END OF PROJECT REPORT

THE K4HEALTH PROJECT
Outcomes, Innovations, and Technical Highlights

September 23, 2008 – March 22, 2014

Knowledge for Health (K4Health) Project
Leader with Associate Cooperative Agreement Award
GPO-A-OO-08-0000 6-00

www.k4health.org

Acknowledgments

We would also like to thank the K4Health staff who contributed to the mission and success the project, particularly the K4Health directors (Earle Lawrence, Piers Bocock, and Ann Hendrix-Jenkins) and deputy directors (Philipe LeMay, Kirsten Bose, and Tara Sullivan) who guided the vision.

We are grateful to all the users of K4Health products who applied our products and services, shared their expertise, provided feedback to help us improve our work, and made inroads to strengthen their local knowledge management and health systems. These leaders challenge themselves and others to embrace change to ensure health professionals can access and use knowledge to improve health and save lives.

Countless organizations and experts contributed to K4Health products and services by writing blogs, reviewing eLearning courses, contributing toolkit resources, submitting photographs, and championing knowledge management for better global health. Many others contributed to the development and implementation of this project, and we are grateful for their innovation, time, and support.

Family planning providers at a training of trainers workshop in Kenya learn how to counsel on providing oral contraceptivess. © 2012 Institute for Reproductive Health (IRH) at Georgetown University, Courtesy of Photoshare

K4Health™
Knowledge for Health

Executive Summary

This End-of-Project Report recaps the Knowledge for Health (K4Health) Project, including its unique products, services, field activities, innovative approaches, and novel research.

Project Overview: The Big Picture

With funding from the United States Agency for International Development (USAID), the Johns Hopkins Bloomberg School of Public Health's Center for Communication Programs (JHU·CCP), in collaboration with FHI 360 and Management Sciences for Health (MSH), led the K4Health Project from September 23, 2008 – March 22, 2014.

Our Vision

K4Health envisions a world in which public health professionals from all levels around the globe have a voice to articulate their needs, share best practices, contribute content, avoid duplication, and, ultimately, use knowledge to make better health care decisions that improve and save lives.

Our Approach

K4Health has approached its work from a knowledge management (KM) perspective, which entails employing a set of methods to generate, capture, organize, and adapt knowledge. It also involves making that knowledge both accessible and usable in different formats according to the needs and preferences of a wide range of audiences around the world. K4Health continually evaluated the knowledge sharing structures within health programs and systems and among individuals in order to enable them to generate and share knowledge most effectively. As a result, our products, resources, and services strengthened the KM capacity and systems of the global health sector.

Our Successes

Over the course of the five years, in a myriad of ways described in this overview, K4Health advanced its mission to increase the use and dissemination of evidence-based, accurate, and up-to-date family planning/reproductive health (FP/RH) information to improve health service delivery and health outcomes worldwide. Our top achievements can be grouped into three broad categories: (a) making the latest FP/RH knowledge easy to find and easy to use through 10 influential platforms; (b) building KM capacity in the field; and (c) advancing the field of KM for global health.

A. Products, Resources, and Services: An Extensive Portfolio

K4Health uses technology as a tool to support health workers as they create, share, and use knowledge. Ten K4Health platforms have been key to synthesizing and sharing this knowledge in the FP/RH field:

I. Global Health: Science and Practice

In 2012, K4Health launched the peer-reviewed, open-access journal *Global Health: Science and Practice* (GHSP), fulfilling the need for a respected medium to share experiences and lessons learned from the implementation of global health programs—the kind of implementation detail that most other scholarly journals tend to shy away from. GHSP has received more than 160 unsolicited submissions and published four issues with 62 articles.

II. K4Health Website and Blog

Launched on October 22, 2009, the K4Health global Web portal has effectively delivered our products, resources, and services to hundreds of thousands of people and organizations worldwide. In addition to serving as the link to our extensive portfolio, the website features the K4Health blog, an innovative source of global health news and insights with contributions from both K4Health staff and health professionals worldwide.

III. K4Health Toolkits

The user-friendly, collaborative Toolkits platform hosts high-quality, up-to-date resources for health professionals to use and adapt. A total of 122 organizations contributed to building or maintaining 65 toolkits on a wide range of topics, including the latest guidance on contraceptive technology and FP/RH programming issues, gender, maternal and child health, HIV/AIDS, and cross-cutting issues, such as mHealth.

IV. POPLINE

K4Health enhanced POPLINE, the one-of-a-kind, comprehensive database of population, family planning, and reproductive health and development literature, with a sleek new website design, including many new features to improve the user experience. Visits to the POPLINE website nearly tripled following the new website launch. Staff also streamlined the process of identifying and adding new documents and journal articles to the database, allowing for more rapid growth in the collection.

V. Photoshare

After launching the new Photoshare website redesign in 2011, the project continued to build its collection of international public health and development images, ran high-profile photography contests, and pursued meaningful partnerships to broaden the scope of the collection. Custom-built image upload and import features drew many new contributing photographers from low- and middle-income countries (LMICs). During the length of the K4Health Project, Photoshare staff cataloged more than 6,000 new photos and fulfilled more than 3,500 photo requests from users around the globe.

VI. Global Health eLearning Center

K4Health launched an improved and redesigned USAID Global Health eLearning Center in 2013, which hosts 65 health and development courses. Since its launch in 2005, over 100,000 registered learners from 251 countries and territories have earned more than 200,000 certificates.

VII. Communities of Practice and Online Forums

K4Health also maintained the Implementing Best Practices Knowledge Gateway, supporting over 600 virtual CoPs where more than 30,000 health and development professionals connect. Project staff facilitated several popular forums focused on specific topics or health challenges, featuring experts in the field and community participation.

K4Health
Knowledge for Health

Puspa Rani Paramdar, a Family Welfare Assistant (FWA) in Bangladesh and a recipient of a K4Health Project Netbook.
© 2013 Shusmita Khan/Eminence, Courtesy of Photoshare

VIII.   Family Planning: A Global Handbook

K4Health updated the seminal *Family Planning: A Global Handbook for Providers* in line with revised WHO guidance and redesigned the Global Handbook website to improve accessibility.

IX.   "Do You Know Your Family Planning Choices?" Wall Chart

The companion Wall Chart to the Global Handbook contains information about specific contraceptive methods; it is commonly used in health care settings as an educational tool for clients and a reminder for providers. The Wall Chart has been translated into eight languages, and more than one million copies have been distributed worldwide.

X.   Application for Contraceptive Eligibility (ACE) Mobile App

K4Health developed the ACE mobile app for Android phones to give health care workers an interactive method at the point of care to check medical eligibility for contraceptive methods, based on WHO guidance. In response to user feedback, K4Health also began developing an Apple iOS version.

B.   KM Activities in Low- and Middle-Income Countries: Increasing Reach While Building Capacity

Throughout the project, K4Health branched out, taking KM to the heart of our global health efforts. Our partnerships with local, national, and regional organizations and governments supported tailored KM activities that showed immediate results while simultaneously institutionalizing KM understanding and capabilities. In addition to designing and launching country-specific toolkits in 11 countries, K4Health implemented in-depth field support programs in Bangladesh, Malawi, and Southern Africa. In addition, USAID missions in Indonesia and Nigeria selected K4Health for Associate Awards.

In **Malawi**, K4Health worked at multiple levels of the health system; a key activity included creating an SMS-based mobile phone network connecting district health centers and community health workers. The network improved emergency response time, reduced the frequency of pharmacy stock-outs, and improved health practices and case management.

In **Southern Africa**, K4Health developed the Southern Africa HIV/AIDS Resource Exchange (SHARE) portal, a regional Web-based commons for policy makers, program managers, and health care providers to connect and communicate with each other and to share HIV/AIDS information. K4Health also partnered with several local organizations to build their capacity to develop appropriate knowledge products and services for their audiences.

Executive Summary

The **Bangladesh** Knowledge Management Initiative (BKMI) provided hands-on support and capacity building to three key units of the Ministry of Health and Family Welfare and developed a comprehensive package of digital resources for field workers. The project trained more than 300 field workers on how to use K4Health Toolkits with information on maternal, neonatal, and child health, reproductive health, and nutrition, which improved their health knowledge and credibility in the community.

The **Nigeria** Web-Based Continuing Medical Laboratory Education Program improved the knowledge of Medical Laboratory Scientists by revitalizing the Continuing Professional Development Policy and developing and supporting Nigerian-authored and accredited eLearning courses. More than 1,350 learners have successfully passed at least one of the six courses.

The Improving Contraceptive Method Mix (ICMM) Project in **Indonesia** is investigating the impact of applying knowledge management and exchange principles to support targeted advocacy activities to improve the contraceptive method mix. Research conducted in the first year, which found that long-acting and permanent methods of family planning were underutilized, is informing ICMM advocacy activities and the design of national family planning strategies.

C. Advancing Knowledge Management for Global Health

As an established leader in the field of KM for global health, our project convened partners to advance the science of KM via purposeful and innovative technologies.

K4Health convened and launched the KM Working Group, later renamed the **Global Health Knowledge Collaborative (GHKC)**, in collaboration with the World Health Organization (WHO), USAID, and the Public Health Institute (PHI). Through this model, K4Health and partners had a finger on the pulse of global KM. We saw what was working and perceived the many gaps in this nascent field. In response, often in collaboration with this community of practice (CoP), we:

- Created a KM Toolkit

- Developed the "Knowledge Management Logic Model"

- Designed and hosted several KM-focused webinars

- Published a series of KM case studies

- Published the *Guide to Monitoring and Evaluating Knowledge Management in Global Health Programs*

- Orchestrated the Knowledge Management Share Fair, a wildly successful symposium, focused on advancing KM, for global health and development practitioners

One way K4Health makes sure our products are accessible and adaptable by all health organizations and professionals is by building them with the **open-source content management system Drupal**, a free software package that allows developers to build and customize websites and applications. K4Health shares back our software products and platforms with the collaborative Drupal community, magnifying our value as these products have been freely used, customized, and improved by others. K4Health has also embraced appropriate technologies, such as **mobile devices and social media**, as tools to meet KM needs.

K4Health also integrated **capacity building** into many of its activities to improve sustainability and effectiveness. For example, technical advisors placed within the Bangladesh Ministry of Health provided guidance and support to government counterparts on using KM and behavior change communication approaches as public health interventions.

These advisors also assisted government employees with designing and executing the Bangladesh eHealth Pilot, ensuring ownership and continuous support of the initiative after the project cycle ended. Thus, K4Health works to not only improve KM and health systems but also partner with key organizations and governments to strengthen their ongoing capacity to build, maintain, and improve KM and health systems.

Operations Research, and a Host of Lessons Learned

K4Health ensured its products and services were evidence-based by conducting rigorous needs assessments and continuously evaluating its products and services. In the first years of the project, findings from the Environment Scan, the Global Online Survey, and qualitative country-level needs assessments in Ethiopia, India, Malawi, Peru, and Senegal guided the project strategy and activities. This research identified leading barriers to accessing and using health information and led the K4Health Project to focus on identifying, engaging, nurturing, and supporting existing health networks with a variety of KM products.

Based on these experiences, K4Health developed a guide to conducting needs assessments, full of practical tools and materials designed to help health organizations continue to pose key KM questions and seek answers through research.

Throughout the project, K4Health used a combination of Web analytics, online surveys, and in-depth interviews to inform ongoing enhancements to its products. Based on the findings, we refined our products—changes whose value was confirmed by positive feedback from users.

K4Health
Knowledge for Health

Our wide-ranging research revealed several key lessons that other organizations can apply to improve access to and use of critical health information:

- Some health workers struggle with too little information, others with too much. Furthermore, the information is sometimes unreliable, conflicting, not applicable, or not appropriate for the local context. High-quality, trustworthy information that is easy to access, understand, and use is a common need.

- Maintaining awareness of the technology landscape while staying flexible is critical to advancing KM. There are significant disparities in access to Internet and mobile phones, particularly smart phones, even within a single country.

- Face-to-face events and training, along with blended learning activities, continue to be important to maximize the use of online and/or mobile-accessible resources.

- KM plays an important role in health systems strengthening. Well-implemented, tailored KM interventions improve the knowledge of health workers, and knowledge empowers them and enhances their credibility in the community.

- Both local and international health organizations have an urgent need for affordable, easy-to-use, customizable website platforms to organize and share health information.

- Partnerships and working groups with leading subject matter experts produced high-quality, consensus-driven resources. These partnerships establish buy-in from a variety of stakeholders, reduce duplication of efforts, and reduce inconsistencies in messages from different organizations.

- User feedback and usability testing drive the evolution of KM products and services. Users tend to prefer clean, simple designs with limited text and multiple search options.

As a whole, K4Health's track record shows a host of accomplishments at a range of levels and in a wide variety of formats, all designed and implemented in response to our audiences' needs as they deliver measurable health improvements around the world. USAID's investment bore fruit—and continues to do so—in the form of increased capacity in LMICs as well as via products, resources, and services in greater demand than ever.

The sum total of all this? A more sophisticated global health landscape in which health care workers have better access to essential health information that can improve, and even save, lives.

A father in a rural health facility in Momostenango, Totonicapán in Guatemala, who supports and believes in the benefits of family planning. © 2013 Shusmita Khan/Eminence, Courtesy of Photoshare

Acronyms

ACE	Application for Contraceptive Eligibility
AIDS	Acquired Immune Deficiency Syndrome
AMLSN	Association of Medical Laboratory Scientists of Nigeria
BCC	Behavior Change Communication
BKKBN	National Population and Family Planning Board [Indonesia]
BKMI	Bangladesh Knowledge Management Initiative
BLC	Building Local Capacity for Delivery of HIV Services in Southern Africa Project
BSR	Business for Social Responsibility
CHW	Community Health Worker
CMLE	Continuing Medical Laboratory Education
CoP	Community of Practice
CPD	Continuing Professional Development
DLC	District Learning Center
FP	Family Planning
FP/RH	Family Planning and Reproductive Health
FWA	Family Welfare Assistant
GHeL	Global Health eLearning Center
GHSP	Global Health: Science and Practice Journal
GHKC	Global Health Knowledge Collaborative
HC3	Health Communication Capacity Collaborative
HIFA 2015	Healthcare Information for All by 2015
HIV	Human Immunodeficiency Virus
HPN	Health, Population, and Nutrition
IBP	Implementing Best Practices
ICCM	Improving Contraceptive Method Mix
ICFP	International Conference on Family Planning
INFO	Information and Knowledge for Optimal Health
IT	Information Technology
IUD	Intrauterine Device
IVAC	International Vaccine Access Center
JHU·CCP	Johns Hopkins Bloomberg School of Public Health's Center for Communication Programs
K4Health	Knowledge for Health
KM	Knowledge Management
LAPM	Long-Acting and Permanent Methods
LGBTI	Lesbian, Gay, Bisexual, Transgender, and Intersex
LMIC	Low- and Middle-Income Countries
M&E	Monitoring and Evaluation
MLSCN	Medical Laboratory Science Council of Nigeria
MOHFW	Ministry of Health and Family Welfare
MSH	Management Sciences for Health
mHealth	Mobile Technologies for Health
NERCHA	Swaziland's National Emergency Response Council on HIV and AIDS
NGO	Nongovernmental Organization
NTB	West Nusa Tenggara
OPRH	Office of Population and Reproductive Health
PEPFAR	The United States President's Emergency Plan for AIDS Relief
PHI	Public Health Institute
PIP	Population Information Program
RHAP	Regional HIV/AIDS Program in Southern Africa
SADC	Southern African Development Community
SAfAIDS	Southern Africa HIV and AIDS Information Dissemination Service
SHARE	Southern Africa HIV AIDS Resource Exchange
SM4GH	Social Media for Global Health Interagency Working Group
SMS	Short Message Service
UN	United Nations
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

Table of Contents

K4Health™
Knowledge for Health
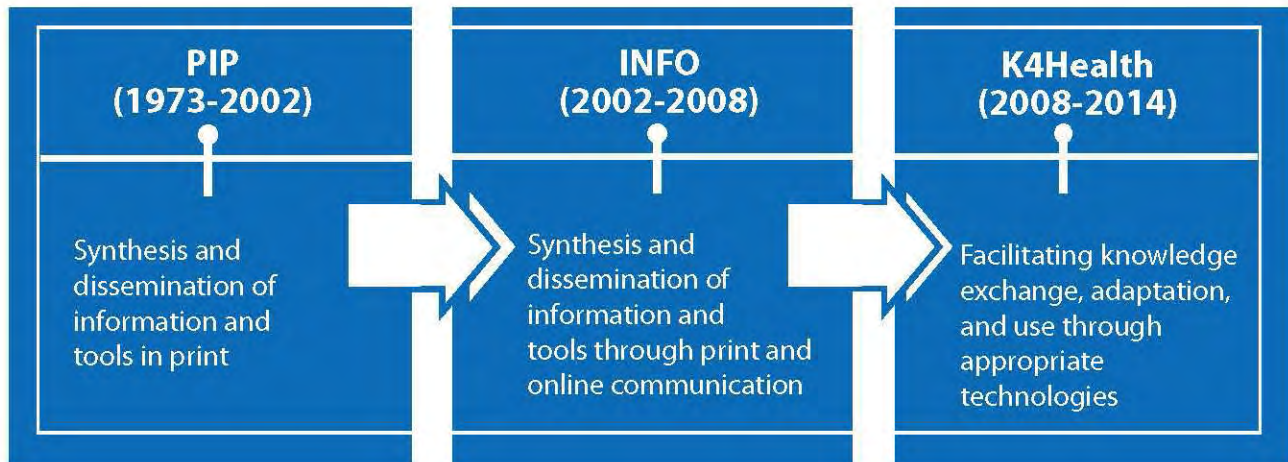
Background and Overview

For nearly 40 years, the Knowledge for Health (K4Health) Project and its predecessor projects at JHU·CCP have been synthesizing and sharing health knowledge with program managers, service providers, and other health care professionals around the world. K4Health built on the experience of the Population Information Program (PIP), which ran from 1973 to 2002, and the Information and Knowledge for Optimal Health (INFO) Project, implemented from 2002 to 2008.

PIP historically linked health professionals in low- and middle-income countries (LMICs) to emerging scientific literature by mail. This delivery mechanism changed dramatically when INFO began taking advantage of the Internet and online communication, which accelerated the process exponentially. With the advent of K4Health, the focus transformed from disseminating information to exchanging and using knowledge, harnessing the latest digital and mobile technologies. K4Health ensured that health professionals not only had access to new, evidence-based information but also had the capacity and tools to use the information to strengthen their health services and systems and the means to share their experience with other professionals. With funding from the United States Agency for International Development (USAID) Office of Population and Reproductive Health (OPRH), within its Bureau for Global Health, K4Health improved access to and sharing of global, regional, and country-specific public health knowledge, particularly about international family planning and reproductive health (FP/RH).

Project History

PIP (1973-2002)	INFO (2002-2008)	K4Health (2008-2014)
Synthesis and dissemination of information and tools in print	Synthesis and dissemination of information and tools through print and online communication	Facilitating knowledge exchange, adaptation, and use through appropriate technologies

Mission

Our mission is to increase the use and dissemination of evidence-based, accurate, and up-to-date information to improve health service delivery and health outcomes worldwide. The K4Health platform facilitates the capture, synthesis, adaptation, sharing, and use of this critical knowledge.

K4Health
Knowledge for Health

K4Health approached its work from a knowledge management (KM) perspective. KM is a set of approaches that value and support generating, capturing, organizing, and adapting knowledge, and making it accessible and usable in different formats for different people.

K4Health evaluated the knowledge sharing structures in health programs and systems and found ways for knowledge to be shared more effectively. Its products and services strengthened the KM capacity and systems of the global health sector.

Vision

K4Health envisions a world in which public health professionals from all levels around the globe have a voice to articulate their needs, share best practices, contribute content, avoid duplication, and, ultimately, use knowledge to make better decisions to improve and save lives.

A young couple with their newborn in the maternity ward of a state health facility in the Free State, South Africa. © 2008 Marilyn Keegan, Courtesy of Photoshare

Major Lessons Learned

- Conducting health information needs assessments facilitates a thorough understanding of the existing networks and information needs in a given community and health system. Some communities and health systems struggle with too little information, and others struggle with too much. Regardless of the quantity, sometimes the information is unreliable, conflicting, not applicable, or not appropriate for the local context. High-quality, trustworthy information that is easy to access, understand, and use is a common need.

- Maintaining awareness of the technology landscape while staying flexible is critical to advancing knowledge management. There are significant disparities in access to Internet and reliable technology even within a single country. Access to mobile phones and networks, although growing rapidly, is still limited, with smart phone coverage at less than 5%.

- Face-to-face events, local training, and blended learning activities continue to be important to maximize the use of online and/or mobile-accessible resources. Despite expanding Internet and mobile phone coverage, many health care providers and other professionals still prefer to obtain knowledge and information from meetings and personal interaction.

- Knowledge management plays an important role in health systems strengthening. K4Health KM activities in Malawi strengthened five of the six WHO building blocks of a functional health system. In virtually all settings, health workers and program managers reported that access to knowledge through KM . interventions was empowering. KM interventions also improve knowledge exchange and service delivery. Field workers who participated in the K4Health-led Bangladesh Knowledge Management Initiative, as well as the mothers they served, showed increases in health knowledge. Field workers in Bangladesh and Malawi felt empowered, and their communities viewed them with more credibility.

- An urgent need exists among local and international health organizations for affordable, easy-to-use, customizable website platforms to organize and share health information. Websites not only disseminate credible and accurate health information but also provide an online space for health professionals to share resources, network with colleagues, and contribute to knowledge repositories. The K4Health Toolkits platform, Sites4Dev, OpenAid, and the Southern Africa HIV/AIDS Resource Exchange (SHARE) have begun to effectively meet these demands.

- Partnerships and working group collaborations with leading subject matter experts produced high-quality, consensus-driven resources, such as the "Knowledge Management for Global Health Logic Model," the *Guide to Monitoring and Evaluating Knowledge Management in Global Health Programs, The mHealth Planning Guide: Key Considerations for Integrating Mobile Technology into Health Programs*, and a gold standard Health, Population, and Nutrition Toolkit for Field Workers in Bangladesh. These partnerships establish buy-in from a variety of stakeholders, reduce duplication of efforts, and reduce inconsistencies in messages from different organizations.

- User feedback and usability testing drive the evolution of KM products and services. Considering user feedback when upgrading products, creating new products, and developing original content helps to successfully improve the user experience. Findings from user experience sessions indicated that users preferred clean, simple designs with limited text and multiple search options. Data from needs assessments and program evaluations were the foundation for the overarching project strategy and field activities.

Top K4Health Project Achievements

Key K4Health Project accomplishments can be grouped into three broad areas: (a) improving access to and use of up-to-date FP/RH information and knowledge; (b) building KM capacity in the field; and (c) advancing the field of KM for global health.

A. Making the latest FP/RH knowledge and information easy to find and easy to use

K4Health built a strong commitment to synthesizing and sharing the latest FP/RH research and experiential knowledge with its audiences through 10 key platforms:

(1) the *Global Health: Science and Practice (GHSP)* journal,

(2) the K4Health website and blog,

(3) Toolkits,

(4) POPLINE,

(5) Photoshare,

(6) the Global Health eLearning (GHeL) Center,

(7) communities of practice (CoPs) and online forums,

(8) *Family Planning: A Global Handbook for Providers,*

(9) the companion "Do You Know Your Family Planning Choices?" Wall Chart, and

(10) the spin-off Application for Contraceptive Eligibility (ACE) mobile app.

Over the life of the project, K4Health made major improvements to our Web products and services and renewed our dedication to reaching our audiences.

Under the K4Health Project, we adopted a mobile-friendly responsive design, which is critical for LMIC audiences in particular, as mobile infrastructure and access are quickly outpacing fixed or desktop Internet access in remote settings.

We updated our high-demand Web products and services, such as POPLINE, Photoshare, and GHeL, to facilitate easier navigation and an enhanced user experience. By automating the creation of offline versions of K4Health Toolkits and GHeL courses, we streamlined the process for reaching users in low-bandwidth settings.

Many of the new functionalities, developed for K4Health products and services, are now available to the open source software community at Drupal.org for use by anyone with a Drupal 7 website, extending USAID's investment beyond K4Health and into the open source community.

Some specific highlights for K4Health products, resources, and services include:

- *Global Health: Science and Practice*, a new peer-reviewed, open-access online journal was launched in March 2013, with a focus on advancing practical program implementation research and experience.

- *Family Planning: A Global Handbook for Providers* was updated in 2008 and 2011 to ensure the latest guidance on contraceptive methods and eligibility is available to health care providers. We also launched a suite of related products, including an enhanced website for the Handbook; ePub, iBook, and other electronic versions of the Handbook; and the companion ACE mobile application for Android phones.

- The redesigned GHeL Center, launched in March 2013, offers easier navigation, a robust public-facing website, and an enhanced learning experience driven by dynamic courses and the ability to connect with and learn from other users on the site.

- A new POPLINE website expanded access to and reach and usefulness of FP/RH resources through major improvements to its functionality, including a flexible search interface, over 400 pre-coordinated instant searches, a "My Documents" folder, and multiple export options.

Top K4Health Project Achievements

K4Health
Knowledge for Health

A 20-year-old implant user from Bangladesh sits with her local Field Worker Assistant at a group talk discussing family planning options.
© 2011 Lynn M. Van Lith, Courtesy of Photoshare

Global Health: Science and Practice Journal

I. Global Health: Science and Practice Journal

In Year 4, K4Health, in collaboration with USAID, conceptualized, launched, and managed a new peer-reviewed journal in global health. The *Global Health: Science and Practice* (GHSP) journal addresses the need for a credible medium to share experiences and lessons learned from the implementation of global health programs—the kind of information that most other scholarly journals tend to shy away from.

To produce the journal, K4Health composed an editorial team of an Editor-in-Chief, seven general and specialized associate editors, and two managing editors that oversaw different aspects of the publication process. K4Health registered over 400 expert peer reviewers and required two to three peer reviews for each paper. Finally, the team established a small but diverse editorial board of 19 global health leaders who continue to be strong advocates and promoters of the journal.

Since the first call for manuscripts in August 2012, GHSP received more than 290 submissions and published four issues comprising 62 articles. More than 120,000 articles were viewed in HTML (78,805) or downloaded as PDFs (41,593) by more than 44,000 unique visitors.

The *Global Health: Science and Practice* (GHSP) journal home page: www.ghspjournal.org

The 10 most-read articles from the four issues covered a wide range of topics. The list was topped by an editorial on cell phones and community health workers (CHWs), and included a technical concept paper on mHealth; commentaries on global health diplomacy, contraceptive implants, and tuberculosis diagnostic testing; an editorial on behavior change communication (BCC) as a health systems building block; a viewpoint on providing assistance to ministries of health; and original articles on Islam and family planning, scaling up community health programs, and polio eradication.

Over 2,200 readers subscribed—via the GHSP journal website—to receive email alerts about the journal. The website also features a Job Opportunities page, which allows recruiters to post jobs and job seekers to search for jobs at no cost. More than 100 jobs have been posted and viewed by more than 3,000 unique visitors.

By bringing forward field experiences and presenting them in a peer-reviewed format, GHSP offers practical and reliable information for global health program implementers to use to improve their programs, and ultimately improve the health of people in developing countries.

"Congratulations on an excellent electronic journal. I am enjoying the published articles and am selecting several for both my undergraduate and post graduate courses on global health here at the University of Arizona."

- Lecturer in Public Health, University of Arizona

K4Health Website and Blog

II. K4Health Website and Blog

The K4Health global Web portal, designed to serve as an effective and engaging delivery system for the project's products and services, was launched on October 22, 2009 and underwent iterative improvements over time to streamline and integrate our Web product portfolio.

A redesign in September 2010 provided improved navigation, more dynamically-driven content, prominent social media icons, and a stronger home page presence for the blog. However, user feedback revealed that, while visitors found the content valuable, they were looking for a clearer, more welcoming experience.

An intense 15-month process of strategy, visioning, and implementation led K4Health to launch a major series of upgrades in 2011–2012—bringing together products that had been developed at different times and on different platforms all onto the same platform (Drupal 7) and giving them a unifying look and feel. The process resulted in six upgrade releases in just over a year: a new Photoshare website was launched in September 2011, and the revised K4Health Blog went live in December 2011. In 2012, changes included the main K4Health.org website in April, the beginning of Toolkits' migration in June, POPLINE's first major update in more than 10 years in July, and a much more functional site for *Family Planning: A Global Handbook for Providers* in October.

New features for these existing products were designed to meet users' needs in the field, including mobile-responsive design across the portfolio, a redesigned information architecture, and a flexible search engine on K4Health.org to make the most relevant content easy to find. The website became more user-centered by focusing more on health information and users' needs, and less on the K4Health Project itself.

Site Improvements
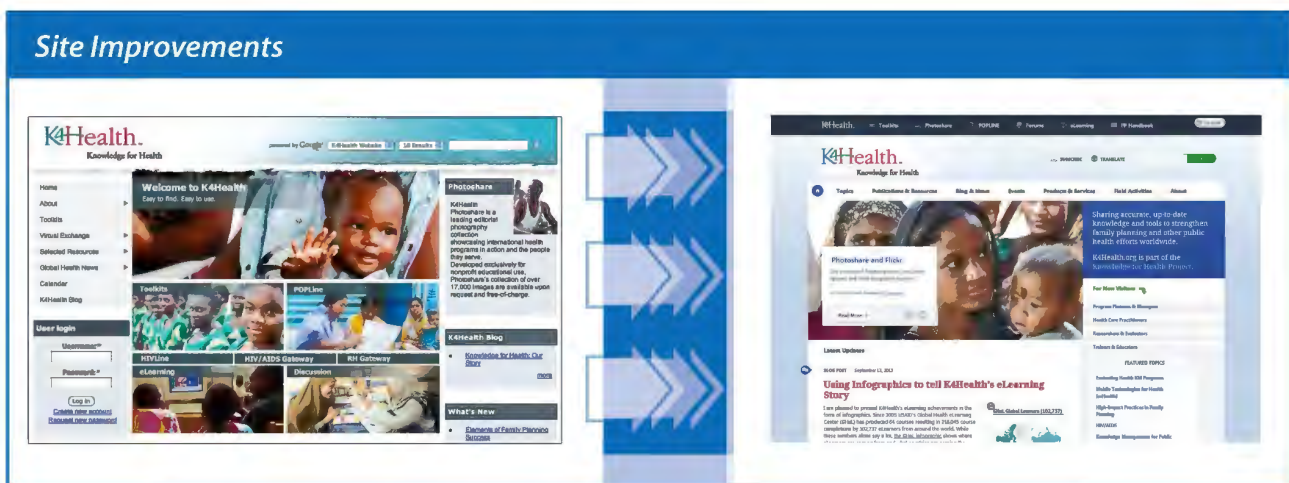
After the April 2012 release, a majority of respondents to a usability survey approved of the new K4Health.org, with many stating they find the site "well-organized, aesthetically pleasing, and easy to navigate." With the exception of reputability, which remained high at 84% of respondents, increases were seen in all positive-rating categories, with the largest increase in the percent of respondents agreeing with the statement, "The site is easy to use: clear, structured appropriately, logical."

The K4Health Blog also evolved into an innovative source of global health news and insights with a burgeoning audience. Between 2009 and 2013, the blog featured posts by 34 staff members and 31 guest contributors (16 added in the final project year alone). It highlighted emerging KM, FP/RH, and broader public health issues, insights from conferences and events, and new K4Health products and services. In the blog's first year (October 2009–September 2010), there were 65 posts; in the final year of the project, that had more than doubled to 165 posts.

The October 2009–December 2011 blog had an average of 683 unique pageviews per month; for December 2011–September 2013, that number had more than tripled, to 2,259 unique pageviews per month.

The K4Health Blog covers topics ranging from research on emergency contraceptives to dispatches from family planning conferences. The audience appreciates the broad variety: the most popular posts are about the updated Health Commodities Logistics course in the GHeL Center, an updated Couple Years Protection fact sheet, misconceptions about KM, and how male involvement in family planning empowers women.

Toolkits

III. Toolkits

K4Health Toolkits are online libraries of resources that provided quick and easy access to relevant and reliable health information in one convenient location. Toolkits enable health program managers, policy makers, and service providers to use and adapt information to improve their programs and outcomes. K4Health developed the Toolkit Application (the software used to develop K4Health Toolkits) in the first year of the project and launched the first three toolkits—on Elements of Family Planning Success, Injectables, and IUDs—with the initial website launch in September 2009.

K4Health Toolkits cover a wide range of topics, including:

- Family planning methods
- Family planning/reproductive health programs and services
- HIV/AIDS
- Maternal and child health
- Environmental health
- Gender
- Cross-cutting technical areas, such as mHealth and KM for Health and Development

By July 2010, the number of published toolkits jumped to 30, developed in collaboration with nearly 60 organizations. In addition, use of the toolkits steadily increased from 1,120 visitors in October–December 2009 to almost 9,000 visitors during April–June 2010. At the end of the project, 65 toolkits had been published in collaboration with 122 organizations.

K4Health also facilitated the development of more than 25 country-specific toolkits—identified and developed by on-the-ground working groups—in 11 countries on a variety of topics such as adolescent health, HIV/AIDS, and malaria. Country-specific toolkits were designed and launched in Bangladesh, Côte d'Ivoire, Ethiopia, Indonesia, Jordan, Kenya, Malawi, Swaziland, Uganda, Zambia, and Zimbabwe.

Site Improvements

K4Health
Knowledge for Health

K4Health fostered the abilities of individuals and organizations to develop and build toolkits on the K4Health Toolkits platform, providing them with multiple models to vet useful resources and the means to organize them and make them accessible.

Our trainings, supported by a series of guidance documents such as the "Conceptual Framework for Producing K4Health Toolkits" and the "Toolkit Dissemination Kit," are focused on establishing a technical working group, developing a user-friendly Toolkit, promoting and disseminating the Toolkit, updating the Toolkit, and monitoring and evaluating use and usefulness of the Toolkit.

In response to user feedback, K4Health launched an improved Toolkit Application in Year 3, which featured more design options for toolkit managers, including a vertical navigation menu, custom logos, more colors, and the ability to select content blocks.

The application also featured a sitemap, showed the date the toolkit was last updated, and displayed the number of resources adjacent to each linked subheading.

In Year 5, the Toolkit Application was redesigned in Drupal 7 for improved functionality and security, and featured a link checker and Google Analytics for each individual toolkit. After all toolkits were migrated to the new system, K4Health saw a 10% increase in the proportion of return visitors to toolkits compared with Year 4.

K4Health Toolkits were a top entrance avenue to the K4Health website; in Year 5, there were nearly 143,000 total visits to the more than 60 K4Health Toolkits with over 420,000 pageviews. Toolkits were also made available in offline formats—both flash drives and CD-ROMs—to over 60 countries to facilitate access in hard-to-reach, underserved areas.

Custom Toolkits

POPLINE

IV. POPLINE

For four decades, POPLINE has contributed to improved health programs as the world's most comprehensive collection of population, family planning, and related reproductive health and development literature from both research and programmatic experience. Starting as a card catalog in 1973 and celebrating its 40th anniversary in 2013, POPLINE has facilitated thousands of comprehensive literature reviews, delivered nearly 500,000 full-text documents to requesters in LMICs, and provides 50,000 links to a diverse array of open-access documents.
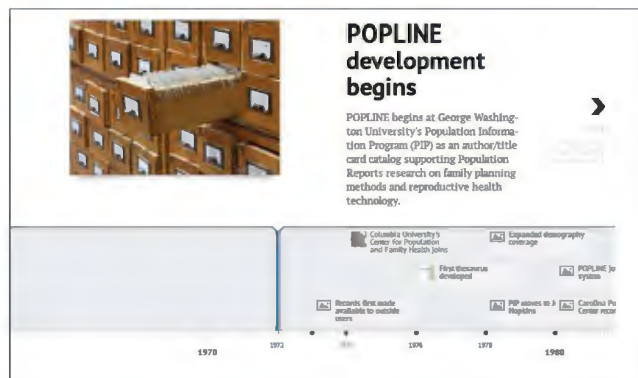
POPLINE Celebrates its 40th Anniversary! Timeline

In addition to peer-reviewed journal articles, POPLINE offers unique value to its users by including gray literature and journal articles from LMICs not indexed by PubMed or Scopus.

In the first two years of the K4Health Project, POPLINE streamlined the process for identifying and including new journal article records by automatically importing selected journal articles from PubMed and Scopus into the POPLINE database with minimal human intervention. More articles from a wider variety of sources are now identified more quickly, while requiring less staff time.

In Year 4, Google Scholar began indexing POPLINE, increasing visits 400% over the previous year, from 8,839 to 45,371, and elevating the visibility of its content to the global community. At the same time, work began on a major upgrade to the POPLINE website to expand access to and reach, usefulness, and use of resources. These upgrades were informed by user feedback, analysis of search logs, and research needs.
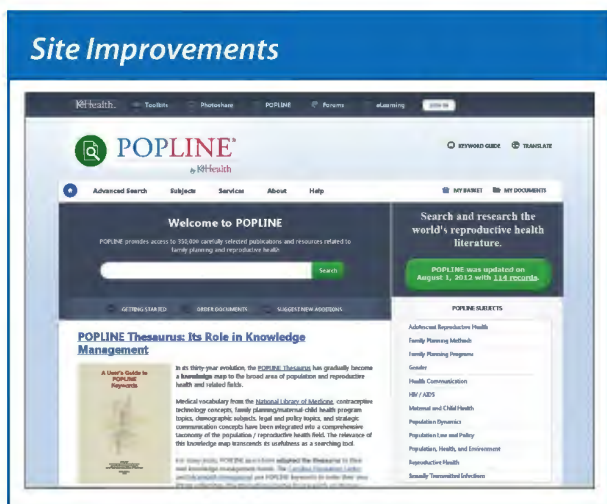
Launched in Year 5, POPLINE's new website specifically addressed the needs of a range of users, from novice to experienced researchers and subject matter experts.

New features included: customizable advanced search, over 400 pre-coordinated instant searches, multiple export options, filter search results by keyword, saved searches and "My Documents," the ability to share search results via social media, and a mobile-friendly interface.

"Depth of resources available (so many spanning so many years), ease of use."

"I am very thankful to POPLINE for providing me the printed copies of the documents, which is very helpful for me and my students."

"At least I can see what is not being done in projects - PubMed had many articles on diabetes in pregnancy in developing countries but not clearly describing the interventions from USAID-funded projects."

-Value of POPLINE from survey respondents

Following these upgrades, visits increased 193%, from 75,432 to 221,284, and visits from mobile devices increased by more than 1,300%, from 1,834 to 25,740. Since the launch of the new site in July 2012, users have accessed full-text links to more than 32,000 documents (41% of those were accessed by LMIC users).

Coinciding with the launch, an online survey was conducted to gather user perceptions of the new website. Overall, 90% of survey respondents rated their POPLINE visit favorably.

Respondents cited the breadth and quality of the collection, links/access to full-text, and the inclusion of gray/programmatic literature not in PubMed or Google Scholar as what they valued most about POPLINE.

BOX 1: VOICES FROM THE FIELD ABOUT POPLINE

When a program manager identifies a global development or health need, she then faces a new challenge: how to find the knowledge that will help lead to an effective program. This is why Tendai Gunda, a nutrition expert who primarily works in Zimbabwe, continues to turn to POPLINE for the information she needs to build, implement, and evaluate programs. Gunda already knew POPLINE as a resource for sharing and synthesizing new knowledge from her experience as both a student and program manager. "When I was in school I introduced [POPLINE] to several people," she noted.

While completing her Master's degree, Gunda used resources from POPLINE to help her set up, run, and evaluate the Community-based Management of Malnutrition program in three districts of Zimbabwe. She found the scientific and programmatic knowledge she needed to gain an understanding of the issues, set benchmarks, and find the evidence base to generate support for the program. "[Information from POPLINE] helped me really understand the background and context of childhood malnutrition. It helped me get buy-in from the government because I had the scientific background." Through POPLINE, Gunda tapped into knowledge captured in published and unpublished literature as she set out to create knowledge through new programs. "POPLINE is my go-to place when I need information," says Gunda.
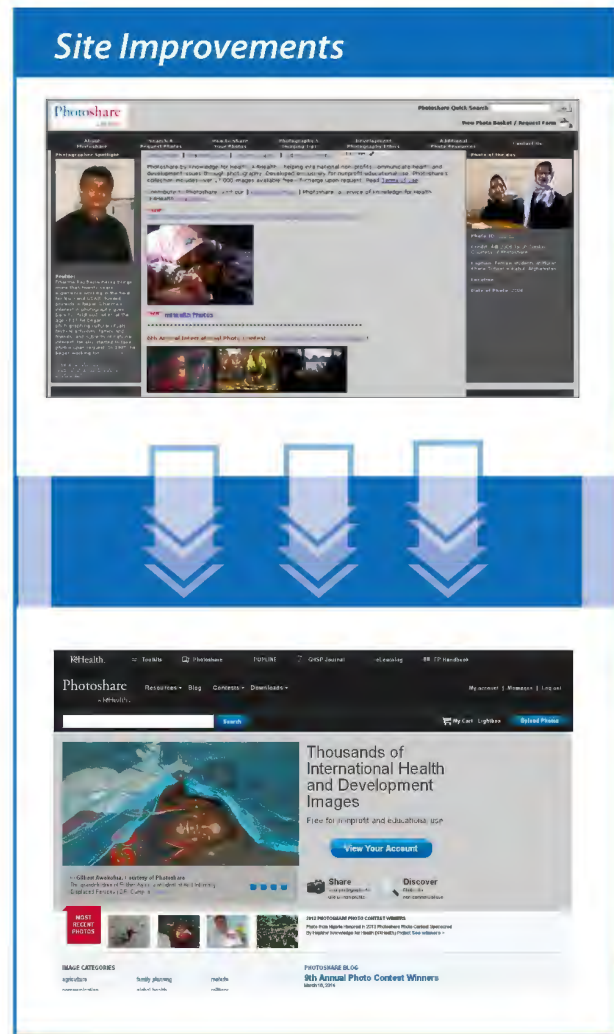
Photoshare

V. Photoshare

A globally unique product and service, Photoshare is a high-quality collection of more than 25,000 international public health and development images made freely available for nonprofit and educational use. Photoshare facilitates health communication through photography, representing: FP/RH, HIV/AIDS, maternal and child health, environment, humanitarian assistance, democracy and governance, and agricultural and economic development.

First created in 2003 (during the INFO Project), Photoshare's collection grew significantly throughout the K4Health Project by promoting contests, improving usability and ease of uploading photos, and forming strategic partnerships.

Photoshare's Annual International Photo Contests and Awards were popular international events mobilizing photographers to share their work for charitable and educational use, in return for a chance to win an award. By submitting their images, participants contributed to a growing collection, helping nonprofits communicate health and development issues worldwide.

In 2010, K4Health launched a unique Photoshare World Pneumonia Day Photo contest, a collaborative endeavor with the International Vaccine Access Center (IVAC) and the World Pneumonia Day Coalition.

Site Improvements

Judges included Nicholas Kristof, columnist for the *New York Times*, Ann Curry of NBC News, and a professional photojournalist. The contest brought together 350 participants from 82 countries who submitted 1,350 images. The 2012 Photoshare Photo Contest, in partnership with Healthcare Information for All (HIFA2015), built the collection by more than 2,500 images in less than three months.

K4Health
Knowledge for Health

A mother with her child at the Nhamatanda Health Center in Mozambique. © 2012 Arturo Sanabria, Courtesy of Photoshare

K4Health launched a redesigned Photoshare website in 2011 to improve the user experience in finding, requesting, receiving, and submitting images informed by monitoring data. The redesigned site included user profiles with a Lightbox for saving images, as well as new shopping cart features and tools for tracking orders and downloading requested images.

A new search interface made the collection more accessible with faceted search for filtering and refining results, as well as a new search results display that allowed users to view up to 200 thumbnail images per page. Features for Batch Upload and Flickr import also made it easier to contribute photos, particularly important in low-bandwidth settings. These upgrades were followed by significant increases in image requests and fulfilled orders, as well as image contributions.

During the K4Health Project, Photoshare focused on encouraging photo contributions from photographers in LMICs and demonstrating the vital role of photography in communicating about global health and development, particularly focusing on projects in action and the people they serve. K4Health also began developing partnerships to acquire rich image collections from USAID-Kenya, USAID's Bureau for Economic Growth and Trade, the President's Malaria Initiative, the mHealth Alliance, and the Gates-funded Measurement, Learning & Evaluation Project.

During Year 5, K4Health also partnered with the HERproject, which is active in Bangladesh, China, Egypt, Kenya, India, Indonesia, Pakistan, and Vietnam, extending the reach and impact of Photoshare images. HERproject is an initiative of BSR (Business for Social Responsibility) linking multinational companies and factories to local NGOs with workplace programs that increase women's health awareness. The partnership places Photoshare images directly into the HERproject Toolbuilder so users can create customized posters and flipcharts with Photoshare images. Additionally, many of the original illustrations included in the Toolbuilder were inspired by Photoshare images.

2012 Best of Category—Family Planning & Reproductive Health

Mrs. and Mr. Yaqub visit Shahnaz Kousar, a health worker, at her home office in Punjab Province, Pakistan.
© 2012 Derek Brown/USAID

"Great photos with information that puts the photo into context, making it easier to find and choose the perfect image for my needs."

- Survey respondent, October 2012

Global Health eLearning

VI. Global Health eLearning

K4Health supports the USAID GHeL Center, which offers 65 courses on a range of public health topics. These virtual, self-paced tutorials deliver up-to-date, evidence-based learning materials developed by experts directly to field staff around the world. The courses are free, low-bandwidth friendly, and accessible to anyone.

Although originally intended for USAID Population, Health, and Nutrition officers, GHeL's courses are also popular among non-USAID global health professionals; since its launch in 2005, more than 200,000 certificates were earned by over 100,000 registered learners from 251 countries. Learners can earn certificates in any of the following certificate programs:

1. Child Survival
2. Cross-Cutting
3. Early Childhood Development
4. Family Planning and Reproductive Health
5. Gender and Health
6. Health Systems
7. HIV/AIDS
8. Infectious Diseases
9. Maternal Health
10. Neonatal Health

March 2013 marked the launch of an improved and redesigned GHeL Center, with easier navigation, a more robust public-facing website, and an enhanced learning experience driven by more dynamic courses.

The site includes an option to download courses in multiple formats for easy offline use, a revised "action plan" feature that allows learners (or trainers) to better understand intended use and application of knowledge, and the ability to connect with—and learn from—other users on the site as part of the GHeL Community Groups.

Site Improvements
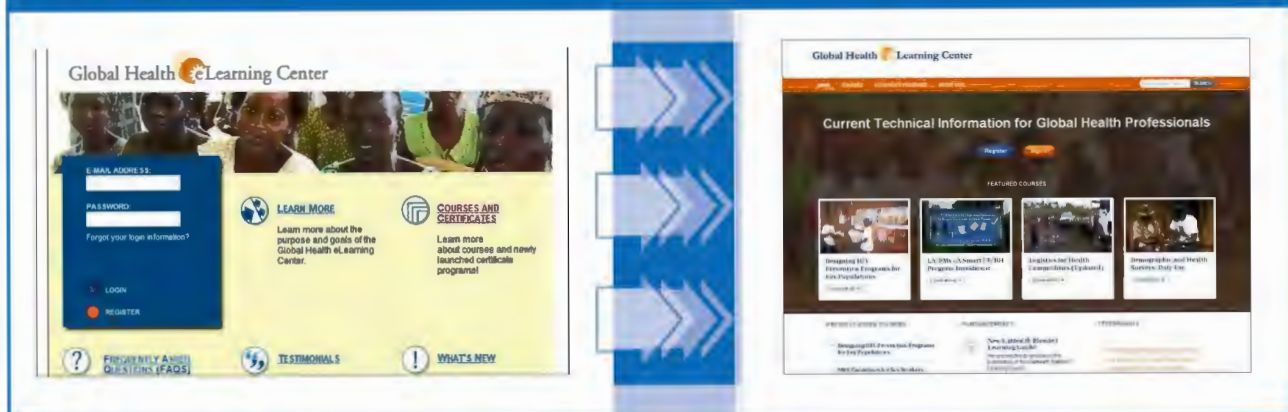
K4Health's robust eLearning portfolio contributed to capacity building of individual public health practitioners who took eLearning courses, while also building institutional capacity of other projects and organizations to implement similar educational opportunities.

- K4Health eLearning staff shared expertise in instructional design, strategic communication, and writing for the Web with subject matter experts.

- We also provided technical and programmatic guidance to the U.S. President's Emergency Program for AIDS Relief (PEPFAR) eLearning Initiative under the guidance of the Office of the U.S. Global AIDS Coordinator by collaborating with more than 75 experts from 32 organizations to produce 20 online courses on a variety of topics. Our work with PEPFAR also laid the groundwork for development of the "Blended Learning Guide" and helped to inform Community Groups on the GHeL Center.

- K4Health published the "Blended Learning Guide" to provide guidance on incorporating GHeL courses into capacity building activities in resource-limited settings to enhance and reinforce learning.

- The project also developed a course on KM in Global Health Programs, which provides a basic understanding of KM systems and guidance for health organizations on developing and supporting knowledge exchange activities.

- K4Health contributed to the eLearning literature by publishing an article in September 2012 on using eLearning to strengthen the capacity of global health practitioners and institutions in *Knowledge Management & E-Learning: An International Journal.*

To address feedback from more than 1,700 learners that indicated a need for interactivity among learners, K4Health created "Community Groups," which provide a public space for learners to interact with each other, explore course content together, and share experiences related to course topics. A community for each of the 10 certificate programs has been created, and in each of the groups, eLearners post questions, comment, or read what others have posted to enhance their understanding of course material. Course authors and program leaders facilitate moderated discussions on a specific GHeL course or topic.

BOX II: VOICES FROM THE FIELD ABOUT GHeL

In September 2013, K4Health, in collaboration with Save the Children and CARE, launched a six-course eLearning certificate program on Early Childhood Development for vulnerable populations on the GHeL Center. Sixty participants from 10 African countries are working through the eLearning modules as a complementary activity to the Essential Package, while also participating in targeted discussions that foster cross-country knowledge sharing to enhance programming focused on young vulnerable children and their caregivers.

As the Essential Package community continues to grow with champions all over Africa, face-to-face trainings are not always possible. The eLearning modules are critical to increasing the reach of this important program guidance, which can be downloaded as a PDF onto cell phones and other mobile devices for easy access and offline learning.
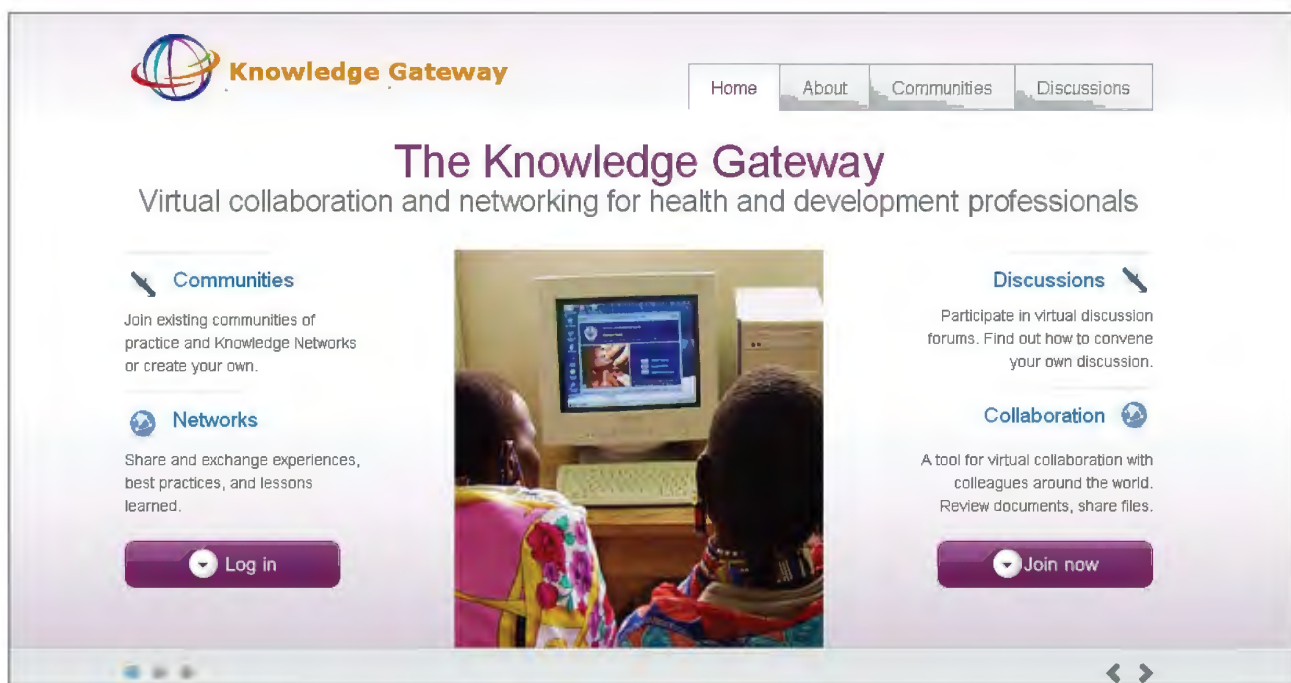
K4Health
Knowledge for Health

VII. Communities of Practice and Online Forums

Online forums connect health and development professionals to increase access to essential health information, foster peer support, elicit experiential knowledge, provide professional development opportunities, and avoid recreating the wheel. K4Health's virtual networks are composed of CoPs and discussion forums.

K4Health maintained and supported the Implementing Best Practices (IBP) Knowledge Gateway, which hosted over 600 groups where more than 30,000 health and development professionals connect. Members accessed resources and tools while sharing experiences on effective practices, success stories, lessons learned, and challenges. The low-bandwidth friendly online platform was developed by WHO's Department of Reproductive Health and Research and the IBP Initiative in 2004.

K4Health served as the IBP chair for one year and mentored other chairs in subsequent years. K4Health also helped to redesign and launch an improved IBP platform in December 2011 with better navigation and functionality. In August 2013, K4Health transitioned support of the Knowledge Gateway to the IBP Secretariat.

K4Health trained CoP leaders on the IBP Knowledge Gateway platform, which hosted more than 50 time-bound global discussion forums focused on FP/RH topics. To spark dialogue among CoP leaders, K4Health conducted two online discussion forums on developing and sustaining CoPs and measuring CoP success. The first forum in January–February 2011, "If I Build It, Will They Come? Sustaining Active CoPs," included 302 participants from 48 countries with 87 total contributions.

The Knowledge Gateway home page: www.knowledge-gateway.org

A subsequent forum in April 2011 on "Looking Beyond Numbers: Measuring the Value of CoPs for Global Health" included 371 participants from 56 countries with a total of 142 contributions. Participants remarked on the usefulness of the virtual forum and the benefits of participating in a CoP. The community continues to exist as a space where those working on CoPs can interact. K4Health-led online forums offered simple and effective solutions for health professionals to exchange information and virtually connect with others working on common goals to advance health outcomes.

Other K4Health forum highlights included a series of forums leading up to the International Conference on Family Planning (ICFP) in Dakar, Senegal, during November–December 2011 covering topics on progress at the national level since the 2009 ICFP, rapidly growing youth populations and implications for family planning, and national strategies for contraceptive security and financing.

These forums, held in both English and French, focused on connecting health care professionals, including those in Francophone Africa. More than 650 people participated in the discussions and advanced the dialogue on a number of common themes before the conference started.

Following the previous ICFP, held in Kampala, Uganda, in November 2009, K4Health facilitated a two-week forum. The forum, held in April 2010, aimed to capitalize on the energy and excitement from the conference and strengthen family planning programs. More than 700 people registered for the forum, and the majority of contributions were from participants in LMICs on such topics as implementing family planning programs in conflict areas or in places where family planning is controversial and the need for community-based contraceptive distribution and access to accurate information at all levels of health systems.

K4Health provided leadership and support for knowledge exchange forums and virtual CoPs to a wide variety of other organizations. In addition, lessons learned from forum evaluations were regularly published and shared to facilitate ongoing learning and improvement of activities.

K4Health staff also published the article "Six years of lessons learned in monitoring and evaluating online discussion forums" in the December 2011 issue of the *International Journal of KM and eLearning*. The article compiles and synthesizes K4Health's experiences supporting forums and synthesizes a series of in-depth interviews with participants.

"In many cultures, including mine, views contradicting with authorities are not well received, [but] e-forums and CoPs are different. There are no hierarchies. I can express without shame, fear, and guilt. I participate because I am heard."

-Medical program manager from Nepal

K4Health™
Knowledge for Health

VIII. Family Planning Handbook

Family Planning: A Global Handbook for Providers serves as a quick-reference resource with the latest guidance on contraceptive methods for all levels of health care workers. The Handbook was prepared through a unique collaboration between editorial staff at the K4Health Project and technical experts from WHO, USAID, and more than 30 other organizations around the world. In 2011, K4Health updated the 2007 version based on new WHO guidance as well as the content of our translated versions: Arabic, Farsi, French, Portuguese, Romanian, Russian, Spanish, and Swahili.

K4Health launched a new Global Handbook website in July 2012. Based on our users' feedback, the new website (fphandbook.org) provides users with easier access to information through improved search functions and a cleaner, more intuitive design. Following the launch campaign, visits increased by more than 330%, from 4,067 to 13,699.

The new site offers more than just a book; it offers an entire contraceptive methods portfolio. Components of the Handbook, such as individual chapters and job aids, were made easily accessible for download and printing. In addition, the Handbook is available for download from the website in multiple offline formats, including ePub and Kindle versions for eReader devices.

K4Health also began offering downloadable Microsoft Word versions of the Handbook in English, French, and Spanish to facilitate easier local adaptation of content.

Home page of *Family Planning: A Global Handbook for Providers*: www.fphandbook.org

IX. Family Planning Wall Chart

The "Do You Know Your Family Planning Choices?" Wall Chart helps ensure clients interested in family planning are aware of the available methods and can make a more informed decision.

The Wall Chart contains information about specific family planning methods, drawn from the Global Handbook, and is commonly used in health care settings as an educational tool for clients and a reminder for providers.

The Wall Chart has been translated into eight languages, and more than one million copies have been distributed worldwide. The revised Global Handbook website features the option to download the Wall Chart as a PDF or to order a print version of the chart.

ACE Mobile App

X. ACE Mobile App

The ACE mobile app for Android phones provides an interactive method at the point of care to check medical eligibility for contraceptive methods, based on WHO's *Medical Eligibility Criteria for Contraceptive Use.*

The first version of the ACE App was developed for Android mobile phones in Year 4 in partnership with Forum One. K4Health launched an improved version the following year using a streamlined database decision tree that allows users to answer fewer questions before viewing a recommended contraceptive method.

The newer version of this application—whose improvements were informed by usability testing of the app with family planning providers in low-resource settings—has helped deliver guidance more quickly and effectively to family planning providers, contributing to improved quality of care.

In response to user feedback, K4Health staff also began developing an Apple iOS version.
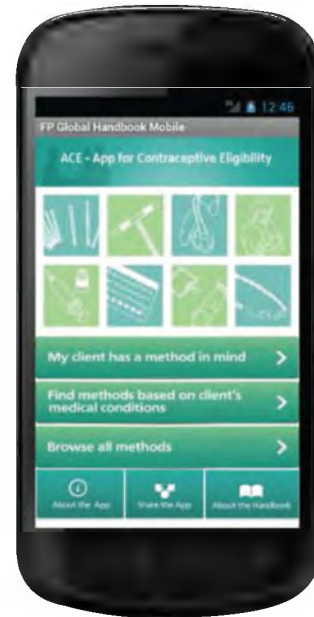
A group of Accredited Social Health Activists (ASHA) in India. © 2008 Meenakshi Dikshit, Courtesy of Photoshare

B. Designing, implementing, and evaluating KM activities at the country and regional levels

With bold steps, K4Health took KM interventions to the field level in order to improve the knowledge, attitudes, and behaviors of health program managers and providers, and to improve service quality and health systems overall.

At both regional and country levels, health care professionals need to network and exchange knowledge so they can provide effective and efficient health care services.

In close collaboration with local counterparts, K4Health conducted needs assessments to understand knowledge needs and networks and to implement innovative, tailored KM solutions to improve the capacity of local partners to capture, synthesize, and share the latest research and best practices.

In addition to designing and launching country-specific toolkits in 11 countries, K4Health provided in-depth field support in five countries/regions: Malawi, Southern Africa, Nigeria, Bangladesh, and Indonesia. Our regional and country-level activities improved communication, streamlined processes, and empowered health care providers by providing them with the information and knowledge they needed to do their jobs well.

Capacity building factored as a core component of K4Health's approach to KM. Throughout its global and field activities, K4Health worked to not only improve KM and health systems but also strengthen other organizations' and governments' capacity to build, maintain, and improve KM and health systems.

K4Health Needs Assessments

Specific accomplishments stemming from our field programs include:

- K4Health created the SHARE portal, which provides a space for policy makers, program managers, and health care providers working on HIV prevention across Southern Africa to connect, communicate, and share information. The SHARE portal has had over 43,000 unique visits from 199 countries.

- K4Health supported an SMS-based mobile phone network between district health centers and CHWs in Malawi, which improved overall communication between health workers, such as rapid responses to emergencies and outbreaks, reduced stock-outs, and decreased travel time and expenses among CHWs.

- The Bangladesh Knowledge Management Initiative (BKMI) improved coordination among health communication stakeholders and sharing of evidence among frontline service providers. BKMI trained more than 300 CHWs on using K4Health Toolkits containing information on maternal, neonatal, and child health; reproductive health; and nutrition.

- Associate Awards from USAID Missions in Indonesia and Nigeria led to the implementation of health initiatives in these countries. The Indonesia project is working to improve the contraceptive method mix, and the Nigeria initiative is advancing the continuing professional development of medical laboratory scientists through eLearning courses.

Top K4Health Project Achievements

K4Health
Knowledge for Health

I. Malawi

When K4Health began work in Malawi in 2009, health program managers and providers reported that health information and knowledge was scattered and difficult to find, and communication was a challenge. A thorough needs assessment formed the basis of our Malawi K4Health Project; and then, from January 2010 to June 2011, we co-designed and introduced a series of KM interventions at different levels of the health system to build sustainability through health systems strengthening. The initial assessment and pilot activities in Malawi were supported by USAID core funds, with project activities led primarily by K4health partner MSH.

At the **national** level, K4Health helped to create a National KM Task Force that enabled members to exchange public health knowledge, creating a consistent flow of knowledge sharing, adaptation, and use. In addition, K4Health worked with Family Planning and HIV Technical Working Groups to create four online Toolkits, including resources to support implementation of national policies and standards, communication materials in the local language (Chichewa), and other locally relevant materials. Toolkits focused on family planning, HIV, maternal and neonatal health, and young people and reproductive health.

Amon Chimphepo, a community health worker in rural Malawi, received a cell phone and solar charger from K4Health. He has saved at least one life by making an emergency call for an ambulance.

At the **district** level, K4Health established two District Learning Centers (DLCs) at hospitals in Nkhotakota and Salima, which provided a range of newly available online and offline health resources as well as face-to-face and distance learning programs.

At the **community** level, K4Health collaborated with FrontlineSMS and the Ministry of Health to create an SMS-based mobile phone network connecting DLCs and CHWs. K4Health distributed 663 mobile phones and solar chargers to CHWs, who used the phones to send SMS messages to the district management team to report critical events (such as stock-outs) and request support and guidance for challenging cases. In return, DLCs used the mobile phone network to alert CHWs about new resources, training opportunities, and changes in protocols. CHWs also took advantage of the novel ability to exchange information directly with each other to coordinate and improve care.

The evaluation of the Malawi Pilot Project found:

- Improved promptness in responses to emergencies and outbreaks
- Improved health practices and case management
- Significant cost reduction in travel for CHWs with mobile phones
- Reduced stock-outs
- Increased CHW self-confidence
- Increased trust between CHWs and the communities they served

In an ideal show of sustainability, the Malawi Ministry of Health took over management of activities when the effort ended.

The experience and insights of this effort are captured via several journal articles for the global health community (see list of Publications at the end of the report).

"Before the Knowledge for Health Project I was not confident enough to help my clients because I was not sure when answering some of the technical questions that some of my clients were asking me. But with the phones that we received from K4Health, I am able to help my clients with firsthand information from the coordinator, and the phone has also helped me to know a lot of things that were giving me problems when asked by my clients."

-Health Surveillance Assistant, Nkhotakota, Chididi Health Facility

k4Health
Knowledge for Health

II. Southern Africa

From 2008 to 2014, the K4Health Southern Africa Project partnered with HIV/AIDS professionals in the region, fueled by funding and guidance from USAID's Regional HIV/AIDS Program in Southern Africa (RHAP), under PEPFAR. The overall goals of this groundbreaking project were to employ evidence-based KM to:

- Improve knowledge sharing about HIV prevention in the region

- Improve the capacity of stakeholders to strengthen knowledge sharing systems

As the basis for program activities, K4Health conducted a rapid HIV/AIDS information needs assessment among health care professionals in Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe.

K4Health found that people working in HIV/AIDS in the Southern Africa region desperately needed access to up-to-date, accurate, and relevant knowledge and information to appropriately respond to the HIV/AIDS epidemic.

Built on open source software, K4Health developed the Southern Africa HIV/AIDS Resource Exchange (SHARE), a regional Web-based commons for capturing HIV/AIDS information and promoting knowledge exchange.

Launched in October 2011, this virtual space provides a platform where health and HIV-focused professionals could connect with one another, seek answers to technical questions, and contribute their own knowledge for others to access.

SHARE home page: www.hivsharespace.net

SHARE also forged strong links to existing online resources from a variety of high-quality collections including K4Health Toolkits, Swaziland's National Emergency Response Council on HIV and AIDS (NERCHA) Info Centre, MSH's Building Local Capacity for Delivery of HIV Services in Southern Africa Project (BLC) publications, and a Southern African Development Community (SADC) literature review database. Since it launched, SHARE has had over 43,000 unique visits from 199 different countries with more than 1,000 registered users.

K4Health trained local organizations in KM, instructional design, toolkit building, and online forum facilitation to strengthen sustainable, locally developed KM systems. These activities included the creation of local and regional toolkits, eLearning courses, moderated discussion forums, national and local information centers, and other general knowledge sharing and dissemination activities.

The project also helped to create and launch several regional toolkits, including the Human Resources and Health Toolkit, and we partnered with the Southern Africa HIV and AIDS Information Dissemination Service (SAfAIDS) to create the LGBTI Populations and HIV Prevention Toolkit and Engaging Traditional Leaders in the Prevention of HIV and Gender-Based Violence Toolkit.

Two toolkits were created with regional partners: Information Resources from SADC's HIV and AIDS Programme and the SAVE Toolkit from INERELA+. Several country-based toolkits for HIV prevention were also created in Botswana, Lesotho, Swaziland, Zambia, and Zimbabwe.

Based on the need for more national and local access to HIV/AIDS information, K4Health provided support to launch and back several information centers in Lesotho and Swaziland. These centers not only provided information but also served as a gathering place for many other collaborative and knowledge sharing activities.

In Swaziland, extensive support was given to the National HIV and AIDS Information Centre (Info Centre) in Manzini to create the Male Circumcision (Swaziland's Accelerated Initiative) Toolkit and the HIV and AIDS Toolkit for Teachers and Schools in Swaziland to support an initiative to increase HIV/AIDS information in tertiary institutions.

In addition to toolkits, K4Health partnered with SAfAIDS to develop eLearning courses on Documenting Best Practices, Engaging Traditional Leaders, and LGBTI.

Top K4Health Project Achievements

K4Health
Knowledge for Health

45

A group of adolescent girls discuss being the first generation in Kembata, Durame Woreda, Ethiopia, who do not have to undergo female genital cutting at their young age. © 2005 Netsanet Assaye, Courtesy of Photoshare

III. Nigeria

While laboratories obviously serve as a vital part of any health system, Nigerian laboratory scientists often lack regular, varied opportunities to keep their skills and clinical knowledge sharp and up-to-date. Conversely, the national health system struggles with assessing which scientists might be in need of refresher training and/or updates. In response to these pressing needs, the K4Health/Nigeria Web-Based Continuing Medical Laboratory Education (CMLE) Program developed a system for continuously improving the knowledge of medical laboratory scientists, updating and sharpening their skills, and acquiring new skills. The CMLE Program (which is also referred to as the Continuing Professional Development [CPD] project) began in September 2011 as a two-year Associate Award from the USAID Mission in Nigeria, receiving additional funding to continue through September 2015.

The two primary interventions of the K4Health/Nigeria CPD project are:

- Revitalizing, launching, and institutionalizing a CPD Policy, making CPD credits a requirement of licensure renewal

- Developing, managing, and hosting Nigerian-authored and accredited eLearning courses

The K4Health Project implements these interventions in close collaboration with the Medical Laboratory Science Council of Nigeria (MLSCN) and the Association of Medical Laboratory Scientists of Nigeria (AMLSN), building their capacity to continue these activities beyond the project life. By the end of the project, at least 50% of medical laboratory scientists in Nigeria seeking annual re-licensing will have earned a CPD credit from the MLSCN through the successful completion of an AMLSN-authored eLearning course.

Since the launch of the first set of courses in September 2012 until October 2013, 3,057 successful course completions have been recorded. More than 1,350 unique learners successfully passed the courses. Of these, 1,001 successfully completed more than one course and 43 successfully completed all six courses.

From the onset of the project, K4Health has been working side-by-side with our local partners and stakeholders to build their individual and organizational capacity, as well as sharing responsibility and leadership of project activities to ensure all aspects of the project are gradually transferred to them to guarantee its sustainability beyond the project-funded period.

K4Health started by conducting a rapid needs assessment targeting information gaps and technological capabilities of medical laboratory scientists in Nigeria to inform not only the eLearning course topics but also the design, development, and deployment of the courses.

Top K4Health Project Achievements

At the same time, K4Health worked with the MLSCN to understand the challenges in enforcing the earlier 1996 CPD Policy. With this information, K4Health facilitated the development and institutionalization of an updated CPD policy and actively promoted the CPD Policy, which included the accredited eLearning courses, throughout the medical laboratory scientist community. After just two years of project implementation, seven courses had been authored by AMLSN members and peer-reviewed by Nigerian subject matter experts on the essentials of HIV; tuberculosis; malaria diagnosis quality improvement; and supply chain management for medical laboratories.

The courses are currently free and available to everyone. Even though the courses have been mainly promoted within Nigeria, they have been found and accessed by medical laboratory professionals from 31 other countries, with the largest contingent of visitors from outside of Nigeria coming from Niger, in which French is the official language.

Research conducted from February to April 2013 determined the extent to which medical laboratory scientists improved their knowledge and skills as a result of taking an eLearning course. Nearly all reported that they had either greatly or somewhat improved their job performance in the following areas as a result of completing a course:

- Ability to provide accurate diagnosis
- Ability to conduct diagnosis safely
- Technical knowledge
- Ability to provide appropriate information to clients
- Understanding of biological and environmental factors that lead to disease
- Ability to work with supervisors and colleagues

Respondents cited knowledge gained and ability/skill improved as a result of taking the courses. Several said the courses provided a good refresher and were fun and interesting.

Under K4Health II, the project activities will continue with an emphasis on bolstering sustainability of the project activities by continuing to build the local capacity of AMLSN and MLSCN. Ensuring they have the necessary IT infrastructure, proper financial management, and human resources systems will allow them to receive USG funds directly and implement effective monitoring systems to inform program and policy decisions.

"…previously I use[d] only the thick film method in my diagnosis of malaria, but after the course I now use both thick and thin film, which gives me a better diagnosis. Also, [I learned about] other diagnostic methods which I was previously not aware of as a means of diagnosis malaria parasite; if I have the opportunity in the future, [I] will like to apply [this knowledge] practically."

– Nigerian laboratory scientist who completed the malaria course

IV. Bangladesh

Under K4Health and with funding from the USAID Mission in Bangladesh, the Bangladesh Knowledge Management Initiative (BKMI) was a 2.5-year project which began in July 2011 and ended in December 2013.

BKMI partnered with the Ministry of Health and Family Welfare (MOHFW) to build capacity in KM for BCC, coordinate health communication, and strengthen the quality of community-level health services for family planning, maternal newborn and child health, and nutrition.

Health, Population, Nutrition eToolkit for Field Workers

K4Health's BKMI technical advisors provided hands-on support and capacity building in the areas of strategic communication to three key units within the Directorate General of Family Planning and the Directorate General of Health Services of the MOHFW.

Advisors provided guidance on developing, delivering, monitoring, and evaluating integrated health, population, and nutrition (HPN) BCC campaigns and materials. BKMI spearheaded the BCC Working Group in Bangladesh to bring together health practitioners from government, NGOs, the private sector, and the donor community to create a shared vision for coordinated health communication in Bangladesh and to identify opportunities for collaboration.

"I am working as an FWA [Family Welfare Assistant] for 25 years. This is the first time I feel empowered! Empowered with information and knowledge. Knowledge presented in a way which I find interesting."

– BKMI netbook recipient

Top K4Health Project Achievements

In collaboration with the MOHFW, BKMI developed a comprehensive package of digital resources for field workers (both health and family planning). Resources included eight eLearning courses focusing on maternal and child health, nutrition, family planning, integrating services, and interpersonal communication and counseling.

The package also included an integrated HPN BCC Toolkit for field workers, a collection of carefully vetted BCC materials used in Bangladesh to facilitate counseling in HPN. The resources were made available offline on 304 portable netbook computers.

Field workers carrying the lightweight, long battery life-netbooks could easily access clear and accurate resources to aid in their counseling and strengthen their own knowledge.

The results of the BKMI eHealth Pilot evaluation are compelling, showing increases in knowledge among both field workers and mothers in the community exposed to the digital resources. In addition, field workers have felt empowered, their ability to integrate messages improved, and their communities view them as a more credible source of information. Although the pilot duration was short, some mothers did change their health behaviors.

The USAID Mission in Bangladesh will continue to fund BKMI under the Health Communication Capacity Collaborative (HC3) Project, also led by JHU·CCP, to continue capacity-building activities with the MOHFW, scale up the digital resources, and conduct further research in the community.

Sabita Rani Das, a Family Welfare Assistant in Sylhet District, counsels clients using a netbook computer and resources from BKMI.

V. Indonesia

With funding from a buy-in by the USAID/Indonesia Mission and the Australian Government, as part of the Alliance for Reproductive, Maternal, and Newborn Health, K4Health supported the Improving Contraceptive Method Mix (ICMM) Project.

Beginning in October 2012, this four-year project investigates the impact of applying knowledge management and exchange principles on targeted advocacy activities to improve the contraceptive method mix. The three major components of the project are research, advocacy, and local capacity building for knowledge exchange.

During the first year of ICMM—with support from K4Health core funding—researchers completed qualitative and quantitative baseline studies on family planning use, preferences, knowledge, and access in East Java and West Nusa Tenggara (NTB).

Initial data analysis showed that long-acting and permanent methods (LAPMs) were underutilized in the study districts.

Specifically, the quantitative survey found that in these districts more women desiring to limit births were using short-term methods, such as injectables and oral contraceptives, than LAPMs.

The qualitative study, however, pointed to an opportunity for revitalization of LAPMs, and suggested that women understood that there are advantages to using LAPMs, such as increased effectiveness and ease of use.

Members of the ICMM team and DWG from NTB participate in Indonesia's National FP Summit in Jakarta, September 2013.

Top K4Health Project Achievements

K4Health.
Knowledge for Health

These baseline results on patterns of LAPM use are contributing to ICMM advocacy activities in the districts, and being used to inform design of national family planning strategies.

Effective dissemination of the results convinced the Indonesian government and nonprofit agencies of the need to improve training for midwives to provide IUDs and implants. Initial ICMM results are also being used by the Australian Government as they plan to expand their family planning portfolio in Indonesia.

District-level working groups, working closely with project staff, are developing advocacy plans with the goal of increasing funding for LAPMs in six districts (three in East Java and three in NTB).

ICMM continues through an Associate Award, implemented through JHU·CCP's Indonesia office. Drawing on the technical skills of ICMM partners—The Center for Health Research/University of Indonesia and the Cipta Cara Padu Foundation—JHU·CCP also works closely with the Directorate of Maternal Health from Indonesia's Ministry of Health and BKKBN (the National Population and Family Planning Board) to implement the activities.

K4Health and the other collaborating partners working with USAID/Indonesia leveraged funding from the Australian Government to support the project. As a collaboration between USAID's Indonesia Mission and the Australian Government, this marks one of the first joint-funding mechanisms between the two entities.

At a Basic Health Unit in Punjab Province, Pakistan, 23-year-old Tahira Rashid receives counseling by Dr. Fauzia Amin, a female medical officer. © 2012 Derek Brown/USAID, Courtesy of Photoshare

C. Advancing the field of **KM** for global health

KM is relatively new in its application to global health. K4Health has taken steps to improve the "state of the science" in KM for health by systematically measuring health information and knowledge needs; creating a working group to make the case for the importance of KM and to provide a forum for learning with others; creating a graduate course at the Johns Hopkins Bloomberg School of Public Health on KM for public health; and developing metrics for capturing the contribution of KM to health programs.

As a fairly new intervention area in global health and development, the body of evidence to draw upon to design, monitor, and develop programs is thin—few resources provide guidance on how to best identify health knowledge needs, create activities to address those needs, and subsequently measure their impact.

K4Health helped the field take a giant leap forward by developing and testing a needs assessment methodology and by sharing the country-specific and overarching findings from the needs assessments in *The Journal of Health Communication* supplement.
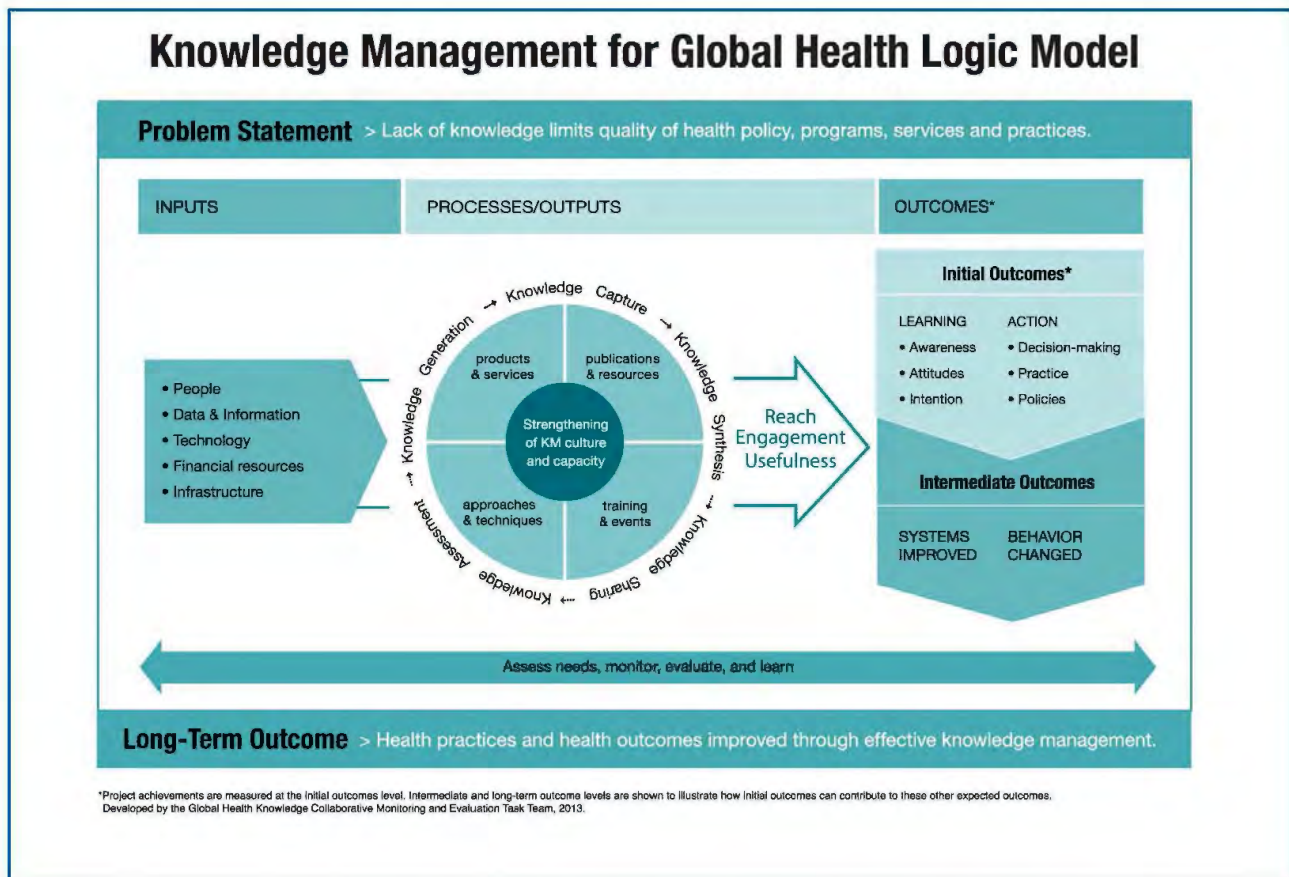

Knowledge Management and Exchange Logic Model developed by the Monitoring & Evaluation (M&E) Task team of the KM Working Group

To better understand the causal relationship between KM inputs, processes, outputs, and outcomes, K4Health initiated development of the "Knowledge Management and Exchange Logic Model" and created a master list of common KM indicators collated from collaborating agencies and literature reviews. The project also created in-depth guidance on how to measure the contribution of KM activities.

Project staff also took a lead role in using robust study designs and publishing the methodologies and results in peer-reviewed journal articles. Working with other organizations,

K4Health updated and expanded upon the 2007 *Guide to Monitoring and Evaluating Health Information Products and Services*, and published the *Guide to Monitoring and Evaluating Knowledge Management in Global Health Programs* in November 2013. Designed to help program managers improve the design, implementation, and assessment of their KM efforts, the Guide includes the logic model, indicators, and sample instruments for global health professionals.

We also practiced what we preached by creating the KM Toolkit in July 2011, a repository of KM resources for global health KM practitioners attracting, on average, 1,600 pageviews each month as well as by launching two KM eLearning courses in September 2011.
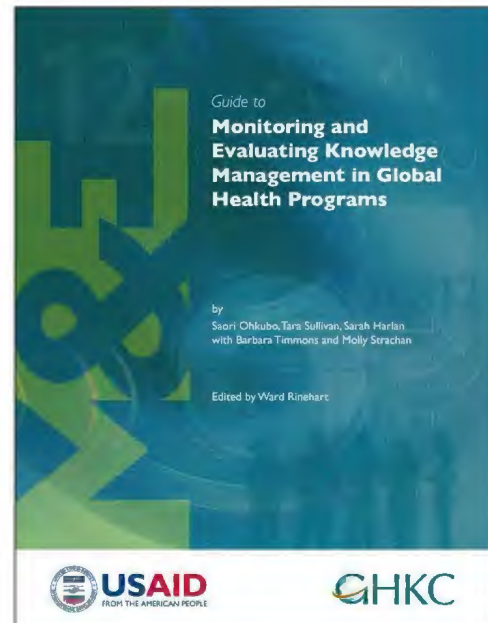
Cover of the *Guide to Monitoring and Evaluating Knowledge Management in Global Health Programs*

In Year 3 of the project, K4Health convened and launched the KM Working Group in collaboration with WHO, USAID, and the Public Health Institute (PHI). As the working group evolved, it changed its name to the Global Health Knowledge Collaborative (GHKC) in 2012, and K4Health continued to nurture the CoP by serving as the organizational chair during Year 4 and 5 of the project.

As chair, K4Health conducted webinars on KM topics, including how to host successful virtual meetings, using visual models for KM, planning for an Intranet, creating and sustaining CoPs, using social media for global health, designing and delivering KM events, and disseminating program learning.

K4Health also convened multiple in-person meetings for sharing and strategic planning. K4Health also led the GHKC Case Studies Task Team, and published a series of seven case studies focusing on sharing lessons learned from implementing KM activities for global health projects. Membership in the GHKC grew from about 40 in October 2010, to more than 350 by the end of 2013, primarily through "word of mouth" by members who have found the collaborative useful.

Participants brainstorm and collaborate during an interactive session at the GHKC Knowledge Management Share Fair.

In April 2013, in collaboration with the GHKC, K4Health orchestrated the GHKC Knowledge Management Share Fair, a symposium for global health and development knowledge management practitioners to advance the science and practice of KM. Innovative and interactive sessions facilitated connections and knowledge exchange between nearly 200 participants, and graphic facilitators translated key points into engaging visual representations.
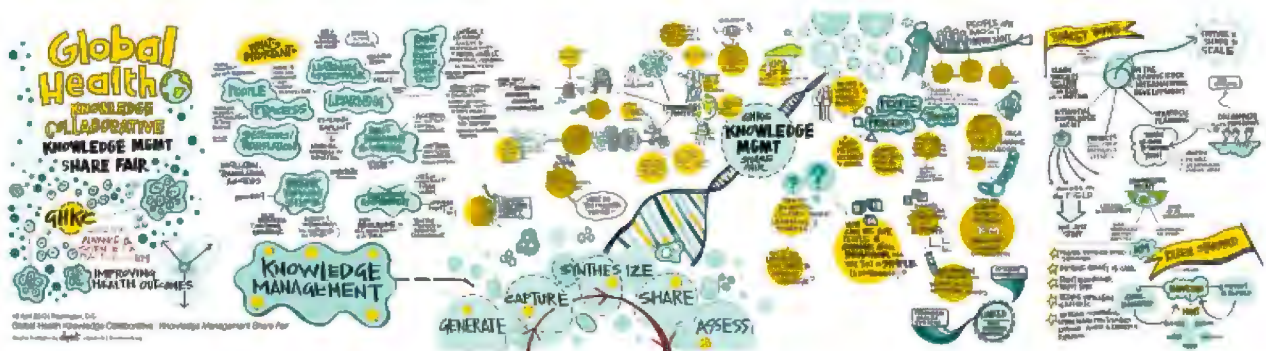
Designs created by the graphic facilitators at the GHKC Knowledge Management Share Fair representing the discussion

Finally, K4Health created and taught a Master's level course at Johns Hopkins University on "KM for Public Health in Low and Middle Income Countries" in 2012 and 2013 to build the next generation of KM leaders. Members of the K4Health leadership team introduced KM basics and showed students how KM theory and methods can strengthen health systems.

Key accomplishments in providing leadership in the KM for global health field include:

- Published the *Guide to Monitoring and Evaluating Knowledge Management in Global Health Programs* in 2014, containing 42 indicators and a unique KM logic model to support designing and measuring KM activities.

- Developed a guide to conducting information needs assessments, which includes tools, tips, and materials that audiences can adapt, to meet the information needs of health professionals and improve KM systems, reducing cost and duplication of effort.

- Served as organizational chair of the GHKC from 2010 to 2013, and created and held the innovative KM Share Fair in April 2013.

- Published 12 peer-reviewed publications, four guides, and numerous reports sharing health information needs assessment findings, results of evaluations of country activities, and best practices in KM.

Top K4Health Project Achievements

Contestants during the Miss Health Kandara launch in the Kandara constituency of Kenya. © 2006 Felix Masi, Courtesy of Photoshare

Innovative Approaches to KM for Global Health

Throughout the project, K4Health embraced new yet appropriate technologies to share information and to connect people—at rapid speeds and at scale. Foremost among our approaches were to use open source technology, which makes it possible to share our platforms freely; to capitalize on the growing popularity of mobile technologies for health (mHealth); and to harness social media to promote knowledge exchange.

In addition, to ensure KM awareness, understanding, and skills were institutionalized globally and locally, K4Health strengthened the capacity of others to build and improve KM and health systems.

A. Open Source Technology

To fully practice knowledge sharing and exchange for improved global health, K4Health made its products accessible and adaptable by all health organizations and professionals, including both the content of its products and the technology platforms that supported them.

K4Health embraced the use of open source technologies, which are free, available to anyone, and adaptable, thereby extending the impact, reach, and sustainability of its development work.

The K4Health website, Toolkits, and GHeL have all been built with the content management system Drupal, a free software package that allows developers to build and customize websites and applications. Drupal developers participate in a collaborative community where improvements to the software are shared, refined, tested, and approved for use. Thus, all code is secure, while Drupal community support ensures that the use of the software is sustainable.

K4Health actively participated in this open source community by creating modules for the Drupal software framework to develop and deliver KM products and contributing their innovative designs back to the community for further use and adaptation.

Drupal is an open source content management platform.

Examples of K4Health's contributions include the batch upload and Flickr import functionality originally developed for the Photoshare website and the Organic Groups Linkchecker module, which was developed for the K4Health Toolkits platform.

The redesign of the GHeL platform and the K4Health Toolkits platform will also be shared with the community.

In April 2012, as a direct result of collaboration with K4Health, Aten Design Group shared OpenAid with the Drupal community. OpenAid is a platform to help NGOs create program-focused websites quickly and at low cost by reusing a single code base with common website features while providing flexibility to customize configurations and to mix-and-match features.

The software has been downloaded 5,020 times and 90 websites are running on the platform, as of March 31, 2014.

In addition, K4Health used its own version of OpenAid, called Sites4Dev, to quickly build and launch new project sites, including: mhealthworkinggroup.org, malariafreefuture.org, and mini-u.k4health.org.

Embracing open source technology and communities advanced the goals of the K4Health project allowing the project to share its know-how with other individuals and organizations, which may not have been reached through traditional channels.

OpenAid is a platform to help NGOs launch customizable websites quickly and easily.

The Drupal contributions mentioned above can be found at drupal.org using the following links:

- Bulk File Nodes module:
  https://drupal.org/project/bulk_file_nodes
- OG Linkchecker module:
  https://drupal.org/project/og_linkchecker
- OpenAid distribution profile:
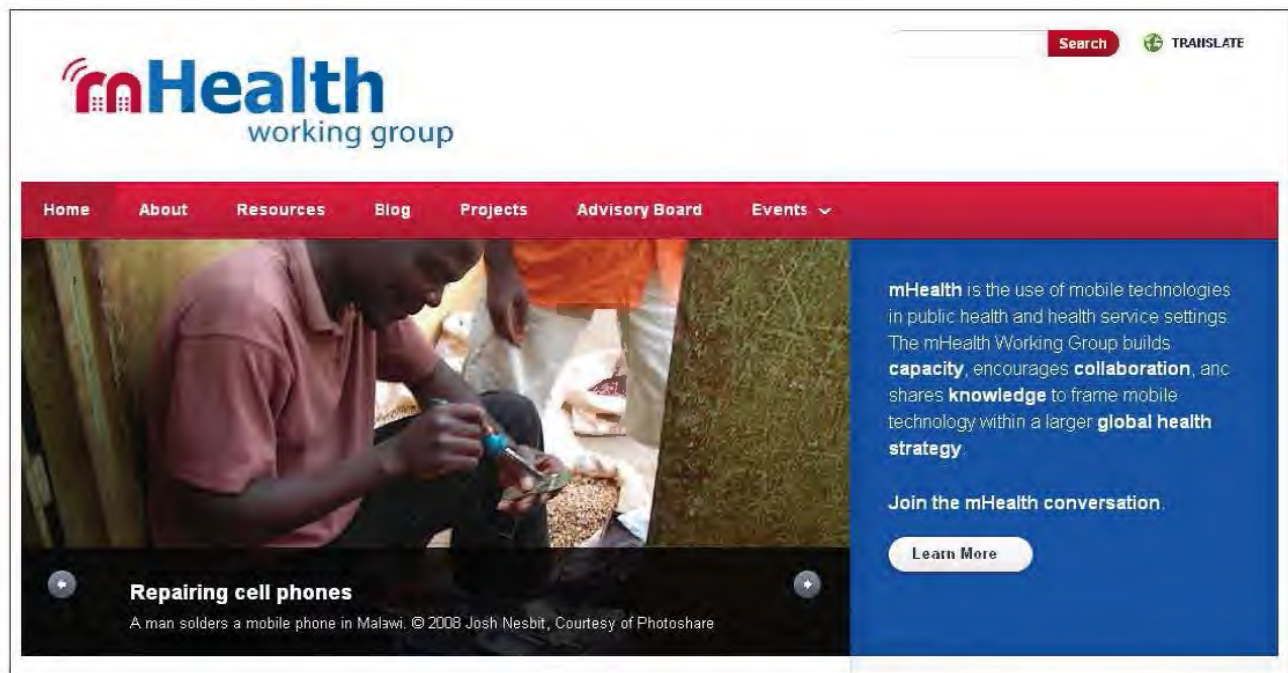 https://drupal.org/project/openaid

In addition to these projects, K4Health developers are responsible for numerous error reports, bug fixes, patches, and other contributions to the Drupal community.

B. Mobile Technologies for Health (mHealth)

As access to mobile technologies and networks skyrockets in LMICs, outpacing access to computers, mobile devices are becoming a practical and affordable means to share health information, increase knowledge, and improve health professionals' capacity to do their jobs effectively. For this reason, K4Health embraced the use of appropriate technologies to meet KM needs.

Through support from K4Health, the mHealth Working Group and accompanying website provide thought leadership and a venue for mobile health experts to convene and share proven and emerging practices by facilitating and supporting use of mobile phones in low-resource settings as a means of improving knowledge exchange and service delivery.

In April 2013, in collaboration with the mHealth Working Group, K4Health helped organize and facilitate the first mHealth Deep Dive focusing on the development of mobile health information for clients of health services. Deep Dives are hands-on meetings that highlight a particular topic or technical area in depth. The meeting objectives were to share information on various types of mobile health messaging in current use and to share best practices and acquire "hands-on" experience with designing mobile health content.

Home page of the mHealth Working Group website: www.mhealthworkinggroup.org

K4Health leaders were frequently featured in international mHealth conferences focusing on issues of implementation and understanding and building the evidence base, and K4Health produced two peer-reviewed journal articles on mHealth.

A number of important mHealth tools were developed and launched in 2014. At the request of USAID's Office of eHealth, K4Health partnered with the Johns Hopkins University Global mHealth Initiative (GmI) to develop a first-of-its-kind database of mHealth evidence and to coordinate existing collections.

Home page of the mHealth Planning Guide

The *mHealth Planning Guide: Key Considerations for Integrating Mobile Technology into Health Programs* was also developed to guide individuals and organizations through considerations and deployment of mHealth programs.

In addition, K4Health developed an eLearning course, *mHealth Basics: Introduction to Mobile Technology for Health*, which is available on the GHeL Center. Together, these activities and products contribute to the mHealth field by giving program managers tools and resources to design activities based on evidence and experience of the global mHealth community.

C. Social Media for Knowledge Management

One source of information may have limited reach, but when information is shared by multiple people and organizations through social media, reach expands rapidly. As access to and use of social media has expanded globally, K4Health has harnessed it, creating and using new and existing networks and platforms to share health information and promote knowledge exchange.

In the emerging social media field, K4Health founded the Social Media for Global Health Interagency Working Group (SM4GH), which has more than 40 member organizations and about 300 members from 23 different countries. The group meets quarterly and offers a space to connect and share experiences around the use of social media to promote the messages and products of global health and development organizations. K4Health has also nurtured a robust social media presence with 5,913 Facebook Likes, 7,581 Twitter followers, and more than 400 members of the online community at LinkedIn. K4Health's blog expanded from 4 posts in July 2011 to 18 in September 2013, and has received comments from high-profile visitors including the Editor of the Gates Foundations' Impatient Optimist Blog.

K4Health was also at the forefront of advancing the science of monitoring and evaluating social media for global health. Staff members were featured at several conferences, including the Global Health Mini-University in 2012 and the Christian Connections for International Health conference in 2013, to share their expertise in implementing and evaluating social media. K4Health worked with several other health organizations and USAID cooperating agencies to build their capacity to develop and implement a social media strategy.

Home page of the Social Media Working Group website: http://knowledge-gateway.org/socialmedia

Research and Lessons Learned

To ensure that its products and services were evidence-based, K4Health was designed with research as the first project result. Prior to K4Health, there were few rigorous needs assessments to document what information health professionals needed, what formats they preferred, or how they accessed information.

K4Health worked to fill this void with systematic information needs assessments on global and regional levels, using online surveys, personal interviews, and focus group discussions with a variety of health professionals.

Focusing on assessing needs related to FP/RH and other health topics, these studies provided insight and direction for subsequent programs. The assessments provided a means to address the unique needs of various countries, identifying existing gaps in health information and knowledge as well as preferred formats and delivery mechanisms to enhance work performance, save costs, and ultimately improve the quality of health care services and health outcomes.

A. Needs Assessments

During the first years of the project, K4Health learned about the knowledge needs and information-sharing preferences of key audiences by applying a theory-based needs assessment methodology.

Three key needs assessment activities were conducted and yielded useful findings: (1) an Environment Scan of the literature, knowledge networks, and health information projects and programs; (2) a Global Online Survey of more than 800 health professionals; and (3) qualitative country-level needs assessment in Ethiopia, India, Malawi, Peru, and Senegal.

The K4Health Environment Scan and Global Online Survey determined that rather than building new networks, efforts should focus on identifying, engaging, nurturing, and supporting the many health networks, CoPs, and professional working groups that already exist at the global, regional, and national levels.

The studies found that the leading barriers to accessing and using health information were: too much information to sort through, too little time, limited access to computers and the Internet, slow and unreliable Internet connections, cost, and lack of access to journals.

These assessments informed K4Health's strategies to offer a diverse suite of KM products, available in multiple formats, both online and offline.

K4Health's first country-level qualitative health information needs assessments in India, Malawi, and Senegal included interviews with 146 key informants working in governments, local and international NGOs, professional networks, and service organizations, and 21 focus group discussions with grassroots organizations and CHWs.

Results showed that health professionals needed current, evidence-based technical and program-related information adapted to the local context and language to be immediately usable in practice. Barriers to accessing and using information became more challenging at the lower health system levels where there was an "information divide" with little to no information accessed below the district level. Mobile phones were ubiquitous at all levels of the health system and presented an important opportunity for improving information access, exchange, and use.

Results, shared through global forums and national events, informed K4Health activities and in-country initiatives. K4Health's findings from the needs assessments in India, Malawi, and Senegal were also featured in a 2012 *Journal of Health Communication* supplement—entitled "Meeting the Information Needs of Health Care Providers, Program Managers, and Policy Makers in Low- and Middle-Income Countries"—for which K4Health staff also helped coordinate and co-edit.

Needs assessments in Ethiopia and Peru also provided insight about FP/RH networks as well as needs of health professionals. Overall, the findings in Ethiopia and Peru corroborated the evidence collected in India, Malawi, and Senegal; for example, the "information divide" was apparent in all five countries; specific information needs of health professionals differed at each level and role within the health system; and there was a strong need for tailored FP/RH information, particularly at the community level.

However, we did learn of important distinctions among the various country settings; for example, Ethiopia had much lower coverage (and use) of mobile phones outside of the large urban centers, and thus methods of information sharing are quite different. Full results from the Ethiopia assessment were published in the September 2013 issue of the *Knowledge Management for Development Journal* (article title: "Mapping networks to improve knowledge exchange among family planning and reproductive health organizations in Ethiopia").
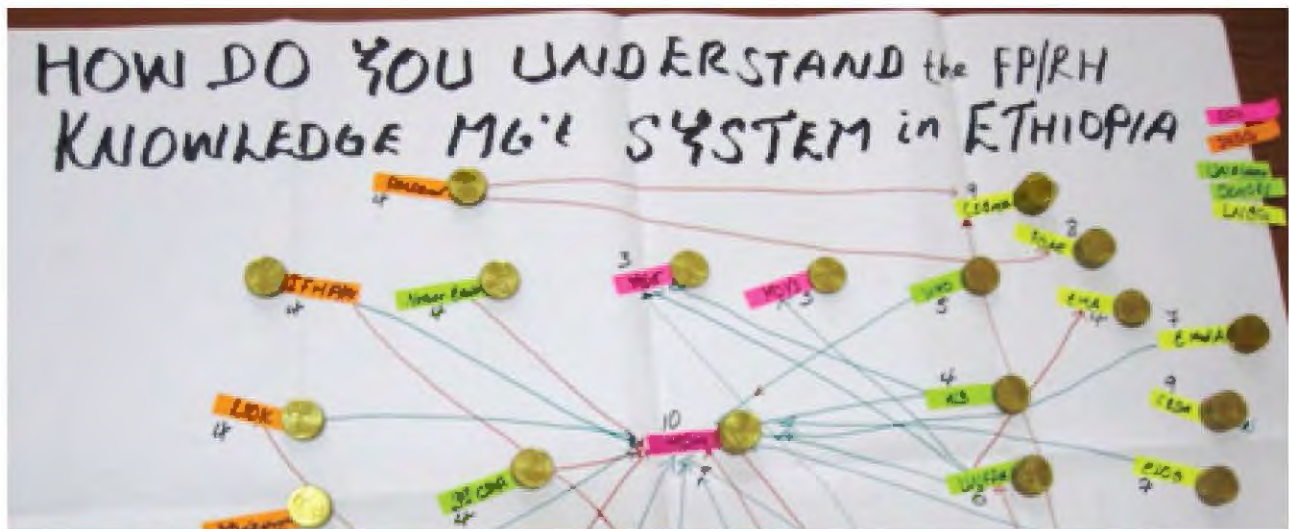
The result of an interview-based individual Net-Map exercise in Ethiopia. A typical Net-Map exercise will result in a visual representation of key actors, their linkages, and levels of influence, helping to make strategic decisions in complex situations. The coin towers represent relative influence.

Research and Lessons Learned

Further in-depth country needs assessments in Botswana, Indonesia, Lesotho, Namibia, Nigeria, South Africa, Swaziland, Uganda, Zambia, and Zimbabwe continued to inform K4Health global and country-level activities.

The Ethiopia and Peru needs assessments included Net-Mapping—as did the Malawi assessment—which revealed important details about the flow of information among FP/RH stakeholders.

Net-Map is a social mapping tool that combines the visual aspects of creating a map with an interview.

Net-Maps can be created by individuals or groups. Using a participatory approach, respondents work with interviewers to address a key question and create a network map of actors related to the question/topic of inquiry.
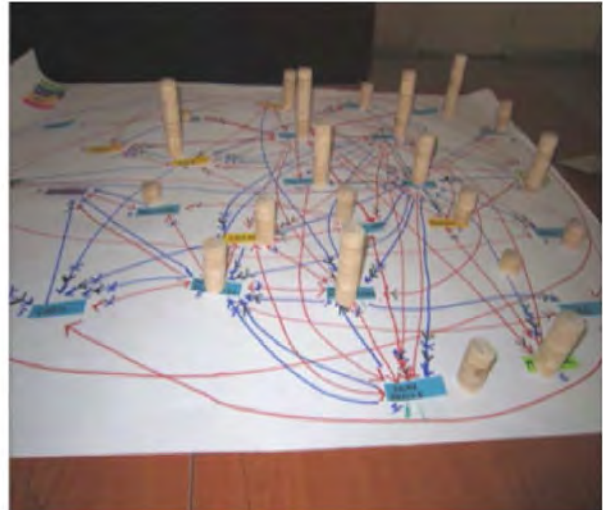
Net-Map exercise in Malawi

Cover of the K4Health *Guide for Conducting Health Information Needs Assessments*

Net-Maps used in Ethiopia, Malawi, and Peru provided insights about types of FP/RH actors in the country and detected bottlenecks that hindered the flow of information, producing recommendations to improve networks and programs. In addition, Malawi conducted a Net-Map at the end of the pilot project to show how the network had changed over time.

Building on these experiences and the unique methodology for assessing FP/RH information needs at the global and country levels,

K4Health developed a guide to conducting needs assessments, which includes tools, tips, and materials that audiences can adapt.

The guide, as well as collective findings from K4Health needs assessments, helps programs meet the information needs of health professionals and improves KM systems, thereby strengthening health programs and policies and reducing cost and duplication of effort.

B. Evaluation of Web Products

In addition to conducting needs assessments, K4Health also regularly evaluated the performance and use of its online products, including the K4Health website, the Toolkits platform, the GHeL Center, and the ACE mobile app. K4Health used a combination of Web analytics, online surveys, usability studies, and in-depth interviews to inform ongoing enhancements to its products.

Web analytics—regularly collected for all K4Health Web products, including individual toolkits—were used to assess the frequency of duration of visits to websites, how visitors arrive at a website (for example, from a search engine, direct address, or referral from another site), and the navigation path within a site. Online user surveys asked visitors to describe their information needs and how easily they were able to find what they needed.

These surveys were conducted annually on the K4Health website and as needed to gather feedback on other K4Health sites and products, such as Photoshare and POPLINE. To conduct usability testing, a K4Health staff member observed users navigating a specific website as they attempted to complete a task, such as finding a specific tool or resource. Understanding how both new and experienced users search for information informed the iterative design of Web products to improve use and usability.

From 2010 to 2011, K4Health conducted a comprehensive, three-tiered evaluation of the GHeL Center. First, K4Health used data from registration and course evaluations, followed by an online survey to evaluate learners' application of knowledge gained from the courses, and in-depth interviews with learners who had successfully completed a course to better understand use and adaptation of course information.

The evaluation found that learners sought technical knowledge for use in their current job and found the courses useful and relevant. Consistent and affordable Internet access was a barrier to completing courses, and learners expressed the desire for more opportunities for mentoring and connection with other learners and experts. Findings from the evaluation informed the revision of the GHeL platform, launched in March 2013.

In 2011, K4Health conducted an online survey and a total of 52 (23 in India) in-depth interviews with both new and experienced users to evaluate its Web products. Feedback from these interviews was used to enhance navigation, organization, coordination, and look and feel of the products.

After the launch of several key revisions to the portfolio of Web products, K4Health conducted a follow-up online survey and 27 (12 in India) in-depth interviews in 2013, in which users reported improved usability, complimented the cleaner and more modern design of the website, and shared their experiences adapting K4Health resources to inform projects, increase their personal knowledge, and assist with trainings.

Research and Lessons Learned

K4Health.
Knowledge for Health

C. Evaluation of Field Work

I. Malawi

K4Health implemented a multilevel intervention in Malawi to meet health information needs and promote communication among health professionals working at different levels of the health system.

The establishment of a KM Task Force at the national level contributed to the dissemination of FP/RH and HIV/AIDS information, and two DLCs in Nikhotako and Salima facilitated information sharing between health workers at the national, district, and community levels. In addition to these national and district-level interventions, K4Health initiated an SMS-based mobile phone network to improve CHWs' access to information and their ability to communicate with other levels of the health system.

Blessings Makono, an HSA for 14 years, said K4Health has helped him provide better service to his community because he has greater access to clinical advice.

In Nikhotako and Salima, 633 CHWs received mobile phones and solar chargers, and the CHWs in the control district of Nikhatabay did not receive phones. From June to October 2010, K4Health evaluated the intervention by tracking SMS messages exchanged as well as through focus group discussions, in-depth interviews, and surveys of CHWs in the intervention and non-intervention districts.

Results from the evaluation showed improved communication, including reduction in time of supervisors providing health information to CHWs from an average of 29 hours to 9 minutes; increased efficiency of referrals and reduction in time to report stock-outs from 8.7 hours to 3 minutes. Furthermore, as a result of numerous stock-out SMS messages, health officials initiated a review of the supply chain system and changed how frequently medical supplies were distributed and their quantities.

Additionally, with the SMS communication system, CHWs spent less time traveling to health centers or meeting with supervisors, and they spent more time counseling clients in the community. On average, 74 home visits were conducted each month in intervention districts versus 30 in the control district. The communication system also facilitated rapid responses to cholera, meningitis, and measles outbreaks.

II. Bangladesh

Health field workers (HFWs) in Bangladesh struggle with access to up-to-date health information and using innovative counseling methods in sharing integrated health messages with clients. In response to this challenge, BKMI in collaboration with the MoHFW and the Bangladesh Center for Communication Programs (BCCP) conducted an eHealth pilot from mid-May to the end of August 2013 in Sylhet and Chittagong.

The pilot involved the creation and dissemination of Bangla-language digital resources covering family planning; maternal, newborn and child health (MNCH); and nutrition.

HFWs in Bangladesh with their netbooks.

These resources primarily consisted of videos, charts, and pictures to ensure accessibility and understanding among low-literate populations. Resources were then downloaded onto 304 netbooks, and HFWs were encouraged to use these resources for their personal knowledge and with clients. Evaluation of the pilot included pre- and post-testing of HFWs, and a pre-post survey of 674 mothers with children under age two.

Results from pre- and post-tests showed significant improvements in HFWs' knowledge of family planning (49% at pre-test, 84% at post-test), complementary food (78% to 100%), maternal danger signs (60% to 96%), skilled birth (7% to 95%), and prevention of diarrhea (57% to 74%). HFWs also showed progress in using integrated messages during counseling sessions (MNCH: 49% to 79%; nutrition: 17% to 72%).

Mothers who received visits from HFWs during the pilot demonstrated improved health knowledge as well, including increased awareness of family planning method side effects (25% pre-survey, 53% post-survey), and danger signs during pregnancy and childbirth danger, such as convulsions (61% to 87%) and high fever (39% to 58%).

Furthermore, mothers reported increased perceptions of HFWs as credible sources of information on family planning (37% to 56%), MNCH (39% to 50%), and nutrition (19% to 52%).

Future of Knowledge Management for Global Health

In its first five years, K4Health made tremendous progress in developing KM products and services, building capacity, and strengthening knowledge networks and health systems, but challenges still remain. K4Health established itself as a leader in strengthening the monitoring and evaluation of KM activities.

Our research has shown how KM interventions can strengthen the health system, improve quality of care, and increase the knowledge and confidence of health workers. However, future work must continue to evaluate and improve process, outcome, and impact indicators, as well as to strengthen and quantify the link between KM interventions and improvements in health. Rigorous research will improve the quality of future KM work as well as continue to build the case for the importance of KM in health systems strengthening.

Social and professional networks and the technologies that support them continue to evolve rapidly. It is therefore critical for future KM work to not only stay abreast of these new advances but also build regional and local KM capacity, so that local systems can adapt to local changes and local needs. KM capacity building can include strengthening monitoring and evaluation, strategic communication skills, IT knowledge and support, human resources management, health financing, and leadership and management skills. Capacity-building efforts should be tailored to local needs and based in the field.

Future KM efforts also need to better foster communities and encourage individuals to share meaningful knowledge in useful ways with other individuals who need it. Understanding, using, and quantifying group and organizational knowledge are also growing areas of knowledge management.

In addition, women and men may interact with health and KM systems in different ways, and it is important to consider the influence of gender differences to ensure systems address gender inequities.

A group of young women in India train as rural health workers and disaster preparedness organizers in their villages.
© 2007 Sean Hawkey, Courtesy of Photoshare

Publications

Peer-reviewed journal articles

From Research to Policy and Practice: A Logic Model to Measure the Impact of Knowledge Management for Health Programs
Authors: Tara M. Sullivan, Saori Ohkubo, Ward Rinehart, & J. Douglas Storey
Published: May 2010
Knowledge Management for Development Journal, 6(1), 53-69.
http://www.tandfonline.com/doi/abs/10.1080/19474199.2010.498964#preview

Six Years of Lessons Learned in Monitoring and Evaluating Online Discussion Forums
Authors: Megan Avila, Kavitha Nallathambi, Catherine Richey, & Lisa Mwaikambo
Published: December 2011
Knowledge Management & E-Learning: An International Journal, 3(4), 621-43.
http://www.kmel-journal.org/ojs/index.php/online-publication/article/viewFile/120/118

Reaching Remote Health Workers in Malawi: Baseline Assessment of a Pilot mHealth Intervention
Authors: Nancy Vollmer Lemay, Tara M. Sullivan, Brian Jumbe, & Cary Peabody Perry
Published: May 2012
Journal of Health Communication: International Perspectives, 17(Supplement 1), 105-17.
http://www.tandfonline.com/doi/abs/10.1080/10810730.2011.649106?url_ver=Z39.88-2003&rfr_id=ori:ri
d:crossref.org&rfr_dat=cr_pub%3dpubmed#.UtWKIGRDtRd

Meeting the Health Information Needs of Health Workers: What Have We Learned?
Authors: Margaret D'Adamo, Madeleine Short Fabic, & Saori Ohkubo
Published: June 2012
Journal of Health Communication: International Perspectives, 17:sup2, 23-29.
http://dx.doi.org/10.1080/10810730.2012.666626

Qualitative Study of Health Information Needs, Flow, and Use in Senegal
Authors: Amadou Hassane Sylla, Elizabeth T. Robinson, Laura Raney, & Karim Seck
Published: June 2012
Journal of Health Communication: International Perspectives, 17:sup2, 46-63.
http://dx.doi.org/10.1080/10810730.2012.666624

Understanding Health Information Needs and Gaps in the Health Care System in Uttar Pradesh, India
Authors: Nandita Kapadia-Kundu, Tara M. Sullivan, Basil Safi, Geetali Trivedi, & Sanjanthi Velu
Published: June 2012
Journal of Health Communication: International Perspectives, 17 (Supplement 2), 30-45.
http://www.tandfonline.com/doi/full/10.1080/10810730.2012.666625#.UtWFRmRDtRc

Working Together to Meet the Information Needs of Health Care Providers, Program Managers, and Policy Makers in Low- and Middle-Income Countries
Authors: Tara M. Sullivan, Sarah V. Harlan, Neil Pakenham-Walsh, & Symphrose Ouma
Published: June 2012
Journal of Health Communication: International Perspectives, 17(Supplement 2), 5-8.
http://www.tandfonline.com/doi/full/10.1080/10810730.2012.666629#.UtVVFRGRDtRc

Building a National Model for Knowledge Exchange in Malawi: Findings From a Health Information Needs Assessment
Author: Nancy Vollmer LeMay & Piers J.W. Bocock
Published: June 2012
Journal of Health Communication: International Perspectives, 17:sup2, 64-78.
http://dx.doi.org/10.1080/10810730.2012.666623

Utilizing eLearning to Strengthen the Capacity of Global Health Practitioners and Institutions Around the World
Authors: Lisa Mwaikambo, Megan Avila, Sara Mazursky, & Kavitha Nallathambi
Published: September 2012
Knowledge Management & E-Learning: An International Journal, 4(3), 293-309.
http://www.kmel-journal.org/ojs/index.php/online-publication/article/viewFile/176/146

Mapping Networks to Improve Knowledge Exchange Among Family Planning and Reproductive Health Organizations in Ethiopia
Authors: Sarah V. Harlan, Tara M. Sullivan, & Samson E. Hailegiorgis
Published: December 2013
Knowledge Management for Development Journal 9(2), 140-61.
http://journal.km4dev.org/index.php/km4dj/article/viewFile/163/231

Is mHealth a Silver Bullet to Improve Maternal And Child Health in Rural Uttar Pradesh, India? Results of a Health Information Needs Assessment
Authors: Nandita Kapadia-Kundu, Tara M. Sullivan, Basil Safi, Geetali Trivedi, & Sanjanthi Velu
Published: 2013
In Mobile Media Practices, Presence and Politics: The Challenge of Being Seamlessly Mobile edited by Kathleen M. Cumiskey & Larissa Hjorth.

Taking Knowledge for Health The Extra Mile: Participatory Evaluation of a Mobile Phone Intervention for Community Health Workers in Malawi
Authors: Natalie Campbell, Eva Schiffer, Ann Buxbaum, Elizabeth McLean, Cary Perry, C., & Tara M. Sullivan
Published: February 2014
Global Health Science and Practice 2(1):23-34.
http://dx.doi.org/10.9745/GHSP-D-13-00141

K4Health
Knowledge for Health

Publications

Guides

A User's Guide to POPLINE Keywords, 9th Edition
Authors: Debra L. Dickson, Judith Mahachek, & Sean Stewart
Published: September 2010
http://www.popline.org/POPLINEKeywordGuide_NinthEdition.pdf

Three Process Models to Meet the Needs and Interests of Our Partners
Authors: Ruwaida Salem
Published: October 2010
http://www.k4health.org/resources/k4health-etoolkits-three-process-models-meet-needs-and-interests-our-partners

K4Health Guide for Conducting Health Information Needs Assessments
Published: October 2011; Updated May 2013
http://www.k4health.org/resources/k4health-guide-conducting-needs-assessments

K4Health Blended Learning Guide
Authors: Karen Chio, Liz McLean, Sara Mazursky, & Lisa Mwaikambo
Published: February 2013
http://www.globalhealthlearning.org/sites/default/files/page/b-learning-060613.pdf

Guide to Monitoring and Evaluating Knowledge Management in Global Health Programs
Authors: Saori Ohkubo, Tara M. Sullivan, Sarah V. Harlan, Barbara K. Timmons, & Molly Strachan
Published: November 2013
http://www.k4health.org/resources/guide-monitoring-and-evaluating-knowledge-management-global-health-programs

Reports

Knowledge for Health: Environment Scan
Published: September 2009
http://www.k4health.org/resources/knowledge-health-environment-scan

K4Health Health Information Needs Assessment 2009 Summary Report: Global Online Survey
Published: November 2009
http://www.k4health.org/resources/k4health-health-information-needs-assessment-2009-summary-report-global-online-survey

Malawi: Assessment of Information Needs Among Health Managers and Health Service Providers; Knowledge for Health Summary Report
Published: November 2009
http://www.k4health.org/resources/malawi-assessment-information-needs-among-health-managers-and-health-service-providers

Key Findings from the Swaziland HIV Information Needs Assessment
Published: 2009
http://www.k4health.org/resources/key-findings-swaziland-hiv-information-needs-assessment
Key Findings from the Botswana HIV Information Needs Assessment
Published: 2009
http://www.k4health.org/resources/key-findings-botswana-hiv-information-needs-assessment

Knowledge for Health Southern Africa Online Survey
Published: 2009
http://www.k4health.org/resources/knowledge-health-southern-africa-online-survey

Strengthening Health Systems: A Health Information Needs Assessment in Uttar Pradesh, India
Published: April 2010
http://www.k4health.org/resources/strengthening-health-systems-health-information-needs-assessment-uttar-pradesh-india

Peru: Knowledge for Health Results of a Reproductive Health Information Needs Assessment
Published: June 2011
http://www.k4health.org/resources/peru-knowledge-health-results-reproductive-health-information-needs-assessment

Senegal Health Information Needs Assessment
Authors: Amadou Hassane Sylla & Karim Seck
Published: August 2011
http://www.k4health.org/resources/senegal-health-information-needs-assessment

Taking Knowledge for Health the Extra Mile: An Evaluation of the Malawi Knowledge for Health (K4Health) Project
Authors: Thokozani Bema, Natalie Campbell, Brian Jumbe, & Cary Perry
Published: November 30, 2011
http://www.k4health.org/resources/taking-knowledge-health-extra-mile-evaluation-malawi-knowledge-health-k4health-project

Ethiopia Family Planning/Reproductive Health Information Needs Assessment and Network Mapping
Authors: Samson E. Hailegiorgis, Sarah V. Harlan, Tara M. Sullivan, & Sisay Wagnew
Published: May 2012
http://www.k4health.org/resources/ethiopia-family-planningreproductive-health-information-needs-assessment-and-network

The Intersection of Knowledge Management and Health Systems Strengthening: Implications from the Malawi Knowledge for Health Demonstration Project
Published: October 2012
http://www.k4health.org/resources/intersection-knowledge-management-and-health-systems-strengthening-implications-malawi

Publications

K4Health.
Knowledge for Health