mHealth Mobile Messaging Toolkit: Considerations When Selecting a Mobile Messaging Platform Vendor

OCTOBER 1, 2014

MAMA
Mobile Alliance for Maternal Action

mHELP

PATH

ACKNOWLEDGMENT

This toolkit was developed by PATH with funding from the mHealth Expert Learning Program (mHELP) and the Mobile Alliance for Maternal Action (MAMA), made possible by the United States Agency for International Development. The views expressed herein are solely those of PATH and do not necessarily reflect the views of the funders.

AUTHORS

Matt Morio, *Consultant*

Hallie Goertz, *Learning and Communications Specialist, PATH*

Brian Taliesin, *Systems Analyst, PATH*

Kate Wilson, *Director, Digital Health Solutions, PATH*

ABOUT PATH

PATH is the leader in global health innovation. An international nonprofit organization, we save lives and improve health, especially among women and children. We accelerate innovation across five platforms — vaccines, drugs, diagnostics, devices, and system and service innovations — that harness our entrepreneurial insight, scientific and public health expertise, and passion for health equity. By mobilizing partners around the world, we take innovation to scale, working alongside countries primarily in Africa and Asia to tackle their greatest health needs. Together, we deliver measurable results that disrupt the cycle of poor health. Learn more at www.path.org or email tsdhs@path.org.

ABOUT MHELP

The mHealth Expert Learning Program (mHELP) provides support and technical assistance to individuals, governments, the private sector, and non-governmental organizations in low- and middle-income countries that wish to implement electronic health (eHealth) and mobile health (mHealth) into their health programs. Focused on improving reproductive health, maternal, newborn and child health, and HIV and AIDS, mHELP offers a range of services designed to build capacity and strengthen implementation. For more information, please visit http://www.mhelp.org or email to info@mhelp.org.

ABOUT MAMA

Mobile Alliance for Maternal Action (MAMA) delivers vital health information via mobile phones to new and expectant mothers living in poverty throughout the developing world. Hosted by the United Nations Foundation, MAMA provides age and stage-based messages aligned with global best practices, empowering women to make the best decisions for themselves and their families. MAMA was launched in 2011 by then Secretary of State Hillary Clinton as a public private partnership between USAID, Johnson & Johnson, United Nations Foundation, mHealthAlliance and BabyCenter. For more information visit http://mobilemamaalliance.org or email info@mobilemamaalliance.org.

Suggested citation: PATH. *mHealth Mobile Messaging Toolkit: Selecting a Mobile Messaging Platform Vendor.* Seattle: PATH; 2014.

TABLE OF CONTENTS

About this Toolkit

WHAT?

This toolkit provides information about currently available mobile messaging technology solutions, as well as things to consider when selecting a vendor and deploying a mobile health, or mHealth, campaign. It is meant to be used with other resources on project design, content development, and behavioral change communications, including *Planning an Information Systems Project: A Toolkit for Public Health Managers.*[1]

WHO?

This toolkit is designed for mHealth project implementers looking to deploy mobile messaging campaigns to encourage healthy participant behaviors in low- and middle-income countries. Whether a project is in the early design phase or preparing for implementation, this toolkit will help project implementers navigate through critical questions ensuring that the vendor of choice matches the goals and needs of the pilot project as well as the project at scale.

WHY?

The mobile technology marketplace is very dynamic. Not only is the technology evolving but so are the infrastructure and politics around mobile communications. This toolkit looks to provide frameworks for evaluating the best solution for a mHealth project within this environment.

TOOLBOX

Please refer to the "Additional resources" section for suggestions of other informational materials, guides, and tools.

1 World Health Organization, PATH. *Planning an Information Systems Project: A Toolkit for Public Health Managers*. Seattle: PATH; 2013. Available at: http://www.path.org/publications/files/TS_opt_ict_toolkit.pdf.

Glossary

eHealth	Electronic health
GSM	Global system for mobile communications (formerly Groupe Spéciale Mobile)
IVR	Interactive voice response
M&E	Monitoring and evaluation
MAMA	Mobile Alliance for Maternal Action partnership
mHealth	Mobile health
mHELP	mHealth Expert Learning Program
MMS	Multimedia Messaging Service
MNO	Mobile network operator
NGO	Nongovernmental organization
PATH	Program for Appropriate Technology in Health
SIM	Subscriber identification module (general reference to a SIM card)
SMS	Short message service (common text message limited to 160 characters)
UNICEF	United Nations Children's Fund
USSD	Unstructured Supplementary Service Data

Introduction

There are more than a billion mobile devices in the world. Mobile devices are increasingly being used to reach under-served, low-income, or remote populations.[2] We are seeing that mobile messaging can drive behavioral change.[3] Once health program implementers have chosen to use the power of mobile devices to influence health behavior, the challenge then is selecting and applying the appropriate mobile technology to address a health problem so that there is an actual behavioral impact. Unfortunately, this is not as simple as selecting a vendor, uploading a few files, and pressing go. Being aware of the key considerations in choosing a mHealth application can help implementers avoid common pitfalls in information and communication technology projects. For example:

- What are the capabilities of your organization?
- What is the technology scope and scale you want to achieve?
- What are the project requirements?

The toolkit provides practical step-by-step questions that global health program implementers may want to consider when planning and selecting the most appropriate communications vendor and application for use in a particular behavioral change intervention or country.

We have focused explicitly on solutions and services that can be oriented to the size and context of MAMA projects, which are typically between 1,000 and 3,000 participants or subscribers. However, the principles and recommendations can be adapted for any small technology project supporting behavior change. Larger programs also can still use this guide, keeping in mind that their planning and implementation will be more complex, possibly involving outreach and marketing campaigns, multimedia and online presence, and custom software development, which are outside the scope of this guide.

In the first section of this toolkit, we will review the eight essential steps in planning and preparing for a mobile health (mHealth) project. We then will discuss key considerations for each step, with an end goal of selecting a vendor that can help implement a successful mobile messaging project. You will find a summary of some illustrative vendors, as well as helpful budget worksheets in the appendices.[4]

MAMA

The Mobile Alliance for Maternal Action (MAMA) is a global partnership that provides vital health messages to new and expectant mothers in developing countries via their mobile phones in order to support a healthy pregnancy and the all-important first months of a child's life. MAMA provides two types of messages: core messages are built around key health behaviors and interventions and are arranged by "age and stage," while topic-based messages have been designed on infant feeding, post-partum family planning, and other requested topics.

Early results show an increase in pre and postnatal visits to health clinics and increased knowledge around nutrition and other vital information.

Expected outcomes include:

- Reduced maternal deaths.
- Reduced childbirth complications/ deaths.
- Healthier and more informed communities.

For more information, please visit:

http://www.mobilemamaalliance.org

2 International Telecommunication Union (ITU). *ICT Facts and Figures*. Geneva: ITU; 2013. Available at: http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2013-e.pdf.

3 Page on Data and Evidence. MAMA website. Available at: http://www.mobilemamaalliance.org/evidence. Accessed August 1, 2014.

4 The vendor list and capability descriptions were developed by compiling existing references, including MAMA's Technical Platform for Mobile Messaging resource. We then sent a survey to all of the compiled vendors. Only those who responded to this survey are included in this toolkit. This is meant to be a dynamic resource and vendors can be added by contacting PATH.
Page on Technical Platforms for Mobile Messaging. MAMA website. Available at: http://www.mobilemamaalliance.org/sites/default/files/Mobile%20Messaging%20Tech%20Platforms%20.pdf. Accessed August 1, 2014.

Information System Planning in Eight Steps

Before starting out, it is a good practice for any mHealth project to review the eight essential steps to planning an impactful information systems project, as outlined in *Planning an Information Systems Project*.

STEP 1. DEFINE OUTCOMES: How will a better information system benefit you? How should you define the scope? How will you measure success?

STEP 2. FORM YOUR TEAM: What skills and roles are required to bring your project to a satisfying outcome?

STEP 3. DEFINE WHAT YOUR SYSTEM NEEDS TO DO: How can you define your requirements for the system?

STEP 4. FIND THE RIGHT SOLUTION: Should you buy or build your system? Do you select an open-source or proprietary system? How do you evaluate different systems and select the best one?

STEP 5. SELECT THE RIGHT VENDORS: How do you make sure you select the best providers of technical services?

STEP 6. ESTIMATE IMPLEMENTATION AND OPERATING COSTS: How much will your project cost to pilot, scale up, and maintain?

STEP 7. CREATE AN IMPLEMENTATION PLAN: How long will it take to develop, pilot, and scale up?

STEP 8. UNDERSTAND AND MANAGE PROJECT RISKS: What can go wrong and how can you plan for that?

STEP 1. DEFINE OUTCOMES

In implementing mHealth projects like those of the MAMA partnership, much of the groundwork on best practices, processes, and requirements have already been documented through the learning community.[5] It is, however, still a good idea to get project leaders and advisors to agree on the scope and scale of a project so that appropriate requirements can be documented. In this toolkit, we focus on solutions and services for a messaging project that will initially deploy with 1,000 to 3,000 subscribers. However, these can be adapted to smaller and larger projects.

5 Page on Tools and Resources. MAMA website. Available at: http://www.mobilemamaalliance.org/tools-and-resources. Accessed August 1, 2014.

STEP 2. FORM YOUR TEAM

In forming your project team, it is important to carry out a resource assessment to ensure you have both the critical in-country support and technological capacity and availability to develop (or configure), deploy, and operationalize a messaging platform. Critical questions to ask include:

- Does the required staff exist internally?
- Who will manage and maintain the platform and databases?
- What sort of support will be provided to end users (e.g., call center, registration support)?
- Where can the vendor provide the knowledge and skills needed?

NOTE: We will assume that, because you are reading this toolkit, you will be adding an outside vendor to your team to provide the appropriate messaging platform technology.

STEP 3. DEFINE REQUIREMENTS: WHAT DOES YOUR SYSTEM NEED TO DO?

In this section, we will review some of the key considerations in defining requirements for a mobile messaging program. We will look at the project itself, as well as the messaging platform.

OVERALL PROJECT

PILOT TO SCALE: HOW LARGE WILL IT GET?

It is essential to keep the intended scale of the project in mind when planning a pilot. The decisions made now should be made with scaling-up needs and processes in mind. For example, if you selected a platform that runs solely on a laptop computer and modem yet plan to scale up nationally, the conversion to a web-based application and data centers of a mobile network operator (MNO) may be prohibitively costly and require a complete replacement of the underlying information system. However, if the program is only intended to scale up to a district or regional level, the laptop platform may be sufficient.

These are a few key questions to think about early in the design and development phases of a proposed mHealth pilot program:

- After a successful pilot, is there support to scale up the program?
- Have proper channels, partners, and promotional campaigns been established?
- How will the end user experience be affected?
- What is the financial impact of adding subscribers and/or increasing the volume of messages?
- How easy is it to scale up the program?
- What additional hardware is needed? Are additional human resources needed?
- Is there financial and stakeholder support for the scale-up?

LARGER SCALE IMPLEMENTATIONS

More integrated, full-service vendors such as MOTECH/Grameen Foundation; Praekelt Foundation; Innovative Support to Emergencies, Diseases, and Disasters (InSTEDD); or Text to Change can offer deeper design and integration solutions. Examples of large-scale implementations exist on each vendor's website.

These larger vendors offer great consulting and customization options for their messaging solutions. As you evaluate vendors, you will need to look at the value for money and be careful not to over-purchase a solution. Well-defined requirements that correlate to program adoption and impact will help manage "scope creep."

SUBSCRIBERS: HOW MANY PARTICIPANTS WILL HAVE ACCESS?

It is also important to understand the capacity of the target population to access and use mobile technology. For example:

- How many participants have mobile phones?
- What is the literacy rate?
- What is the market share of telecommunications companies in the targeted region?
- What is the local language? (If there is more than one, what proportion of participants uses each?)

MONITORING AND EVALUATION: HOW WILL IMPACT BE MEASURED?

Evidence on the success of any mHealth pilot vis-à-vis more traditional health programming should be an early design consideration. We recommend developing monitoring and evaluation (M&E) benchmarks and reporting requirements with input from key stakeholders, ensuring that they are a component of the overall health program's M&E plan. This could be a simple Excel spreadsheet with registration and subscriber information, more complex delivery receipt success/failure logs, or a reporting system that is integrated with existing electronic health (eHealth) platforms so that mothers' clinic visits can be cross-referenced with messaging reminders as part of overall project reporting.

CONTENT DEVELOPMENT AND LANGUAGE SUPPORT: WHAT IS THE LOCALIZATION PLAN?

Establish a plan to translate and/or adapt the messages to the appropriate delivery tone and voice for your subscribers. If you plan to record voice messages, identify the messages and type of persona or actor (voice, tone, etc.) that will have the greatest positive effect on behavior given the cultural context. You will also want to develop a messaging distribution schedule tied to key events.

COUNTRY HOSTING REQUIREMENTS: WHERE WILL THE DATA BE STORED?

It is important to understand the data policies and regulations in the context where you will operate when considering where to store the data that you collect via mobile messaging. Keeping health care and patient data private is a major concern. See Table 1 for information on hosting options and important questions to consider regarding each of them.

Table 1. Overview of data hosting options.

Hosting Option	Software as a Service (SaaS)/cloud	Private cloud	Locally hosted
Servers	Shared	Not shared	Project controlled
Location	Data centers, typically out-of-country	Data centers, typically in-country	Organization, in-house
Cost	Lowest	Higher	Highest
Questions to ask	Where are the servers located? How is the data stored and processed? Are they compliant with local policies/regulations?	How are the servers structured? Where are the servers located? How is the data stored and processed? Are they compliant with local policies / regulations?	What hardware requirements are needed to host the platform? Does the organization have the resources to deploy and maintain the system?

MESSAGING PLATFORM REQUIREMENTS

LITERACY AND LANGUAGE: WRITTEN OR VOICE MESSAGING?

As we noted before, it is important to assess the literacy and language of the target population, or subscribers, early. This information will be essential to help you decide whether written (short message service, or SMS) or voice messaging (interactive voice response, or IVR) is most appropriate for your project. Table 2 compares the two systems.

SOME IVR-CAPABLE VENDORS WORKING IN MHEALTH:

- DataDyne
- engageSPARK
- Push Mobile Media
- TextIt
- VOTO Mobile
- Vumi/Praekelt Foundation

- **Interactive voice response or IVR** is an automated telephone system that interacts with callers using programmed information drawn from a database, including prerecorded voice responses. Callers respond by pressing digits on their phones or by speaking short phrases or words.
- **Short message service or SMS** is a standardized protocol that allows mobile phone devices to exchange short text messages.

Table 2. Overview of IVR versus SMS messaging.

System	IVR	SMS
Subscriber literacy	Low	High
Cost	Higher	Lower
Local language	Tone and intent are NOT easily communicated in written form	Tone and intent are easily communicated in written form
Platform	Can support multiple languages	Can support multiple languages

Note: IVR, interactive voice response; SMS, short message service.

ADDITIONAL CONTENT OR INTERACTIVITY: ARE THEY NEEDED?

In addition, to basic text or voice messaging you also might want to send pictures or videos, or provide a callback or interactive service.

- **Unstructured Supplementary Service Data (USSD)** is a protocol that creates a real-time open connection between a global system for mobile (GSM) communications and a remote service, which allows it to be more responsive than SMS. This protocol can be also be used to provide callbacks.
- **Multimedia Messaging Service (MMS)** is a protocol that allows for rich content, such as pictures or videos, to be sent to and from mobile phones.

REGISTRATION: WHAT IS THE ENROLLMENT PROCESS?

Establish how subscribers will enroll or register with the program by considering the following questions:

- Will registration be via SMS or IVR?
- Does the platform need to offer online/web registration capabilities?
- Will you use community health workers to register mothers in person or at a clinic?

- Will subscribers register on their own via their own mobile devices?
- What questions will be asked upon registration?

NOTE: These same questions should be asked in regard to opt out processes.

OUTREACH: HOW WILL PARTICIPATION BE ENCOURAGED?

It is not enough for the government or an organization to think that a mobile messaging project is needed; there needs to be demand or obvious benefits for the subscribers to join. A marketing plan and budget should be agreed upon for a pilot implementation as well as for a larger scale implementation, which should take into consideration:

- How will subscribers become aware of the service?
- Will media (print, radio, etc.) be used to create interest?
- What plan is there to reach the targeted number of subscribers for a pilot?

TIP: The MAMA website at www.mobilemamaalliance.org has great resources to help convey the value and benefits to mothers of enrolling in a program.

SHORT CODES: DO YOU NEED ONE?

Short codes are special telephone numbers, typically four to six characters long, that can be used to send and receive SMS messages (e.g., text "join" to 55333 to enroll). Custom short codes may be available in certain networks, and it is also possible to share a short code with other organizations.

- **Benefits:** offer reverse billing (e.g., free to end user), easy to remember number for subscribers.
- **Drawbacks:** may be expensive and/or time-consuming to set up.

SOME VENDORS OFFERING ASSISTANCE SECURING SHORT CODES:

- engageSPARK
- InSTEDD
- Push Mobile Media
- TextIt
- VOTO Mobile

CUSTOMER SUPPORT: HOW WILL HELP BE PROVIDED?

You also want to think about how subscribers will get help if they have a problem—either with the technology or with health-related issues. Some questions to answer include:

- Is two-way mobile messaging communication part of the program?
- Is the program going to offer support services such as a helpline or the ability to request a call back via SMS? What hours will it be staffed (e.g., on weekends or when clinics are closed)?
- How will you connect: SMS only or voice?
- Will you provide call-back services for flashing?

FLASHING

Flashing is a method of communication used in several low-resource countries in which a caller places a phone call but quickly hangs up before their call is answered to avoid being charged for a call. The recipient calls the number back, thus incurring the charges.

TRANSMISSION: HOW WILL MESSAGES BE SENT?

This is an important question related to the number of subscribers the project is targeting. Details are provided below and a summary is provided in Figure 1.

- Direct to mobile: Smaller programs and proof-of-concept pilots (less than 1,000 subscribers)may only need a platform that supports a very simple GSM modem or subscriber identification module (SIM) card to send SMS messages from a mobile device (typically an Android phone). This can be quick to deploy and is a simple form of communicating with subscribers. Scaling up can be done by adding SIM cards or devices or by switching to a direct-to-SMS gateway or aggregator. Vendors often allow for trials with their platforms, and can also assist with scaling.

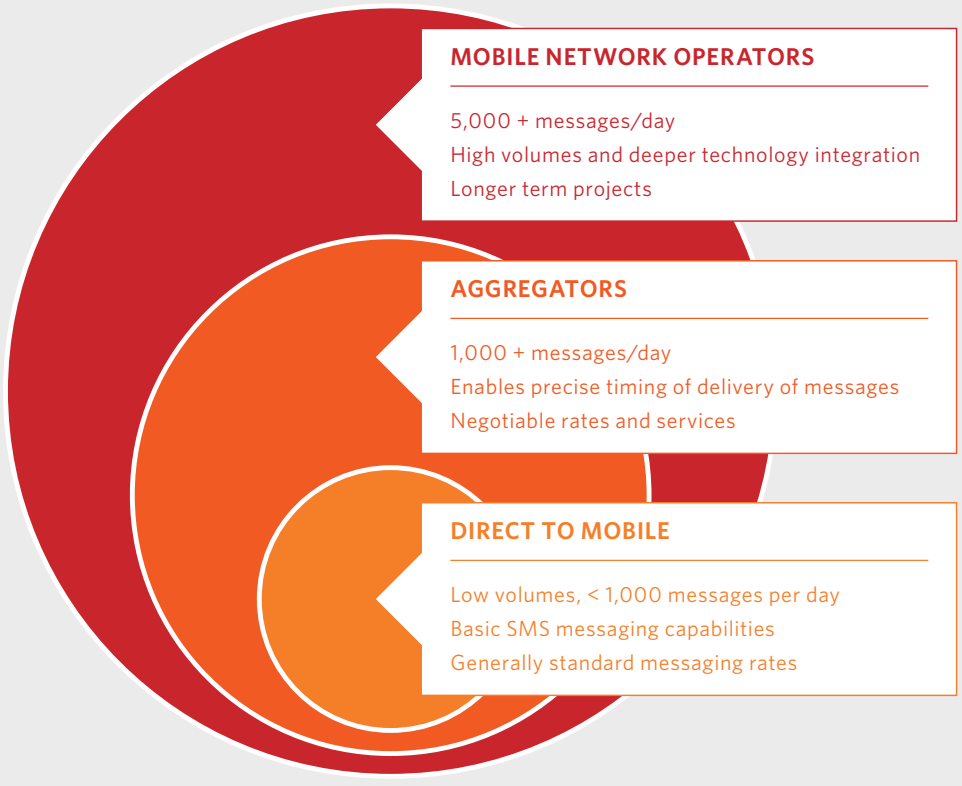
Simple GSM modem options are generally not recommended for large-scale projects because they cannot handle higher message volumes. The technology only allows for one SMS to be sent every 6 seconds, which can cause a bottleneck if multiple messages need to be delivered to subscribers at a specific time of day.

SERVICE-LEVEL AGREEMENTS

Service-level agreements are agreements between two parties that define the level(s) of service being sold or agreed upon. For mobile messaging, this can refer to network availability, on-time transmission delivery, system monitoring, among others. Some vendors offer service-level agreements to customers, while others may pass along mobile network operator service-level agreements to their customers in their contracts.

- SMS gateways, aggregators, and MNOs: SMS gateways and aggregators are third parties that enable the transmission of bulk messages to subscribers through an interface or platform that works with multiple MNOs.
  - An SMS gateway is a website that allows SMS messages to be sent via computer by establishing connections across various operators' communication protocols.
  - Aggregators make use of established gateways and provide services such as help managing the delivery and receipt of messages, reporting, as well as volume discounts for transmission rates.
  - MNOs are the actual telephone companies that own the networks that the messages are transmitted across. Multiple MNOs may exist in each location, each with a slightly different messaging protocol. Understanding the mobile landscape and number of MNOs in existence as well as their coverage of your targeted subscribers will help determine whether you should use an aggregator. The good news is that many vendors have strong existing relationships with aggregators and MNOs.

Figure 1. Mobile Transmission Methods



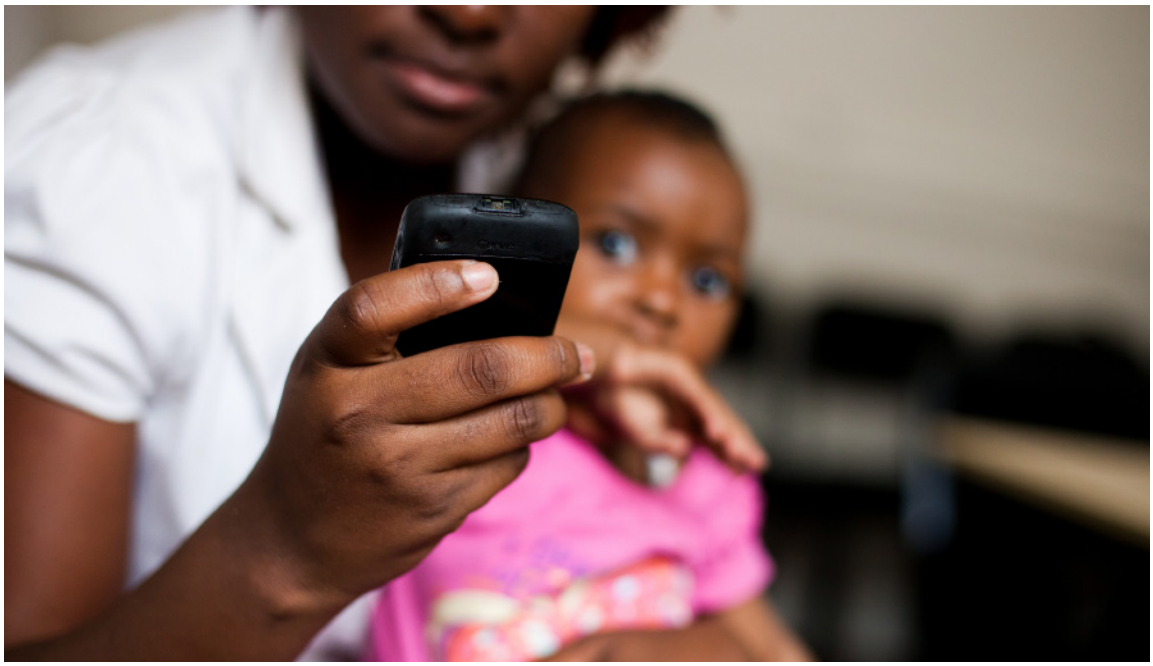
INTEGRATE WITH EXISTING EHEALTH SYSTEMS: YES OR NO?

As mentioned in the M&E section, you will want to identify if there are other eHealth systems that your system can integrate with for purposes of data collection and reporting. If so, you will need to establish common standards to facilitate this information sharing. Table 3 provides some questions to help you navigate this process.

Table 3. eHealth M&E platform integration checklist.

Yes/No	Sample questions
	Is there an existing national eHealth system in place?
	Does the eHealth platform allow for inter-operability with other systems? • Are there data standards? • Is there capacity and knowledge within the team to extract and interrogate the data from the eHealth system?
	Is needed data readily accessible? • Are mother/child unique identification numbers/registration numbers included? • Is the mobile phone number attached to the record? • Is there an existing prenatal visit schedule? • Can the system track health center or clinic visits/no-shows? • Does the system include vaccination schedules for newborns? • Can vaccination records and dates be extracted?
	Can data be cross-referenced with the mHealth messaging platform?
	What are the standards for M&E metrics?

Note: eHealth, electronic health; M&E, monitoring and evaluation; mHealth, mobile health.



STEPS 4 AND 5. FIND THE RIGHT SOLUTION AND VENDOR

Now that you have defined your requirements, you can start looking for a vendor who can build the appropriate (or apply an existing) mobile messaging application for your project. It can be helpful to complete the vendor requirement checklist (Table 4) so you have a summary of what you are looking for.

Once you have shortlisted your prospective vendors, it is a good idea to ask for a demonstration of the proposed solution. You want to evaluate the vendor as a potential partner, as well as whether the technology is a good match for your project. Some exploratory questions to ask include:

- What do I need to know about your solution/company?
- Do you understand our project? Why are you the best solution and partner for the project?
- How easy is the technology to configure and use? Will we require training? If yes, how will it be provided?
- What resources do you have to manage and maintain the system? What are the costs for these resources?
- Will we need customization or is your "out of the box" solution sufficient for our needs? What are the costs for customization/development as well as the ongoing maintenance of these customizations?
- How will your solution scale up (to regional and national levels)? What are the conversion costs? What is the cost of the network bandwidth, data storage, and hardware? Any economies of scale as messaging volume increases?
- How will the collected data be presented? How will it be stored?
- What have the main obstacles been for implementing projects in the past?
- What is your largest implementation example? What is an example of an implementation that you are most proud of or had the most impact? Can you provide references?

Table 4. Vendor requirement checklist.

Question	Answer
Does the vendor need to have prior experience with a MAMA project?	Yes/No
In which country is the project planned?	List
Is it preferable for the vendor to have experience in the country?	Yes/No
Are there national MOH requirements around cloud vs. local storage?	Yes/No
If YES, what sort of data center hosting is required?	Cloud, private cloud, local hosting
Do you need to send messages in multiple languages?	Yes/No
What is the number of subscribers targeted for the project?	Numeric
Is there sufficient literacy for SMS only?	Yes/No
How do you intend to transmit messages to subscribers?	Direct to mobile (Android/GSM modem), web-based hosted service, either
Do you prefer to work with an aggregator or MNO directly?	Yes/No
Do you need help negotiating agreements/messaging rates?	Yes/No
Does your project intend to use short codes?	Yes/No
If YES, do you need help securing and negotiating short codes?	Yes/No
Do you plan to offer:	
• Two-way communications with subscribers?	Yes/No
• Web-based registration?	Yes/No
• Flashing?	Yes/No
• Customer support/call center?	Yes/No
• Is additional interaction via USSD or MMS desired?	Yes/No
• Does the vendor have a viable data privacy and security policy?	Yes/No

Note: GSM, global system for mobile, MAMA, Mobile Alliance for Material Action; MOH, ministry of health; MMS, multimedia messaging service; MNO, mobile network operator; SMS, short message service; USSD, Unstructured Supplementary Service Data.

STEP 6. ESTIMATE IMPLEMENTATION AND OPERATING COSTS

The next step is to estimate the total cost of ownership for the project. Be sure to include all three phases of the project: design/development, deployment, and operations, as well as general management and overhead costs (see Table 5). Questions to consider include the following:

- What are the daily maintenance and operation costs?
- What are the transmission costs and platform fees?
- Are there hardware maintenance costs, rental fees, or equipment depreciation?
- How many hours a day are needed to maintain the system?
- Does the platform require a full-time employee? More than one?

FIXED VS. VARIABLE COSTS: FINDING ECONOMIES OF SCALE

Variable costs are costs that increase or decrease with a change in volume or usage. In the context of a mobile messaging solution, the most common variable cost is the messaging itself. Typically, SMS and IVR messages are billed on a per-message or per-minute basis. Therefore, as the quantity of messages increases, so does the cost of messaging. Likewise, if more advanced messaging like MMS or USSD is used, data usage will typically have a linear relationship with the data rates. These costs and rates should be known in advance via your contract with the partner or aggregator so that they can be modeled before deploying the solution.

Understanding which costs are variable helps in understanding where efficiencies and economies of scale can be made in the financial model. If the solution is able to increase the efficiency of the human resources needed (e.g., message more mothers/subscribers with the same number of staff), the solution will be generating efficiencies.

TOOLBOX

- Appendix A provides an overview of ten vendors who participated in a survey on mobile messaging platforms with solutions for low-resource countries.
- Appendices B, C, and D specify the hosting options, platform offerings, and geographic expertise of these vendors.

Table 5. Total cost of ownership budget categories.	
Governance	
Meetings and administrative support	Meetings and administrative support of the project
Management	
Overall project management	Project manager, staff, and stakeholders involved in day-to-day operations (travel and number of resources multiplied by rates)
Research, monitoring, and evaluation	Hours (and associated rates) for M&E activities (collating data from health centers and messaging platform, surveys, etc.)
Design/development	
Defining program and solution requirements	Days budgeted for number of staff to define requirements for the program design and platform needs
Vendor evaluation and selection	Days budgeted and travel for evaluating and observing messaging platforms from shortlist of vendors, meetings to define project
Platform deployment and customizations	Costs for the software licensing, any additional development of the messaging platform, customization needs, connecting with telecommunications companies
Content development, scheduling, and localization	Customization of messages (adapting content to ensure language is appropriate for the local context and culture, professional voice recordings for IVR)
Deployment	
Training	Days training staff on the messaging platform and program itself, outreach training to health centers or CHWs to register subscribers. This should be budgeted annually to account for attrition and program growth
Enrollment of subscribers	Number of staff, salary, incentives to support registration (such as the use of CHWs or on-the-ground staff to help enroll subscribers)
Marketing and outreach	Budget for awareness raising and registration of mothers (posters, radio, partnerships with ministries of health, etc.). This should be an annual line item to grow the program and raise awareness
Operations	
Messaging costs	See Appendices F and G
Staffing	Day to day operations (manage subscribers, schedule messages, ensure messages are being sent and enrollments are successful, etc.)
Solution/platform management and hosting	Technical staff to ensure system availability, troubleshoot technical issues
Administration and call center support	Customer support, ability to respond to inbound messages, flashes, requests for information or assistance
Overhead	General fixed expenses associated with the project (power, internet connectivity, hardware, etc.)

Note: CHW, community health worker; IVR, interactive voice response; M&E, monitoring and evaluation.

STEPS 7 AND 8. CREATE AN IMPLEMENTATION PLAN AND UNDERSTAND AND MANAGE PROJECT RISKS

You are almost finished with your project planning! Before you start implementation, work through a few final tasks:

- Establish milestones and deliverables with your new partner vendor.
- Set a realistic development schedule.
- Establish a risk management plan.
- Develop and sign off on a written scope of work with your vendor to avoid scope creep or delays.

See the additional resources in the following sections for templates and tools that provide additional example schedules and methods for managing risks.

TOOLBOX

- Appendices E, F, and G contain budgeting worksheets to help you calculate the cost of the total project, as well as annual and per subscriber messaging costs. Be sure to complete the worksheets for your pilot, as well as a fully scaled project.

Additional Resources

Ask JA, Freeman Evans P, Roberge D. *Mobile Messaging Vendor Overview.* Cambridge, MA: Forrester Research; 2013. Available at: http://www.forrester.com/Mobile+Messaging+Vendor+Overview/fulltext/-/E-RES70461.

Health Metrics Network. *HMN Guide for Procurement and Acquisition of ICT for Health Information Systems.* Unpublished; draft available at: http://wiki.healthmetricsnetwork.info/wiki-kigali/lib/exe/fetch.php?media=background:hmn_procurement_guide:hmn_procurement_guide_v5.2.doc.

Inveneo. *Buyers' Guide to Sustainable ICT Infrastructure in Low Resource Settings.* San Francisco, CA: Inveneo; 2011. Available at: http://www.inveneo.org/wp-content/uploads/2012/09/Buyers_Guide_Sustainable_ICT_Infrastructure_12-11.pdf.

Page on mHealth Planning Tools. Knowledge for Health (K4H) Project website. K4Health's Available at: https://www.k4health.org/toolkits/mHealth-planning-guide/planning-tools. Accessed July 1, 2014.

Umapathy S, O'Sullivan GA, Rahaim S. *mBCC Field Guide: A Resource for Developing Mobile Behavior Change Communication Programs.* Cambridge, MA: Abt Associates Inc.; 2012. Available at: www.mbccfieldguide.com.

World Health Organization, PATH. *Planning an Information Systems Project: A Toolkit for Public Health Managers.* Seattle: PATH; 2013. Available at: http://www.path.org/publications/files/TS_opt_ict_toolkit.pdf.

Appendix A: Vendor Overviews

DataDyne	
Founding date	2003
Number of employees	12
Office locations	Washington, DC, USA; Nairobi, Kenya
Ideal customer	Any organization or individual that needs to communicate by text or voice easily and at a low cost—for health, conservation, education, etc.
Key customers	World Health Organization, United Nations Children's Fund (UNICEF), John Snow, Inc., Abt Associates, Management Sciences for Health, Harvard University, Johns Hopkins University, International Rescue Committee, International Federation of Red Cross and Red Crescent Societies
Website	http://www.datadyne.org
Link to projects / case studies	https://datadyne.zendesk.com/entries/21282536-Case-Studies-Who-Uses-Magpi-formerly-EpiSurveyor-

engageSPARK	
Founding date	2013
Number of employees	12
Office locations	Cebu City, Philippines; San Francisco, CA, USA; Accra, Ghana; Kampala, Uganda
Ideal customers	Our ideal customers are organizations focused on health, agriculture, civil society, education, environment, governance, and emergency response, which are interested in implementing social change programs via mobile phones—worldwide. Our goal is to help nongovernmental organizations (NGOs) and governments, regardless of size, to engage with low-income individuals and communities using short message service (SMS) and especially voice calls. Our range of plans (from free to enterprise levels) will enable small NGOs without technical resources to engage with the very poor within a single country or locality, and also empower international NGOs via our application programming interfaces (APIs) to implement large programs at scale across many countries—easily and quickly.
Key customers	Beta testers: Innovations for Poverty Action, One Acre Fund, UNICEF Uganda
Website	http://engagespark.com
Link to projects / case studies	http://engagespark.com/#about-us

FrontlineSMS	
Founding date	2007
Number of employees	14
Office locations	Washington, DC, USA; London, UK; Nairobi, Kenya
Ideal customer	We work globally, with everyone, from a last-mile NGO to multinational NGOs.
Key customers	not provided
Website	http://www.frontlinesms.com
Link to projects / case studies	http://www.frontlinesms.com/impact-of-frontline/guides-tools-and-case-studies

Innovative Support to Emergencies, Diseases, and Disasters (InSTEDD)	
Founding date	2006
Number of employees	30
Office locations	Sunnyvale, CA, USA; Phnom Penh, Cambodia; Buenos Aires, Argentina
Ideal customer	We serve many classes of customers: direct beneficiaries that, for a fee or under subsidy, access information services; ministries of health, governments, official bodies (e.g., national election commissions, national road safety commission, etc.); large (country-scale) NGO implementers such as FHI 360, Marie Stopes International, Médecins Sans Frontières, etc.; mobile operators in joint ventures offering revenue-share services
Key customers	Cepheid, Google, and the Bill & Melinda Gates Foundation
Website	http://instedd.org
Link to projects / case studies	http://instedd.org/our-work/projects

Push Mobile Media	
Founding date	2006
Number of employees	33
Office locations	Tanzania
Ideal customer	NGOs, faith-based organizations, government ministries, and sector donors
Key customers	John Snow, Inc. (Marasi Mwencha); Johns Hopkins Bloomberg School of Public Health (Radio Distance Learning program, Waziri Nyoni, Robert Ainsley); Vodafone Foundation (Jon Lee); Text to Change (Bas Hoefman); Vodacom Tanzania Ltd. (Saurabh); Tigo Tanzania (David Zacharia); Airtel Tanzania (Gaurav); Zantel (Sajid); Tanzanian Ministry of Lands, Housing and Human Settlements Development; Tanzanian Public Procurement Regulatory Authority; Tanzania Communications Regulatory Authority; Tanzanian Government Ethics Secretariat; Greenmash UK
Website	http://www.push.co.tz
Link to projects / case studies	http://www.push.co.tz/solutions

Telerivet	
Founding date	2012
Number of employees	7
Office locations	San Francisco, CA, USA; Dar es Salaam, Tanzania
Ideal customers	Organizations with limited budgets and limited technical expertise that want to deploy a manual or automated SMS service to send and receive SMS messages using a local phone number in any country.
Key customers	Farm Radio International, Kiva, InVenture
Website	http://telerivet.com
Link to projects / case studies	https://telerivet.com/examples

Text to Change	
Founding date	2007
Number of employees	32
Office locations	The Netherlands, Uganda, Bolivia, Malawi
Ideal customer	Large international organizations facing difficulties reaching or collecting data from its target audience; large groups of people in emerging markets with health care information.
Key customers	World Bank, FHI 360, CDC Foundation
Website	http://www.texttochange.org
Link to projects / case studies	http://projects.texttochange.org/en

TextIt	
Founding date	2010
Number of employees	4
Office locations	Rwanda
Ideal customer	Small- to medium-sized NGOs looking to deploy a flexible tool for data collection, outreach, and coordination using text messaging.
Key customers	TechnoServe Rwanda
Website	http://textit.in
Link to projects/ case studies	http://textit.in/video

VOTO Mobile	
Founding date	2013
Number of employees	8
Office locations	Kumasi, Ghana; Toronto, Ontario, Canada; Palo Alto and San Francisco, CA, USA
Ideal customer	Our ideal customer is focused on figuring out the human-centered and communication design aspects to really translate mobile engagement into social change (whether for encouraging healthier behaviors, being responsive to constituent feedback, or advocating effectively for policy change). They are excited to learn with us in these areas. They are focused on being inclusive of all their constituents, which means reaching each individual over the channel that works best for him/her, whether it is voice in local languages, SMS, or a mobile app. They have a short timeline and might not have strong technical capacity, so they need a provider that can solve mobile operator headaches, get them up and running immediately, and integrate all these features into one app that is simple for them to use. They are really interested in measuring what works and spend lots of time exploring the detailed analytics on our platform as well as measuring impact in the field.
Key customers	UNICEF, Innovations for Poverty Action, Savana Signatures (Ghana), World Bank Ghana, Citi FM (Ghana), Journalists for Human Rights, Text to Change
Website	http://www.votomobile.org
Link to projects / case studies	http://www.votomobile.org/case-studies

Vumi/Praekelt Foundation	
Founding date	2006
Number of employees	18
Office locations	Johannesburg and Cape Town, South Africa; Lagos, Nigeria; Nairobi, Kenya; London, UK; Hyderabad, India
Ideal customers	In countries where we have SMS/Unstructured Supplementary Service Data (USSD) connectivity, our ideal customer is someone who wants to start using basic SMS/USSD tools to reach an existing audience and have a conversation with them. In countries where we do not have connectivity, we are looking for partners (NGOs, multilateral organizations, donors, governments, corporations) who would want to partner with us to set up connectivity that can be leveraged by other partners in this sector.
Key customers	UNICEF, US Agency for International Development, Omidyar Network, Nike Foundation, Wikimedia Foundation, Bill & Melinda Gates Foundation, Vodacom Foundation, Johnson & Johnson
Website	http://vumi.org and www.praekeltfoundation.org
Link to projects / case studies	http://vumi.org/case-studies

Appendix B: Vendor Messaging and Hosting Options

Vendor	SMS	IVR	USSD or MMS	SaaS/ cloud	Private cloud	Locally hosted
DataDyne (Magpi)	x	x	USSD, MMS	x	x	
engageSPARK	x	x	USSD	x		
FrontlineSMS	x			x		x
InSTEDD	x	x	USSD, MMS	x	x	x
Push Mobile Media	x		MMS			x
Telerivet	x			x		O*
Text to Change	x				x	
TextIt	x	x (Beta Version)		x		
VOTO Mobile	x	x		x		x
Vumi/Praekelt Foundation	x	x	USSD	x		

**Telerivet's locally hosted option is in development.*
Note: IVR, interactive voice response; MMS, multimedia message service; SaaS, software as a service; SMS, short message service; USSD, Unstructured Supplementary Service Data.

Appendix C: Vendor Platform Offerings

Vendor	Import of contacts	SMS registration of users	IVR registration of users	Web-based registration of users	Scheduling of messages (time of day)
DataDyne (Magpi)	Yes	Yes	No	Yes	Yes
engageSPARK	Yes	Yes	Yes	Yes	Yes
FrontlineSMS	Yes	Yes	No	No	In development
InSTEDD	Yes	Yes	Yes	Yes	Yes
Push Mobile Media	Yes	Yes	Yes	Yes	Yes
Telerivet	Yes	Yes	No	Requires custom development	Yes
Text to Change	Yes	Yes	No	Requires custom development	Yes
TextIt	Yes	Yes	No	Requires custom development	Yes
VOTO Mobile	Yes	Yes	Yes	Yes	Yes
Vumi/Praekelt Foundation	Yes	Yes	In Development	Yes	Requires custom development

Scheduling of messages (based on logic; i.e., due date)	Multiple language support	Free to end user options	Two-way messaging	Flashing	Call center support
Yes	Yes	Yes	Yes	No	No
Yes	Yes	Yes	Yes	Yes	In development
In development	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	
Yes	Requires custom development	Requires custom development	Yes	Yes	Requires custom development
In Development	Yes	Yes	Yes	Yes	No
Yes	Yes	Yes	Yes	Requires custom development	Yes
Yes	Yes	Yes	Yes	Yes	No
Yes	Yes	Yes	Yes	Yes	No
Requires custom development	Requires custom development	Yes	Yes	Requires custom development	Yes

Appendix D: Countries with Vendor Projects or Offices

Countries	Data Dyne*	engageSPARK**	Frontline SMS*	InSTEDD	Push Mobile Media	Telerivet	Text to Change	TextIt	VOTO Mobile	Vumi/ Praekelt Foundation	Projects
Argentina				#							1
Bangladesh				x							1
Bahrain				x							1
Bolivia							#				1
Brazil				x							1
Burkina Faso							x		x		2
Cambodia				#							1
Cameroon				x		x				x	3
Canada									o		0
CAR				x							1
Chile				x							1
Columbia						x					1
Costa Rica						x					1
DR Congo				x		x	x				3
Ecuador		o									1
Ethiopia						x	x	x		x	4
Ghana		#		x		x	x		#		5
Hong Kong		o									0
India				x		x			x	o	3
Indonesia		x		x							2
Kenya	o	x	o	x	x	x	x	x	x	#	8
Laos				x							1
Liberia									x		1
Madagascar						x					1
Malawi					x		#				2
Malaysia						x					1
Mali						x	x				2
Morocco						x					1
Mozambique						x					1
Myanmar				x							1
Netherlands, The							o				0
Nicaragua						x					1
Nigeria		x		x		x			x	#	5

Countries	Data Dyne*	engageSPARK**	Frontline SMS*	InSTEDD	Push Mobile Media	Telerivet	Text to Change	TextIt	VOTO Mobile	Vumi/ Praekelt Foundation	Projects
Papua New Guinea		x		x							2
Paraguay						x					1
Peru							x				1
Philippines		#									1
Rwanda				x				#	x	x	4
Senegal						x					1
South Africa										#	1
South Sudan				x							1
Tanzania				x	#	#	x	x	x	x	7
Thailand				x							1
Uganda		#					#	x	x	x	5
UK			0							0	0
USA	0	0	0	0		0			0		0
Vanuatu		x									1
Zambia				x			x			x	3
TOTAL:	2	11	3	23	3	19	13	5	11	11	

Project = x **Office = O** **Both = #**

**DataDyne and FrontlineSMS did not provide country lists for projects but have experience in many countries.*

***engageSPARK is currently beta testing.*

Note: CAR, Central African Republic; DR Congo, Democratic Republic of the Congo; UK, United Kingdom; USA, United States of America.

Appendix E: Total Cost of Ownership Budget Matrix

This matrix can be used to summarize costs across categories.

Budgeting category	**Year 0** *(Initial Launch)*	**Year 1**	**Year 2**	**Year 3**
Governance				
Meetings and administrative support				
Management				
Overall project management				
Research, monitoring, and evaluation				
Design/development				
Defining program and solution requirements				
Vendor evaluation and selection				
Platform deployment and customizations				
Content development, scheduling, and localization				
Deployment				
Training				
Enrollment of subscribers				
Marketing and outreach				
Operations				
Messaging costs				
Staffing				
Solution/platform management and hosting				
Administration and call center support				
Overhead				
Total				

Note: CHW, community health worker; IVR, interactive voice response; M&E, monitoring and evaluation.

Appendix F: Example of Excel-based Messaging Cost Tool

Messaging Cost Tool						
		Pilot	@ Scale			
Transmission Costs / Year		$12,324	$1,170,000		**Legend**	
Total Messaging Costs / Year		$12,324	$1,170,000		Orange	Input Required
Cost Per Subscriber		$12.97	$5.57		Blue	Select from List
					Yellow	Output - do not edit
		Pilot	@ Scale		Grey	Final Output - do not edit
Targeted Number of Subscribers		1,000	300,000			
% Literate In Target Area		80%	50%			
SMS subscribers		800	150,000			
Is This Enough Subscibers?		No	Yes			
If No, % of Subscribers Reached Via IVR		15%	20%			
IVR Subscribers		150	60,000			
Messages Per Week SMS	3	2,400	450,000			
Messages Per Week IVR	2	300	120,000			
If transmitting across multiple mobile network operators (MNOs) with different rates, create a separate worksheet for each MNO with proper coverage estimates and rates including volume discounts if applicable.						
Cost Per SMS		$0.08	$0.05			
Cost Per IVR		$0.15	$0.10			
Assumption is that each IVR message is one minute or less; use airtime rates provided by MNO, vendor, or aggregator.						
Additional Costs:						
Using a short code?		No				
Annual Cost		$5,000				
Vendors estimate ~US$5,000 for a dedicated short code						

Appendix G: Messaging Cost Calculator

To calculate annual messaging costs for the sample project in the worksheet in Appendix F, use the worksheet below. Instructions are included to help with the formulas.

Line			Pilot	@ Scale	
A	Transmission Costs / Year		$ -	$ -	
B	Total Messaging Costs / Year		$ -	$ -	
C	Cost Per Subscriber		$ -	$ -	
			Pilot	@Scale	
D	Targeted Number of Subscribers				
E	% Literate In Target Area		0%	0%	
F	SMS subscribers		0	0	
G	Is This Enough Subscibers?		Yes or No	Yes or No	
H	If No, % of Subscribers Reached Via IVR		0%	0%	
I	IVR Subscribers		0	0	
J	Messages Per Week SMS		0	0	
K	Messages Per Week IVR		0	0	
If transmitting across multiple mobile network operators (MNOs) with different rates, create a separate worksheet for each MNO with proper coverage estimates and rates including volume discounts if applicable.					
L	Cost Per SMS		$ -	$ -	
M	Cost Per IVR		$ -	$ -	
Assumption is that each IVR message is one minute or less; use airtime rates provided by MNO, vendor, or aggregator.					
	Additional Costs:				
	Using a short code?		Yes or No		
N	Annual Cost		$		
Vendors estimate ~US$5,000 for a dedicated short code					

MESSAGING COST CALCULATOR INSTRUCTIONS

- To begin, **complete the orange-shaded boxes** with the appropriate data for your project.
- There are two columns, one for a **Pilot** and another for running the project **@ Scale** (regional or national level). Calculations can be done in parallel for each column if desired.
- After you have filled in the green boxes, perform the following calculations:
  - **Line F:** Multiply **Line D x Line E**. Do you understand our project? Why are you the best solution and partner for the project?
  - This will provide the number of subscribers in the targeted population for which SMS is appropriate. If this number is sufficient, enter a "Yes" in the blue box. If more subscribers are needed for the study, enter "No."
  - **Line I:** If "No" was entered in Line G, multiply Line H x Line D to calculate the number of IVR subscribers.
  - **Line F + Line I** will be your total number of subscribers.
  - **Line J:** SMS messages per week. Multiply the value in the green box by **Line F** to get the number of SMS messages to be sent per week.
  - **Line K:** IVR messages per week. Multiply the value in the green box by **Line I** to get the number of IVR messages to be sent per week.
  - **Line L** and **Line M** are the per message rate provided by the vendor, aggregator, or MNO. For the model, we assume the IVR rate is the charge for a 1-minute message; adjust according to the project's average voice message length.
- Now we are ready to calculate the costs per year. For pilot study years, use the values in the Pilot column. To calculate costs at scale, use the values in the @ Scale column. If the project is projecting growth year over year, adjust the variables in the green boxes to calculate each year as appropriate.
  - **Line A: Transmission costs** (the cost to send messages to subscribers):
    Multiply Line J x Line L for the SMS weekly cost, then **multiply by 52** for the number of weeks in the year.
    Multiply Line K x Line M for the IVR weekly cost, then **multiply by 52** for the number of weeks in the year.
  - **Add the SMS and IVR costs together for the annual transmission costs.**
  - **Line B:** If a short code is being used for the program, **add Line N + Line A** for the total messaging costs.
  - **Line C:** Cost per subscriber. **Divide Line B by the sum of Line F + Line I** for the total cost per subscriber.
  - Finally, input the calculated values from **Line B** for each year in the total cost of ownership budget matrix (Appendix E).

MAILING ADDRESS

PO Box 900922
Seattle, WA 98109
USA

ADDRESS

2201 Westlake Avenue
Suite 200
Seattle, WA, USA

TEL: 206.285.3500
FAX: 206.285.6619

www.path.org