Mobile for Development

mHealth Country Feasibility Report: Tanzania

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CONTENTS

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 from the Department for International Development (DFID), 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 the GSMA Mobile for Development mHealth programme, please contact mHealth@gsma.com
or visit www.gsma.com/mobilefordevelopment/programmes/mHealth

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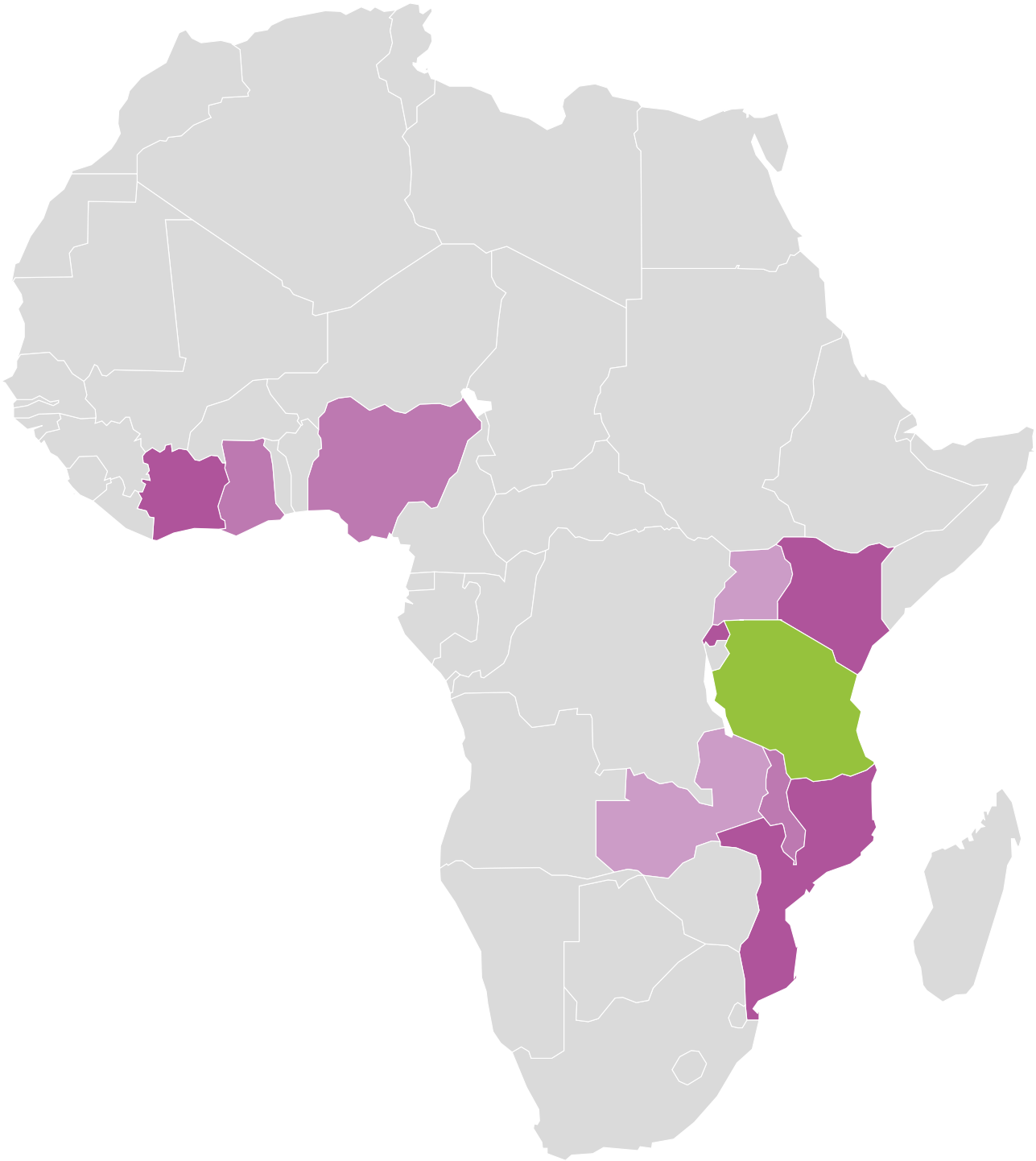


3-year 10-country nutrition initiative which aims to develop mHealth services in the area of maternal and child health in Sub-Saharan Africa.

Tanzania has been selected as a GSMA priority country.

- 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 Tanzania. 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.

1 The case for nutrition and maternal and child health in Tanzania

What problems can mHealth solve?

- Tanzania exhibits the third highest indicator for maternal mortality of the GSMA nutrition initiative target countries and is in the top five for stunting in children under 5.
- Whilst there is relatively good mHealth service distribution across Tanzania (a total of 3,379,883 beneficiaries have been reached by mHealth services) there is scope for realignment in mHealth deployments. While the Southern Highlands zone suffers the 2nd highest child mortality rate (102 deaths per 1000 births in children under 5), the highest incidence of stunting in children (51% below -2 SD1), and the 2nd highest incidence of severely thin women (3.5%) there is only one mHealth implementation, which does not include any nutrition or maternal, newborn and child health (MNCH) intervention.
- Of the total mHealth interventions tracked by the GSMA in Tanzania only 32% are directly related to maternal health interventions yet maternal mortality for Tanzania is 3rd highest when ranked against the 10 GSMA nutrition initiative countries. Mobile, which is widely available to the population of Tanzania (85%[1] of the urban population report access to a mobile and 79.4% access internet services using mobile), could provide access to nutritional, maternal and child health content for beneficiaries.

1. http://www.audiencescapes.org/sites/default/files/Chapter%201.pdf

2 The opportunity for mHealth to support nutrition and maternal health initiatives

What is conducive to mHealth success in a country?

- Buy-in to mHealth initiatives from the Tanzanian Ministry of Health (MoH) is strong. Approaches that have favoured multiple partners have proved particularly successful. For mHealth services tracked by the GSMA that have secured partnerships with 3 or more organizations 75% have managed to partner with the MoH, while 83% have secured partnerships with mobile operators.
- The country ranks 3rd for population above the poverty line and 1st for distribution of wealth, aligning well with the aim of developing commercially sustainable mHealth services that meet public health needs.
- The potential addressable market for maternal segments alone is 1.4 million. This forecast is estimated to rise to 2.2 million by 2020.
- With a female literacy rate in the top 5 of the ten nutrition initiative countries, Tanzania is well positioned for messaging-based knowledge-change using mobile. Moreover the available audience (approximately 23 million individuals[2]) is sizeable enough to see a demonstrable effect on maternal health nutrition knowledge and practice.
- Policy developments in Tanzania are gearing towards an enabling mHealth environment. For example the government's activation of HSSP III implementation and the instigation of the National eHealth Strategy Guide (NESG). This initiative acts to supplement the impetus coming from commercial mobile VAS developments by providing a framework and planning infrastructure to guide all ICT projects from pilots through to scaled initiatives. These enterprises will ensure implementation is efficient and accelerated.

2. http://www.indexmundi.com/tanzania/literacy.html, http://www.indexmundi.com/tanzania/demographics_profile.html

3 The readiness of stakeholders to support mHealth in Tanzania

What position are stakeholders in to facilitate mHealth?

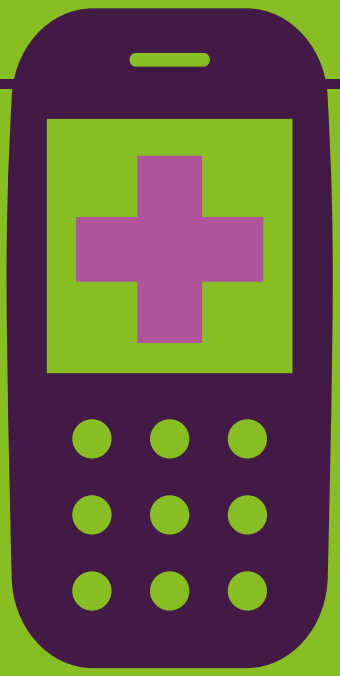
- Just over a third of Tanzanian households (35%) have at least one mobile money user. There is also an established cultural habit of saving for emergencies with mobile money that associates well with insurance and mHealth in Tanzania. Vodafone, Airtel, and Zantel have linked mHealth services to mobile money components.
- There is a well-established in-country NGO infrastructure and many mHealth initiatives are backed by internationally recognised funding bodies. Over 90% of all mHealth services tracked by the GSMA are funded in Tanzania. This funding structure acts as a foundation from which financial sustainability can be built that benefits public health needs.
- The mHealth Tanzania Partnership initiative which addresses public health priorities through the support of nationally-scaled solutions creates an environment that is conducive to innovative developments around mHealth and has seen some success with the Wazazi Nipendeni SMS service (case study below).
- Tanzania is advantaged in having a centrally defined nutrition strategy managed through the Tanzania Food and Nutrition Centre (TFNC). mHealth is centrally positioned within TFNC strategy while the governing board of the centre is drawn from across all Tanzanian government ministries (cutting across all ministerial strategies), with the result that mHealth implementation is efficient and accelerated.

Market conditions in Tanzania

mHealth indicators

Tanzania shows strong indicators for mHealth, being in the top five of the metrics considered across 48% of selected indicators, ranked against the other ten countries considered in the GSMA mHealth initiative.

Advantageous for mHealth



Of all the mHealth indicators we considered Tanzania is in the top five percentile in

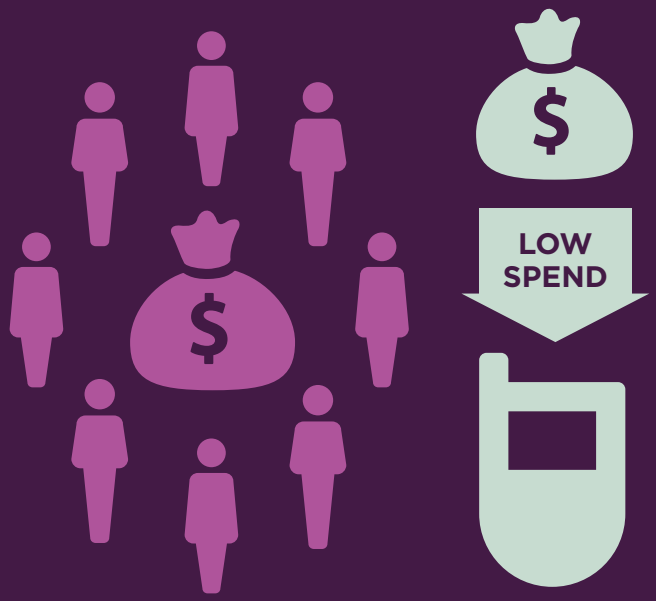
7 OUT OF 23 CASES

Country feasibility scaling

GDP versus spend

Tanzania has excellent indicators for distribution of wealth, having the lowest rate of financial dominance by the top 10% of society and second lowest Gini coefficient of the 10 mHealth nutrition countries. It also has good indicators for people above the poverty line (5#).

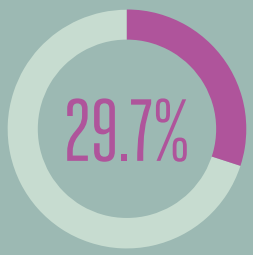
However, a low percentage of GDP spend on mobile and average ARPU require mHealth services to be highly impactful to attract consumer attention.



Good potential for mHealth but challenging environment

Penetration versus access

UNIQUE USER PENETRATION



ACCESS TO MOBILE PHONE

Advantageous for mHealth particularly in high need rural regions

NGO support of health services

Tanzania has the **third highest spend** by non-profit organisations on health initiatives.

Advantageous for mHealth and business to business models specifically

General market considerations

Tanzania is actively involved in fulfilling the aims of its National eHealth Strategy Plan. This plan places mobile in a key role, in realisation of the ideal of ICT as a mechanism to improve the socio-economic position of Tanzania's population.

Figure 1 highlights some of the general features of the Tanzanian market in relation to mHealth and places these challenges and opportunities within the wider context of health and ICT development.

The National ICT Broadband Backbone (NICTBB) is a government led and part subsidised initiative designed to distribute connectivity more widely across the country towards improving the overall economic situation through the use of ICT. Health service provision is a key part of the initiative and has been explicitly defined in the national plan through the provision of subsidised access for health facilities.

The NICTBB will support mHealth service development by improving backhaul capacity and connectivity between health facilities as well as improving network tolerance and reliability in heavily demanded mobile regions and by providing better coverage options in those regions where connectivity is an issue. These features will combine to improve the commercial sustainability as well as demonstrating the tangible (health impact, cost, ROI, market share) and intangible (quality of service delivery, brand loyalty) of a shared value creation approach to mHealth, while demonstrating the value proposition to both public and private stakeholders.

Tanzania's activation of HSSP III, which concentrates specifically on maternal, newborn and child health, and the instigation of NESG have acted to supplement the impetus coming from commercial mobile Value Added Service (VAS) players in developing mHealth services that meet public health needs, in the areas of demand generation, registration and data surveillance. By providing a framework and planning infrastructure a robust outline can be provided to guide mobile projects from pilots through to larger scale initiatives.

Figure 1

General Tanzania ICT market view SWOT

STRENGTHS

The GSMA currently tracks 31 live mHealth services in Tanzania. These have partnerships with 54 different organizations.

There are at least 4 mHealth projects available in each region with the most serviced regions having up to 9 different mHealth services implemented including four that are nationally available.

mHealth services driving maternal interventions have reached a cumulative total of 2,788,782 (Q3 2014) beneficiaries of which 1,014,197 are currently actively engaging with the services.

Improving data surveillance, training and education are important features of the Tanzania NESG. The most addressed mHealth application tracked by the GSMA in Tanzania is data collection and reporting (addressed by 58% of services), closely followed by client education and behaviour change communication (48% of services), and electronic decision support (45% of services).

WEAKNESSES

Network coverage is an issue in rural areas and requires investment to improve the situation. This investment is contingent on proving both the commercial and public benefits and impact of services like mHealth in Tanzania.

A lack of clear regulation and governance structure to guide development of mHealth across the health sector in Tanzania is impacting mHealth initiatives and creates a sense of uncertainty when scaling up regional pilots to national scale.

There are a large number of mHealth initiatives (over 31 related to maternal health and nutrition tracked by the GSMA alone) and fragmentation and lack of co-operation in areas like HIS initiatives is an issue. Partnerships have been forged but integration remains a problem e.g. In some cases upwards of 18 months is required to integrate MNOs with mHealth organizations.

OPPORTUNITIES

Strong donor support in Tanzania (90% of tracked mHealth Initiatives have secured donor funding) creates a strong basis from which to develop sustainable and scaled mHealth services that benefit public health needs. Indicators around distribution of wealth (1# best Gini coefficient and 2# lowest percentage dominating top 10% wealth) support the potential for commercial propositions in mHealth becoming self-perpetuating and generating revenue for health infrastructure re-investment through taxation.

There is a need and consequently an opportunity for mHealth services in a number of underserved regions of Tanzania. The Southern Highlands zone for example has the 2nd highest child mortality rate, the highest incidence of stunting in children and 2nd highest incidence of severely thin women yet has only one mHealth implementation which does not include any nutrition or MNCH intervention.

The Lake zone of Tanzania is ranked highly across a number of health indicators and has a poor distribution of healthcare facilities (average of 1.15 per 10,000, falling as low as 0.94 in some parts). Staffing and capacity constraints provide a strong feasibility for the use of mobile to enable, extend and empower health workers and the communities they serve.

THREATS

Initiatives are in place to distribute connectivity (e.g. the National ICT Broadband Backbone (NICTBB) to the wider populace in Tanzania but there remains a digital divide delineated by geography, income, education level and literacy.

The delays with the National Road Map Strategic Plan To Accelerate Reduction of Maternal, Newborn and Child Deaths in Tanzania pertaining to mobile (specifically implementation of installation of communication equipment in health facilities) could lead to a risk of players going it alone, leading to duplication of effort and stalled development.

The most disadvantaged health beneficiaries are those in the base of pyramid and within rural regions of Tanzania. To reach these neglected audiences basic mobile access channels should be exploited. Of the GSMA mHealth tracked initiatives 48% reported using internet/an installed application within their project. Basic access mechanisms including USSD and native voice showed very low prevalence, at 19% and 16% respectively.

Source: GSMA

The Tanzanian opportunity to scale

As part of the GSMA nutrition initiative country feasibility research we set out to identify the most comparable health, mobile and economic indicators and datasets within each of the 10 priority countries. These indicators are represented in figure 3.

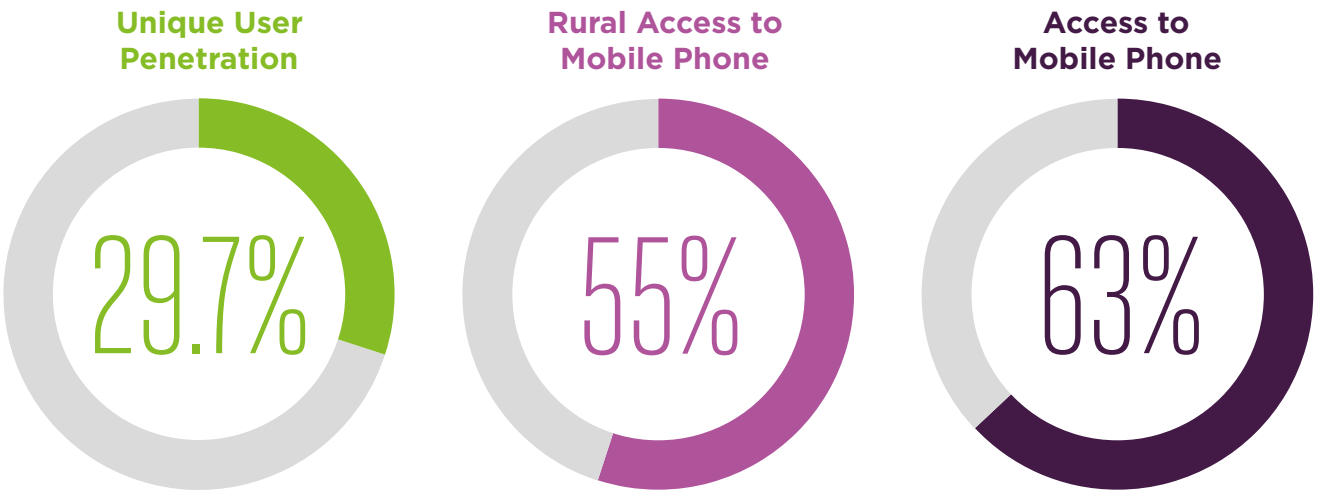
Tanzania shows strong potential to scale mHealth, as indicated by its top five positioning in 48% of the selected indicators.

Indicators of addressable market and health burden in maternal segments are particularly strong in Tanzania - 1.5 million pregnant women and 5.3 million mothers with children under five.

There is a reasonable incidence of phone sharing in Tanzania. This feature means there is a larger audience for mobile services than published penetration rates would suggest.

Figure 2

Mobile phone use: penetration versus access to mobile



Source: InterMedia FITS study of households in Tanzania, April-May 2012; N=2,980

Figure 3

General market indicator metrics - top 5 country ranking

INDICATOR METRICS*	1	2	3	4	5
Maternal mortality	Nigeria 6.3	Mozambique 4.9	Tanzania 4.6	Malawi 4.6	Zambia 4.4
Infant mortality	Nigeria 77.8	Cote D'Ivoire 76.2	Mozambique 63.1	Zambia 56.4	Kenya 48.7
Child mortality <5	Nigeria 123.7	Cote D'Ivoire 107.6	Mozambique 89.7	Zambia 88.5	Kenya 72.9
Children aged <5 stunted	Malawi 48%	Zambia 46%	Rwanda 44%	Mozambique 43%	Tanzania 43%
No. of pregnant mothers	Nigeria 5.7	Tanzania 1.5	Uganda 1.3	Kenya 1.2	Mozambique 0.8
No. of mothers with children <5y	Nigeria 17.7	Tanzania 5.3	Kenya 4.1	Uganda 3.8	Mozambique 2.8
Penetration + growth + coverage	Rwanda 1.29	Malawi 1.16	Ghana 1.14	Uganda 1.11	Zambia 0.90
Unique mobile subscriber penetration	Ghana 50%	Cote D'Ivoire 45%	Zambia 40%	Kenya 32%	Rwanda 30%
Mobile subscriber penetration 5 year growth	Rwanda 25%	Zambia 15%	Malawi 15%	Mozambique 14%	Ghana 10%
Mobile geographical coverage	Malawi 79%	Uganda 76%	Rwanda 74%	Ghana 54%	Tanzania 41%
Overall literacy rate >15y	Uganda 73%	Kenya 72%	Ghana 71%	Tanzania 68%	Rwanda 66%
Female literacy rate <15y	Kenya 67%	Ghana 65%	Uganda 65%	Rwanda 62%	Tanzania 61%
Per capita GDP	Ghana 1605	Nigeria 1555	Zambia 1469	Cote D'Ivoire 1244	Rwanda 1244
Health expenditure	Zambia 87	Nigeria 80	Cote D'Ivoire 79	Rwanda 79	Ghana 75
% above poverty line	Uganda 74%	Cote D'Ivoire 73%	Rwanda 73%	Nigeria 63%	Tanzania 60%
% out-of-pocket spend on health	Nigeria 95%	Cote D'Ivoire 88%	Rwanda 88%	Kenya 77%	Zambia 67%
Spend on mobile (ARPU/month)	Nigeria 16	Cote D'Ivoire 13	Rwanda 13	Kenya 12	Zambia 12
% of GDP spent per month on mobile	Mozambique 1.77%	Malawi 1.49%	Uganda 1.46%	Kenya 1.27%	Cote D'Ivoire 1.05%
% of GDP spent per month on mobile over 12 months	Mozambique 21%	Malawi 18%	Uganda 18%	Kenya 15%	Cote D'Ivoire 13%
Gini co-efficient	Rwanda 5.82%	Tanzania 37.58%	Malawi 39.02%	Uganda 44.30%	Mozambique 45.66%
Income share held by top 10% of the population	Tanzania 29.61%	Cote D'Ivoire 31.75%	Malawi 31.85%	Ghana 32.75%	Uganda 36.10%
% government funding on health	Malawi 73%	Zambia 60%	Ghana 56%	Mozambique 42%	Kenya 40%
% donor funding on health	Mozambique 70%	Malawi 52%	Tanzania 41%	Kenya 39%	Zambia 27%

Source: WHO, WorldBank, GSMA Intelligence, M4D Impact

*Indicator metrics in table have been left in original format. Data in market indicator analysis normalised for cross indicator comparison.

Tanzania market indicators

As part of the quantitative evaluation process the 10 GSMA nutrition initiative target countries were placed in a ranked scale. Twenty six unique data indicators were considered in the evaluation process and grouped into relevant indicator sectors, categories of feasibility evaluation and output drivers.

Figure 4

Criteria considered for opportunity matrix indicator

The exact methodology, justifications for metrics chosen and source material used are available separately in the GSMA mHealth Country Feasibility Report Methodology. It is highly recommended that the methodology is read in conjunction with this report.

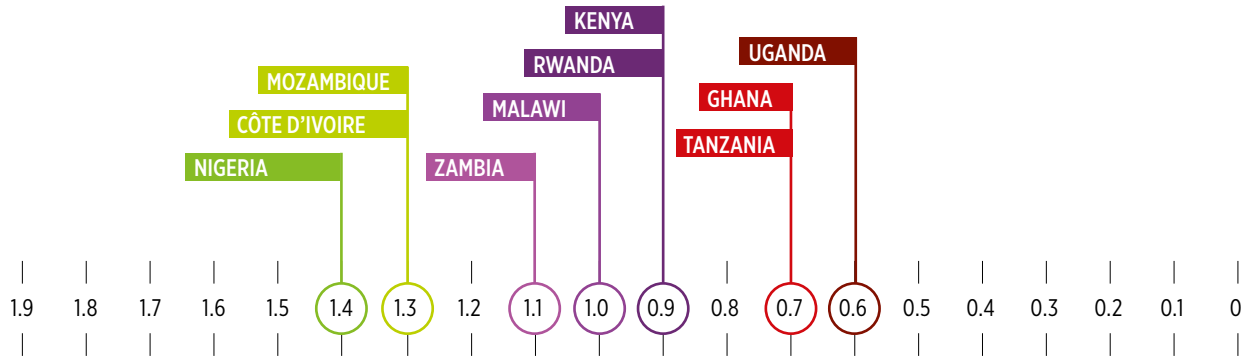
It is important to consider what proxy indicators combine into the category and output drivers when considering the opportunity matrix scale. Seemingly counterintuitive assumptions, e.g. a particular country having a higher addressable market than one might think, can be explained by considering the input metric indicators.

Figure 5 represents a comparative health opportunity in each country. A score of 1 indicates a good opportunity, while less than 1 indicates a lower opportunity for the particular indicator considered.

The Tanzanian market opportunity related to health burden is characterised by a high incidence (3#) of maternal mortality rate and stunting of children under five (5#) relative to the other nutrition initiative countries. Tanzania's comparative index of 0.7 indicates a lower health burden compared to other priority countries. Interestingly in Tanzania, there is a slightly higher than average incidence of maternal mortality (5#) but a low incidence of child and infant mortality (both indicators ranking lowest). The positive features of low child mortality are brought into stark contrast when compared with maternal mortality. This feature is an area mHealth can target with improved information and education during pregnancy and postpartum.

Figure 5

Tanzania health burden opportunity matrix



The addressable market in Tanzania exhibits good market feasibility characteristics (figure 6), sitting within the ideal market conditions indicator of 1. This is primarily due to strong maternal features including the second highest number of pregnant mothers and mothers with children under five, which is forecast to increase to 6.3 million individuals by 2020 with a CAGR of 2.63%, the third highest of the 10 in nutrition countries. Mobile penetration and subscriber growth are just outside of the top five (6#) but contribute to Tanzania's overall addressable market potential.

Figure 6

Tanzania addressable market opportunity matrix

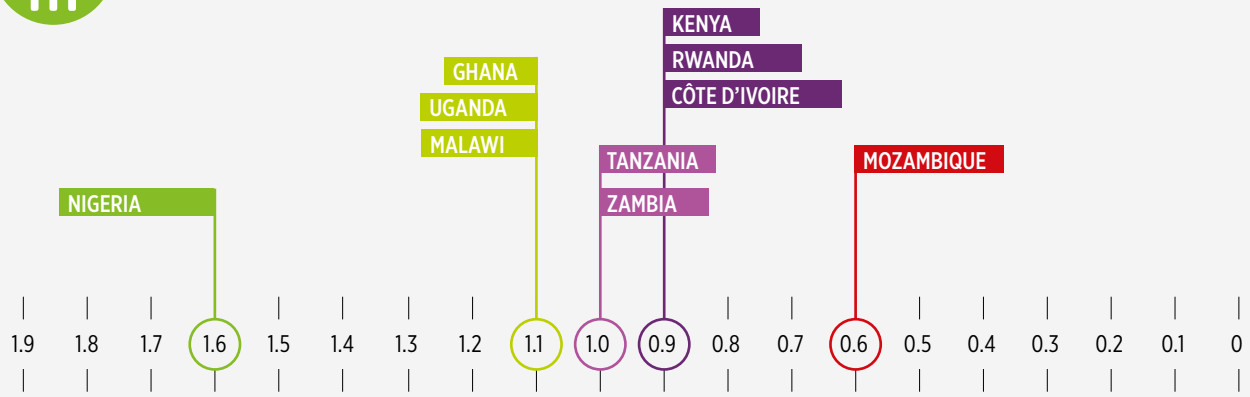
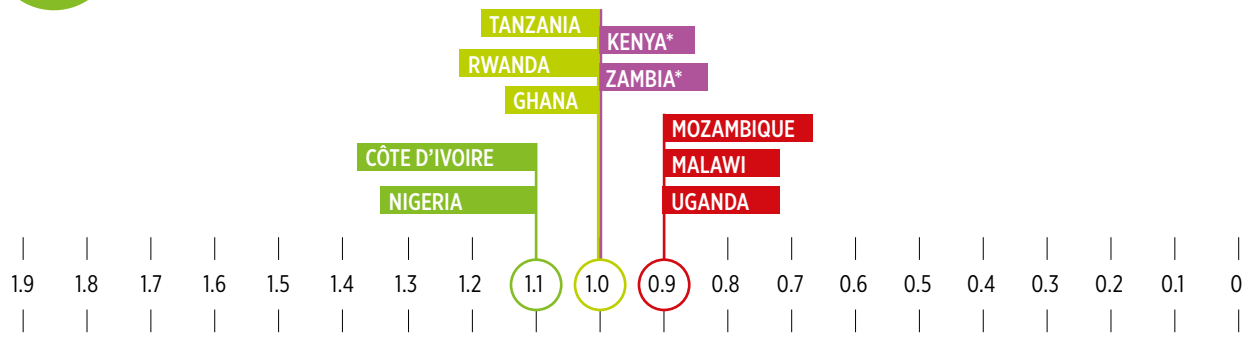


Figure 7

Tanzania ability to pay opportunity matrix



* Denotes rounding of figure
Source: GSMA

The Tanzanian market opportunity related to ability to pay for mHealth services is characterised by a number of features pertinent to the B2C and B2B segment opportunity indicators. Overall the country occupies an index of 1, representing a good feasibility for payment capability of mHealth users within both B2B and B2C sectors.

A relatively high share of the population over the poverty line combined with a good distribution of wealth provide a strong ability to pay index. The country occupies the number 1 and number 2 spots for income share held by top 10% of the population and Gini-coefficient respectively. Conscious of the fact that the burden of out of pocket expenditure on the patient should be reduced, it does provide a proxy for the willingness of those patients to seek out medical care independent of the public health system. This willingness should drive the adoption and active use of mHealth services.

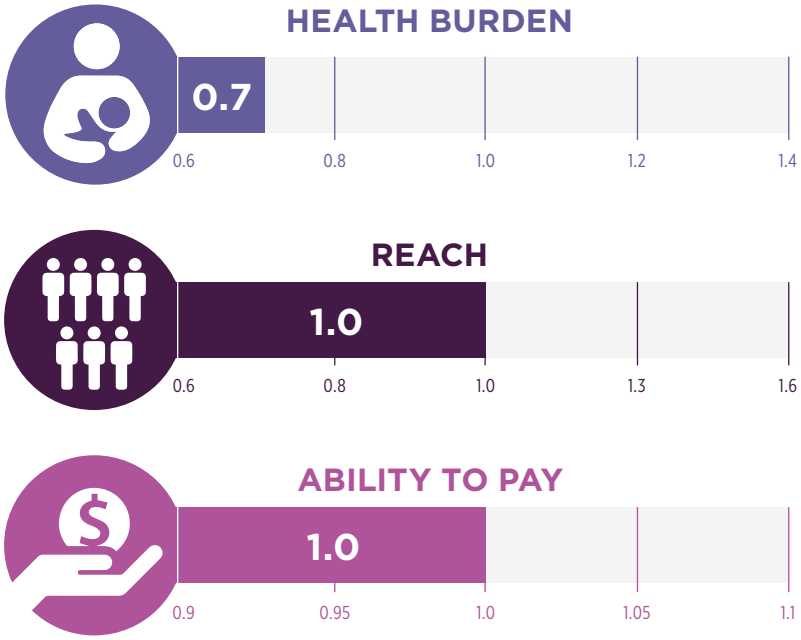
B2B shows a strong indication, due to the high percentage of donor funding (#3), which, when combined with the external impetus toward the development of advanced health solutions that leverage ICT, enhances the opportunity to service this segment through mHealth. Funding bodies are also looking to leverage new mechanisms to achieve their health support aims.

When the aggregate mHealth driver indicators are considered as a combined output (figure 8 below), they are within positive index score indicators.

Figure 8

Combined aggregated indicator metrics*

INDIVIDUAL SCALE SCORES



COMBINED SCALE SCORE

0.98

OVERALL INDEX SCORE ACROSS COMPARISON COUNTRIES

Source: GSMA. *Please see GSMA methodological framework for additional clarification on quantitative scoring

Part of this potential is attributable to the strong impetus from central government toward technology led solutions to health and the drive for centralisation of services in-country including initiatives to register all mHealth services within a centrally organised and government run information depository.

Mobile service development

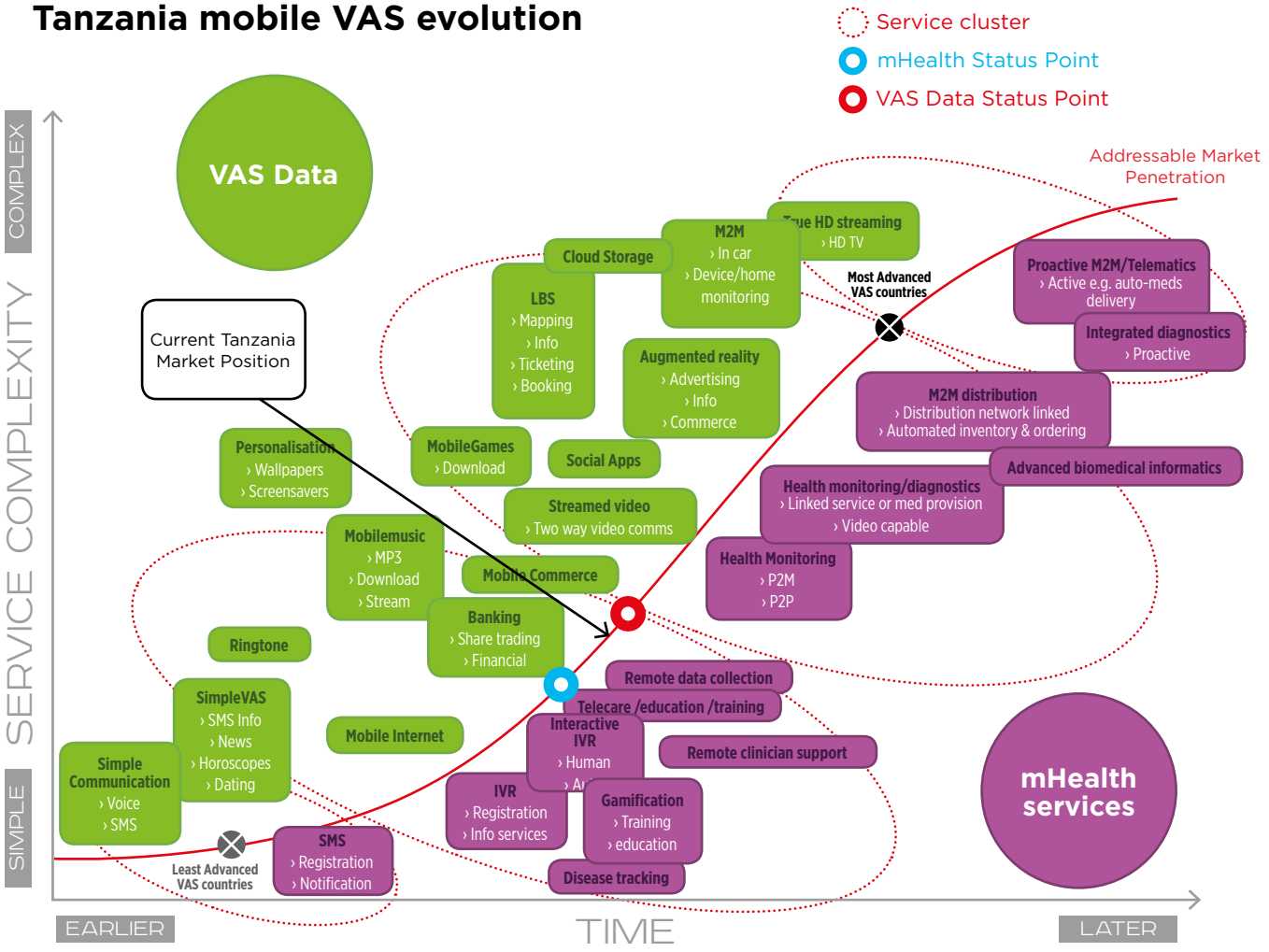
The dotted service clusters in Figure 9 denote 4 evolutionary points within the VAS and mHealth service environments. The evolution of mHealth services correspond with the VAS evolution points as depicted below.

Tanzania VAS and mHealth service development are shown with a blue and red indicator circle. The distance between most developed service markets and least developed service markets denotes overall maturity. The position of Tanzania on this maturity scale was evaluated by considering overall market maturity. Data considered a number of usage metrics including total number of VAS and mHealth services offered, complex versus simple service ratio, data ARPU and data ARPU increase over defined periods. This process was replicated across all of the 10 country feasibility report countries in order to generate a scale of service maturity.

For comparison, a country such as the USA would be further up the scale toward most advanced VAS, based on a number of advanced mHealth service functionalities and offerings: scripting, machine-to-machine, reimbursement and decision support.

Figure 9

Tanzania mobile VAS evolution



Source: GSMA M4D mHealth

mHealth services are currently reaching an estimated 3,379,883 people (Q3 2014), approximately 7% of the population, with the most targeted segment being women (55% of mHealth services). Fifty-two percent of mHealth services use SMS as an access channel while 48% report use of internet/ installed application within their project. For comparison purposes, this places Tanzania slightly above Ghana.

Spend on mobile relative to available income is low in Tanzania at $6 per month, the second lowest of the nutrition countries and well below the normative range for these countries, at USD$10 per month.

Despite this, consumer use of VAS is quite sophisticated. Use of mobile money and other financial services including micro-transaction saving and prepaid insurance is well established, with around 35%[3] of households in Tanzania having at least one mobile money user. Mobile operators have supported this dynamic in the mHealth space, with Vodafone launching a maternal obstetric care solution that leverages mPesa. Zantel has partnered with the National Insurance Corporation of Tanzania with its Ezy Pesa Insurance. Tigo launched Tigo Bima, a micro-insurance offering for medical health emergencies, as part of users' monthly contractual spend (incentive driven upsell).

According to data from the Bill and Melinda Gate Foundation Financial Services for the Poor Program, the majority of mobile transactions undertaken in Tanzania are associated with fee payments (school, taxes and utility bills) while mobile money is more popular as a savings device than bank deposits. The second most prevalent saving activity is emergency planning including medical emergencies.

Service users are comfortable using the mobile device to pay official bills, including hospital bills and healthcare (acceptance/usage model). These consumption characteristics illustrate a strong opportunity for mHealth combined with payment services.

Developing mHealth in combination with mobile financial services would further benefit Tanzania by:

1. Growing mobile operator VAS revenues and usage
2. Developing financial infrastructure and socio economic mobility
3. Creating revenue from insurance that can be reinvested to develop health infrastructure through taxation and reimbursement.

3. Bill and Melinda Gate Foundation Financial Services for the Poor program and its Financial Inclusion Tracker (FIT)

Core mHealth services

One of the simplest mHealth services to provision is SMS delivered health information. Such services can be launched relatively quickly through existing infrastructure, are inexpensive to provision comparative to data VAS, have a low infrastructure demand and are simple for customers to use.

Tanzania was an early innovator in the mHealth space through the adoption of the Wired Mothers Initiative using SMS and direct contact with primary care providers to reduce maternal and neonatal morbidity and mortality, in cooperation with the University of Copenhagen and Ministry of Health and Social Welfare. This project ran through 2009-2010 in Zanzibar.

Fifty two percent of GSMA tracked mHealth services use SMS while voice and USSD have lower usage, at 16% and 19% respectively.

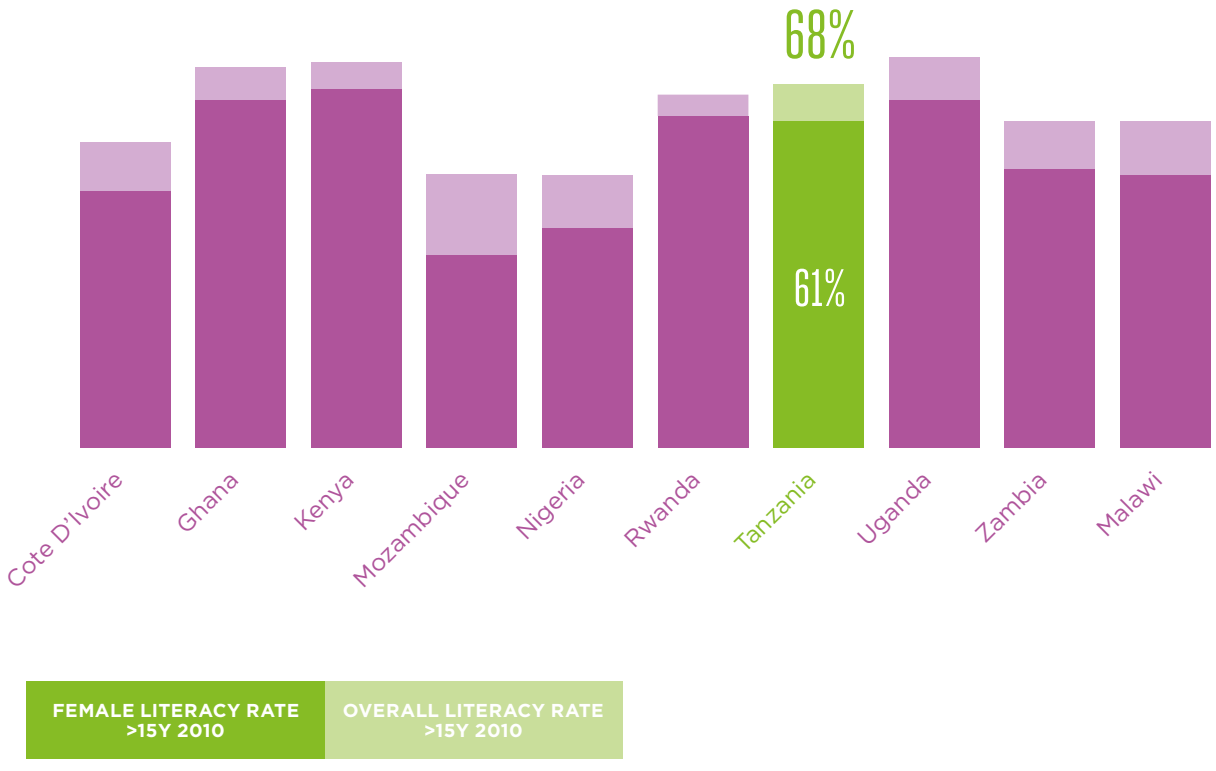
In Tanzania SMS generated an ARPU of $7.33[4] in April-June 2014 and $7.74 for the same period in 2013, a 6% fall year-on-year. This is particularly important as SMS generates around 15% of the total ARPU reported in Tanzania. While mHealth in Tanzania aims to meet public health needs there is scope to develop a commercial proposition, if proof of impact can be realised, and in this way reduce or even halt SMS revenue losses.

High literacy rates and access to mobile devices suggest an opportunity for bundling of content in Tanzania; freemium vs premium offerings; inclusion of surveys and campaigns which can subsidise operational costs; and inclusion of a transacting component - voucher/coupon or other. The potential for health messaging to reach intended targets is good in Tanzania based on the ratio of literacy between male and female (4# highest comparative across the GSMA nutrition countries).

4. Tanzania Communications Regulatory Authority

Figure 10

Total literacy and female literacy rates



While literacy rates are high in Tanzania, cultural challenges prevail. Anecdotal evidence gathered from GSMA interviews in country and feedback from industry stakeholder identified an aversion to pushed communication (SMS) on topics that are considered educational, personal, or taboo e.g. pregnancy and health. With such topics word-of-mouth was preferred. Consequently, a combination of direct communication (IVR) and SMS should be considered for any mHealth services in this area.

Pricing mHealth services

There is no established B2C mHealth market in Tanzania but some useful comparisons can be drawn from the mobile VAS market in country.

According to mobile operator and VAS provider feedback service take-up varies widely across Tanzania although average cost per service is relatively stable at around USD$0.12 (day rate) with an average spend around USD$2.68 per month (TZS 4500). The perceived value of services and/or their trading performance are important criteria for selection. Rates of take-up range between 3%-10% of subscriber bases while data tariffs are relatively affordable, 4Gb data plans bundled with unlimited voice averaging at around TZS 25,000 (USD$15) on average. However, these bundled packages are far beyond the grasp of Base of Pyramid (BoP) users.

A number of the mobile operators in Tanzania have not yet recouped investment in network rollout. Tigo is currently the only operator that has achieved full ROI on infrastructure rollout. This makes competitive pricing, beneficial to accelerated VAS development which is absent in Tanzania. Despite this there has been some aggressive pricing recently with bundled short-term contracts e.g. 500 SMS and 200MB data for TZS 500 for a 7-day period.

The combination of affordable data plans, increasing tendency for aggressive pricing and the need to recoup network infrastructure costs mean that mHealth of a more commercial nature has a potential in Tanzania if it can capture the attention of operators as a mechanism for driving revenues and creating market differentiation.

Features of the Tanzania VAS ecosystem

According to in-country feedback from VAS stakeholders there is no standard industry revenue share agreement in place within Tanzania. Contracts rely almost exclusively on negotiated terms, although some players have quoted average ratio splits of 70:30 and 80:20 in favour of the mobile operator.

The promotion of mHealth services is generally undertaken by the VAS provider aside from big-ticket items where government departments are involved.

There are some initiatives within Tanzania that are reaching scale. The Healthy Baby initiative impacts an estimated 500,000 mothers, although it relies on additional coverage provided by the pregnant woman's family network (around 40% of registered participants are actually male). This service is also notable in respect that content is provided to mobile operators to broadcast on a revenue share basis, while revenues generated are used to sustain the content system itself.

Mobile operators play a critical role in the provision of mHealth services in Tanzania. Testimonials from in-country stakeholders demonstrate that, in spite of a number of high-level initiatives and proof of concept activities involving mobile operators, the speed of development sometimes appears slow.

One of the reasons given for this is operator fatigue in relation to requests for zero rating mHealth initiatives, ranged against their need to ensure ROI and increase traffic, market share and revenues. The solution to these problems is striking a balance between CSR activities and commercial activities. Integrating CSR activities, using mHealth as a mechanism to drive penetration, is one approach that proves popular in Tanzania and provides the opportunity to migrate mHealth users from basic service propositions to more advanced premium channels in the long-term.

The alternate approach is to allow other players to occupy and popularise the mHealth sector. If other players in the sector deliver mHealth services without direct support and commitment from mobile operators, using the operator network simply as a channel, then the operators risk being marginalised and missing the opportunity to deliver sustainable mHealth services to their customers. Not to mention the value of the exposure and potential customer loyalty.

Mobile and VAS sector alignment to mHealth

Mobile operators

The mobile and VAS sector within Tanzania is competitive and benefits from a number of large players.

Mobile operators are generally conducive to partnering although VAS revenue share agreements are challenging for all but the largest of players. Tigo has trialled an approach that challenges the status quo by providing a volume based option, with the number of events defining value rather than any premium charge generated by services. This is an important development as mHealth, which is an unproven VAS platform, does not generate premium revenues. However, it has the capacity to create high volumes of use.

Interviews with Airtel, the second largest operator in terms of market share, revealed a number of activities in the areas of nutrition and health. Airtel's greatest challenge is finding the initial investment to supplement its CSR activities. It has engaged with the Tanzanian MoH and CDC Foundation and has expressed a willingness to partner in different scenarios. However, Airtel qualifies that preferred partner types include official/government organisations and those with start-up investment available. Airtel also has preferred VAS partners.

Vodacom has opted to tie aggregators together when providing mHealth services in order to provide regional coverage. Its SMS for Life initiative, a project designed to help capture, analyse and distribute data about stock levels of life saving medicines in Tanzania, is a successful example.

VAS aggregator experiences of mHealth in Tanzania

PUSH is a mid-sized aggregator active in a number of African countries, including Tanzania.

For PUSH the main challenge when launching mHealth initiatives in Tanzania has been negotiating revenue share with mobile operators who refuse revenue share agreements until services generate levels of consumption that command premium charges. Unproven mHealth services do not command premium level demand and generally rely on low-priced SMS and USSD channels when first launched. This situation stifles development. The problem is compounded when considering BoP users with low purchasing power. Bundled service approaches have attempted to tackle this problem but require subsidies. Moreover, zero rated initiatives have historically seen substantial churn when charges are introduced later in the product life-cycle.

Content management

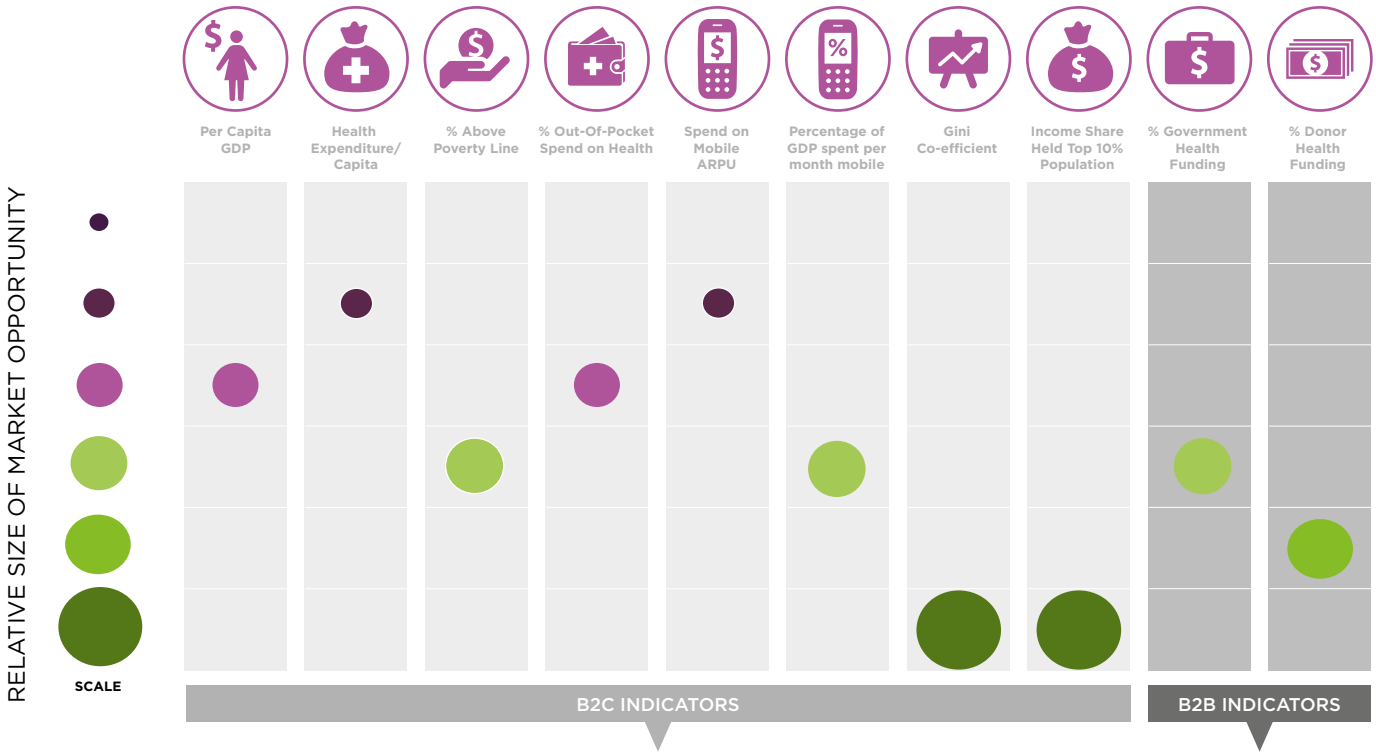
Star Fish is a Tanzanian content management specialist who like PUSH has found it challenging to develop health content. In the case of Star Fish cost has been an issue, as mobile operators have pushed increasing tax burdens down the value chain. This is a common feature in fast developing mobile markets where governments see growth as a tax revenue opportunity. Whilst there are benefits in drawing taxation revenue from burgeoning markets, the Tanzanian regulators need to be mindful of the need for investment by mobile operators.

The B2B vs B2C sectors

The mHealth opportunity in Tanzania is made up of both B2C and B2B opportunities. Figure 11 takes a deeper dive into the feasibility metrics considered for these particular user segments.

Figure 11

Relative B2B and B2C indicators



INDEX	
1.2	Nigeria
1.2	Cote D'Ivoire
1.1	Rwanda
1.0	Ghana
1.0	Uganda
1.0	Tanzania
1.0	Zambia
1.0	Kenya
0.8	Mozambique
0.7	Malawi

INDEX	
1.9	Malawi
1.5	Mozambique
1.1	Zambia
1.1	Kenya
1.1	Tanzania
0.9	Ghana
0.6	Cote D'Ivoire
0.6	Nigeria
0.6	Rwanda
0.6	Uganda

Source: WHO, WorldBank, GSMA extracted data

Figure 11 illustrates the relative data point indicators for the B2C and B2B market opportunity in Tanzania, denoted by the size of the circle. The larger the circle the greater the opportunity for that particular indicator compared with the other indicators shown. The aggregated B2C and B2B opportunities for Tanzania, relative to the other nutrition initiative target countries, are indicated by the index score beneath the main chart.

Tanzania is well positioned within the positive index scoring zone, showing a slight predilection toward B2B business indicators. The B2C indicators including out of pocket spend on health and an uninspiring mobile ARPU indicate this market sector will be more challenging for B2C. Qualitative feedback from stakeholder interviews supports this claim, with a strong belief that mHealth will not be fully open to market forces while the government remains in control and guides overall strategy. However, there is the strong impetus within government toward improving healthcare and a ready consumer base within Tanzania potentially willing to pay for services that will improve their overall health and consequently the wider socio-economic profile of Tanzania.

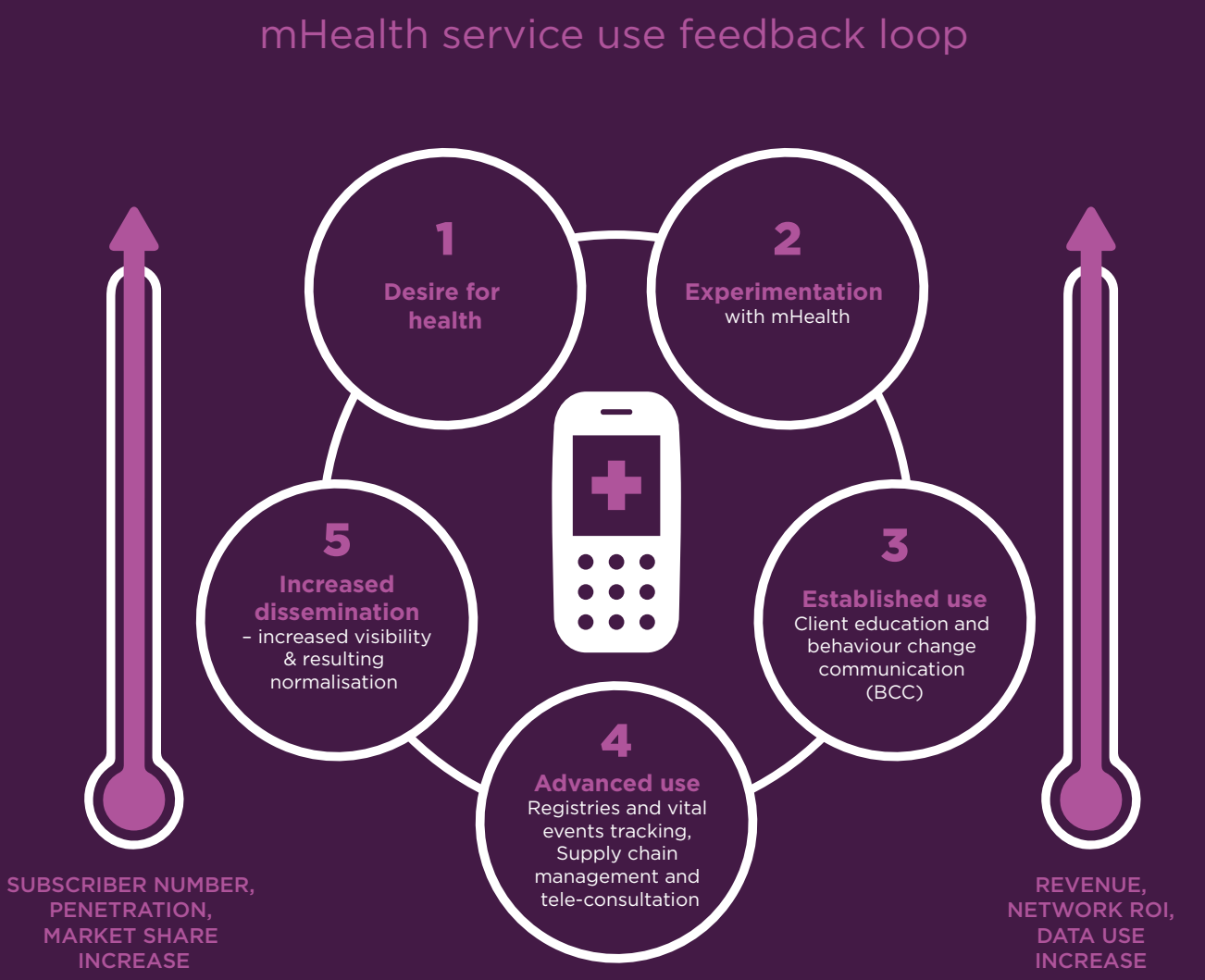
The data shown in figure 11 is a single set of reference points and provides a normalised and averaged view of the market. This is a highly complex area and additional insight would be attained using other qualitative indicators pertinent to specific consumers (audiences) of this data e.g. a mobile operator vs an NGO. Such user-specific cross-referencing cannot be undertaken here but is encouraged to better focus market entry and market development strategy for specific stakeholders.

Mobile market view

The mHealth opportunity has two distinct pathways. On the one side, it provides a valuable mechanism to grow operator subscriber numbers, market share and overall penetration. On the other, it is a strong driver for take-up of data VAS services, with the proposition built around providing and gathering health information (push and pull) and health monitoring (tracking disease and health indicators). These features create the potential for mHealth services to become self-perpetuating. Mobile operators providing mHealth services have the opportunity to occupy a position within markets without established health infrastructure that positions them as the preferred health service providers and in this way they become normalised (i.e. they are identified as the go-to option for such services). In such a position mobile operators can create a sustainable service offering.

Figure 12

mHealth normalisation process and the impact on mobile operators



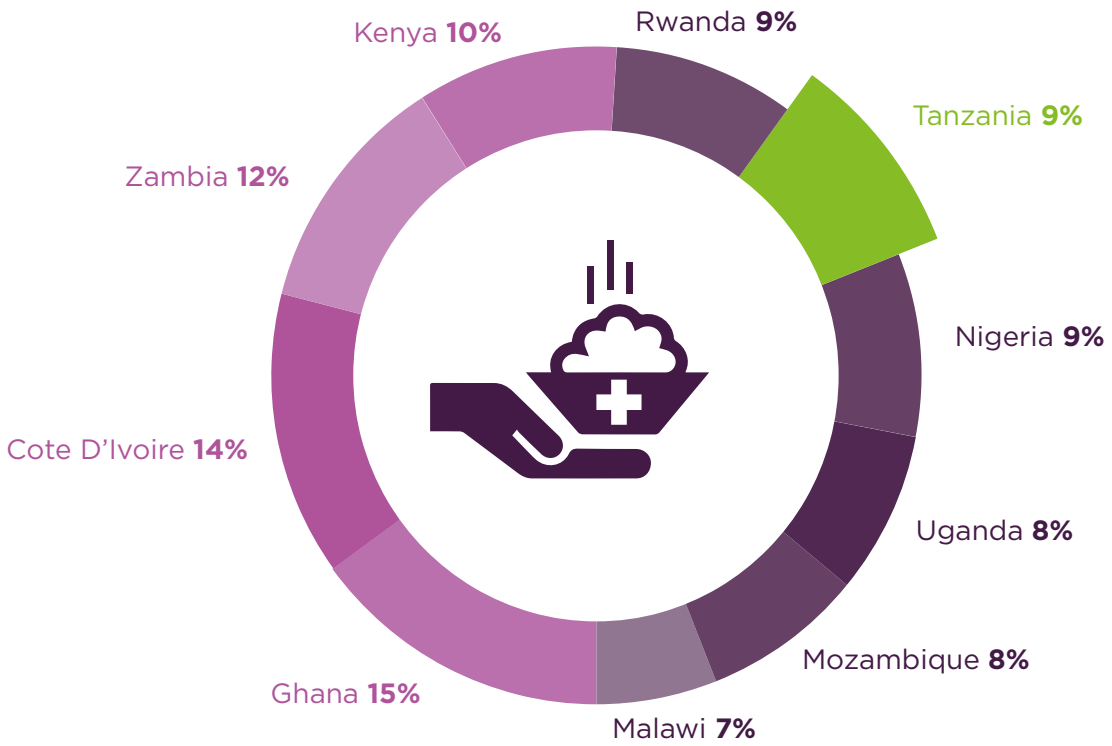
Source: WHO/World Bank/GSMA extracted data

The Tanzania mobile market – market specifics

Tanzania has a relatively low ARPU of $6, placing it as one of the lowest amongst the 10 nutrition countries. When compared with the percentage spend on mobile of overall GDP this position is slightly improved, delivering approximately 12% but this remains in the bottom third of the mHealth nutrition programme countries.

Figure 13

Comparative mobile penetration rates of GSMA nutrition initiative countries - Tanzania extracted



Source: GSMA

Despite a relatively low ARPU the unique mobile subscriber penetration rate in Tanzania is comparatively good, standing at 9%, which is just below the average of 10% for the 10 GSMA countries.

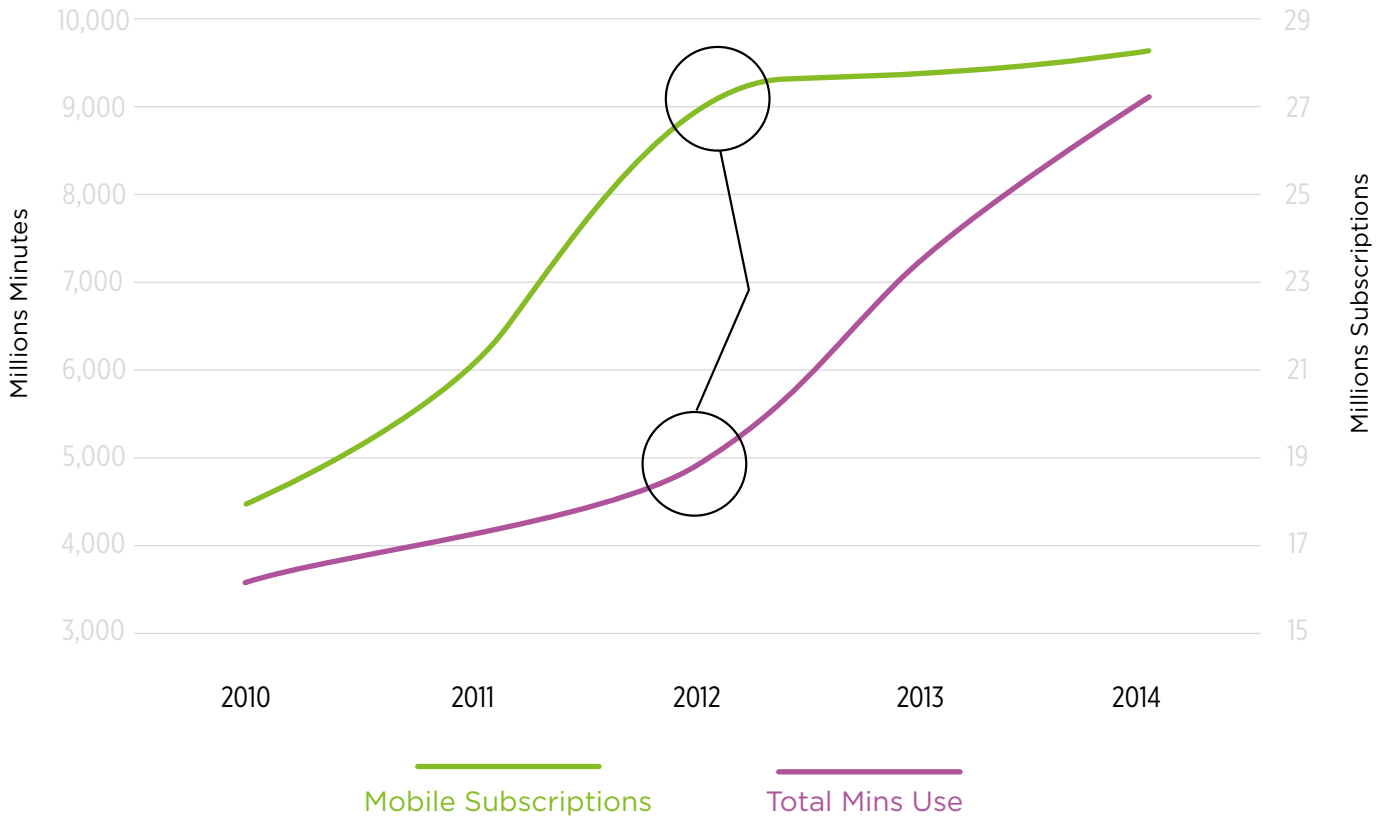
mHealth has a role to play in driving mobile usage figures. There is also an opportunity for growing ARPU as comparable penetration rates to Tanzania see higher ARPU levels.

A good distribution of wealth (1#) and a sizeable percentage of people above the poverty level point to a potential market for mHealth in the B2C sector, but there are a large number of challenges needing to be tackled not least of which is proving the efficacy of mHealth as a business in its own right and its beneficial impact on society at large.

Year-on-year growth based on aggregated subscriptions as reported by the Tanzanian communications regulatory authority shows a market in flux, yet indicators remain generally good.

Figure 14

Mobile subscriptions and total minutes of use Q1 2010 to Q1 2014



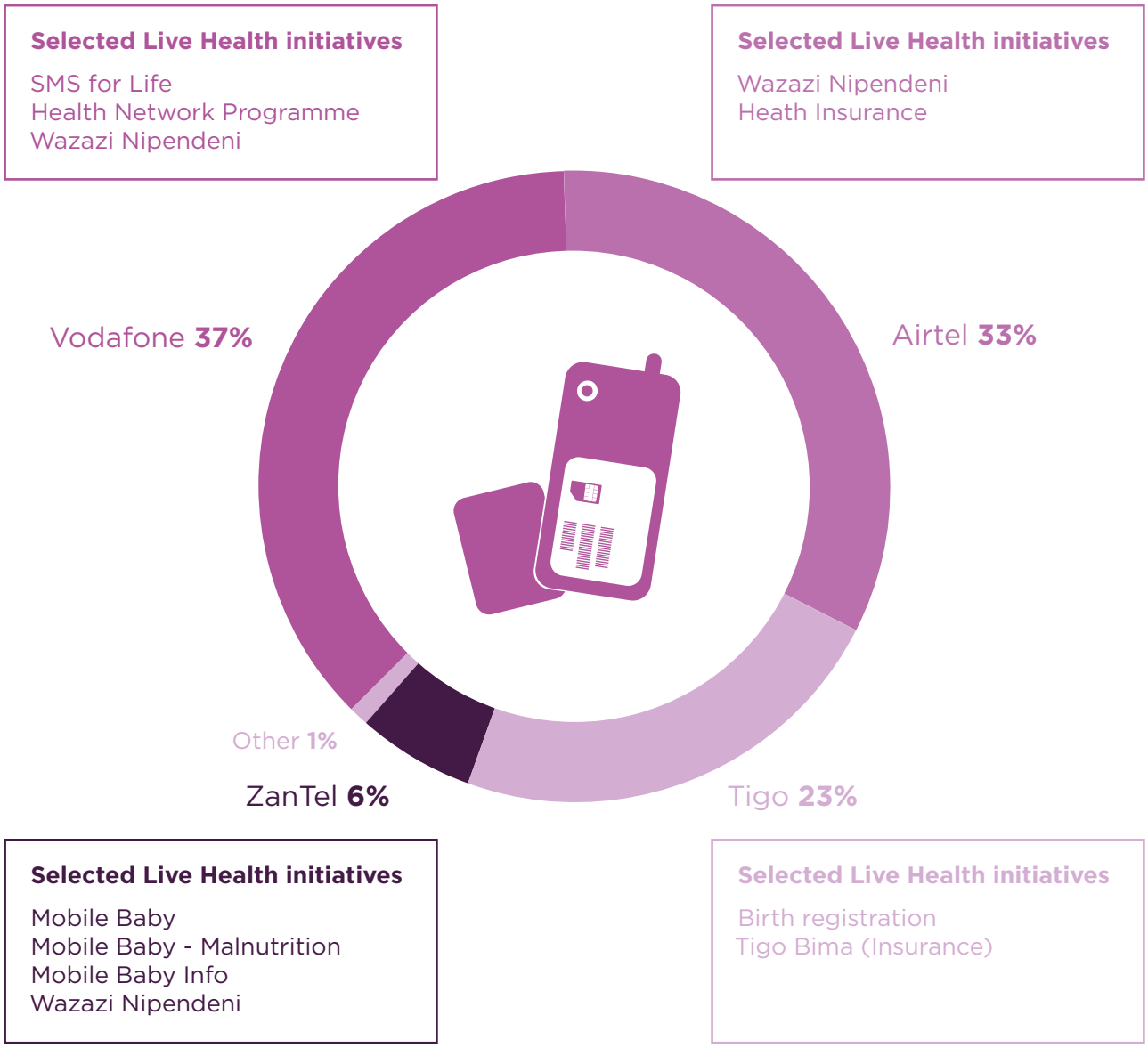
Source: Tanzania Communications Regulation Authority Quarterly Statistics Report

In March 2012 the regulator introduced stricter registration policies, requiring that customers display a physical ID to register a phone. At the same time the regulator reduced interconnection rates by 70% while mobile operators launched a number of price discount offerings. The mobile subscription rate shown in figure 14 (green line) and overall minutes of use (purple line) for the period Q1 2010-2014 show the impact of these initiatives with a marked slowdown in subscription growth but a substantial increase in total minutes of use.

Registration had been a feature of the Tanzanian market for some time, but the enforcement of ID requirements accelerated this process, ensuring that by Q1 2014 approximately 98% of mobile operator SIM cards had been registered. The push for registration has been justified as a mechanism to enhance security and improve opportunities for electronic money transfer. It also indirectly benefits mHealth by introducing the concept of compulsory registration. Additional data could be added to the registration process, such as health and patient tracking, as well as specific coverage mapping to registered individuals for epidemiological tracking.

Figure 15

Mobile operator market share and selected mHealth initiatives

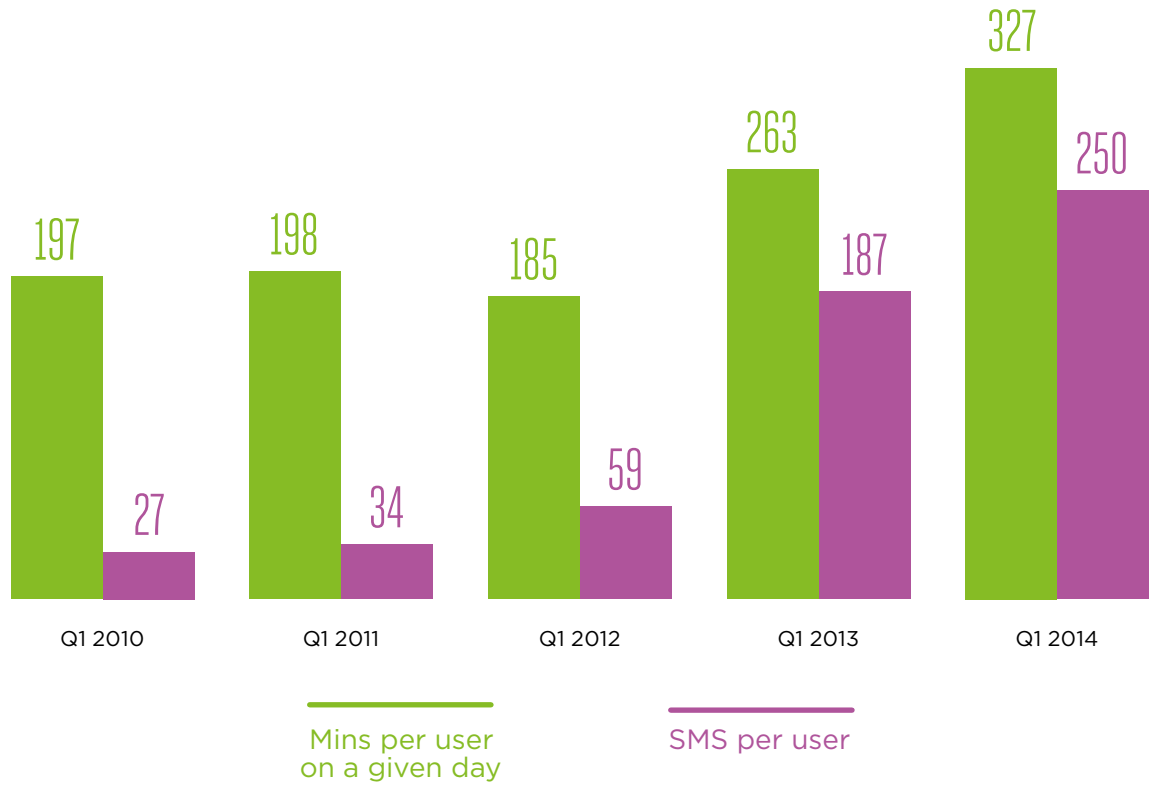


Source: TCRA and GSMA mHealth tracker

The Tanzanian market is highly competitive, featuring a trio of large players with relatively similar market shares. This creates competitive market dynamics that breeds rivalry and are conducive to developing new services and differentiation by service offering. Whilst competition is good, in Tanzania it does create challenges for coordination of national health initiatives that require co-operation between multiple parties.

Figure 16

Average voice minutes and SMS Q1 2014



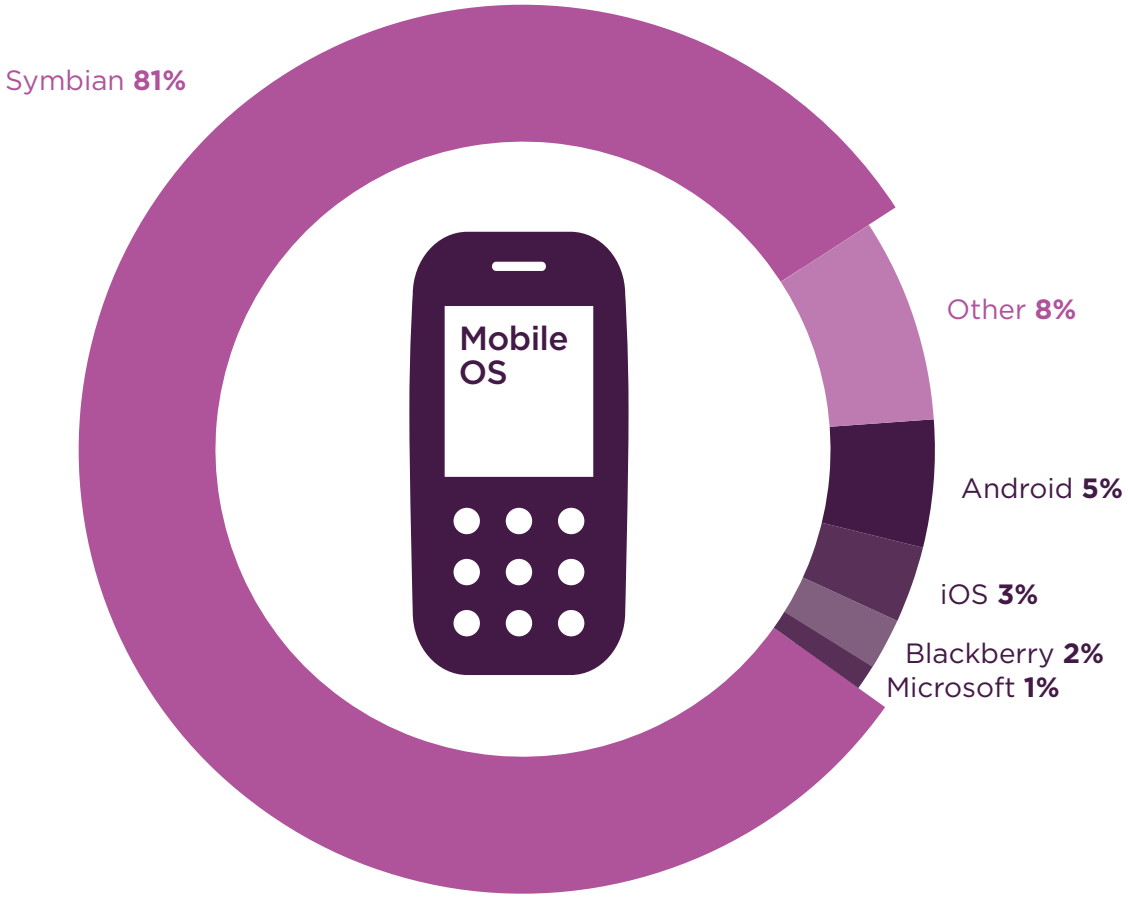
Source: Tanzania Communications Regulation Authority Quarterly Statistics Report

The average consumption rates for voice (minutes of use) and SMS shown in figure 16 correlate with the instigation of price wars in Tanzania (marked increase).

These indicators demonstrate that Tanzanian mobile operators face a competitive challenge. Achieving ROI targets, in light of this competition, mean that the differentiation of service offering is critical. mHealth services provide a unique opportunity to differentiate.

Figure 17

Mobile OS prevalence in Tanzania



Source: Tanzania Communications Regulation authority, Buddecomm, Internet World Stats, CMS 2012

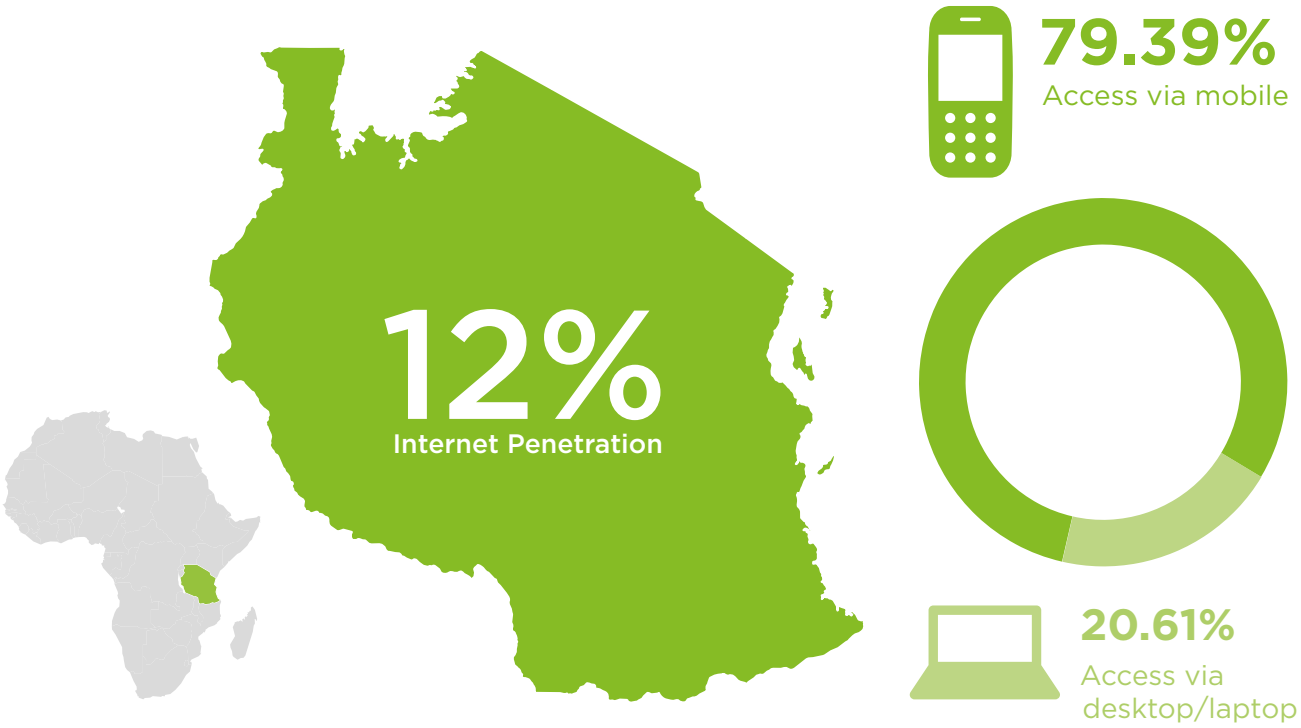
The Tanzania devices market is dominated by legacy OS formats, most notable Nokia's Symbian OS. There are a number of reasons for this, all based on the attributes of legacy Nokia phones that benefit the unique usage requirements of African countries:

- Battery life – access to electricity is sporadic in rural regions and older Nokia feature phones have standby for up to 30 days
- Ruggedness and resistance to dust ingress
- Simply intuitive design enabling illiterate segment use
- Low bandwidth footprint - design inbuilt with compression technologies making internet access easier

This situation is likely to evolve rapidly as a result of Microsoft's discontinuance of Nokia feature phones running Symbian S40 (basic Nokia phone OS).

Figure 18

Internet access in Tanzania



Source: Internet World Stats 2012

Mapping mHealth service penetration and reach in Tanzania

As part of the qualitative review of Tanzania's feasibility as an mHealth target country service mapping was undertaken using a mix or survey, interview and desk research. The following sections highlight some of the insights from this activity.

Key insights

- There are a number of partnerships between multi stakeholder groups in Tanzania:
  - 39% of mHealth services are being implemented in partnership with organizations from 3 or more different mHealth stakeholder groups
  - 35% have secured partnership with the MoH
  - 42% have secured partnership with a mobile operator
- An approach geared to partnering has proved successful in Tanzania. For the mHealth services that have secured partnership with 3 or more organizations from different stakeholder groups:
  - 75% are partnering with the MoH
  - 83% are partnering with a mobile operator
- There are currently 4 services in implementation stage that have secured partnership support from the leading mobile operators in Tanzania (Vodacom, Zantel (Etisalat), Airtel and Tigo)
- 58% of mHealth services are available across 2 or more regions. 5 (16%) are available nationally
- A total number of 3,379,883 beneficiaries (7% of the population) have been reached by mHealth services to date
- 26% of the mHealth services tracked have reached a total of 1,243 frontline health workers
- As part of the Big Results Now! initiative, the MoH has identified a few key partners within mHealth to drive the 'Stand Up For African Mothers' campaign, targeted at training and equipping 3,800 nurses and midwives by 2016

Source: http://www.thecitizen.co.tz/News/-Big-Results--initiative-now-focuses-on-health-sector/-/1840392/2483604/-/11atmy7z/-/index.html

Barriers

- Whilst partnerships have been forged with mobile operators, integration remains a problem. In some cases, upwards of 18 months is required. mHealth organisations attribute part of the problem to churn in mobile operator staff
- Although the roles of the Community of Practise and the MoH have contributed to the improvement of coordination and collaboration, there is still work to be done on this front. Many organisations implement similar mHealth services, which leads to confusion between beneficiaries of these services. The MoH hopes that the introduction of an mHealth service registry will give them better insight into the coverage
- Poor network coverage remains an issue in rural areas. Operator commitment to improve this situation has been forthcoming but is contingent on wider investment strategies
- Cost of delivery of most services is high, as airtime charges (specifically costs for SMS) remain high
- Lack of communication and low levels of collaboration between relevant government ministries is a concern, as the effective scaling and integration of mHealth into the health system will depend on cooperation from multiple ministries including regulatory players

Overall mHealth coverage in Tanzania

The GSMA is currently tracking 31 mHealth services (of which 27 are live), deployed with partnerships from over 54 different organizations representing multiple stakeholder groups in Tanzania.

Fifty eight percent of the mHealth services are available / implemented in 2 or more regions with 4 services being nationally available. There are at least 4 mHealth projects available in each region, with the most serviced regions having up to 9 different mHealth services implemented (this includes the 4 that are nationally available).

Thirty percent of districts in Tanzania have an mHealth project deployment of some form or other.

Although there is overlap between the distribution of mHealth services and the regional health burden, there is still a need for better alignment in mHealth deployments to unreached regions in Tanzania.

Figure 19

mHealth services: zonal distribution

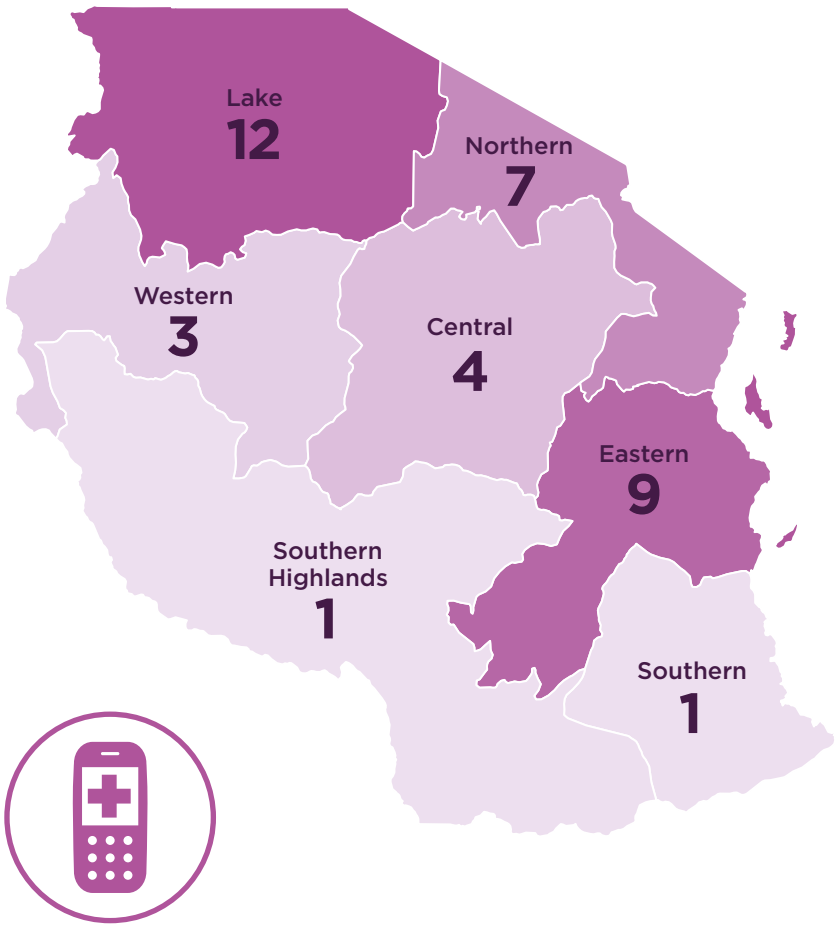


Figure 20

Children under 5 mortality rates per 1,000 births: zonal distribution

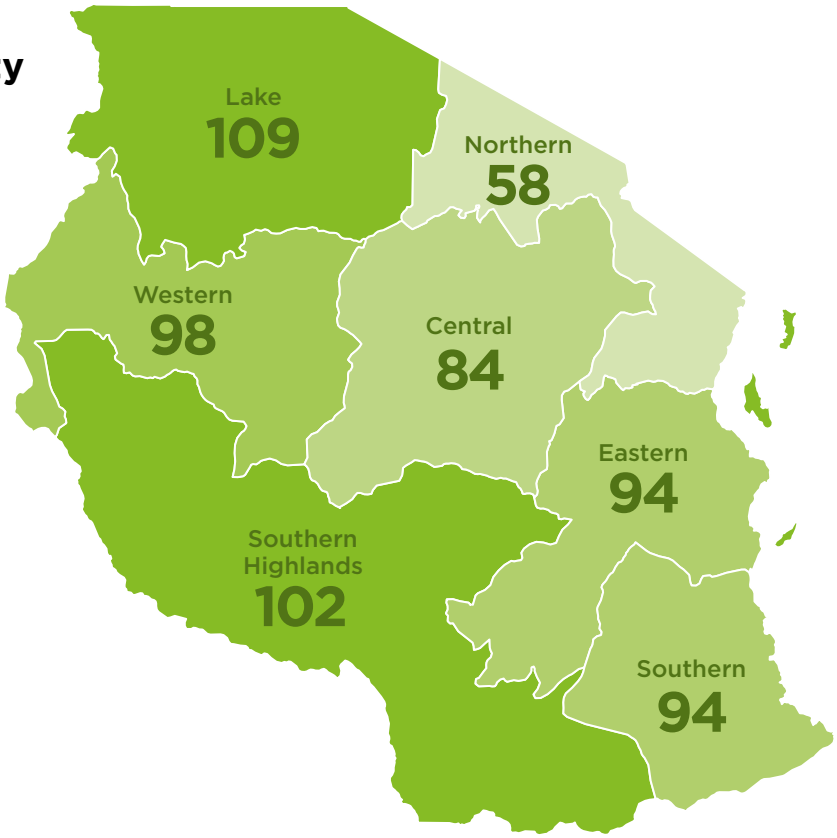


Figure 21

Stunting in children under 5 (height for ages, % below -2SD): zonal distribution

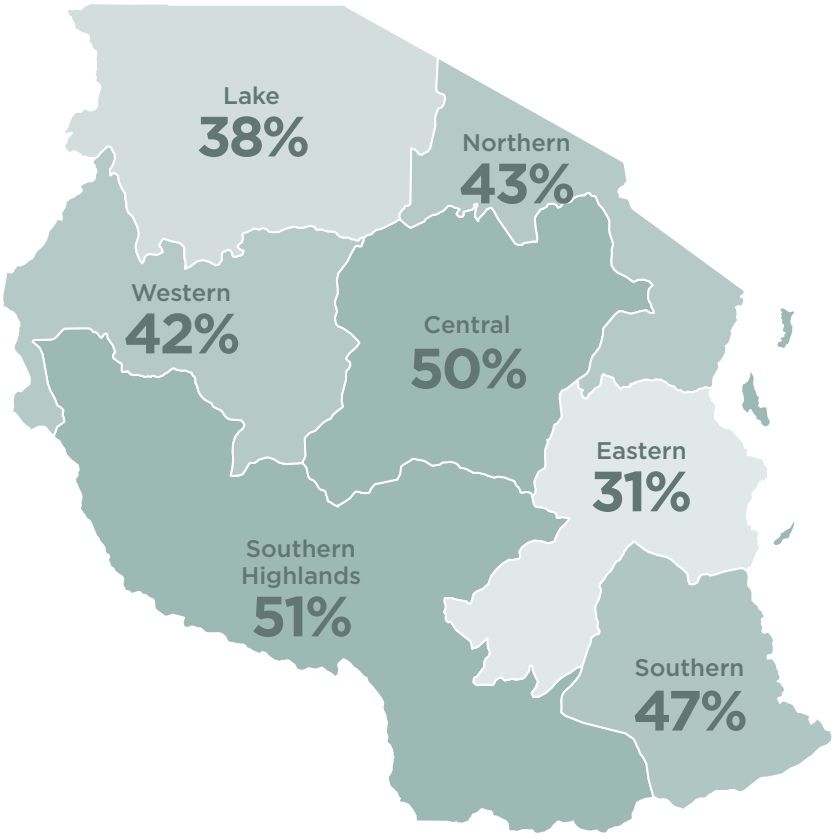
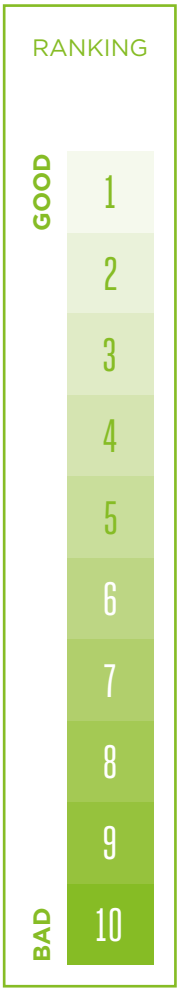


Figure 22

Health burden indicators from the Lake zone and the Eastern zone

	Lake zone		Eastern zone	
INDICATOR	NUMBER	RANK	NUMBER	RANK
Birth at facility	45.2%	6	74.7%	1
Delivery assisted by skilled provider	43.9%	6	76.2%	1
No post natal check-up	81.8%	7	55.6%	2
Under-5 mortality (per 1000 births)	109	7	94	4
Stunting in children (% below 2 SD1)	38%	2	31%	1
Moderately &/ severley thin women	2.7%	5	1.1%	2
Facilities/ 10,000 population	1.15	7	1.77%	2
HIV positive	4.7%	5	6.0%	6
Number of mHealth service deployments	**12**		**9**	



Source: GSMA. Data from Multiple Indicator Survey, MICS, 2011; The Health Sector in Ghana, Facts and Figures, GHS, 2010

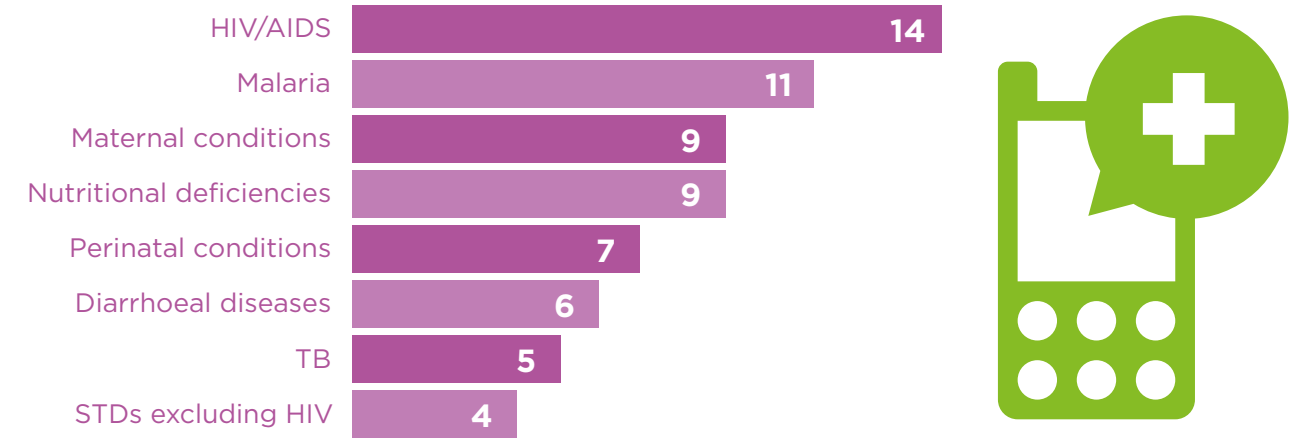
Figure 22 illustrates that the Lake zone is ranked relatively highly across a number of health indicators. Combined with the poor distribution of healthcare facilities in this zone (average of 1.15 per 10,000 population, and as low as 0.94 in some parts) it becomes clear that there is a need and consequently an opportunity for mHealth services.

The Eastern zone in Tanzania is not as heavily burdened across the indicators highlighted, but has the second highest distribution of mHealth services with 9 unique mHealth implementations (excluding the services that are nationally available).

The Southern Highlands zone has the 2nd highest child mortality rate (102 deaths per 1000 births of children under 5), the highest incidence of stunting in children (51% below -2 SD1), and the 2nd highest incidence of severely thin women (3.5%). Yet it only has one mHealth implementation that does not include any nutrition or MNCH intervention.

Figure 23

Health conditions addressed by mHealth services

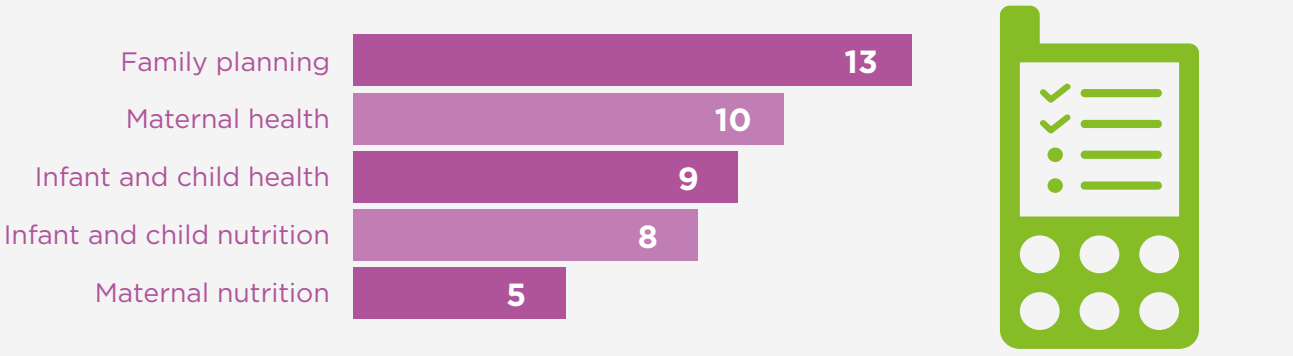


Source: GSMA mHealth Tracker

Within Tanzania the most addressed health conditions for mHealth are related to HIV (addressed by 45% of mHealth services), followed by antimalarial initiatives (35%). A further 29% of mHealth services address maternal conditions and nutrition in some form with strong alignment to MDGs 4, 5 & 6.

Figure 24

Health interventions covered by mHealth services



Family planning is the most addressed health intervention (42% of mHealth services) in Tanzania followed by maternal health interventions (32% of mHealth services).

Family planning & reproductive health interventions

The most addressed family planning and reproductive health interventions are education around the use of contraception (32% of mHealth services), birth spacing / planning (32%% of mHealth services), and having safe sex (29% of mHealth services)*.

10	Contraception	9	Safe sex
10	Birth spacing and planning	4	Safe abortion care

*Note that the number of mHealth services cited is not necessarily new unique mHealth services and that a service which is addressing maternal nutrition may also be addressing child nutrition or any other intervention.

Maternal health interventions

mHealth services driving maternal interventions have reached a cumulative total of 2,788,782 (Q3 2014) beneficiaries of which 1,014,197 are currently actively engaging with the services. Most maternal health interventions focus on pregnancy, antenatal care, pregnancy danger signs, and post-partum care.

10	Pregnancy	7	Pregnancy complications
9	Antenatal care	7	Emergency preparedness
8	Pregnancy danger signs	7	Labour
8	Postpartum care	7	Breast feeding

Infant & young child health interventions

The most addressed infant and young child health interventions include newborn care, prevention of mother-to-child transmission (PMTCT), and promotion of vaccinations / immunisations (each addressed by 5 mHealth services).

5	Newborn care	4	Growth and development
5	PMTCT	1	Child abuse
5	Vaccines/immunisations	4	Malformations/birth defects

Maternal nutrition

The most addressed maternal nutrition intervention is education around the supplementation of iron and folic acid and the improved use of locally available foods to ensure increased intake of important nutrients.

4	Iron and folic acid supplements and deworming	1	Food fortification with folic acid, iron, vitamin A, zinc and iodine
2	Improved use of locally available foods to ensure increased intake of important nutrients	1	Vitamin A supplement in first 8 weeks after delivery. Handwashing with soap.

Infant & child nutrition

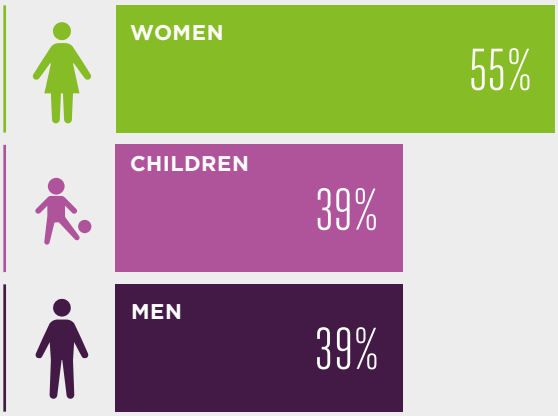
The most addressed nutrition intervention for infants and young children is education around early initiation of breastfeeding after birth, and exclusive breastfeeding.

5	Initiation of breastfeeding within 1 hour (including colostrum feeding)	1	Continued breastfeeding
3	Exclusive breastfeeding	1	Vitamin A supplementation and deworming
2	Appropriate feeding of HIV-exposed infants	1	Zinc treatment for diarrhoea
2	Timely, adequate, safe and appropriate complementary feeding	1	Management of severe acute malnutrition
1	Management of moderate acute malnutrition		

Quantifying users

Figure 25

Target beneficiaries



The total number of end users / beneficiaries reached in Tanzania by the tracked initiatives was 3,379,883 (Q3 2014), reached by 48 of the mHealth services. The most targeted segment was women, accounting for 55% of mHealth services.

The total number of frontline health workers reached by mHealth in Tanzania was 1,243 (by 26% of services). The number of facilities reached was 11,589 (by 35% of services).

Quantifying mHealth platforms, device, technology and applications

Seven of the 13 mHealth applications are being offered by at least 7 mHealth services. All 13 mHealth applications are offered by at least 3 mHealth services.

The most addressed mHealth application is data collection and reporting (addressed by 58% of services), closely followed by client education and behaviour change communication (addressed by 48% of services) and electronic decision support (addressed by 45% of services).

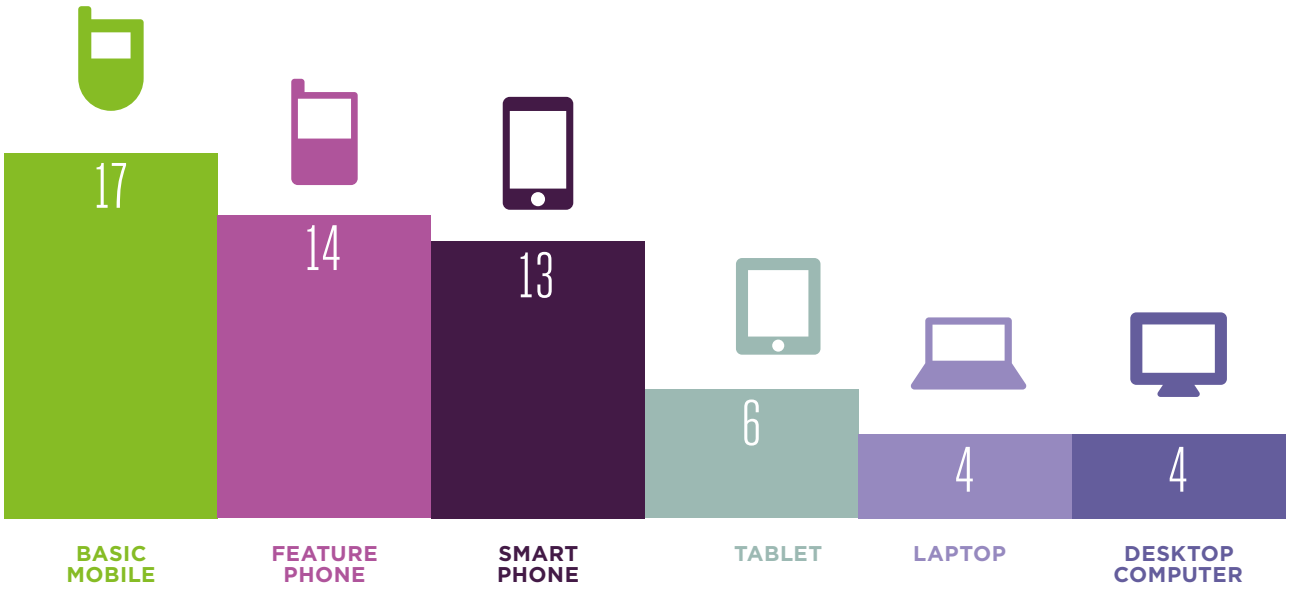
18	Data collection and reporting
15	Client education and behaviour change communication (BCC)
14	Electronic decision support
8	Provider work planning and scheduling
7	Registries and vital events tracking
7	Electronic health records
7	Provider training and education
6	Provider-to-provider communication - user groups, consultation
5	Service use supply chain management
4	Financial transactions and incentives
3	Sensors and point-of-care diagnostics (and monitoring)
3	Human resource management
3	Tele-consultation

*For definitions of mHealth applications please see Appendix A

Fifty-five percent of all mHealth services in Tanzania are implemented or available on a basic mobile phone. Feature phone usage and smartphone usage are not far behind, with 45% and 42% respectively.

Figure 26

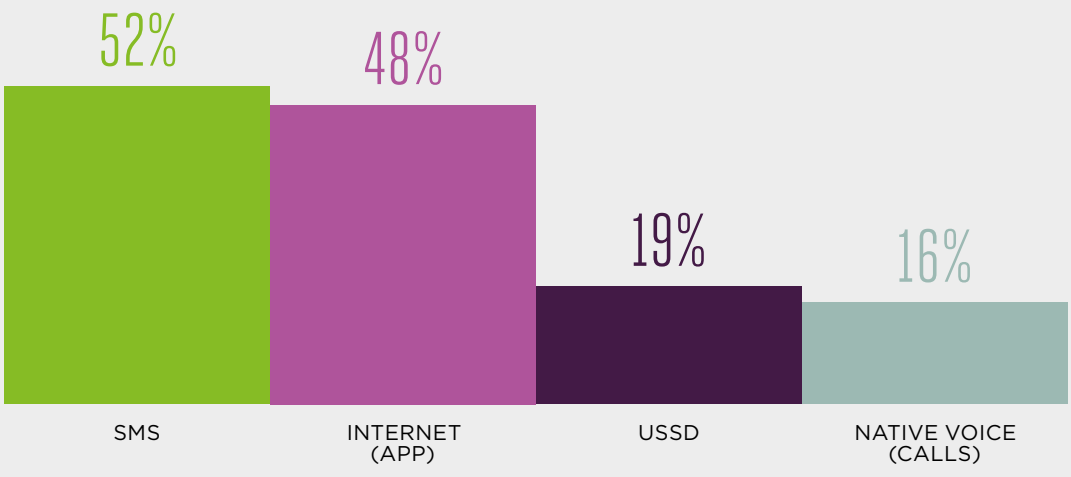
Technology devices



Fifty-two percent of mHealth services use SMS as an access channel within their projects and 48% report to use the internet and/or an installed application within their project. USSD and native voice usage is very low, at 19% and 16% respectively.

Figure 27

Technology channels



Partnerships

Approximately 35% of mHealth service providers have partnered with the MoH in Tanzania. Approximately 39% of mHealth services have secured partnerships with organizations from 3 or more different stakeholder groups, including government, academic Institutions, technology players, aggregators, mobile operators, donors, investors, NGOs and regulators.

Mobile operators

Forty-two percent of mHealth services in Tanzania have secured partnership and/or support from a mobile operator while 4 services have partnership and/or support from all 4 leading mobile operators. Vodacom/Vodafone has invested the most in mHealth, lending support to 9 initiatives. There is respectable support from the other operators. Airtel and Zantel have launched 6 services and Tigo has launched 5 services.

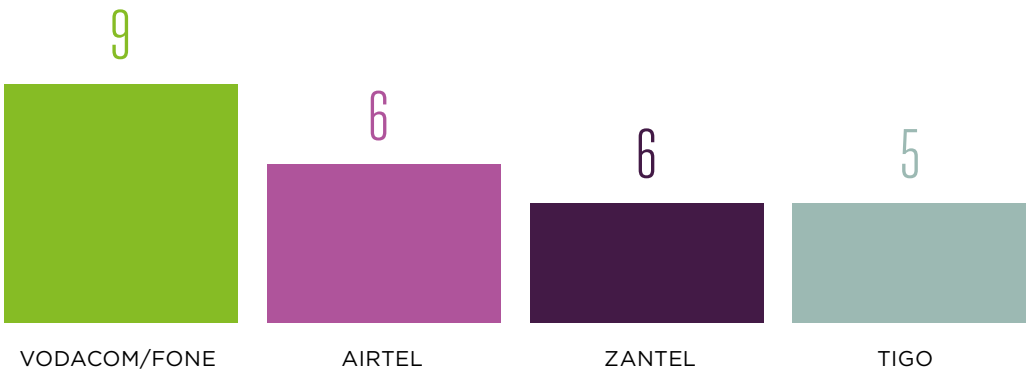
Vodafone, Airtel, and Zantel have also linked mHealth services to mobile money components.

The majority of services mapped by the GSMA nutrition initiative are donor funded (90%), whilst 3 are funded by the government, 2 are B2C, 1 operates on a B2B model, and 3 are paid for by service providers.

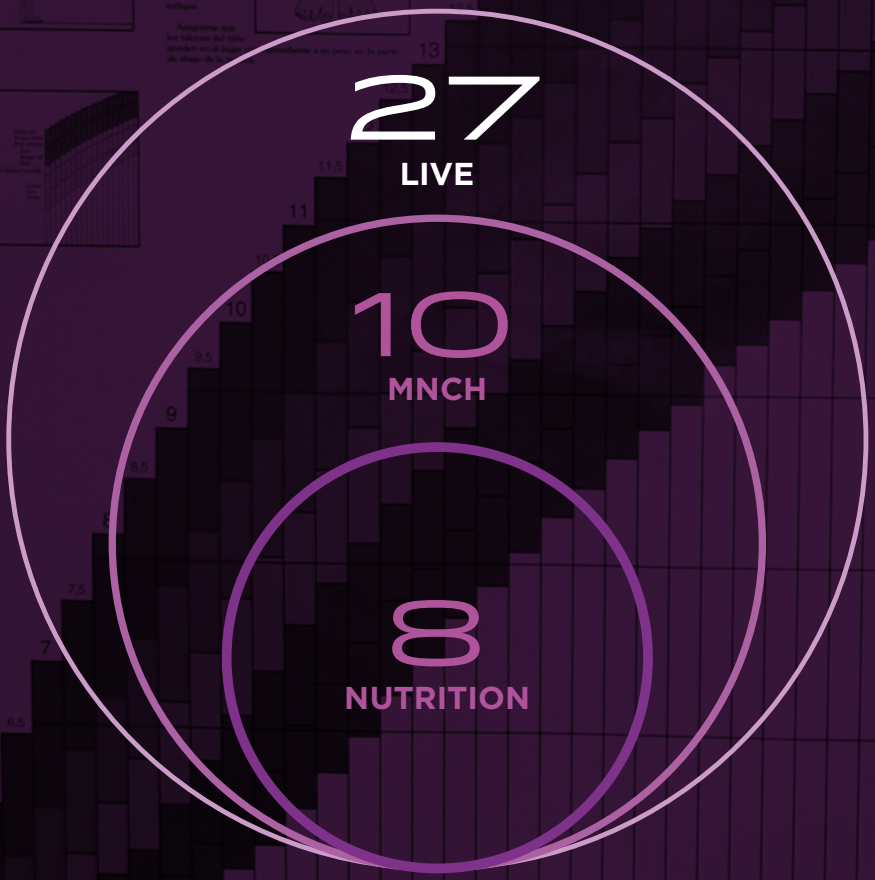
Revenue generating models that are emerging include freemium (3 existing services) and pay-per-transaction (1 existing service). A number of mobile operators are also exploring new revenue generating models with NGO partners, in the hope of ensuring financial sustainability.

Figure 28

Mobile operator involvement in mHealth



Alignment to GSMA objectives



Of the twenty seven live mHealth services tracked in the country eight have an impact on nutrition outcomes.

mHealth case studies
Tanzania

Mobile operator led case study: MoH & mHealth Tanzania Public Private Partnership – Wazazi Nipendeni

mHealth use case

The Tanzania Healthy Pregnancy, Healthy Baby Text Messaging Service (HPHB), otherwise known as Wazazi Nipendeni, offers free maternal and early childcare health information to subscribers of all networks.

The service offers reminders and informative text messages in Swahili to pregnant women and mothers with newborn babies up to 16 weeks old. This will be extended to children up to 5. The objective is to promote healthy pregnancy and early childhood care behaviours. In addition, the service seeks to assist health professionals in the dissemination of information typically shared during antenatal care (ANC) visits.

mHealth applications:

Client education & behaviour change communication (BCC)

Delivery channels:

SMS

Registrations are carefully monitored by channel and time of registration on a monthly basis and the system can distinguish between self-registration and registrations through partnering health professionals. Implementation partners report on adoption rates on a regular basis and the CDC Foundation's mHealth Tanzania Partnership conducts Monitoring and Evaluation to retrieve data on the general system performance and to monitor service adoption rates.

Technology device:

Basic phone, feature phone, smartphone

Health focus:

Maternal and newborn child health

Target audience / beneficiaries:

Pregnant women and mothers with newborn babies up to the age of 16 weeks (shortly to be extended up to the age of 5 years).

The service also targets the supporters of these women, such as husbands, other relatives and friends.

Target actors:

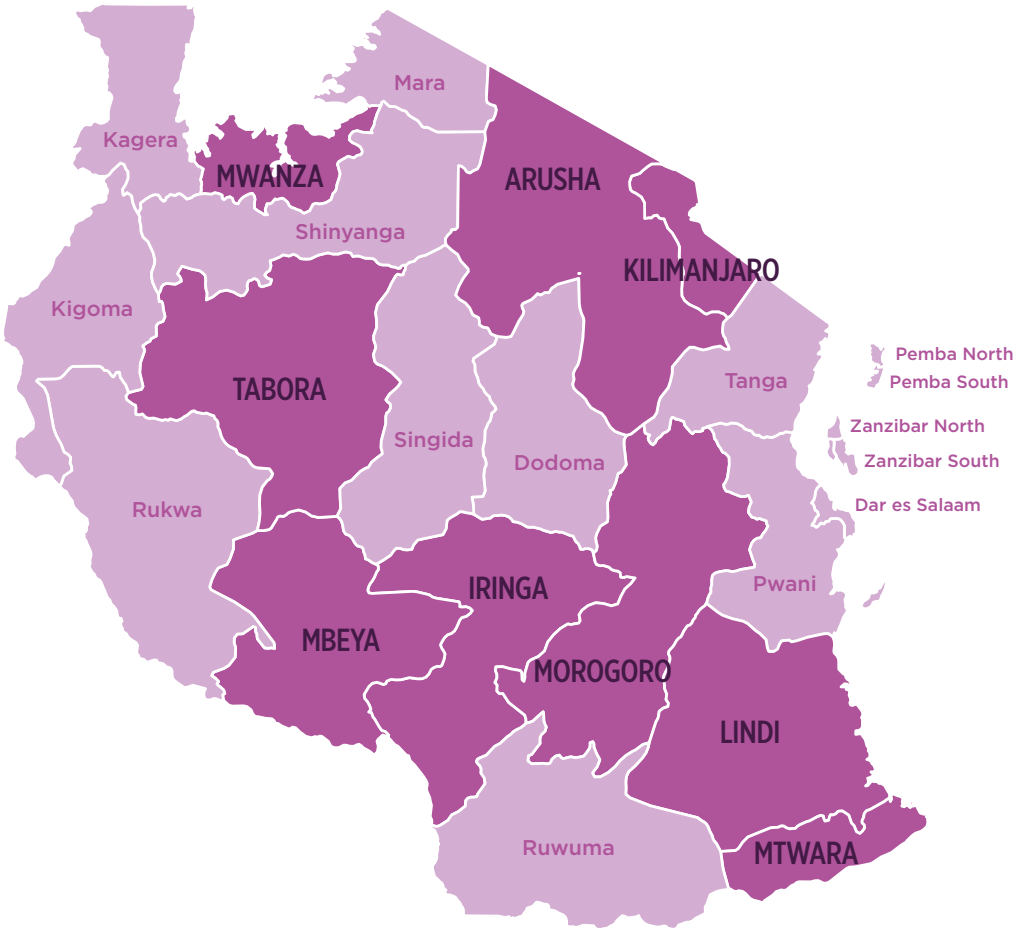
Healthcare workers at health facilities: nurses, auxiliary nurses, midwives

Frontline health workers: community health workers

Initial orientation and training is conducted for healthcare workers and local government representatives at the start of their engagement with the service. Continuous training is facilitated at the health facilities by 'oriented' healthcare workers, collaborating closely with on-the-ground partners of the service, including the Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) and the Joining Hands Initiative (AKHST– JHI). Periodically, the facility registration achievements are reviewed and if needed new orientations are planned.

Geographical focus:

Wazazi Nipendeni is available nationally through self-registration, but there is a parallel effort in on-the-ground implementation at health facilities. Almost 1,000 health workers in 800 health facilities, working in 10 regions and 35 districts, are actively registering mothers and supporters during ANC visits to date. It is expected that health workers nationally at an additional 400 facilities will also join this activity by 2015.



Content:

The Ministry of Health and Social Welfare (MoHSW) led the development of the Healthy Pregnancy, Healthy Baby text message content, in collaboration with the mHealth Tanzania Public Private Partnership (led by the CDC Foundation) and several key technical partners. The content team also leveraged messages from the global Mobile Alliance for Maternal Action (MAMA) messaging service.

Content underwent a lengthy localization process, translating messages into Swahili and ensuring cultural relevance. The mHealth Tanzania Public Private Partnership found significant value in pre-testing the messages at different stages of the content development process in both urban and rural settings.

Continuous review and expansion of the content to include new health topics is enabled and the messaging suite is currently being extended from 150 messages from early registration until the baby reaches 16 weeks, to include an additional 125-140 messages offering information until the child celebrates his/her 5th birthday.

Registrants receive a broad range of complementary topics on their phones, including:

- PMTCT of HIV/AIDS
- Antenatal care
- Family planning
- Malaria prevention
- Nutrition (during pregnancy and for mother and child after delivery)
- Danger signs
- Individual birth plan
- Postpartum care
- Fun information (such as 'fetal development')
- Maternal and child health & nutrition

Nutrition messages range from information on timely iron and folic acid intake to healthy food and clean water consumption as well as breast feeding instructions. These messages include simple instructions on how to treat early pregnancy nausea to comprehensive information on the importance of the first breast milk and how to observe the correct intake of milk by babies.

The service also targets the support network of these women, such as husbands, relatives and friends. They receive the same time sensitive information, in an appropriate tone for this particular target group. The service also caters for those who do not wish to reveal their status (pregnant, parent) or those who wish to just receive general information concerning a healthy pregnancy and early childcare.

Implementation experience:

Since its implementation in 2012, Wazazi Nipendeni has benefited from multiple project partners, bringing with them extensive experience in public health within Tanzania and implementation experience from other markets.

Partner coverage:

- **MoHSW** – government partner, project lead, validation of approach, approvals support, educational messaging content
- **Elizabeth Glaser Paediatric AIDS Foundation (EGPAF)** - implementation partner, content partner, funding of on-the-ground support
- **JHI-Aga Khan** - implementation partner, funding of on-the-ground support
- **Afya Connect for Change (C4C)** - implementation partner, community mobilization, funding of on-the-ground support
- **Text To Change** - technology partner, community mobilization, technology maintenance
- **Walter Reed Program** - implementation partner, community mobilization, funding of on-the-ground support
- **JHU** - implementation partner, community mobilization, marketing & PR, funding of the communication campaign
- **US Government Centers for Disease Control and Prevention (CDC)** – donor funding, implementation management, educational messaging content

Mobile operators

Airtel has supported Wazazi Nipendeni, by zero rating text messages to its subscribers, since its launch in November 2012. Vodacom, Tigo and Zantel have partnered with Wazazi Nipendeni since mid-2014 and are also zero rating text messages. The mHealth Tanzania Public Private Partnership and mobile operators are currently undertaking steps to develop additional services, allowing the content to reach a larger audience.

Funding

This service uniquely brings together several funding partners, each financing a specific component.

The Wazazi Nipendeni multimedia campaign, promoting the text messaging service, is funded by USAID. It is developed and implemented by the Johns Hopkins Bloomberg School of Public Health Center for Communication Programs (JHU–CCP) under the leadership of the MoHSW. Various implementation partners fund their specific contributions in community mobilization. This includes the orientation and training of healthcare workers in facilities and community health workers.

For the technical implementation and management of the service the CDC Foundation is financially supported by the CDC. The cost of the text messages is taken up by all the mobile operators in Tanzania.

Business model

Donor funded

Health partners use the service as a tool. Mobile operators regard the service in a similar way although for different reasons. CSR is the main reason for supporting the service, although operators understand the marketing and sales value of the MoHSW approved MNCH content. Several mobile operators are taking steps to work with the mHealth Tanzania Public Private Partnership, in collaboration with the MoHSW, on innovative ways (via USSD and voice) to expand content dissemination. These new services will be offered at limited costs for the subscribers, in exchange for a continuous (contextually expanded) free Wazazi Nipendeni text messaging service and free periodical promotion to subscribers. The current and growing mix of partners paves the way for a sustainable existing text messaging service. Paid for services will not only satisfy the needs of the end user, but will sustain the zero rating of the existing text messaging service while the growing group of health partners will increase on-the-ground registrations.

Revenue generation

Revenue share model. No money is exchanged; revenue comes in and goes back to end user as a subsidized cost.

Scale

The average registration rate is 21,250 registrants per month. The initiative has reached 430,000 beneficiaries to date and is targeting one million registrants by October 2016.

The take-up of the service was difficult to predict for the partners involved in its inception. The CDC Foundation's mHealth Tanzania Public Private Partnership benchmarked the concept against the mHealth Alliance MAMA initiatives which were at the start of the service, also at first implementation phase. The team expected a similar adoption rate of about a 150,000 registrants within its first year. Thanks to the successful collaboration with partner Johns Hopkins Bloomberg School of Public Health Center for Communication Programs (JHU – CCP) and the promotion of self-registration by subscribers of all networks, the enthusiastic reaction of the general public meant that the service reached its first 100,000th registrant within 11 weeks.

Subscribers can also receive assistance at health facilities. To date over 1,000 health workers in 800 health facilities, working in 10 regions and 35 districts, are actively registering mothers and supporters during ANC visits. Since 2013 13,500 pregnant women have been registered with the help of healthcare workers.

Wazazi Nipendeni continues to partner with new implementation partners to drive on-the-ground implementation and awareness of the service.

Successes

Since the launch of the service in November 2012, the Health Pregnancy, Healthy Baby service has sent out over 32 million healthy pregnancy and early childhood care messages to an accumulated 430,000 registrants. Of this total registrants 408,000 enrolled for the service themselves. Of these 123,250 (29%) are pregnant women, 68,000 (16%) are mothers with newborns up to 16 weeks old and 63,750 (15%) are part of the support network of these women.

Male involvement is higher than expected (50% of the supporters revealed their gender of which 68% are male).

Secured partnership and zero rating of SMS from four leading mobile operators.

Partnerships with several organizations who are promoting the short code on the ground and driving community mobilization of the service.

Ministry of Health and Social Welfare

HEALTH Tanzania

PUBLIC PRIVATE PARTNERSHIP

Healthy Pregnancy and Motherhood Free SMS Serv

"Wazazi Nipendeni" is a national He Pregnancy and Safe Motherhood multi-m campaign that supports the achievemen the Millennium Development Goals and United Nations Campaign on Accelera Reduction of Maternal Mortality (CARM The campaign, led by the Government Tanzania, is supported by several key partn including CDC, CDC Foundation, USAID, Jo Hopkins Bloomberg School of Public He Center for Communication Progra Elizabeth Glaser Pediatric AIDS Foundatio and Joining Hands Initiative – Aga Kh Health Services.

The mHealth Tanzania Partnership strengthen the campaign by providing informative SM messages and appointment reminders i Swahili at no charge for pregnant women and mothers of newborn babies (up to 16 weeks of age) as well as to her supporters (husband, friends and family) and information seekers.

Tanzanians registered for free Healthy Pregnancy SMS service: since Nov 20th, 2012

How mHealth Tanzania Partnership is transforming healthcare

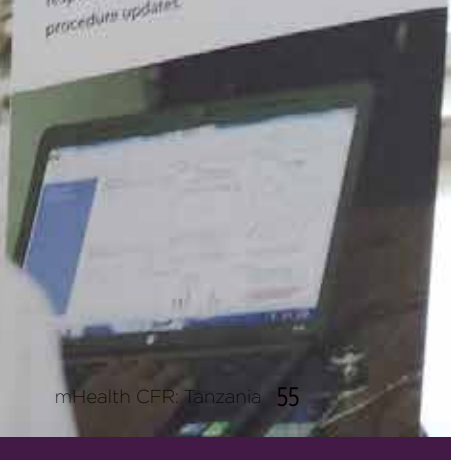
The mHealth Tanzania Partnership is an innovative PPP co-lead by the Ministry of Health and Social Welfare of Tanzania, with support from the Centers for Disease Control and Prevention (CDC), as well as numerous Tanzanian and international public and private sector partner. The Partnership convenes multiple sectors, combining expertise and resources to

Blood Donor SMS Messaging System

To help address the on-going critical blood shortages in Tanzania, the Partnership supports the National Blood Transfusion Services program to scale the use of SMS communications to existing blood donors to improve donor retention rates, and to mobilize new donors and sensitize communities about blood donation with radio and opt-in SMS campaigns and quizzes.

e-IDSR (Electronic Integrated Disease Surveillance & Response System)

The e-IDSR aims to improve containment and eventual prevention of disease outbreaks by providing real-time disease data directly from the field, making it available at all levels of the Ministry for immediate action and response, as well as longer-term analysis for policy and procedure updates.



mHealth Case Studies
Tanzania

NGO led case study: Millennium Promise

mHealth use case

Millennium Promise is an mHealth platform aimed at empowering Community Health Workers (CHW) to improve child and maternal health.

CHWs use Android phones that provide algorithm-based decision support for targeted counselling, case management and performance monitoring. This application is developed using free, open-source software called CommCare.

mHealth applications

- Registries and vital events tracking
- Data collection and reporting
- Electronic health records
- Electronic decision support
- Provider-to-provider communication - user groups, consultation
- Provider work planning and scheduling
- Human resource management

Delivery channels

Application-based and internet

Automatic monitoring of the usage of this channel is facilitated

Technology device

Feature phone

The device was tested and validated in the local community prior to launch of the service. The monitoring and maintenance of these devices is facilitated manually to ensure effective device performance.

Health focus

Maternal and child health & nutrition

Target audience / beneficiaries

Pregnant women and new mothers

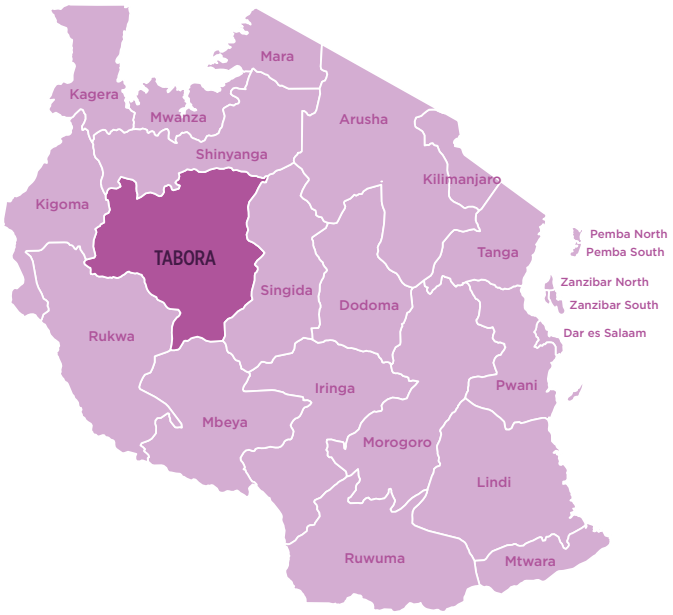
Target actors

Frontline Health Workers: CHWs

68 CHWs were trained in this project. The initial training duration was four days with a focus on the use of the smartphone and the CommCare application. This was followed by 2 weeks practice in the field using a test password. Refresher training is facilitated after the first three months, and depending on individual performance which is monitored by the system, additional training sessions are provided on an on-going basis, and they are tailored to address the main difficulties being faced by CHWs.

Geographical focus

Tabora - 6 healthcare facilities involved



Content

The decision support built into the application is based on MoH counselling protocols. Counselling messages available on the mobile phones to be shared with beneficiaries are also based on MoH counselling content historically provided in laminated print outs.

The CommCare application had to be translated into Swahili. The application was then tested on healthcare professionals prior to implementation.

A range of MNCH related topics/ issues including nutrition.

The application enables CHWs to update and monitor pregnant women and children under 5 ensuring that they maintain a healthy nutrition status.

Nutrition related activities include measuring the Length for Age assessment for the children using length mats, measuring the Mid Upper Arm Circumference (MUAC) for children and pregnant women using MUAC Tape, and recording and conducting follow-ups on all children, based on whether their vaccine status and Vitamin A supplements are up to date or not.

These activities are executed to address malnutrition and stunting in children.

Implementation experience

The programme launched in 2013 with shared learning from implementations in Ghana, Kenya, Malawi, Mali, Nigeria, Rwanda, Senegal and Uganda. Millennium Promise launched in 2006 and has experience in the areas of maternal and child health since 2006.

Partner coverage

Dimagi is the technical partner, providing the technical solution and support. Sony/Ericsson provides handsets. The Tanzanian government organises distribution to clinical staff.

Mobile operators

Airtel provides free SMS, data and voice communications to CHWs and other project staff.

Funding

Multiple project funders

Business model

Donor funded

Scale

By Q3 2014 7,000 pregnant women and new mothers had been reached. Expectant mothers use the services repeatedly. The target number for pregnant mothers is 2,000 per year. The current number of expectant mothers, ranging from 15 to 49 years, is 8,250.

Successes

The initiative has achieved all of the Millennium Development Goals (MDG), in most cases surpassing them by more than 80% in the area where the project has been implemented.

Due to the availability of real time data, reporting on nutritional statistics happens far more regularly. Based on results, nutrition interventions become more targeted and timely. This has led to a number of discoveries e.g. based on data from the system it was noted that trends in under-nutrition can be tracked to specific regions by certain times of the year. This has allowed nutrition interventions to be up-scaled in those regions to reduce the likelihood of malnutrition.

Additional activities are pushed through the system. For example, mothers are educated and assisted in instigating income generating activities at their sites. Activities include poultry keeping and home gardening, which provide a balanced diet, whilst also giving a mechanism to earn money by selling produce.


HE WAS THE
WRONG ONE
#TEAM

mHealth Case Studies
Tanzania

NGO led case study: D-tree International

mHealth use case

Decision support tools assisting health workers in registering, screening, treating, counselling and referring pregnant and post-partum women. The application provides step-by-step prompts through danger signs, physical examination, lab results and counselling and combines this with medical records stored on the phone. A single database of client data is shared between community, primary and secondary level health facilities to allow for the sharing of information and the tracking of clients.

mHealth applications

- Registries and vital events tracking
- Data collection and reporting
- Electronic health records
- Electronic decision support
- Provider-to-provider communication - user groups,
- Provider work planning and scheduling

Delivery channels

Application-based and Internet.

Usage of the application is reviewed on a dashboard which enables tracking of the current activities of nurses and CHWs on the application, as well as numbers of registered clients, tracking referrals, clients screened for danger signs and risk factors. This enables the effective monitoring of usage against predicted models.

Technology device

Smartphone

The smartphones offered through the initiative were tested during field refinements for acceptability by the CHWs, nurses and the clients themselves. Monitoring can be undertaken remotely through the dashboard. The IMEI number of the device, the user and the version of the application they are using is visible.

Monitoring of devices using MQTT, by pinging all or a certain number of those devices, for information about GPS coordinates, what other applications are running on the phone, etc.

Health focus

Maternal, newborn and child health & nutrition

Target audience / beneficiaries

Pregnant women and new mothers

Target actors

The target for this service are frontline health workers, CHWs and nurses.

Training is a one-time event, with intensive support provided through field visits during the 1st few weeks following deployment to ensure the CHWs are comfortable. The training consists of an introduction to the device itself as well as use and troubleshooting of the application. The CHWs and nurses provide feedback during site visits and follow-up phone calls. The CHWs are typically incentivised through partners which may include a small stipend, training and working tools.

Geographical focus

Pwani

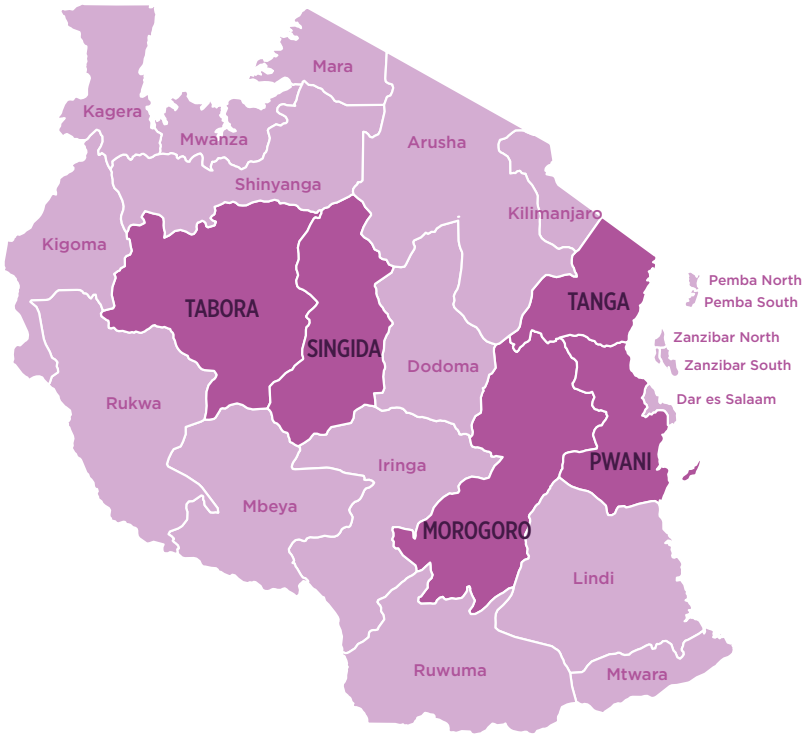
Morogoro

Singida

Tanga

Tabora

15 healthcare facilities involved in this service



Content

Source: developed by D-tree International with support from the MoH as well as subject matter experts at UNICEF, Jhpiego, EGPAF and World Vision, with input from the district health management teams, facility in charges and the nurses and the CHWs themselves. MoH guidelines for maternal healthcare and community integrated guidelines for MNCH were built into the application.

Content includes: digital protocols, decision support algorithm, electronic checklists.

Nutrition related content aids counselling on eating iron-rich foods, taking 3 meals a day, eating a variety of foods including fruits and vegetables and meals high in protein, education around maintaining a balanced diet, the importance of taking enough fluids (2-3 litres of water daily), the importance of avoiding tea, coffee and colas because they reduce Vitamin C absorption.

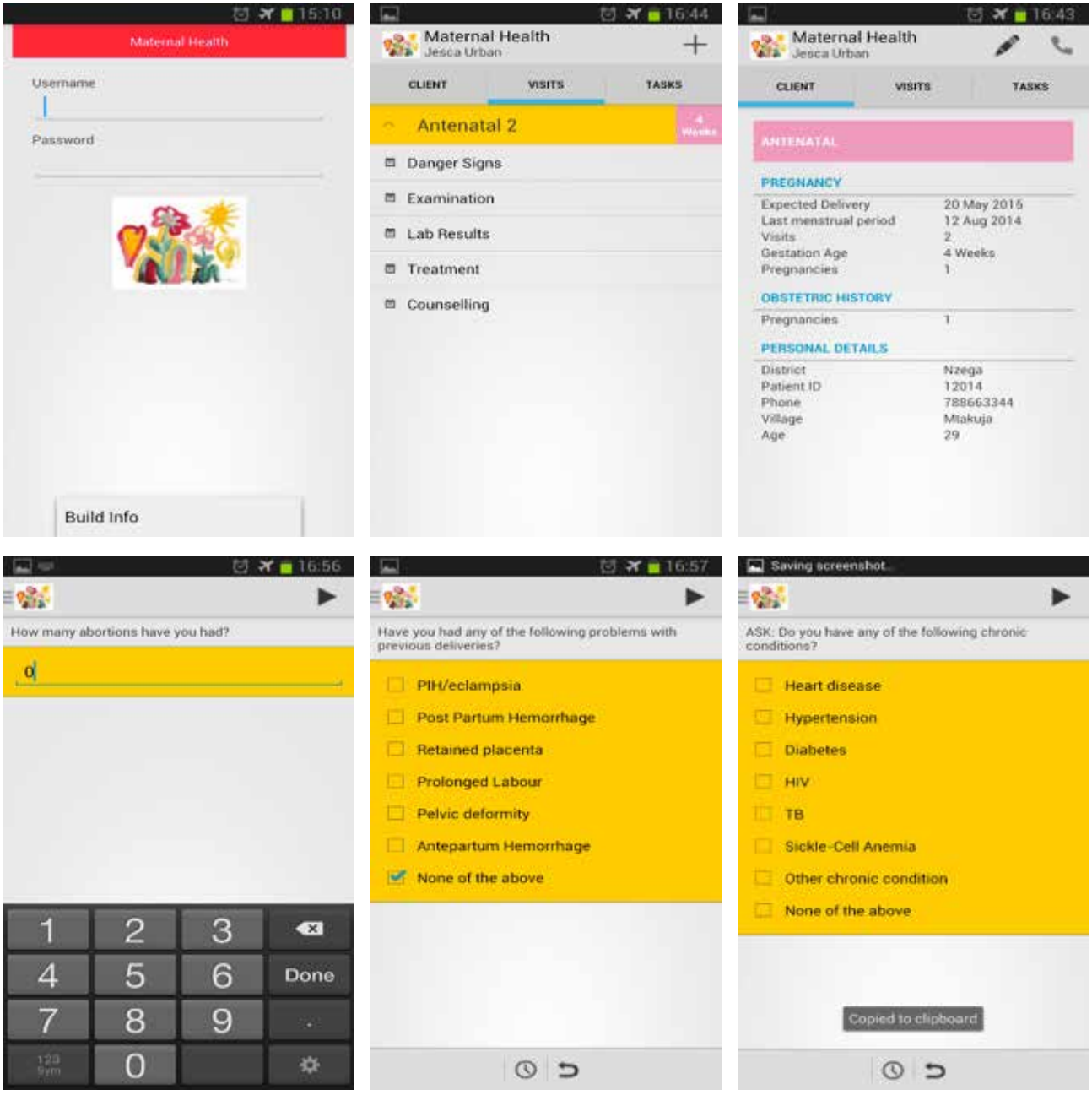
The application allows for the tracking of the mother's weight. If she is not gaining weight as expected through the pregnancy, the provider is alerted for further investigation.

Content localization: translated into Swahili and reviewed by the MoH, development partners, nurses and CHWs. Replication of the training materials and guidelines and then field tested during design and field refinement to ensure the language is natural for the health workers to use during the provision of care. Testing took place with a small group of users over a 4-6 week period. Continuous efforts to evaluate the impact and usability of the content by the CHWs. Additionally, the project data is reviewed to ensure that the health workers are understanding and populating the questions correctly.

Content expansion: has added PMTCT and has had discussions about adding other health areas which may be well addressed during routine ANC and PP visits.

Figure 29

mHealth for maternal health application screen shots



Implementation experience

D-tree International has had implementations since 2004, with experience in Sub-Saharan Africa and Asia markets. D-tree has mHealth services across 4 countries in Africa and 2 countries in Asia. D-tree has developed decision support tools supporting community and facility health workers in maternal and child health, chronic disease and emergency triage. D-tree has developed and deployed integrated mHealth and mobile money tools.

Partner coverage

UNICEF - implementation partner, M&E

Jhpiego - implementation partner, staffing

EGPAF - implementation partner, implementation management

World Vision - implementation partner

MOH RCHS - government partner: approval, implementation & support

ThingsPrime - technology partner: technology solution

Funding

Johnson and Johnson – funding development of technology and implementation in Nzega with EGPAF

mHealth Alliance

USAID through Jhpiego MAISHA program

UNICEF

World Vision

Does not currently have funding for scale but actively seeking

Business model

Donor funded

Scale

Current reach:

More than 11,000 pregnant women and new mothers reached. 46 nurses and 72 CHWs have been trained in this service.

The plan is to ensure that the MoH and the development partners working in maternal health see the value of this service, so that they include it in their plans. The MoH has indicated that they are interested in potentially scaling this up to one complete region at least and a number of development partners are watching the progress of the program in the Tabora region. The potential for scale is to all health facilities which provide RCH services and where partners utilise CHWs for maternal and newborn health programs.

Revenue generation

The potential payers for this service are the MoH and the development partners that support them in attaining their MDG targets. As implementation happens through government health facilities, where RCH services are provided free of charge, it is not anticipated that individual clients pay to use this service.

Successes

Increased detection rates of anaemia and high blood pressure, successfully introduced decision support tools to CHWs and nurses.

Overall the perception of the CHWs, health workers and mothers is that this project has been a success. The mobile application enabled health workers and CHWs to better communicate with one another and to exchange information. This information sharing was reported to have positive benefits particularly surrounding staying informed of the mothers' progress during their pregnancies and birth planning. Use of the technology improved the knowledge and confidence of the CHWs and health workers alike and better linked them to households, making mothers feel more supported during their pregnancies and post-partum period.

The opportunity for mHealth to support nutrition, maternal and child health

Ranking of overall opportunity

Ranking of overall opportunity is a combination of both quantitative and qualitative inputs.

Scale of maternal and child health / nutrition problem

MEDIUM

Size of addressable population

MEDIUM

Ability to pay or fund mHealth

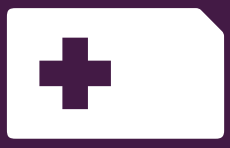
MEDIUM

Ability to deliver

MEDIUM-LOW

Ability to deliver

Ranking of ability to deliver is a combination of both quantitative and qualitative inputs.

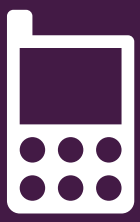


mHealth service providers
HIGH

Strength of supporting programmes
MEDIUM HIGH

Interest from commercial aggregators
HIGH MEDIUM

Interest from mobile operators
MEDIUM LOW



Supporting mobile / health regulation
MEDIUM

Willingness to partner
MEDIUM

Total addressable maternal mHealth market

	SMS Based Services	SMS & IVR Based Services
2015	Total addressable market 1.1M	Total addressable market 1.7M
2020	Total addressable market 1.4M	Total addressable market 2.2M

Aligning Tanzanian mHealth Initiatives to desired health outcomes

Collaborative approach

Consortia or group-led initiatives are likely to be most successful in tackling the multiple challenges of facilitating, developing and managing health in Tanzania. Identifying pathways of collaboration is critical to this endeavour. The mHealth Tanzania Partnership, a public private arrangement between the CDC Foundation and the MoHSW, shows great promise in relation to achieving this collaborative approach. The approach has borne fruit in the Wazazi Nipendeni SMS program that provides nationwide info and booking / reminder data to pregnant and postpartum women and caregivers.

Beyond this the government's monitoring of mHealth initiatives, in order to redirect resources and avoid duplication and waste, provides a strong efficiency motivation while creating a resource for collaborative learning. This strategy fulfils the requirement for mHealth initiatives to be replicable, reusable and maximise resources.

Infrastructure

From the perspective of implementing mHealth, Tanzania has a strong indicator for feasibility with its NICTBB. However, health service logistics, supply chain and the processes linked to these areas remain challenging. In particular, distribution management of the Tanzanian Medical Stores Department and supply chain processes defined in the Tanzanian Supply Chain Management System (SCMS) face a number of alignment challenges that act as obstacles to mHealth take-up.

Alignment to nutrition and mHealth

Tanzania is advantaged in having a centrally defined nutrition strategy managed through its Food and Nutrition Centre (TFNC). There is also a good understanding of the critical nature of nutrition across the health sector with a governing board drawn from across all Tanzania government ministries (consideration for nutrition cuts across the ministerial silos).

Key aims of the TFNC are promoting communication, awareness and understanding of nutrition across industry stakeholders and the general public. Mobile is a key tool in this endeavour and has seen support through the Mwanza Bora Initiative that incorporated an SMS breastfeeding campaign. However, challenges remain in the Implementation of such services. For example regional decisions on nutritional activities are deferred to the district level requiring buy-in at both local and regional government level.

Figure 30

Tanzanian market developments alignment to mHealth and ranking

INDICATOR FEATURES	RANK
COLLABORATIVE APPROACH Established partnerships with government organisational tie-in and a degree of acceptance to collaborative working models.	
REPLICABILITY, REUSABILITY AND RESOURCE MAXIMISATION Strong drive towards centralisation, efficiency improvements and making best use of limited resource. Push to learn from models of replicability and best practice as learning opportunities.	
B2C ALIGNMENT CHARACTERISTICS Good understanding of the advantages of a consortia led approach incorporating B2C and the need for all parts of the health and telecoms stakeholder environment to work together.	
INFRASTRUCTURE First-rate combination of backbone network infrastructure and drive to combine with initiatives to improve health. Challenges remain in logistical and distribution support.	
ALIGNMENT TO NUTRITION AND MHEALTH Clear and concise nutrition targets and strategy benefiting from central government overseeing. Implementation remains challenging due to indigenous district-based players.	

Source: GSMA extracted from in-country stakeholder interviews

Capturing stakeholder sentiment

An important feature of this research was the collection of insights collected directly from industry stakeholders.

Figure 31 is a weighted word tree created from the combined interviews undertaken in Tanzania.

Figure 31

Word tree generated from qualitative interviews with stakeholders and value chain players

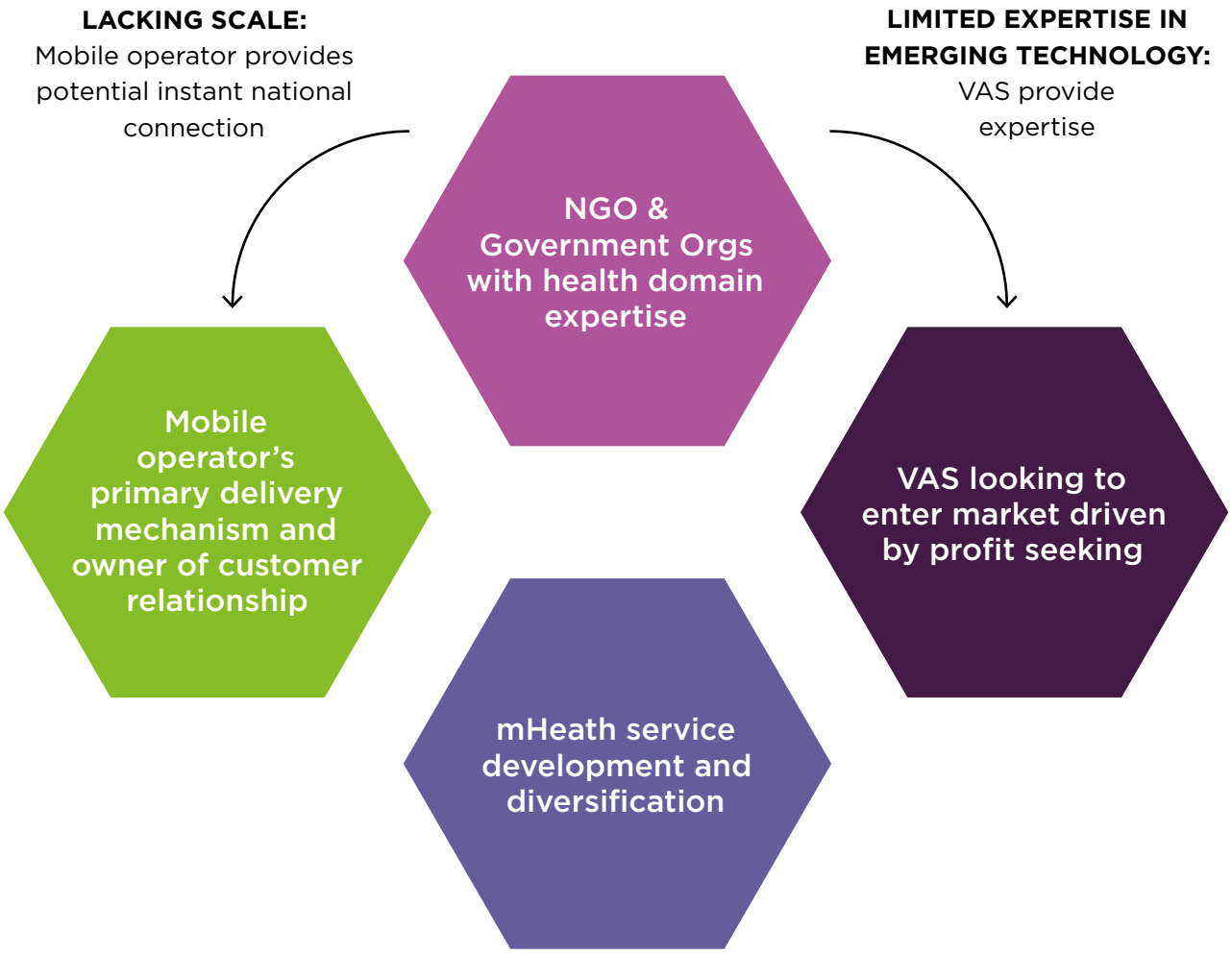
Source: GSMA, in-country interviews

The size of a word or phrase denotes its importance based on positioning within sentences and emphasis structure and number of repetitions. Whilst not entirely scientific this word tree does give an indication of topics that are front of mind within the Tanzanian mHealth sector. Recurring themes are readily identified with the fixation on government partners, service-led initiatives and technologies, which are identified as both obstacles and opportunities in Tanzania.

In those countries that the GSMA has undertaken qualitative research, a recurring theme is the assertion that a consortium-led approach is the best to engage stakeholders and to create a sustainable and scalable mHealth service. In Tanzania feedback identified a prescribed set of roles for the various stakeholders involved in this consortium-led approach. These roles and how they interrelate are visualised in figure 32 below.

Figure 32

mHealth value chain players and stakeholder interrelation*



Source: GSMA, in-country interviews

*Note: opinions expressed by respondents are not necessarily the view of the GSMA

Figure 33 highlights key features from interviews. These insights were then considered in the context of mHealth and specific strategies suggested that might tackle the features highlighted.

Figure 33

Feedback from members of the mHealth value chain in Tanzania

PRIMARY: INSIGHTS STAKEHOLDER INTERVIEW QUOTES	EXTRACTED CONCLUSION	SUGGESTED STRATEGY
"...with limited expertise in new emerging technologies, VAS companies primarily with the notion of profit orientation join the party.....however delivery of these [new] services cannot be possible without the access provided by the MNOs."	Consortium led approach desirable	Each member of the mHealth value chain must be convinced of the efficacy and value of mHeath before initiatives are launched to ensure effectiveness.
"The players (donors, NGOs, government, public sector, MNOs, communities, etc) have to embrace the fact that technologies for the masses can easily be misinterpreted. In rural Africa ....motivation to have a health survey effectively conducted really depends on the interpretation of the service to the population."	While government and mobile operators may understand the mHealth proposition end-users remain unconvinced	Communications to the end consumer/service user should define the features of mHealth in terms of features, drivers and needs in a context that is applicable to them.
"Effectively designed mHealth propositions with measurable outcomes will lead to greater funding for more initiatives...operating under a grouped umbrella will...tackle many of the issues."	Evidence and clearly defined proof points that are effectively broadcast will stimulate success for mHealth	Adoption of accepted evaluation mechanisms from the NGO and government sectors will lead to wider adoption of mHealh across the enterprise and consumer sectors.
"it is evident that mHealth can effectively inform policy-making and planning within health care systems and improve the health of local communities."	mHealth has a role to inform policy-making	Strong efficacy and proof points are key to influencing policy makers. Evaluation initiatives are the vital mechanisms to achieving this.
"Donors, NGOs, government organisations, VAS companies, MNOs and community leaders are the main players. It will be nice to see these entire key players group together more objectively for a common cause."	Approaches are at variance. Clarification of aim and approach between players wil lead to better outcomes for all	Vested interest need to take a back-seat. working groups, communication, collaboration to provide proof of the efficacy of mHealth are the tools to achieve this.
"mHealth should be perceived as a complimentary measure to already existing health structures in country. Under no circumstances should it be seen as disparate agenda to defined government protocols."	mHealth should not set itself up as an alternate to existing structured health initiatives	Independent initiatives should be avoided until the mHealth market is proven and secured and consequently capable of supporting competitive differentiation strategies.

Source: GSMA extracted from the stakeholder surveys

Regulatory situation

There is little regulation directly targeting mHealth in Tanzania, but a number of regulatory developments have had an indirect impact. During the last 12 months excise duty has increased from 12% to 17% while an 18% VAT rate has been implemented across Tanzania. The impact of these developments has been felt by mobile operators, who in many instances have passed this increase on to VAS and aggregator partners. The discernible impact of this strategy is that the revenue shares between aggregators and mobile operators has become favourable to the operators. Revenue shares of 50/50 have in some cases become 85/15. An unintended result of the mobile operator revenue squeeze has been the development of in-house capabilities for content development and management, creating a scenario where competition between VAS, aggregators and mobile operators could develop.

If the Tanzanian government continues to tax mobile operators and they in turn decide to undertake in-house VAS development and management, it will create a different dynamic for mHealth development. In other Sub-Saharan African countries innovation has been driven by specialist VAS providers and aggregators. It remains to be seen if this innovation in the mHealth space will be emulated by mobile operators in Tanzania.

Conclusions

- There is a very strong market potential in Tanzania. GSMA tracked mHealth interventions have reached approximately 3.4 million beneficiaries to date, which is just under 7% of the country's total population.

- The potential market for maternal segments is 1.7 million and is forecast to rise to 2.2 million by 2020.

- Mobile money and insurance are key facilitators for mHealth in Tanzania, with over a third of Tanzanian households using mobile money. This figure is forecast to rise exponentially in the short term while all the mobile operator players in Tanzania have combined some form of mobile transaction capability with their mHealth initiatives. Innovations like Tigo's Bima micro-insurance offering, which ties in with bundled service propositions, are key to this sector's development, where strong synergies can be leveraged toward the mutually beneficial aims of commercially sustainable mHealth services that meet public health needs.

- Developing mHealth in collaboration with mobile money and micro-insurance offerings benefits multiple players across commercial and public sectors. Mobile applications can grow mobile operator VAS revenues and usage by migrating mHealth users from basic service propositions and freemium options to more advanced premium channels. The development of financial infrastructure through medical health insurance improves socio economic mobility while insurance taxation can be used to further develop health infrastructure.

- There have been some successful partnerships in Tanzania with 35% of GSMA tracked mHealth initiatives having secured a partnership with the MoH while 42% have secured partnership with a mobile operator. Despite this, partnerships remain a challenge, in some cases taking upwards of 18 months to achieve. Ongoing support across the service provisioning ecosystem is required to tackle this.

- The greatest success in partnerships has been where multiple parties are involved. 39% of tracked initiatives have implemented partnerships with multiple organizations of 3 or more stakeholder groups. Of these 75% are partnering with the MoH and 83% are partnering with a mobile operator.

- Health demands are not being fully realised in Tanzania. Regions are not always reached by the right type of mHealth initiative. The Southern Highlands zone has multiple nutritional, maternal health burden and demands, yet has only one active mHealth initiative which does not concentrate on nutrition or MNCH. This absence creates a market opportunity for mHealth.

Overall feasibility assessment

The feasibility of mHealth to address nutrition and maternal and child health in Tanzania is good. The GSMA and the public sector will work together to address common challenges and optimize the chance of success of partnerships.

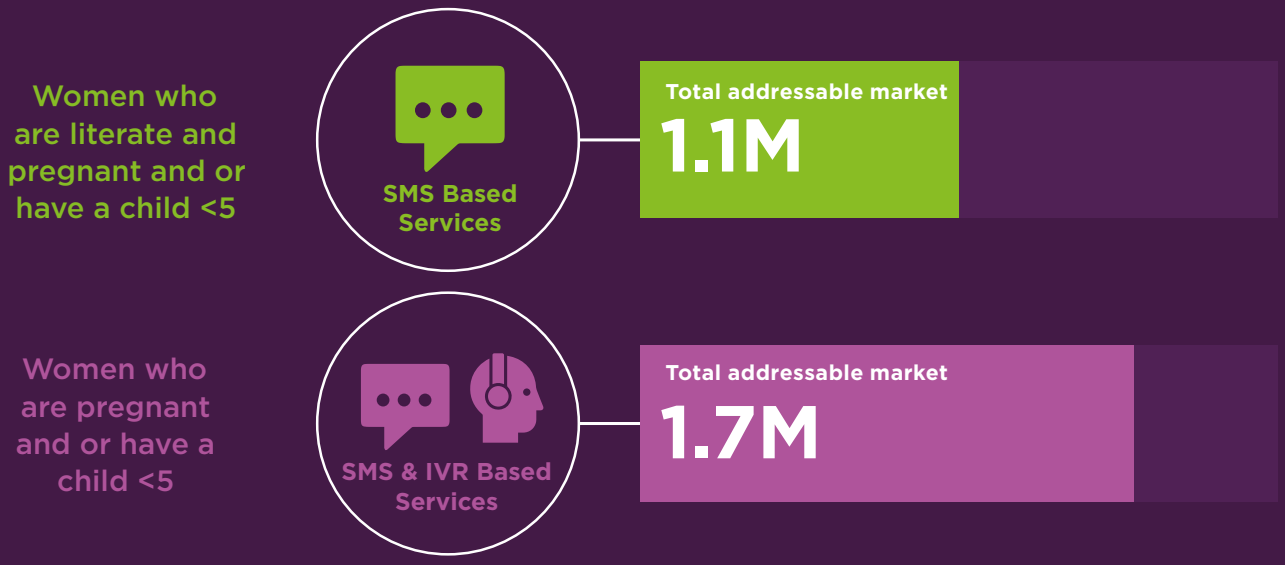
Opportunity size

The high incidence of phone sharing in Tanzania means access to mobile phones is higher than mobile market penetration would infer.

This feature sees a long-term opportunity in targeting literate women with children under five with SMS nutrition and maternal health information services. This segment is forecast to grow by 31% over the 2015-2020 period.

Figure 34

Total addressable maternal mHealth market 2015

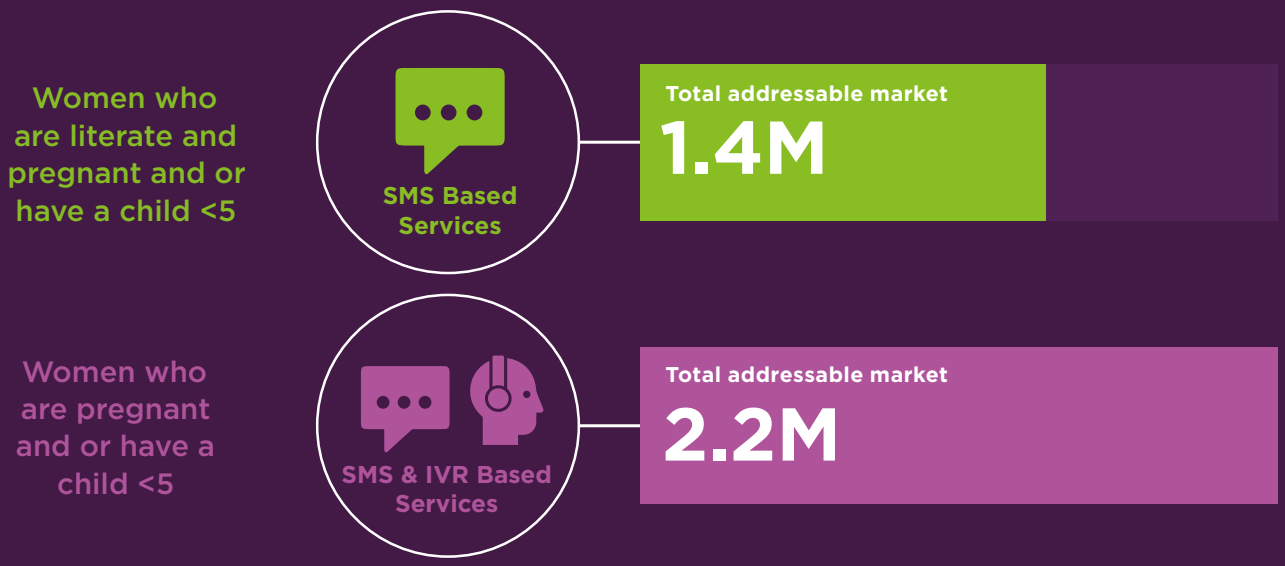


Source: GSMA Mobile for Development mHealth model, GSMAi data

When both literate and illiterate maternal segments are targeted using IVR services this opportunity increases further to an addressable market of 2.2 million by 2020, growing by 27% over 2015-2020 for this segment alone.

Figure 35

Total addressable maternal mHealth market 2020



Source: GSMA M4D health model, GSMAi data

Ranking of overall opportunity

Ranking of overall opportunity is a combination of both quantitative and qualitative inputs.
Scale of maternal and child health / nutrition problem – **MEDIUM**
Size of addressable population – **MEDIUM**
Ability to pay or fund mHealth – **MEDIUM**
Ability to deliver – **MEDIUM** - **LOW**

Ability to deliver

Ranking of ability to deliver is a combination of both quantitative and qualitative inputs.
mHealth service providers – **HIGH**
Strength of supporting programmes – **MEDIUM** - **HIGH**
Interest from commercial aggregators – **HIGH** - **MEDIUM**
Interest from mobile operators – **MEDIUM** - **LOW**
Supporting mobile / health regulation – **MEDIUM**
Willingness to partner – **MEDIUM**

Biblography

- Bill & Melinda Gates Foundation's (BMGF) Financial Services for the Poor (FSP) program commissioned InterMedia to design and implement a project to track the uptake, use and market potential of mobile money services in Pakistan, Uganda and Tanzania. The findings from the Financial Inclusion Tracker Surveys Project (FITS)
- United Republic of Tanzania Ministry of Health and Social Welfare. Tanzania National eHealth Strategy Guide July 2013 to June 2018
- Tanzania Mobile Money Tracking Study Quarter 1 Report (September - November 2011) – Intermedia

Abbreviations and terminology

ANC - Antenatal Care

ARPU - Average Revenue per User

B2B - Business to Business

B2C - Business to Consumer

BoP - Base of the Pyramid

CAGR - Compound Annual Growth Rate

CHW - Community Health Worker

CSR - Corporate Social Responsibility

HSSP III - Third Health Sector Strategic Plan

ICT - Information and Communications Technology

IMEI - International Mobile Station Equipment Identity

IVR - Interactive Voice Response

MDG - Millennium Development Goals

MNCH - Maternal Newborn and Child Health

MNO - Mobile Network Operator

MoH - Ministry of Health

MoHSW - Ministry of Health and Social Welfare

MQTT - Message Queue Telemetry Transport

NESG - National eHealth Strategy Guide

NGO - Non-Governmental Organisation

NICTBB - National Information and Communications Technology Broadband Backbone

OS - Operating System

PAMI - Pan-African mHealth Initiative

PMTCT - Prevention of Mother to Child Transmission

PP - Post Partum

RCH - Reproductive and Child Health

ROI - Return on Investment

SMS - Short Message Service

SUN - Scaling Up Nutrition

TCRA - Tanzania Communications Regulatory Authority

TFNC - Tanzania Food and Nutrition Centre

USSD - Unstructured Supplementary Services Data

VAS - Value Added Services

For more information on GSMA Mobile for Development mHealth,
please visit **www.gsma.com/mobilefordevelopment/programmes/mHealth**