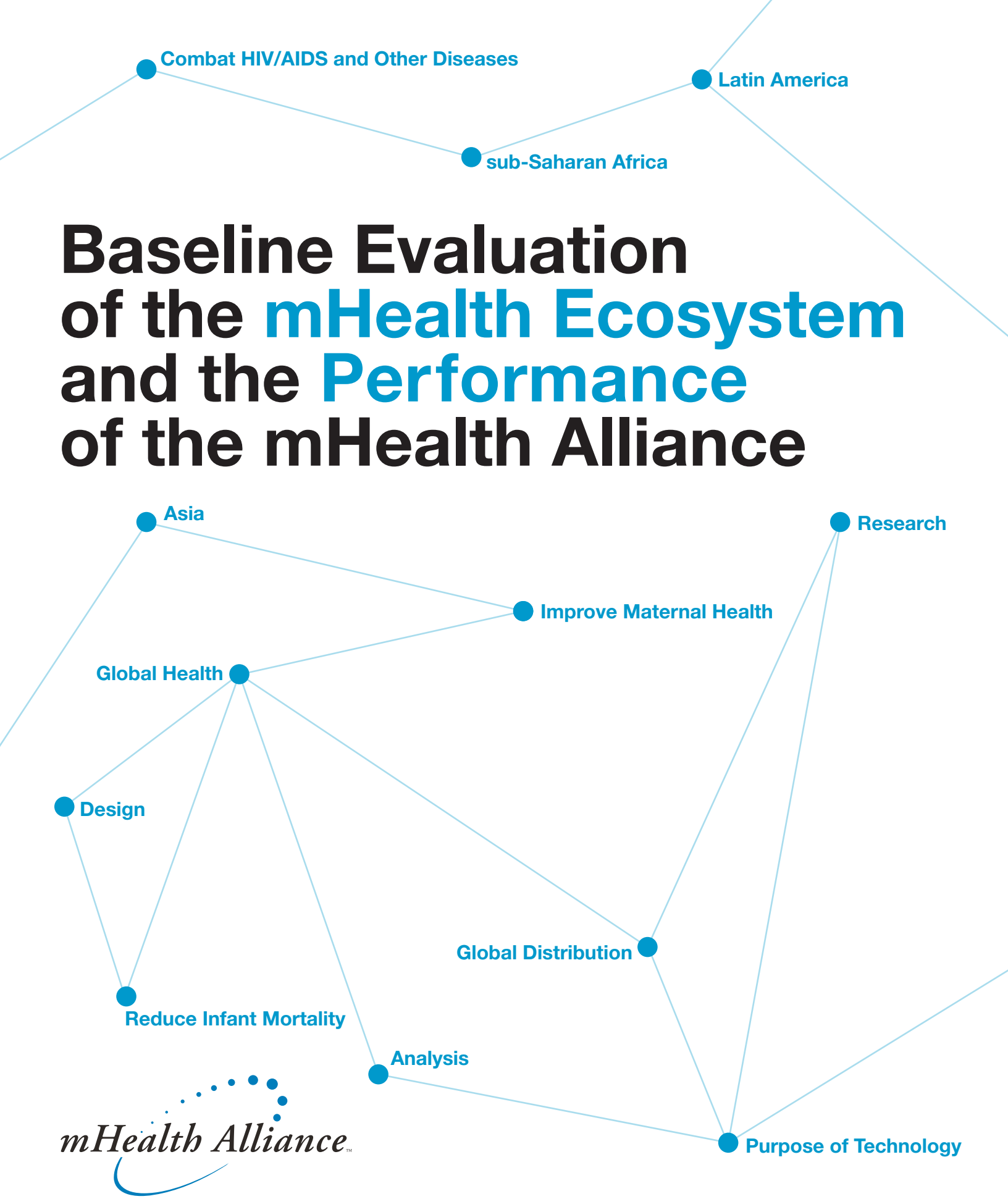


Baseline Evaluation of the mHealth Ecosystem and the Performance of the mHealth Alliance

mHealth Alliance™

December 2012

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

The mHealth Alliance would like to thank Shariq Khoja, Technical Advisor for Evidence, Policy, and Capacity, and Yvette Efevbera, Program Intern, for conducting this study in collaboration with other mHealth Alliance staff, consultants, and partners.

The Alliance would like to express its gratitude to many partners, working group members, and *Every Woman Every Child* Innovation Working Group mHealth catalytic grantees, all of whom provided valuable information and suggestions in conducting the baseline evaluation.

Additionally, the Alliance would like to acknowledge the contribution of Caricia Catalani and the InSTEDD mHealth Working Group, who graciously shared their comprehensive review of thousands of articles on mHealth evidence and allowed the Alliance to adapt findings for the baseline evaluation.

The study would not have been possible without the cooperation of the mHealth Alliance staff and consultants, including Dr. Patricia Mechael, Executive Director; Jonathan Payne, Technical Advisor; William Philbrick, Technical Advisor; Avrille Hanzel, Program Manager; Mandy Sugrue, Community Manager; and Heidi Lelle, HUB Intern.

Finally, we would like to acknowledge the Founding Partners of the mHealth Alliance and other key supporters for their ongoing assistance, which allows the Alliance to continue its work to drive mainstreaming, scale and sustainability of mHealth. The mHealth Alliance Founding Partners include the United Nations Foundation, Vodafone Foundation, Rockefeller Foundation, Norwegian Agency for Development Cooperation (NORAD), Hewlett-Packard, and the GSM Association (GSMA).

ABREVIATIONS

AusAID	Australian Agency for International Development
CHW	Community Health Worker
DFID	U.K. Department for International Development
eHealth	electronic Health
EACA	Europe and Central Asia
EAP	East Asia and Pacific
EHR	Electronic Health Record
EMR	Electronic Medical Record
EWG	mHealth Alliance Evidence Working Group
HUB	Health Unbound online network
IHME	Institute for Health Metrics and Evaluation
IMIA	International Medical Informatics Association
ITU	International Telecommunication Union
IWG	*Every Woman Every Child* Innovation Working Group catalytic grant
LAC	Latin America and Caribbean region
LMICS	Low and Middle Income Countries
MDG	Millennium Development Goal
MENA	Middle East and North Africa
mHealth	mobile Health
mHS	mHealth Summit
MOH	Ministry of Health
MOIT	Ministry of Information Technology
MSM	Men who have Sex with Men
NGO	Non-Governmental Organization
MNCH	Maternal, Newborn, and Child Health
NORAD	Norwegian Agency for Development Cooperation
NIH	National Institutes of Health
PLWHA	People living with HIV/AIDS
RCT	Randomized Control Trial
SIWG	mHealth Alliance Technology Standards and Interoperability Working Group
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

To support its mission of serving as a global catalyst for advancing the use of mobile technologies to improve health throughout the world, the mHealth Alliance implemented a baseline evaluation of the mHealth ecosystem and of the Alliance's performance. This evaluation focused on the adoption of mHealth programs and strategies, particularly in low and middle income countries (LMICs). Moreover, it evaluated the available funding for mHealth, the status and rigor of literature, and the adoption of mHealth standards by the global community. Additionally, it measured the activities of the Alliance for their acceptance and impact.

This report will play an important role in understanding the current landscape of mHealth initiatives, focus areas, evidence, strategies, and funding. The information contained within the report will help the Alliance and other stakeholders plan their future activities. The report also provides analysis of the current activities of the mHealth Alliance and their impact, which will be useful for future evaluations of the Alliance's role.

Objectives: The main objective of the baseline evaluation was to provide information about the current level of adoption, actual implementation, funding, and impact of mHealth in LMICs. The evaluation also measured the impact of the mHealth Alliance on promoting mHealth in the global health ecosystem. Some specific objectives of the baseline evaluation included an assessment of:

1. Current status of adoption of mHealth as part of strategies and programs in LMICs
2. Inclusion of mHealth in the funding of leading global health donors
3. Quantity and quality of publications of some common applications of mHealth
4. Adoption of mHealth-related standards in LMICs
5. Number of *Every Woman Every Child* Innovation Working Group (IWG) grantees that successfully transition from catalytic to sustainable funding
6. Visits to the Health Unbound online network and views of mHealth packages, such as reports and tools
7. Number of people participating in mHealth Alliance capacity-building workshops
8. Progress of mHealth Alliance technical working groups in achieving their objectives
9. Status and composition of mHealth Alliance membership

Process: The mHealth Alliance conducted a baseline evaluation from October to November 2012. Several indicators were identified and developed, as were methods to measure each, across every level of the strategy. Key indicators were selected from the list, which will continue to be tested and refined as necessary over time. The evaluation was conducted at different levels (impact, outcome, organization, and activities levels) to concretely articulate the state of mHealth globally, both at the country level and within the Alliance. To further understand the scope of mHealth at the country level, a sample of nine focal countries representing low, medium, and high mHealth activity levels were selected and investigated within the Asia, Latin America, and sub-Saharan Africa regions.

Key Findings: At the impact level, the baseline evaluation revealed that sub-Saharan Africa had the highest number of identified mHealth projects as compared to the Asia and Latin America regions. Nearly 50% of projects were focused on the United Nations Millennium Development Goal (MDG) 6: Combat HIV/AIDS, malaria, and other communicable diseases. Limited uptake of formal mHealth policies was present globally, and only two of the nine focal countries mentioned mHealth in a national strategic document. Funding for mHealth was limited, as only 22% of the leading 50 global health donors were found to fund mHealth activities.

At the outcome level, the evaluation identified a dearth in the quantity and rigor of evidence for mHealth as determined from 62 articles on a health issue (i.e., HIV/AIDS) and 27 articles on a user group (i.e., community health workers). Uptake of technology standards was also very low, as only one of the nine focal countries belonged to International Organization for Standardization (ISO)

Technical Committee 215 as an observer. On the positive side, the evaluation revealed that the mHealth Alliance has successfully provided support to facilitate technical working groups and that 100% of the IWG grantees surveyed have made a plan for sustainable financing of their project in the post-grant period.

The evaluation also measured outputs at the activities level, including the Alliance's membership of 137 organizations as of October 31, 2012. The Alliance can still reach its goal of 200 members by early 2013.

Recommendations: Several recommendations for the mHealth Alliance and the mHealth community emerged from the baseline evaluation.

1. Increase the number of projects and project reporting on Millennium Development Goals (MDGs) 4, 5 and 6, especially in Asia and South America.
2. Enhance awareness of mHealth among policymakers in LMICs and encourage the formal development of mHealth strategies.
3. Increase awareness among global health funders to identify appropriate mHealth solutions and support mHealth initiatives in LMICs.
4. Increase the number of analytic studies and randomized control trials (RCTs) to enhance the quality of evidence for mHealth.
5. Build capacity among LMICs and enhance adoption of technical, semantic, and process-related standards to improve scalability of mHealth initiatives.
6. The mHealth Alliance, specifically, should increase its membership in LMICs to ensure that these voices are heard at different levels and that the benefits of global efforts reach the countries where there is most demand.

Conclusion:

The mHealth Alliance will continue to track progress on these key indicators over time. Additionally, the Alliance will use the findings and recommendations from the baseline evaluation to improve its own contributions to the greater mHealth community and to strengthen its ability to advise others actively working within the mHealth field.

1. BACKGROUND AND RATIONALE

The mission of the mHealth Alliance is to serve as a global catalyst for advancing the use of mobile technologies to improve health throughout the world, with a focus on low and middle income countries (LMICs). Hosted by the United Nations Foundation, which is designed to support and scale-up United Nations initiatives, the mHealth Alliance is particularly focused on promoting the use of mobile technologies to strengthen the United Nations MDGs 4 (Reduce child mortality), 5 (Improve maternal health), and 6 (Combat HIV, malaria, and other communicable diseases). More specifically, the goal of the Alliance is to mobilize the effective integration of mHealth into global health practices, programs, and policies by building the mobile health commons. The Alliance firmly believes that greater integration of mobile technologies will strengthen the impact that mHealth has on key health issues globally.

As such, this evaluation focused on the adoption of mHealth programs and strategies, particularly in LMICs. Moreover, it evaluated the available funding for mHealth, the status and rigor of literature, and the adoption of mHealth standards by the global community. The activities of the Alliance were also measured for their acceptance and impact.

2. OBJECTIVES

The main objective of the baseline evaluation was to provide information about the current level of adoption, actual implementation, funding, and impact of mHealth in LMICs. The evaluation also measured the impact of the mHealth Alliance on promoting mHealth in the global health ecosystem.

Specific objectives of the baseline evaluation included an assessment of:

1. The current status of adoption of mHealth as part of strategies and programs in LMICs
2. Inclusion of mHealth by the leading global health donors in their funding
3. Quantity and quality of publications of some common applications of mHealth
4. Adoption of mHealth-related standards in LMICs
5. Number of IWG grantees that successfully transition from catalytic to sustainable funding
6. Ratio of page views to number of mHealth packages (reports and tools) available on the HUB online network
7. Number of people participating in mHealth Alliance capacity-building workshops
8. Progress of mHealth Alliance technical working groups in achieving their objectives
9. Status and composition of mHealth Alliance membership

3. PROCESS OF COLLECTING INFORMATION

Several indicators were identified and developed, as were methods to measure each, across every level of the strategy. Through consultation with the Executive Director and other Alliance staff, key indicators were selected from the list, which will continue to be tested and refined as necessary over time. The Alliance will continue to track progress on these indicators, summarize the results, and present findings to the Partnership Board.

The evaluation was conducted at four different levels, which included:

1. Impact level. This level measured the end goal, or the change in the world the mHealth Alliance aimed to see but was not directly responsible for, as many organizations may contribute to this end goal.
2. Outcomes level. This level measured the intermediate progress made towards achieving the end goal that the organization contributed to but was not fully responsible for. The Alliance was

partially accountable for these outcomes, as it played a key role in mobilizing the network to deliver against these targets.

3. Activities level. This level measured the outputs of the Alliance's activities, which the Alliance was directly accountable for producing. This level can be considered the products and services produced by the organization.
4. Organization level. This level included the targets for how well the Alliance was operating, including business processes, staff retention, and satisfaction.

The baseline evaluation also looked at evaluating impact, outcomes, activities, and organizational targets within global and country-level contexts. Several indicators were analyzed globally, with a focus on synthesizing and analyzing mHealth-related data within all countries for which data was available and particularly within LMICs. To ensure more in-depth analysis of policy and strategy documents, the baseline evaluation identified a sample of nine countries, which represented low, middle, and high mHealth activity levels in the Asia, Latin America, and sub-Saharan Africa regions. This sample, also referred to as 'focal countries,' was used on key indicators that required a more specific focus. The countries include India, Bangladesh and Vietnam in Asia, Guatemala Peru and Panama in Latin America, and Tanzania, Nigeria and South Sudan in Africa.

The sources of information and methodology are described in detail below.

3.1 Impact level

At the impact level, described above, key measures included:

a. Contribution of mHealth to MDGs 4, 5, and 6
b. Number of countries with 'mHealth' or 'eHealth with focus on mobile technology' incorporated in national programming
c. Number of leading global health donors with explicit mention of 'mHealth' or 'eHealth with focus on mobile technology' programming or strategic priority (e.g., business plan, annual report, other strategic document)
d. Number of NGOs from focal countries who report using mHealth within a country

Details of specific outcomes, sources of information, and methodology for each indicator are given in the following table.

Measure	Outcome	Sources of Information	Methodology Used
Contribution of mHealth to MDGs 4, 5 & 6	Number and distribution of mHealth projects addressing MDGs 4, 5 & 6	▪Reports ▪White papers ▪Web ▪WHO mHealth survey	1. Selected all mHealth projects recorded in the mHealth Working Group Inventory and Royal Tropical Institute's mHealth Database. 2. Conducted database analysis. 3. Created matrix that categorized projects by MDG and health focus, mHealth application, and region.
Number of countries with 'mHealth' or 'eHealth with focus on mobile technology' incorporated in national programming	Number of countries from sample of nine with mHealth or eHealth incorporated into programming of health initiatives and services	▪MoH ▪MoIT sites ▪WHO mHealth survey ▪Web	1. Conducted web search to generate a table of countries with different levels of mHealth activity by region (i.e., 3x3 table, row: Africa, Asia, Latin America; column: existing policy and reports). 2. Selected nine countries from above grid. 3. Conducted document analysis using national web information.

Number of leading global health donors with explicit mention of 'mHealth' or 'eHealth with focus on mobile technology' programming or strategic priority (e.g., business plan, annual report, other strategic document)	Measure of health-related funding that includes mHealth component	▪IHME report ▪ Donor sites ▪Web	1. Identified leading 50 global health and development donors. 2. Conducted web and document analysis for each of these donors. Note: "leading" was defined as the 50 donors who gave the most money toward global health, based on available data.
Number of NGOs from focal countries who report using mHealth within a country	Measure of field-based implementers aware of and effectively using mHealth	▪WHO survey, ▪Country sites ▪MOH sites ▪Web	1. Identified key information portals, including country websites with health NGO listings, MOH sites, and key informants in field using selected sample of nine countries. 2. Conducted document analysis.

3.2 Outcomes level

At the outcomes level, described above, key measures included:

a. Number, proliferation, and rigor of comparative effectiveness studies across countries
b. Number of countries, and organizations within focal countries, adopting mHealth standards
c. Number of leading global health donors with mobile components
d. Number of projects scaled to two or more districts in the nine focal countries
e. Number of countries that have signed onto WHO eHealth Resolution (2005)
f. Number of countries that have 'mHealth' or 'eHealth with focus on mobile technology' explicitly mentioned in public strategic documents

Details of specific outcomes, sources of information, and methodology for each indicator are given in the following table.

Measure	**Outcome**	**Sources of Information**	**Methodology Used**
Number, proliferation, and rigor of comparative effectiveness studies across countries	Measure of quantity and quality of mHealth evidence, linking mHealth to operational benefits and improved health	Systematic review of mHealth literature	Used systematic reviews conducted by InSTEDD for rigorous landscape analysis and in-depth review of all relevant mHealth literature.
Number of countries, and organizations within focal countries adopting mHealth standards	Measure of technology integration and interoperability at global and/or country level	▪Reports ▪White papers ▪Web	Analyzed country-level adoption of key mHealth standards.

Number of leading global health donors with mobile components	Measure of funding for mHealth activities and sustainability of funding sources	▪IHME report ▪Donor web sites	1. Identified leading 50 global health and development donors. 2. Conducted web and document analysis for each of these donors.
Number of projects scaled to two or more districts in the nine focal countries	Level 1: donor level Level 2: country level - government budgets; organizations	▪IHME report ▪Donor sites, ▪MOH and MOIT sites ▪Web	1. Conducted document and web analysis to identify mHealth projects for each country in sample of nine focal countries. 2. Counted number of projects implemented on a large scale, defined as “in two or more districts”.
Number of countries that have signed onto WHO eHealth Resolution (2005)	Measure of global policies acknowledging and supporting mHealth use	▪WHO eHealth Charter ▪Web	For global level, analyzed eHealth charter for number of signatures.
Number of countries that have 'mHealth' or 'eHealth with focus on mobile technology' explicitly mentioned in public strategic documents	Measure of national-level policies acknowledging and supporting mHealth use	▪MOH and MOIT sites ▪Web	Conducted document analysis using national web information from sample of nine focal countries identified.

3.3 Activities level

At the activities level, described above, key measures included:

a. Number of countries with policy reviews conducted by the mHealth Alliance
b. Number of countries with policy activities supported by the mHealth Alliance
c. Ratio of page views to number of mHealth packages (reports and tools) available on HUB
d. Number of people participating in mHealth Alliance capacity-building and training workshops, excluding Alliance staff

Details of specific outcomes, sources of information, and methodology for each indicator are given in the following table.

Measure	**Outcome**	**Sources of Information**	**Methodology Used**
Number of countries with policy reviews conducted by mHealth Alliance	Measure of the reach (thus, impact) of the Alliance in supporting mHealth policy development	mHealth Alliance records	Identified and examined Alliance records.

Number of countries with policy activities supported by mHealth Alliance	Measure of the reach of the Alliance in supporting mHealth policy development	mHealth Alliance records	Identified and examined Alliance records.
Ratio of page views to number of mHealth packages (reports and tools) available on HUB	Measure of health community capacity to design and deploy mHealth initiatives	HUB reports (including mHealth Online Scorecard and Google Analytics)	Conducted analysis of HUB site statistics to identify number of reports available and downloads within specified one-year time period (November 1, 2011 to October 31, 2012).
Number of people participating in mHealth Alliance capacity-building and training workshops, excluding Alliance staff	Measure of health community capacity to design and deploy mHealth initiatives	mHealth Alliance workshop records	Conducted analysis of mHealth Alliance capacity-building and training workshop records within one-year specified time period (November 1, 2011 to October 31, 2012).

3.4 Organization level:

At the organization level, described above, key measures included:

a. Number of HUB members
b. Number and average duration of HUB visits
c. Number and percentage representation of LMICs at mHealth Summit
d. Number of mHealth Alliance members, disaggregated

Details of specific outcomes, sources of information, and methodology for each are given in the following table.

Measure	**Outcome**	**Sources of Information**	**Methodology Used**
Number of HUB members	Measure of HUB impact, as tool for sharing mHealth information and tools	HUB reports (including mHealth Online Scorecard and Google Analytics)	Reviewed mHealth online scorecard, which collates HUB statistics using Google Analytics, and actual Google Analytics site to tabulate total number of HUB members who had signed up on the HUB website, through October 31, 2012.
Number and average duration of HUB site visits	Measure of HUB impact, as tool for sharing mHealth information and tools	HUB reports (including mHealth Online Scorecard and Google Analytics)	Reviewed mHealth online scorecard, which collates HUB statistics using Google Analytics, and actual Google Analytics site to collect information within one-year specified time period (November 1, 2011 to October 31, 2012).

Number and percent representation of LMICs at mHealth Summit	Measure of mHealth awareness as supported by mHealth Alliance among LMICs	mHealth Summit records	Conducted analysis of mHealth Alliance Summit records within the one-year time period (November 1, 2011 to October 31, 2012) to calculate total number of participants and total number of participants from LMICs.
Number of mHealth Alliance members, disaggregated	Measure of whether mHealth Alliance has met goal of 200-400 members by 2013, with balanced distribution across different sub-groups	mHealth Alliance records	1. Worked with Alliance membership administrator to identify membership records. 2. Disaggregated and calculated totals by member organization's primary sector (e.g., non-profit, private, foundation, academic institution) and primary location (e.g., North America, South America, Africa) through October 31, 2012.

4. KEY FINDINGS

The key findings of the baseline evaluation are presented below in accordance with the specific objective they relate to. The objectives of the evaluation are outlined above.

4.1 The current status of adoption of mHealth as part of strategies and programs in developing countries

The evaluation looked at the number of mHealth projects and initiatives in the LMICs of Asia, Latin America, and sub-Saharan Africa, specifically focusing on MDGs 4, 5, and 6. More than 130 mHealth interventions were identified in the sub-Saharan Africa and Middle East Region, as compared to 50 projects in the Asia and Pacific region and 23 in Latin America. In both sub-Saharan Africa and Latin America, most mHealth projects (48% and 40% respectively) targeted HIV, malaria, or other communicable diseases (MDG 6). In the Asia-Pacific region, a 40% majority of mHealth projects targeted maternal health (MDG 5). These findings are represented in the table below.

	Addressing MDG 4	**Addressing MDG 5**	**Addressing MDG 6**	**Total**
Global distribution	46	58	92	206
mHealth projects in Asia	10	20	17	47
mHealth projects in sub-Saharan Africa	31	41	63	135
mHealth projects in Latin America	3	4	9	16

The following table shows the distribution of mHealth projects in the nine focal countries and the mention of eHealth and mHealth as part of the key strategic documents. Five out of the total nine countries have eHealth or mHealth mentioned in their key strategic documents, whereas only two countries have mHealth mentioned specifically.

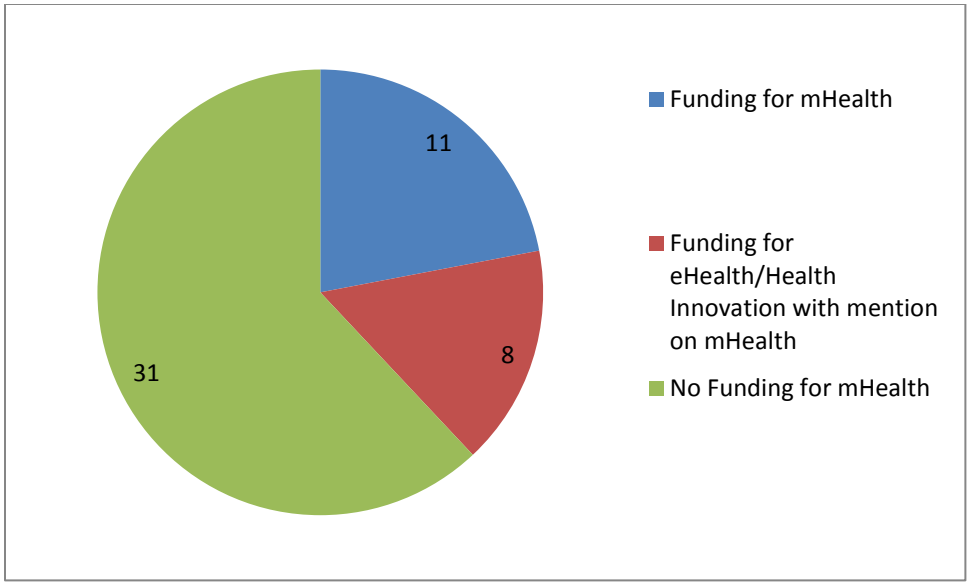
Region	Country	Number of programs identified	Level of mHealth Activity	Number of mHealth interventions that address…			Adoption of …	
				MDG 4	MDG 5	MDG 6	eHealth in national strategic document	mHealth in strategic document
Asia	India	16	High	1	6	6	Yes	No
	Bangladesh	7	Medium	5	5	0	Yes	No
	Viet Nam	1	Low	0	0	0	No	No
Latin America	Guatemala	4	High	0	0	0	No	No
	Peru	2	Medium	0	0	2	Yes	Yes
	Panama	1	Low	0	0	0	Yes	No
Sub-Saharan Africa	Tanzania	21	High	5	8	7	Yes	Yes
	Nigeria	5	Medium	1	2	3	No	No
	South Sudan	2	Low	1	0	0	No	No

4.2 Inclusion of mHealth by the leading global health donors in their funding.

In order to catalyze improvements to maternal, newborn, and child health (MCNH) and diseases such as HIV and malaria using mHealth, support from global health and development donors is key. Contribution from top donors provides greater amounts of funding for mHealth activities while further raising the profile of mHealth. Of the top 50 global health funders identified, 36% provided some funding for mHealth or eHealth focusing on mobile technology. The U.S. government played a large role in supporting mHealth initiatives by providing mHealth funding through USAID and the NIH. Bilateral funding for mHealth also came through DFID, AusAID, and the Norwegian Ministry of Foreign Aid (including NORAD). The WHO and UNICEF were key multilateral organizations funding mHealth initiatives. Philanthropic initiatives, including the Bill and Melinda Gates Foundation, Clinton Foundation, and Rockefeller Foundation, also funded mHealth projects.

The baseline evaluation studied the websites of the 50 leading donors in global health to identify specific funding for mHealth, or inclusion of mHealth as part of other funding programs such as eHealth or health innovations. The table and figure below show the breakdown of donors providing funding for mHealth, eHealth, or neither.

Number (percent) of leading 50 global health donors with specific funding for mHealth	11 (22%)
Number (percent) of leading 50 global health donors with funding for eHealth or health innovations with mention of mobile technology, but no specific funding for mHealth	8 (16%)



4.3 Quantity and quality of publications of common applications of mHealth

This evaluation focused on available evidence in mHealth on one health issue (i.e., HIV/AIDS) and one user group (i.e., community health workers). Existing systematic reviews of published articles conducted by InSTEDD were used, and the data was summarized based on the needs of this evaluation.

A total of 62 articles on HIV/AIDS and 27 articles on the use of mHealth by community health workers were studied. The literature was evaluated under the following criteria:

A. Rigor: The literature generally lacked rigor in terms of the design and methodology used for the studies. Out of the 62 studies on HIV/AIDS, only 35 (56%) were research articles. Of these 35 HIV/AIDS research articles, only 29% used a control group, 14% did some kind of randomization, 34% showed relations between different factors, and 14% showed cause and effect relationship. In comparison, the studies done with CHWs were more rigorous. Out of 27 studies with CHWs, 33% used experimental design while 30% used quasi-experimental designs.

B. Distribution: The following tables shows the distribution of mHealth studies across regions, population groups, purpose of using mHealth, and the taxonomy used in these studies.

Overview of mHealth for HIV/AIDS literature and research (Total articles = 62)			
		n	%
Research	Yes	35	56%
	No	27	44%
Peer-reviewed	Yes	45	73%
	No	13	21%
Rural/urban	Urban	44	71%
	Rural	28	45%
Population	PLWHA	28	45%
	General	17	27%
	Providers	7	11%
	Youth/Teens/Young adults	6	10%
	MSM	3	5%
	Sex workers	3	5%
	Others	5	8%
Region	Africa	18	29%
	North America	14	23%
	Latin America	4	6%
	Asia	3	5%
Purpose of technology	Alerts/reminders	37	60%
	Data collection	15	24%
	Direct voice communication	15	24%
	Educational messaging	8	13%
	Information on demand	7	11%
	EMR/EHR	4	6%
	Decision support	3	5%
	Mapping	2	3%

Design and methodology of the Research Articles (n=35)			
		n	%
Implementation science component	Monitoring/evaluation reports	16	46%
	Operations research	10	29%
	Literature review	6	17%
	Impact evaluation	5	14%
Methods	Quantitative	24	69%
	Qualitative	16	46%
Design	Multiple measurements	12	34%
	Control group	10	29%
	Randomization	5	14%
Study Type	Descriptive	18	51%
	Relational	12	34%
	Causal	5	14%

Table: Overview of mHealth Literature and Research for Community Health Workers (Total articles = 28)			
		n	%
Peer-reviewed	Yes	17	61%
	No	9	32%
Rural/urban	Urban	8	29%
	Rural	13	46%
Populations provided with health services	General	8	29%
	Infants/ newborns	4	14%
	PLWHA	4	14%
	Pregnant women	4	14%
	Women	4	14%
	Others	2	8%
Region	Africa	15	54%
	Central and South America	2	7%
	Asia	1	4%
Purpose of technology	Health data collection	16	57%
	Alerts/ reminders	6	21%
	Decision Support	6	21%
	Information on Demand	5	18%
	Electronic medical record	2	7%
	Mapping	2	7%
	Person-to-person communication	2	7%
	Data quality control	1	4%
	Direct observation	1	4%
	Multimedia Content	1	4%
	Pharmacy management	1	4%

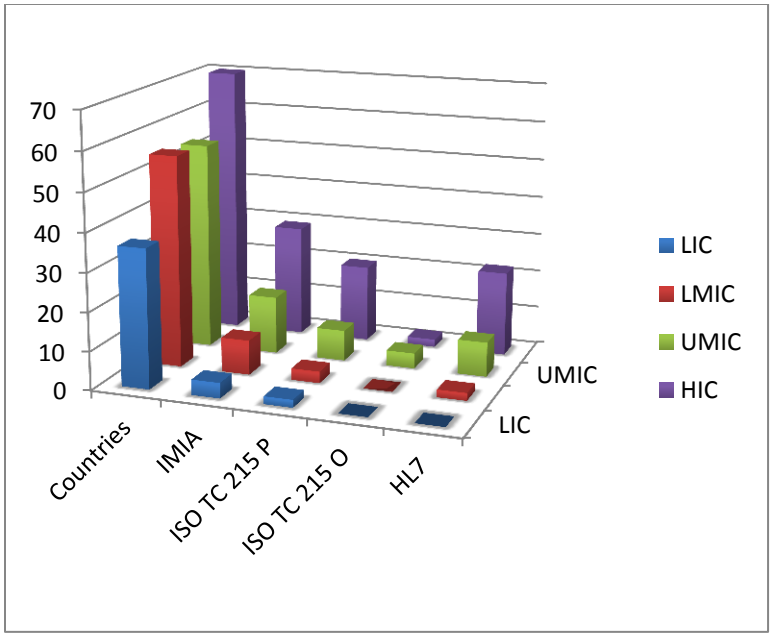
Design and methodology of the Research Articles (n=28)			
		n	%
Theoretical framework	Yes	9	32%
	No	24	86%
Design	Non-experimental	10	36%
	Quasi-experimental	9	32%
	Experimental	8	29%
Methods	Quantitative	12	64%
	Qualitative	18	43%
Unit of analysis (n)	1-9	4	14%
	10-19	4	14%
	20-29	2	7%
	30-39	1	4%
	40-49	0	0%
	50-59	1	4%
	60-69	1	4%
	70-above	11	39%
	500-above	5	18%
Unit of analysis (focus)	CHW	12	43%
	Patients	6	21%
	Facilities	1	4%
	Data/Survey	2	7%
	Events	2	7%

4.4. Adoption of mHealth-related standards in low and middle income countries

The mHealth Alliance recognizes the need for country ownership in implementing consistent technology standards to ensure interoperability and cross-system interaction. Consequently, the baseline evaluation assessed the adoption of technology standards globally, focusing on key standards bodies. The baseline evaluation found three sets of standards for technology and data management to ensure interoperability of mHealth solutions. These include International Medical Informatics Association (IMIA), International Organization of Standards (ISO) and Health Level Seven (HL7). The ISO standards have been adopted by the countries either in 'Participating (P)' or 'Observing (O)' capacities. IMIA is not a standards organization and does not require member countries to have a standards body. However, it does serve as an organization that could be used to reach countries interested in standards but without the resources to engage at the ISO level.

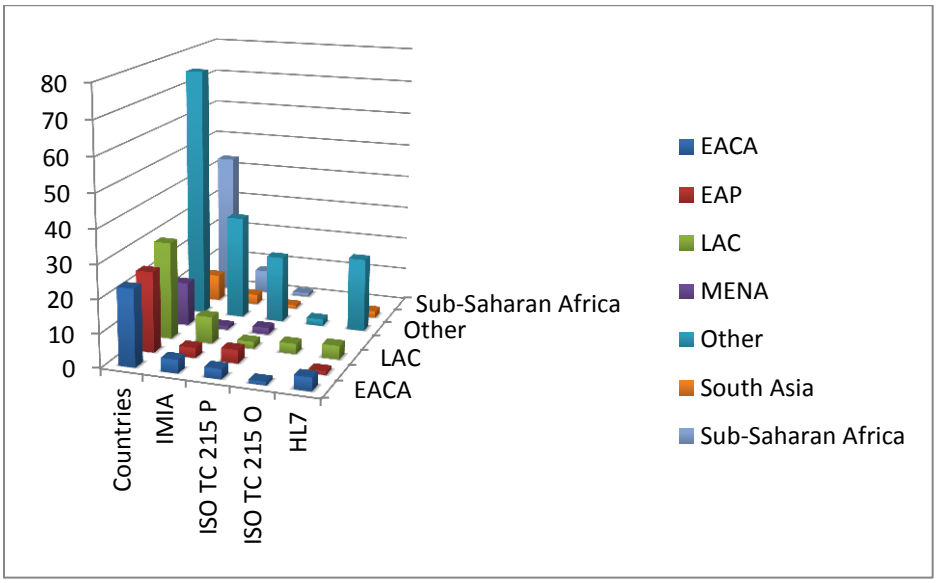
Of the 215 countries included in the assessment, only 15% were participating members of ISO TC 215, considered the 'gold standard' of standards. Additionally, 26% were members of the IMIA. The following table shows the distribution of countries in various income groups adopting various standards.

Membership by Income Group					
Income Group	Countries	IMIA	ISO TC 215 P	ISO TC 215 O	HL7
LIC	36	4	2	0	0
LMIC	55	9	3	0	2
UMIC	54	15	8	4	9
HIC	70	29	20	2	22
Total	215	57	33	6	33



The following table gives regional distribution of countries adopting these standards.

Membership by Region					
Region	Countries	IMIA	ISO TC 215 P	ISO TC 215 O	HL7
EACA	23	4	3	1	4
EAP	24	3	4		1
LAC	29	8	2	3	4
MENA	13	1	2		
Other	75	31	20	2	22
South Asia	8	3	1		2
sub-Saharan Africa	43	7	1		
Total	215	57	33	6	33



The table below shows the adoption of mHealth standards in the nine focal countries. India was the only country formally adopting mHealth standards through involvement as an observer with ISO TC 215 and as a member of HL7.

Region	**Country**	**Level of mHealth Activity**	**Adoption Status**
Asia	India	High	IMIA ISO TC 215 O (BIS) HL7
	Bangladesh	Medium	None
	Viet Nam	Low	None
Latin America	Guatemala	High	None
	Peru	Medium	IMIA
	Panama	Low	None
Sub-Saharan Africa	Tanzania	High	None
	Nigeria	Medium	IMIA
	South Sudan	Low	None

4.5 Number of Innovation Working Group grantees that successfully transition from catalytic to sustainable funding

Eight IWG grantees from the first round of funding in 2011 were asked to complete a survey on the financial sustainability of their projects. Seven of these projects responded to the survey. Of the seven respondents, five received additional funding from an outside source for their IWG catalytic grant project. All projects made plans for sustainability, while 71% identified national governments as the most important factor for achieving funding sustainability. The following table presents key results of the survey.

	Number of IWG projects answering yes (N=7)	Percent
Did your project receive funds from any other sources?	5	71%
Does your institution contribute any funds to the project?	4	57%
Has there been any funding from a government for this project?	4	57%
Do you have any cost recovery from the project activities?	3	43%
If yes, what percent of the cost is recovered?	<10% (all 3)	43%
Have you made any plans for sustainability of the mHealth initiative at the end of IWG grant?	7	100%
If yes, please explain in detail: • Government support and ownership • Using open source solutions • Merged with a larger national program	 3 2 1	 43% 29% 14%
What are the three most important factors for planning sustainability of your initiative? • Government support • Low cost technology • Telcom support	 5 2 1	 71% 29% 14%
What are the three most important barriers for planning sustainability of your initiative? • Government support • Support for hardware/connectivity • Logistic issues of operating in wide geographical area	 4 3 1	 57% 43% 14%

4.6 Ratio of page views to number of mHealth packages (reports and tools) available on Health Unbound

The mHealth Alliance makes packages (e.g. reports and tools) available via its Health Unbound online network (HUB). As of October 31, 2012, there were two packages on HUB, including the Community Health Worker Library and the Child Survival Toolkit. The following table summarizes the use of HUB as an information sharing tool for mHealth. This indicator will particularly be tracked as HUB is renovated based on feedback from the mHealth community.

Ratio of page views to number of mHealth packages available on HUB	980:2
Community Health Worker Library	600 views in last year
Child Survival Toolkit	380Views in last year

4.7 Number of people participating in mHealth Alliance capacity-building workshops

The mHealth Alliance organized 12 capacity-building workshops in the one-year period analyzed (November 1, 2011 to October 31, 2012). A total of 910 people attended these workshops, excluding mHealth Alliance staff. The following table provides the list of workshops, the date and location, and the total participation for each.

Event	Date and Location	Number of Attendees
2011 IWG Grantee Workshop	December 4, 2011, Washington, D.C.	13
mHealth Summit (mHS) National Stakeholder Event	December 2011, Washington, D.C.	250
mHS Participatory Design for mHealth	December 2011, Washington, D.C.	70
mHS Evidence Matters	December 2011, Washington, D.C.	150
mHS MAMA Session	May 2012, Cape Town, South Africa	100
mHS Members Meeting	May 2012, Cape Town, South Africa	40
mHS Leadership Forum	May 2012, Cape Town, South Africa	42
mHS Evidence WG Meeting	May 2012, Cape Town, South Africa	15
IWG Grantee Workshop	June 3-5, 2012, Cape Town, South Africa	15
International AIDS Conference – mHealth 101 session	July 2012, Washington, D.C.	30
International AIDS Conference – PMTCT workshop	July 2012, Washington, D.C.	25
Rio+20 – mHealth Workshop	July 2012, Rio de Janeiro, Brazil	35

4.8 Progress of mHealth Alliance technical working groups in achieving their objectives

To address key strategic priority areas, the mHealth Alliance hosts technical working groups to discuss and generate solutions to furthering the agenda of mHealth. Of the several key mHealth leaders convened to participate in these working groups, three completed surveys sharing their perspective of their respective working groups' activities and the Alliance's role in supporting them. Despite a small number of respondents, the Evidence Working Group revealed greater success in accomplishing the activities and objectives laid out for the working group. Both the Evidence Working Group and the Technology Standards and Interoperability Working Group members shared that the mHealth Alliance played a key role in logistically supporting the group and encouraging them to pursue their objectives. Results from the survey are below.

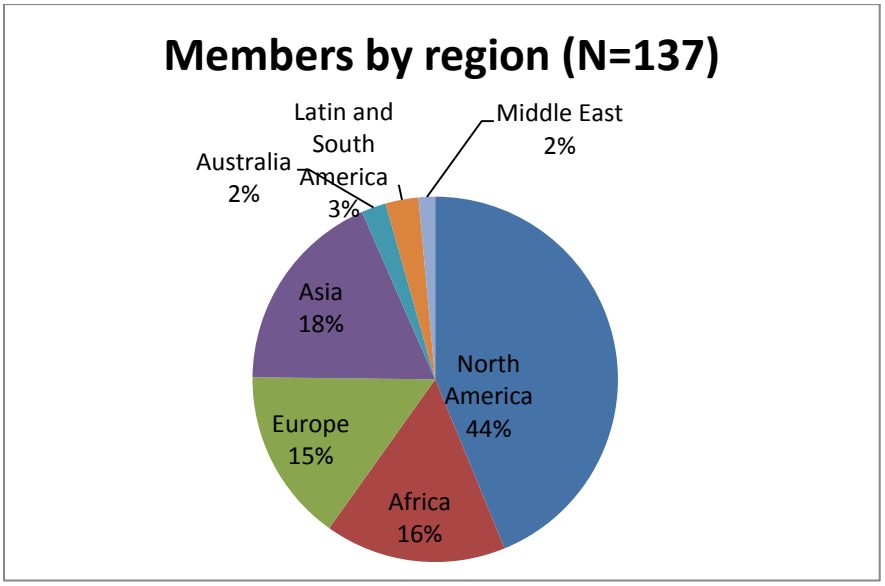
	Evidence Working Group (N=2)	Technology Standards and Interoperability Working Group (N=1)
What were key objectives set for the working group when it started?	1. Identification and promotion of research to generate credible evidence. 2. Join key actors to interact and interchange knowledge and good practices on mobile health applications and use. 3. Start moving forward to accomplish the list of ten deliverables.	1. Implementers in different places with different organizations with different platforms deploy open "standards," ideally based on global standards (e.g., HIS messages or technologies) to solve key interoperability issues in their workflow. 2. Countries have adopted and implemented 1 of 3 registries (Facility registry/provider registry/ patient registry) based on shared, open source, standards-based reference implementation. 3. Clearly published and documented roadmap of how to use these standards.

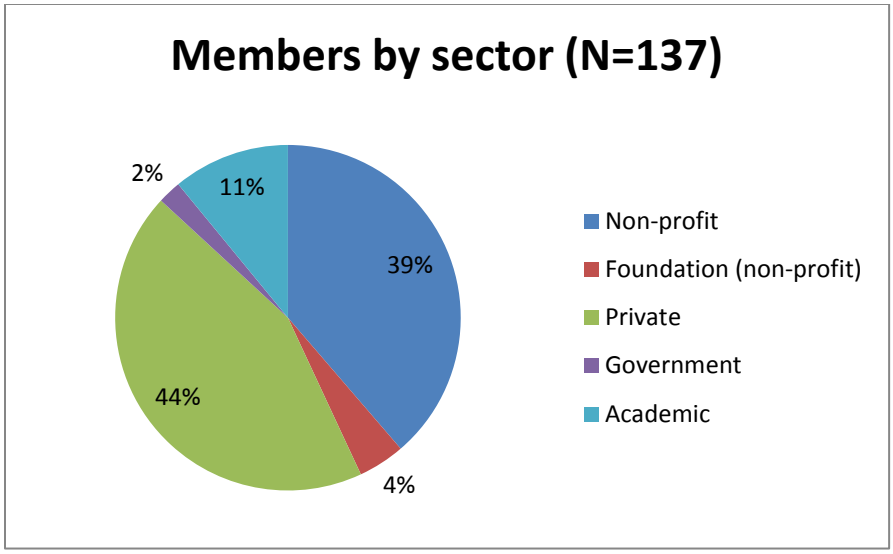
What were your key expectations from the working group?	1. To understand the pathways through which mHealth influences health outcomes and how such evidence/impact/role of mHealth can be measured. 2. Highlight key examples of such evidence from implementation projects. 3. Disseminate ways for implementation projects to understand how and what aspects of mHealth projects work. 4. Contribute to the identification, analysis, and dissemination of the best evidence in order to support public health solutions in LIMCs. 5. Create the EWG Communities of Practice with a wide vision and scope on evidence matters. 6. Produce key resources that would support policy making.	1. To better understand the challenges of interoperability and standards from the perspective of the mHealth world and influence key stakeholders. 2. Promote greater use of architecture and standards by mHealth applications and implementers. 3. Promote greater convergence of mHealth applications around a common eHealth architecture.
Which of the key objectives have either been achieved or made significant progress?	1. Determining the pathways through which mHealth works. 2. Disseminating evidence on mHealth through the Communities of Practice group is also working well. 3. Joining key actors to interact and interchange knowledge and good practices on mHealth applications and use.	Some progress in getting a better understanding of the challenges of interoperability and standards from the perspective of the mobile health world and influencing key stakeholders.
Which of the key objectives have not made significant progress and why?	1. Identification and promotion of research to generate credible evidence.	Objectives 1 and 2 have not made significant progress, as it has taken time to establish the working group, develop and agree on the charter, and establish working group members. The charter was changed during the course of 2012.
Which of your key expectations have either been achieved or made significant progress?	Create the EWG Communities of Practice with a wide vision and scope on evidence matters.	Objective 1. We are beginning to have a clearer understanding of the issues involved in application of standards and interoperability for mHealth applications.
Which of the key expectations have not made significant progress?	Produce key knowledge resources that would support policy making.	We have not made significant progress in the practical goals, as this was removed from the charter as a result of budgetary limitations.

How, if at all, did the mHealth Alliance play a role in facilitating working group progress?	1. Setting up the sub groups and identifying group members and chairs. 2. Bringing important resources to strengthen EWG activities; Alliance staff have been devoted in a high professional way, promoting the calls, supporting the co-chairs and activities, and responding to the different demands of the EWG members.	The mHealth Alliance was central in driving the working group forward.

4.9 Status and composition of mHealth Alliance membership

Membership in the mHealth Alliance is free and open to institutions across all sectors that are actively engaged or interested in mHealth. Members of the Alliance join the Founding Partners and Partnership Board Members in supporting the Alliance's efforts to mainstream mobile technologies into global health. The mHealth Alliance had 137 member organizations committed to mHealth, as of October 31, 2012. Nearly 40% of these members were based in Asia, Africa, or Latin America. Most members (44%) belong primarily to the private sector while 39% were non-profit organizations. Members also represented academic, foundation, and government institutions. The following graphs show the distribution of members across regions and sectors.





5. RECOMMENDATIONS AND CONCLUSION:

Based on the key findings and results reported above, the mHealth Alliance has identified the following six key recommendations:

1. Increase the number of projects and project reporting on MDGs 4, 5, and 6, especially in Asia and South America. More focus is required on MDGs 4 and 5, as well as on support for the efforts of governments and international agencies using mHealth solutions. Also, since the distribution of mHealth initiatives among LMICs is very uneven, greater support should be ensured for the countries with low and medium adoption of mHealth to allow these countries to implement additional programs.
2. Enhance awareness of mHealth among policy-makers in countries without mHealth strategies or policy documents on mHealth and encourage the formal development of mHealth strategies at the national level.
3. Increase awareness among global health funders to identify appropriate mHealth solutions and support mHealth initiatives in LMICs.
4. Encourage more analytic studies and randomized control trials (RCTs) to enhance the quality of evidence for mHealth.
5. Build capacity among LMICs and enhance adoption of technical, semantic, and process-related standards to improve scalability of mHealth initiatives.
6. Encourage organizations from LMICs to acquire membership in the mHealth Alliance to ensure that these voices are heard at different levels and to strengthen the delivery of benefits in the countries where there is greatest demand.

In conclusion, the mHealth Alliance conducted the baseline evaluation to assess the mHealth ecosystem, as well as the Alliance's contributions to it. The Alliance focused on measuring several objectives through operationalizing key indicators that assessed progress at the impact, outcome, activity, and organizational levels. The mHealth Alliance will continue to track progress on these key indicators over time. Going forward, the Alliance will use the findings and recommendations from the baseline evaluation to improve its own contributions to the greater mHealth community and to strengthen its ability to advise others actively working within the mHealth field.