Ministry of Health and Population

mHealth in Malawi

Landscape Analysis

May 2018

KUUNIKA Data for Action

COOPER/SMITH

Table of Contents

COOPER/SMITH

1. Key Acronyms

CHS	Community Health Services Section
CHT	Community Health Team
CHW	Community Health Worker
CMED	Central Monitoring & Evaluation Division
EHP	Essential Health Package
EPI	Expanded Program on Immunizations
GPS	Global Positioning System
HIS	Health Information System
HSA	Health Surveillance Assistant
HIV	Human Immunodeficiency Virus
IMCI	Integrated Management of Childhood Illnesses
M&E	Monitoring & Evaluation
MoHP	Ministry of Health & Population
NTDs	Neglected Tropical Diseases
PDAs	Personal Digital Assistants
SMS	Short Messaging Service (Texting)
TB	Tuberculosis
USSD	Unstructured Supplementary Service Data

2. Overview of The mHealth 360 Analysis

As mobile technology has become ubiquitous, Malawi has seen several robust service delivery mobile applications for healthcare deployed with different levels of success. SMS and phone hotline projects have reached national scale and have been widely regarded as having both high impact and ease of use. Unfortunately, to date, no smartphone applications have been able to scale to a national audience and systems remain in silos both geographically, topically, and technically.

With limited resources, how do we determine which solutions should expand, where pilots can provide new insights into existing gaps, and how to create a national policy that allows for both innovation and scale? To aid the Kuunika: Data for Action project in developing and implementing mobile technology in Malawi, and to a larger extent, to aid the Ministry of Health and Population in the governance of mobile technology, we conducted an independent evaluation of mobile health technology systems currently being implemented in Malawi. This assessment provides a concrete way that Malawi can adapt high-level frameworks and tools into assessments that provide evidence for policies, standards, and strategies in mobile health.

As part of the Kuunika Project, the Central for Monitoring and Evaluation Division (CMED) and the Community Health Services Section (CHS) in the Ministry of Health and Population worked with Cooper/Smith to conduct a mobile health landscape analysis and technical feasibility study. This activity aligns with the project work plan and complements the current efforts of other Malawi programs. To date, few countries have conducted such an assessment. We hope this assessment will serve as a template for routine evaluations in Malawi and other countries interested in improving the alignment of mobile health investments and streamlining mobile health systems.

The mHealth 360 analysis consists of a 4-step approach:

1 | Survey of all mobile health projects in Malawi

2 | In-depth analysis of a select group of platforms

3 | End user experience feedback with a select group of platforms

4 | Provide recommendations for policy and standards

This report includes the results from mHealth 360 Analysis Step 1: survey of all mobile health projects in Malawi. This survey was undertaken as part of a national registration of all mHealth projects with results were synthesized by Cooper/Smith.

3. The State of mHealth in Malawi

3.1 National mHealth Registration

In 2017, the Secretary for Health and Population required that all Malawian mHealth projects complete a formal registration process. 31 mHealth projects officially registered. Information about the projects was extracted during registration. Additionally, a list of known mHealth projects was cross-referenced using existing databases.

31

mHealth Projects in Malawi

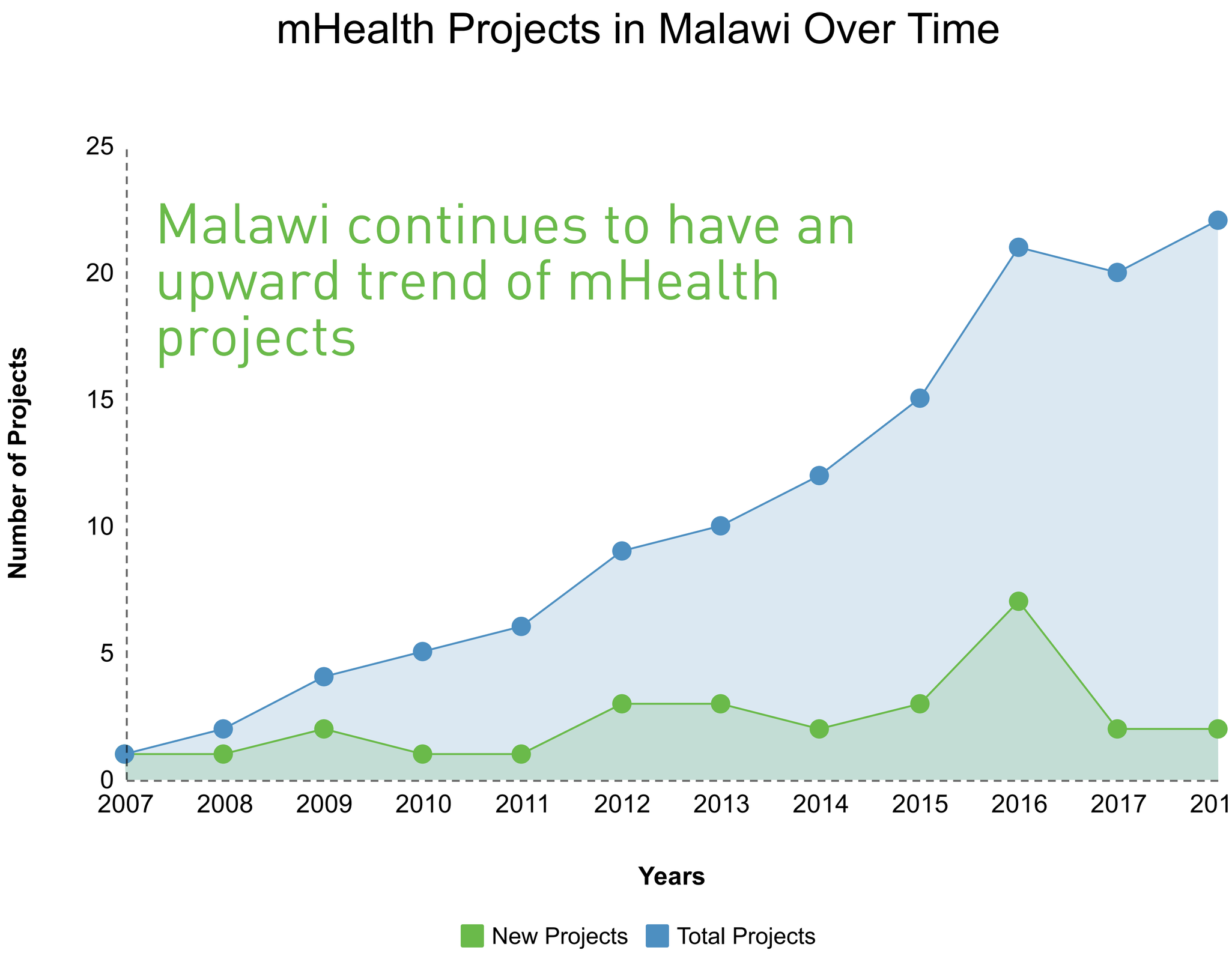
surveyed through the national mHealth registration

mHealth is a component of electronic health (eHealth). It is the medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices.

-World Health Organization (WHO)

4. Timeline of mHealth in Malawi

mHealth projects in Malawi have existed since at least 2007, with an average of 2 new projects coming online each year. The average lifespan of a mHealth project is 5 years. 2016 was the most active year for new projects with 7 new projects coming online. As of March of 2018, there were 22 live mHealth projects.



First mHealth project in Malawi

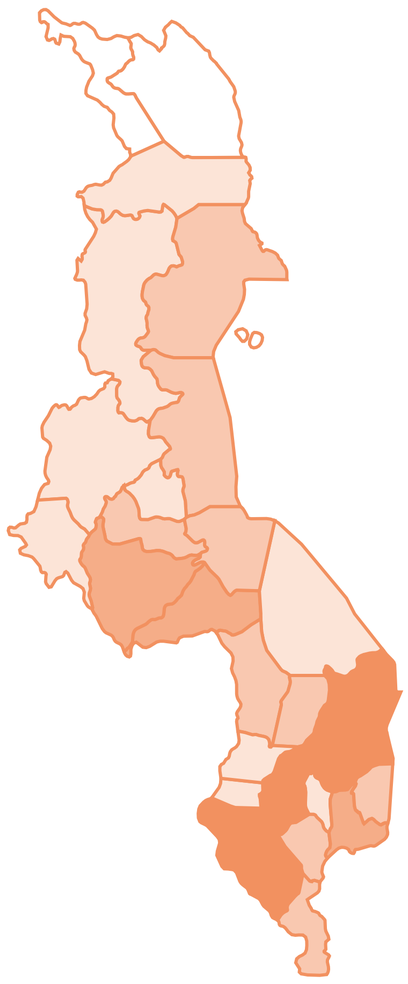
Average number of new projects per year

Average project lifespan

5. Geographic Distribution

At least 5 mHealth projects have been implemented in each district in Malawi. There is an average of 8 projects per district. In addition, national/regional projects tend to span an average of 8 districts (out of a total of 28). Most mHealth projects are concentrated in the Southern region. Blantyre & Zomba districts have 13 projects each (the greatest number).

mHealth is geographically widespread, reaching every district in Malawi.



5

MINIMUM PROJECTS PER DISTRICT

8

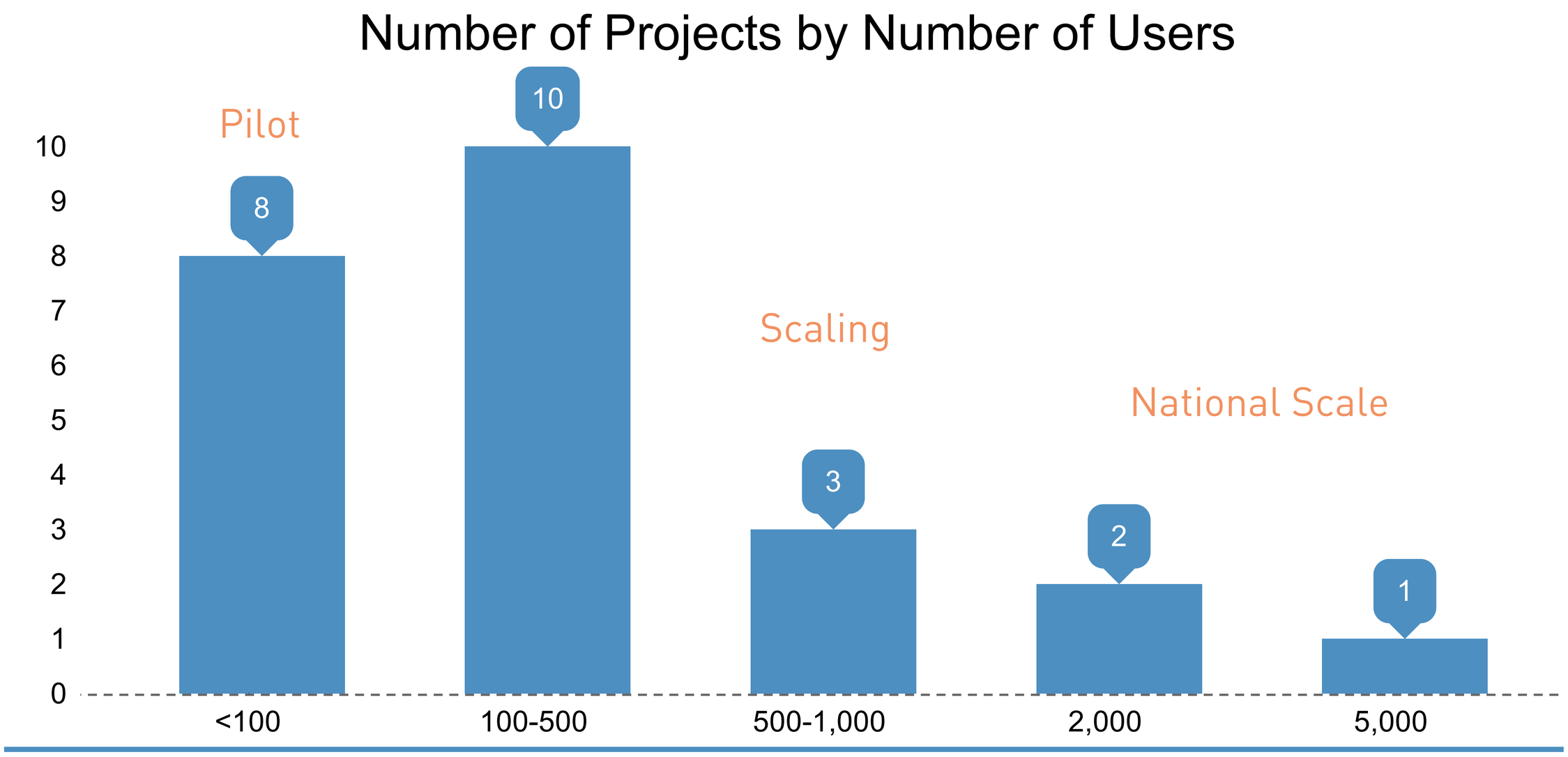
AVERAGE NUMBER OF PROJECTS PER DISTRICT

13

MOST PROJECTS PER DISTRICT (BLANTYRE & ZOMBA)

6. Project Maturity by Users

When broken down into scale categories, the majority of mHealth projects in Malawi have less than 100 users or have 100-500 users, meaning they are either in the pilot phase or are scaling. Of those projects at a large scale, the majority are using voice or SMS services. No smartphone applications have been able to reach a large scale of users to date.



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7. National Community Health Strategy

The Malawi National Community Health Strategy 2017-2022 states that Community Health Teams (CHTs) should increase the use of mHealth and has set the target that by 2022, 50% of CHTs will be using mHealth for integrated service delivery, data collection, and supervision.

Based on the registration survey results, we estimate that 1,823 Health Surveillance Assistants (HSAs) are currently using mHealth for community health service delivery. This number was calculated by including all registered projects that address the Malawi Essential Health Package for "Community Health" and have HSAs as the target end users. Excluded in the calculation are projects such as cStock - which is solely focused on nutrition, CCPF which does not specifically target HSAs, and ONSE which had not started implementation at the time of the registration.

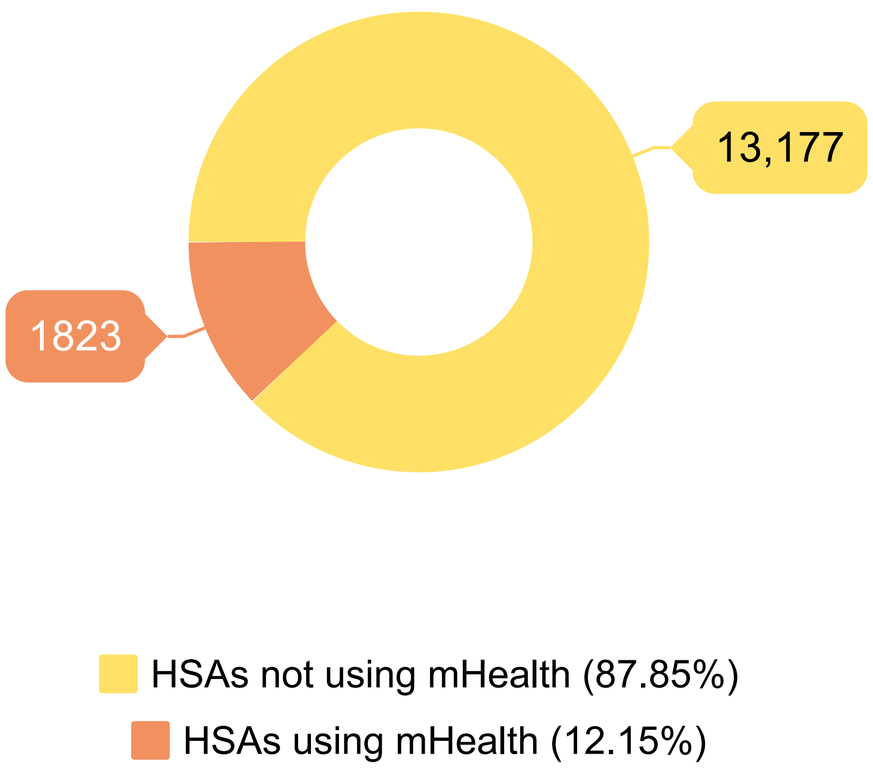
Using the Community Health Strategy target of 15,000 HSAs employed by 2022 to fulfill the proper ratios, 12.15% of HSAs, or a quarter of the target goal, has been achieved. To achieve the target in full, we will need to see a 3 fold increase in mHealth uptake among HSAs.

50%

By 2022, 50% of Community Health Teams (CHTs) will be using mHealth for integrated service delivery, data collection, and supervision.

8. HSAs Using mHealth

Community Health Strategy Progress to Date



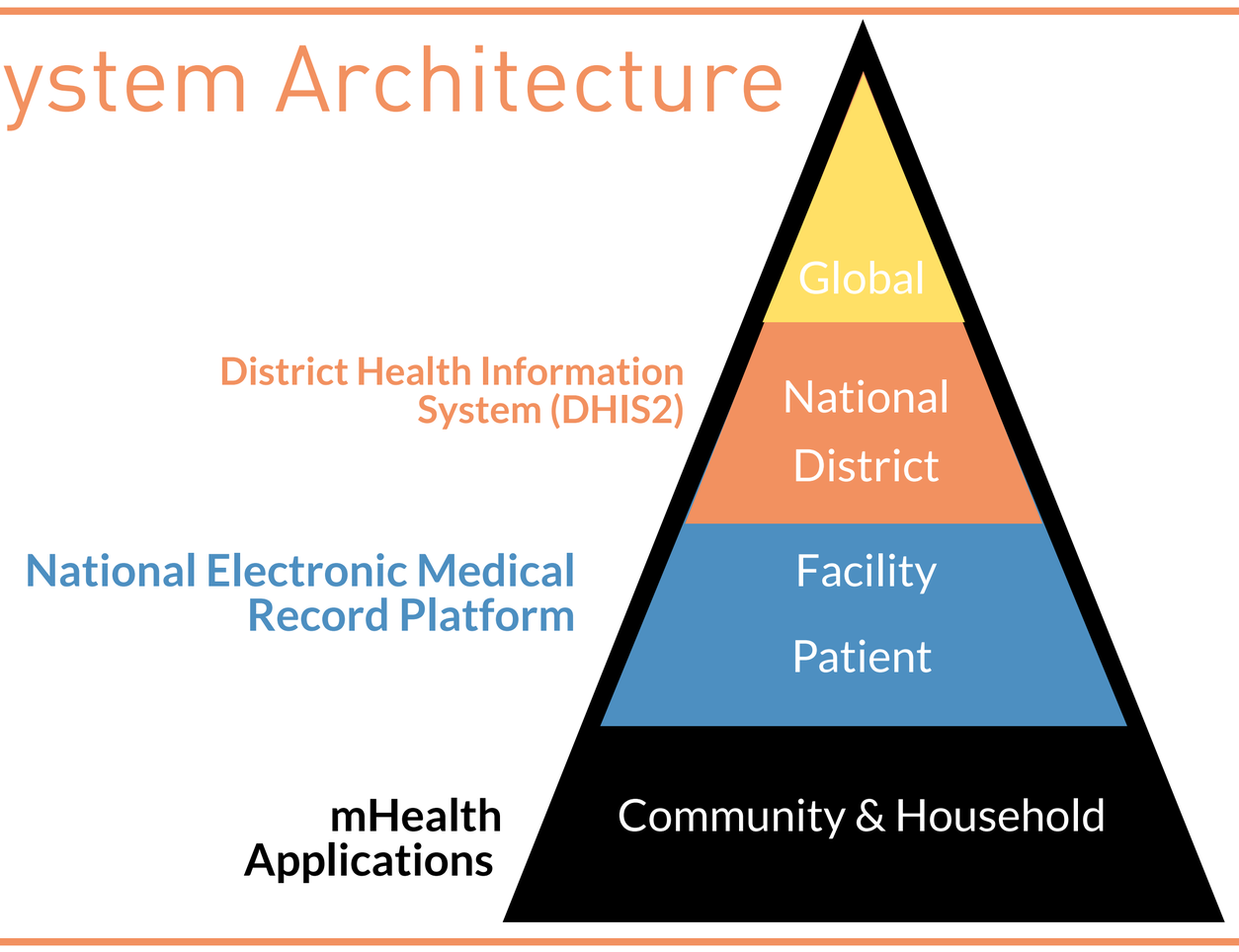
1,823

Estimated number of Health Surveillance Assistants (HSAs) or Community Health Workers (CHWs) currently using mHealth for integrated service delivery, data collection, and supervision.

9. Health Informatics System Architecture

To reduce data collection burden on HSAs and CHWs, government programmes (e.g. civil registration and vital statistics, National ID, and others) and partners need to standardize and harmonize data collection methods. Integrated electronic data management solutions should be harmonized with the National eHealth Strategy and consider leveraging existing mHealth/digital tools.

-National Community Health Strategy 2017-2022



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10. Achieving Integrated Service Delivery at Scale

To achieve integrated service delivery at scale, expansion of mHealth will be necessary in 3 areas:

Scaling users both by increasing the number of Community Health Team members using mHealth tools and expanding geographically.

Linking mHealth users with other levels of the health system to include supervisors and facilities. Linking mHealth tools to other platforms that are part of the National Health Information System.

Expanding content to include coverage of service delivery areas that are not currently being covered and fully implement all services provided by Community Health Teams.

11. Current mHealth Focus Areas

The majority of Malawi's mHealth projects are working in maternal and reproductive health, infant and child health, and community health.

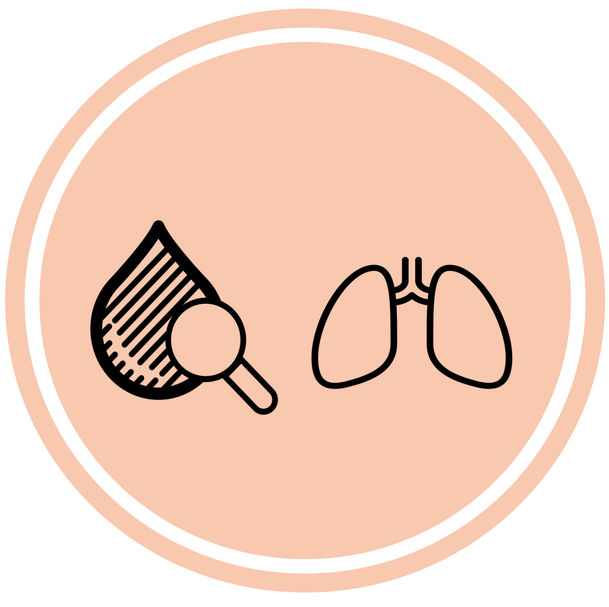
Maternal and Reproductive Health

Infant and Child Health

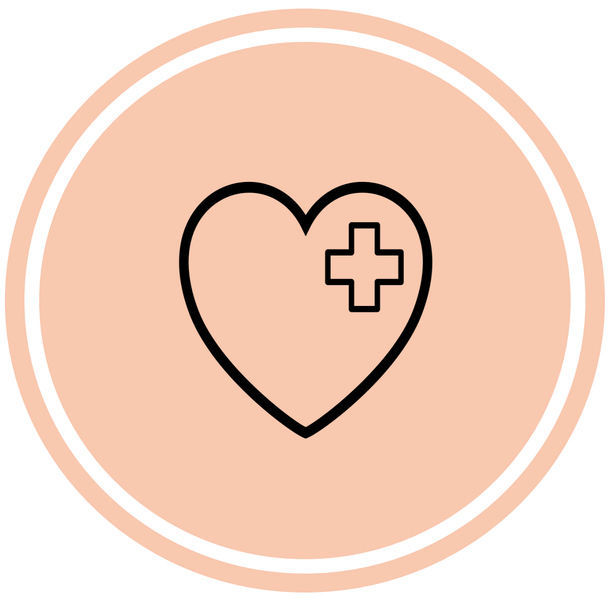
Community Health

12. Potential Areas for mHealth Expansion

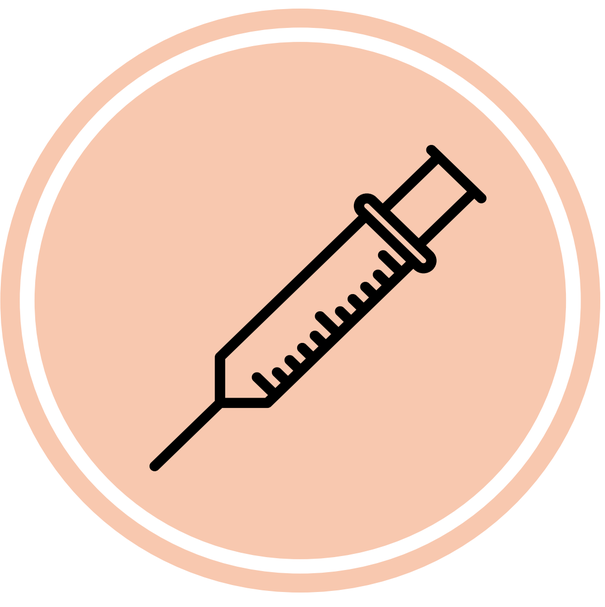
Based on the burden of disease and national priorities, key areas for expansion include HIV and Tuberculosis (TB); chronic diseases; and vaccines, Expanded Program on Immunizations (EPI) or vaccine-preventable diseases.



HIV and Tuberculosis (TB)



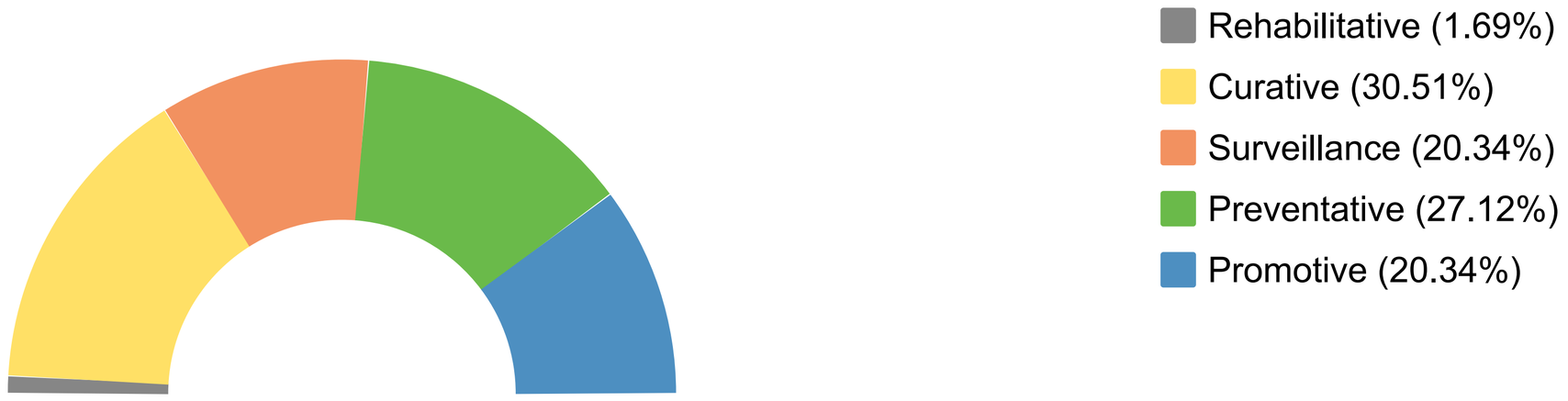
Chronic Diseases



Vaccines and Expanded Program on Immunizations (EPI)

13. Service Domain Areas

As part of national policies and guidelines, 5 service domain areas have been outlined. In the registration we asked partners which service domains they aligned with. While promotive, preventive, surveillance, and curative service domains were all covered by 22%-30% of projects, only 1 project reported aligning with rehabilitative services.



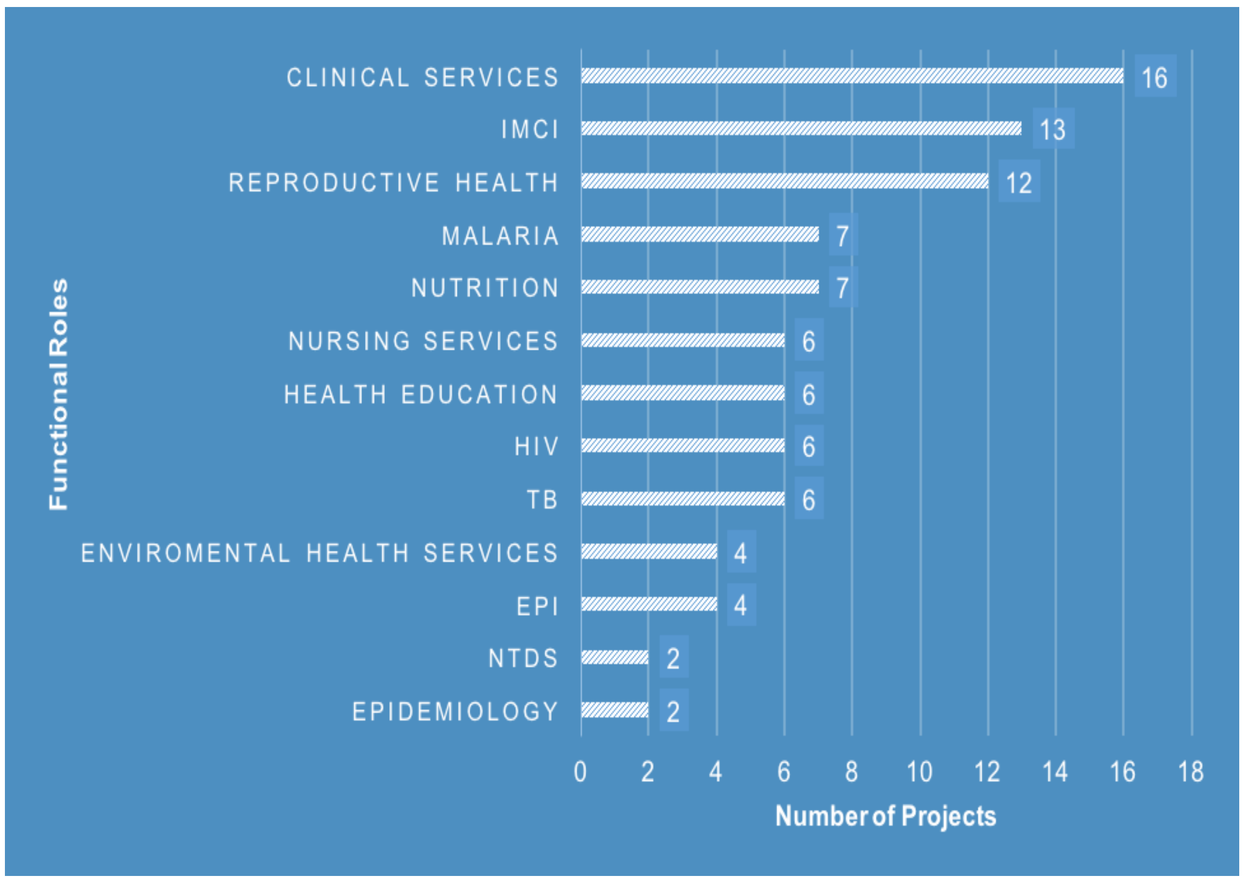
14. Functional Roles

50% of projects registered aligned themselves with clinical services (16 projects). Most projects are in Reproductive Health, Integrated Management of Childhood Illness (IMCI), and Nutrition, with HIV, Neglected Tropical Diseases (NTDs) and Expanded Program on Immunization (EPI) lagging behind.

50%

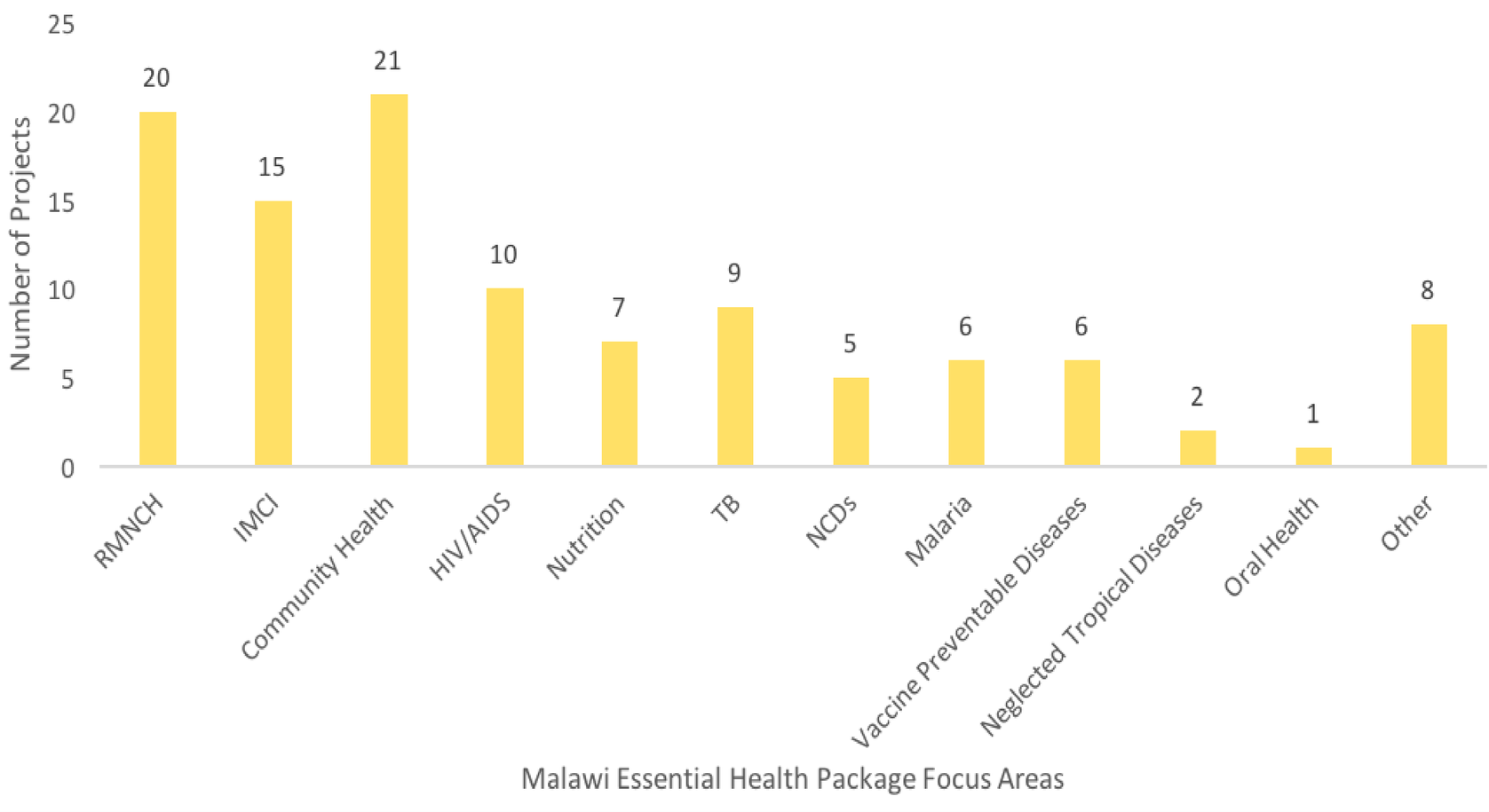
OF PROJECTS

ARE LINKED TO CLINICAL SERVICES



15. Malawi Essential Health Package (EHP)

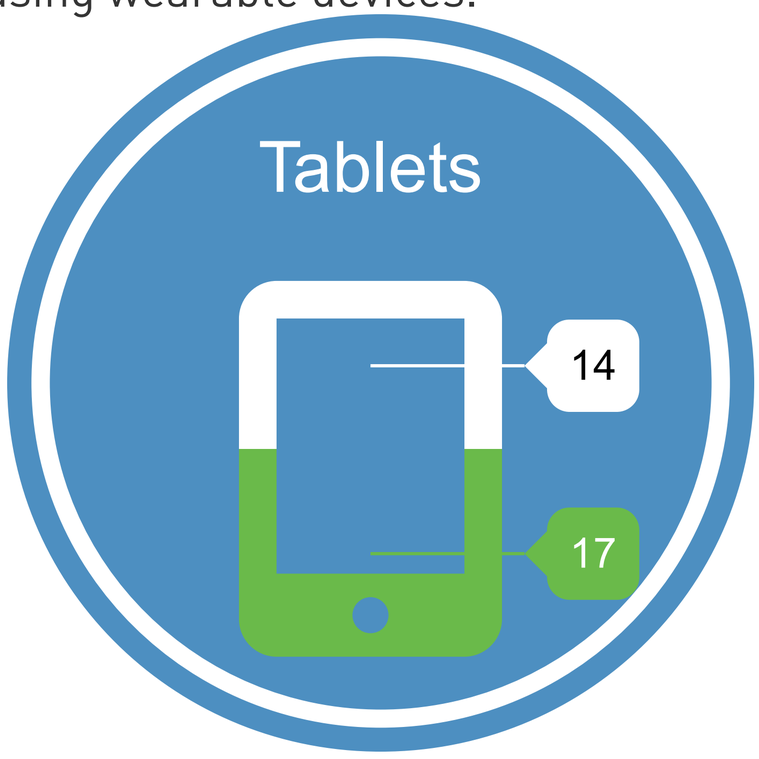
Projects were allowed to choose multiple areas for the Malawi Essential Health Package (EHP) with which their project aligned. Community Health, Reproductive Maternal Neonatal and Child Health (RMNCH), and Integrated Management of Childhood Illness (IMCI) accounted for the majority of the projects.



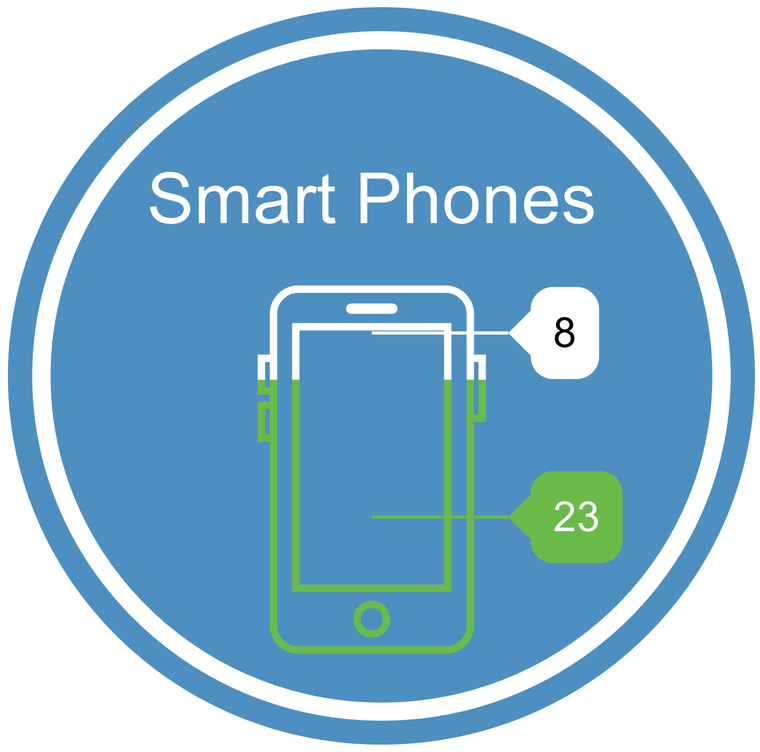
16. Types of Hardware

Across all projects surveyed, the hardware used is moving away from basic phones and towards smart devices. Many projects used multiple types of devices. However, no projects recorded using Personal Digital Assistants (PDAs), and only one project recorded using wearable devices.

7 Projects use basic phones (23%)



17 Projects use tablets (55%)



23 Projects use smart phones (74%)

17. Modes of Interaction

Projects mostly interact with users via mobile applications or SMS as demonstrated below by the number of projects using each mode.

Application Projects

SMS Projects

Touch Screen Projects

Web based Projects

GPS Projects

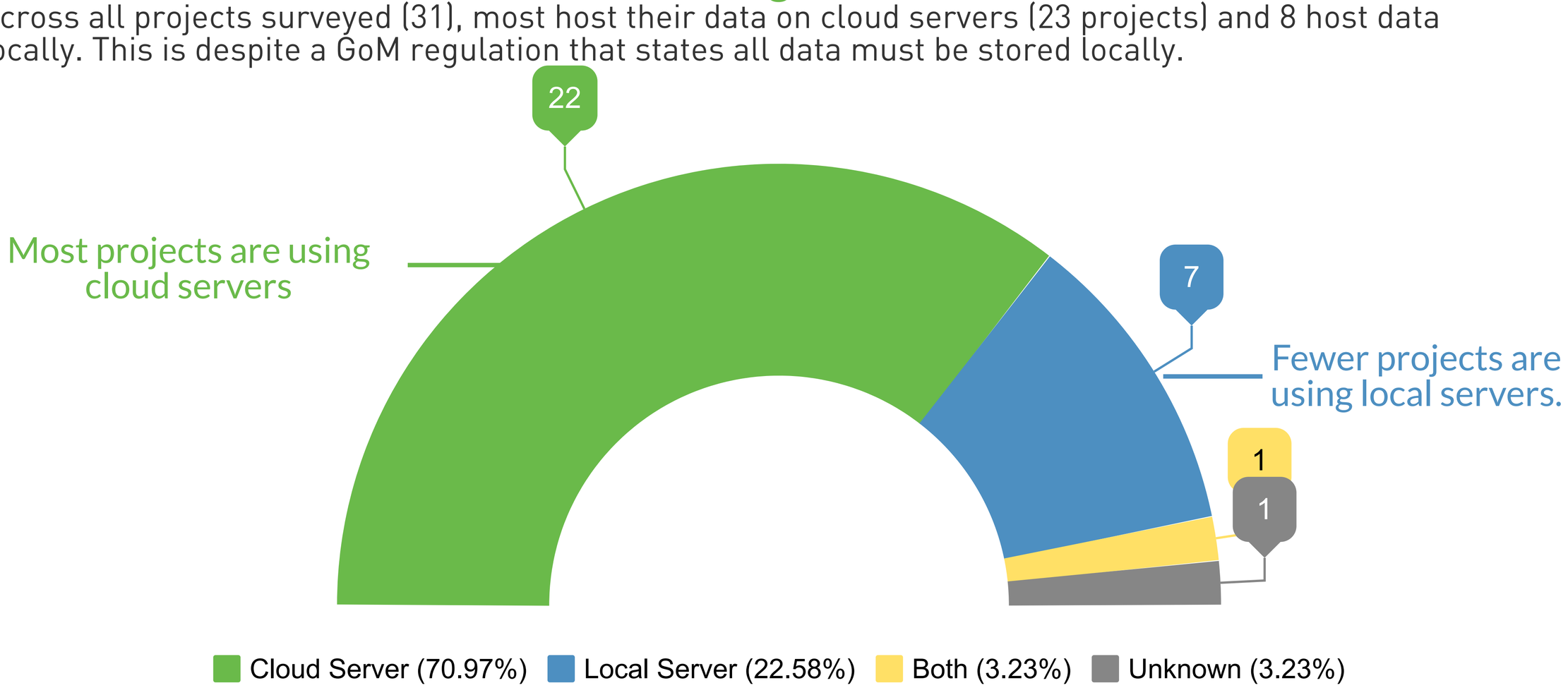
Voice Projects

Email Projects

USSD Projects

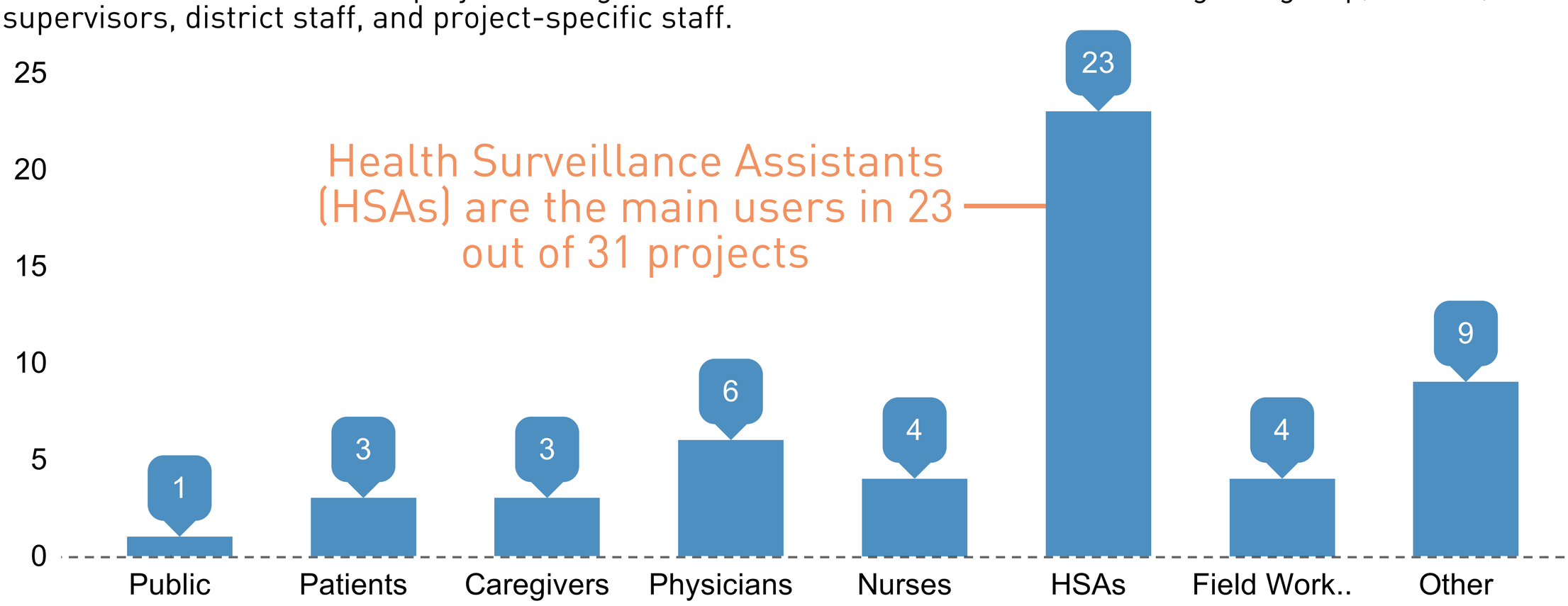
18. Servers and Data Storage

Across all projects surveyed (31), most host their data on cloud servers (23 projects) and 8 host data locally. This is despite a GoM regulation that states all data must be stored locally.



19. Type of Users

Health Surveillance Assistants (HSAs)/ Community Health Workers (CHWs) are the largest group of mHealth users in Malawi. 23 out of 31 projects citing HSAs and CHWs as users. The second highest group, "other", included supervisors, district staff, and project-specific staff.



20. Number of End Users

Across all projects since 2007, there have been 15,231 users. 13,275 of those users are still active.

15,231

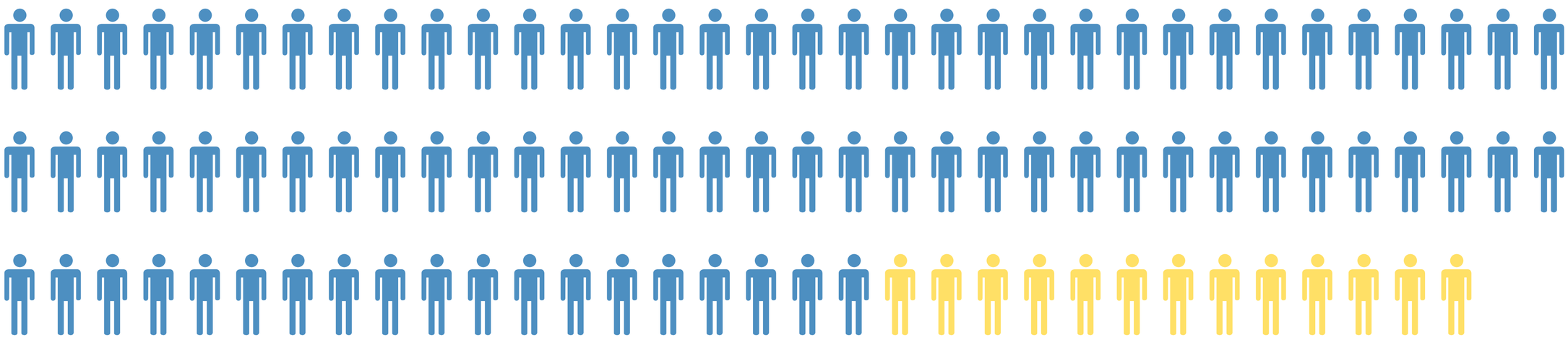
mHealth Users Ever
across 31 registered projects in Malawi

13,275

Active mHealth Users
across 31 registered projects in Malawi

87%
OF EVER USERS STILL ACTIVE

428
AVERAGE ACTIVE USERS PER PROJECT



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21. Project Costing Across All Projects

Budget data was not a required as part of registration. However, 12 out of the 31 projects provided detailed costing data across specific categories. This offers a glimpse into the general cost of mHealth implementation in Malawi.

$9,535,880

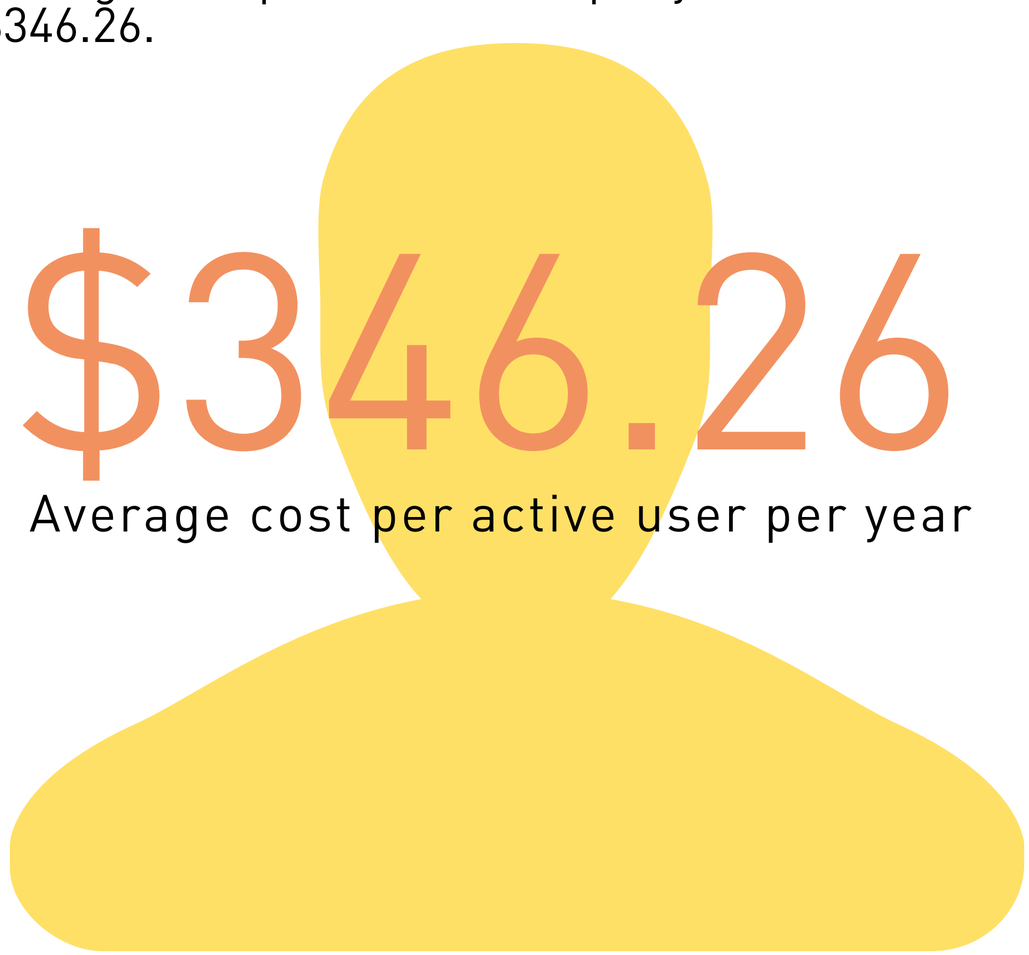
All time cost for the 12 projects that submitted costing data

12

REGISTERED PROJECTS

SUBMITTED COSTING INFORMATION

We used the average number of active users (n=459) and the average cost per project year taken from the 12 registered projects that submitted costing data ($158,931) to calculate the average cost per active user per year to be $346.26.



$346.26

Average cost per active user per year

$794,657

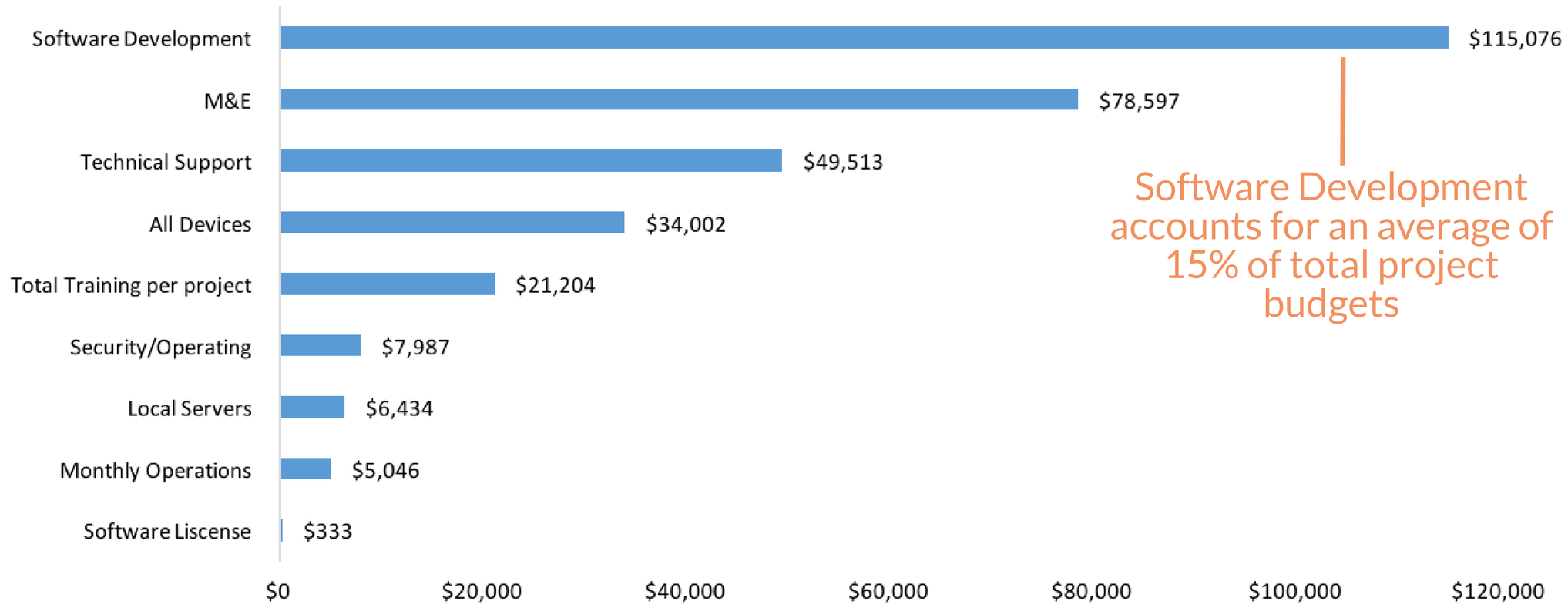
Average cost per project across project lifetime (average 5 years)

$158,931

Average cost per project year

22. The Average Project Costs

The average cost per category across the 12 projects shows that Software Development accounts for the largest portion of budgets ($115,076) at 15% of the average mHealth project total budget ($794,657).



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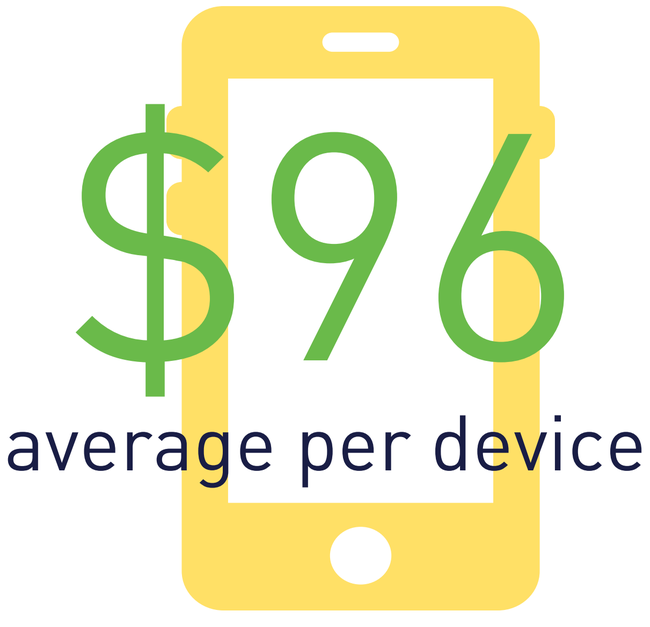
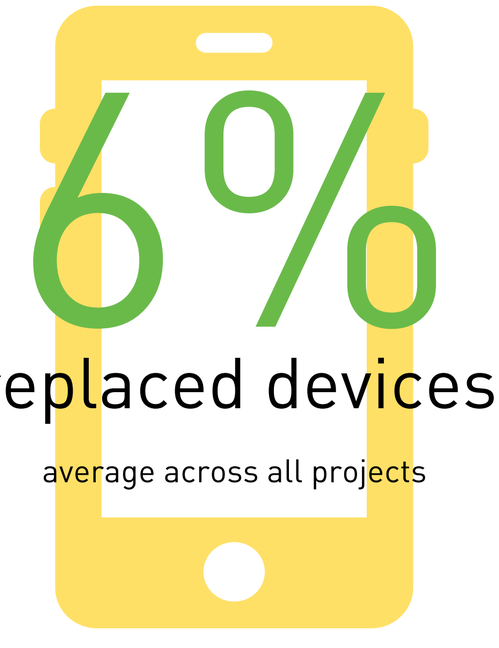
23. Average Device Costs

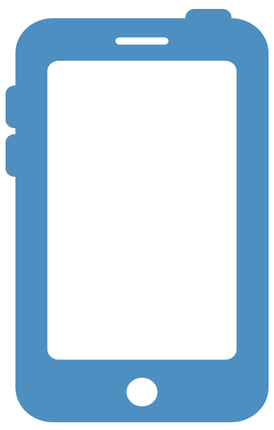
The average cost per device per user is $96 with an average of 6% of hardware being replaced each year due to hardware being lost, stolen, or damaged. This contradicts common misconceptions around the loss of mobile phones that are often cited as a reason not to undertake mHealth projects.





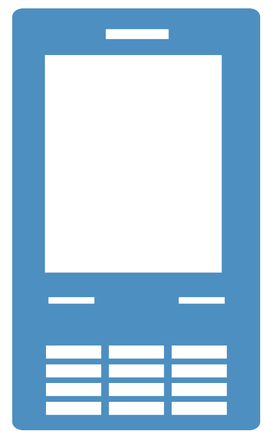
24. Applications vs. SMS in mHealth

Malawi has a mix of both mobile applications and SMS projects. There are challenges and benefits to using each system. As part of the analysis of registration responses we separated mobile applications and SMS because these are the largest categories for projects, and there are large differences between the two types of projects.



APPLICATIONS

- Expanded functionality such as collecting surveys, GPS location, and images
- Uses data which is generally cheaper than SMS
- Requires a smartphone which is more expensive than a basic phone.
- More training is necessary due to complexity of applications



SMS

- Typically does not require hardware purchases since all phones can send an SMS
- Cost effective for mass communications
- Limited data collection abilities and functionality
- As smartphones become more common, the trend is moving away from SMS and towards messaging platforms such as WhatsApp

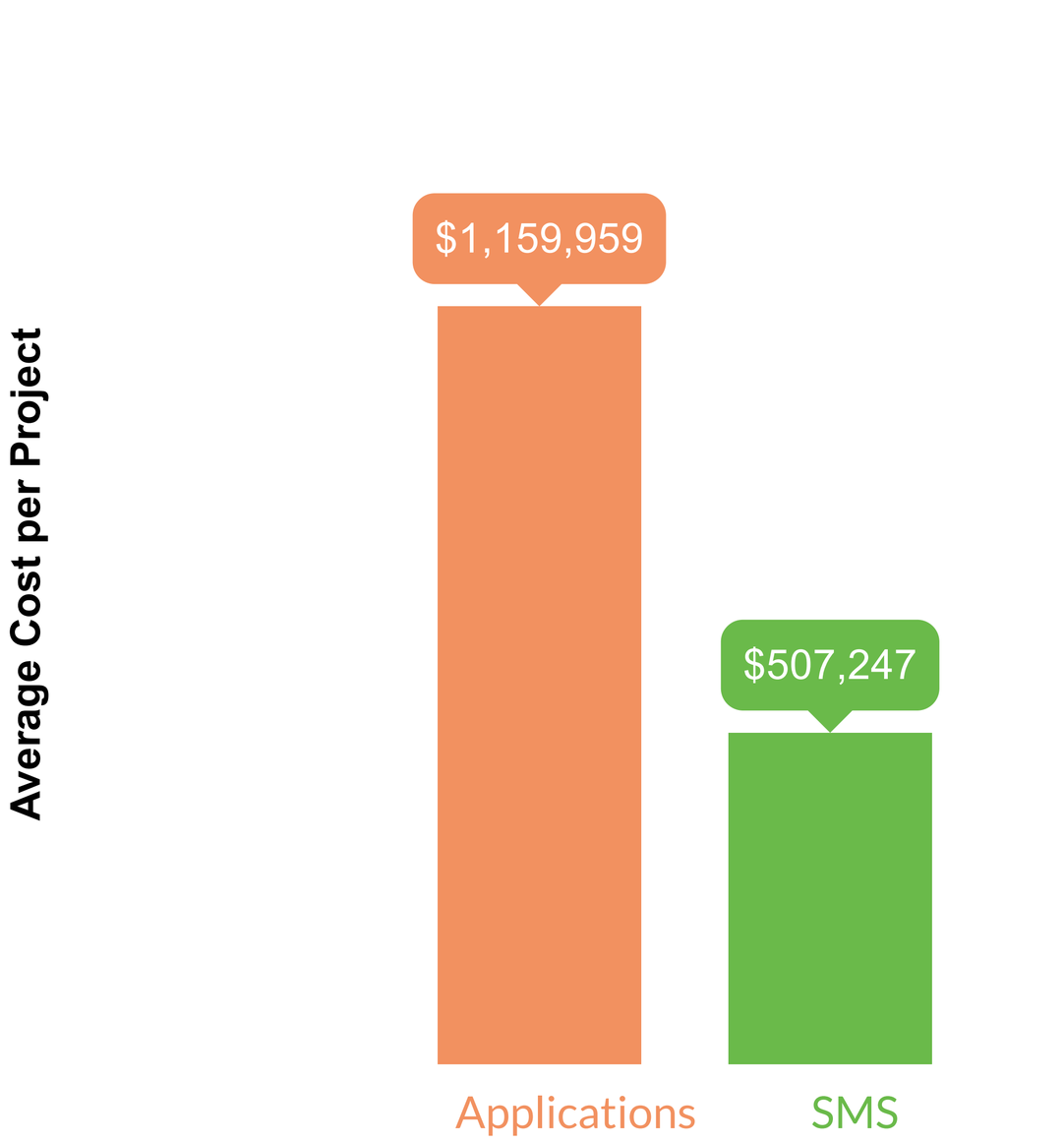
25. Application vs. SMS Projects

The average cost per SMS project is less than half the average cost of a mobile application project. The average cost of an application project across the 8 projects that submitted costing information is $1,159,959, whereas the average cost per SMS project across the 6 projects that submitted costing information is $507,247.

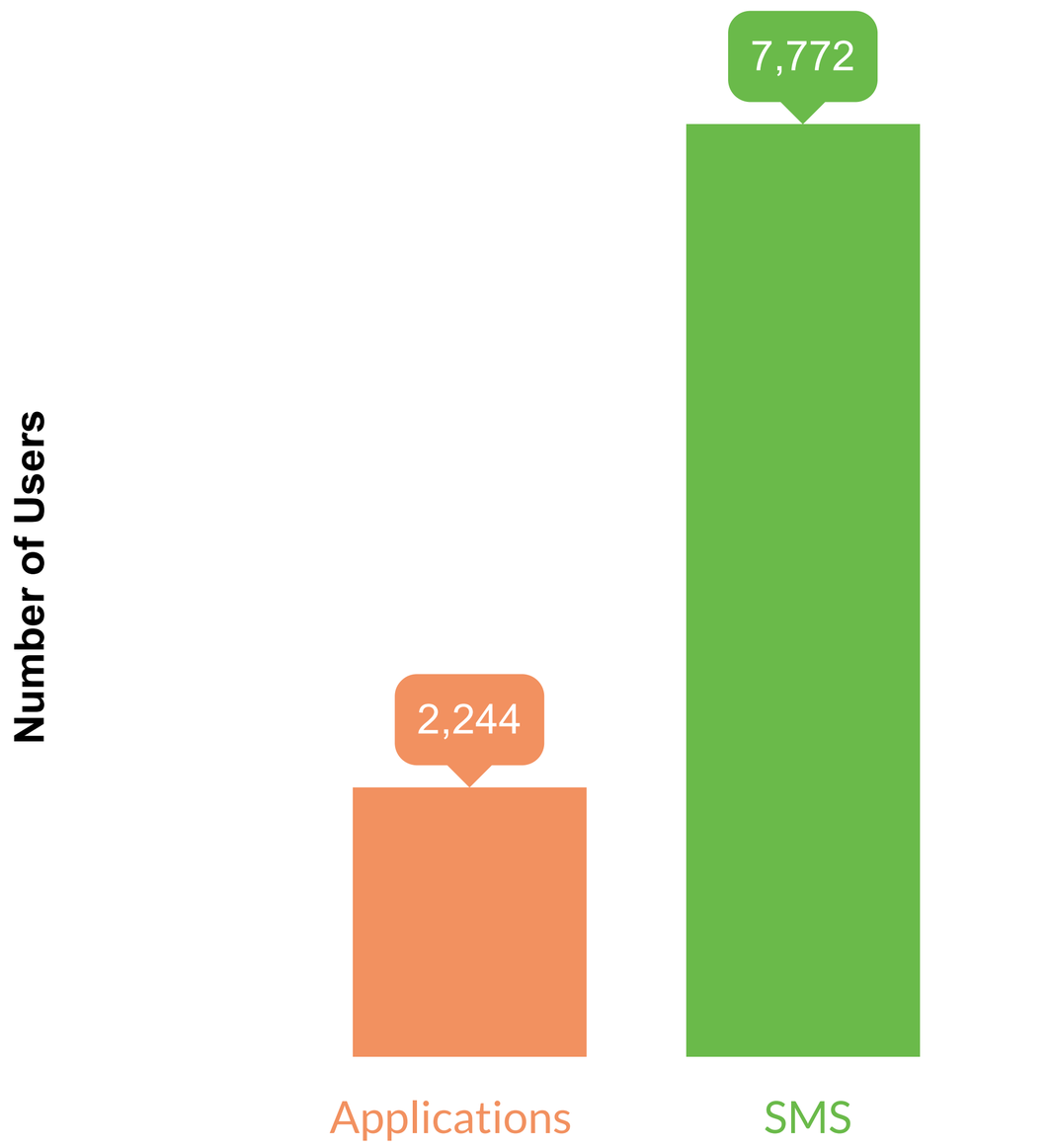
If we split mHealth users by applications and SMS, there are 3.5 times more SMS users (7,772) than application users (2,244). Application projects average 187 users per project, whereas SMS projects average 1,554 users per project.

Applications and SMS each have specific use cases for which they are appropriate, and the appropriateness of the technology, as well as the cost of the tool, should be taken into account with each mHealth project.

25.1 Cost of Application Projects vs. SMS Projects



25.2 Applications vs. SMS Users



On average, SMS projects cost half as much as application projects.

3.5

TIMES MORE SMS USERS

than mobile application users

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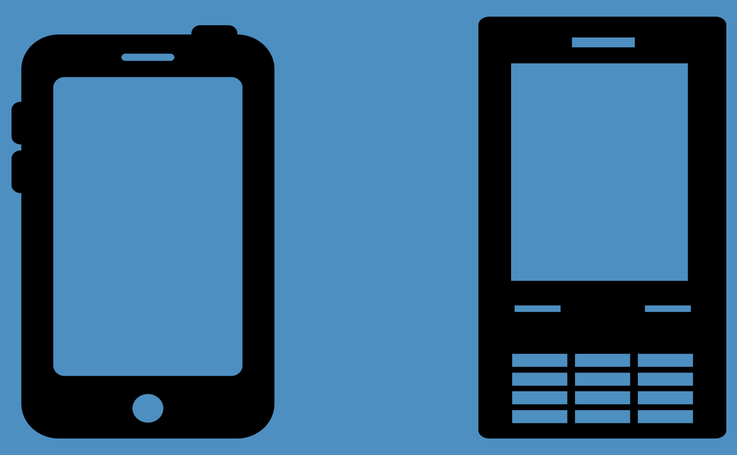
26. Key Takeaways

Malawi has a mature, geographically widespread, robust mHealth ecosystem with a variety of projects at different levels of maturity.

There is a clear trend toward smartphone applications and away from the use of basic phones.



Smartphone applications have not been able to reach a scale beyond a few hundred users, whereas SMS and voice-based projects are reaching regional and national scale.

Projects are concentrated in 3 main healthcare domains:

- Reproductive and Maternal Health
- Infant and Child Health
- Community Health

An annual registration process for mHealth tools provides valuable trend information. The registration should be continued to provide valuable information regarding future policies and standards. The registration should be expanded to include other digital health tools and continue to be conducted by the Ministry of Health.

27. Appendix 1: Registered Projects

PROJECT NAME	ORGANIZATION	CONTACT PERSON	CONTACT EMAIL
Argus Pilot for IDSR Weekly Reporting	Luke International Norway (LIN)	Joseph Wu	wcsg@lukeinternational.no
ASPIRE	Malawi Liverpool Wellcome Trust, Clinical Research Programme (MLW)	Dr. Nicola Desmond	nicola.desmond@lstmed.ac.uk, ndesmond@mlw.mw
Barr Foundation iCCM mHealth Project	D-tree International	Christopher Kulanga	ckulanga@d-tree.org
Chipatala Cha Pa Foni (CCPF) Health Center by Phone	VillageReach		villagereachmalawi@villagereach.org
CMAM Stock Monitoring System	World Vision International (WVI)	Dr. Kovalan	drkovalan@gmail.com
Community Health Tracker	University of Malawi - Chancellor College	Dr. Manda	tmanda@cc.ac.mw
Digital Village Clinic in ECHS project	D-tree International	Christopher Kulanga	ckulanga@d-tree.org
DVC Implementation in SSDI project - Facility IMCI Pilot	D-tree International	Christopher Kulanga	ckulanga@d-tree.org
e-Health for Community Intervention	The National TB Programme	Francis Muwalo	fmuwalo@ntp.health.gov.mw
ECHS Project - Digital Village Clinic (DVC)	D-tree International	Christopher Kulanga	ckulanga@d-tree.org
EID ART Initiation Tracking	Clinton Health Access Initiative	Jonathan Mtaula	jmtaula@clintonhealthaccess.org
eIDSR Case Based Surveillance App	Baobab Health Trust (BHT)	Soyapi Mumba	soyapim@gmail.com
Emergency Triage, Assessment and Treatment (ETAT) mHealth Application	D-tree International	Christopher Kulanga	ckulanga@d-tree.org
One Community Project	Johns Hopkins University	Glory Mkandawire	glorym@jhuccpmw.org
Medic Mobile Do-it-yourself (DIY)	Medic Mobile	Mercy Simiyu	mercy@medicmobile.org

PROJECT NAME	ORGANIZATION	CONTACT PERSON	CONTACT EMAIL
Mentorship and Enhanced Support at Health Facilities	Partners in Health (PIH)	Emily Wroe	ewroe@pih.org
mHealth4Afrika	University of Malawi		ckanjo@cc.ac.mw
Millennium Promise Inc.	Millennium Promise Inc.	Abigail Simkoko	abigail.simkoko@millenniumpromise.org
NeoCare	University of Oslo and Chancellor College	Dr. Manda	tmanda@cc.ac.mw
Organized Network Services for Everyone's Health (ONSE) Integrated Supportive Supervision Toolkit	Management Sciences for Health (MSH)	Rudi Thetard	rthetard@msh.org
Organized Network Services for Everyone's Health (ONSE) - ISS Toolkit	Management Sciences for Health (MSH)	Rudi Thetard	rthetard@msh.org
PMTCT Tracing	Medic Mobile	Mercy Simiyu	mercy@medicmobile.org
Program for Social and Economic Rights	Partners in Health (PIH)	Dr. Emily Wroe	ewroe@pih.org
Program Mwana - RemindMI and Results160	UNICEF	Marie-Claude Villacorta	mvillacorta@unicef.org
RAce iCCM mHealth Application	D-Tree International	Christopher Kulanga	ckulanga@d-tree.org
Screening for Health and Referral at the Community	Partners in Health (PIH)	Dr. Emily Wroe	ewroe@pih.org
Staying Alive	Medic Mobile and AMREF Malawi	Madalitso Tolani	Madalitso.Tolani@amref.org
Supporting LIFE	Luke International Norway (LIN)	Joseph Wu	wcsg@lukeinternational.no
Towards reaching Universal Coverage	World Vision International (WVI)	Alexander Chikonga	alexander_chikonga@wvi.org
UBALE (MIRA Study)	Catholic Relief Services (CRS)	Dane Fredenburg	dane.fredenburg@crs.org

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