in health at the moment, with only one player providing content to AirTel on health.

	OPERATOR PARTNER	CURRENT FOCUS IN MALAWI
VERSE	AirTel	Health tips
Mahindra COMVIVA	AirTel	Managed services
onmobile	AirTel	CRBT
IT DOLLS	AirTel / TNM	Infotainment, RH tips

Figure 33

Mobile Network Operators

Key Observations

Mobile operators are targeting rural customers as a means to increase market share, however mHealth not currently seen as a means to reach out to them.

- Operators are targeting rural customers in order to grow their subscriber base, as the urban market is increasingly saturated.
- mHealth can be an important component of rural targeting for mobile operators.
- Feedback from operators suggests that mHealth at present is not a high priority area, unless they can see clear, short term, commercial potential and partners with market-ready products.
- There have been recent moves by the regulator to liberalize the market and drive down mobile costs for the consumer.
- There is an opportunity, at the moment, to define mHealth-friendly regulations in the health sector so that the mobile sector can participate positively in mHealth.

AirTel and TNM are the two major mobile operators in Malawi.

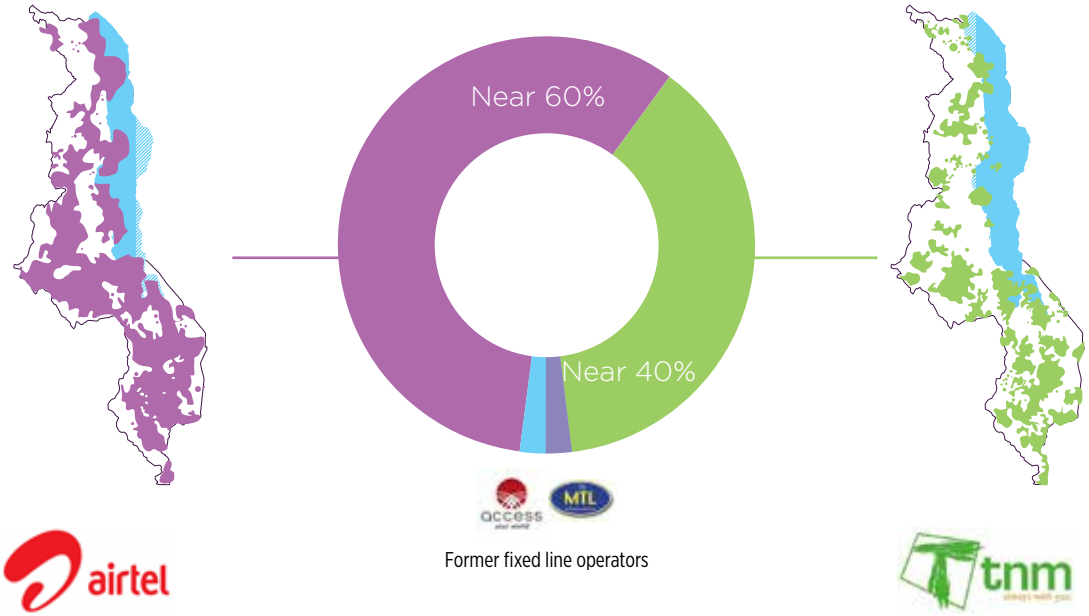


Figure 34

Operators are increasingly targeting low income, rural consumers.

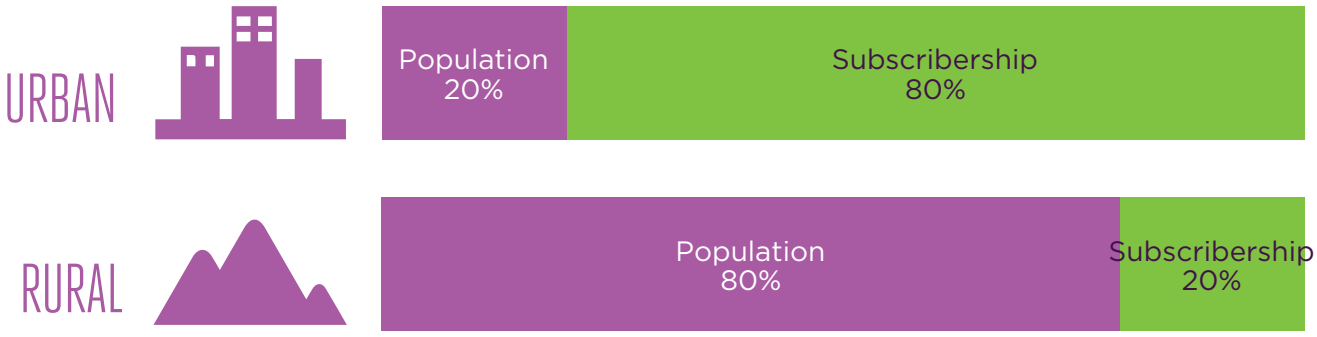


Figure 35. Source: Communications Africa, "Malawi Telecoms Players Tap into Rural Market" 2013

Malawi is still at a very early stage in VAS introduction.

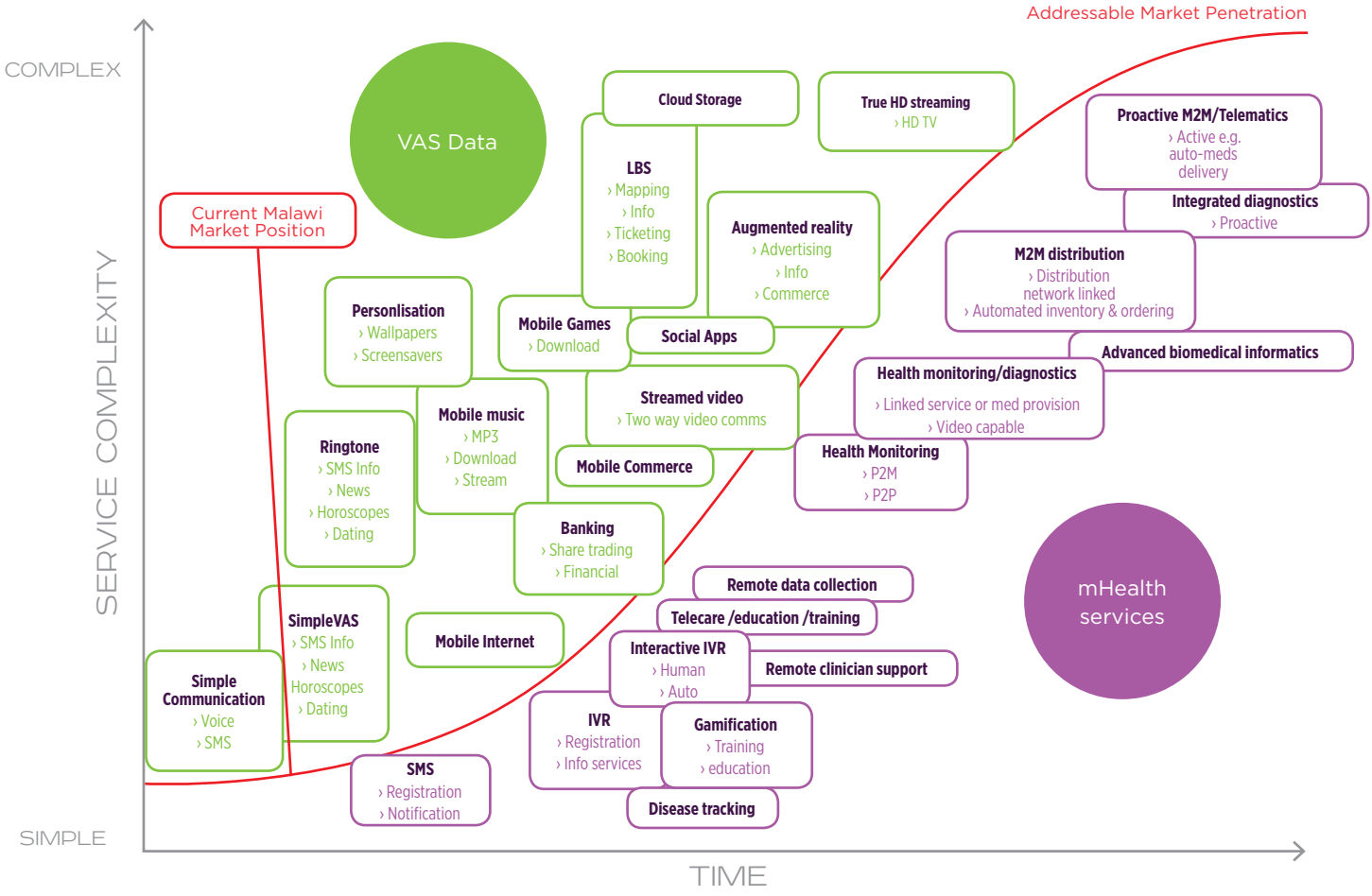


Figure 36

mHealth can play a part in the introduction of a more targeted rural penetration strategy.

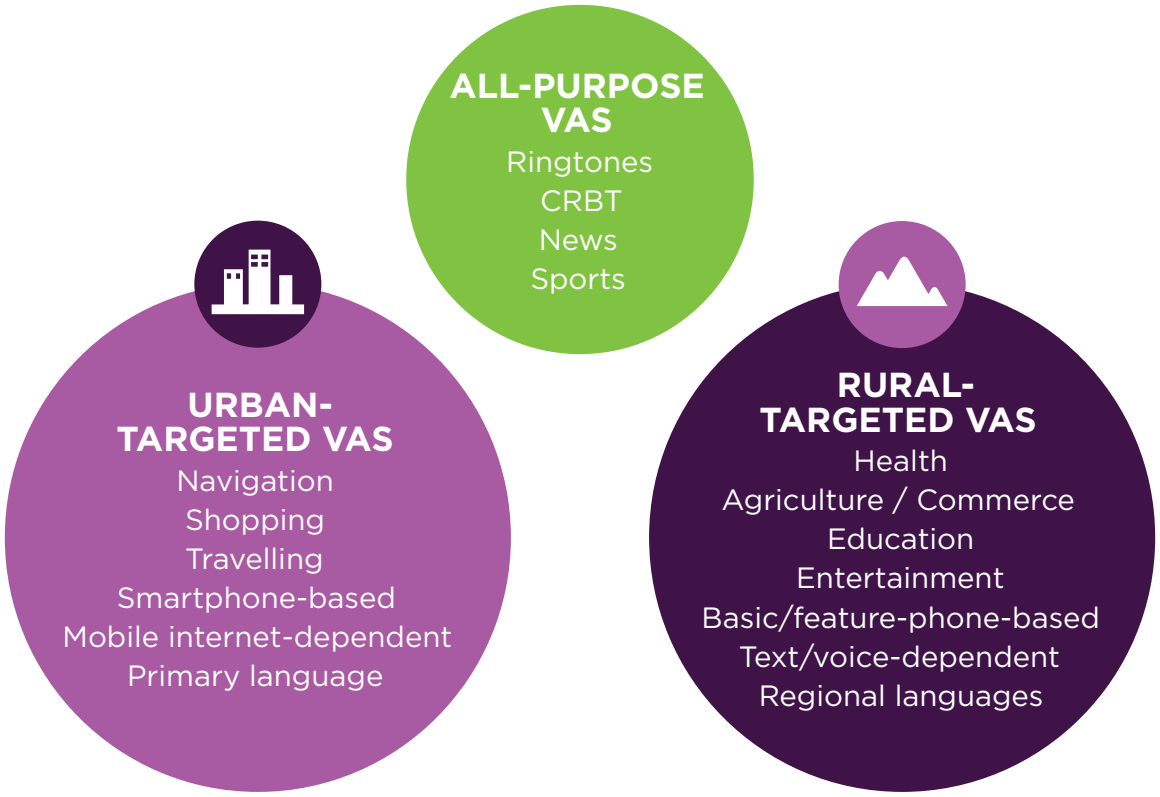


Figure 37 Source: Gartner Research, mVAS Content Aimed At Rural Masses (2012)

Regulation and government support for mHealth is positive.

An overall supportive position on mHealth	Regulators are working to reduce the costs of mobile through sector liberalization
Success and take up by government of mobile-based registration initiatives such as RapidSMS / UNICEF as well as community-based health support services such as CCPF indicate government buy-in for mHealth	MACRA deregulates mobile market, increasing operators from 2 to 4
	Operation of the transmission towers awarded to independent 3rd party
No specific mention of restrictive regulation regarding health advice being delivered over the phone indicates an opportunity for mHealth to be a viable health delivery support channel	Recent increases in mobile phone charges more due to inflation rather than failure of liberalization

Figure 38

The Potential for mHealth Partnerships

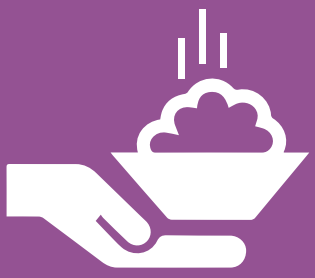
Regulation and government support for mHealth is positive

Government has deregulated mobile market

Operation of the transmission towers awarded to independent 3rd party

Recent increases in mobile phonecharges more due to inflation rather than failure of liberalization

Size of Opportunity



Scale of MCH/Nutrition problem

HIGH

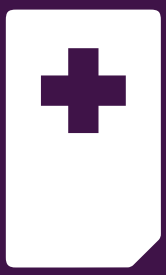
Size of addressable population

LOW

Ability to pay

LOW

Ability to Deliver



mHealth service providers

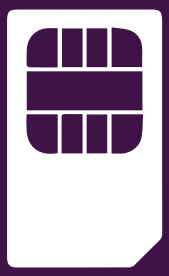
HIGH

Strength of supporting programmes

HIGH

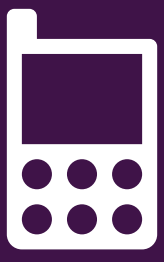
Interest from commercial aggregators

LOW



Interest from mobile operators

LOW



Supporting mobile / health regulation

MEDIUM

Willingness to partner

MEDIUM

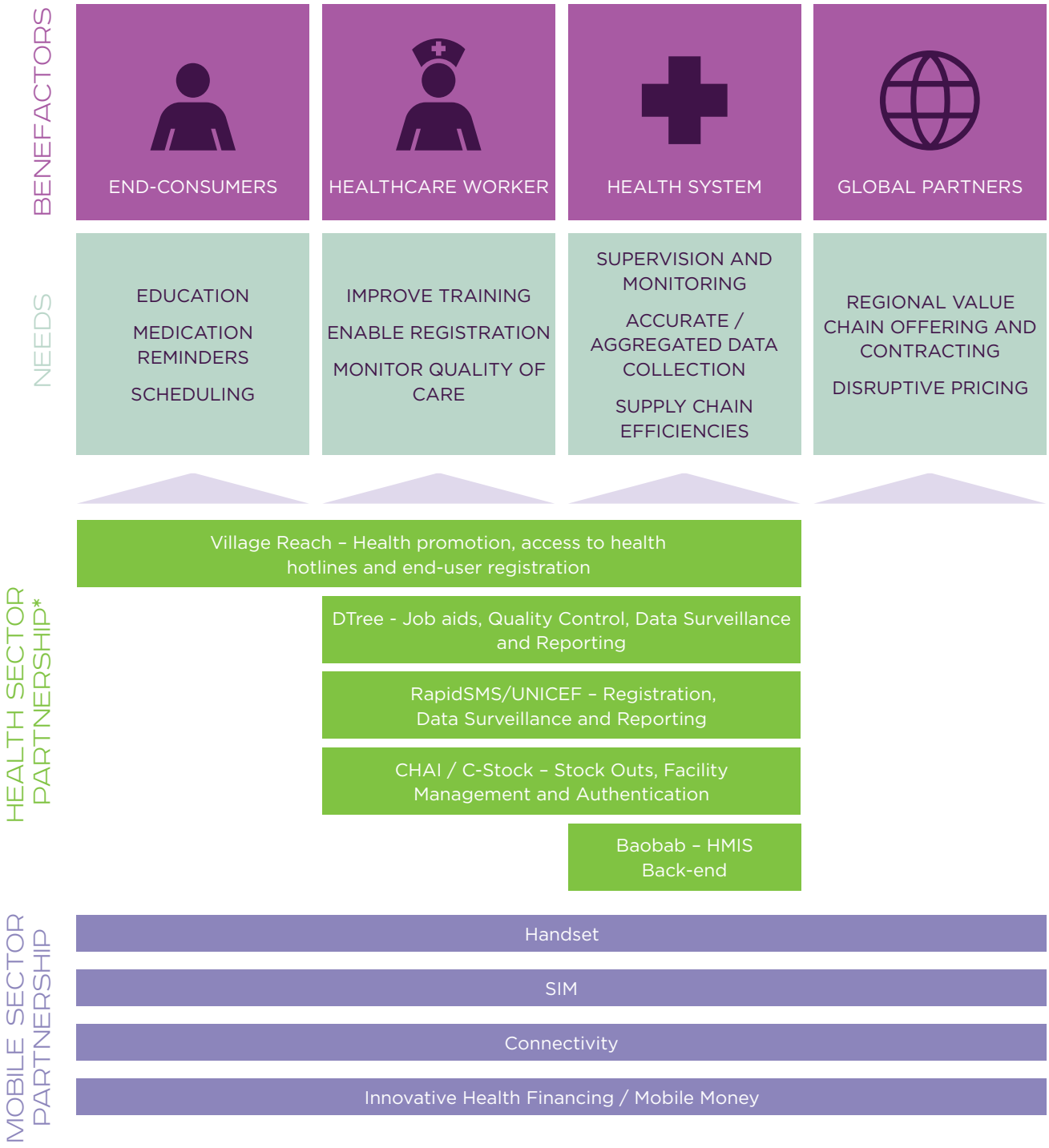
The Potential for mHealth Partnerships

Key Observations

- There is significant scope for different players in the mHealth delivery value chain to help each other in scaling up mHealth.
- Aggregating different mHealth service providers into a partner consortium can present a holistic product offering to operators, as well as form a common platform for negotiation.
- The existing goals of most mHealth players in Malawi is to prove impact and value to the public sector, to motivate the government to fund and take on services in the future.
- However, proving the short term commercial viability of mHealth for the private sector remains a challenge, in the face of Malawi's current economic and demographic characteristics. It may be that commercial mHealth will take longer to take off.

The Potential for Partnership

A multi-stakeholder product map shows the potential for collaboration between health and mobile sectors.



*Partners shown here are illustrative and non-exhaustive

Figure 39

Barriers to Scale

Different stakeholders can work together to address common challenges.

Challenge	mHealth Service Provider can help by	Commercial aggregator	Mobile operator
Availability of validated, localized, relevant, mobile content	Providing proven, field-tested health content	Working with mHealth players to define format of content which is suitable for mobile	Working with mHealth players to define format of content which is suitable for mobile
Commercial aggregators and mobile operators lack credibility in the health sector	Working with the commercial sector to provide vital credibility	Partnering with health sector players in rolling out services	Partnering with health sector players in rolling out services
Lack of clarity around mHealth regulations and standards	Providing input around supportive mHealth regulations on the health side	Providing input around supportive mHealth regulations on the mobile side	Providing input around supportive mHealth regulations on the mobile side
Connectivity costs which reduce affordability and access	Quantifying connectivity costs as a proportion of their operational costs	Considering alternative business models for health services	Considering alternative business models for health services
Lack of common short codes which limit reach & ease of use	Coordinating around common shortcode asks to the mobile sector	Supporting common short codes to the health sector to promote reach and scale	Supporting common short codes to the health sector to promote reach and scale
Lack of sustainable commercial model for mHealth	Being sensitive to commercial considerations for effective private sector participation	Considering alternative business models for healthcare services, including the packaging of health content with other forms of mobile content	Considering alternative business models for healthcare services, including the packaging of health content with other forms of mobile content

Figure 40

Assessment of mHealth Feasibility for Maternal and Child Health and Nutrition

While there is significant capacity and interest within the health sector, near term commercial viability affects greater mobile sector participation at this point in time.

Size of Opportunity

Scale of MCH/Nutrition problem – High
Size of addressable population – Low
Ability to pay – Low

Ability to Deliver

mHealth service providers – High
Strength of supporting programmes – High
Interest from commercial aggregators – Low
Interest from mobile operators – Low
Supporting mobile / health regulation – Medium
Willingness to partner - Medium

Action Plan and Recommendations

Capitalize on health sector momentum

- Assess the availability of credible open-source content for the mHealth community and develop new localized content to address gaps if needed.
- Perform field research on drivers of mobile usage habits to support product development for current / future mHealth service providers.
- Support government M&E efforts, to ensure that mHealth continues to align well with national and regional health goals.

Drive and increase mobile sector interest in mHealth

- Source and drive interest in the mHealth VAS market within the commercial aggregator space; a crucial intermediary in the mHealth value chain.
- Work with mobile operators to develop suitable business models which are aligned to consumer purchase habits as well as institutional interests in Malawi.

Abbreviations and Terminology

ANC	Antenatal Care
B2B	Business to Business
B2C	Business to Consumer
CCT	Conditional Cash Transfer
CHW	Community Health Worker
CHEW	Community Health Extension Worker
EID	Early Infant Diagnosis
HISP	Health Information Systems Programme
HSA	Health Surveillance Assistant
IBD	Inbound Dialling
ICT	Information and Communications Technology
IVR	Interactive Voice Response
LGA	Local Government Area
M2M	Machine to Machine
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MCH	Maternal and Child Health
MNCH	Maternal Newborn and Child Health
MoH	Ministry of Health
NGO	Non-Governmental Organisation
NPHCDA	National Primary Healthcare Development Agency
NSHDP	National Strategic Health Development Plan
OBD	Outbound Dialling
P2M	Person to Machine
P2P	Person to Person
PAMI	Pan-African mHealth Initiative
PHC	Primary Healthcare Centre
SMS	Short Message Service
USSD	Unstructured Supplementary Services Data
VAS	Value Added Services
WAP	Wireless Application Protocol
WHO	World Health Organisation

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