Dedicated to what works in global health programs

GLOBAL HEALTH: SCIENCE AND PRACTICE

2015 | Volume 3 | Number 2

www.ghspjournal.org

USAID FROM THE AMERICAN PEOPLE

School of Public Health & Health Services
THE GEORGE WASHINGTON UNIVERSITY

JOHNS HOPKINS Center for Communication Programs™

K4Health™ Knowledge for Health

Global Health: Science and Practice

Global Health: Science and Practice (ISSN: 2169-575X) is a no-fee, open-access, peer-reviewed journal published online at www.ghspjournal.org. It is published quarterly by the Johns Hopkins Center for Communication Programs, 111 Market Place, Suite 310, Baltimore, MD 21202 with funding from USAID.

For further information, please contact the editors at editorialoffice@ghspjournal.org.

Table of Contents

June 2015 | Volume 3 | Number 2

EDITORIALS

COMMENTARIES

REVIEWS/META-ANALYSES

Action-Oriented Population Nutrition Research: High Demand but Limited Supply

Action-oriented research in nutrition, vital to guiding effective policies and programs at scale, is greatly underrepresented in public health journals and, even more so, in nutrition journals.

Judy Pham, David Pelletier

Glob Health Sci Pract. 2015;3(2):287-299
http://dx.doi.org/10.9745/GHSP-D-15-00009

FIELD ACTION REPORTS

Bedside Availability of Prepared Oxytocin and Rapid Administration After Delivery to Prevent Postpartum Hemorrhage: An Observational Study in Karnataka, India

Advance preparation and bedside availability of oxytocin before childbirth was significantly and robustly associated with rapid administration of the utertonic, as recommended to prevent postpartum hemorrhage.

Corrina Moucheraud, Jonathon Gass, Stuart Lipsitz, Jonathan Spector, Priya Agrawal, Lisa R Hirschhorn, Atul Gawande, Bhala Kodkany

Glob Health Sci Pract. 2015;3(2):300-304
http://dx.doi.org/10.9745/GHSP-D-14-00239

Successful mLearning Pilot in Senegal: Delivering Family Planning Refresher Training Using Interactive Voice Response and SMS

Health workers' knowledge of contraceptive side effects increased substantially after the refresher training. The mobile phone approach was convenient and flexible and did not disrupt routine service delivery. Clear limitations of the medium are participants can't practice clinical skills or have interactive discussions. Also, some participants had trouble with network reception.

Abdoulaye Diedhiou, Kate E Gilroy, Carie Muntifering Cox, Luke Duncan, Djimadoum Koumtingue, Sara Pacqué-Margolis, Alfredo Fort, Dykki Settle, Rebecca Bailey

Glob Health Sci Pract. 2015;3(2):305-321
http://dx.doi.org/10.9745/GHSP-D-14-00220

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

EDITORIAL

Social Franchising: A Blockbuster to Address Unmet Need for Family Planning and to Advance Toward the FP2020 Goal

Social franchising has scaled-up provision of voluntary family planning, especially long-acting reversible contraceptives, across Africa and Asia at a rapid and remarkable pace. The approach should be pursued vigorously, especially in countries with a significant private-sector presence, to advance the FP2020 goal of providing access to modern contraception to 120 million additional clients by 2020.

See related articles by Munroe and by Thurston.

In this issue of GHSP, we showcase 2 landmark articles on family planning social franchising. Social franchising differs from social marketing by focusing on providing a *service* (typically a clinical service), such as inserting and removing contraceptive implants, along with providing the accompanying needed products. It taps the vast resource of largely small-scale private health outlets in developing countries. While the approach has been around for some time, Population Services International (PSI) and Marie Stopes International (MSI) have "honed" the model to a highly successful, keen intervention.

HOW DO THEY DO IT?

Among the key ingredients described by Thurston and colleagues[1] are:

1. **Amenable settings** with an adequate private sector already serving low-income clients and a favorable government policy environment, including a positive climate for task sharing
2. **Motivated providers**, often female, supportive of reproductive health services and well-located in low-income areas with little overlap with other reproductive health providers
3. Key support including: competency-based clinical **training**, minimum **standards**, **supplies**, **supervision**, and a variety of **quality assurance** mechanisms
4. A franchise **"brand"**
5. Support for providers to **build their business** though business management training and by selectively providing affordable capital
6. **Demand creation** and selective use of financial mechanisms such as vouchers to enhance access for those least able to pay
7. **Advocacy** with governments on issues such as task shifting and linkage with health insurance schemes
8. Good **service products** including long-acting reversible contraceptives (**LARCs**)—implants and IUDs—which are both popular among clients and conducive to the skill level of many private providers

MAJOR PROGRESS TOWARD THE FP2020 GOAL

What has been accomplished? An amazing amount. Munroe and colleagues[2] report detail on MSI's efforts only. But Thurston et al. report on couple-years of protection (CYPs) for both PSI and MSI combined. The CYPs they provided through social franchising grew rapidly—remarkably, by roughly 25% in just 1 year, from 8.6 million to 10.8 million between 2013 and 2014. If the annual growth going forward were an admittedly optimistic 25%, then by 2020 CYPs provided in that year alone would be over 40 million! Clearly this effort is destined to be pivotal for serving great numbers of women and for helping to reach the challenging Family Planning 2020 (FP2020) goal of providing access to modern contraception to 120 million additional clients by 2020.[3]

BUT WAIT, THERE'S MORE

Munroe et al. describe many other positive accomplishments of MSI's efforts:

- A high proportion of clients were **young** women—26.1% aged 15–24
- A high proportion were **low-income** women—57.4% living on under US$2.50 per day
- A high proportion were **"new" clients**—40.7% (in the sense that they had not used a modern method in the prior 3 months), thus indicating MSI is reaching clients otherwise often not reached and is squarely addressing unmet need

68% of MSI social franchising clients chose LARCs.

- A very high proportion of clients selected **LARCs**—68% by 2014
- **Quality** promotion, including improving quality audit scores over time
- High reported client **satisfaction**, with a mean score of 4.51 out of a possible 5 (although we know social desirability bias may likely yield high satisfaction scores in any case)

WHERE NEXT?

First, keep going with a winner and continue to scale-up. Achievement of FP2020 goals will rise or fall depending on success in key countries such as Nigeria, the Democratic Republic of the Congo, Ethiopia, and Pakistan. *Nigeria, in particular, should be a major priority.* This largest country in Africa has thus far shown little progress in family planning, but it appears especially conducive to wide expansion of social franchising in view of its very high reliance on private-sector providers for health services. Other countries with less private-sector presence will need a different strategic program mix, notably including emphasis on mobile outreach, which has also demonstrated remarkable success.[4]

Nigeria, with its high reliance on the private sector, may be especially conducive to wide expansion of social franchising.

Challenges

Continued growth and scale-up always present important challenges. Over time, both PSI and MSI have made many improvements and adjustments. Incremental improvements in efficiency, quality, and quantity should continue to accrue through experience and additional innovation. Maintaining **quality**, including promoting wide choice of methods, is always challenging with rapid scale-up, especially realizing private providers remain largely free agents. Franchisors must develop additional quality assurance mechanisms that are replicable and cost-effective. Thurston and colleagues describe strategies that MSI and PSI are testing, including new use of technology. Additional challenges are continued progress in reaching **youth and low-income** women.

Promoting quality, including ensuring a wide choice of methods, is important.

And **sustainability** over the longer term must always be on the agenda. The effort so far has required substantial donor support. But family planning is such a good long-term investment for individuals and society that a large degree of donor subsidy is fully justified for a long period of time in many countries, in return for such impressive results. Nevertheless, one attraction of a commercial-sector model is the possibility of recouping costs and eventually even long-term cost self-sufficiency. After all, the history of family planning in Latin America saw an evolution from subsidized social marketing though such organizations as Profamilia in Colombia, to out-and-out true commercial marketing of contraceptives, notably oral contraceptives, that continues to this day. As Thurston et al. point out, additional ways of addressing sustainability are broadening services beyond family planning (although that would need to be done selectively and with care) and coverage under health insurance schemes, whether considered under the label of universal health coverage or otherwise.

Beyond MSI and PSI, many other organizations are taking up social franchising for family planning and for other worthy health objectives.[5] The global health community should pursue this programmatic "best bet" vigorously. *–Global Health: Science and Practice*

REFERENCES

1. Thurston S, Chakraborty N, Hayes B, Mackay A, Moon P. Establishing and scaling-up clinical social franchise networks: lessons learned from Marie Stopes International and Population Services International. Glob Health Sci Pract. 2015;3(2): 180–194. CrossRef
2. Munroe E, Hayes B, Taft J. Private-sector social franchising to accelerate family planning access, choice, and quality: results from Marie Stopes International. Glob Health Sci Pract. 2015; 3(2): 195–208. CrossRef
3. Brown W, Druce N, Bunting J, Radloff S, Koroma D, Gupta S, et al. Developing the "120 by 20" goal for the Global FP2020 initiative. Stud Fam Plann. 2014;45(1): 73–84. CrossRef. Medline
4. Duvall S, Thurston S, Weinberger M, Nuccio O, Fuchs-Montgomery N. Scaling up delivery of contraceptive implants in sub-Saharan Africa: operational experiences of Marie Stopes International. Glob Health Sci Pract. 2014;2(1): 72–92. CrossRef. Medline
5. Viswanathan R, Schatzkin E, Sprockett A. Clinical social franchising compendium: an annual survey of programs: findings from 2013. San Francisco (CA): University of California, San Francisco, Global Health Sciences, The Global Health Group; 2014. Available from: http://sf4health.org/sites/sf4health.org/files/wysiwyg/Social-Franchising-Compendium-2014_0.pdf

Cite this article as: Social franchising: a blockbuster to address unmet need for family planning and to advance toward the FP2020 goal. Glob Health Sci Pract. 2015;3(2):147-148. http://dx.doi.org/10.9745/GHSP-D-15-00155.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

EDITORIAL

Benefits of Advance Oxytocin Preparation Could Extend to the Newborn

Advance preparation of oxytocin not only facilitates rapid administration after delivery to prevent postpartum hemorrhage but also could free health workers to provide immediate neonatal resuscitation to non-breathing newborns within the critical 1-minute time window.

See related articles by Moucheraud.

Details matter. To reliably ensure good care, health workers need clearly defined processes, including provisions to ensure reliable and timely availability of all needed supplies and equipment. The paper by Moucheraud and colleagues in this issue of GHSP takes a close look at a particular service delivery setting, documenting current practices with regard to routine administration of oxytocin immediately after birth for preventing hemorrhage.[1] Specifically, they looked at the extent to which timely dosing was facilitated by having the oxytocin injection drawn up in advance.

According to guidelines released in 2006 by the International Confederation of Midwives (ICM) and the International Federation of Gynaecology and Obstetrics (FIGO), oxytocin is to be given within 1 minute of birth. The study by Moucheraud et al. assessed performance against this standard. The investigators found that having the injection drawn up in advance increased the proportion of cases in which oxytocin was delivered within this interval and shortened mean time to injection.

Although this timing threshold is arbitrary for maternal outcomes (and has not been retained in the current World Health Organization guidelines[2]), streamlining the process and ensuring timely injection, with high reliability, is important for other reasons. In many country settings with high maternal and newborn mortality, many births are attended by only a single skilled health worker who is responsible for care of both the mother and the newborn. The most common life-threatening complication around the time of labor and delivery is birth asphyxia. In approximately 1 in 20 births, the baby requires help to initiate breathing, and this needs to happen within a critical time window.[3] Under the Helping Babies Breathe newborn resuscitation initiative, health workers are trained on the importance of helping the baby to breathe within the "Golden Minute" after birth. The greater the delay, the higher the probability of death.

Having oxytocin at hand, already drawn up in a syringe when the woman is still in active labor, means that administering the drug takes mere seconds, so that this needn't get in the way of giving non-breathing newborns the immediate attention required. Advance preparation of the oxytocin should be an explicit operational standard, as one of various preparations that, if done reliably (helped by use of checklists), can ensure smooth, streamlined provision of key elements of care for both mother and newborn, even in situations where complications arise. *–Global Health: Science and Practice*

REFERENCES

1. Moucheraud C, Gass J, Lipsitz S, Spector J, Agrawal P, Hirschhorn LR, et al. Bedside availability of prepared oxytocin and rapid administration after delivery to prevent postpartum hemorrhage: an observational study in Karnataka, India. Glob Health Sci Pract. 2015;3(2):300–304. CrossRef
2. World Health Organization (WHO). WHO recommendations for the prevention and treatment of postpartum haemorrhage. Geneva: WHO; 2012. Available from: http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/9789241548502/en/
3. Bang AT, Bang RA, Baitule SB, Reddy HM, Deshmukh MD. Management of birth asphyxia in home deliveries in rural Gadchiroli: the effect of two types of birth attendants and of resuscitating with mouth-to-mouth, tube-mask or bag-mask. J Perinatol. 2005;25 (Suppl 1):S82–S91. CrossRef. Medline

Cite this article as: Benefits of advance oxytocin preparation could extend to the newborn. Glob Health Sci Pract. 2015;3(2):149. http://dx.doi.org/10.9745/GHSP-D-15-00156.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

COMMENTARY

Leveraging the Power of Knowledge Management to Transform Global Health and Development

Tara M Sullivan,[a] Rupali J Limaye,[a] Vanessa Mitchell,[a] Margaret D'Adamo,[b] Zachary Baquet[c]

Good knowledge is essential to prevent disease and improve health. Knowledge management (KM) provides a systematic process and tools to promote access to and use of knowledge among health and development practitioners to improve health and development outcomes. KM tools range from publications and resources (briefs, articles, job aids) and products and services (websites, eLearning courses, mobile applications), to training and events (workshops, webinars, meetings) and approaches and techniques (peer assists, coaching, after-action reviews, knowledge cafés).

By its very nature, global health and development work involves a multitude of actors working toward common goals that transcend geographic, sectoral, organizational, and financial boundaries. These efforts require immediate access to the latest research and know-how and demand optimal use of limited resources to achieve maximum impact.[1] Knowledge management (KM) can improve coordination, enhance learning and knowledge application, and improve capacity, thus heightening service quality, strengthening health systems, and, ultimately, improving health and development outcomes.

The purpose of this article is to demystify KM and advocate its increased use in global health and development projects. We first describe knowledge, define KM, and highlight some KM tools. Then we trace the history of KM as used in the private sector and in health and development. Finally, we illustrate through a case study from Bangladesh how KM can be used to support health and development outcomes.

WHAT DOES KM REALLY MEAN?

Knowledge is the capacity to act effectively.[2] Few would argue this is essential in our fight to prevent disease and improve health. Knowledge, or know-how, draws from our experience and allows us to solve problems using a combination of information and contextual understanding.[4]

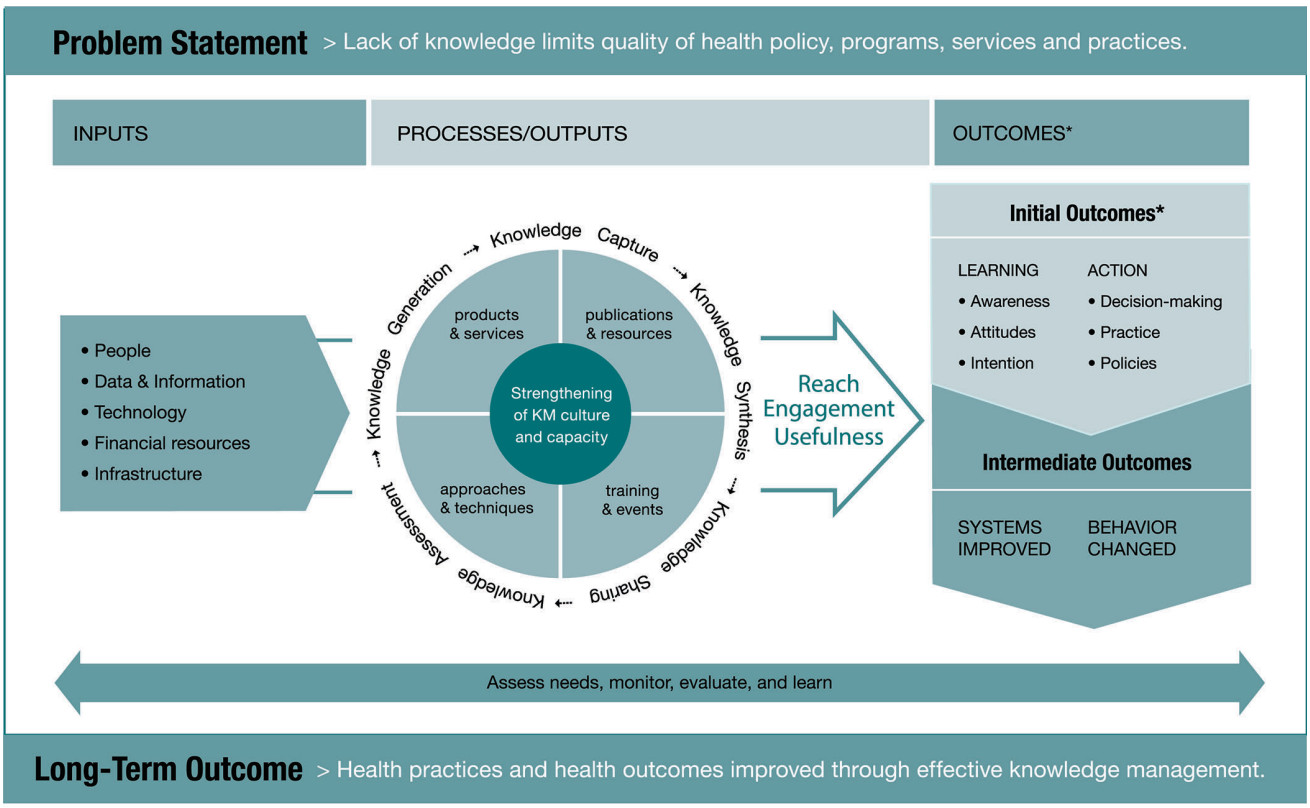
[a] Johns Hopkins Center for Communication Programs, Baltimore, MD, USA.
[b] United States Agency for International Development (USAID), Bureau for Global Health, Office of Population and Reproductive Health, Washington, DC, USA.
[c] USAID Bureau for Food Security, Washington, DC, USA.
Correspondence to Tara M Sullivan (tara.sullivan@jhu.edu).

There are a variety of KM definitions in use. What is common to most definitions is that KM is a systematic or intentional process that is linked to a broader set of organizational or project objectives. For this paper, we define *knowledge management* as the systematic process of collecting and curating knowledge and connecting people to it so they can act effectively.[2,3]

Two types of knowledge are managed: explicit and tacit. *Explicit knowledge* is easy to express in words and can be shared in written documents, manuals, or databases.[4] On the other hand, *tacit knowledge*—that is, knowledge that lives "in our heads"—is difficult to articulate and is best shared through discussion, stories, observation, and personal interaction.[5] Knowledge management gives us the ability to tap into and share explicit and tacit knowledge and to translate that knowledge into action.

Within global health, lack of knowledge limits the quality of health policy, programs, services, and practices, but effective knowledge management can improve the situation. Knowledge management can be applied to boost an organization's efficiency and effectiveness, or it can be used to improve service delivery throughout a health system. The Knowledge Management for Global Health Logic Model shows how KM program inputs, processes, and outputs work together to achieve intended health outcomes (Figure 1). KM inputs (people, data and information, technology, financial resources, and infrastructure) feed into 5 processes that make up the knowledge cycle (knowledge assessment, generation, capture, synthesis, and sharing) that, in a myriad of combinations, creates KM outputs, or tools.[5] Knowledge management processes are supported by a strong KM culture and strengthened KM capacity. KM tools are measured in terms of reach, engagement, and

FIGURE 1. Knowledge Management for Global Health Logic Model



*Project achievements are measured at the initial outcomes level. Intermediate and long-term outcome levels are shown to illustrate how initial outcomes can contribute to these other expected outcomes.
Developed by the Global Health Knowledge Collaborative Monitoring and Evaluation Task Team, 2013.

usefulness and result in learning and action. Drawing on Rogers' Diffusion of Innovation theory of how people adopt a new idea,[6] the logic model illustrates how people generally move through an "innovation-decision process" when putting new knowledge to use, from initial awareness of the knowledge and intention to use that knowledge (learning) to actually using the new knowledge through informed decisions, improved practices, and better policies (action). These actions translate into strengthened systems, changed behavior, and, ultimately, improved health outcomes.

Since development of the Knowledge Management for Global Health Logic Model, KM practitioners have come to further appreciate the central role of human interaction and people in the transfer and uptake of knowledge and the key role that KM can play in coordinating complex global health work.

Knowledge management tools can be classified into 4 categories, involving a range of low- to higher-end technologies: publications and resources, products and services, training and events, and approaches and techniques (Box). Publications and resources, such as policy briefs, guidelines, journal articles, and job aids, can help ensure health professionals have the knowledge and skills they need to do their jobs. Products and services, many of which harness the latest digital and mobile technologies, such as electronic repositories of essential information (toolkits and websites), eLearning courses, and mobile applications, can help share information quickly and widely. In addition, KM approaches and techniques such as peer assists (bringing together a group of peers to elicit feedback on a problem, project, or activity and draw lessons from the participants' knowledge and experience), coaching, mentorship, storytelling, and online or

KM is a systematic process of collecting and curating knowledge and connecting people to it so they can act effectively.

KM focuses on people, processes, and technology.

BOX. Knowledge Management Tools

Publications and Resources

- Fact sheets
- Guidelines
- Handbooks
- Job aids
- Journal articles
- Manuals
- Policy or research briefs
- Project reports

Products and Services

- Databases
- eLearning platforms
- Help desks
- Mobile applications
- Resource centers or libraries
- Websites and Web portals

Training and Events

- Conferences
- Forums
- Meetings
- Seminars
- Webinars
- Workshops

Approaches and Techniques

- After-action reviews
- Coaching
- Communities of practice
- Knowledge cafés
- Peer assists
- Study tours
- Twinning

Social KM promises to better incorporate human and social factors into KM processes and tools.

face-to-face forums such as communities of practice, are KM tools that can assist in enhancing coordination, learning, and adaptation. Other KM tools include after-action reviews (a structured debrief of an activity to learn how it can be done better in the future) and knowledge cafés (a type of meeting structure, which aims to provide an open and creative conversation on a topic of mutual interest to surface participants' collective knowledge, share ideas and insights, and gain a deeper understanding of the subject and the issues involved), as well as trainings and events such as workshops, seminars, meetings, and webinars.

HOW HAS KM EVOLVED AS A DISCIPLINE?

Practical needs for knowledge expertise and understanding have been present for millennia.[7] However, in the last 3 decades, primarily for-profit businesses have transformed KM into a discipline that focuses on people, processes, and technology to ensure the knowledge necessary for an organization to succeed is captured, created, synthesized, shared, and leveraged for maximum benefit.[8]

First-generation KM focused on technology, codification, and efficiency, with the goal of providing access to explicit knowledge.[9] This technology- and codification-focused approach was intended to increase efficiency within mostly private-sector organizations[10–12] but paid minimal attention to how or why knowledge is generated.[9] The next generation focused on learning to maximize knowledge sharing, as technology applications that facilitated improved interaction became increasingly accessible.[13] However, practitioners and scholars began to recognize that, despite technology's ability within many companies to successfully leverage knowledge in many ways, it was not the only tool needed to deliver comprehensive knowledge management.[14] The current generation uses people-focused approaches, such as after-action reviews, peer assists, and knowledge cafés. However, it has been noted that simply focusing on people and the technologies and tools they use does not automatically lead to knowledge application. Rather, the interaction between these factors is what allows an organization to manage knowledge effectively, and this application is dependent on a nurturing environment, including capacity building.[15]

All these trends have pointed to the need to better incorporate the most critical factors of the world we live in—human and social factors. Social knowledge management (social KM) promises to be the next generation of KM, building upon past generations while adding what has been the missing piece—the power of social. *Social KM* is driven by *social benefit* and recognizes the importance of *social capital, social learning, social media,* and *social networks*, all within the context of a larger *social system*.

HOW HAS KM BEEN USED IN GLOBAL HEALTH AND DEVELOPMENT?

Application of KM to global health and development has evolved over time, and as a result, interest has been growing among health care professionals about the importance of capturing, sharing, and using explicit and tacit knowledge.[16] Initially, development organizations created centralized databases, such as the Development Experience Clearinghouse (DEC) from the United States Agency for International Development (USAID), and assumed users would find the database and content useful. Organizations also pushed explicit knowledge (for example, reports and data) to potential users, which—thanks to the expansion of the Web—was becoming easier and less expensive to do. However, limited attention was paid to how such knowledge would or could be used and even less attention was given to how people drove the flow of knowledge within groups, networks, and organizations.

The World Bank played a critical role in highlighting the strategic importance of knowledge sharing, after incorporating the idea of the "knowledge bank" as a central element of its work in the late 1990s.[17] Knowledge capture, synthesis, analysis, and sharing require potential users to seek knowledge proactively and to adapt or modify it. Understanding this, development practitioners started to focus more on the ways people use expertise and less on the technology used to facilitate sharing. The Bank was one of the first to organize Knowledge Fairs, where thematic groups could display their knowledge sharing activities and could further illustrate with concrete examples the benefits of working together. The KM program director and staff used storytelling to sensitize the organization to the idea that sharing knowledge would enhance its organizational performance and, therefore, its global impact on poverty.

Many communities of practice formed around this time, and USAID, for example, supported the establishment of working groups, which provided a venue for the agency and its partners to collaborate informally around such issues as communication, monitoring and evaluation (M&E), social media, and even KM itself. It was during this time that USAID supported the development of online and face-to-face communities, including Microlinks (microfinance, 2004), FRAMEweb (environment, 2003), Agrilinks (agriculture and food security, 2011), the Virtual Leadership Development Program (management and leadership, 2002), and the Knowledge Gateway (global health, 2004).

Today KM continues to be an important discipline that global health and development organizations use to make their work more efficient and effective through its ability to transform health care delivery systems.[8] Scholars have recognized that *information* is explicit and factual, while *knowledge* results from the integration of information with belief and context. This implies that while information can flow easily, knowledge is embedded in people and must be extracted to bridge the gap between knowledge and its application in policy and practice.[18]

Knowledge results from the integration of explicit information with belief and context.

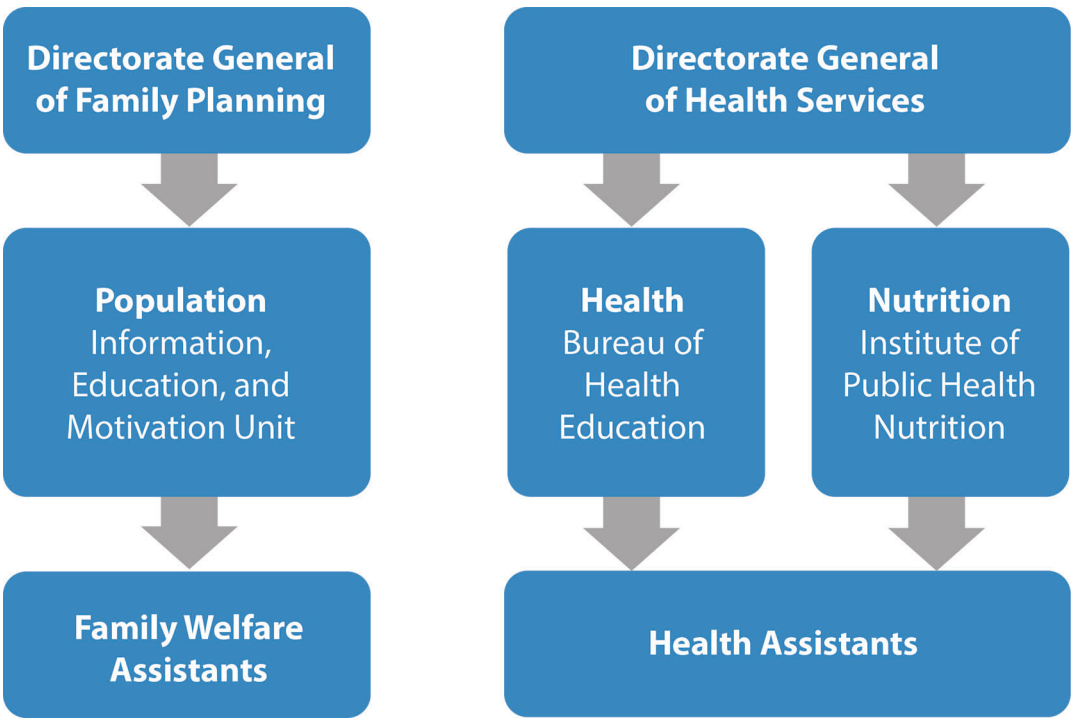
Evaluations of global health-related KM suggest KM can help impact clinical practice, which, in turn, can improve health outcomes. For example, one study suggests that through eLearning, users are able to learn at their own pace, use customized training tools, and save both time and costs of travel to attend a class, increasing the potential for knowledge gain.[19] Knowledge exchange portals create platforms for exchanging evidence-based information through online libraries, accessing epidemiological and demographic data, and creating or maintaining communities of practice.[20] A randomized controlled trial reported that knowledge exchange portals, combined with tailored messaging services, can be effective at encouraging evidence-based policy and program design.[21] A recent evaluation of a community of practice intended to build a critical mass of experts on performance-based financing by sharing expertise showed the community of practice had indeed become the central platform for knowledge sharing on this topic.[22] In addition, KM tools and processes implemented at multiple levels of the health system in Malawi yielded improvements in knowledge exchange and health service delivery.[23]

Evidence on KM thus far has primarily focused on the impact of eLearning, portals, and platforms on health service delivery. The following case study from the Bangladesh Knowledge Management Initiative (BKMI) provides an example of how KM, particularly in the areas of learning and adaptation, coordination, and capacity strengthening, has been used to support health and development in Bangladesh.

A KM CASE STUDY FROM BANGLADESH

Bangladesh has a population of more than 160 million people. In the last 20 years, child mortality has declined substantially (from 50 to

FIGURE 2. Bangladesh Ministry of Health and Family Welfare Structures Targeted by the Bangladesh Knowledge Management Initiative



11 deaths per 1,000 live births between 1993/94 and 2011), total fertility has dropped (from 4.3 to 2.3 children per woman between 1991 and 2011), and use of modern contraception has increased (from 31% of currently married women in 1991 to 52% in 2011).[24] Yet deaths in the first month of life now account for more than 60% of all under-5 deaths, and the nation has among the world's highest malnutrition rates.[24]

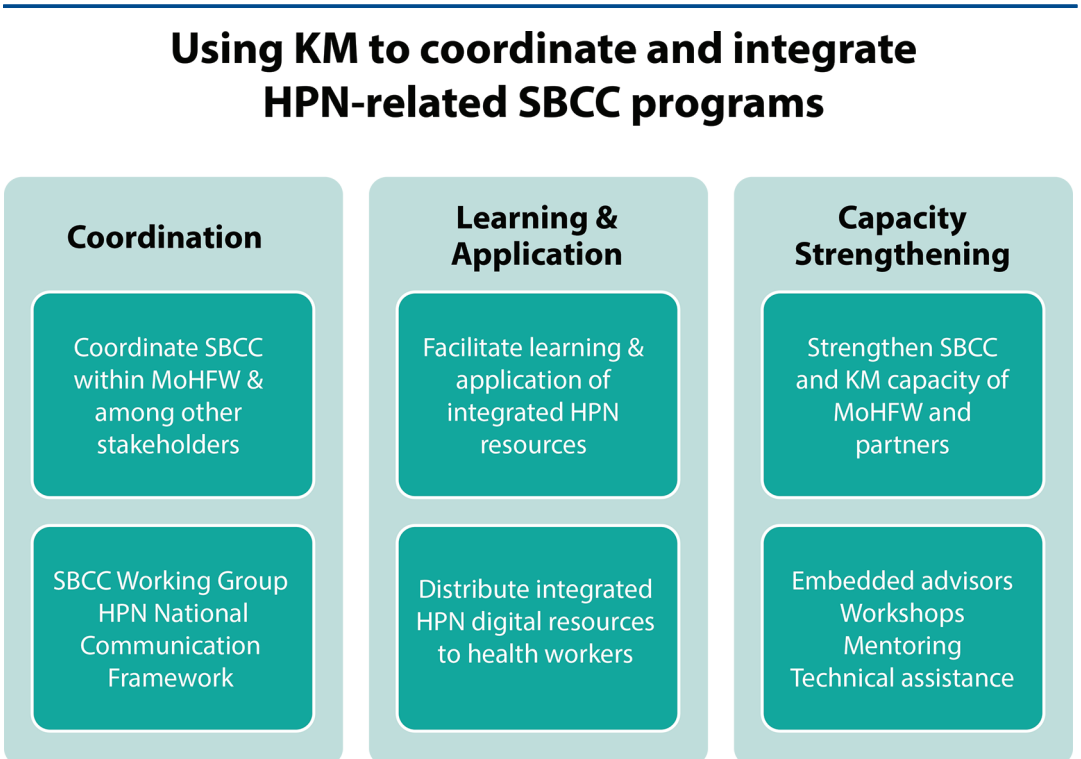
Social and behavior change communication (SBCC) for health is an evidence- and theory-based process designed to improve health behavior and outcomes. Using communication strategies to change knowledge, attitudes, norms, and behavior within a particular socio-ecological context, SBCC practitioners recognize that the social and cultural environment can influence barriers to change—and action. The most effective SBCC programs are strategically designed and implemented so the selected mix of media approaches (for example, interpersonal, group, and mass media) results in maximum exposure to and mutually reinforcing messaging across all levels of the socio-ecological system.

Within the Bangladesh Ministry of Health and Family Welfare (MoHFW), 3 distinct government units design SBCC activities covering particular aspects of health (Figure 2):

- Health activities, including those focused on maternal and child health, are designed through the Bureau of Health Education (BHE) Unit of the Directorate General of Health Services
- Population activities, largely focused on family planning, are created through the Information, Education, and Motivation (IEM) Unit of the Directorate General of Family Planning
- Nutrition activities are carried out through the Institute of Public Health and Nutrition (IPHN) Unit of the Directorate General of Health Services

Two cadres of government field workers are primarily responsible for counseling clients at the clinic and household level: family welfare assistants (FWAs), who counsel and educate community members specifically about family planning, and health assistants (HAs), who counsel and communicate about general health issues such as

FIGURE 3. Key Components of the Bangladesh Knowledge Management Initiative.



Abbreviations: HPN, health, population, and nutrition; KM, knowledge management; MoHFW, Ministry of Health and Family Welfare; SBCC, social and behavior change communication.

maternal and child health, immunizations, and nutrition. As both cadres have distinct technical mandates, the field workers typically are not able to address health issues outside their scope that arise during counseling sessions.

In early 2011, the Knowledge for Health (K4Health) Project—the flagship project for KM in family planning funded by USAID's Office of Population and Reproductive Health—was invited by USAID/Bangladesh and the MoHFW in Bangladesh to undertake a scoping visit to identify issues that could be resolved by applying KM solutions to their SBCC work.

The project found that within each ministry unit, capacity for SBCC was low, as was overall SBCC coordination among ministry staff. Furthermore, coordination of SBCC activities between ministry units and implementing partners was weak, leading to duplication of effort and a lack of awareness of the scope of SBCC programs in the country. At the field level, government field workers had little access to information and training, and they needed stronger counseling skills to communicate integrated health, population, and nutrition (HPN) messages to clients.

Subsequently, the Bangladesh Knowledge Management Initiative (BKMI) was implemented by K4Health from July 2011 to December 2013, focusing on 3 components to support SBCC (Figure 3):

1. Coordination of health, population, and nutrition SBCC programs and materials
2. Learning and application of an integrated package of health, population, and nutrition SBCC materials
3. Strengthening the SBCC capacity of the 3 units of the MoHFW

Building on the Knowledge Management for Global Health Logic Model, the BKMI conceptual framework theorized that KM processes and tools

Lack of coordination between organizations led to duplication of effort.

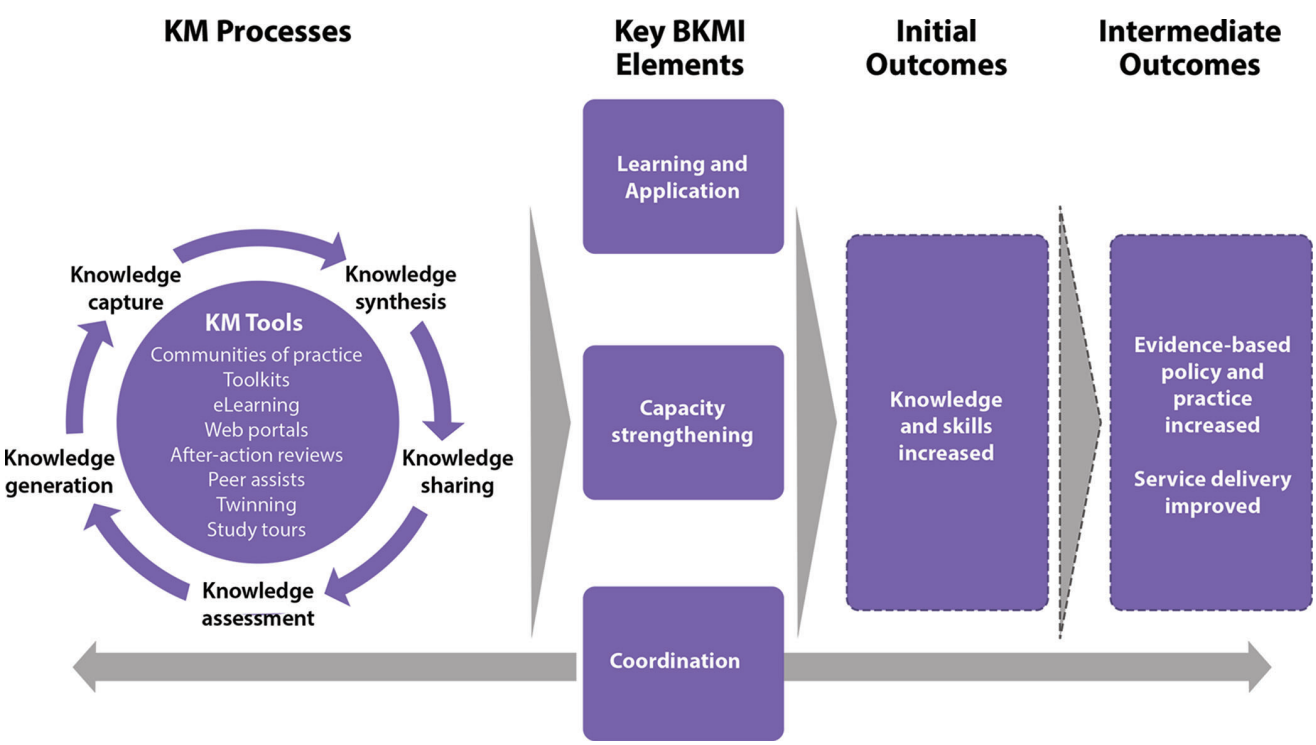
could work together to contribute to the 3 key components of the project of SBCC coordination, learning and application, and capacity strengthening (Figure 4). Coordination was an ongoing and integral part of the project that supported the learning and application and capacity strengthening components. Improvements in the 3 key project components were hypothesized to yield enhancements in SBCC knowledge and skills among MoHFW stakeholders and partner organizations as well as improvements in service quality.

Coordination of Health, Population, and Nutrition SBCC Activities and Materials

The large SBCC community in Bangladesh, made up of government bodies, local and international NGOs, donor agencies, and private sector organizations, often worked in isolation from one another and was not always aligned with the MoHFW SBCC strategies. Similarly, the MoHFW was not fully aware of all the SBCC activities in the country, so there was a clear coordination gap. It was common to find several organizations working on SBCC projects with similar objectives, similar audiences, and in similar geographic areas as a result of failure to communicate and an absence of mechanisms for coordination. This duplication of effort can slow progress, lead to financial waste, and confuse the target audience with inconsistent messaging. There was a clear need for BKMI and the MoHFW to address inconsistent, outdated, and fragmented communication practices with cross-sectoral coordination and harmonization of HPN SBCC activities.

The Bangladesh SBCC Working Group was established in March 2011, following a roundtable discussion in which donors, the MoHFW, and NGOs identified the need for better coordination of HPN activities. When BKMI began working in Bangladesh in July 2011, it was selected to serve as the secretariat for the working group. Membership included the MoHFW, development partners, NGOs, and the private sector. This group met every 2 months to share knowledge and identify synergies among SBCC stakeholders working across HPN. Representatives

FIGURE 4. Conceptual Framework of the Bangladesh Knowledge Management Initiative



from the SBCC community voluntarily and actively participated in the working group to learn from each other and to update each other on progress and upcoming events. BKMI supported the group by convening stakeholders, developing the agenda, and arranging logistics. BKMI also hosted a website to store and share key documents and created a listserv for the working group's announcements.

Toward the end of the BKMI project, the SBCC Working Group was officially institutionalized, and the MoHFW took ownership of the group. A subgroup of the SBCC Working Group began mapping existing HPN communication programs and activities in the country to help ensure coordination. A second subgroup, called the Strategy Review Subgroup, conducted a review of 17 SBCC strategies and 4 operational plans with strong HPN communication components in Bangladesh to identify gaps, inconsistencies, synergies, and opportunities for cross-sector linkages. The last subgroup, called the Health, Population, and Nutrition SBCC Best Practices Subgroup, began to define, identify, and share HPN best practices.

In November 2012, the SBCC Working Group organized a 2-day workshop to align all HPN stakeholders and partners around a country-wide shared communication implementation framework and to develop a plan of action that coordinated activities across all partners in support of the MoHFW's Health, Population and Nutrition Sector Development Program (HPN SDP), 2011–2016. Over the course of the 2 days, KM tools such as peer learning, small group work, and guided imagery with visual reporting were introduced. For example, small cross-sectoral groups were formed at roundtables to encourage peer-to-peer learning, and the workshop facilitator took participants through a guided imagery exercise as part of the visioning for the framework. Participants were tasked with imagining and then drawing what Bangladesh would look like with improved coordination and alignment of activities and SBCC messages. Participants then shared their drawings at their tables, and each table produced a common picture that was shared in a plenary. Common themes across the pictures were identified, which informed the vision for the framework.

Relevant stakeholders and experts continued to develop the framework in a participatory and iterative manner. Finalized in 2013, the framework is now being used to inform communication strategies, guide resource allocation, identify opportunities for collaboration, and guide implementation of SBCC activities.

These coordination activities, aimed at instituting high-quality standards and processes for the development of SBCC programs, were aligned with the strategic plan for the 2011–2016 HPN SDP.

Learning and Application of Integrated HPN SBCC Activities and Materials

Because the FWAs and HAs addressed only a single set of issues during their respective counseling sessions (FWAs focused on family planning while HAs covered health and nutrition issues), they missed an opportunity to educate and counsel clients comprehensively about other important health issues. In the past, these field workers also struggled to do their jobs effectively given a number of other constraints. For example, they had little access to up-to-date information, few opportunities for continuing education, insufficient (or, conversely, overwhelming) counseling materials, and job aids that often contained conflicting communication messages. This resulted in confusion for both field workers and clients.

To address these challenges, BKMI conducted an eHealth pilot from May to August of 2013 in 2 districts (Chittagong and Sylhet) that have relatively high total fertility rates and low contraceptive prevalence rates, as well as poor maternal and child health and nutrition status, compared with other districts in the country. To improve field workers' knowledge and skills in the use of information and communication technologies and their ability to integrate messages, including the ability to counsel on the full range of HPN topics, 300 field workers (150 FWAs and 150 HAs) received netbooks containing a digital HPN Toolkit and 8 video-based eLearning courses.

The Toolkit contained 116 HPN SBCC materials, including TV spots, flip charts, brochures, posters, and job aids, vetted by both the MoHFW and the field workers themselves. The MoHFW and subject matter experts used a standardized assessment tool (with 9 criteria) developed by the BKMI team that measured technical accuracy and quality of the materials and alignment with MoHFW priorities. The field workers then vetted the high-scoring materials with a separate assessment tool (also 9 criteria) for comprehension, appropriateness of messaging, and usability in

counseling. (See supplementary materials for the assessment tool used by subject matter experts and the tool used by field workers.) The final materials that were vetted by both the subject matter experts and the field workers were uploaded into the Toolkit. The Toolkit is considered the gold-standard package of HPN SBCC resources for field workers in Bangladesh.

The eLearning package, designed to address the training needs of the field workers, included 2 family planning courses; 2 maternal, newborn, and child health courses; 2 nutrition courses; a course on interpersonal communication and counseling; and a course on integrated messaging. Courses contained 15- to 20-minute self-paced videos designed for low-literacy audiences. The project periodically assessed the field workers' knowledge to measure learning from topics covered in the courses. These KM tools (digital Toolkits and eLearning courses) connected field workers to the knowledge and materials they needed to act effectively in their work. Preliminary results indicate the package enhanced field workers' knowledge in family planning, exclusive breastfeeding, complementary feeding, and maternal health including danger signs.

Strengthening KM and SBCC Capacity

From the outset, BMKI, in collaboration with the MoHFW, decided to second SBCC advisors within each of the 3 units to provide hands-on coaching and mentorship to staff. The units had limited capacity to coordinate activities across HPN, a problem that KM could solve through this secondment. To guide this work, BKMI conducted a 2-part baseline assessment in each of the government units to: (1) understand individual SBCC capacity needs, and (2) understand KM efforts currently being used to support SBCC within the unit. (See supplementary materials for the SBCC and KM capacity assessment tools.)

Specifically, the SBCC assessment tool measured capacity to:

- Conduct a situation analysis (including use of frameworks or models, research data to design SBCC programs, and activity reviews of other stakeholders to avoid duplication)
- Develop a communication strategy (including audience segmentation, communication objectives, and messaging)
- Develop materials (including creative briefs, concept testing, pretesting)
- Implement, manage, and lead programs (including work plan development, staffing plans and competencies, and supervision)
- Monitor, evaluate, and replan (including frameworks and mechanisms for measurement and the use of results for replanning)

The KM assessment measured each unit's capacity to:

- Create and use KM processes in support of SBCC (including familiarity with concepts and the existence of systems for identifying and filling knowledge gaps and identifying tacit knowledge among staff)
- Manage and lead SBCC programs using KM (including development of strategies to disseminate and promote lessons learned and use of learning to strengthen existing skills among staff)
- Nurture support for KM (including providing forums for knowledge sharing, fostering staff responsibility for their own learning, and developing a strategy to deliver SBCC programs through digital platforms)
- Monitor, evaluate, and replan SBCC programs using KM (including use of frameworks, M&E data, and results to assess program progress and improve current programs)

Initially, all 3 units had low SBCC capacity and weak KM processes. Baseline data found SBCC programs did not use evidence-based design, SBCC materials and message development were of low quality, and M&E of SBCC activities was limited. In addition, standard processes for KM and SBCC were nearly nonexistent.

To address the identified capacity building needs, BKMI, in collaboration with the unit line director and SBCC program managers, developed unit-specific capacity strengthening plans to improve SBCC skills and each unit's overall culture to support KM. To strengthen individual SBCC capacity, BKMI arranged workshops and trainings and provided technical assistance and continuous coaching and mentoring. Workshops and trainings (on message and material design, graphic design, and M&E) were provided to staff of all 3 units together to ensure a uniform understanding of SBCC and to facilitate learning and collaboration across the units. Knowledge management was integrated into many workshops, both to introduce the concept to

participants and to demonstrate how it could support SBCC work. For example, an SBCC capacity strengthening training for 72 senior and junior health officers from 64 districts occurred in several increments from May to September 2013. As they received very little on-the-job training in this area, the 4.5-day curriculum covered how to design and implement strategic communication activities, how to use SBCC materials effectively, how to design and develop effective messages, monitoring and supervision for SBCC, as well as KM for SBCC.

As KM was a new concept for the health officers, the trainers first had to introduce the concept and ensure the participants understood it. After the introduction, the participants discussed typical challenges in public health, such as national guidelines not being updated or shared, program managers not being sure of which field workers were performing well, field workers leaving their jobs because they were not growing professionally, lack of opportunity to attend trainings, and SBCC materials being developed that have conflicting messages. Participants then worked in teams to discuss whether KM tools such as peer assist, mentorship, storytelling, online forums, and eLearning could help resolve any of these problems. The exercise helped participants understand how KM could support their activities and program goals.

Using a participatory assessment tool that scored various SBCC and KM capacity components from 1 to 4 (1 = poor, 4 = excellent), baseline and endline data were compared for each of the government units. For SBCC, in the IEM unit, the scores jumped from 1.92 to 3.42; for BHE, they increased from 1.97 to 2.64; and for IPHN, they increased slightly from 1.97 to 2.0. For KM, the IEM unit scores rose from 1.61 to 2.48; for BHE, they increased from 1.43 to 1.65; and for IPHN, they rose from 1.35 to 1.57. The IEM unit had the greatest improvement in SBCC and KM capacity compared with other units, and SBCC capacity scores improved more than KM scores overall. No statistical tests were conducted.

The endline post-assessments found that staff knowledge of how to design and implement SBCC activities had improved, and they increasingly used a strategic process for developing messages and materials. Staff also demonstrated greater ability to manage data, more appreciation for monitoring and evaluation, and improved leadership skills. However, BKMI staff did not successfully put KM processes in place. Although the units recognized the need, KM processes were not prioritized. Barriers included competing demands and limited information sharing. BKMI advocated improved KM with the line directors and at higher levels, including the Secretary of Health, specifically to develop processes and use tools that could help improve organizational effectiveness, knowledge sharing, and on-the-job skills. The MoHFW, however, had a greater interest in using external KM to improve coordination between SBCC stakeholders, rather than using it internally at the unit level.

Competing demands and limited information sharing impeded the use of KM processes.

Lessons Learned

The BKMI project yielded many lessons that can inform future KM initiatives in the global health field.

Coordination of HPN SBCC Activities and Materials

Knowledge management in support of SBCC programs requires time and space to share knowledge in order to harmonize plans and align messages and activities within and across health sectors and among varying SBCC stakeholders. Coordination allows SBCC stakeholders opportunities to collaborate, share, and validate good practices and lessons learned, pool resources, avoid duplication of effort, and create and implement activities according to common quality standards. By establishing a systematic process for exchanging knowledge around SBCC programs and materials and institutionalizing a process through the working group and its members, BKMI sought to create a sustainable solution to chronic coordination issues. BKMI learned that to institutionalize effective coordination practices, it is important to take a multisector approach from the outset and to work closely with the MoHFW and align coordination activities with the Government of Bangladesh's strategies and operational plans. In addition, coordination objectives and activities must be clear and inclusive of all who want to be involved. The BKMI team found that inclusiveness helped address common challenges from different angles and ensured that those implicated in SBCC activities in Bangladesh could have a voice and contribute to the national conversations occurring within the health system. Furthermore, for the effort to be sustainable, the MoHFW must take ownership of the group and drive the agenda.

Learning and Application of Integrated HPN SBCC Activities and Materials

The eHealth pilot presented an opportunity to use new technology to deliver effective HPN counseling to the community and improve knowledge in a standardized manner. While the BKMI team had concerns about using the netbooks with field workers, they quickly learned how to access the digital resources, demonstrating that technology can be a useful tool for facilitating SBCC and strengthening counseling skills. While not its original intention, field workers used the eLearning courses as counseling tools because clients found the courses entertaining and easy to understand. The BKMI team learned that providing field workers with digital resources on netbooks empowered them, increased their confidence on the job, and heightened their credibility in the community. The team also learned that the field workers would have benefitted from a more in-depth, in-person interpersonal communication and counseling training on how to use the netbook and its resources during counseling sessions. In addition, field workers would have been better supported if their supervisors had been part of the pilot and had been available to answer content-related questions and to help navigate the resources in the netbook to find those most appropriate for a particular counseling session. Finally, the project team learned that any activity involving technology requires ongoing IT and monitoring support.

Field workers used the eLearning courses as counseling tools—not by design but because clients found the courses entertaining and easy to understand.

The major activities of the BKMI project mutually reinforced each other. Capacity strengthening efforts through 3 units of the MoHFW contributed to improved SBCC capacity of staff and increased knowledge sharing through the coordination activities of the SBCC Working Group. All 3 units were involved in every stage of Toolkit and eLearning course development for the eHealth pilot that took place at the community level. The eHealth pilot was an important activity to link national coordination and community needs. Applying KM processes to SBCC activities, especially in the context of coordination, improved knowledge, helped people build on each other's work, impacted efficiency, and ultimately strengthened the health system.

Strengthening KM and SBCC Capacity

Given the high staff turnover within the MoHFW, it is important to go beyond strengthening the capacity of individuals to focus on strengthening the capacity of the whole organization by setting up strong processes and employing state-of-the-art tools to ensure sustainability. Furthermore, organizations need to take responsibility for their own capacity strengthening initiatives by recognizing their importance and helping identify areas for improvement. Also, given competing time pressures, capacity strengthening plans should support and help meet the objectives and deliverables of operational plans. To be most effective, capacity strengthening efforts must include the full team of SBCC staff members to achieve a common level of SBCC ability throughout the organization. Integrating new technology as part of capacity strengthening can motivate staff and enable them to achieve deliverables more efficiently. Finally, the BKMI team learned that changing an organization's culture and putting KM processes in place takes time and sustained advocacy.

With regards to sustainability of the BKMI activities, the project successfully advocated the institutionalization of the SBCC working group, and it continues to conduct SBCC and KM capacity building and coordination activities in the 3 units of the MoHFW. In addition, the project continues to update and expand the HPN Toolkit and 8 eLearning courses through a local organization called the Bangladesh Center for Communication Programs. The netbooks used for the eHealth pilot were deemed to not be scalable because of the cost associated with the netbook itself, as well as ongoing needs for IT and monitoring support. The netbooks loaded with the BKMI resources were therefore given to another USAID project in Bangladesh. Rather than pursuing scale-up through netbooks, the project is now exploring how it can scale-up use of the Toolkit and the eLearning courses to more health service providers in Bangladesh through the existing infrastructure, which includes mostly desktop computers in clinics and tablets among the health assistants.

CONCLUSION

Many global health programs are grappling with issues related to coordination, learning and application, and capacity strengthening. Addressing these issues is critical across technical topics and sectors, as these foundational factors, if properly achieved, can increase efficiency, maximize resources, and contribute to both short- and long-term health goals.

The case study from Bangladesh illustrates how KM can improve coordination by creating and implementing a systematic process to exchange knowledge on a particular technical topic—in this case, SBCC programs and materials—as well as institutionalizing such a process to ensure sustainability. Toolkits increased HPN knowledge among field workers and eLearning courses strengthened field workers' counseling and integrated messaging skills. These changes are hypothesized to improve service delivery quality. From a health systems strengthening perspective, this example illustrates that ensuring coordination among different actors, such as those working cross-sectorally in SBCC, supporting learning, and investing in capacity building, can contribute to improving health and development outcomes.

Further research would be beneficial in understanding the application of KM within the health sector. At a minimum, more rigorous studies that isolate KM activities and compare them to the absence of KM activities would provide stronger evidence of its effectiveness on health outcomes. Having a deeper understanding of how health care organizations use KM and further testing of various KM interventions within the health care context would be helpful in demonstrating the potential impact.[16] Within the case of BKMI, we are in the process of evaluating impact data to more clearly make conclusions regarding the impact of strengthening coordination, capacity, and learning and application.

The discipline of KM as applied to global health and development would benefit from adopting more systematic processes, better defining the terms used to describe KM tools and processes, and critically examining the "how" to better integrate relevant theories into KM design, implementation, and research. Additionally, because the focus of today's KM has shifted to KM practices for capturing knowledge that are fundamentally people-focused approaches, considering human and social factors in the KM puzzle is critical to potentially further the impact of health and development programs.

Because knowledge management has been informed by and used within disciplines outside public health, there is a crucial need to consider how to apply KM tools and processes from other fields to global health. Public health practitioners must recognize that one of the primary intangible assets we possess is knowledge and that we all require knowledge to solve the world's pressing global health problems. The management of that knowledge is paramount but has yet to be viewed as such.

Acknowledgments: This commentary was supported by the Knowledge for Health-II Project, funded by the Office of Population and Reproductive Health, Bureau for Global Health, US Agency for International Development, Cooperative Agreement No. AID-OAA-A-13-00068. The views expressed in this document do not necessarily reflect those of the US Agency for International Development or of the US government. The authors wish to thank Stacey Young, Senior Learning Advisor, Bureau for Policy, Planning and Learning Office of Learning, Evaluation and Research, US Agency for International Development, for her contributions in conceptualizing this commentary. We also are grateful to Elizabeth Futrell from the Johns Hopkins Center for Communication Programs (CCP) for her editorial assistance and to Susan Krenn, Director of CCP, for her review of this paper.

Competing Interests: None declared.

REFERENCES

1. Ferguson J, Cummings S. Knowledge management in practice: the case of international development. In: Koohang A, Harman K, Britz J, editors. Knowledge management: research and application. Santa Rosa (CA): Informing Science Press; 2008. p. 75–112.
2. Sveiby KE. The new organizational wealth: managing and measuring knowledge-based assets. San Francisco (CA): Berrett-Koehler Publishers; 1997.
3. Milton N. Knowledge management for teams and projects. Oxford: Chandos Publishing; 2005.
4. Brown JS, Duguid P. Organizing knowledge. Calif Manage Rev. 1998;40(3):90–111. CrossRef
5. Ohkubo S, Sullivan TM, Harlan SV, Timmons BK, Strachan M. Guide to monitoring and evaluating knowledge management in global health programs. Baltimore (MD): Johns Hopkins Bloomberg School of Public Health, Center for Communication Programs; 2014. Available from: https://www.k4health.org/resources/guide-monitoring-and-evaluating-knowledge-management-global-health-programs
6. Rogers EM. Diffusion of innovations, 5th edition. New York: The Free Press; 2003.
7. Wiig KM. Knowledge management: where did it come from and where will it go? Expert Syst Appl. 1997;13(1):1–14. CrossRef
8. Guptill J. Knowledge management in health care. J Health Care Finance. 2005;31(3):10–14. Medline
9. McElroy MW. Second-generation KM: a white paper. Emergence. 2000;2(3):90–100.
10. Horton D, Thiele G, Oros R, Andrade-Piedra J, Velasco C, Devaux A. Knowledge management for pro-poor innovation: the Papa Andina case. Knowl Manage Dev J. 2011;7(1):65–83. CrossRef
11. Benbya H. Knowledge management for services, operations and manufacturing. Knowl Manage Res Pract. 2009;7(2):186–187. CrossRef
12. Sulaiman VR, Thummuru L, Hall A, Dijkman J. Tacit knowledge and innovation capacity: evidence from the Indian livestock sector. Knowl Manage Dev J. 2011;7(1):32–44. CrossRef
13. Alavi M, Leidner DE. Review: knowledge management and knowledge management systems: conceptual foundations and research issues. Manage Inf Syst Q. 2001;25(1):107–136. CrossRef

14. McDermott R. Why information technology inspired but cannot deliver knowledge management. Calif Manage Rev. 1999;41 (4):103–117. CrossRef
15. Bhatt GD. Knowledge management in organizations: examining the interaction between technologies, techniques, and people. J Knowl Manage. 2001;5(1):68–75. CrossRef
16. Kothari A, Hovanec N, Hastie R, Sibbald S. Lessons from the business sector for successful knowledge management in health care: a systematic review. BMC Health Serv Res. 2011;11 (1):173. CrossRef. Medline
17. Kim K, McGrath S. Knowledge sharing in development agencies: lessons from four cases. Washington (DC): World Bank; 2003. Available from: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2004/06/23/000011823_20040623121712/Rendered/PDF/293860Knowled0sharing040cases.pdf
18. Pablos-Mendez A, Chunharas S, Lansang MA, Shademani R, Tugwell P. Knowledge translation in global health. Bull World Health Organ. 2005;83(10):723–723. Medline
19. Ruggeri K, Farrington C, Brayne C. A global model for effective use and evaluation of e-learning in health. Telemed J E Health. 2013;19(4):312–321. CrossRef. Medline
20. Quinn E, Huckel-Schneider C, Campbell D, Seale H, Milat AJ. How can knowledge exchange portals assist in knowledge management for evidence-informed decision making in public health? BMC Public Health. 2014;14(1):443. CrossRef. Medline
21. Dobbins M, Hanna SE, Ciliska D, Manske S, Cameron R, Mercer SL, et al. A randomized controlled trial evaluating the impact of knowledge translation and exchange strategies. Implement Sci. 2009;4:61. CrossRef. Medline
22. Bertone MP, Meessen B, Clarysse G, Hercot D, Kelley A, Kafando Y, et al. Assessing communities of practice in health policy: a conceptual framework as a first step towards empirical research. Health Res Policy Syst. 2013;11:39. CrossRef. Medline
23. Campbell N, Schiffer E, Buxbaum A, McLean E, Perry C, Sullivan TM. Taking knowledge for health the extra mile: participatory evaluation of a mobile phone intervention for community health workers in Malawi. Glob Health Sci Pract. 2014;2(1):23–34. CrossRef. Medline
24. National Institute of Population Research and Training (NIPORT); Mitra and Associates; ICF International. Bangladesh demographic and health survey 2011. Dhaka (Bangladesh): NIPORT; 2013. Co-published by Mitra and Associates and ICF International. Available from: http://dhsprogram.com/pubs/pdf/FR265/FR265.pdf

Peer Reviewed

Received: 2014 Dec 7; **Accepted:** 2015 Feb 17; **First Published Online:** 2015 Apr 27

Cite this article as: Sullivan TM, Limaye RJ, Mitchell V, D'Adamo M, Baquet Z. Leveraging the power of knowledge management to transform global health and development. Glob Health Sci Pract. 2015;3(2):150-162. http://dx.doi.org/10.9745/GHSP-D-14-00228.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

COMMENTARY

Family Planning Policy Environment in the Democratic Republic of the Congo: Levers of Positive Change and Prospects for Sustainability

Thibaut Mukaba,[a] Arsene Binanga,[b] Sarah Fohl,[c] Jane T Bertrand[c]

Building on expressed support from the Prime Minister to the Ministries of Health and Planning, the country's new family planning commitment grew out of: (1) recognition of the impact of family planning on maternal mortality and economic development; (2) knowledge sharing of best practices from other African countries; (3) participatory development of a national strategic plan; (4) strong collaboration between stakeholders; (5) effective advocacy by champions including country and international experts; and (6) increased donor support. The question becomes: Will the favorable policy environment translate into effective local programming?

INTRODUCTION

The Democratic Republic of the Congo (DRC)—with a population estimated at 67.5 million[1]—is the third most populous country in sub-Saharan Africa and the most populous francophone country. Since its independence from Belgium in 1960, the country has had a tumultuous history.

During the dictatorship of President Mobutu Sese Seko (1965–1997), when the country was named Zaire, the repressive government provided periods of relative stability but at great cost to the country and to its citizens. In 1991, Mobutu lost control over the population; political turmoil and social unrest, known as the *pillage* (plundering), created a highly volatile environment that caused foreign investors and international donor agencies to withdraw completely or reduce support to the country, plunging the country further into poverty. The First Congo War (1996–1997) resulted in Mobutu being overthrown by the Rwandan-backed rebel leader Laurent-Desiré Kabila.[2]

The Second Congo War (that involved 9 neighboring countries) occurred primarily in the eastern part of the country between 1998 and 2002, resulting in further economic devastation. By the early 2000s, life in the capital city of Kinshasa and some other provinces began returning to normalcy, although the threat of war continued to simmer in the eastern provinces bordering Rwanda and Uganda.[3] Because of the ravages of war, political uncertainty, external exploitation, inadequate investment in human capital, and widespread poverty, the DRC—one of the richest countries in the world in minerals—ties for last place among 187 nations on the Human Development Index.[4]

The DRC is typical of African countries that are just beginning the demographic transition, with a total fertility rate of 6.6 as of 2013,[5] a doubling in population size every 23 years, and a very young population (46% are under the age of 15). Almost three-quarters (71.3%) of the population live below the poverty line, and 45.9% live in severe poverty.[5] With its high maternal mortality rate of 846 per 100,000 live births[5] and large population base, the DRC is among the 5 countries that contribute the greatest number of maternal deaths to the global total.[6]

Although the country established a national family planning program (*Projet National des Naissances Desirables*, or PSND) in the early 1980s, it became inactive in the early 1990s in the wake of the *pillage*. In the mid-2000s, external donors and technical organizations tentatively began to resume operations in the DRC. With a myriad of challenges facing the government from every sector, family planning was low on the priority list; the government had more important problems to address. Although the government established the National Program of Reproductive Health (*Programme National de Santé de la Reproduction*, or PNSR) in 2001 to address maternal mortality, family planning,

[a] United States Agency for International Development/Democratic Republic of the Congo, Kinshasa, DRC.
[b] Tulane International LLC, Kinshasa, DRC.
[c] Tulane University School of Public Health and Tropical Medicine, Department of Global Health Systems and Development, New Orleans, LA, USA.
Correspondence to Jane T Bertrand (bertrand@tulane.edu).

and related issues, it drew little attention or support from higher levels of government. While maternal mortality did register as a national priority, family planning did not during the first decade of the millennium. The Growth and Poverty Reduction Strategy failed to mention family planning, although it did touch on leprosy, onchocercosis, and tuberculosis[7]; family planning was mentioned in the second edition released in 2010. For decades, there was little evidence of government interest in family planning.

Some have questioned if the Roman Catholic Church has been an obstacle to family planning in the DRC. The Ministry of Health estimates that 40% of health facilities in the DRC are managed by the Church.[8] In some cases, these facilities refuse to offer modern contraceptive methods; in others, they turn a blind eye. To the extent that the Roman Catholic Church in the DRC has attempted to exercise its influence in terms of family planning, it has been to promote natural methods over "artificial contraception." In contrast to selected countries in Latin America and to the Philippines (where the Church has tried to block government or NGO family planning programs), it does not constitute a source of organized opposition to family planning programming in the DRC.

Few tangible benefits resulted from holding national family planning conferences because insufficient attention was paid to substantive follow-up.

Beginning in 2012, the DRC government took a number of actions that demonstrated its commitment to family planning, which has taken the international family planning community and many local observers by surprise. The purpose of this article is to document the evolution of the family planning policy environment in the DRC, analyze events that led to positive change, and identify factors that could influence the durability of this change.

PREVIOUS ATTEMPTS TO HEIGHTEN THE PROFILE OF FAMILY PLANNING

It is useful to begin the analysis of the family planning policy environment in the DRC in 2004, as the country was beginning to return to normalcy after the *pillage* and subsequent political turmoil. Two key conferences to reposition family planning occurred in 2004 and 2009 that typified the lack of high-level support for family planning and inability of the PNSR to mobilize and sustain political support for family planning.

The first *Conférence pour le Repositionnement de la Planification Familiale* (Conference on Repositioning Family Planning), held in 2004, was funded by the United States Agency for International Development (USAID) and executed by the PNSR with technical assistance from the Advance Africa Project.[9] Given the country's ongoing struggle to return to normalcy, perhaps it was premature to expect tangible results to come from this gathering.

The second National Conference on Repositioning Family Planning in the Democratic Republic of Congo took place in 2009, again with support from USAID in addition to the United Nations Population Fund (UNFPA).[10] This costly event, held at the Ministry of Foreign Affairs conference room, took place under the auspices of the First Lady of the DRC. At a time when programs in other health sectors (e.g., HIV, malaria, vaccination) were receiving major funding and government attention, the second conference on repositioning family planning was designed to heighten visibility for family planning through the high-level endorsement by the First Lady and to promote public dialogue around its importance. One tangible benefit of the conference was that it called for establishing a multisectoral committee of family planning stakeholders (*Comité Technique Multisectoriel Permanent*, CTMP), which proved to be very useful. However, overall, the conference produced no immediate results in terms of political support or programmatic action. In retrospect, a major investment of time, effort, and resources went into planning and implementing this event, with insufficient attention to substantive follow-up. For example, the First Lady was not engaged to play a role in subsequent events, although she is still cited as a champion of family planning.

In 2007, between the two national family planning conferences, USAID established a Family Planning Partners' Group, including its own implementing partners and the PNSR. This group improved coordination within the USAID program; however, the PNSR lacked the capacity to organize coordination at the national level. In 2008, the PNSR created the Family Planning Task Force, which was joined by members from USAID's Family Planning Partners' Group. When the CTMP was established following the 2009 conference, it included many of the same players as the Family Planning Task Force, at which point the task force ceased to exist.

FACTORS CONTRIBUTING TO THE EVOLVING SUPPORT FOR FAMILY PLANNING

Since 2012, the DRC government has boldly endorsed family planning in a number of actions (Box 1).

BOX 1. Evidence of DRC Government Commitment to Family Planning Since 2012

2012:

- **June.** The DRC government included family planning as 1 of 6 elements in its framework to accelerate achievement of Millennium Development Goal No. 4 (reduce child mortality) and No. 5 (improve maternal health).
- **August.** The *Cadre Permanent de Concertation des Femmes Congolaises* (CAFCO, or the Permanent Consultative Framework of Congolese Women) drafted a law favorable to reproductive health/family planning.
- **October 15.** PNSR, with support from UNFPA and other partners in Kinshasa, launched a family planning campaign in Masina municipality (consisting of intensified mass communication and free distribution of contraceptives).
- **December 13.** CAFCO submitted the draft reproductive health/family planning law to the National Assembly for consideration.

2013:

- **February.** DRC government allocated US$994,000 from the national budget toward the procurement of contraceptives, with subsequent allocations conditional on receipt of initial order.
- **July 29.** The Prime Minister sent a letter to the Minister of Health, with a copy to the Minister of Planning, to prioritize family planning, citing the negative socioeconomic impact of population growth if the issue of high fertility was not addressed appropriately.
- **August 21.** The Minister of Health sent a letter of response to the Prime Minister regarding prioritizing family planning in the 2014 budget and taking explicit steps toward strengthening work in family planning. The Minister of Budget also sent a letter of response to the Prime Minister stating that the Ministry of Budget would allocate funding for family planning in the 2014 budget.
- **November 15.** The DRC Government presented the Declaration of Commitment to Family Planning at the Third International Conference on Family Planning in Addis Ababa.
- **November 28.** The Prime Minister sent a second letter to the Minister of Health declaring the importance of finalizing the National Strategic Plan for Family Planning, formalizing the Permanent Multisectoral Technical Committee (CTMP), and developing performance contracts for PNSR staff.
- **Exact date unknown.** National Assembly selected the draft reproductive health/family planning law for discussion in the March 2014 session of the National Assembly.

2014:

- **January 10.** The DRC government officially approved the National Strategic Plan for Family Planning in the DRC: 2014–2020.
- **February 13.** The Minister of Health officially launched the National Strategic Plan for Family Planning.
- **March–November.** The government held additional deliberations on the proposition of the reproductive health/family planning law.
  - **March.** The National Assembly sent the proposition to the Government for *Avis Technique* (technical opinion).
  - **March.** The Government forwarded the proposition to the Minister of Health to supply the *Avis Technique*.
  - **April 4.** The Minister of Health provided the *Avis Technique* to the Government.
  - **June 12.** Two members of the National Assembly—who are also members of CAFCO—presented the draft reproductive health/family planning law to the National Assembly for deliberation.
  - **August 28.** The National Assembly sent the proposition to the Supreme Court to determine whether the National Assembly is authorized to legislate on the proposition.
  - **November.** The Supreme Court of Justice sent the proposition to the *Parquet Général de la Republique* (National General Prosecutor's office) for consultation.
  - **November.** The *Parquet Général de la Republique* returned the proposition to the Supreme Court to pronounce whether the National Assembly should legislate on this topic.

BOX 1 (continued.)

- **December 3–5, 2014.** The Office of the Prime Minister sponsored the Third National Conference on Repositioning Family Planning in the DRC, which was attended by more than 400 participants, including provincial ministers from the 11 provinces.
  - The Minister of Health presided over the opening and closing ceremony as well as a roundtable.
  - The Minister of Planning presided over both a plenary session on Day 1 and a roundtable.
  - The DRC government and donors attended the roundtable on December 5, at which the DRC government doubled its family planning commitment in 2015 to US$2.5 million and representatives from multilateral/bilateral agencies and foundations declared commitments to family planning in the coming years.

2012 marks a turning point in the DRC's support for family planning—from near virtual neglect only 2 years prior.

In particular, the letters in late 2013 from the Prime Minister's office to the Ministry of Health and Ministry of Planning reflected support from the highest levels of government, which triggered several subsequent public commitments to family planning. How did the change from near virtual neglect to explicit, strong support of family planning by the DRC government occur in a period of approximately 2 years? This question does not lend itself to statistical analysis, but a review of relevant events points to the following factors.

Heightened Awareness of Family Planning as a Means to Reduce Maternal Mortality

In June 2012, the Minister of Health and other technical advisors attended the first meeting on the Child Survival Call to Action: A Promise Renewed,[11] which included participants from countries with some of the highest maternal mortality rates in the world, as well as those from countries currently on track to achieving Millennium Development Goal (MDG) No. 4 (reduce child mortality) and No. 5 (improve maternal health). One aim of the meeting was to encourage the participating countries to be more accountable for these high levels of maternal mortality and to discuss strategies for taking action. Each country was asked to develop a plan to address the question of what it was doing to reduce infant and child mortality. These same parties, as well as the director of the Health Office of USAID/DRC, participated in a follow-up meeting in Kinshasa in late 2012.

Awareness of family planning's impact on reducing maternal mortality propelled the DRC government to take action.

The DRC government, with support from the United Nations Children's Fund (UNICEF), USAID, the World Health Organization (WHO), and others, responded by developing the "Plan for Accelerating Achievement of the MDGs," in which family planning was 1 of 6 actions to achieve MDG 4 and 5. This plan provided one of the first signs that the DRC government intended to pay more than lip service to family planning.

Regional family planning conferences improved DRC stakeholder knowledge of best practices from other African countries.

Strengthened Ties Between Partners

Although the PNSR is a government entity, historically its dealings with higher levels of government were limited and perfunctory. However, beginning in 2012 ties strengthened between the PNSR and the government bodies that it represents (10ème Direction [D10], Ministry of Health). Also, an expert within the *Direction d'Etudes et Planification* (DEP) (Studies and Planning Directorate) came forward as a champion for family planning. Although responsible for multiple areas of health, he strategically used his time and influence to participate in key meetings, intercede on behalf of the PNSR, and liaise with higher-level government officials on issues related to family planning. He also recognized the role that external partners could play in advancing the family planning agenda within the country and embraced their participation, although doing so on his own terms.

Increased Awareness About Best Practices From Other African Countries

Between 2008 and 2012, USAID invited PNSR, the *Programme National de Santé de l'Adolescent* (PNSA) (National Adolescent Health Program), and key implementing partners to participate in successive regional family planning meetings held in Kenya, Rwanda, and Tanzania, that convened up to 14 African countries. Participants at the regional meetings discussed strategies for meeting the family planning demand to achieve the MDGs, effective community approaches to family planning, and using mobile technology to improve family planning and health services. In addition, the same DRC organizations attended the International Conference on Family Planning in Kampala in 2009 and in Dakar in 2011. Attending these conferences not only improved DRC stakeholders' knowledge of successful family planning models from across the continent but also reinforced ties among family planning activists in the DRC and

facilitated collaboration within coordination bodies that were created later.

Greater Cohesiveness and Teamwork Among Technical Partners

Prior to 2010, some 10 organizations (funded by USAID, UNFPA, the World Bank, the Department for International Development [DFID], the International Planned Parenthood Federation [IPPF], and others) implemented family planning service delivery in Kinshasa, albeit in a relatively isolated manner. Others operated in the 10 provinces outside Kinshasa. Each organization diligently pursued individual projects or institutional objectives, but none (including the PNSR) was addressing the larger questions: How can we increase the availability of contraceptive methods? Can we increase contraceptive use? The PNSR was unable to operate effectively in its convening capacity, given insufficient human and financial resources.

Two coordinating mechanisms based in Kinshasa—the CTMP and the Kinshasa Family Planning Coalition—helped to bring greater cohesiveness among these different partners and greater collaboration with the PNSR in the capital city of Kinshasa. The CTMP—mandated by the 2009 Conference on Repositioning Family Planning—gained a new level of functionality as it planned a conference in Kinshasa in June 2012. The conference, entitled "Advocacy for the Financing of Family Planning in the DRC," aimed at increasing awareness of the work of different partners in promoting family planning.[9] In late 2013, the CTMP became the main liaison between the organizers of the 2013 International Conference on Family Planning in Addis Ababa and the delegation from the DRC, which numbered more than 40 participants. In addition, the CTMP served as a key intermediary in organizing the presentation of the DRC government's declaration of commitment at the Addis meeting. Once in Addis, the CTMP arranged meetings with the DRC delegation (including government and NGO representatives) and foundation representatives, as well as a press conference with international correspondents. In February 2015, the Office of the Prime Minister gave official status to the CTMP, further strengthening its mandate as a coordinating body.

The second group that has brought greater cohesiveness among the organizations implementing family planning service delivery is the Kinshasa Family Planning Coalition. Since its creation in December 2012, this group of 10 service delivery organizations and 4 key donors has met quarterly. In 2013, the group aimed to increase the percentage of health structures offering "3-star" quality services from 44% (determined by a 2012 baseline survey) to 80%. Results from a follow-up survey showed that by the end of 2013, the number of health facilities reporting that they provided family planning services increased from 184 to 395. The percentage of health facilities with a 3-star quality rating increased from 44% to 63% among the total number of sites surveyed in 2013.[12] Although short of the 80% aspirational goal, this significant increase provided evidence that local organizations could effectively increase access to and quality of family planning services in Kinshasa.

Donor-funded implementing partners have had a major role in advancing the family planning agenda to date. For example, external donors bear 85% of the costs of contraceptive procurement in the DRC, while households shoulder 15% of the costs and the DRC

© David Colwell/Johns Hopkins University

In November 2013, DRC government and NGO representatives held a press conference at the Third International Conference on Family Planning in Addis Ababa, where the government presented its Declaration of Commitment to Family Planning. Left to right: Dr. Arsene Binanga (Tulane's Director of Family Planning Programs in the DRC), Dr. Thomas Kataba (of the Ministry of Health's Studies and Planning Directorate), Mr. Dieudonné Kwete (advisor to the Prime Minister), Dr. Therese Kyungu (Director of the National Program of Reproductive Health), and Mr. Mbadu Mwanda (Director of the National Program for Adolescent Health).

government less than 1%.[13] While commitment of donors is commendable, eventual success of the national family planning program must involve solid collaboration between the government and the private sector, including international and local NGOs and faith-based organizations.

The strength of the ongoing collaboration among multiple donors and partner organizations was evident in the organization and execution of the Third National Conference on Repositioning Family Planning in the DRC, held in Kinshasa from December 3–5, 2014, and attended by more than 400 participants. The event included 4 plenary sessions, 12 parallel technical sessions, 8 mini-workshops, and 2 consultative sessions with more than 40 officials representing the 11 provinces of the DRC. Sponsored by the Office of the Prime Minister and opened by the Minister of Planning, this event had strong government representation. It culminated with a roundtable of donors and ministry officials. The Ministers of Planning and Health jointly presided over this event, in which the DRC government doubled its commitment to the procurement of contraceptives from the previous year to $2.5 million for 2015.

Development of a National Strategic Family Planning Plan

In 2012, the CTMP took on the task of developing the National Strategic Plan for Family Planning, soliciting and obtaining financial assistance to support the process from various implementing partners, thus drawing in multiple parties. The President of the CTMP led the highly participatory process, consisting of 4 workshops between December 2012 and October 2013 and involving more than 200 participants from the provinces and from different ministries. In the fourth and final workshop, the Provincial Ministers of Health and Provincial Medical Directors (*Médecins Inspecteurs*) from the 11 provinces of the DRC were invited to Kinshasa to discuss the key components of the plan.

Using a participatory process to develop the national strategic family planning plan helped create buy-in.

Because the large majority of family planning stakeholders, especially those based in Kinshasa, had participated in one or more of the workshops, the final strategic plan had considerable buy-in throughout the family planning community. The final draft was ready just in time for the Addis Ababa International Conference on Family Planning, which gave added weight and credibility to the government's declaration of commitment to family planning. The national strategic plan outlined objectives and sub-objectives, along with concrete activities to achieve them at specified points in time (in other words, a roadmap for increasing contraceptive prevalence in the DRC). The Minister of Health participated in the process at regular intervals and presided over the high-profile launch of the strategic plan on February 13, 2014, where he gave a very impassioned public endorsement of it.

Informed Advocacy From International Experts

The presence of international experts with a keen interest in the DRC combined with years of experience in other African countries allowed them to effectively advocate increased support for family planning from different vantage points. Three family planning champions, in particular, contributed to the momentum in the DRC that dates back to 2012 (Box 2). These individuals ensured that family planning was on the public health agenda at a time when there was very little public discourse about family planning, made visible the economic benefits of lower fertility rates, and encouraged partners on the ground that improving access to and use of family planning in the country was in fact possible.

Increased Technical and Financial Support From Donors

Historically, USAID and UNFPA have been the primary donors for family planning in the DRC. Between 2002 and 2014, USAID's budget for family planning in the DRC increased steadily. The World Bank also funded family planning as part of integrated health programming through June 2014 through the *Project d'Appui à la Réhabilitation du Secteur de la Santé* (PARSS) (Health Sector Support Project); similarly, DFID has supported family planning through its rural health-strengthening project, *Projet d'Accès aux Soins de Santé Primaire* (Access to Primary Health Care Project).

Since 2012, new donors have entered the DRC. The Bill and Melinda Gates Foundation supported a project to build the evidence base for family planning in Kinshasa, starting in 2010, and then expanded its activities to include advocacy work (through the Advance Family Planning initiative of the Johns Hopkins Bloomberg School of Public Health, which supported work in preparation for the Addis

BOX 2. Champions Contributing to the Family Planning Momentum in the DRC

Many individuals, both local and international, have contributed to the family planning momentum in the DRC. Here, we highlight the contributions of 3 international family planning experts in particular.

Dr. Richard Dackam-Ngatchou served as UNFPA Representative for the DRC from 2010–2012. Within UNFPA, he gave heightened priority to family planning activity. Moreover, he lost no opportunity to advocate family planning in private meetings with government officials and in public fora with large audiences. At a time when there was too little public discourse on family planning, Dr. Dackam-Ngatchou ensured this topic remained part of the public health agenda.

Dr. Jean-Pierre Guengant, demographer and economist from the Université Paris 1 Panthéon-Sorbonne, has performed analyses involving population projections, socioeconomic consequences, and the demographic dividend in countries throughout francophone Africa (including for all 9 countries participating in the Ouagadougou Partnership).[14] Although he visited the DRC several times in the early 2000s, he returned in 2012 to continue this work in a more sustained manner, meeting periodically with different government officials and presenting his findings to selected audiences. In addition, he directly contributed to the costing section of the Strategic Plan. His research, published in 2014 under the title *Bénéficier du Dividende Démographique? Replacer la population au centre des trajectoires de développement de la République Démocratique du Congo*,[15] provided the evidence base for public dialogue on the demographic dividend. It was the lead theme at the December 2014 Third National Conference on Repositioning Family Planning in the DRC, which gave a highly visible platform to the linkage between lower fertility rates and economic progress.

Dr. Sahlu Haile, African Advisor for the David and Lucile Packard Foundation, had worked on family planning programming in Kinshasa in the 1980s. He returned in 2009 for an exploratory visit and again in June 2012 to speak at the meeting on Advocacy for the Financing of Family Planning in the DRC. During his presentation at the conference and in 3 subsequent visits to the country, he was able to draw parallels between the situation in Ethiopia (in the years before family planning had yet to take off) and the DRC (currently at a similar point in its history). His return visits to the DRC and relentless encouragement to implementing partners—despite the obvious challenges—allowed government officials and implementing partners to believe that increasing contraceptive prevalence at the national level was in fact an attainable objective.

declaration) and improved monitoring and evaluation of contraceptive uptake (through the projects PMA2020 [Performance Monitoring and Accountability 2020] and Track 20). In 2014, the Gates Foundation provided additional support for strengthening the contraceptive logistics system, introducing the subcutaneous injectable Sayana Press, and piloting a system to track contraceptive stock levels using cell phones.

Other new donors in the DRC include the Packard Foundation, which funded a major initiative to increase access to, quality of, and demand for family planning services in Kinshasa. In addition, Agence Française de Développement (AFD) (French Development Agency) began supporting the demographic analysis of the consequences of population growth, as well as collaborating with the PARSS project of the World Bank. In 2013, the Norwegian government allocated US$20 million to a population and environment project. Furthermore, while USAID funding has continued at a fixed level for population activities, the national family planning program has benefitted from additional funding from PEPFAR (the United States President's Emergency Plan for AIDS Relief). The identification of family planning as the second pillar of preventing mother-to-child transmission of HIV has resulted in the introduction of new family planning services in Kinshasa and elsewhere in the country.

Increased government support of family planning has encouraged increased donor support.

Signs of increased government support of family planning and the existence of a costed strategic plan provide donors with additional justification to invest in the national program, creating a virtual cycle. Several other organizations are currently exploring their entry into family planning activity in the DRC, and recently the European Union committed 150 million euros to health programs, which include those to address MDG 4 and 5, beginning in 2014.[16]

POSSIBLE THREATS TO DURABILITY OF THE MOMENTUM

Given how recently this change in the family planning policy environment has occurred (basically, since 2012), the question arises whether it will have staying power or whether it will be reversed as quickly as it came about.

The most positive argument for sustained government commitment is that key government authorities and divisions have been involved in developing, validating, and approving important documents that signal this engagement (e.g., the General Secretary for Health, the DEP, PNSR, PNSA, D10, and others). Moreover, the current alignment of vision between the government, local implementing partners, and external donors serves to reinforce this commitment. Certain groups within civil society (e.g., *Cadre Permanent de Concertation des Femmes Congolaises* [CAFCO], or the Permanent Consultative Framework of Congolese Women) currently play a key role in advocating laws in favor of reproductive health and sustaining government commitment to family planning (Box 1).

Potential threats to sustained government commitment are many, including turnover in government staffing and lack of a fixed line item for family planning in the MOH budget.

However, continued government commitment is by no means guaranteed; multiple threats exist. First, the periodic reshuffling of DRC government officials may lead to the departure of key personnel who have been instrumental in championing family planning in the DRC. Second, although the government allocated funds for the procurement of contraceptives and supplies in 2013, there is no fixed line item for this activity in the MOH budget, risking possible reduction or loss of this support if there are competing priorities. Third, the country is expected to enter the electoral period when the current presidential term ends in 2016. The election process could trigger political instability and uncertainty, which could cause external donors to reduce or suspend their aid to the DRC. Finally, in 2013 the country made large strides in consolidating peace in the east. However, the challenge ahead is demobilizing and reintegrating combatants from eastern Congo into mainstream society. If the country fails to secure peace, the fragile progress made in family planning (and many other sectors) may be jeopardized by another cycle of violence.

DISCUSSION

For long-time observers of the policy environment for family planning, the recent changes in the DRC are unprecedented and groundbreaking.

BOX 3. Key Ingredients to Family Planning Policy Change in the DRC

- Directives from the highest levels of government (i.e., Office of the Prime Minister) effectively increased involvement and concrete actions on the parts of several Ministries (e.g., Planning, Health, and Gender).
- Developing a cohesive group of family planning stakeholders—from government, implementing agencies, and donors—took time but proved to be an invaluable investment (e.g., CTMP, Kinshasa Family Planning Coalition).
- Concrete achievements—such as the DRC government's Statement of Commitment in Addis Ababa, the launch of the Strategic Plan for Family Planning, granting official status to the CTMP, and a growing body of family planning research—have contributed to the momentum and have increased morale for those working in family planning.

At the high levels of government, family planning is no longer a neglected area for intervention but rather an activity that has gained visibility and political support. Key to spurring this change was the expressed support from Office of the Prime Minister and the directives for the relevant Ministries to take explicit action to prioritize family planning (Box 3).

A national law addressing reproductive health and family planning in the country is currently making its way through a series of judicial and legislative reviews, providing further evidence of the momentum for family planning (Box 1). This favorable reproductive health and family planning law includes comprehensive measures such as the protection of legal ethics and quality of life; improvement of gender relations; accountability of public authorities, civil society, and local communities; fertility assistance; availability of contraceptives and quality services; and the decriminalization of reproductive health. Whereas some might consider the multiple steps outlined in Box 1 as evidence of stalling, others familiar with the situation believe the multiple steps are a good-faith effort to ensure that all possible considerations are reviewed before the proposition comes up for a vote in the National Assembly.

Although much has been achieved at the central level, this progress has yet to diffuse to the 10 other provinces of the DRC, which is a vast country equivalent to the size of the United States east of the Mississippi River or of Western Europe. The Provincial Ministers of Health and Provincial Medical Directors have participated in key events relating to the acceleration of the MDGs (including family planning) and the development of the Strategic Plan for Family Planning in the DRC: 2014–2020. However, much policy work remains to be accomplished in the provincial capitals, with the aim of translating policy to action (e.g., family planning service delivery and demand generation) at the local level. In fact, because of the prolonged conflict in the eastern Congo, there has been a proliferation of NGOs in Kivu Province that work in reproductive health, gender-based violence, and family planning. Although we have no data to demonstrate cause-and-effect, North Kivu had the third highest modern contraceptive prevalence rate (mCPR) in the DRC as of 2013.[5]

Similar changes in the family planning policy environment have begun to occur in other francophone African countries, which generally have made less progress in family planning than their anglophone counterparts.[17] For example, Senegal's policy environment for family planning has shifted to include more concrete and explicit support from leaders in recent years. In 2011, the government hosted the International Conference on Family Planning, and in 2012 it made a financial commitment to double the national budget for contraceptive procurement the following year. The national program has tested and/or adopted innovative programming supported by research, including use of the "informed push model" for contraceptive logistics management and a pilot program to introduce Sayana Press.[18] Although there are likely many contributing factors, modern contraceptive prevalence jumped from 12% to 16% between 2011 and 2013.[19]

Additionally, 8 francophone countries took part in a regional meeting in 2011 entitled "Population, Development, and Family Planning in West Africa: An Urgency for Action." Also known as the Ouagadougou Partnership, the multi-agency delegations developed action plans for strengthening family planning programs and policies in their countries. Subsequently, several of these countries have made additional progress in this realm.[20] For instance, in 2011, Burkina Faso committed a line item in its national budget for contraceptive procurement.

The policy environment is also improving in Côte d'Ivoire. Prior to 1991, the government actively discouraged family planning services. The IPPF member association, the Association Ivorienne Pour le Bien-Être Familial (AIBEF), was prohibited from publicizing its services, and provision of contraceptive methods to the public sector was restricted. Since then, the government position on family planning has improved, but use of contraception remains low. However, as of 2011, the government made more concrete commitments to improving contraceptive prevalence when President Alassane Ouattara issued a declaration on maternal health, including increasing family planning availability via health facilities from 60% in 2010 to 100% by 2015; expanding method access for women living with HIV and for youth; and increasing contraceptive commodities by including them in the recommended list of essential medicines to be subsidized and made more affordable.[21]

Much work remains to be done at the local level to translate national policy to programmatic action.

Niger, the fastest growing country in the world, was characteristic of the countries of francophone Africa that historically gave little priority to family planning. However, in 2013 political commitment changed dramatically with a quadrupling of its family planning budget for that year. Also, the government has taken several innovative actions, such as authorizing community health workers to provide Sayana Press, creating new mobile clinic services for isolated communities, and integrating family planning in the school health curriculum.[22]

Similar positive changes in the family planning policy environment have begun to occur in other francophone African countries.

Niger, the fastest growing country, quadrupled its family planning budget in 2013.

The larger question is whether change in the policy environment of a country will lead to effective programmatic action that translates into increased contraceptive use and decreased fertility rates. One marker of political support is an official population policy, but literature on its effect is mixed. Some of the most effective programs in the world have been led by countries with strong official population policies (e.g., China, Indonesia, and Mexico, to name a few).[23] In other countries, especially in Latin America, NGOs provided leadership in family planning in the early years when governments still feared political fall-out, especially from the Catholic Church, for endorsing family planning.[24] Conversely, not all countries that promulgated a strong population policy converted this into increased contraceptive use (e.g., Ghana, which in 1969 had one of the first population policies in sub-Saharan Africa but did not see much increase in its mCPR until 3 decades later).[25] In earlier

years, population policy often signaled that family planning programming was well underway rather than a driver of the process.[26] In the context of francophone sub-Saharan African countries, government commitment would seem to be a prerequisite to meaningful change in family planning programming and contraceptive use. However, verbal support for policies and programs is insufficient to trigger meaningful change; it must be accompanied by financial support and programmatic action.

Observers of the international family planning movement will follow the promising policy advances in the DRC with great interest. Given the significant cultural and financial barriers to family planning in the DRC, change—to the extent it occurs—will be gradual. The recent advances in the policy environment represent an unprecedented platform on which to work toward this change.

Acknowledgments: The preparation of this manuscript was supported by the Advance Family Planning (AFP) initiative at the Bill & Melinda Gates Institute for Population and Reproductive Health at the Johns Hopkins Bloomberg School of Public Health, which is funded by the Bill & Melinda Gates Foundation, the David & Lucille Packard Foundation, and The William and Flora Hewlett Foundation.

Competing Interests: None declared.

REFERENCES

1. United Nations (UN), Department of Economic and Social Affairs, Population Division. World population prospects: the 2012 revision. New York: UN; 2013. Available from: http://www.un.org/en/development/desa/population/publications/pdf/trends/WPP2012_Wallchart.pdf
2. Heale J, Yong JL. Democratic Republic of the Congo (cultures of the world). 2nd ed. Tarrytown (NY): Cavendish Square Publishing; 2009.
3. van Reybrouck D. Congo: the epic history of a people. New York: HarperCollins; 2014.
4. Malik K. The rise of the South: human progress in a diverse world. New York: United Nations Development Programme (UNDP); 2013. Available from: http://hdr.undp.org/sites/default/files/reports/14/hdr2013_en_complete.pdf
5. Ministère du Plan et Suivi de la Mise en œuvre de la Révolution de la Modernité (MPSMRM); Ministère de la Santé Publique (MSP); ICF International. Enquête démographique et de santé en République Démocratique du Congo 2013–2014. Rockville (MD): ICF International; 2014. Co-published by MPSMRM and MSP. Available from: http://dhsprogram.com/pubs/pdf/FR300/FR300.pdf
6. World Health Organization (WHO). Trends in maternal mortality 1990 to 2010: WHO, UNICEF, UNFPA and The World Bank estimates. Geneva: WHO; 2012. Available from: http://whqlibdoc.who.int/publications/2012/9789241503631_eng.pdf
7. Gouvernement de la RDC. Document stratégie de croissance et reduction de la pauvreté (DSCRP). Kinshasa: Gouvernement de la RDC; 2006. Available from: http://www.unicef.org/drcongo/french/DSCRP_RDC.pdf
8. Ministere de la Sante Publique [République Démocratique du Congo], Secretariat General. Plan national de développement sanitaire (PNDS): 2011–2015. Kinshasa: Ministere de la Sante Publique; 2010.
9. Familyplanning-drc.net [Internet]. New Orleans (LA): Tulane University School of Public Health; c2013–14. Meeting of advocacy for the financing of family planning in the DRC; 2013 Jun [cited 2014 Oct 16].
10. Ministère de la Santé Publique (MSP) de la RDC. Conférence nationale pour le repositionnement de la planification familiale en République Démocratique du Congo: rapport finale. Kinshasa: MSP; 2009. Available from: http://planificationfamiliale-rdc.net/docs/10_ConferenceNational_2009.pdf
11. United Nations Children's Fund (UNICEF). Committing to child survival: a promise renewed-progress report. New York: UNICEF; 2013. Available from: http://www.unicef.org/lac/Committing_to_Child_Survival_APR_9_Sept_2013.pdf
12. Bertrand JT, Kayembe P, Dikamba N, Mafuta E, Hernandez J, Hellen J, et al. Using mapping of service delivery sites to increase contraceptive availability in Kinshasa, Democratic Republic of the Congo. Int Perspect Sex Reprod Health. 2014;40(2):95–99. CrossRef. Medline
13. United Nations Population Fund (UNFPA)/AccessRH RH Interchange [Internet]. New York: UNFPA. 2000 - . DRC: Summary of shipments [cited 2014 Oct 16]; [about 2 p.]. Available from http://www.myaccessrh.org/rhi-home
14. May JF, Guengant JP. Les défis démographiques des pays sahéliens. Études (Paris). 2014;(6):19–30.
15. Guengant JP, Mangalu M, Agbada J, Mavula Banda N. Bénéficier du dividende démographique? Replacer la population au centre des trajectoires de développement de la République Démocratique du Congo (version préliminaire). Kinshasa: Agence Française de Développement; 2014.
16. La Commission Européene; Le Gouvernement de la RDC. Programme indicatif national.11ème fonds Européen de développement 2014–2020. Brussels: European Commission; 2014. Available from: http://eeas.europa.eu/development-cooperation/docs/national-indicative-programme_2014-2020/2014-2020_national-indicative-programme_rdc_congo_en.pdf
17. Cleland JG, Ndugwa RP, Zulu EM. Family planning in sub-Saharan Africa: progress or stagnation? Bull World Health Organ. 2011;89(2):137–143. CrossRef. Medline
18. République du Sénégal Ministere de la Santé et de l'Action Sociale, Direction de la Santé Division de la Santé de la Reproduction. Plan d'action national de planification familiale 2012–2015. Dakar: Ministere de la Sante et de l'Action Sociale; 2012. Available from: http://www.fhi360.org/sites/default/files/media/documents/senegal-plan-action-national-planification-familiale-2012-2015.pdf
19. Agence Nationale de la Statistique et de la Démographie (ANSD) [Sénégal]; ICF International. Enquête démographique et de santé continue (EDS-Continue 2012–2013). Calverton (MD): ICF International; 2013. Co-published by ANSD. Available from: http://dhsprogram.com/pubs/pdf/FR288/FR288.pdf
20. Le Partenariat de Ouagadougou (PO). Planification familiale [Internet]. Dakar: PO; c2014 [cited 2014 Oct 16]. Available from: http://partenariatouaga.org/
21. Family Planning 2020 (FP2020) [Internet]. Washington (DC): FP2020; c2014. Côte d'Ivoire commitment; 2014 [cited 2014

Oct 16]. Available from: http://www.familyplanning2020.org/entities/92/commitments

22. Family Planning 2020 (FP2020) [Internet]. Washington (DC): FP2020; c2014. Niger commitment; 2014 [cited 2014 Oct 16]; [about 2 screens]. Available from: http://www.familyplanning2020.org/entities/93/commitments
23. United Nations (UN), Department of Economic and Social Affairs, Population Division. World population policies. New York: UN; 2013. Available from: http://www.un.org/en/development/desa/population/publications/pdf/policy/WPP2013/wpp2013.pdf#zoom=100
24. Bertrand JT, Ward WM, Santiso R. Family planning in Latin America: the achievements of 50 years. Chapel Hill (NC): MEASURE Evaluation. Forthcoming 2014.
25. Rosen JE, Conly SR. Africa's population challenge: accelerating progress in reproductive health. Washington (DC): Population Action International; 1998.
26. Jain AK, Ross JA. Fertility differences among developing countries: are they still related to family planning program efforts and social settings? Int Perspect Sex Reprod Health. 2012; 38(1):15–22. CrossRef. Medline

Peer Reviewed

Received: 2014 Dec 20; **Accepted:** 2015 Mar 13; **First Published Online:** 2015 June 12

Cite this article as: Mukaba T, Binanga A, Fohl S, Bertrand JT. Family planning policy environment in the democratic republic of the congo: levers of positive change and prospects for sustainability. Glob Health Sci Pract. 2015;3(2):163-173. http://dx.doi.org/10.9745/GHSP-D-14-00244.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

COMMENTARY

How Can We Better Evaluate Complex Global Health Initiatives? Reflections From the January 2014 Institute of Medicine Workshop

Sangeeta Mookherji,[a] Kate Meck[b]

An IOM workshop on evaluation design drew on recent evaluations of 4 complex initiatives (PEPFAR; the Global Fund to Fight AIDS, TB and Malaria; the President's Malaria Initiative; and the Affordable Medicines Facility-malaria). Key components for good evaluations: (1) a robust theory of change to understand how and why programs should work; (2) use of multiple analytic methods; and (3) triangulation of evidence to validate and deepen understanding of results as well as synthesis of findings to identify lessons for scale-up or broader application.

The context for global health interventions and their evaluations has become more complex in the 21st century. Donor assistance for global health has increased dramatically in the last 15 years, and most of these resources are channeled through complex global health initiatives that target various health outcomes through a multitude of interventions, implemented by diverse partners in multiple countries and regions of the world. Rigorous evaluations are needed to assess the achievements of these initiatives and to justify and increase investments in them. Large-scale evaluations of complex global health initiatives are relatively new, and knowledge of how to improve such evaluations is needed.

Our recent experiences have repeatedly exposed the challenges in evaluating global health initiatives that involve any degree of complexity. Health initiatives are often implemented at national scale, and reasonable comparison groups cannot be identified. Even though many initiatives monitor progress toward outputs and outcomes using performance- or results-based strategies, these strategies rarely provide insight as to whether or how different implementing partners were able to achieve success; what problems were or were not addressed successfully; and how situational variability affected successes and challenges. Often, we simply don't gain the learning needed from evaluations about how a complex intervention worked or did not, and how implementation context affected intervention success.

We need to do better with designing and conducting more complex evaluations of complex global health initiatives and to do this in creative yet robust ways that allow us to understand both the complexity and the specificity of implementation context. This will require support and input from program implementers, evaluators, and commissioners of evaluations. In this article, we report on key messages from a workshop on "Evaluation Design for Complex Global Health Initiatives," convened by the Institute of Medicine (IOM) in January 2014, during which workshop participants discussed just how this might be done.

OVERVIEW OF IOM WORKSHOP

What information do we need to scale-up and sustain a success story? What can failure to achieve expected health effects teach us about how implementation conditions and the political landscape contributed to the observed results? What can evaluators do better when evaluating complexity in global health initiatives?

The IOM asked workshop participants to address these important questions. The goal of the workshop was to extend evaluation methodology by capturing lessons learned from recent large-scale, complex, multinational global health initiatives. The workshop derived lessons learned from the execution of evaluations and discussed how to apply lessons to future evaluations.[1]

[a] George Washington University, Department of Global Health, Washington, DC, USA.
[b] Institute of Medicine of the National Academies, Washington, DC, USA.
Correspondence to Sangeeta Mookherji (smookher@gwu.edu).

Four recent evaluations served as core examples for the workshop:

- The US President's Emergency Plan for AIDS Relief (PEPFAR)[2]
- The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund)[3]
- The US President's Malaria Initiative (PMI)[4]
- The Affordable Medicines Facility-malaria (AMFm)[5]

For the core examples, "large-scale" was defined as having total cumulative budgets, over multiple years, in at least the hundreds of millions of US dollars. "Multinational" meant implementation on a global scale, including multiple countries and regions or subregions of the world. "Complex" referred to several dimensions of the initiative: multiple activity components; varied settings for implementation of different sets of activities; systems-strengthening efforts; capacity building; efforts to influence policy changes; use of health diplomacy to achieve the aims of the initiative; and implementation at multiple levels through a large number of diverse, multisectoral partners at the country level.[1]

The IOM invited representatives from each of the 4 core evaluations to elucidate the decision making process and the options that were available to develop and implement a credible and rigorous evaluation that was also feasible, affordable, and maximally matched to the priority evaluation questions, aims, and audiences. In addition, representatives from other evaluations that met some, but not necessarily all, of the criteria above (Box), were asked to serve as panelists and to present their experiences and perspectives on the methodological challenges they addressed. Evaluation experts from other relevant disciplines, including education, climate and environment, and other non-health areas, along with commissioners of evaluations, held honest discussions over the course of 2 days regarding the challenges of and lessons learned from conducting evaluations of complex, large-scale, multinational global health initiatives.

The IOM workshop proceedings were published in June 2014.[1] We used the published proceedings as a data source and applied 34 codes using NVivo to distill the large amount of information in the proceedings text into key messages. (See the supplementary materials for details about the coding methodology and summary.) Although the proceedings are comprehensive, the publication organizes the workshop information chronologically. The free-form discussion sessions and information sharing, as well as the linkages among dedicated panel sessions, meant that, for example, relevant lessons on addressing context could be found throughout the 115-page text. We used the coding exercise to further organize the information in the proceedings document to make the important lessons and messages more accessible for practitioners of global health evaluations. Both authors were workshop participants, and one a panelist, so we also used our own participant observations to triangulate and synthesize the following lessons and recommendations from the workshop.

BOX. Global Health Initiatives and Evaluations Represented at IOM Workshop, January 2014

Four recent evaluations of large-scale, multinational, complex global health initiatives served as core examples for the workshop:

- Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund)
- US President's Malaria Initiative (PMI)
- Affordable Medicines Facility–malaria (AMFm)
- US President's Emergency Plan for AIDS Relief (PEPFAR)

Other evaluation experiences were presented that had addressed issues of complexity and scale:

- Global Environment Fund (GEF)
- Gavi (formerly, the Global Alliance for Vaccines and Immunisation)
- Integrated Management of Childhood Illness (IMCI)
- Accelerated Child Survival Development (ACSD) Program
- Africa Routine Immunization System Essentials (ARISE)
- Saving Mothers, Giving Life
- Avahan in India
- Expanded Quality Management Using Information Power (EQUIP)

Evaluations of complex global health initiatives need to provide information on both the complexity and specificity of implementation context.

KEY MESSAGES ABOUT EVALUATING COMPLEX GLOBAL HEALTH INITIATIVES FROM THE IOM WORKSHOP

Three areas of focus to improve future evaluation of complex global health initiatives were identified at the IOM workshop: (1) the importance of theory of change for grounding complex evaluations; (2) the need to use multiple methods to address complexity; and (3) the need to focus more on triangulation and synthesis of findings.

Theory of Change Grounds Complex Evaluations

A theory of change depicts the series of expected causal steps leading from program activities to outcomes and impacts.

Theories of change help evaluators address the critical role of context.

Workshop participants confirmed the critical role of theory of change (ToC) that depicts the series of expected causal steps between activities and impacts for optimizing complex evaluations. Participants used various terms—logic models, results chain, causal chain pathway, program impact pathway, program theory, and program impact theory—but whatever the name, workshop participants confirmed that a ToC is most useful when it identifies the links in program planning, implementation, and delivery and especially the central assumptions, implementation conditions, and contextual factors that are likely to influence a complex initiative. The panel discussions confirmed the crucial need for developing a ToC for all program purposes: design, implementation, and continuous performance improvement, as well as for evaluation.

A critical early step in the PEPFAR evaluation was developing a ToC (program impact pathway) that incorporated the various inputs into the PEPFAR initiative, including the considerable financial and technical assistance resources and the strategies, guidance, and planning activities that support implementation of the initiative.[2] This ToC was then simplified to cover the diversity of programs and used to communicate to a variety of audiences about the evaluation. The ToC helped the evaluation committee explore the feasibility of the various designs and methods that might be used in the evaluation, and then it was used during analysis to help the committee understand the impacts of PEPFAR in terms of proximal, intermediate, and distal effects.[1]

The AMFm evaluation team developed a ToC to depict the causal pathways through which AMFm interventions were intended to work. This ToC was used to target the collection of quantitative and qualitative data that would be used to prepare case studies for each country, thereby providing a standard framework for evaluation across countries for data collection and later for analysis. The evaluation team collected qualitative data through interviews with key stakeholders from the public and private sector and a review of key documents to understand the AMFm implementation processes and contextual factors identified by the ToC within each country. The evaluation team used quantitative data from the outlet surveys on process-related outcomes, such as coverage of training and exposure to communications messages. These were analyzed separately for each country case study and then synthesized into findings across countries.

ToCs helped evaluators address the critical role of context. The Global Fund explained that it takes an open approach to causation that considers alternative hypotheses involving context, often starting with impact and outcomes and working back along the causal chain pathway to identify other change factors that could be dependent on context.[1] In the PEPFAR evaluation, the issue of context surfaced early during design of the evaluation, as the committee understood that the program impact pathway for PEPFAR operations was embedded in the context of many other factors in each country; the evaluation team then examined a variety of indicators across countries to give a contextual background to PEPFAR's operating environment. Contextual issues in countries visited were explored through the significant qualitative data collection component of the PEPFAR evaluation.[1] One of the lessons from the AMFm evaluation was the importance of documenting the process of implementation using a ToC model when large-scale, complex interventions are being implemented in a messy, real-world setting.[1] In fact, the AMFm evaluation found that context probably made the most crucial difference between countries in terms of performance.

Workshop participants continually emphasized the need to pay more attention to context and challenged each other to "really unpack what the notion of context means," including recognizing that contextual issues arise at micro-, meso-, and macro- levels and that they can evolve over time. The participants called for better differentiation between contextual "constants," which cannot be influenced; contextual factors that can be influenced; and contextual factors that directly support the observed changes. If evaluators parse context in this way, it may become clear that controlling for contextual

complexity through study design may not be desirable in many evaluation situations, because this could strip out the very things that are important mechanisms for change.[1] Including contextual factors and categorizing them this way in a comprehensive ToC is the crucial step that allows comprehension of how and why a program worked the way it did, and whether it would work that way somewhere else or at larger scale.

Using Multiple Methods Helps Address Complexity

Workshop participants affirmed that for complex global health initiatives, evaluations need to use a methodological approach that includes multiple data collection and analysis methods, often through nested study designs that combine qualitative and quantitative approaches to data collection and analysis, to address a variety of evaluation questions. "Multiple" and "mixed" methods described how the 4 large-scale evaluation examples used a number of complementary methods to arrive at evaluation findings and conclusions. Most panelists agreed that 2 sources of data are often not enough to have confidence in the results from a complex evaluation—hence, panelists mostly referred to "multiple" methods, and not just mixed methods.[1]

The critical question faced by each of the 4 core examples was how to ensure that these multiple methods were mixed, and not mixed up or parallel. These issues had to be addressed during both the design and the analysis stages, to ensure that any qualitative and quantitative data collection conducted in parallel were linked during analysis and that data from different sources were collected in a way to allow triangulation later on.

The end result of the PEPFAR design phase was a "hybrid" evaluation that included retrospective and cross-sectional elements, as well as time series and time trend data and nested in-depth approaches on different topical areas. The approach used multiple sources of qualitative and quantitative data to balance the limitations of each other.[1] One of the primary challenges was that few data sources were available consistently across the entire PEPFAR program. The PEPFAR evaluation team instead focused on using the best methods for each type of data and matched the appropriate analytical methods to different types of data.

The AMFm team learned the importance of standardizing data collection and analysis methods to assure quality. The team also recognized the challenges of mounting a large primary data collection exercise that is constrained on the one hand by epidemiology and logistics and on the other hand by dependency on countries for data that may not be forthcoming within the required timeline. Finally, relying on secondary analysis for key outcomes was a limitation but one that could not be overcome because of budgetary and time restrictions.

The PMI evaluation started with a qualitative management review exercise in which the primary sources of data were key stakeholder interviews with PMI leadership, as well as global, regional, and in-country stakeholders who benefit from the initiative. While this was a relatively straightforward activity, the evaluation team soon recognized that it needed to explore other data to understand what the program was actually doing. This included both quantitative data about key interventions and qualitative data about strengthening health systems and capacity building within national malaria control programs; for the latter, it was useful to look at program data from other donors supporting malaria control, such as the Global Fund, as yet another source of data. The Global Fund data, for example, might show the total number of drugs and nets purchased and delivered to a country, but to understand distribution and consumption, the PMI evaluation team had to look to other sources. It was more difficult to understand whether PMI was strengthening health systems or national malaria control efforts. The evaluation team considered the methodological trade-offs when deciding on the right mix of qualitative and quantitative methods and use of routine program monitoring data, and the need to balance these trade-offs to generate results that were useful and informative.

Recent evaluations of 4 complex global health initiatives used multiple, complementary research methods.

To implement multiple methods well and produce useful evaluations of complex interventions, multidisciplinary teams of evaluators are needed. Evaluators and commissioners of evaluations noted it is difficult to assemble teams comprising individuals with the wide range of skills required for evaluating complex programs. Working with a multidisciplinary team of investigators to do good multidisciplinary science also is a major challenge. The approach taken by the PMI evaluation team was to match the team member with the dominant relevant expertise for each key issue with someone who had a completely different set of expertise—someone with a different perspective. The result was a richer understanding of the analysis. Investing in multidisciplinary collaboration and capacity building for complex evaluation, especially among local partners, often required more time

Multidisciplinary teams of evaluators are needed to implement the multiple research methods needed for large-scale evaluations.

and focus than the evaluation study time frame and budget allowed; rectifying this imbalance will require evaluation commissioners to develop more realistic budgets and timelines, preferably done in partnership with evaluators.

Triangulation and Synthesis Validates and Builds Confidence in Evaluation Findings

Using multiple methods to address complexity demands triangulation. There is no other way to consolidate multiple sources of qualitative and quantitative information, collected and analyzed using different methods, and to arrive at useable evaluation findings and conclusions. In the evaluation process, when data are unreliable, scarce, or inconsistent across implementation settings, methodological triangulation is necessary to accurately interpret data from different sources and methods. Workshop participants distinguished between *triangulation*, which is the analytical process to validate results from different sources of data or address discordance in findings related to different sub-questions of an evaluation, and *synthesis*, which is the analytical process that pulls together findings across different units of analysis to identify context-neutral findings that can be used in other settings or for scale-up.

Triangulation validates results from different sources of data while synthesis brings together findings from different units of analysis.

All 4 of the large-scale evaluations used purposive, case-based selection of study units, either exclusively or as part of their multiple methods approach. Findings from these nested studies did not use statistical methods but had to be integrated with findings from other nested studies that did, in a robust way to support generalizability of the overall findings. This could only be done through a systematic triangulation process and synthesis of context-specific and context-neutral findings.

In the core workshop examples, triangulation was done to validate the results and deepen and broaden the understanding and insights gained from the evaluation findings. All the triangulation and synthesis approaches described in the core examples were grounded in the evaluation's purpose and ToC. The PEPFAR evaluation team conceptualized data triangulation happening at the levels of analyses and interpretation, instead of data collection, since data across the entire PEPFAR program were scarce. They were careful to document what analytical methods were used for what data, to ensure that the analysis of data from the multiple methodological sources was as transparent, purposeful, and rigorous as possible. The PEPFAR evaluation team noted that the quality and rigor of the causal contribution analysis were improved by using triangulation for the different types of data and different analyses. When combined with the ToC, this provided a solid basis to help determine not just whether PEPFAR was affecting health outcomes but also how and why.

A theory of change supports robust triangulation and synthesis processes.

The AMFm team distinguished that triangulating data from multiple sources deepened the evaluators' understanding of within-country results, while synthesizing the findings across countries contributed to an understanding of how an AMFm intervention could work in other countries in the future, by identifying the key factors that contributed to strong performance and those that were associated with weaker performance.

Evaluations from the Global Environment Fund (GEF) examined progress from outcomes to impact, usually in the face of sparse data, in particular country program objectives and indicators and national statistics on environmental indicators and data series over the 20 or so years of a typical evaluation time frame. To overcome this data scarcity, GEF uses a standard set of data-gathering methods and tools that include desk and literature reviews, portfolio analyses, and in-depth interviews, in addition to GEF-specific methods, such as analyses of a country's environmental legal framework. All these methods are deployed within the context of an evaluation matrix that the GEF develops for each evaluation, which then feeds into a triangulation matrix.[1] In the triangulation process, the evaluation team brainstorms question-by-question to populate the matrix and discuss which findings are credible and which need further analysis. After the brainstorming meeting, the team tries to confirm or challenge the key preliminary evaluation findings and identify what else can be done to fill in the missing information, using the GEF's theory-based approach to examine progress from outcomes to impact.

Presenters of the 4 core examples emphasized the importance of the ToC in supporting robust triangulation and synthesis processes. For example, in reaching the conclusion that context was most likely the most important contributing factor to performance differences across countries, the AMFm evaluation relied on the ToC to help them parse the findings. The PEPFAR evaluation was able to determine not only whether PEPFAR was affecting health outcomes but also how and why, through a process of triangulation of multiple sources of data and multiple analyses, in combination with the ToC.[1] The PEPFAR ToC was the key to high-quality, rigorous causal chain analysis that provided

a solid evidence base for the evaluation's conclusions and recommendations.

Workshop participants expressed that evaluators need better guidance on triangulation and synthesis and that implementers and commissioners need to understand what is involved with these analytical processes, because they take time, yet are crucial for producing the evaluation results that are expected. Systematic triangulation and synthesis across study units is important for increasing confidence in the reliability, credibility, and applicability of evaluation findings, especially when case-based, non-probability–based evaluation designs are used. However, participants agreed that evaluators should continually assess the purpose of the triangulation or synthesis exercise: Is it enriching survey data with qualitative findings? Assessing hypotheses emerging from analysis of one data source with results from another? Explaining unexpected results using another source of data? Verifying or rejecting conclusions based on the concordance or discordance of results from different sources of data? Each requires a different process of triangulation and synthesis, and each requires sufficient time and input from the multidisciplinary team that must be adequately budgeted and planned by evaluators and evaluation commissioners.

WHY ARE THE KEY MESSAGES FROM THE IOM WORKSHOP IMPORTANT?

Each of the 3 areas identified at the IOM workshop presents an important opportunity for evaluators, commissioners, and implementers to do better with evaluating large-scale and complex global health initiatives. Addressing the 3 critical areas identified here will become increasingly important in the future: our evaluation questions, the settings in which we implement, and the initiatives themselves, are becoming more complex and interlinked. Evaluators, program implementers, and commissioners of evaluations must address the issues identified through the IOM workshop, and soon. We need evaluations of large-scale global health initiatives that speak to both their complexity and the specificity of implementation context in order for the findings to be useful. We need to improve how we commission, conduct, consume, and convert evaluation findings from complex global health initiatives to improvements in implementation and impact. Without sufficient and immediate attention to these 3 areas from all parties, we risk continued low returns on our evaluation investments and minimal progress in building the evidence base for improved global health.

Systematic triangulation and synthesis is important for increasing confidence in the reliability, credibility, and applicability of evaluation findings.

Acknowledgments: The workshop was sponsored by the Doris Duke Charitable Foundation, the Bill and Melinda Gates Foundation, the William and Flora Hewlett Foundation, and the Wellcome Trust. The Wellcome Trust hosted the workshop. Individual presentations and videos from the IOM workshop can be found on the IOM website at: http://iom.edu/Activities/Global/EvaluationMethodsGlobalHealth/2014-JAN-07.aspx. The authors would like to thank the IOM for conducting the workshop, and Bridget Kelly of the IOM for her input and guidance on this commentary. The authors did not receive financial support from IOM or any other sources to produce this commentary.

Competing Interests: None declared.

REFERENCES

1. Institute of Medicine of the National Academies. Evaluation design for complex global initiatives: workshop summary. Washington (DC): National Academies Press; 2014. Available from: http://www.nap.edu/catalog.php?record_id=18739
2. Institute of Medicine. Evaluation of PEPFAR. Washington (DC): National Academies Press; 2013. Available from: http://books.nap.edu/openbook.php?record_id=18256
3. Sherry J, Mookherji S, Ryan L. The five-year evaluation of the Global Fund to Fight AIDS, Tuberculosis and Malaria: synthesis of study areas 1, 2 and 3. [Fairfax (VA)]: Macro International; 2009. Available from: http://www.theglobalfund.org/documents/terg/TERG_FiveYearEvaluationSynthesisOfSAs_Report_en/
4. Simon J, Yeboah-Antwi K, Schapira A, Cham MK, Barber-Madden R, Brooks MI. External evaluation of the Presidents Malaria Initiative: final report. Washington (DC): Global Health Technical Assistance Project; 2011. Available from: http://www.pmi.gov/docs/default-source/default-document-library/pmi-reports/audit_execsum.pdf?sfvrsn=9
5. Tougher S; ACTwatch Group, Ye Y, Amuasi JH, Kourgueni IA, Thomson T, et al. Effect of the Affordable Medicines Facility—malaria (AMFm) on the availability, price, and market share of quality-assured artemisinin-based combination therapies in seven countries: a before-and-after analysis of outlet survey data. Lancet. 2012;380(9857): 1916–1926. CrossRef. Medline

Peer Reviewed

Received: 2014 Oct 23; **Accepted:** 2015 Apr 14; **First Published Online:** 2015 May 20

Cite this article as: Mookherji S, Meck K. How can we better evaluate complex global health initiatives? reflections from the january 2014 institute of medicine workshop. Glob Health Sci Pract. 2015;3(2):174-179. http://dx.doi.org/10.9745/GHSP-D-14-00184.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

ORIGINAL ARTICLE

Establishing and Scaling-Up Clinical Social Franchise Networks: Lessons Learned From Marie Stopes International and Population Services International

Sarah Thurston,[a] Nirali M Chakraborty,[b] Brendan Hayes,[c] Anna Mackay,[c] Pierre Moon[b]

Family planning social franchising has succeeded in countries with an active private sector serving low- and middle-income clients, with services provided mostly by mid-level providers, such as nurses and midwives. Key support for social franchising includes: clinical training and supportive supervision, help building sustainable businesses, marketing and demand creation, and mechanisms to make services affordable for clients. The forward agenda includes selectively introducing other priority health services, improving cost-effectiveness of the model, and promoting sustainability and health systems integration.

ABSTRACT

In many low- and middle-income countries, a majority of people seek health care from the private sector. However, fragmentation, poor economies of scale, inadequate financing, political opposition, a bias toward curative services, and weak regulatory and quality control systems pose serious challenges for the private sector. Social franchising addresses a number of these challenges by organizing small, independent health care businesses into quality-assured networks. Global franchisors Marie Stopes International (MSI) and Population Services International (PSI) have rapidly scaled their family planning social franchising programs in recent years, jointly delivering over 10.8 million couple-years of protection (CYPs) in 2014—up 26% from 8.6 million CYPs just 1 year prior. Drawing on experience across MSI's 17 and PSI's 25 social franchise networks across Africa, Asia, and Latin America and the Caribbean, this article documents the organizations' operational approaches, challenges faced, and solutions implemented. The organizations provide intensive capacity building and support for private-sector providers, including clinical training, branding, monitoring quality of franchised services, and commodity support. In addition, franchising programs engage providers and clients through behavior change communication (BCC) and demand generation activities to raise awareness and to attract clients, and they implement initiatives to ensure services are affordable for the lowest-income clients. Social franchise programs offer the private sector a collective platform to better engage government in health policy advocacy and for integrating into new public health care financing and procurement mechanisms. The future of social franchising will require developing approaches to scale-up and sustain the model cost-effectively, selectively integrating other health services into the franchise package, and being responsive to evolving health care financing approaches with the potential to contribute to universal health coverage.

INTRODUCTION

In many low- and middle-income countries, a majority of men and women seek health care from the private sector, be it a clinic, a pharmacy, or a roadside kiosk. As an example of this trend, analysis of data from the Demographic and Health Surveys since 2000 indicates that 51% of the population in sub-Saharan Africa, 66% in Southeast Asia, and 79% in South Asia sought health care in the private sector in response to children's illness,[1] without meaningful differences between the rich and poor.

Patients often prefer the private sector over public hospitals or clinics for their perceived availability, including shorter waiting times and better customer service orientation.[2] Two systematic reviews have determined that these perceptions are well founded.[3,4] A number of assessments of the effectiveness of private-sector strategies on health outcomes have been conducted,[5-7] although results have been largely mixed or inconclusive.[3,4,8]

[a] Independent Consultant, Marie Stopes International, New York, NY, USA.
[b] Population Services International, Washington, DC, USA.
[c] Marie Stopes International, New York, NY, USA.
Correspondence to Sarah Thurston (sarah.thurston@mariestopes.org).

In most contexts, the private sector is highly fragmented and lacks economies of scale, adequate financing, and quality control and assurance systems. Among the strategies used to engage the private sector, social franchising has been shown to improve quality, client satisfaction, and access to services,[9-12] especially preventive services that may be underprovided due to lower profit potential.

Social franchising aims to address challenges of oversight, quality, and scale in the private sector by organizing small, independent health care businesses into quality-assured networks. Social franchising is among the only models to leverage existing private-sector infrastructure to expand access to and improve quality of services. The model applies the principles of commercial franchising to achieve social goals. Under the social franchising model, the *franchisor* is the entity that organizes private clinics into quality-assured networks while providing a comprehensive support package, ranging from training, quality monitoring, and commodities to branding, marketing, behavior change communication (BCC), and demand generation support. Clinic members, called *franchisees*, retain ownership and management of their facilities but maintain compliance with franchise quality standards and monitoring.

The franchising model explicitly addresses failures in providing high-quality, high-priority, accessible health services,[13] and it speeds the dissemination of new health technologies in the private sector. However, to deliver its promise of health impact, social franchising must be brought to scale. Scaling the franchise model poses a number of operational challenges that Marie Stopes International (MSI) and Population Services International (PSI), two of the largest global franchisor entities, have been working through in recent years.

This article describes MSI and PSI's franchising approaches, from launch through scale-up. It begins with background on MSI and PSI clinical social franchising programs before setting out key contextual factors in policy environments and health markets that support franchising success. The paper goes on to examine social franchising from the supply side (that is, MSI and PSI inputs for building the capacity of franchisee clinics) followed by an exploration of the support given to the demand side (for example, client engagement, BCC, and strategies for equitable access). The article closes with a discussion of the opportunities for integrating social franchising into health systems and of the future of social franchising, specifically examining how MSI and PSI work toward the long-term goals of franchise sustainability and contributing to achieving universal health coverage.

MSI AND PSI SOCIAL FRANCHISING PROGRAMS

As international global health organizations, MSI and PSI approach franchising with the same core objective: to strengthen the private sector's role in meeting health care needs in countries where poor health and inequities in health outcomes persist. Influenced by their respective histories and the evolution of their franchising models, the MSI and PSI approaches to social franchising share many characteristics but differ on a number as well.

Social franchising organizes small, independent health care businesses into quality-assured networks.

Both organizations operate a *fractional* franchise model, whereby the organizations franchise a specific package of services while franchisee clinics continue to offer other services without MSI or PSI involvement. This is in contrast to well-known, full-format commercial franchising models, such as McDonald's, in which the franchisor has extensive control over all aspects of the franchisee's business. The fractional approach allows for rapid scale-up of services because it builds on the franchisee's existing basic health care and business infrastructure and takes advantage of the clinic's existing client base to expand access to services. It also provides a solid foundation for introducing preventive and other high-impact but underprovided services (Box 1).

MSI began franchising in 2001 in Latin America after decades of experience operating an extended network of wholly owned clinics, which in 2014 comprised more than 620 facilities in 37 countries. Social franchising provided a mechanism to accelerate access to family planning and other sexual and reproductive health (SRH) services by working with existing private providers in contexts where it was either not feasible or not cost-effective to open new MSI clinics. MSI currently operates social franchise networks in 17 countries in Africa and Asia (Figure 1).

MSI's franchising focus on family planning has most often involved adding missing health technologies and services, especially voluntary long-acting reversible contraceptives (LARCs), to franchisee clinics' existing service platform, alongside strengthening counseling and short-acting method provision, in order to expand contraceptive choice. As detailed in the companion paper in *Global Health: Science and Practice*, 70%

BOX 1. What Is the Difference Between Social Marketing and Clinical Social Franchising?

Both MSI and PSI deliver social marketing and clinical social franchising programs; the focus of this paper is on clinical social franchising.

Social marketing programs make health products, including contraceptives, accessible and affordable through private-sector outlets, such as pharmacies and shops, while using commercial marketing techniques to achieve specific behavioral goals.[14]

Clinical social franchising focuses on building the capacity of existing private-sector health facilities (typically clinics and, in some cases, hospitals) and their staff providers to deliver important yet often underprovided health care services, such as contraceptive methods that require a clinical procedure (i.e., implants, intrauterine devices, or permanent methods).

While social marketing and clinical social franchising share a number of functional requirements, such as provider and client behavior change communication, clinical social franchising requires more-involved clinical training and monitoring, from provider recruitment and skills transfer to quality assurance.

MSI and PSI together delivered over 10.8 million couple-years of protection in 2014.

of the 1.24 million family planning clients served through MSI's franchisees in 2014 chose a voluntary LARC or permanent method.[15]

PSI's work in social franchising began more than 20 years ago in Pakistan, emerging from its focus on product social marketing to strengthen the existing private sector. PSI identified the need to complement health products with access to clinical services, and social franchising provided a strategic expansion opportunity to better serve clients with both products and the services. Currently, PSI social franchise networks operate in 25 countries across Africa, Asia, and Latin America and the Caribbean (Figure 1).

PSI approaches franchising with a broader range of services beyond family planning. In some cases, PSI has introduced new products, for example, malaria rapid diagnostic tests, but most often the approach focuses on changing provider behaviors and practices to improve the quality of existing services. While most PSI franchise networks began with contraceptive services, PSI's networks in southern Africa initiated franchising with HIV services and in Somaliland with child health services. PSI's franchise networks expand their service offerings into new health areas—for example, child health or tuberculosis—as franchisee capacity develops and financing opportunities and donor interests align.

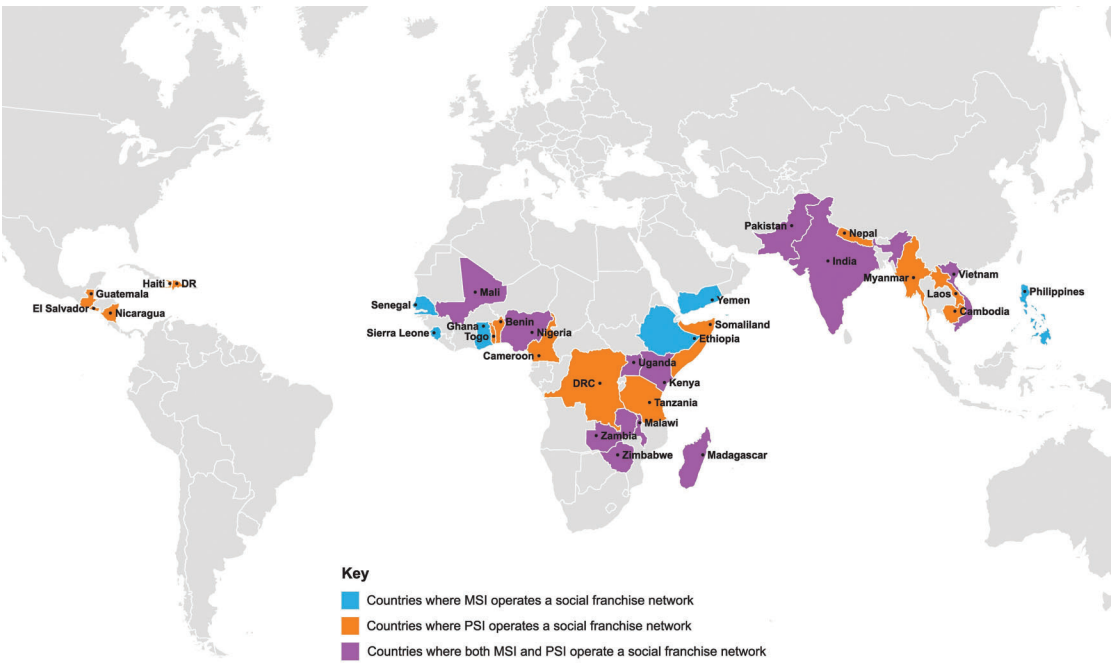
© Vanessa Vick/PSI

A midwife in Uganda, operating under the PSI ProFam social franchising brand, examines a young child. Most PSI franchise networks began with family planning services, but some have expanded their offerings into new health areas, such as child health.

Growth in Franchise Networks

Between 2008 and 2014, MSI and PSI's social franchising footprints grew exponentially. In 2013, the organizations' combined social franchising programs delivered 8.6 million couple-years of protection (CYPs) (Figure 2). In just 1 year, the CYPs they delivered rose by 26%, to over 10.8 million, based on preliminary 2014 data from MSI and PSI internal records. (CYPs provide a measure of the amount of time a couple will be protected against unintended pregnancy per unit of

FIGURE 1. Global Footprint of MSI and PSI Social Franchise Programs in 2013



Abbreviations: DR, Dominican Republic; DRC, Democratic Republic of the Congo; MSI, Marie Stopes International; PSI, Population Services International.

the particular contraceptive method used. One CYP is the equivalent of 1 year of protection from unintended pregnancy for 1 couple.)

The overall health impact of the family planning services provided by MSI and PSI social franchise networks can be measured in terms of the disability-adjusted life years (DALYs) averted. DALYs are calculated as the sum of years of life lost due to premature mortality in the population and the years lost due to disability for people living with a health condition or its consequences. One DALY can be thought of as 1 lost year of "healthy" life, and the sum of DALYs across a population can be thought of as a measurement of the gap between current health status and an ideal health situation whereby the entire population lives to an advanced age, free of disease and disability.[17] In 2013, PSI's social franchising family planning services averted more than 2 million DALYs in Africa, and MSI averted about 1.6 million DALYs in the continent (Figure 3). Similarly in Asia, PSI averted about 2 million DALYs while MSI averted nearly 0.5 million DALYs.

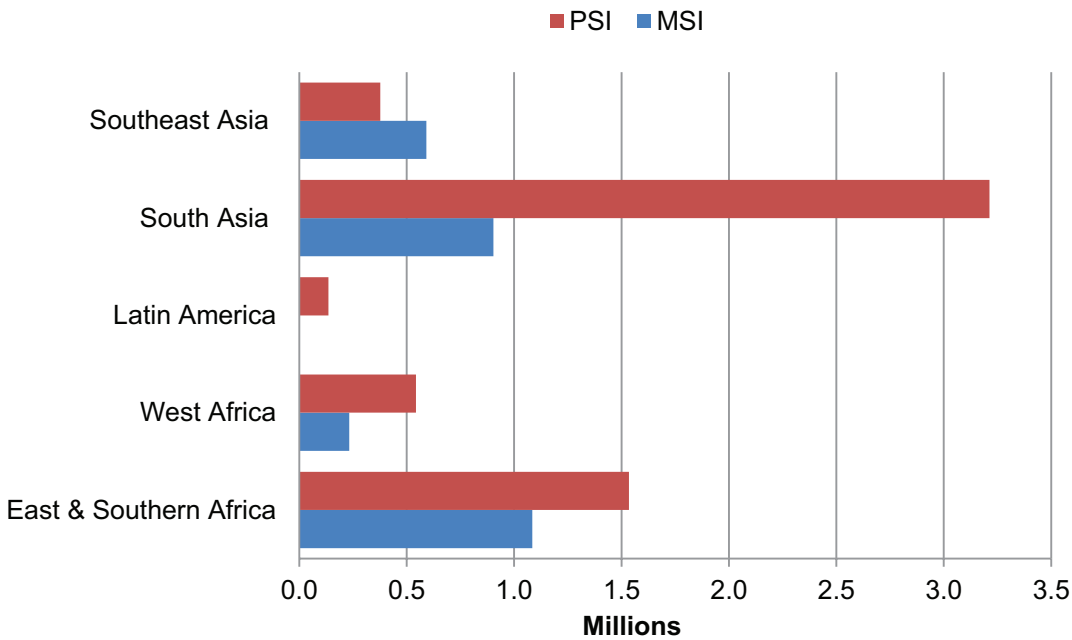
FEASIBILITY AND POSITIONING OF FRANCHISE NETWORKS IN NEW MARKETS

MSI and PSI make the decision to launch social franchising in a new country context after a thorough assessment of the health market and policy environment. Each organization conducts feasibility assessments to determine whether the context is conducive to franchising and how a new franchise might be best positioned in the health market. Through experience, MSI and PSI have honed their approach to identifying and evaluating the contextual factors that matter most (Box 2).

Determining Feasibility

In addition to assessing whether a particular context is conducive to franchising, feasibility

FIGURE 2. Couple-Years of Protection (CYPs) Delivered Through MSI and PSI Social Franchise Clinics in 2013



Abbreviations: MSI, Marie Stopes International; PSI, Population Services International.

Data are from Viswanathan et al.[16]

assessments also offer a platform for engaging with stakeholders in government and civil society. Social franchising may be new to in-country audiences, especially in cases where previous public-private partnerships focused on tertiary care rather than small and medium enterprise.

MSI and PSI work through the existing private sector in areas where private providers already serve low-income clients.

Because fractional franchising works through the existing private sector, a base level of activity in the private sector must be present, and these providers must be actively serving catchment areas where low- and middle-income clients live or work. Franchising has flourished in countries where lower-income clients *already* seek care in the private sector, such as in India, Kenya, Pakistan, and Uganda. Conversely, the model has not flourished as well in places without a strong private sector or where the private sector serves mainly wealthier clients, for example, in Angola, Rwanda, and Sierra Leone.

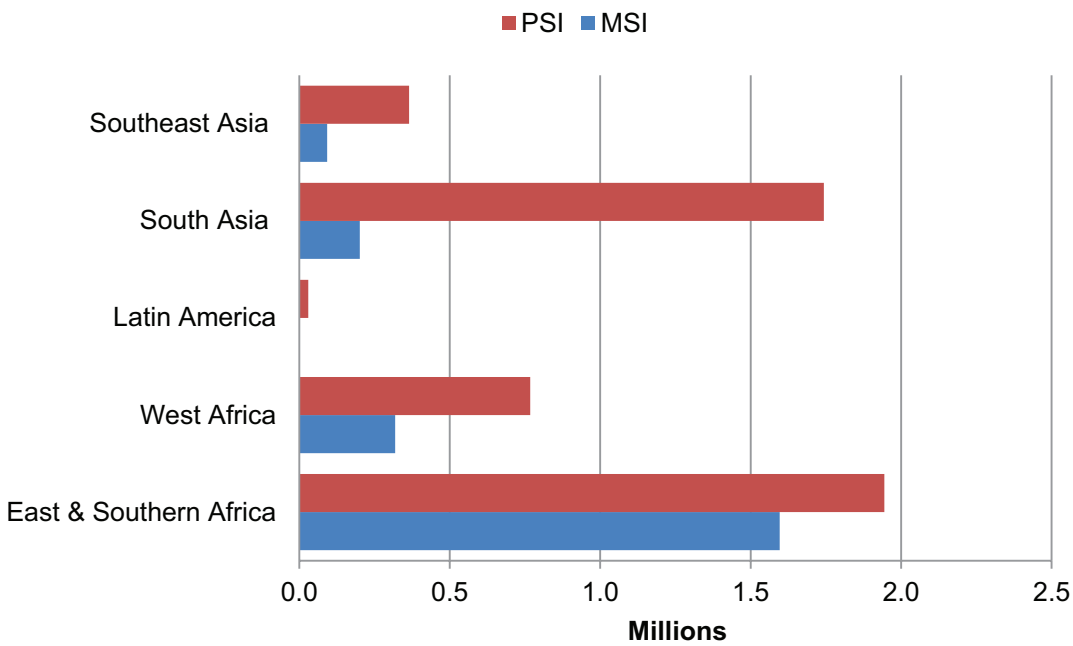
Experience shows, however, that few contexts are perfect for franchising; barriers exist in any health market. Franchising success depends on early identification of barriers so that strategies to overcome them can be developed and implemented.

Positioning a New Franchise Brand

MSI and PSI use commercial brand positioning principles to introduce new franchise brands. Brand positioning refers to the space that a brand occupies in the minds of clients in relation to alternatives. MSI and PSI work to define and communicate what is special about their franchise. What positive attributes does the brand signal to clients? How will it deliver its promise of quality, choice, and affordability?

MSI and PSI communicate these brand attributes through targeted marketing of their social franchise networks to a wide potential client base. A range of traditional marketing approaches may be used—for example, signs and billboards or radio advertisements—but the specific approaches used depend largely on what

FIGURE 3. Disability-Adjusted Life Years (DALYs) Averted Through MSI and PSI Social Franchise Clinics in 2013



Abbreviations: MSI, Marie Stopes International; PSI, Population Services International.

types of marketing and advertising are permitted for health services in a given country.

MSI has adopted a strategy of uniform brand identity through the *BlueStar* brand and uses this name, logo, and brand across country platforms with only a few exceptions. To better customize the brand to the local context, an appropriate tag line such as *health care network* (in the local language) is also used.

BOX 2. Where Can Social Franchises Succeed? The Factors That Matter the Most

MSI and PSI's experience has shown that the ideal scenario for establishing a social franchise occurs in health markets where:

- The private medical sector, especially the outpatient sector, has adequate institutional capacity
- Poor and underserved client groups currently seek care from private providers
- The public sector is overburdened and/or unable to meet unmet need for family planning
- The government is interested in and supportive of developing, regulating, or contracting the private sector
- Clients or third-party payers are willing to buy health services offered in small private-sector outlets
- Clients or third-party payers are able to pay for services, either through out-of-pocket payments, health insurance, or other demand-side financing schemes
- Adequate resources are available for franchise set-up and ongoing management
- The policy environment is favorable to task sharing whereby mid-level providers can offer the franchised package of services

Social franchising in PSI originally grew out of the needs of each country, and so PSI enabled the brands, products, and services of each social franchise to evolve according to the marketing and health needs of each country. More recently, PSI has begun promoting a regional brand strategy, where possible, to enable coordination and economies of scale. The *Tunza* and *ProFam* brands are common in East and West Africa, respectively, the *Sun Quality Health* network operates in Asia, and *Red Segura* serves Latin America. The approach still allows for local customization—for example, branding in Swahili in East Africa and in Spanish in Latin America—but equally keeps costs down by allowing new franchises to leverage existing brand strategy, marketing materials, and other inputs.

Shared Risk to the Brand

Brand is an important part of the value that social franchising adds to participating clinics. Positive brand association can increase client volumes and improve clinic profitability.[15] It may also raise the prestige of franchise providers among their colleagues and in their communities, although more research is needed to test and quantify this effect.

BOX 3. Who Makes for Good Franchisee Candidates?

As an absolute minimum standard, MSI and PSI require all prospective franchisees to be licensed to practice and the clinic to be registered with the national regulatory authority.

Beyond this requirement, recruitment strategies for MSI and PSI differ but may favor providers who:

- Are employed full-time in their private practice, rather than part-time while also being employed in the public sector
- Demonstrate interest in SRH services, for example, by previously offering some SRH services (or other target areas) but not necessarily the full range
- Are supportive of SRH services, for example, supportive of family planning
- Are located in a low-income area and are willing and motivated to serve the poor
- Are not located too close to other outlets for franchised services (for MSI, this includes clinics owned and operated by MSI)
- Are female, in contexts with strong client preferences for female providers, such as in Pakistan and Yemen

Although the fractional franchise model that MSI and PSI operate can be more rapidly scaled than a full franchise model, fractional franchising carries inherent brand risk. Because franchisees continue to offer non-franchised services that MSI and PSI do not regulate or monitor for quality, an ever-present risk exists that the non-franchised services could be of poor quality or could result in an adverse event that could damage the franchise brand, not only in one franchisee clinic but across the network.

In recent years, both MSI and PSI have begun partnerships with Netherlands-based *SafeCare,* a certification scheme taking root in East Africa that acts as a quality assurance, improvement, and accreditation scheme for an overall clinic. The certification program aims to help providers deliver safe and quality-secured care to their patients, according to internationally recognized standards. This type of program may be one solution to address the inherent limitations of a fractional franchise model that has historically focused on specific health interventions, such as family planning or maternal health.

To date, the risks of fractional franchising have not materialized into brand damage for either MSI or PSI. Still, the tension in fractional franchising is clear, and so special attention must be paid to franchisee selection and brand management. Specific franchisee recruitment strategies differ between MSI and PSI, but both organizations tend to favor a shared set of characteristics in providers, such as being employed full-time in their private practice and demonstrating interest in providing the franchised package of services (Box 3).

THE SUPPLY SIDE OF FRANCHISING: WORKING WITH PROVIDERS

Choosing the right providers for franchising and effectively supporting them to deliver franchised services—many of which are new to the providers—are essential franchise management functions.

It can be tempting to selectively choose only the highest-capacity providers for recruitment into the network. However, such providers do not typically operate in areas where low- and middle-income clients live. Further, working with lower-capacity providers to improve quality and expand their range of services is an important part of improving standards of care in the private

sector, a key promise of franchising and one that selectively choosing only high-capacity providers negates.

In the franchisee recruitment process, MSI and PSI work to strike the right balance between acceptable standards and room for improvement. Critically, prospective franchisees must be willing and committed to improving their clinical quality and expanding their range of services to include franchised services, typically encompassing primary care and preventive services with lower profit margins than curative services.

Both MSI and PSI have had good experiences working with owner-operated facilities. When franchise providers own their facility, buy-in and accountability for agreed quality improvements can be more easily ensured. For recruitment, both organizations seek out clinics run by mid-level provider cadres, such as clinical officers, midwives, and nurses. Experience has shown that the behavior and practices of doctors is harder to influence.

© Marie Stopes International

In the Philippines, a client with her children leaves a private family planning clinic run by a midwife. The clinic is part of the MSI *BlueStar* social franchising network, which generally recruits mid-level provider cadres, such as nurses and midwives.

Recruiting Providers Into the Network

Mapping existing facilities in target regions is the first step in franchisee recruitment. Using a combination of official records and site visits for scoping, MSI and PSI identify the number and distribution of prospective franchisees. This mapping work is combined with analysis of population and health data to determine the concentrations of underserved clients.

MSI and PSI visit prospective franchisees and assess their capacity using a standardized tool that is customized to the country context. Standardization and transparency in the selection process is important. It provides a basis to explain to clinics that are not selected what they can do to improve their prospects for future consideration.

Prospective franchisees need to see value in joining the franchise network. In Malawi, MSI's affiliate Banja La Mtsogolo (BLM) engages current franchisee providers to speak with prospective franchisees in a group setting. Hearing from other providers they deem credible helps prospective franchisees understand the benefits of membership and how franchisee and franchisor can best work together.

There is no exact right number of franchisees for a network. Volume depends on program objectives, expected client volumes, and likely attrition rate. Attrition due to relocation, retirement, or drop-out happens in the course of managing a franchise network. De-franchising due to breaches in compliance is also a reality. Good recruitment practices help keep attrition and de-franchising to a minimum.

Clinical Training and Monitoring Quality of Services

Clinical training, provider certification, and ongoing quality assurance are important functions of franchise management (Box 4). Competency-based classroom and practical training relate specifically to the services being franchised but include general good clinical practices as well.

For example, MSI and PSI train their franchisees on a full range of family planning information and methods including comprehensive client counseling, provision of voluntary LARCs, refresher training on short-acting methods, and referral for voluntary permanent methods. Building franchisees' skills to offer voluntary LARCs involves classroom and practical training modules covering quality monitoring; counseling; infection prevention; method insertion and removal; and preparedness to handle medical emergencies. Once franchisees demonstrate competence in all clinical quality areas, they are branded as part of the franchise network and can begin delivering franchised services.

Both MSI and PSI undertake a regular program of monitoring and support for their

Mid-level providers, such as nurses and midwives, tend to be a better fit for social franchising than doctors.

BOX 4. How Do MSI and PSI Quality-Assure Social Franchise Providers?

- Establish clinical minimum standards aligned with national standards
- Issue clinical governance policy, which includes requirements for clinical quality audits, client satisfaction surveys, and incident reporting protocols
- Deliver competency-based training on the package of franchised services, including training for procedures, comprehensive client counseling, infection prevention, management of clinical emergencies, and referrals
- Facilitate supply of appropriate commodities and equipment
- Provide quarterly supportive clinical supervision and routine use of quality monitoring audits (see supplementary material)
- Conduct independent audits of the quality assurance system and practices (for PSI)

franchisees. Through this supportive supervision, the franchise managers work to reinforce clinical skills; ensure uninterrupted access to medical commodities; and help franchisees build demand for franchised services in their communities. MSI and PSI standards of practice require at minimum quarterly monitoring visits for each franchisee; however, many franchisees require more frequent visits, especially in the early months when skills are first being developed. (See supplementary material for sample indicators used by MSI to assess franchisees' clinical standards during quality audits.)

Supportive supervision visits offer the opportunity to hear from providers on a range of issues and to identify potential problems, including problems stemming from low provider confidence. In Uganda, MSI's *BlueStar* providers were trained to offer a full range of short- and long-acting contraceptive methods. However, during a client tracing survey, a significant number of respondents reported that their franchisee provider had not counseled them about intrauterine devices (IUDs). After following-up with franchisees, Marie Stopes Uganda learned that many franchisees, although trained to provide IUDs, felt less confident with counseling and inserting IUDs than they did with providing implants and short-acting methods. *BlueStar* retrained franchisee providers on IUD counseling, insertion, and removal, and it established a mentoring program between more-experienced franchisees and those reporting low confidence. As a result, IUD provision among *BlueStar* franchisees in Uganda grew from 12% of LARCs provided in 2012 to 24% at the end of 2013 (data from internal MSI sources).

Strong communication and effective interaction with providers is key. As a backdrop to all interactions with franchisee providers, PSI field staff use medical detailing or provider BCC techniques and skills. Medical detailing and provider BCC are similar processes (as they relate to franchising) that involve a PSI staff member visiting individual health clinic providers or owners of pharmacies or drug shops to educate them about a particular product or service and to promote that product or service. During medical detailing, PSI staff will explain how a particular product works, its benefits, and its side effects. This information is intended to influence provider/owner behavior, and the provider can also transfer the information to clients during counseling and service provision.

PSI has found that training providers on clinical skills does not always translate into immediate uptake or practice of those skills in the clinical setting (for a variety of reasons). PSI's provider BCC approach addresses the training-to-practice gap by complementing training with follow-up medical detailing but also by managing the overall relationship with the provider effectively and maximizing opportunities to support and influence provider behaviors and provider-client interaction skills. The specialized communications skills of the medical detailers, modeled after those used in the pharmaceutical industry, allow PSI field staff to identify underlying provider needs, motivations, and/or barriers and biases to performing the desired behavior or service. PSI field staff can then offer the provider a variety of relevant and actionable solutions designed to meet the individual provider's needs and motivations—solutions that are valuable to

the provider. The medical detailers distribute resources such as literature, counseling charts, and patient brochures to assist providers in adopting the desired behaviors.

Helping Franchisees Build Sustainable Businesses

The quality improvements that clinics achieve through their franchise membership continue to deliver impact so long as the franchisee remains in business. Helping franchisees strengthen and expand their businesses is often a key part of the value promised by the franchisors. For example, business management training for franchisees was developed by Banyan Global and has been used by PSI and MSI to train franchisees in a number of countries, including Ethiopia, Malawi, Sierra Leone, and Zimbabwe. The training, covering such topics as assessing one's business, recordkeeping, financial statements and analysis, cash flow plans, and accessing finance, is popular with franchisees. Some franchise networks approach business strengthening by linking franchisees to services present in the market: PSI is currently piloting various approaches, including recruiting specialist "business advisors" in Kenya and outsourcing business support to franchisees to a third-party supplier in Tanzania. In addition, several networks have used their platform to connect franchisees to private and public health insurance companies in a bid to help diversify sources of revenue for franchised businesses.

Access to affordable capital for business expansion is limited in many developing countries, especially for small health care businesses with little loan collateral. MSI, PSI, and Society for Family Health (SFH) have worked to align franchising with programs designed to help small and medium enterprises develop business plans and secure capital. Franchisees in Ghana, Kenya, and Nigeria are eligible for small-business loans facilitated by the Medical Credit Fund (MCF) of PharmAccess. Small loans, in the amounts ranging from US$2,000 to $5,000, can be used to finance clinic renovations, procure new medical equipment, improve technology, buy assets, or upgrade administrative systems. Once franchisees pay off their first loan, they are eligible for follow-on lending.

PSI is also partnering with the private sector to scale-up social franchising while improving financial sustainability. For example, in rural Uganda PSI is collaborating with a corporate partner to support the PSI franchise and ensure greater access to maternal health facilities and commodities for pregnant women. Alongside this partnership, PSI's social franchising programming in Uganda is developing a sustainable supply chain for maternal health products through wholesale pharmacies and drug shops.

Taking Provider-Side Approaches to Scale

Social franchising can make a great difference in quality and access to care at the community level.[19] However, to achieve a wider and sustained health impact, social franchising must operate at scale. Scaling a model that requires a high level of interpersonal interaction and support is challenging and costly; therefore, MSI and PSI must work to develop quality-assurance mechanisms that are replicable and cost-effective at scale.

Technology can help scale social franchising mechanisms cost-effectively.

Technology has a role to play in reaching that scale cost-effectively. In Zimbabwe, MSI's *BlueStar* network has created a mentoring program that uses WhatsApp, a free mobile phone application that allows real-time communication and problem solving between new franchisees and more-established clinic mentors. PSI has begun using technology for improved data collection and better, more-targeted monitoring and supportive supervision visits. In Nepal, for example, PSI franchise staff are equipped with tablet computers that they use to collect real-time data, but the tablets are also programmed with a variety of clinical reference guides and behavior change tools. For staff stationed in hard-to-reach areas, the tablets allow them to keep up-to-date on new and revised materials efficiently, as well as to improve timely data collection.

Strategies such as improved use of technology help overcome operational challenges to make franchising more cost-effective at scale. Finding such cost-effective solutions is an important precursor to positioning franchise networks for longer-term sustainability.

ENGAGING CLIENTS TO OVERCOME DEMAND-SIDE BARRIERS

Social franchising is often understood to be a supply-side intervention aimed at improving provider capacity. While intensive work with providers plays a big part in implementation, engaging clients is also key. Franchisees themselves are at the frontline of community-level marketing and client engagement in their

catchment areas, as fractional franchising builds off their brand equity.

However, MSI and PSI play an important support role, namely to target key underserved groups with health information and ensure communities are aware that quality, affordable services are available at their local franchisee clinic. Franchisors use BCC approaches to encourage positive health-seeking behavior and demand generation strategies to raise awareness about franchised services and the health benefits they offer. BCC and demand generation messages may be delivered through various channels including mass media and interpersonal engagement. In addition, both MSI and PSI selectively use financing mechanisms, such as vouchers, to reduce barriers to access and to attract clients to the franchised clinics.

Voucher programs, although often costly to run, may improve service access for the poor.

Attracting Clients With BCC and Demand Generation

Franchisors use behavior change communication to generate demand for franchised services.

BCC and demand generation activities undertaken by MSI and PSI work to reduce information and behavioral barriers that can restrict service uptake. One key BCC and demand generation strategy is interpersonal engagement. Reaching clients where they live and work is both highly interactive and time-intensive. However, this work is an important part of the franchise network's added value; small owner-operated facilities rarely have the time or resources to undertake person-to-person engagement at scale.

PSI's Latin America franchise, *Red Segura*, works inside garment factories, visiting the factory floors to educate young female employees about their SRH choices and how and where to access services through franchisees. In India, PSI's network conducts door-to-door mapping and household visits, working to reach young married women in their homes. In Pakistan, MSI's *Suraj* network takes a similar approach by engaging female health educators to conduct door-to-door visits with information on SRH topics and franchisee locations.

Making Services More Affordable Through Demand-Side Financing

Considerable evidence suggests that out-of-pocket payments reduce use of preventive health services in low- and middle-income countries.[20] To expand access for low-income clients, MSI and PSI have piloted and adopted different mechanisms to reduce client out-of-pocket payments. These include setting price caps, encouraging sliding-scale fees, distributing targeted vouchers, and offering periodic free service days, often coupled with provider training.

While many of these mechanisms have demonstrated success, they are not without challenge. For example, price caps can be difficult to enforce in practice, and differential, sliding-scale fees introduce the risk of friction between clients or between client and provider. Vouchers and free service days have increased service uptake in several MSI and PSI franchise networks, with some evidence of improved equity in service access.[21,22] Voucher programs, however, can be costly to run and therefore should be used in appropriate circumstances as an equity intervention and not solely as a marketing device.

In Pakistan, PSI integrated safe motherhood vouchers into its client engagement approach. The safe motherhood voucher provided clients with subsidized access to 8 services, including 3 antenatal care (ANC) visits, normal delivery, referral for cesarean section if needed, postpartum family planning, and postnatal care visits. In the pilot study, women who purchased vouchers had a significantly higher uptake of ANC and institutional delivery than women who did not purchase vouchers.[21] When the intervention was expanded, results indicated that while poorer women were less likely to use ANC and institutional delivery, those living in areas with vouchers had a significantly increased likelihood of doing so than those living in control areas.[22]

In Madagascar, MSI has successfully used vouchers to increase access to family planning for underserved groups. From 2012 to 2014, more than 50,000 poor women were able to access family planning using a voucher. Research in 2013 showed that 85% of voucher clients were poor, as measured by multidimensional poverty index (MPI), compared with 25% of franchisee family planning clients overall. Moreover, franchisee client records showed that the volume of paying clients rose significantly between 2012 and 2014, indicating that well-targeted vouchers can be used to attract poor or underserved clients without compromising the paying-client revenue model that franchisees often rely on (data from MSI internal sources). In 2014, MSI combined a voucher program for adolescents with training on youth-friendly services for franchisees. Where franchisees previously served very few adolescents, more than 3,000 adolescents a month are

now using the vouchers to access voluntary family planning services from franchisees (data from MSI internal sources).

HEALTH SYSTEMS INTEGRATION

Social franchise networks offer a platform to more successfully engage the private sector in countries' wider health systems. Two important areas gaining traction are articulation of a private-sector voice in health policy advocacy and integration of the private sector into new public health care financing and procurement mechanisms.

Engaging the Voice of the Private Sector in the Health System

Fragmentation in the market results in missed opportunities for the private sector to engage in dialogue on important national health care issues. Through social franchise networks, private providers can engage with a collective voice, amplifying their agenda and offering a platform for government and other stakeholders to effectively engage with them. In some countries, groups of franchisors have formed franchise associations, providing a unified platform for knowledge sharing and advocacy. For example, in Kenya, the Association of Social Franchising for Health brings together more than 1,000 private providers from 6 franchise networks, with the aim of entering into policy engagement and dialogue with the government and other decision makers.

Advocacy for task sharing and task shifting provides examples of successful use of this collective voice for policy change on issues directly affecting lower- to mid-level provider cadres. In Mali, PSI's *ProFam* network is changing norms around public-sector task shifting by piloting an approach to task shift IUD provision to midwives in private *ProFam* clinics. After advocating the change in national health guidelines, PSI conducted training of trainers for Ministry of Health staff to ensure the ministry would be able to adopt and replicate the task shifting approach independently. In 2009, only 4 public-sector locations provided IUD services; by 2013, trained midwives were providing IUDs in 248 community health centers.

Task-sharing policies, however, do not always change in a direction that is favorable to franchising, as PSI's *Sun Quality Health* franchise experienced. In Laos and Myanmar, the *Sun Quality Health* franchise trained nurse-owned private facilities to deliver voluntary LARCs. Training was complete and the franchise up and running when policies changed in both countries. In Myanmar, the government reversed permission for nurses to offer IUDs and implants; in Laos, private-sector provision of LARCs was banned. Through its franchise network, PSI immediately engaged partners in both countries and, in Myanmar, has successfully advocated policy change back to allow nurses to provide voluntary LARCs.

Additional important advocacy areas include private-sector licensing requirements. In Ethiopia, MSI's *BlueStar* network was able to successfully advocate a 12-month delay and reconsideration of minimum facility size standards for clinic licenses, regulations that would have negatively impacted the ability of smaller-sized clinics to offer a wide range of services to their clients.

Linking the Private Sector to Opportunities in the Broader Health System

In many countries, governments see the private sector as an important player in the health system and, in response, are prioritizing better regulation of the private sector. Further, many governments are working to integrate a better-regulated, higher-capacity private sector into structures and mechanisms previously reserved for the public sector. Examples of this integration include permitting private health facilities to access public medical commodity supplies and linking private providers with emerging health financing schemes such as national health insurance.

Reliable access to medical commodities is central to high-quality service delivery. Across many countries, the Ministry of Health or other government entity runs commodity procurement and distribution programs. However, these programs are often closed to the private sector or very difficult for small, independent private providers to access due to bureaucratic barriers, high minimum order quantities, or poor information about eligibility criteria. On behalf of their franchise networks, MSI and PSI have tapped into government supply chains in a number of countries. In some instances, commodities are accessible free of charge, while in others subsidies or purchasing pool discounts are available. These cost savings can then be passed on to franchisee clients in the form of lower service fees.

A second and strategically important area where inroads are being made is integrating the

private sector into health financing schemes run by the government. Although national health insurance schemes are not yet established in most countries where MSI and PSI work, the movement is expanding in keeping with the principles of universal health coverage.[23,24] In countries with a more developed insurance sector, both MSI and PSI are helping their franchisees gain insurance accreditation, which translates into reduced out-of-pocket payments for clients. In the Philippines, MSI's *BlueStar* network has worked successfully with 188 of its 267 franchisees to pass the stringent accreditation process by the national health insurance, PhilHealth. Even after passing, claims submission challenges persist for small franchisees. Insurance claims must be submitted on paper at locations some distance from franchisees' towns and villages, requiring them to close their clinics to make the journey. In response, *BlueStar* began integrating claims submission into its routine supportive supervision for franchisees. Now, *BlueStar* staff collect and submit quarterly national insurance claims, allowing franchisees to focus on client care.[25] Further, in an effort to help bridge cash flow constraints caused by weeks or months of waiting for claims to be paid by PhilHealth, *BlueStar* offers short-term loans to help franchisees cover costs while waiting for their reimbursements.

LOOKING FORWARD: THE FUTURE OF SOCIAL FRANCHISING

For social franchising to be effective, both in terms of health impact and financial sustainability, franchisors such as MSI and PSI and their stakeholders should consider the following priority areas, many of which are already underway: developing and using uniform metrics to measure success; addressing operational challenges and improving cost-effectiveness; integrating new franchised services; adapting to new health financing landscapes; and continuing to play an active role in health systems strengthening.

Toward Development and Use of Uniform Metrics

Social franchising has shown promise in its ability to improve quality and increase uptake of underutilized preventive and primary care services among low- and middle-income clients. However, franchise results are often not comparable. MSI and PSI are active participants in the Social Franchising for Health community of practice (see www.sf4health.org) to define and use standard metrics, and both organizations are strong advocates of using research to quantify the social franchising model's potential to achieve equity, cost-effectiveness, and health market expansion.

Opportunities for Domestic Autonomy

MSI and PSI continue to work through operational questions that have implications for financial sustainability and for the sustainability of health impact delivered through franchise networks. Both organizations are interested in increasing scale to improve access to quality services. However, it is not clear if the current quality assurance systems, including supportive supervision, provider behavior change, and clinical monitoring, are scalable in a cost-effective way. Without ongoing donor subsidy, it is also unclear whether networks structured around preventive health services such as family planning can deliver value for franchisees as small businesses. Finally, the goal of franchisors' financial sustainability can be debated, as we do not know what will happen to service availability, quality, and equity if franchisors leave the market. As noted below, the emergence of increased domestic finance for health (for example, social health insurance schemes) as a replacement for donor subsidy may provide some opportunities, provided that such schemes are accessible to the non-state/private sector (including small private providers) and that they adequately reimburse for preventive care measures such as family planning.

Experiences from successful social marketing programs including Social Marketing Company (SMC) Bangladesh and GreenStar Pakistan suggest that country-level programs can move toward autonomy from previous international franchisor support structures. However, this autonomy is at a governance level, and donor support often remains important for commodities and operations. Clinical social franchise networks may also have opportunities for greater or full domestic autonomy, as seen with the Well Family network in the Philippines[25] (not affiliated with MSI or PSI), and the need for donor subsidy is likely to decline in countries where domestic financing systems are able to cover health care costs for the poor while a growing middle class may increase the number of clients willing and able to pay for services.

Ultimately, franchise network sustainability will depend on franchisors creating value for their franchisees and for the health systems they are supporting.

Opportunities for Service Integration

Today, family planning services comprise the majority of services delivered through social franchise networks.[16] That being said, most PSI franchise networks include integrated provision of HIV counseling and testing, management of childhood illness, and fever case management including malaria treatment. PSI sees this scope expansion as a cost-effective way to leverage existing provider relationships, take advantage of improvements in cross-cutting clinical areas such as infection prevention, and deliver a franchise offering that covers a larger share of the revenue-generating services offered by their providers.

MSI's approach largely continues to focus on the reproductive health needs of women but is testing an expanded basket of services in several countries to meet those needs beyond family planning. Offering a broader package of services can also facilitate access to family planning, whether for young people interested in a broader range of SRH services or for women with young children seeking maternal and child health services. For example, both MSI and PSI are increasing access to postpartum contraception by strengthening franchisee family planning counseling during ANC visits and by introducing postpartum IUD services to franchisees already providing obstetrics services.

Irrespective of the degree of service integration, both of these approaches have historically encountered challenges with vertical funding streams of priority health areas. Increasingly, however, donors are funding an expanded package of franchised services through the same financing mechanism.

Health Financing and Health Systems Strengthening

With momentum building around universal health coverage, there is increasing attention on public financing of health care for the poor and underserved and on a reduction in cash payments at the point of service. The benefits achieved to date of organizing small private providers into networks could translate into reduced transaction costs for public payment mechanisms as well as ensure that the small private providers that many of the poor currently use can be included in the universal health coverage agenda.

While franchisors need to continue to be advocates for including their network members into payment schemes (small private providers in the case of most of the networks), other stakeholders should also remember that the private sector is a vast resource and that an organized, quality-assured private sector can be more easily accredited for inclusion in emerging insurance networks, similar to MSI's successful integration into the Philippines' National Health Insurance Programme (NHIP).

While the discussion continues on where social franchising will be in 10 or 15 years, it is clear that organizations such as PSI and MSI are working in diverse, dynamic, and quickly evolving health markets. In many countries, there will continue to be a compelling case for franchise networks to scale health care access with the benefit of subsidies. However, franchisors will also need to be responsive to changing health care needs and to the evolution of how health care is paid for. In some countries, such changes may mean a business model that works toward health impact goals while optimizing services in a predominantly cash-based private health care market. This could evolve into autonomous domestic franchise networks or a process of graduating individual high-capacity franchisees out of franchise programs. In other countries, evolution may mean integration into public financing systems.

Integrating other priority health services beyond family planning into the social franchise package can be a cost-effective way to leverage existing provider relationships.

CONCLUSION

The benefits of organizing and quality-assuring small health care businesses that serve the poor, at scale, presents tantalizing opportunity in the context of the universal health coverage debate. With a growing body of evidence on social franchising and operational experience across a greater number of country contexts and health areas, the coming years promise to be an exciting time for this model and for the access, quality, and equity objectives that the global health community shares.

Acknowledgments: This paper is made possible by the generous support from the American people through the United States Agency for International Development (USAID) under the Support for International Family Planning Organizations (SIFPO) projects implemented by MSI and PSI. The contents are the responsibility of Marie Stopes International and Population Services International and do not necessarily reflect the views of USAID or the United States Government.

Competing Interests: None declared.

Social franchising can support the universal health coverage agenda by potentially reducing public payment transaction costs.

REFERENCES

1. Private Healthcare in Developing Countries [Internet]. San Francisco (CA): University of California, San Francisco, Global Health Group; c2008. [Data on private general outpatient pediatric care]; [cited 2014 Dec 12]. Available from: http://ps4h.org/globalhealthdata.html

2. Zwi AB, Brugha R, Smith E. Private health care in developing countries. BMJ. 2001;323(7311):463–464. CrossRef. Medline
3. Basu S, Andrews J, Kishore S, Panjabi R, Stuckler D. Comparative performance of private and public healthcare systems in low- and middle-income countries: a systematic review. PLoS Med. 2012;9 (6):e1001244. CrossRef. Medline
4. Berendes S, Heywood P, Oliver S, Garner P. Quality of private and public ambulatory health care in low and middle income countries: systematic review of comparative studies. PLoS Med. 2011;8(4):e1000433. CrossRef. Medline
5. Madhavan S, Bishai D. Private sector engagement in sexual and reproductive health and maternal and neonatal health: a review of the evidence. Baltimore (MD): Johns Hopkins Bloomberg School of Public Health; 2010. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/330940/Private-Sector-Engagement-in-SRH-MNH.pdf
6. Waters H, Hatt L, Peters D. Working with the private sector for child health. Health Policy Plan. 2003;18(2):127–137. CrossRef. Medline
7. Peters DH, Mirchandani GG, Hansen PM. Strategies for engaging the private sector in sexual and reproductive health: how effective are they? Health Policy Plan. 2004;19 (Suppl 1): i5-i21. CrossRef. Medline
8. Montagu DD, Anglemyer A, Tiwari M, Drasser K, Rutherford GW, Horvath T, et al. Private versus public strategies for health service provision for improving health outcomes in resource-limited settings: systematic review. San Francisco (CA): University of California, San Francisco, Global Health Sciences; 2011. Available from: http://r4d.dfid.gov.uk/PDF/Outputs/SystematicReviews/Private_v_Public_2011Montagu_report.pdf
9. Koehlmoos T, Gazi R, Hossain S, Rashid M. Social franchising evaluations: a scoping review. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London; 2011. Available from: http://eppi.ioe.ac.uk/cms/LinkClick.aspx?fileticket=9x-E3kGWGmE%3d&tabid=3085&language=en-US
10. Shah NM, Wang W, Bishai DM. Comparing private sector family planning services to government and NGO services in Ethiopia and Pakistan: how do social franchises compare across quality, equity and cost? Health Policy Plan. 2011;26(Suppl 1):i63–i71. CrossRef. Medline
11. Agha S, Gage A, Balal A. Changes in perceptions of quality of, and access to, services among clients of a fractional franchise network in Nepal. J Biosoc Sci. 2007;39(3):341–354. CrossRef. Medline
12. Stephenson R, Tsui AO, Sulzbach S, Bardsley P, Bekele G, Giday T, et al. Franchising reproductive health services. Health Serv Res. 2004;39(6 Pt 2):2053–2080. CrossRef. Medline
13. Bishai DM, Shah NM, Walker DG, Brieger WR, Peters DH. Social franchising to improve quality and access in private health care in developing countries. Harvard Health Policy Rev. 2008;9 (1):184–197. Available from: http://www.sf4health.org/sites/sf4health.org/files/wysiwyg/Bishai_franchising_2008.pdf
14. High-Impact Practices in Family Planning (HIPs). Social marketing: leveraging the private sector to improve contraceptive access, choice, and use. Washington (DC): US Agency for International Development; 2013. Available from: https://www.fphighimpactpractices.org/resources/social-marketing-leveraging-private-sector-improve-contraceptive-access-choice-and-use
15. Munroe E, Hayes B, Taft J. Increasing access to and expanding choice of high quality family planning services through the private sector: results from Marie Stopes International's social franchising program. Glob Health Sci Pract. 2015;3(2). CrossRef
16. Viswanathan R, Schatzkin E, Sprockett A. Clinical social franchising compendium: an annual survey of programs: findings from 2013. San Francisco (CA): University of California, San Francisco, Global Health Sciences, The Global Health Group; 2014. Available from: http://sf4health.org/sites/sf4health.org/files/wysiwyg/Social-Franchising-Compendium-2014_0.pdf
17. World Health Organization (WHO) [Internet]. Geneva: WHO; c2015 [cited 2015 Apr 15] . Metrics: disability-adjusted life year (DALY). Available from: http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/
18. Huntington D, Mundy G, Hom N, Li Q, Aung T. Physicians in private practice: reasons for being a social franchise member. Health Res Policy Syst. 2012;10(1):25. CrossRef. Medline
19. Khurram Azmat S, Tasneem Shaikh B, Hameed W, Mustafa G, Hussain W, Asghar J, et al. Impact of social franchising on contraceptive use when complemented by vouchers: a quasi-experimental study in rural Pakistan. PLoS One. 2013;8(9): e74260. CrossRef. Medline
20. Lagarde M, Palmer N. The impact of user fees on access to health services in low- and middle-income countries. Cochrane Database Syst Rev. 2011;(4):CD009094. CrossRef. Medline
21. Agha S. Impact of a maternal health voucher scheme on institutional delivery among low income women in Pakistan. Reprod Health. 2011;8(1):10. CrossRef. Medline
22. Agha S. Changes in the proportion of facility-based deliveries and related maternal health services among the poor in rural Jhang, Pakistan: results from a demand-side financing intervention. Int J Equity Health. 2011;10(1):57. CrossRef. Medline
23. Yates R. Universal health care and the removal of user fees. Lancet. 2009;373(9680):2078–2081. CrossRef. Medline
24. Yates R. Women and children first: an appropriate first step towards universal coverage. Bull World Health Organ. 2010; 88(6):474–475. CrossRef. Medline
25. Strengthening Health Outcomes through the Private Sector (SHOPS) Project. Private midwife provision of IUDs: lessons learned from the Philippines. Bethesda (MD): Abt Associates, SHOPS Project; 2014. Available from: http://www.sf4health.org/sites/sf4health.org/files/wysiwyg/private-midwife-provision-of-iuds.pdf

Peer Reviewed

Received: 2015 Feb 17; **Accepted:** 2015 May 1; **First Published Online:** 2015 June 12

Cite this article as: Thurston S, Chakraborty NM, Hayes B, Mackay A, Moon P. Establishing and scaling-up clinical social franchise networks: lessons learned from marie stopes international and population services international. Glob Health Sci Pract. 2015;3(2):180-194. http://dx.doi.org/10.9745/GHSP-D-15-00057.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

ORIGINAL ARTICLE

Private-Sector Social Franchising to Accelerate Family Planning Access, Choice, and Quality: Results From Marie Stopes International

Erik Munroe,[a] Brendan Hayes,[a] Julia Taft[a]

In just 7 years, Marie Stopes International (MSI) has scaled-up social franchising across Africa and Asia, from 7 countries to 17, cumulatively reaching an estimated 3.75 million clients including young adults and the poor. In 2014, 68% of clients chose long-acting reversible contraceptives, and many clients had not been using modern contraception in the past 3 months. Service quality and efficiency (couple-years of protection delivered per outlet) also improved significantly.

ABSTRACT

Background: To achieve the global Family Planning 2020 (FP2020) goal of reaching 120 million more women with voluntary family planning services, rapid scale-up of services is needed. Clinical social franchising, a service delivery approach used by Marie Stopes International (MSI) in which small, independent health care businesses are organized into quality-assured networks, provides an opportunity to engage the private sector in improving access to family planning and other health services.

Methods: We analyzed MSI's social franchising program against the 4 intended outputs of access, efficiency, quality, and equity. The analysis used routine service data from social franchising programs in 17 African and Asian countries (2008–2014) to estimate number of clients reached, couple-years of protection (CYPs) provided, and efficiency of services; clinical quality audits of 636 social franchisees from a subset of the 17 countries (2011–2014); and exit interviews with 4,844 clients in 14 countries (2013) to examine client satisfaction, demographics (age and poverty), and prior contraceptive use. The MSI "Impact 2" model was used to estimate population-level outcomes by converting service data into estimated health outcomes.

Results: Between 2008 and 2014, an estimated 3,753,065 women cumulatively received voluntary family planning services via 17 national social franchise programs, with a sizable 68% choosing long-acting reversible contraceptives (LARCs). While the number of social franchisee outlets increased over time, efficiency also significantly improved over time, with each outlet delivering, on average, 178 CYPs in 2008 compared with 941 CYPs in 2014 ($P = .02$). Clinical quality audit scores also significantly improved; 39.8% of social franchisee outlets scored over 80% in 2011 compared with 84.1% in 2014. In 2013, 40.7% of the clients reported they had not been using a modern method during the 3 months prior to their visit (95% CI = 37.4, 44.0), with 46.1% (95% CI = 40.9, 51.2) of them reporting having never previously used family planning at all. Analysis of age and poverty levels of clients indicate mixed results in bridging equity gaps: 57.4% of clients lived on under US$2.50/day in 2013 (95% CI = 54.9, 60.0) and 26.1% were 15–24 years old (95% CI = 23.8, 28.4), but only 15.1% lived on less than $1.25/day (95% CI = 13.8, 16.4) and 5.0% were 15–19 years old (95% CI = 3.9, 6.1). The services provided via social franchising are estimated to avert 4,958,000 unintended pregnancies and 7,150 maternal deaths.

Conclusion: Social franchising through the existing private sector has the ability to rapidly scale-up access to high-quality family planning services, including LARCs, for the general population as well as young women and the poor, providing a promising model to help achieve the global FP2020 goal.

INTRODUCTION

The London Summit on Family Planning in 2012 set a bold "FP2020" commitment to expand access to modern contraceptive methods for 120 million more women and girls by 2020.[1] By 2013, an additional 8.4 million women and girls were using contraception in the 69 FP2020 focus countries. While the achievement represents an important milestone, progress must be greatly accelerated to reach the goal of 120 million by 2020.[1]

[a] Marie Stopes International, London, UK.
Correspondence to Erik Munroe (erik.munroe@mariestopes.org).

The private sector is a critical contributor to achieving the FP2020 goal, as a large proportion of the world's population procures health care outside the public sector. Almost 60% of health care expenditures in the least-developed countries is spent in the private sector,[2] and almost two-fifths of women using modern contraceptive methods report obtaining them from the private sector.[3] While this represents a significant proportion of family planning service delivery, the quality of services provided by the private sector and the range of contraceptive method choices available are often limited.

Clinical social franchising is a service delivery approach in which small, independent health care businesses are organized into quality-assured networks. Social franchising involves intensive capacity building and support for providers, including clinical training, branding, quality monitoring, and commodity support, as well as marketing and demand generation among potential clients. In addition, franchising programs engage providers and clients through behavior change communication (BCC) and initiatives to ensure access for the lowest-income clients. Social franchising presents an opportunity to engage private providers in health care delivery to increase access to high-quality family planning and other services.[4]

An estimated 90 clinical social franchising programs are operating in low- and middle-income countries.

There has been a large expansion in the number of clinical social franchising programs in the past 5 years, with an estimated 90 programs operating in low- and middle-income countries in 2013.[4] Operational approaches and lessons learned from the clinical social franchising programs of Marie Stopes International (MSI) and Population Services International (PSI), two of the largest global franchisor entities, both of which experienced rapid growth in recent years, are described in a companion paper in *Global Health: Science and Practice*.[5]

Despite the large increase in clinical social franchising programs, there is limited peer-reviewed published evidence of their health impact. A 2009 systematic review on social franchising found no studies eligible for inclusion in the review.[6] More recently, a 2013 review that included gray as well as peer-reviewed literature identified 23 studies of 9 social franchising programs.[7] The authors concluded that while social franchising has been shown to increase the number of clients and improve client satisfaction, there is limited and mixed evidence on whether clinical social franchising improves health care quality, equity, or population-level health outcomes.[7] In addition, a recent technical consultation identified several evidence gaps related to the provision of voluntary long-acting reversible contraceptives (LARCs) and permanent methods of family planning via social franchising, including whether social franchising could reach new users of LARCs and the ability of social franchisees to provide permanent methods.[8]

The purpose of this paper is to present results from MSI's social franchising programs through the end of 2014 to address key research gaps in global knowledge of social franchising, particularly the ability of social franchisees to increase access to LARCs and permanent methods as part of a broad method mix, to improve the quality of services provided, and to reach clients from groups that typically have high unmet need, such as those of lower-income levels.

MSI is one of the largest global providers of voluntary family planning services, delivering services in 2013 in 37 countries through 5 service delivery channels: static clinics, mobile outreach, social franchising, community-based distribution, and product social marketing.[9] The international organization started its social franchising program in 2008 in 7 countries; by 2014, MSI was operating social franchising programs in 17 country programs across Africa and Asia.

MSI uses a fractional franchising model in which only selected franchisee services and commodities (typically, family planning for MSI franchising) are franchised. In other words, franchisees may provide other health services beyond family planning, but without MSI involvement and quality assurance. This fractional approach enables rapid scale-up of family planning services because it builds on existing service delivery mechanisms and infrastructure. More information on the operation of MSI's fractional social franchising program, as well as the approaches used by PSI, can be found in the companion paper.[5]

METHODS

Data Sources

To assess the performance of the MSI social franchising program, we extracted data from 3 sources: routine program monitoring data, clinical quality audits, and client exit interviews. All 3 sources contained data from a small number of public-sector franchisees, which could not be removed readily and thus are included in all results shown. The proportion of facilities and

services from the public sector were under 5% of those included in the analysis, and the results are considered to still be representative for private-sector franchising. All data collection and analysis were conducted according to international principles of maintaining privacy and confidentiality of personal information.

Routine Program Monitoring Data

Within country programs, social franchisees are required to maintain records of all family planning services provided. For short-acting contraceptive methods, such as pills and condoms, franchisees record the number of commodities distributed or sold to the end user, whereas for LARCs and permanent methods, they record each service provided (e.g., insertion, follow-up, removal). (Family planning counseling resulting in no service provision is also captured through routine data collection but was not used in this analysis.) Reporting procedures and formats (e.g., paper or electronic, weekly or monthly aggregated reporting, etc.) vary between countries, but at a minimum all franchisees periodically report the number of contraceptive commodities and services provided to the central support office in each country. This information is collected and aggregated at a national level, before being submitted electronically via Infor SunSystems (typically version 5.1 in early 2014 and version 6.1 by the end of the year) to the international MSI support office in London each month.

For this analysis, routine program monitoring data from January 1, 2008, to December 31, 2014, for the 17 MSI country programs operating social franchising were extracted and analyzed using Stata version 11. The 17 countries comprised 12 countries in Africa (Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mali, Nigeria, Senegal, Sierra Leone, Uganda, Zambia, and Zimbabwe) and 5 countries in Asia (India, Pakistan, the Philippines, Vietnam, and Yemen).

Clinical Quality Audits

MSI globally oversees and operates a quality technical assistance (QTA) program with an annual external assessment to ensure country programs maintain a high standard of clinical quality and service delivery throughout their service delivery channels. The external audit complements the continuous review process, including internal audits conducted by the country program. External audits are carried out by global MSI medical advisors or approved consultants of clinical social franchisee outlets that have been operating as franchisee clinics for at least 12 months.

Using a standard checklist, auditors assess clinical governance, client focus, infection prevention, medical emergency management, management of equipment and supplies, and provision of core sexual and reproductive health services including family planning. Each checklist item is scored between 0 and 2, and each section is scored as the sum of all component scores out of the maximum possible score. An overall compliance score is calculated as the mean of the scores from each quality component assessed. The results of the QTA are used as part of ongoing program monitoring at a country and global level, as well as to inform improvements to services where required.

External audits of social franchisees commenced in 2011 for 9 country programs, but sampling size varied by country. Consequently, MSI standardized sampling approaches such that a sample of 10% of franchisees, with a maximum of 25, was audited. In 2011, only 3 country programs achieved this level of randomly selected social franchisee outlets. In 2012, after standardizing the sampling guidance, 10 country programs met the sampling requirements; 15 countries qualified in 2013; and 14 countries achieved the minimum sample of facilities in 2014.

QTA results for social franchisees are entered into a Microsoft Excel-based tool, which guides the QTA visit and is completed by the assessor while in-country. The final completed Excel tool, which automatically generates scores, is subsequently sent to the support office in London, where data across programs are managed and analyzed. A list of elements in the tool can be found in the supplementary material.

For this analysis, QTA scores from 2011 to 2014 for 636 audited social franchisees were extracted and analyzed using Stata version 11 and SPSS version 21.

Client Exit Interviews

Most MSI country programs conduct interviews annually with a random sample of family planning clients at different service delivery sites and channels. These exit interviews consist of a short, interviewer-administrated, standardized questionnaire following a client's service visit to gather more detailed information about client demographics and socioeconomic status, services obtained, choice of contraceptive methods, and

client experience. In 2013, exit interviews were conducted with 4,844 clients at 14 of the 17 national social franchise networks; Yemen did not complete exit interviews due to political instability, Zambia because the franchise had only been recently established, and Zimbabwe due to programmatic challenges that caused delays.

In the exit interviews, client satisfaction is measured by asking interviewed clients to rate their experience on a scale of 1 (very poor) to 5 (very good) on a range of questions, including friendliness and respect demonstrated by providers, waiting time, and facility cleanliness.

Poverty is measured using the Progress out of Poverty Index (PPI)[10] in the countries where this index is available (i.e., all MSI countries with franchising except Madagascar and Zimbabwe); for MSI country programs where the PPI is not available, the Multidimensional Poverty Index is used instead.[11] Results from the PPI enable estimation of the proportion of clients living on less than US$1.25/day and those living on less than $2.50/day, two commonly used measures of national poverty.[12]

Clients are also asked about their recent use of contraception. "Family planning adopters" are defined as clients who had not been using any modern method of family planning during the 3 months prior to their visit.

Data from exit interviews were entered at a national level into version 3.5.4 of Epi Info and then imported into version 21 of SPSS for analysis at a country level. For the analysis in this paper, 2013 client exit interview data from 13 countries were exported from SPSS and analyzed using Stata version 11.

Data Analysis

Results of the MSI social franchising program are based on routine service data, clinical quality audits, and client exit interviews.

We combined information from the routine program monitoring data, clinical quality audits, and client exit interviews to examine success of the social franchising program in achieving the 4 intended outputs under the MSI results framework: access, efficiency, quality, and equity (Table 1).[13]

Access was assessed using both estimated numbers of clients and couple-years of protection (CYPs). The number of clients receiving short-acting contraceptive methods was estimated by dividing the number of commodities provided by the number of commodities needed for a full year of contraceptive protection (e.g., 13 for oral contraceptive pills; 98 for condoms; or 4 for DMPA contraceptive injections, given every 3 months). The number of clients receiving LARCs was obtained from the number of voluntary IUD and implant insertion services delivered, and the number of clients receiving voluntary permanent methods was obtained from the number of tubal ligation and vasectomy services provided. International conversion factors were used to convert the number of services and commodities provided into CYPs, a standard measure of the estimated amount of time a couple will be protected against unintended pregnancy per unit of the contraceptive method used.[14] CYP conversion factors differ slightly from the estimates used in the "number of clients" calculation because CYP factors account for method effectiveness and wastage. (For a list of the conversion factors, see http://www.usaid.gov/what-we-do/global-health/family-planning/couple-years-protection-cyp.) Changes over time were assessed using a non-parametric test for trend across ordered groups.

Efficiency was measured at the national level by dividing annual countrywide CYPs (for the entire franchise network) by the number of franchisees in operation at the end of each calendar year, with the exception of the first year of a franchise's operation. For these new country franchises, the number of franchisees at year's end was divided by the total number of months the franchise had been operating to smooth the data during the period of largest proportional growth. Changes over time were assessed using a non-parametric test for trend across ordered groups.

Quality was assessed using overall clinical audit scores and overall client satisfaction scores. Raw clinical quality audit scores were compared using pairwise adjusted Wald tests. The proportion of franchisees scoring above a minimum acceptable score of 80% was compared over time using chi-square tests. Countries were treated as strata, and QTA results were weighted by the number of social franchisee outlets operating in each country at the end of the calendar year. Client satisfaction was weighted by the number of family planning clients in each country over the calendar year. The significance of multiple pairwise comparisons was adjusted using Holm's method[15]; all P values presented in the results include these adjustments.

Equity was evaluated using client exit interview data to assess the proportion of clients who were family planning adopters (i.e., those who had not used any modern method during the 3 months preceding the service), youth, or living under US$1.25/day or $2.50/day. Results from Madagascar

TABLE 1. Marie Stopes International Social Franchising Results Framework: Measures of Intended Outputs

Intended Output	Definition	Data Source	No. of Countries and Years	Indicators
Access	The extent to which a program ensures potential clients can reach or obtain services regardless of financial, geographic, or cultural barriers to access	Routine program monitoring data	Starting in 7 countries in 2008 and growing to 17 countries by the end of 2014	Estimated number of family planning clients Number of couple-years of protection (CYP)
Efficiency	How inputs (financial, human, technical) are used to produce the maximum output	Routine program monitoring data	Starting in 7 countries in 2008 and growing to 17 countries by the end of 2014	Average number of CYPs generated per social franchisee per year
Quality	The degree to which a provider or facility meets certain objectives and perceived levels or expectations of health care delivery standards	Clinical quality audit	10 countries in 2011, 10 countries in 2012, 15 countries in 2013, 14 countries in 2014	Mean quality score of audited social franchisees Proportion of audited social franchisees scoring over minimum standard (score $\geq$80%)
		Client exit interviews	14 countries in 2013	Self-rating of overall experience
Equity	The extent to which a program ensures all potential clients have an equal or fair opportunity to obtain services.	Client exit interviews	14 countries in 2013	Family planning adopters: Proportion of family planning clients who newly adopt a modern contraceptive method (defined as not using a modern method during the 3 months prior to their visit)
		Client exit interviews	14 countries in 2013	Age: Proportion of clients under 25 years old and proportion under 20 years old
		Client exit interviews	12 countries in 2013	Poverty: Proportion of clients living below US$1.25/day and proportion living below $2.50/day

and Nigeria were excluded from the poverty analysis as they used non-comparable measures to the PPI (Madagascar used the Multidimensional Poverty Index and Nigeria's PPI calculates the proportion living under the national poverty line rather than under international poverty lines). Countries were treated as strata, and franchisees served as the primary sampling unit for clustering in the analysis; exit interview results were weighted by the number of family planning clients in each country over the calendar year.

Outcomes were estimated using MSI's "Impact 2" model. Full details of the model are described elsewhere[16]; in short, the model enables conversion of service data into a variety of estimated health outcomes using the best available data on country demographics, fertility, mortality, and more. To estimate the number of unintended pregnancies that will be averted, for example, method-specific failure rates are applied to modeled users of each, taking discontinuation into account. The results are then compared with the average number of pregnancies that would have occurred had the woman not been using any contraception. Other measures, such as the number of maternal deaths averted, are more complicated. Estimating the number of maternal deaths averted involves 6 point estimates from the World Health Organization of the maternal mortality ratio (MMR) for each country, modeling of the ratio's change over time in each country, isolating the portion of maternal mortality due to live births, and combining that mortality with the estimates of unintended pregnancies averted.

MSI social franchising programs cumulatively reached 3.75 million family planning clients over 7 years.

For this analysis, routine program monitoring data (number of services and number of commodities) was used to estimate the number of unintended pregnancies, maternal deaths, maternal disability-adjusted life years (DALYs) lost, and costs in direct health care spending that will be averted due to services delivered by MSI's social franchising program from 2008 through 2014.

RESULTS

Access

Number of Family Planning Clients

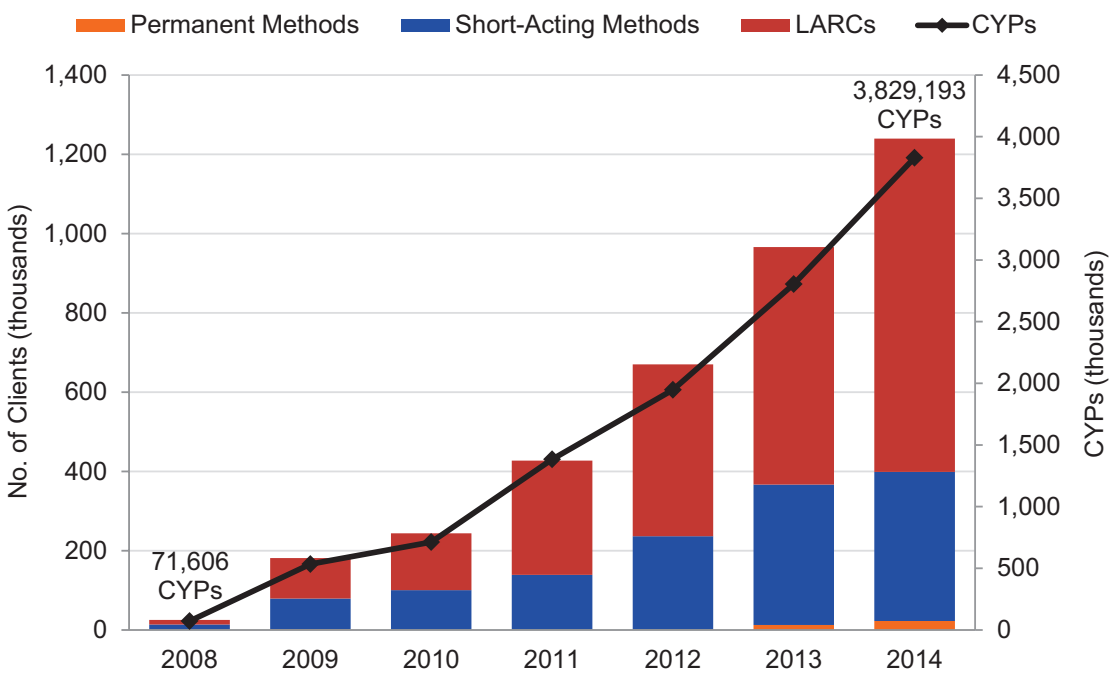
68% of the social franchising clients chose LARCs.

In 2008, the MSI social franchise program provided voluntary family planning services to an estimated 25,335 clients. By 2014, this provision had grown to an estimated 1,239,727 clients, soaring by nearly 49-fold (Figure 1). Over the entire 7-year period, MSI reached an estimated 3,753,065 family planning clients cumulatively.

Clients receiving LARCs and permanent methods accounted for an estimated 50% of clients in 2008, rising significantly to 70% by 2014 ($P=.02$). The increasing number of clients was significant across all client types ($P=.02$ for short-acting method clients, LARC clients, and all clients, and $P=.047$ for permanent method clients). The vast majority of these services were for LARCs. Method-specific results can be found in the supplementary material.

In the Asian countries where MSI has social franchising programs, the LARCs provided were

FIGURE 1. Annual Number of Family Planning Clients[a] by Type of Contraception and Annual Couple-Years of Protection Provided by MSI Social Franchising Programs in Selected African and Asian Countries,[b] 2008–2014



Abbreviations: CYPs, couple-years of protection; LARCs, long-acting reversible contraceptives; MSI, Marie Stopes International.
[a] The number of family planning clients was estimated as follows: for short-acting methods, the number of commodities provided each year divided by the number of commodities needed for a full year of contraceptive protection (i.e., 13 for oral contraceptive pills; 98 for condoms; 4 for DMPA contraceptive injections, given every 3 months; these factors differ slightly from CYP conversion factors because CYP conversion factors take into account method effectiveness and wastage); for LARCs, the number of IUD and implant insertion services provided each year; and for permanent methods, the number of tubal ligation and vasectomy services provided each year.
[b] Data are from routine program monitoring, from 7 countries in 2008 and growing to 17 countries in 2014.

exclusively IUDs through 2011. Implant provision has been increasing in these countries since 2012 but still accounted for only 1% of LARCs in 2014. African programs initially distributed more IUDs than implants, but, overall, that pattern was reversed by 2010 (slightly earlier in West Africa, and slightly later in Southern Africa). The disparity between the two LARC methods peaked around 2012, but since then IUDs have increased as a proportion of LARCs in Africa. Still, in 2014, 75% of LARCs provided through franchisees in Africa were implants.

Number of CYPs

Total CYPs delivered by MSI social franchising programs increased 54-fold, from 71,606 in 2008 to 3,829,193 in 2014 (Figure 1). The trend for this increase was statistically significant ($P = .02$).

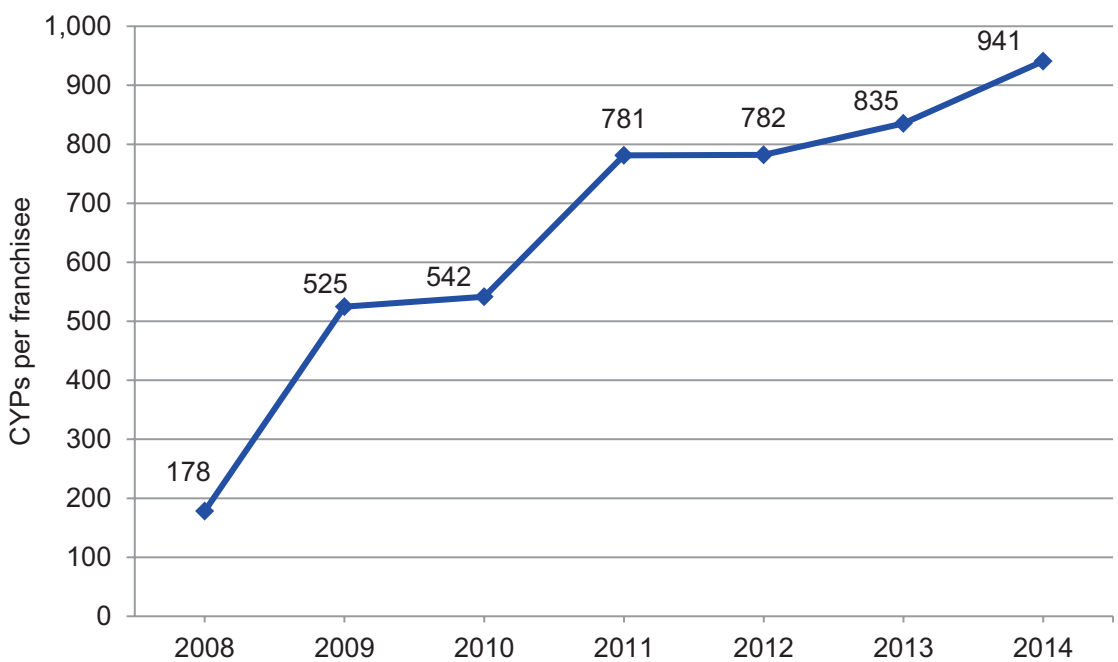
Efficiency

The absolute number of MSI social franchisee outlets has increased over time, from 695 outlets in 7 countries at the end of 2008 to 4,070 outlets in 17 countries by the end of 2014. In 2014, the median number of social franchise outlets per national social franchise program was 225, ranging from 25 outlets in Sierra Leone to 589 outlets in Ethiopia. The next smallest franchise was Zambia, with 38 franchisees.

While the number of franchisees has grown substantially, the increase in outlet numbers did not account solely for the increase in client numbers or CYPs. Efficiency, measured by CYPs generated each year by each social franchisee outlet, has also increased over time, from an average of 178 CYPs per outlet in 2008 to 941 CYPs per outlet in 2014 ($P = .02$) (Figure 2). Increases in efficiency have accounted for an estimated 61% of the growth in

Improved efficiency of social franchisees has accounted for 61% of the growth in couple-years of protection provided over time.

FIGURE 2. Annual Couple-Years of Protection Provided per MSI Franchisee,[a] 2008–2014



Abbreviations: CYPs, couple-years of protection; MSI, Marie Stopes International.
[a] Data are from routine program monitoring, based on 695 social franchisee outlets in 7 countries at the end of 2008 and growing to 4,070 outlets in 17 countries by the end of 2014.

total CYPs, while increases in the number of franchisees have accounted for the remaining 39%. Nearly all (98%) of the increase in efficiency was due to rising numbers of family planning clients per franchisee; provision of longer-acting contraceptive methods, which contribute higher CYPs per contraceptive unit, accounted for little more than 2% of growth in efficiency.

Quality

Mean Quality Score

About one-quarter of social franchisee clients were 15–24 years old.

The mean quality score among audited clinical social franchisees has also increased significantly over time ($P<.002$); among the 61 franchisees audited in 2011, the mean score was 78.5 (95% confidence interval [CI] = 73.5, 83.5), increasing to 87.9 (95% CI = 86.5, 89.3) among the 200 franchisees assessed in 2014 (Table 2). Quality scores in adjacent years were not significantly different, except between 2012 and 2013. The overall significance over time, however, held whether scores for all audited social franchisees were included or only scores from social franchisees in which there was a national social franchise program operating during all 4 years being assessed (n = 8 countries).

Proportion Scoring Above Minimum Standard

Social franchisees reached more clients living in near poverty than in extreme poverty.

In 2011, 39.8% of audited social franchisee outlets scored higher than the minimum standard score of 80%. The proportion scoring higher than the minimum standard score increased to 84.1% in 2014 (Table 2). Comparisons between years were similar to those of the raw scores, with no significant difference detected between 2011 and 2012 or between 2013 and 2014. But the overall increase in scores was statistically significant between the first two years and final two years ($P<.001$).

Client Satisfaction

In 2013, the average weighted client satisfaction score among outlets in 14 countries was 4.51 (95% CI = 4.46, 4.56), out of a total possible score of 5 (Table 2).

Equity

Age

Among the MSI franchise programs in 14 countries that conducted client exit interviews in 2013, the overall proportion of clients aged 15–19 years was 5.0% (95% CI = 3.9, 6.1), and the overall proportion aged 15–24 years was 26.1% (95% CI = 23.8, 28.4) (Table 3). The highest proportion of clients aged 15–24 years were in Mali (42.9%, 95% CI = 36.3, 49.5) and Uganda (41.4%, 95% CI = 25.5, 57.3), and the lowest proportion in Vietnam (8.6%, 95% CI = 5.4, 11.8) and Pakistan (11.0%, 95% CI = 9.7, 12.3) (see supplementary material).

Poverty

In 2013, the overall proportion of clients living on under US$1.25 a day was 15.1% (95% CI = 13.8, 16.4), and the overall proportion living on under $2.50 a day was 57.4% (95% CI = 54.9, 60.0) (Table 3). The highest proportion of clients living on under $1.25 a day was in Mali (39.6%, 95% CI = 32.3, 46.8) and Sierra Leone (32.2%, 95% CI = 25.2, 39.1), but in both countries, the

TABLE 2. Quality Audit and Client Satisfaction Scores of Selected Marie Stopes International Social Franchisee Outlets, 2011–2014

	2011 (N = 61)	2012[a] (N = 164)	2013 (N = 211)	2014 (N = 200)
Overall quality score, mean (95% CI)	78.5 (73.5, 83.5)	80.8 (79.4, 82.3)	86.6 (85.3, 88.0)	87.9 (86.5, 89.3)
Proportion of audited outlets scoring higher than minimum standard score of 80%, % (95% CI)	39.8 (20.9, 58.8)	58.7 (49.5, 67.9)	77.4 (71.7, 83.1)	84.1 (78.5, 89.6)
Client satisfaction score,[b] mean (95% CI)			4.51 (4.46, 4.56)	

Quality scores are from clinical quality audits while client satisfaction scores are from client exit interviews.
[a] The program in Pakistan used a slightly amended scoring methodology for clinical audits in 2012.
[b] Total possible client satisfaction score was 5.

TABLE 3. Equity in Access to Family Planning Through Marie Stopes International Social Franchising Programs in Selected Countries, 2013

Equity Domain	%, (95% CI)
Age of clients	
15–19 years	5.0 (3.9, 6.1)
15–24 years	26.1 (23.8, 28.4)
Poverty level of clients[a]	
Living on under US$1.25/day	15.1 (13.8, 16.4)
Living on under US$2.50/day	57.4 (54.9, 60.0)
Family planning adopters[b]	
Newly adopted a modern contraceptive method	40.7 (37.4, 44.0)

Data are based on client exit interviews in 14 countries (Ethiopia, Ghana, India, Kenya, Madagascar, Malawi, Mali, Nigeria, Pakistan, Philippines, Senegal, Sierra Leone, Uganda, and Vietnam), except for the "poverty" indicator, which excludes results from Madagascar and Nigeria because they used non-comparable measures of poverty than the other 12 countries.
[a] Measured using the Progress out of Poverty Index (PPI).[13]
[b] Defined as modern contraceptive method clients who had not been using a modern method during the 3 months prior to their visit.

proportion of clients living on under $1.25 a day was still lower than the proportion of the national population living on under $1.25 a day. The countries with the lowest proportion of clients living on under $1.25 a day were Ghana (2.1%, 95% CI=0.6, 3.6) and Vietnam (4.9%, 95% CI=3.3, 6.6%). More country-specific information can be found in the supplementary material.

Family Planning Adopters

In 2013, 40.7% of family planning clients reported they had not been using a modern method during the 3 months prior to their visit (i.e., that they were family planning adopters) (95% CI=37.4, 44.0) (Table 3). In 5 of the 14 countries, more than 50% of family planning clients reported they were new family planning adopters (see supplementary material). Of the family planning adopters, 46.1% (95% CI=40.9, 51.2) reported having never previously used family planning, including traditional methods.

Outcomes

Using the MSI Impact 2 model, family planning services provided by MSI's social franchising program between 2008 and 2014 will avert an estimated 4,958,000 unintended pregnancies and 7,150 maternal deaths. The services will also avert an estimated 6,986,500 maternal DALYs lost, and save US$197,812,500 in direct health care spending.

DISCUSSION

Clinical social franchising offers a promising model to rapidly scale-up access to family planning services.

Clinical social franchising through an existing network of private providers offers a promising model to rapidly scale-up access to voluntary family planning information and services, while simultaneously improving quality of services. Such scale-up is needed to achieve the visionary goal set at the London Family Planning Summit to reach 120 million more women and girls with contraception.

In just 7 years, MSI has successfully expanded its social franchising program to more than 4,000 social franchisees across 17 countries, providing voluntary family planning services to almost 3.75 million women cumulatively, many of them poor. Furthermore, two-fifths of modern contraceptive users had not used family planning recently, and nearly half of these women had never used family planning at all—these users are a key group in addressing unmet need. A substantial 68% of the women reached by MSI social franchising opted for voluntary LARCs. At the same time, MSI was able to greatly increase the efficiency of franchisees as measured by the number of CYPs generated each year by

each franchised outlet. By expanding the number and productivity of franchisees, MSI has increased its reach to clients by almost 5000% over 7 years. A number of specific country-level approaches, such as introduction of new services including postpartum IUD insertions, have contributed to the improved quality and expansion of services (Box).

Impact on Population-Level Outcomes

MSI's social franchising program averted nearly 5 million unintended pregnancies and about 7,000 maternal deaths, saving over $197 million in direct health care costs.

Through these expansions, we estimate that MSI's program will avert nearly 5 million unintended pregnancies and approximately 7,150 maternal deaths, and lead to estimated savings in direct health care costs of over US$197 million. A previously published study found that MSI's social franchise program in Pakistan increased the overall contraceptive prevalence rate by almost 20% in intervention districts compared with control districts.[17] Together, these findings provide evidence of the positive impact that social franchising programs can have on population-level health outcomes. Further evidence of health outcomes from social franchising is expected to be generated from a randomized controlled trial currently being conducted through the impact evaluation of the African Health Markets for Equity program,[18] as well as one planned by MSI of its own franchising activities in Pakistan.

Expanding Contraceptive Choice

In addition to providing family planning services to those with unmet need, expanding access can be viewed through the lens of providing additional contraceptive method choices to users. LARCs and permanent methods are safer and more reliable for women than many short-acting methods, but these clinical methods require more training than short-acting methods and thus are seen as more difficult to provide. Furthermore, community myths and misconceptions about LARCs and permanent methods, as well as the associated upfront costs for clients, compound the issue.[19-21] A recent technical meeting highlighted the question of whether social franchising could increase access to LARCs and permanent methods among family planning adopters.[7] The 7 years of data analyzed in this paper clearly demonstrate that franchising

BOX. Strengthening Social Franchising: Case Examples

Several of MSI's national social franchising programs have improved the quality and expanded the range of services that franchisees provide through different approaches. Some examples include:

- **Improving quality:** The social franchise network in Pakistan had the highest level of clinical quality in 2013 of all MSI national social franchise networks. A centralized procurement system that ensures control over commodities and supplies may be a contributing factor. Additionally, the network has invested heavily in supportive supervision, with a ratio of 1 field supervisor to every 10 franchisees.
- **Introducing new services:** In Kenya and Nigeria, many social franchisees provide obstetric services including antenatal care and safe delivery. Recently, these franchisees have been trained in postpartum IUD insertion services. Providing IUDs during the postpartum period further expands contraceptive choice for women at a time of high unmet need. This intervention has resulted in increased access to IUDs as part of a broad range of family planning methods available. The external QTA conducted among 4 providers in Kenya found an average score above the minimum benchmark, suggesting strong retention of skills.
- **Expanding choice:** In Uganda, social franchisees expanded contraceptive choice by addressing supply- and demand-side constraints. On the supply side, social franchisees received counseling training on all contraceptive methods, qualified providers received training on LARC and permanent method service provision while referral pathways were established for providers not able to provide permanent methods, and providers were supplied with equipment and commodities. Demand-side constraints were addressed through a voucher program that reduced financial barriers and facilitated access to voluntary family planning services for poor women. In 2013, 40% of Uganda's social franchise clients were "family planning adopters" (i.e., they had not been using a modern method during the prior 3 months) and 61% lived on less than US$2.50/day.

can increase access to LARCs. By 2014, 68% of methods provided by MSI social franchising programs were LARCs, and nearly half of MSI's family planning clients who had not been recently using family planning opted for LARCs. We are seeking additional information on the proportion of providers who had lacked skills to offer LARCs prior to being franchised, but initial reports suggest a sizable majority of providers gained new skills in family planning service delivery by joining a franchise network.

While there is strong evidence for the ability of social franchising to offer LARCs, there remains less clarity for provision of permanent methods. Less than 25% of MSI's national social franchise networks offered permanent methods in 2014, and delivery of these methods remains low, accounting for less than 2% of overall client numbers in 2014. In addition, in many franchise networks, MSI deliberately recruited lower-level providers, such as midwife- and nurse-led clinics, based on the belief that such franchisees are better able to reach poorer and more underserved clients than doctor-led clinics.[5] While focusing on lower-level providers may improve equity in service delivery, these providers are commonly unable to offer permanent methods under national regulatory frameworks. Further investigation of strategies, such as task sharing or strengthened referral mechanisms, to safely increase the number of social franchisees that are able to provide voluntary permanent methods is needed.[22]

Improving Quality

During scale-up, it is critical to ensure that the services provided are, and remain, of high quality. We recorded high levels of client satisfaction through client exit interviews. We also, encouragingly, found a significant increase over time in external quality audit scores, at the same time that MSI's social franchise networks were rapidly expanding. However, ensuring quality of all outlets across large, geographically dispersed networks remains a challenge and requires major investment of resources. MSI is currently improving its quality monitoring systems through use of a new quality assurance framework, which emphasizes ongoing monitoring of quality to reduce reliance on an annual audit cycle. The new framework includes using information and communications technology to continually gather and analyze data, feed results back to franchisees, and support a supervision process tailored to individual outlet needs. Beginning in 2015, external audit resources will be aligned to emphasize quality assurance in sites that have the most variability or that have lagged in quality increases over the past several years. Additionally, a number of organizations are engaged in a global discussion around measuring the process quality in franchised facilities and gaining a more rigorous understanding of other dimensions of quality such as client satisfaction.

Bridging Equity Gaps

Social franchising clearly improved access to LARCs, but other strategies may be needed to improve the ability of social franchisees to provide permanent methods.

Although MSI has successfully scaled-up access to family planning services through social franchising, it is important to also consider the types of clients being reached to ensure equitable access to services. In 6 of the 14 MSI national social franchise programs that conducted exit interviews in 2013, the proportion of clients aged 15–24 years was significantly larger than the proportion of family planning demand in the national married population from those aged 15–24 (see supplementary material), pointing to MSI's ability to reach **younger populations**, a group which is often underserved.[23] Still, only a relatively small proportion of MSI's clients were under 20 years, a group that, as they become sexually active, is critical to access with services to prevent pregnancy at a young age and the associated health and social risks.[23] However, the social franchisee model, including its associated fee structure, may not be the most appropriate channel to reach this demographic without associated mechanisms to reduce financial or other barriers to access.

We found mixed results in reaching **poor clients**; while 57% of MSI social franchising clients lived on under US$2.50 a day—the median poverty line in all but the 15 poorest countries[12]—only 15% of clients lived on less than $1.25 a day. No country programs had a significantly larger proportion of clients living on less than $1.25 a day than the proportion of the national population living on under $1.25 a day. But we had better results with clients living on under $2.50 a day; several countries had franchise networks with significantly more clients living on under $2.50/day than the proportion of the national population living on under the same amount. Details can be found in the supplementary material.

One country with substantially more near-poor clients than in the national population was

Pakistan. In Pakistan, only providers in periurban and rural areas are selected to be franchised. Additionally, a network of community mobilizers builds demand in communities, and many of these mobilizers provide vouchers to those unable to afford family planning. While such characteristics could be associated with success in reaching those living in poverty, more evidence is needed of successful programs. There are ongoing debates about the ability of clinical social franchising to reach the poorest, particularly in the absence of financing mechanisms such as voucher programs and publicly financed health care[6,24,25]; only 6 of the 17 social franchisee programs included in this analysis were operating voucher programs during the time frame of this analysis. In addition, many social franchisees may not be located in areas where the majority of the population is poor, or, if they are, the poorest clients may still be unable to access these services due to actual or perceived costs and may instead be accessing private health care through the informal sector.[26] Further analysis of other clinical social franchise programs, including their use of various health financing mechanisms and use of national wealth indices to measure relative wealth, would greatly assist in understanding the current situation before formulating approaches to better reach the poorest, whether through social franchising or other service delivery mechanisms such as mobile outreach services.[27]

While there were mixed results in reaching particular groups of clients with high unmet need—reaching some in near poverty but few in extreme poverty, and successfully serving youth aged 20–24 but few under 20—MSI's social franchising program was more consistently able to reach **women who had not been using family planning recently** and those who had **never used family planning**. Some clients have not used family planning recently because they were not sexually active at the time or because they recently changed their fertility intentions (i.e., they had been trying to get pregnant). However, many who have not been using contraception actually do not want children in the near future and have a real unmet need for family planning. Providing family planning services to those who have not used contraception for a period longer than 3 months is therefore key to addressing unmet need. In addition, serving such family planning adopters suggests social franchisees are not solely competing with other providers for existing clients. In some countries, over 70% of MSI's social franchising family planning clients were family planning adopters.

MSI's social franchising program successfully reached women who had not been using contraception recently, including those who had never used it.

Limitations

There are some limitations to the analyses discussed above. Client numbers were estimated from number of services and commodities provided, which may lead to over- or underestimates of true client numbers. Client numbers may also be underestimated as we did not include clients who had received family planning services such as counseling or the removal of IUDs or implants but who did not also choose to receive a modern contraceptive method at the same time. It is possible that franchisee reports of provision of short-acting methods are underreported compared with long-acting methods, as several social franchising programs include voucher programs aimed at reducing barriers to accessing more expensive LARCs; thus, there are direct incentives to report all LARCs provided. These limitations will generally lead to under- rather than overestimation of the true client numbers, and thus are likely conservative in their potential bias.

Aspects of the outputs assessed could not be included. For example, efficiency measures based on cost-effectiveness or access measures based on geographical location or provider discrimination were unable to be included at this stage. We are working to add such indicators to subsequent evaluations.

The location of several franchise networks also led to imperfect data collection. Due to the fragile security situation in Yemen, the Ebola outbreak in Sierra Leone, and a temporary suspension in operations in Uganda, the quality and equity results contain several gaps, and thus are not completely representative of MSI's entire franchising program. With clinical quality audits, there have been slight amendments made over time to the sampling and checklists used. These changes were intended to strengthen the audits based on lessons from previous years but could reduce comparability between years. Client satisfaction questions are often affected by courtesy bias in responses, and collection of true satisfaction could be imperfect as well.

Health outcomes were modeled rather than directly assessed. These estimates were based on the best available data but cannot provide the accuracy of other methods. Efforts were made to minimize the occurrence and impact of these limitations, but many of them reflect the reality

of the environments these franchise programs operate in.

CONCLUSION

Through social franchising, MSI reached almost 3.75 million women with voluntary family planning services, many of whom were considered new contraceptive users, and a substantial 68% chose LARCs. At the same time as rapidly expanding its network, MSI increased efficiency of its outlet operations, significantly increased clinical quality, obtained high levels of client satisfaction, and reached a substantial proportion of young women and women living on under $2.50/day. Taken together, these results reflect the ability of clinical social franchising to rapidly scale-up global access to voluntary family planning services in the coming years and to make a substantial contribution to achieving the FP2020 goal.

Acknowledgments: This paper is made possible by the generous support from the American people through the United States Agency for International Development (USAID) under the Support for International Family Planning Organizations (SIFPO) project implemented by MSI, Cooperative Agreement AID-OAA-A-10-00059. The contents are the responsibility of Marie Stopes International and do not necessarily reflect the views of USAID or the United States Government. The authors wish to thank the national teams who collected the monitoring and evaluation data without which this global analysis would not be possible. Several individuals contributed to the development of this paper including Anna Mackay and James Harcourt for initial concept development and useful review and comment on initial drafts and Dr. Judy Gold for her assistance in preparation of the manuscript.

Competing Interests: None declared.

REFERENCES

1. Family Planning 2020 (FP2020). FP2020 progress report 2013–2014: partnership in progress. [Internet]. Washington (DC): FP2020; 2014. Available from: http://www.progress.familyplanning2020.org/uploads/ckfinder/files/FP2020_Progress_Report_Digital_View_2013-2014.pdf
2. Global Health Expenditure Database [Internet]. Geneva: World Health Organization. 1995 – [cited 2014 Nov 6]. Available from: http://apps.who.int/nha/database/Select/Indicators/en
3. STATcompiler: Building Tables With DHS Data [Internet]. Rockville (Maryland): ICF International. 1985 – [cited 2014 Nov 6]. Available from: http://www.statcompiler.com/
4. Viswanathan R, Schatzkin E, Sprockett A. Clinical social franchising compendium: an annual survey of programs: findings from 2013. San Francisco: University of California, San Francisco, Global Health Sciences, The Global Health Group; 2014. Available from: http://www.sf4health.org/sites/sf4health.org/files/wysiwyg/Social-Franchising-Compendium-2014_0.pdf
5. Thurston S, Chakraborty N, Hayes B, Mackay A, Moon P. Establishing and scaling-up clinical social franchise networks: lessons learned from Marie Stopes International and Population Services International. Glob Health Sci Pract. 2015;3(2): 180–194. CrossRef
6. Koehlmoos TP, Gazi R, Hossain SS, Zaman K. The effect of social franchising on access to and quality of health services in low- and middle-income countries. Cochrane Database Syst Rev. 2009;(1): CD007136. CrossRef. Medline
7. Beyeler N, York De La Cruz A, Montagu D. The impact of clinical social franchising on health services in low- and middle-income countries: a systematic review. PLoS One. 2013;8(4):e60669. CrossRef. Medline
8. LA/PM Community of Practice technical consultation: expanding choice and access to LARCs and PMs through social franchising: meeting highlights. Washington (DC): LA/PM Community of Practice; 2014. Available from: http://www.respond-project.org/pages/files/4_result_areas/Result_1_Global_Learning/LA_PM_CoP/Meeting-Report-LAPM-CoP-Expanding-Choice-and-Access-to-LARCs-and-PMs-through-Social-Franchising.pdf
9. Marie Stopes International (MSI). Global impact report 2013: the client as our compass. London: MSI; 2013. Available from: http://impact.mariestopes.org/wp-content/uploads/2014/05/Marie_Stopes_International_Global_Impact_Report_20131.pdf
10. Grameen Foundation. 2014 global report on poverty measurement with the Progress out of Poverty Index [Internet]. Washington (DC): Grameen Foundation; 2014. Available from: http://www.progressoutofpoverty.org/sites/default/files/PPI Global Report 2014.pdf
11. Alkrie S, Chatterjee M, Conconi A, Seth S, Vaz A. Global multidimensional poverty index 2014. Oxford: Oxford Poverty & Human Development Initiative; 2014. Available from: http://www.ophi.org.uk/wp-content/uploads/Global-MPI-2014-an-overview.pdf?0a8fd7
12. World Bank. Knowledge in development note: measuring global poverty. Washington (DC): The Bank; 2009. Available from: http://go.worldbank.org/NODTCVO0M0
13. Reichwein B, Nuccio O. Promoting effective family planning service provision: Marie Stopes International's results-based framework. Poster presented at: International Conference on Family Planning; 2013 Nov 12–15; Addis Abba, Ethiopia. Abstract available from: http://www.xcdsystem.com/icfp2013/program/index.cfm?aID=1544&seID=418
14. The RESPOND Project. New developments in the calculation and use of couple-years of protection (CYP) and their implications for the evaluation of family planning programs: meeting highlights, Washington, DC, September 8, 2011. New York: RESPOND Project; 2011. Available from: http://www.respond-project.org/archive/files/2/Report-2011-LAPM-CoP-CYP.pdf
15. Holm S. A simple sequentially rejective multiple test procedure. Scand J Stat. 1979;6:65–70.
16. Weinberger MB, Fry K, Boler T, Hopkins K. Estimating the contribution of a service delivery organisation to the national modern contraceptive prevalence rate: Marie Stopes International's Impact 2 model. BMC Public Health. 2013;13 Suppl 2:S5. CrossRef. Medline
17. Azmat SK, Shaikh BT, Hameed W, Mustafa G, Hussain W, Asghar J, et al. Impact of social franchising on contraceptive use when complemented by vouchers: a quasi-experimental study in rural Pakistan. PLoS One. 2013;8(9):e74260. CrossRef. Medline
18. Gertler P. African Health Markets for Equity (AHME) impact evaluation. Cambridge (MA): American Economic Association RCT Registry; 2014. Available from: https://www.socialscienceregistry.org/trials/217
19. World Health Organization (WHO). From evidence to policy: expanding access to family planning. Strategies to increase use of long-acting and permanent contraception. Geneva: WHO; 2012. Available from: http://apps.who.int/iris/bitstream/10665/75161/1/WHO_RHR_HRP_12.20_eng.pdf

20. Townsend JW, Sitruk-Ware R, Williams K, Askew I, Brill K. New strategies for providing hormonal contraception in developing countries. Contraception. 2011;83(5):405–409. CrossRef. Medline

21. Jacobstein R. Long-acting and permanent contraception: an international development, service delivery perspective. J Midwifery Womens Health. 2007;52(4):361–367. CrossRef. Medline

22. Marie Stopes International (MSI); EngenderHealth; IntraHealth International; International Planned Parenthood Federation; Population Council; Jhpiego; et al. Increasing access to high-quality voluntary permanent methods of contraception in low-resource settings: consensus statement. Washington (DC): MSI, Support for International Family Planning Organizations Project (SIFPO); 2014. Available from: http://www.engenderhealth.org/files/external/SIFPO-Symposium-Consensus-Statement-and-Addendum.pdf

23. Bearinger LH, Sieving RE, Ferguson J, Sharma V. Global perspectives on the sexual and reproductive health of adolescents: patterns, prevention, and potential. Lancet. 2007;369(9568):1220–1231. CrossRef. Medline

24. Koehlmoos TP, Gazi R, Hossain SS, Rashid M. Social franchising evaluations: a scoping review. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London; 2011. Available from: http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=3085&language=en-US

25. Patouillard E, Goodman CA, Hanson KG, Mills AJ. Can working with the private for-profit sector improve utilization of quality health services by the poor? A systematic review of the literature. Int J Equity Heal. 2007;6:17. CrossRef. Medline

26. Bloom G, Standing H, Lucas H, Bhuiya A, Oladepo O, Peters DH. Making health markets work better for poor people: the case of informal providers. Health Policy Plan. 201;26 Suppl 1: i45–i52. CrossRef. Medline

27. Barnes J, Vail J, Crosby D. Total market initiatives for reproductive health. Bethesda (MD): Abt Associates, Strengthening Health Outcomes through the Private Sector Project; 2012. Available from: http://abtassociates.com/CMSPages/GetFile.aspx?guid=1e8e3ce0-e800-4b27-bc4f-c40ed8efcd95

Peer Reviewed

Received: 2015 Feb 13; **Accepted:** 2015 May 1; **First Published Online:** 2015 June 12

Cite this article as: Munroe E, Hayes B, Taft J. Private-sector social franchising to accelerate family planning access, choice, and quality: results from marie stopes international. Glob Health Sci Pract. 2015;3(2):195-208. http://dx.doi.org/10.9745/GHSP-D-15-00056.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

ORIGINAL ARTICLE

Toward a Systematic Approach to Generating Demand for Voluntary Medical Male Circumcision: Insights and Results From Field Studies

Sema K Sgaier,[a] James Baer,[b] Daniel C Rutz,[c] Emmanuel Njeuhmeli,[d] Kim Seifert-Ahanda,[b] Paulin Basinga,[e] Rosie Parkyn,[f] Catharine Laube[g]

Using an analytical framework to design and implement voluntary medical male circumcision (VMMC) programs can lead to more effective interventions, especially when insights are incorporated from disciplines such as behavioral science and commercial market research. Promising VMMC behavior change practices: (1) address individual, interpersonal, and environmental barriers and facilitators; (2) tailor messages to men's behavior change stage and focus on other benefits besides HIV prevention, such as hygiene and sexual pleasure; (3) include women as a key target audience; (4) engage traditional and religious leaders; (5) use media to promote positive social norms; and (6) deploy community mobilizers to address individual concerns.

ABSTRACT

By the end of 2014, an estimated 8.5 million men had undergone voluntary medical male circumcision (VMMC) for HIV prevention in 14 priority countries in eastern and southern Africa, representing more than 40% of the global target. However, demand, especially among men most at risk for HIV infection, remains a barrier to realizing the program's full scale and potential impact. We analyzed current demand generation interventions for VMMC by reviewing the available literature and reporting on field visits to programs in 7 priority countries. We present our findings and recommendations using a framework with 4 components: insight development; intervention design; implementation and coordination to achieve scale; and measurement, learning, and evaluation. Most program strategies lacked comprehensive insight development; formative research usually comprised general acceptability studies. Demand generation interventions varied across the countries, from advocacy with community leaders and community mobilization to use of interpersonal communication, mid- and mass media, and new technologies. Some shortcomings in intervention design included using general instead of tailored messaging, focusing solely on the HIV preventive benefits of VMMC, and rolling out individual interventions to address specific barriers rather than a holistic package. Interventions have often been scaled-up without first being evaluated for effectiveness and cost-effectiveness. We recommend national programs create coordinated demand generation interventions, based on insights from multiple disciplines, tailored to the needs and aspirations of defined subsets of the target population, rather than focused exclusively on HIV prevention goals. Programs should implement a comprehensive intervention package with multiple messages and channels, strengthened through continuous monitoring. These insights may be broadly applicable to other programs where voluntary behavior change is essential to achieving public health benefits.

[a] Bill & Melinda Gates Foundation, Global Development Program, Integrated Delivery, Seattle, WA, USA, and University of Washington, Department of Global Health, Seattle, WA, USA. Now with Surgo Foundation, Seattle, WA, USA, and Harvard T.H. Chan School of Public Health, Boston, MA, USA.
[b] Bill & Melinda Gates Foundation, Independent Consultant, London, UK.
[c] US Centers for Disease Control and Prevention, Atlanta, GA, USA.
[d] US Agency for International Development, Division of Global HIV/AIDS, Washington, DC, USA.
[e] Bill & Melinda Gates Foundation, Global Development Program, Integrated Delivery, Seattle, WA, USA.
[f] BBC Media Action, London, UK.
[g] US Department of State, Office of the US Global AIDS Coordinator, Washington, DC, USA.
Correspondence to Sema K Sgaier (semasgaier@surgofoundation.org).

INTRODUCTION

Generating demand for voluntary medical male circumcision (VMMC) is a key component of HIV prevention in 14 priority countries with high HIV prevalence in eastern and southern Africa.[1,2] Modeling studies conducted in 2009–2011 established that if 80% of males aged 15 to 49 years in these priority countries were circumcised within 5 years, and if coverage levels were maintained thereafter, 3.4 million HIV infections could be prevented over 15 years, saving lives as well as US$16.5 billion in HIV treatment costs.[3] Global public health leaders have endorsed an overall goal of achieving 20.3 million male circumcisions between 2012 and 2016.[2]

If 80% of men in 14 priority African countries were circumcised, 3.4 million HIV infections could be prevented over 15 years.

VMMC scale-up has been variable among the 14 priority countries, but overall momentum has been building since early 2013. The World Health Organization provisionally estimates that 8.5 million circumcisions had been completed by the end of 2014—an increase of 2.5 million over 2013.[4] VMMC scale-up is close to reaching half of the overall goal and will have tangible public health benefits.

A wide range of demand generation activities has contributed to the progress of VMMC scale-up.[5] However, most of the 14 countries are running behind the pace needed to reach their VMMC goals. Apart from adequate funding and service delivery capacity, a substantial increase in demand for VMMC is also essential.

Most of the 14 priority countries are running behind the pace needed to reach their VMMC goals.

The VMMC demand generation effort faces unique challenges. First, research suggests that men are less likely than women to seek health care.[6] Second, VMMC is a "hard sell" because it requires healthy men to undergo a surgical procedure involving appreciable discomfort and inconvenience and which offers only partial protection against an uncertain (and often unacknowledged) individual HIV risk.[2] Third, while circumcision is a centuries-old practice with established cultural and religious significance and sensitivity, its ability to reduce risk of HIV and other sexually transmitted infections (STIs) for males has only recently become widely recognized. Scaling-up VMMC, therefore, requires reorienting long-held beliefs to include an appreciation of its protective health benefits. Finally, experience has shown that current approaches to demand generation are often inconsistent, not evidence-based, and poorly coordinated. Political and social factors, including ignorance of the need for strategic demand generation, may contribute to inadequate funding and focus.

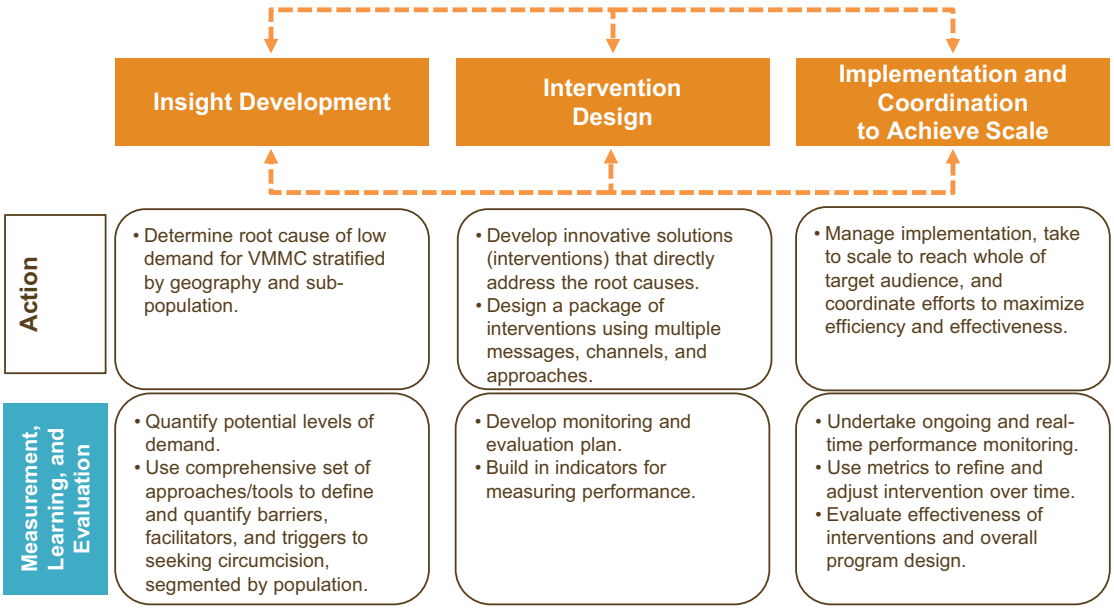
There is growing consensus among stakeholders that more strategic use of demand generation resources and opportunities is needed, taking into consideration fresh perspectives and disciplines, to improve uptake of national VMMC programs.[7] In this paper, we review the available literature on VMMC demand generation and report on field visits to VMMC demand generation programs in 7 countries to assess current strategies and identify gaps, and we suggest fresh approaches to better motivate VMMC candidates to accept services. We do not attempt a systematic review of current VMMC demand generation approaches because there is not yet an extensive or strong evidence base for such a review. Instead, we leverage our extensive collective experience as funders and implementers in the field to present some promising practices and situate these within a framework that may be useful for the systematic creation of more effective and efficient demand generation strategies. The approach and lessons from VMMC scale-up may also be applicable to other public health programs seeking new or improved evidence-based approaches to increase service uptake, retention, and adherence.

FRAMEWORK FOR VMMC DEMAND GENERATION

In this paper, we present our findings and insights in terms of a framework for VMMC demand generation that draws from elements of other behavior change theories and frameworks. Our illustrative VMMC demand generation framework has 4 components: (1) insight development, (2) intervention design, (3) implementation and coordination to achieve scale, and (4) measurement, learning, and evaluation (Figure 1). The first 3 components are interdependent and may overlap. The fourth component underpins the other components, since measurement, learning, and evaluation are foundational for all stages of demand generation.

Insight development. This foundational phase of VMMC demand generation programs consists of a process of conducting quantitative and qualitative research (i.e., formative research) to understand what drives or limits demand for VMMC and how VMMC can be framed for greatest appeal at both the individual and the population levels. Established theories of behavior change

FIGURE 1. Components of Demand Generation for Voluntary Medical Male Circumcision (VMMC)



provide a roadmap for how VMMC candidates may journey toward the commitment to seek services—progressing from unawareness to awareness (sometimes coupled with apathy or opposition), followed by interest, preparation, and finally action.[8–11]

Intervention design. Innovative solutions to generate demand do not focus simply on the public health benefits of VMMC, but address the cognitive, emotional, cultural, and structural barriers that can hinder a man's decision to be circumcised—and the corresponding triggers that can facilitate that decision. Successful interventions tend to use carefully designed and coordinated messages delivered via multiple channels.

Implementation and coordination to achieve scale. Most effective demand generation activities must be delivered at scale, combining high levels of coverage and intensity. This requires more than money: it involves sound implementation management to ensure coordination among key VMMC stakeholders.

Measurement, learning, and evaluation. The environment in which public health programs operate and their beneficiaries live is complex and evolving, and demand for VMMC changes accordingly. A robust, dynamic approach is needed to gather data on levels of demand and on the effectiveness and cost-effectiveness of demand generation programs. Given that global and country-level scale-up targets were originally developed without taking into account the interaction between demand- and supply-side interventions, key questions for VMMC programs are: How much demand is realistic in the context of available supply and the known level of interest at a given time, and how should this level of demand be defined and measured? Setting a demand-based denominator helps establish feasible targets and provides metrics to measure the effectiveness of specific demand generation activities.

METHODS

We reviewed available literature on VMMC demand generation programs, including peer-reviewed publications, gray literature, and a 2013 landscape analysis and documentation.[1,12–15] We also conducted field studies of VMMC demand generation programs over a 4-month period during 2013–2014 in 7 of the priority countries for VMMC[2]—Kenya, Malawi, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe.[16]

VMMC acceptability is generally higher among younger than older men and women.

For the field studies, following desk research, we mapped current demand generation practices for VMMC in each of the 7 countries. We then reviewed 45 interventions and held 112 in-country interviews with implementers and other stakeholders to identify examples of promising practices for wider learning and potential scale-up (see supplementary materials for the phase 1 discussion guide). A brief overview of each example was presented at a meeting of researchers, implementing partners, and government and donor representatives, held in Lusaka, Zambia, in April 2014.[7] The research team then returned to each country to document each promising practice in greater detail (see supplementary materials for the phase 2 discussion guide).

FINDINGS

The literature review produced scant evidence on approaches to demand generation for VMMC, both in terms of understanding drivers of demand and in terms of evaluating existing interventions. Based on our field studies, we produced 27 implementation profiles of interventions that were sufficiently developed to inform adoption, adaptation, and scale-up by colleagues involved in VMMC demand generation in eastern and southern Africa.[16] The Table provides a summary of the 27 interventions. The findings and recommendations we present here are based primarily on the 27 implementation profiles documented through the field studies and on the gaps revealed by the literature review, as well as on our own field experience.

Messages should be tailored to men's behavior change stage.

Insight Development

Our analysis and experience suggest that the extent to which programs currently apply behavior change theories to their VMMC demand generation efforts varies, due to limited expertise, constraints on time, budget, or feasibility, or a combination of these factors. While some degree of research is conducted in most settings, many programs lack a sufficiently systematic and granular view of how men progress through the different stages of behavior change and of all the influences along this path.

The formative research that has been conducted has consisted primarily of acceptability studies in several of the VMMC priority countries, focusing on the perceived barriers and benefits to VMMC.[15] These studies have favored qualitative methods, using in-depth interviews, focus groups, or self-administered surveys.[17] Acceptability of VMMC has been found to vary by demography and geography. In general, studies have found acceptability to be higher among females and males aged 15–25 years than among older people,[18,19] and to be higher in eastern Africa than in southern Africa.[20,21] Commonly identified factors that make VMMC acceptable to males included supportive social norms demonstrated by peers, family, or female partners. Commonly cited barriers included cultural and traditional norms, fear of pain, length of the healing period, perceived threat to masculinity, and financial and other opportunity costs.[15] These triggers and barriers varied by age: adolescents were likely to be more amenable to peer pressure or parental persuasion than older men, while older men were more likely than adolescents to view financial costs and sexual abstinence during the recovery period as barriers.

A limitation of acceptability studies is that the insights they provide are general, and the studies are thus often only useful for designing interventions that move an individual from opposition or apathy toward VMMC to a state of interest in the procedure. A few recent studies in Zimbabwe have described the triggers that influence males to seek VMMC once they are interested in the procedure and understand its benefits.[11,13,22] These studies have identified a dominant pattern in which behavior change occurs along a continuum of 3 fluid stages—pre-intention, intention, and action (Figure 2).

One of the studies identified interventions that are likely to move men more quickly through this process of change.[23] It emphasized the value of tailoring messages and activities to the men's stage-specific needs and concerns. For example, during the pre-intention stage, the aim of behavior change interventions should be to increase men's exposure to VMMC messages through multiple channels, then make VMMC relevant to individuals through targeted messaging. Social pressure and encouragement to ascribe positive values to VMMC help move men further toward the decision to act, and addressing men's fears about the procedure may remove the final barrier. Male friends who have undergone circumcision and female partners are the key influencers throughout the process. At the same time, more should be done to provide information about the procedure itself and to

TABLE. Summary of 27 Promising-Practice Interventions for VMMC

Country and Name/ Description of Intervention	Types of Interventions	Implementing Partner	Brief Description
KENYA			
Demand creation toolkit	Research, messaging, social mobilization, IPC	Impact Research and Development Organization (IRDO)	Tool to assist social mobilizers to communicate consistent messages during IPC
Journalism training	Media	Internews	Training journalists to report accurately and impartially on VMMC
MCC coordination	Coordination	National AIDS & STI Control Programme (NASCOP)	National and provincial coordination
MALAWI			
BRIDGE II project	Social mobilization, IPC, engaging traditional leaders and female partners, coordination, messaging incentives	Johns Hopkins Center for Communication Programs (CCP)	Combining low- and high-intensity efforts at behavior change, balancing supply and demand, and reaching female partners
Lilongwe district scale-up	Social mobilization, media, IPC, engaging traditional leaders and female partners, coordination	International Training & Education Center for Health (I-TECH)	Using satisfied VMMC clients as community mobilizers and training women to reach other women
SOUTH AFRICA			
Brothers for Life	Social mobilization, IPC, media, ICT, messaging	Johns Hopkins Health and Education in South Africa (JHHESA)	Award-winning multipronged and adaptable marketing and awareness campaign involving print media, TV, billboards, community outreach projects, canvassing, education, and information
CareWorks	Social mobilization, IPC, ICT, incentives payment	CareWorks	Workplace programs and a call center to move potential clients from contemplation to action
Centre for HIV and AIDS Prevention Studies (CHAPS)	Social mobilization, IPC, research, incentives and performance-based payment	CHAPS	Record numbers of VMMCs performed, perpetual research, reflection and revision of strategy, tight feedback loop with mobilizers, collective incentive structure translated into highly motivated staff
New Start	Social mobilization, engaging traditional leaders, messaging, research, media	Society for Family Health (SFH)	Use of the DELTA process to design demand creation interventions and pretesting of all materials
Soul City	Research, messaging, media	Soul City	Insertion of VMMC storylines into long-running TV series

TABLE (continued).

Country and Name/ Description of Intervention	Types of Interventions	Implementing Partner	Brief Description
TANZANIA			
Champion project	Social mobilization, IPC, engaging female partners, media	EngenderHealth	Beyond HIV messaging, engendering long-term commitment of social mobilizers
Community mobilization and GIS technology	Social mobilization, IPC, media, engaging female partners, research, advocacy, IPC	Jhpiego	Community mobilization for older men, use of SMS and GIS technology
Community mobilization and SMS technology	Social mobilization, IPC, ICT	IntraHealth and Tanzania Youth Alliance (TAYOA)	Innovative approach combining SMS technology with popular-opinion leaders at grassroots level to create tailored strategy for reaching older men, adaptation of IEC materials to suit local communities
Printed materials and radio spots	Media and messaging	CCP	Printed materials and radio spots
UGANDA			
AMAKA (Adult Male Medical Circumcision in Kampala)	Social mobilization, research	Infectious Diseases Institute	Use of existing community resources and structures for demand creation
Be the Pride of Your Tribe campaign	Social mobilization, advocacy, research	STAR-E	VMMC campaign in traditionally circumcising communities
Makerere University Walter Reed Project	Social mobilization, advocacy, media, IPC, research	US Military HIV Research Programme	Use of cross-country learning to create VMMC demand and meet VMMC need
Stand Proud, Get Circumcised campaign	Research, messaging, social mobilization	Health Communication Partnership (HCP)	Use of research to inform communication strategy development and implementation, national tools with standardized branding and information to ensure consistency and recognition of VMMC but which can also be tailored to specific communities and contexts
Stylish Man campaign	Research, media, messaging, IPC	Rakai Health Sciences Program	Demedicalizing demand creation for VMMC
ZAMBIA			
Community mobilization	Social mobilization, IPC, media, engaging female partners	Marie Stopes International	Community mobilization, health counselor training, and local media
Community mobilization and campaigns	Social mobilization, research, ICT	Society for Family Health	Community mobilization through existing volunteer structures, mobile clinical outreach, client

TABLE (continued).

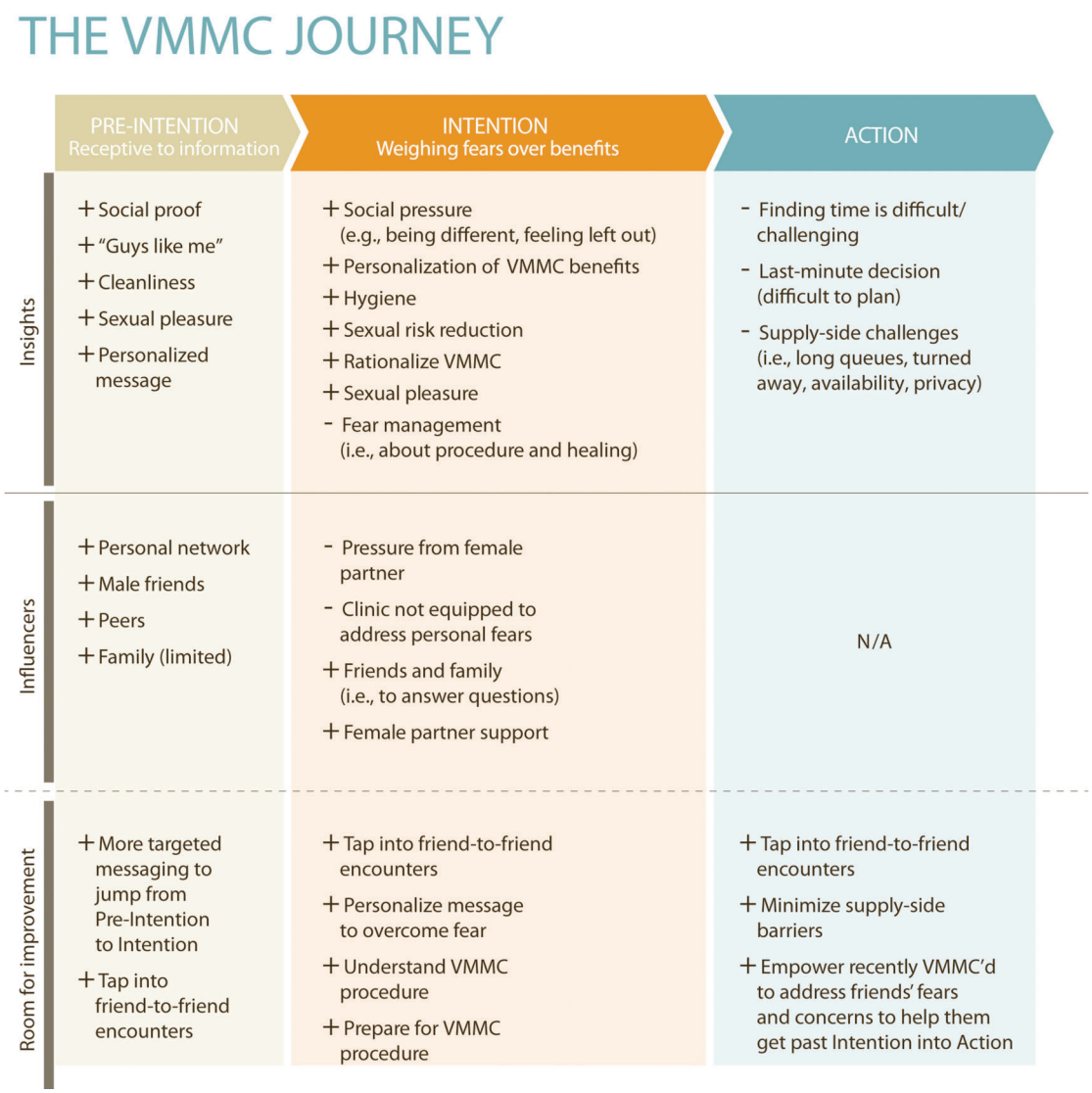
Country and Name/ Description of Intervention	Types of Interventions	Implementing Partner	Brief Description
			voucher/feedback system to disaggregate effective elements of demand creation, and toll-free family planning help lines incorporate VMMC
Mini campaigns and training	Social mobilization. IPC, media, advocacy	Jhpiego	Close linking of demand creation activities with supply, including mini campaigns to marry the two and emphasis on a positive client experience
National MC Month and technical working group	Mass media communication, advocacy, engaging tribal leaders, community mobilization, IPC	National technical working group	National and district-level coordination, advocacy by traditional leaders and public officials, thrice yearly MC drives and engagement with health workers
Safe Love campaign	Research, media, messaging, IPC, ICT, community mobilization	Communications Support for Health	Innovative multiplatform, multi-format content, use of SMS to move from contemplation to action
U Report SMS pilot	ICT, advocacy, community mobilization, IPC	United Nations Children's Fund (UNICEF)	SMS pilot for VMMC demand creation among adolescents and young adults
ZIMBABWE			
Identifying optimal messaging	Research, messaging	Battelle Health and Analytics	Qualitative and quantitative research to establish optimal messages to promote demand for VMMC
SMART campaign	Messaging, media, social mobilization, IPC	Population Services International (PSI)	Research-led message development for "SMART" campaign, management of social mobilization

Abbreviations: GIS, geographic information system; ICT, information and communications technology; IEC, information, education, and communication; IPC, interpersonal communication; MC, male circumcision; SMS, short message service (text message); VMMC, voluntary medical male circumcision.

address the supply-side issues that prevent many males interested in VMMC from accessing it.

Overall, most formative research studies fall short in two ways. First, there is growing acknowledgment that psychographic variables such as attitudes, perceptions, aspirations, emotions, biases, and mental models play a very important role in decision making: most decisions are not rational.[24] However, the studies we reviewed were not designed to uncover such variables. Second, given the heterogeneity of VMMC's target population and the people and institutions that may influence these populations, generalized results from acceptability studies are likely insufficient for designing strategies to reach members of a specific sub-population with compelling information that meets them "where they are." It is this failure to understand the precise needs and concerns of segmented sub-populations of males, and to design interventions and messaging accordingly, that likely accounts for the significant

FIGURE 2. Behavior Change Continuum for Voluntary Medical Male Circumcision (VMMC), Based on Insights from VMMC Program in Zimbabwe



Key: +, motivators; –, barriers.

gap between interest in VMMC and actual uptake of the procedure.

Intervention Design

Our analysis identified different demand generation interventions used by VMMC priority countries to address the barriers and facilitators to VMMC identified in acceptability studies. The interventions included[5]:

- Advocacy with community leaders (political, traditional, or religious) and through existing community structures
- Community mobilization, including engagement of women

- Interpersonal communication (IPC) through community mobilizers
- Mid- and mass media campaigns
- Use of information and communications (ICT) technologies

Many interventions combined different techniques and approaches, which were likely to be more effective the more closely they were aligned with one another. However, most interventions have not yet been formally evaluated. Box 1 provides a summary of the key promising practices.

Many countries have found that **engaging with traditional leaders** can provide reassurance to VMMC candidates that being circumcised will not change their ethnic, religious, or cultural identity. In Malawi, early and ongoing engagement with leaders of traditionally non-circumcising communities has been instrumental in mobilizing community-level support for the VMMC program and in encouraging males to undergo circumcision.[25] In eastern Uganda, safe male circumcision was promoted among traditionally circumcising communities through the "Be the Pride of Your Tribe" campaign, which engaged religious and tribal leaders as well as health care providers.[26]

The deployment of **community mobilizers** to undertake one-on-one messaging with prospective clients has been one of the most consistently employed and effective strategies across the region.[5] This kind of IPC allows men who may be contemplating the procedure to ask questions specific to their own concerns in privacy. It works best when mobilizers use a standardized, comprehensive discussion guide and package of information.[27] In South Africa, training, strong management oversight, and a collective incentive structure strengthened the effectiveness of community mobilizers.[28] In Malawi, satisfied clients have been employed as mobilizers.[29] In Kenya, the Impact Research and Development Organization (IRDO) produced an IPC toolkit to support counselors in conveying information tailored to the individual's stage in the decision-making process.[30] In Zambia, Society for Family Health (SFH) has used the community engagement methodology of education through listening, which emphasizes the need to draw out and address individual barriers.[31] Counseling women on the benefits of VMMC is recognized as an important facilitator of VMMC uptake in most of the priority countries, and the Kenya program has gone a step further in using married women to educate other women and couples about VMMC in women's groups, antenatal clinics, and other health care settings.[32]

Deployment of community mobilizers to address men's individual concerns has been one of the most effective VMMC strategies.

Early engagement with leaders of traditionally non-circumcising communities in Malawi has been key to mobilizing VMMC support.

BOX 1. Promising Practices for Voluntary Medical Male Circumcision (VMMC) Demand Generation

- **Tailoring messages carefully to the audience.** Find the most appropriate message for the demographic—and for the individual's place on the continuum of pre-intention, intention, and action behavior change stages.
- **Reaching out to traditional leaders.** Tribal and religious leaders can change an existing norm, give reassurance, and lend authority to a program.
- **Using mobilizers.** Interpersonal communication can address the client's individual concerns.
- **Targeting women as an audience for messaging and using them as change agents.** Women (wives, girlfriends, and mothers) can be change agents; the protective benefits of VMMC are important to them, too.
- **Appealing to reasons/motivations other than HIV prevention.** Men's motivations to get circumcised may be other than protection for HIV; more near-term benefits such as protection from STIs might be more relevant, and VMMC may be seen as "modern" or aspirational. The appeal of belonging to a group can also be persuasive.
- **Packaging VMMC with other interventions.** Men undergoing HIV testing and counseling, or women receiving treatment for prevention of mother-to-child transmission of HIV, may be open to a VMMC referral.
- **Using new technologies.** Messaging delivered via the Internet, social media, and mobile phones should be part of the mix along with traditional media.

Many men are more likely to consider VMMC for other reasons besides HIV prevention.

Media work has included training Kenyan journalists to report accurately on the science behind VMMC[33]; use of radio magazine broadcasts in Zambia incorporating key messaging on VMMC[34]; and radio spots and print materials tailored to different regions of Tanzania, featuring the voices of "satisfied customers" and local health experts.[35] Generally, implementers working through the media have sought more resources to roll out campaigns and to achieve greater coverage. In Malawi, campaigns were ramped up to correspond to periods of increased supply[29]; elsewhere, mobile vans have been used to meet increasing demand.[36] In Tanzania, a program uses a geographic information system (GIS) to map its VMMC activities, including the location of facilities and infrastructure, to help determine where to conduct demand generation activities and to identify unreached populations.[37]

These examples show that implementers have acted on several behavioral determinants to drive demand for VMMC, but the analysis of these determinants in the planning stage has not always been rigorous. Ideally, interventions should incorporate formative research during the design phase to understand the cognitive and social barriers and motivators to undertaking VMMC. In Zimbabwe, for example, Population Services International (PSI) conducted such research through in-depth interviews as opposed to focus groups, arguing that interviews deliver a deeper, more truthful insight into these barriers and motivators than focus groups.[13,27] PSI also conducted a TRaC (Tracking Results Continuously, a multi-round survey-based research approach) study in Zimbabwe, which segmented respondents according to their stage in the decision-making process.[13,27] Media outputs should be pretested, and interventions should be continually evaluated once implementation is underway to enable course correction and to develop a clear evidence base to support scale-up.

National branding of VMMC should be combined with tailored messaging for different groups of males.

There are other ways in which intervention design has fallen short. First, many country programs have attempted to reach all audiences with a standard set of promotional materials and to apply general messaging in all demand generation activities. While it is vital to try to achieve scale at the national level, this "one-size-fits-all" approach fails to recognize the difference in attitudes, knowledge, and favored communication channels of, for example, a rural Kenyan schoolboy compared with a professional man in the capital city of Nairobi. It is entirely possible to reach large numbers of people with a single brand identity while targeting and tailoring communications to specific groups within that brand.

Second, most demand generation messaging has focused on the programmatic and public health imperatives of VMMC, emphasizing prevention of HIV and other STIs,[38] rather than the values, perceived needs, and aspirations of men. While many VMMC clients may understand the protective benefits of circumcision (which should continue to be explained in counseling sessions before the procedure), they are more likely to consider VMMC for other reasons, including hygiene, pleasing a sexual partner, and conforming to peer norms.[39] The Rakai Health Sciences Program has been conducting safe male circumcision in Uganda since 2003 but experienced a demand plateau in 2013. Research suggested that the protective benefits were well understood by men and that future campaigns could overcome that plateau by presenting VMMC as an aspirational procedure.[40]

Third, programs have often been rolled out individually to address specific barriers to demand, rather than forming part of a package of interventions that holistically address all the touch-points along the behavior change continuum for VMMC. PSI's work in Zimbabwe is a good example of how IPC can be deployed as an effective supplement to mass media interventions: the media element supports development of supportive social norms and sparks private conversations with social mobilizers, religious and community leaders, partners, and peers that could result in a decision to undertake VMMC.[27] In South Africa, the Centre for HIV and AIDS Prevention Studies (CHAPS) regards the quality of the service itself as a crucial touch-point. To illustrate, a client who attends a VMMC clinic has already made the decision to undertake VMMC, but his experience at the clinic will inform whether he recommends the procedure to his peers.[41]

Finally, many programs would benefit from paying more attention to the value of discussion, as opposed to direct messaging, in driving the development of supportive social norms around VMMC. Discussion between prospective clients and counselors or peers is already proving effective in addressing individual concerns and questions a client may have about the procedure, but the media may also have a role to play in sparking or providing a space for audiences to engage in public discussion about VMMC.[42] For

example, in India, where people were embarrassed to say the word condom, a condom normalization campaign humorously encouraged people to shout it in public.[43]

Implementation and Coordination to Achieve Scale

As with most health interventions, plans for VMMC scale-up generally have discounted demand-side challenges.[2,44] Regional and national VMMC strategies have set targets based on epidemiologic considerations, rather than on demand forecasts or other feasibility considerations, even where these constraints are acknowledged.[2] Few national VMMC operational plans have developed comprehensive demand-side strategies based on current data.[45,46] There is insufficient understanding of the proportion of program funds needed for demand generation and how this may vary for easy- versus hard-to-reach populations.[47] Demand generation is frequently perceived as expensive, even though evidence from VMMC and other public health programs suggests that up-front investment in demand generation activities gradually reduces the cost per service provided by fueling higher sustained volume and thus greater efficiency.[48,49] In fact, clinical service volume creates more variability in VMMC unit costs than any other variable.[50,51] But promising interventions have not always been implemented at scale, thereby diminishing their potential impact.[7]

Demand generation interventions, particularly those employing mass media communications, can reach far beyond a service catchment area, necessitating intensive coordination to ensure activities are mutually reinforced across sites and implementers—that is, that they disseminate consistent and complementary messaging, enable efficient client referrals, and reach but do not oversaturate crucial stakeholders and priority audiences. Ideally, national VMMC operational plans would assign the geographic focus, roles, and responsibilities of demand generation partners and identify standing coordination mechanisms to ensure programs remain aligned as the demand generation strategies evolve. Kenya has such a mechanism in place: the National AIDS & STI Control Programme (NASCOP) convenes quarterly meetings with national and provincial VMMC implementing partners to coordinate their efforts and plan joint initiatives. In addition, a Male Circumcision Consortium provides technical support to NASCOP to enhance coordination and quality assurance.[52]

Measurement, Learning, and Evaluation

Evaluation of VMMC demand generation programs is essential, but few interventions have been evaluated for effectiveness, and fewer still for cost-effectiveness. In Zimbabwe, a cluster randomized controlled trial (RCT) tested the effectiveness of the "Male Circumcision Uptake Through Soccer" program, in which soccer teams were randomized to a brief VMMC education and motivation intervention.[53] Those receiving the intervention were relatively more likely to take up VMMC, although the absolute effect was small. In Kenya, an RCT found that conditional economic compensation (in the form of food vouchers) to address reported economic barriers to VMMC uptake led to a modest increase in circumcision coverage among men aged 25–49 years.[54] Five other interventions that explore the use of incentives, advertising, and ICT platforms have been evaluated (publication of results is pending).[55] Nevertheless, there is a need for systematic evaluation to be consistently included in demand generation programs, including evaluating a package of interventions for their collective effectiveness.

Few national VMMC operational plans have developed comprehensive demand-side strategies.

Equally important is the ability to monitor the performance and cost of demand generation interventions as they are being introduced and scaled-up, using key performance indicators to assess strategies and inform the program throughout its course. Typically, programs have judged the performance of demand generation interventions by assessing VMMC outputs (i.e., the number of men circumcised). However, this is an unreliable approach since multiple demand- and supply-side variables contribute to these results, making it difficult to judge the performance of a specific factor. In a study in Zambia, 17 of 40 interviewed men noted they had had 1 to 4 failed prior attempts to get circumcised, suggesting significant supply-side issues creating unmet need.[23]

DISCUSSION

While relatively few VMMC demand generation programs have been formally evaluated, our research identified key approaches that we believe will make interventions more effective and cost-effective. These approaches are summarized in Box 2 and described

BOX 2. Recommendations for an Innovative and Systematic Approach to VMMC Demand Generation

- **Measure demand and set appropriate targets.** Supplement existing research with fresh assessments where needed; ensure that targets take into account supply-side capacities.
- **Place the customer at the center of the campaign.** Segment target audiences by psychographic variables as well as demographic ones, and tailor strategies to each audience.
- **Take a multidisciplinary approach.** Tap into disciplines beyond public health such as behavioral economics, the science of decision making, private-sector market research methods, and network analyses.
- **Design and test interventions.** Use formative research; test effectiveness of interventions; adjust as needed based on data before scaling-up.
- **Apply a comprehensive demand generation strategy.** Use multiple messages, channels, and approaches, coordinated to be mutually reinforcing.
- **Invest in data monitoring systems.** Ensure there is real-time and more proximal feedback on intervention outputs.
- **Strengthen program management.** Analyze the cost of demand generation activities, and advocate increased funding to take effective interventions to scale.
- **Ensure coordination between donors, governments, and implementing partners.** Avoid a patchwork of initiatives: ensure that interventions are consistent and complementary and that roles and responsibilities allow partners to contribute from their core areas of expertise.

in detail below in terms of the framework for VMMC demand generation.

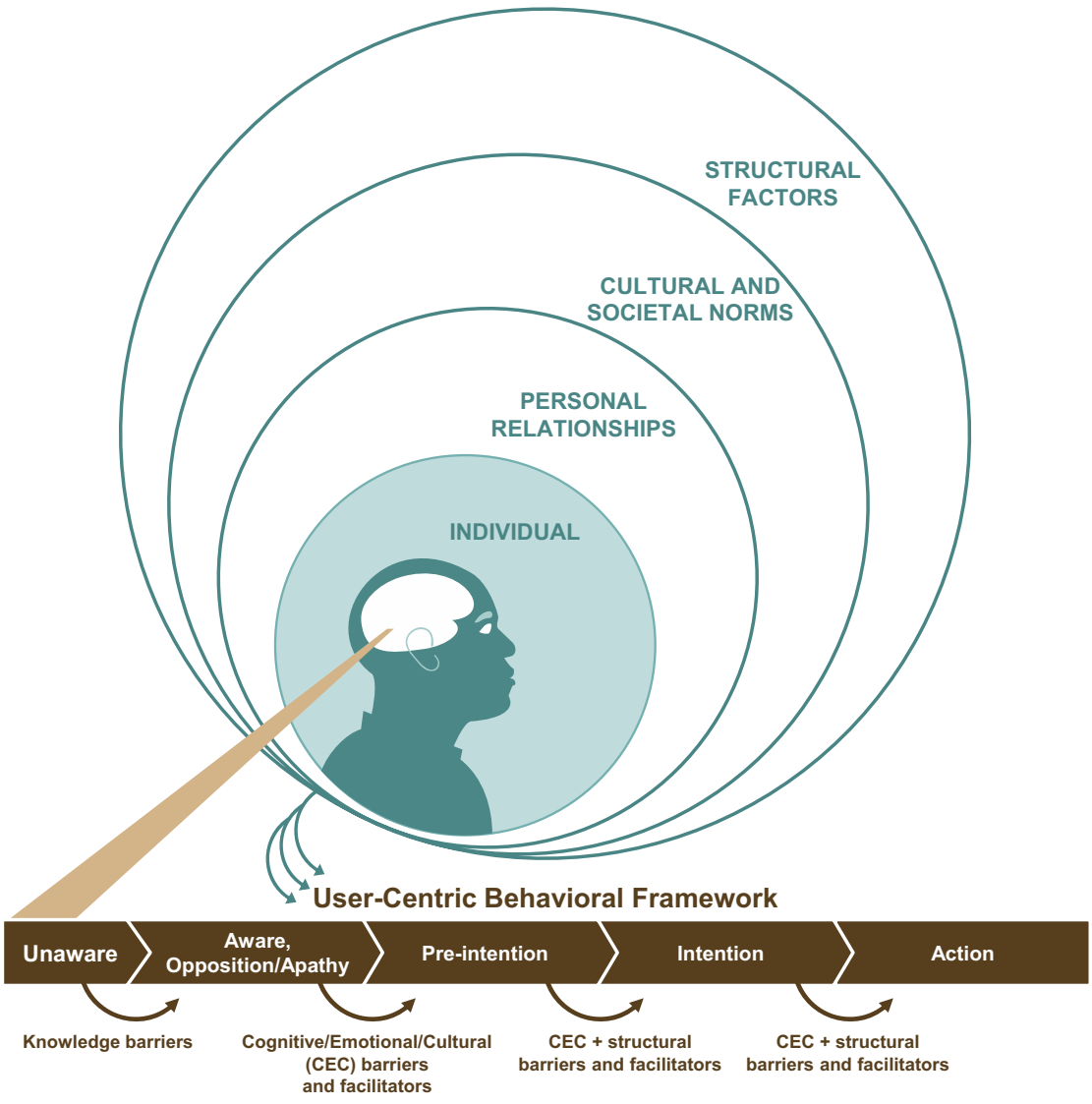
Insight Development: Borrow Behavior Change Theories and Tools From Other Disciplines to Understand Demand More Systematically

In addition to stage models of behavior change,[8–11,56,57] a socio-ecological model can provide insight into the individual and interpersonal factors, community and organizational influences, and public policies that shape behaviors.[58–60] Some implementing partners use one or more of these models, but blending these into a single behavioral framework can unify, systematize, and strengthen the behavior change strategy. A "user-centric" framework, such as the illustrative example in Figure 3, describes the steps in a typical client's progression to changed behavior, with a focus on the individual's perceived VMMC values and needs. At each step, internal factors (e.g., cognitive and emotional) as well as environmental ones (e.g., cultural and ethical factors or issues around service delivery) influence the individual's immediate needs and wants, which, in turn, govern subsequent actions.

While stage and socio-ecological models of behavior change typically underpin social and behavior change communication, we can open the door to a wider range of novel, effective, and efficient demand generation interventions by borrowing formative research tools from disciplines outside classic public health communication. Specifically, research into decision making and behavioral economics reveals a myriad of factors—biological, cognitive (conscious and subconscious), social, cultural, and economic—that drive decision making.[61,62] For example, in rural Rajasthan, India, families were deterred from completing the full immunization schedule for their children by high transportation costs and wage loss. Offering small non-cash incentives (raw lentils and metal plates) proved considerably more effective than simply improving the reliability of services.[63] In Vietnam, social norms were identified as one of the barriers to initiation of early and exclusive breastfeeding.[64]

Commercial marketing takes a systematic, evidence-driven approach to identifying and fulfilling consumer needs and aspirations.[65] Key insights, identified through qualitative and quantitative market research, measure and prioritize market opportunities.[66–68] This translates to the public health field, where, for example, individual adults' acceptance of influenza vaccine has been found to be correlated with positive community

FIGURE 3. User-Centric Behavioral Framework for Voluntary Medical Male Circumcision



attitudes, as well as with the individual having previously had a flu shot; this can enable officials to identify potential markets for flu vaccination and target them with appropriate messaging.[69] Potential customers can be segmented and prioritized according to their values, opinions, attitudes, interests, and lifestyles.[70] Similarly, market research into demand for VMMC can offer an evidence-based understanding of how men progress through the stages of awareness, interest, preparation, and action (Figure 3).

Intervention Design: Consider Evidence From Insight Development to Develop Effective Interventions

It is important that programs consider evidence about cognitive, emotional, cultural, and structural barriers to VMMC to develop and fine-tune their intervention strategies. Knowledge gained from the insight development phase can reveal the best platforms and channels for delivering the right message in the right way and at the right time. For example, the word of traditional leaders

is extremely powerful in some communities. Effective platforms may also include mass and mid-media, IPC, social media, and other new technologies. IPC needs to be localized and personalized. With a strong emphasis on training, management, and use of data, IPC platforms can be scaled-up effectively, even in large, far-flung programs. Tailored training of community mobilizers and other IPC agents can enable them to better share information about VMMC with diverse population segments.[71,72] For example, the Avahan HIV prevention program in India found that illiterate sex workers, when mobilized as peer outreach workers, were able to track the number and content of their meetings with their outreach contacts via tools that used symbols and stickers, when trained to use them in a standardized manner.[73] We can envisage simple, research-based tools that would enable community mobilizers to identify a man's precise position along the VMMC behavior change continuum (Figure 3) on the basis of a small number of screening questions. The community mobilizer could then use IPC tools (scripts, questions, discussion points, etc.) to address the barriers relevant to the man at that time and to strengthen triggers for positive action. The experience of Kenya provides an example of how a country has used evidence to inform its demand generation activities, which evolved over the course of the program to address specific subgroups of the population (Box 3).

Messaging often emphasizes HIV prevention as the primary benefit of VMMC, while at the same time communicating that the procedure provides only partial protection against HIV.[26] Successful advertising positions the product or service in a way that resonates with the prospective customer rather than communicating only the most obvious features. For example, research found that anti-smoking campaigns targeting youth were most effective if the messages did not emphasize the negative long-term effects of smoking, but rather the deceptive promotional practices of cigarette manufacturers and the effects of secondhand smoke on others.[74] Given that HIV prevention—the public health goal of VMMC—may not be the highest priority or most attractive benefit of the procedure for most males, it is important to consider positioning and messaging VMMC in ways that move beyond HIV.

Word-of-mouth recommendations for VMMC influence men's decisions, thus emphasizing the need for high-quality services.

Implementation experience supported by the literature shows that clients frequently cite word-of-mouth as influential in their decision to seek VMMC.[75,76] This underscores the importance of ensuring that clients are well cared for throughout their VMMC experience. Technical excellence provided in an environment that fosters trust, affirmation, and respect increases client satisfaction and makes it more likely that early adopters will encourage their peers to opt for VMMC, in line with the theory of diffusion of innovation.[77] Ensuring that services are not just available and accessible but also acceptable (i.e., staff are respectful and have a good bedside manner, and counseling is honest and appropriate) may help to drive demand. Maintaining customer-service standards for all facility staff providing VMMC may help generate consistently favorable client narratives about the VMMC experience. Intervention design must also take into account supply,[23] so that the service is available and accessible to men who are persuaded by the demand generation activity.

Implementation and Coordination to Achieve Scale: Foster a Coordinated Response

Demand interventions must be scaled strategically. In order to avoid mismatches between supply and demand, partners on both sides of the equation need to use data to drive their decisions, and they must coordinate their work.[1] Coordination minimizes confusion by ensuring that messaging is accurate, culturally appropriate, and not in contradiction with other VMMC messages likely to be encountered by the target population. Coordination between country governments and donors is also important to avoid duplication of activities and to solve infrastructure challenges. In the absence of a national VMMC operational plan, we recommend that countries establish alternative, ongoing national coordination mechanisms for all demand generation partners.

In some countries where seasonal demand is pronounced (e.g., demand is traditionally high during certain seasons of the year or campaigns during school holidays drive high uptake among adolescents), it may be necessary to change attitudes among providers as well as among the male population itself, so that resources are not underused for periods of the year, which drives up unit costs.[78]

Measurement, Learning, and Evaluation: Evolve the Strategy Over the Course of the VMMC Program

There are currently no standard methods for measuring demand for VMMC, but several possible avenues could be explored. Acceptability studies

can estimate the proportion of the population that is interested in VMMC and that can therefore potentially be persuaded easily to get circumcised, as well as the proportion that would need to be convinced first to change their minds about VMMC in order to reach the VMMC program target—what we refer to as the "interest deficit" (Figure 5). These subgroups will require different strategies in

BOX 3. Kenya Case Study: Using Evidence to Evolve VMMC Demand Generation Strategies

The Kenya VMMC program, which has achieved about 70% VMMC coverage, against its target of 80%, provides a good example of how programs should use evidence to inform their demand-side response and to evolve over the course of the program.

First, formative research identified a number of individual, interpersonal, cultural, and structural barriers to circumcision, and the program developed different interventions to address each of these barriers (Figure 4). One of the main barriers to circumcision was cultural—the Luo tribe was traditionally non-circumcising, differentiating the Luo from other tribes. Demand-side interventions in the early days of the VMMC program focused on working with the traditional leaders of the Luo community in Nyanza to build a strong enabling environment for the program and to address traditional barriers to uptake.

As these community-level barriers were broken, the program then focused on one-to-one promotion to address individual barriers (such as fear of pain) by deploying a massive and incentivized outreach campaign with community mobilizers. Journalist training and radio shows ensured a positive "noise" in the environment.

Currently in its final stage, the program focuses on interventions to reach the hardest-to-reach men (those over 25 years old and employed). Several studies have identified financial concerns, specifically lost wages from taking time off for surgery, as a barrier to VMMC uptake among this subgroup. An incentive-based demand creation strategy was therefore evaluated.[54] The study found that small amounts of fixed compensation in the form of food vouchers were effective in removing structural barriers for men who had already committed to getting circumcised. The national program is currently exploring scaling-up this intervention.

FIGURE 4. Addressing Barriers to Voluntary Medical Male Circumcision in Kenya: An Evidence-Based, 360°, Well-Coordinated, Evolving Approach

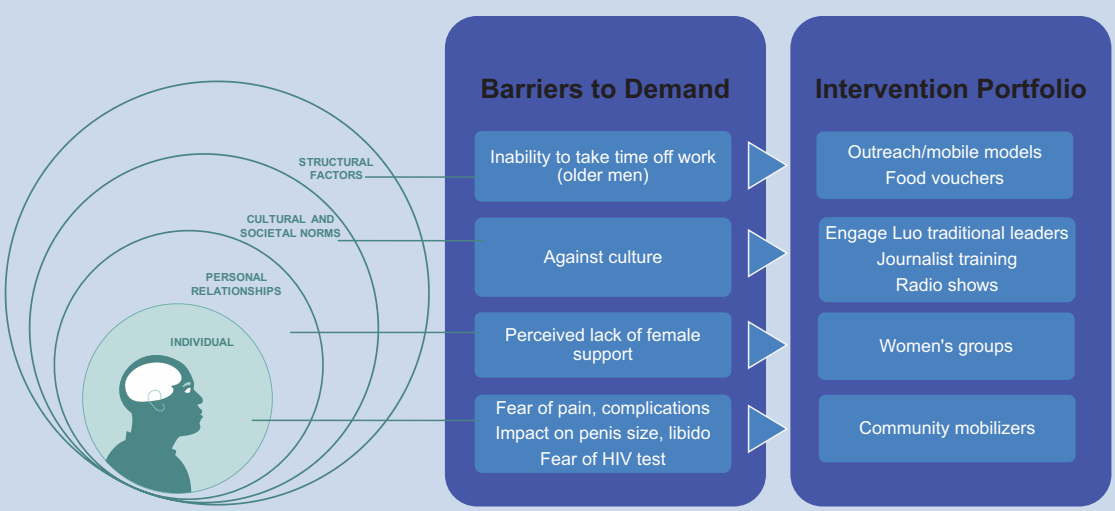
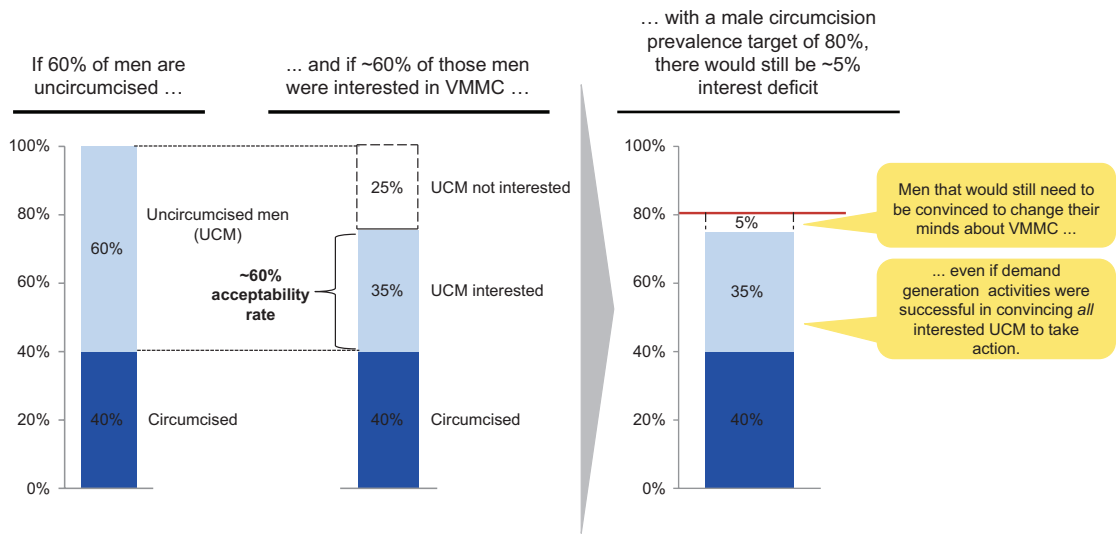


FIGURE 5. Identifying the "Interest Deficit" for Voluntary Medical Male Circumcision (VMMC)



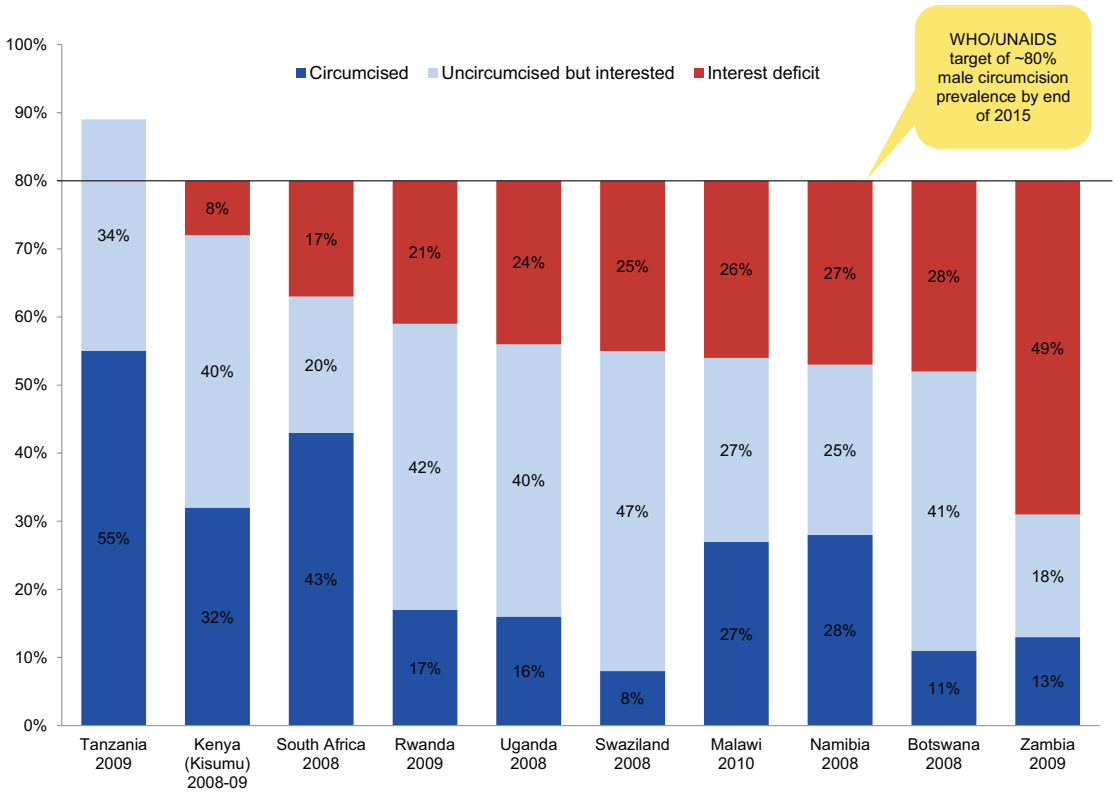
order to be persuaded. Our synthesis of findings from country-level studies between 2008 and 2010 indicates that the level of potential demand varies widely between countries, resulting in interest deficits ranging from 8% in Kisumu, Kenya, to 49% in Zambia (Figure 6). Ideally, market research tools should be used throughout the evolution of a VMMC program to measure interest and accurately track the changing proportions of the target population at each stage of the path toward choosing VMMC (Figure 2). Equipped with these objective data, stakeholders in each country can more accurately estimate demand for VMMC and set realistic demand generation goals.

Programs should develop and use intervention-specific indicators that can help monitor the performance of demand generation interventions well before they translate to the obvious VMMC output of circumcisions performed. For example, indicators should address such questions as: Is the intervention being implemented as designed? Is it reaching the targeted population? Could operations be more efficient? For a mass media campaign, for instance, this could include measuring exposure to and attitudes about the messages.[58]

Demand generation interventions must change over the course of a VMMC program to reflect evolving norms and preferences, with information continuously fed back into the program to identify needs for program refinement or course correction. An early adopter of VMMC may respond to different appeals than a member of the late majority. Similarly, as community knowledge and experience with VMMC increases, the information required to spur demand may change. At the outset of Kenya's VMMC program, for example, demand generation interventions engaged leaders of the traditionally non-circumcising Luo community in Nyanza to address traditional barriers to uptake and to build a strong enabling environment. As the community-level barriers were overcome, the program turned to individual barriers by way of a large-scale, incentivized, peer-led outreach campaign.[87]

Properly evaluating the effectiveness and cost-effectiveness of interventions can help programmers design and scale-up programs to achieve the best possible results. Many of the promising practices highlighted in this paper have not yet been evaluated, and we encourage all field practitioners to formally evaluate VMMC interventions targeting specific barriers and triggers of demand, both to know how well their programs are working and to strengthen the overall evidence base informing demand generation. We also encourage a clearer definition of what constitutes sufficient evidence of impact. While demonstrating attribution, especially through RCTs, has been the gold standard,[88] this can prove too conservative an approach in the context of VMMC. RCTs are of limited use in addressing behavior change interventions,[89] and given the

FIGURE 6. The "Interest Deficit" for Voluntary Medical Male Circumcision (VMMC) in Selected VMMC Priority Countries of Eastern and Southern Africa



Data (and age range) based on country studies: Tanzania (ages 18–44),[79] Kenya (ages 15–49),[80] South Africa (ages 15–49),[81] Rwanda (ages 15–59),[82] Uganda (ages 18–80),[83] Swaziland (ages 15–29),[84] Malawi (ages 15 and older),[85] Namibia (ages 15–29),[84] Botswana (ages 15–29),[84] Zambia (ages 15–59).[86]

complexity of the VMMC environment, most often no single intervention is likely to be able to tackle all barriers to demand. Therefore, consideration should be given to using mixed methods to evaluate effectiveness[90] and to judging "contribution" as a sufficient measure of effectiveness.

Studies highlight the paucity of data on the actual cost of demand generation activities.[1,47,48,91] We recommend building rigorous yet rapid impact evaluation of demand generation interventions into program implementation processes and tracking the cost of interventions more systematically and over the course of the program. This will help programs monitor how different levels of investment affect clinic volume and cost per circumcision performed.

The dynamic environment of VMMC demand sets a high bar for measurement, learning, and evaluation strategies. Nevertheless, national governments and donors can look to strategic measurement and evaluation as an investment that is likely to pay a quick dividend. More research into the effectiveness of demand generation interventions is urgently needed. The time and money spent in this often overlooked area can replace speculative demand generation with strategic interventions for greater effect and efficiency.

CONCLUSION

VMMC is key to achieving sustained declines in HIV incidence across eastern and southern Africa—a

region with the world's highest HIV prevalence. Averting infections, saving lives, and conserving financial and human resources that can be used to address other threats to public health is no longer a far-fetched prospect. The sooner VMMC goals are reached, the sooner countries can expect to enjoy the public health benefits this intervention offers. To get there, VMMC service delivery and demand generation must move forward in tandem. All stakeholders—governments, donors, implementing partners, and the private sector—must coordinate their work, not only to ensure demand for VMMC is balanced with supply but also to better tailor demand generation to the unique environment and circumstances of each country or region, thus ensuring successful programs.

Operations research points the way to more efficient and effective service delivery.[92–95] It is time to apply a similar approach to demand generation, so that promising practices can be identified, tested, adapted, scaled-up, evaluated, and continually renewed. National governments, working with donors and other partners, can look to the components of demand generation described in this paper—insight development, implementation design, implementation and coordination for scale, and measurement, learning, and evaluation—as foundations for their evidence-based strategy for increasing VMMC uptake. This multidisciplinary and systematic approach to demand generation offers benefits extending beyond HIV prevention to issues across the field of health promotion.

Acknowledgments: We would like to acknowledge all our colleagues within the national government agencies that oversee the VMMC program, as well as the implementing agencies, research organizations, and beneficiaries on the ground, without whom this work would not have been possible.

Competing Interests: None declared.

REFERENCES

1. Sgaier SK, Reed JB, Thomas A, Njeuhmeli E. Achieving the HIV prevention impact of voluntary medical male circumcision: lessons and challenges for managing programs. PLoS Med. 2014;11(5):e1001641. CrossRef. Medline
2. World Health Organization (WHO); Joint United Nations Programme on HIV/AIDS. (UNAIDS). Joint strategic action framework to accelerate the scale-up of voluntary medical male circumcision for HIV prevention in Eastern and Southern Africa, 2012–2016. Geneva: UNAIDS; 2011. Available from: http://www.who.int/hiv/pub/strategic_action2012_2016/en/
3. Njeuhmeli E, Forsythe S, Reed J, Opuni M, Bollinger L, Heard N, et al. Voluntary medical male circumcision: modeling the impact and cost of expanding male circumcision for HIV prevention in eastern and southern Africa. PLoS Med. 2011;8(11):e1001132. CrossRef. Medline
4. World Health Organization (WHO). Draft summary from WHO informal consultation on tetanus and voluntary medical male circumcision, 9–10 March 2015. Draft version 5.1. Geneva: WHO; 2015.
5. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Campaign materials from 'Creating Demand for VMMC' website [cited 2015 Apr 2]. Available from: https://www.malecircumcision.org/demand-creation/campaign-materials
6. Galdas PM, Cheater F, Marshall P. Men and health help-seeking behaviour: literature review. J Adv Nurs. 2005;49(6):616–623. CrossRef. Medline
7. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Eastern and Southern Africa Regional Meeting on Demand Creation for Voluntary Medical Male Circumcision, Lusaka, Zambia, April 3–5, 2013 [cited 2015 Jan 18]. Available from: http://www.malecircumcision.org/communication/Zambia_Regional_Meeting_April2013.html
8. Prochaska JO, DiClemente CC, Norcross JC. In search of how people change: applications to addictive behaviors. Am Psychol. 1992;47(9):1102–1114. CrossRef. Medline
9. Schwarzer R. Modeling health behavior change: How to predict and modify the adoption and maintenance of health behaviors. Appl Psychol Int Rev. 2008;57:1–29. CrossRef
10. Sutton S. Stage theories of health behaviour. In: Conner M, Norman P, editors. Predicting health behaviour: research and practice with social cognition models. 2nd ed. Maidenhead (UK): Open University Press; 2005.
11. Montaño DE, Kasprzyk D, Hamilton DT, Tshimanga M, Gorn G. Evidence-based identification of key beliefs explaining adult male circumcision motivation in Zimbabwe: targets for behavior change messaging. AIDS Behav. 2014;18(5):885–904. CrossRef. Medline
12. Macintyre K, Andrinopoulos K, Moses N, Bornstein M, Ochieng A, Peacock E, et al. Attitudes, perceptions and potential uptake of male circumcision among older men in Turkana County, Kenya using qualitative methods. PLoS One. 2014;9(5):e83998. CrossRef. Medline
13. Hatzold K, Mavhu W, Jasi P, Chatora K, Cowan FM, Taruberekera N, et al. Barriers and motivators to voluntary medical male circumcision uptake among different age groups of men in Zimbabwe: results from a mixed methods study. PLoS One. 2014;9(5):e85051. CrossRef. Medline
14. Ashengo TA, Hatzold K, Mahler H, Rock A, Kanagat N, Magalona S, et al. Voluntary medical male circumcision (VMMC) in Tanzania and Zimbabwe: service delivery intensity and modality and their influence on the age of clients. PLoS One. 2014;9(5):e83642. CrossRef. Medline
15. Djimeu Wouabe E. Scoping report on interventions for increasing the demand for voluntary medical male circumcision. Washington (DC): International Initiative for Impact Evaluation (3IE); 2013. Available from: www.3ieimpact.org/media/filer/2013/03/22/white_paper__vmmc.pdf
16. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Promising practices [cited 2015 Jan 18]. Available from: http://www.malecircumcision.org/communication/promising_practices.html
17. Westercamp N, Bailey RC. Acceptability of male circumcision for prevention of HIV/AIDS in sub-Saharan Africa: a review. AIDS Behav. 2007;11(3):341–355. CrossRef. Medline
18. Westercamp M, Agot KE, Ndinya-Achola J, Bailey RC. Circumcision preference among women and uncircumcised men prior to scale-up of male circumcision for HIV prevention in Kisumu, Kenya. AIDS Care. 2012;24(2):157–166. CrossRef. Medline

19. Simbayi L, Peltzer K, Onoya D. Prevalence and acceptability of male circumcision in South Africa. Presented at: 10th AIDS Impact Conference; 2011 Sep 12–15; Santa Fe, NM. Available from: www.hsrc.ac.za/en/research-outputs/ktree-doc/9974
20. Central Statistical Office (CSO) [Zambia]; Ministry of Health (MOH) [Zambia]; National HIV/AIDS/STI/TB Council [Zambia]; University of Zambia; MEASURE Evaluation. Zambia sexual behaviour survey 2009. Lusaka: CSO; 2010. Available from: http://www.cpc.unc.edu/measure/publications/tr-10-73
21. Wambura M, Mwanga J, Mosha J, Mshana G, Mosha F, Changaluc J. Situation analysis for male circumcision in Tanzania. Dar es-Salaam (Tanzania): National Institute for Medical Research (Mwanza) and Ministry of Health and Social Welfare; 2009.
22. Population Services International (PSI), Research and Metrics. Zimbabwe (2013): voluntary medical male circumcision TRaC study among men and women aged 15-49 years in Zimbabwe. Washington (DC): PSI; 2013.
23. Price JE, Phiri L, Mulenga D, Hewett PC, Topp SM, Shiliya N, et al. Behavior change pathways to voluntary medical male circumcision: narrative interviews with circumcision clients in Zambia. PLoS One. 2014;9(11):e111602. CrossRef. Medline
24. World Bank. World development report 2015: mind, society, and behavior. Washington (DC): World Bank; 2014. CrossRef
25. Malawi News Agency. Ngoni chiefs rise to the challenge, accept male circumcision in Malawi AIDS fight. 2012.
26. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Uganda: STAR-E: SMC campaign in traditionally circumcising communities "Be the Pride of Your Tribe" [cited 2015 Apr 24].
27. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Research led message development for "SMART" campaign and management of social mobilization (PSI Zimbabwe) [cited 2015 Jan 18].
28. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. South Africa: CareWorks [cited 2015 Jan 18].
29. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Lilongwe district VMMC scale-up (I-TECH, Malawi) [cited 2015 Jan 18].
30. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Kenya: IRDO, creating a demand creation toolkit [cited 2015 Apr 24].
31. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Zambia: SFH community mobilisation, mid media campaigns and national communications materials [cited 2015 Apr 24].
32. Internews. Women play increasing role in male circumcision programmes. Internews [Internet]. 2012 Jul 22 [cited 2015 Jan 18]. Available from: http://www.internews.org/our-stories/news/women-play-increasing-role-male-circumcision-programmes
33. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Training journalists to report accurately and fairly on VMMC (Internews, Kenya) [cited 2015 Jan 18].
34. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Zambia: communications support for health: mass and local media and civil society organisations [cited 2015 Jan 18].
35. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Tanzania JHU–CCP: printed materials and radio spots [cited 2015 Jan 18].
36. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Uganda: Makerere University Walter Reed Project (MUWRP): using cross-country learning to develop new technologies to create SMC demand and meet SMC needs [cited 2015 Jan 18].
37. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Tanzania: Jhpiego Tanzania: community mobilization for "older men" and use of SMS and GIS technology [cited 2015 Jan 18].
38. RTI International; Population Services International (PSI); US Centers for Disease Control and Prevention (CDC). Voluntary medical male circumcision (VMMC) demand creation toolkit. Washington (DC): US President's Emergency Plan for AIDS Relief (PEPFAR); [200?]. Available from: http://www.thehealthcompass.org/sites/default/files/strengthening_tools/VMMC_Demand%20Creation%20ToolkitFINAL%20PEPFAR%20APPROVED.pdf
39. Lissouba P, Taljaard D, Rech D, et al. Adult male circumcision as an intervention against HIV: An operational study of uptake in a South African community (ANRS 12126). BMC Infect Dis. 2011;11(1):253. CrossRef. Medline
40. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Uganda: Rakai "Stylish Man" Campaign: combining traditional and new approaches to demand creation for safe male circumcision (SMC) [cited 2015 Apr 24].
41. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. South Africa: the Centre for HIV/AIDS Prevention Studies (CHAPS) [cited 2015 Apr 24].
42. van den Putte B, Yzer M, Southwell BG, de Bruijn GJ, Willemsen MC. Interpersonal communication as an indirect pathway for the effect of antismoking media content on smoking cessation. J Health Commun. 2011;16(5):470–485. CrossRef. Medline
43. Frank LB, Chatterjee JS, Chaudhuri ST, Lapsansky C, Bhanot A, Murphy ST. Conversation and compliance: role of interpersonal discussion and social norms in public communication campaigns. J Health Commun. 2012;17(9):1050–1067. CrossRef. Medline
44. Ensor T, Cooper S. Overcoming barriers to health service access: influencing the demand side. Health Policy Plan. 2004;19(2): 69–79. CrossRef. Medline
45. Ministry of Public Health & Sanitation [Kenya]. Kenya national strategy for voluntary medical male circumcision. Nairobi: National AIDS & STD Control Programme; 2009.
46. Ministry of Health [Zambia]. Operational plan for the scale-up of voluntary medical male circumcision in Zambia 2012–2015. Lusaka: Ministry of Health; 2012.
47. Bertrand JT, Njeuhmeli E, Forsythe S, Mattison SK, Mahler H, Hankins CA. Voluntary medical male circumcision: a qualitative study exploring the challenges of costing demand creation in eastern and southern Africa. PLoS One. 2011;6(11):e27562. CrossRef. Medline
48. Chandrashekar S, Guinness L, Kumaranayake L, Reddy B, Govindraj Y, Vickerman P, et al. The effects of scale on the costs of targeted HIV prevention interventions among female and male sex workers, men who have sex with men and transgenders in India. Sex Transm Infect. 2010;86 Suppl 1:i89–i94. CrossRef. Medline
49. Vassal A, Chandrashekar S, Pickles M, et al. Towards a comprehensive approach to HIV prevention for female sex workers: the cost effectiveness of community mobilization and

empowerment interventions for female sex workers in Southern India. PLoS Med. Under review.

50. Bollinger L, Adesina A, Forsythe S, Godbole R, Reuben E, Njeuhmeli E. Cost drivers for voluntary medical male circumcision using primary source data from sub-Saharan Africa. PLoS One. 2014;9(5):e84701. CrossRef. Medline
51. Menon V, Gold E, Godbole R, Castor D, Mahler H, Forsythe S, et al. Costs and impacts of scaling up voluntary medical male circumcision in Tanzania. PLoS One. 2014;9(5):e83925. CrossRef. Medline
52. Clearinghouse on Male Circumcision for HIV Prevention [Internet]. New York: AIDS Vaccine Advocacy Coalition; c2015. Kenya: NASCOP & MCC, national and provincial coordination in Kenya [cited 2015 Jan 18].
53. Kaufman ZA, DeCelles J, Bhauti K, Weiss HA, Hatzold K, Chaibva C, et al. A sport-based intervention to increase uptake of voluntary medical male circumcision among adult male football players: results from a cluster-randomised trial in Bulawayo, Zimbabwe. Poster presented at: 20th International AIDS Conference, Melbourne, Australia; 2014 Jul 20-25. Available from: http://pag.aids2014.org/Abstracts.aspx?AID=5834
54. Thirumurthy H, Masters SH, Rao S, Bronson MA, Lanham M, Omanga E, et al. Effect of providing conditional economic compensation on uptake of voluntary medical male circumcision in Kenya: a randomized clinical trial. JAMA. 2014;312(7):703–711. CrossRef. Medline
55. International Initiative for Impact Evaluation (3ie) [Internet]. New Delhi (India): 3ie; c2012. Thematic window 3 award winners [cited 2015 Jan 18]. Available from: http://www.3ieimpact.org/en/funding/thematic-window/thematic-window-3-voluntary-male-medical-circumcision/thematic-window-3-award-winners/
56. Rosenstock IM. The health belief model and preventive health behavior. Health Educ Behav. 1974;2:354–386.
57. de Vries H, Dijkstra M, Kuhlman P. Self-efficacy: the third factor besides attitude and subjective norm as a predictor of behavioural intentions. Health Educ Res. 1988;3(3):273–282. CrossRef
58. McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs.Health Educ Behav. 1988;15(4):351–377. CrossRef. Medline
59. Stokols D. Translating social ecological theory into guidelines for community health promotion. Am J Health Promot. 1996;10(4):282–298. CrossRef. Medline
60. Richard L, Potvin L, Kishchuk N, Prlic H, Green LW. Assessment of the integration of the ecological approach in health promotion programs. Am J Health Promot. 1996;10(4):318–328. CrossRef. Medline
61. Iyengar S. The art of choosing. New York: Twelve; 2010.
62. Camerer CF, Loewenstein G. Behavioral economics: past, present, future. In: Camerer CF, Loewenstein G, Rabin M, editors. Advances in behavioral economics. Princeton (NJ): Princeton University Press; 2004.
63. Banerjee AV, Duflo E, Glennerster R, Kothari D. Improving immunisation coverage in rural India: clustered randomised controlled evaluation of immunisation campaigns with and without incentives. BMJ. 2010;340:c2220. CrossRef. Medline
64. Creative for Good [Internet]. Geneva: World Economic Forum. Jimerson A. Talking babies for breastfeeding (Vietnam); [cited 2015 Apr 2]. Available from http://www.weforum.org/best-practices/creative-good/talking-babies-breastfeeding-vietnam
65. Hawkins DI, Mothersbaugh D. Consumer behavior: building marketing strategy. 11th ed. New York: McGraw-Hill/Irwin; 2010.
66. McDonald M. Marketing plans: how to prepare them, how to use them. 6th ed. Oxford: Butterworth-Heinemann; 2007.
67. Janiszewska K, Insch A. The strategic importance of brand positioning in the place brand concept: elements, structure and application capabilities. J Int Stud. 2012;5(1):9–19. CrossRef
68. Malhotra N, Peterson M, Kleiser SB. Marketing research: a state-of-the-art review and directions for the twenty-first century. J Acad Market Science. 1999;27(2):160–83. CrossRef
69. Frew PM, Painter JE, Hixson B, Kulb C, Moore K, del Rio C, et al. Factors mediating seasonal and influenza A (H1N1) vaccine acceptance among ethnically diverse populations in the urban south. Vaccine. 2012;30(28):4200–4208. CrossRef. Medline
70. Geeroms N. Towards a better understanding of motivational consumer behavior: cross-validation, construct validation and application of a psychological taxonomy of consumer motives. Ghent (Belgium): Ghent University; 2007.
71. Nieuwoudt S, Frade S, Rech D, Taljaard D. Uncovering the dirt on demand creation for medical circumcision. Johannesburg (South Africa): Centre for HIV and AIDS Prevention Study (CHAPS); 2012.
72. Ananya [Internet]. New Delhi: BBC Media Action. Mobile Kunji [cited 2015 Jan 18]. Available from: http://www.rethink1000days.org/programme-outputs/mobile-kunji/
73. Bill & Melinda Gates Foundation. Managing HIV prevention from the ground up: Avahan's experience with peer led outreach at scale in India. New Delhi: The Foundation; 2009. Available from: https://docs.gatesfoundation.org/Documents/peer-led-outreach.pdf
74. Pechmann C, Reibling ET. Anti-smoking advertising campaigns targeting youth: case studies from USA and Canada. Tob Control. 2000;9 Suppl 2:II18–31. CrossRef. Medline
75. Nielsen Newswire [Internet]. New York: Nielsen; c2015. Why word-of-mouth is loudest in Africa. 2013 Apr 3 [cited 2015 Jan 18]. Available from: http://www.nielsen.com/us/en/newswire/2013/why-word-of-mouth-is-loudest-in-africa.html
76. Galukande M, Sekavuga DB, Duffy K, Wooding N, Rackara S, Nakaggwa F, et al. Mass safe male circumcision: early lessons from a Ugandan urban site - a case study. Pan Afr Med J. 2012;13:88. Medline
77. Rogers E. Diffusion of Innovations. 5th ed. New York: Free Press; 2003.
78. Gold E, Mahler H, Boyee D. Overcoming seasonality in scaling up voluntary medical male circumcision: a case study from Tanzania. Arlington (VA): Strengthening High Impact Interventions for an AIDS-free Generation (AIDSFree) Project; 2015. Available from: http://www.healthcommcapacity.org/wp-content/uploads/2015/02/Tanzania-Seasonality.pdf
79. Wambura M, Mwanga J, Mosha J, Mshana G, Mosha F, Changalucha J. Situation analysis for male circumcision in Tanzania: final report. Mwanza (Tanzania): National Institute for Medical Research [Tanzania]; 2009. Co-published by Ministry of Health and Social Welfare [Tanzania].
80. Westercamp M, Agot KE, Ndinya-Achola J, Bailey RC. Circumcision preference among women and uncircumcised men prior to scale-up of male circumcision for HIV prevention in Kisumu, Kenya. AIDS Care. 2012;24(2):157–166. CrossRef. Medline
81. Peltzer K, Onoya D, Makonko E, Simbayi L. Prevalence and acceptability of male circumcision in South Africa. Afr J Tradit Complement Altern Med. 2014;11(4):126–130. Medline
82. Gasasira RA, Sarker M, Tsague L, Nsanzimana S, Gwiza A, Mbabazi J, et al. Determinants of circumcision and willingness to be circumcised by Rwandan men, 2010. BMC Public Health. 2012;12:134. CrossRef. Medline
83. Albert LM, Akol A, L'Engle K, Tolley EE, Ramirez CB, Opio A, et al. Acceptability of male circumcision for prevention of HIV infection among men and women in Uganda. AIDS Care. 2011;23(12):1578–1585. CrossRef. Medline

84. Andersson N, Cockcroft A. Male circumcision, attitudes to HIV prevention and HIV status: a cross-sectional study in Botswana, Namibia and Swaziland. AIDS Care. 2012;24(3):301–309. CrossRef. Medline

85. Bengo JM, Chalulu K, Chinkhumba J, Kazembe L, Maleta KM, Masiye F, et al. Situation analysis of male circumcision in Malawi: a report prepared by the College of Medicine. Blantyre (Malawi): University of Malawi College of Medicine; 2010. Available from: http://www.researchgate.net/profile/Joseph_Mfutso-Bengo/publication/262062700_Final_report_for_the_Situation_analysis_of_Male_circumcision/links/0c9605368c21ca2f81000000

86. Central Statistical Office (CSO) [Zambia]; Ministry of Health [Zambia]; University of Zambia; MEASURE Evaluation. Zambia sexual behaviour survey 2009. Lusaka (Zambia): CSO; 2009. Co-published by MEASURE Evaluation. Available from: http://www.cpc.unc.edu/measure/publications/tr-10-73

87. Mwandi Z, Murphy A, Reed J, Chesang K, Njeuhmeli E, Agot K, et al. Voluntary medical male circumcision: translating research into the rapid expansion of services in Kenya, 2008-2011. PLoS Med. 2011;8(11):e1001130. CrossRef. Medline

88. Padian NS, McCoy SI, Balkus JE, Wasserheit JN. Weighing the gold in the gold standard: challenges in HIV prevention research. AIDS. 2010;24(5):621–635. CrossRef. Medline

89. Over M. Achieving an AIDS transition: preventing infections to sustain treatment. Washington (DC): Center for Global Development; 2001. Available from: http://www.cgdev.org/publication/9781933286389-achieving-aids-transition-preventing-infections-sustain-treatment

90. Greene JC, Caracelli VJ, Graham WF. Toward a conceptual framework for mixed-method evaluation designs. Educ Eval Policy Anal. 1989;11(3):255–274. CrossRef

91. Njeuhmeli E, Kripke K, Hatzold K, Reed J, Edgil D, Jaramillo J, et al. Cost analysis of integrating the PrePex medical device into a voluntary medical male circumcision program in Zimbabwe. PLoS One. 2014;9(5):e82533. CrossRef. Medline

92. Rech D, Bertrand JT, Thomas N, Farrell M, Reed J, Frade S, et al. Surgical efficiencies and quality in the performance of voluntary medical male circumcision (VMMC) procedures in Kenya, South Africa, Tanzania, and Zimbabwe. PLoS One. 2014;9(5):e84271. CrossRef. Medline

93. Bertrand JT, Rech D, Omondi Aduda D, Frade S, Loolpapit M, Machaku MD, et al. Systematic monitoring of voluntary medical male circumcision scale-up: adoption of efficiency elements in Kenya, South Africa, Tanzania, and Zimbabwe. PLoS One. 2014;9(5):e82518. CrossRef. Medline

94. Rech D, Spyrelis A, Frade S, Perry L, Farrell M, Fertziger R, et al. Implications of the fast-evolving scale-up of adult voluntary medical male circumcision for quality of services in South Africa. PLoS One. 2014;9(5):e80577. CrossRef. Medline

95. Jennings L, Bertrand J, Rech D, Harvey SA, Hatzold K, Samkange CA, et al. Quality of voluntary medical male circumcision services during scale-up: a comparative process evaluation in Kenya, South Africa, Tanzania and Zimbabwe. PLoS One. 2014;9(5):e79524. CrossRef. Medline

Peer Reviewed

Received: 2015 Jan 19; **Accepted:** 2015 Apr 27; **First Published Online:** 2015 June 12

Cite this article as: Sgaier SK, Baer J, Rutz DC, Njeuhmeli E, Seifert-Ahanda K, Basinga P, et al. Toward a systematic approach to generating demand for voluntary medical male circumcision: insights and results from field studies. Glob Health Sci Pract. 2015;3(2):209-229. http://dx.doi.org/10.9745/GHSP-D-15-00020.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

ORIGINAL ARTICLE

Appropriate Management of Acute Diarrhea in Children Among Public and Private Providers in Gujarat, India: A Cross-Sectional Survey

Christa L Fischer Walker,[a] Sunita Taneja,[b] Amnesty LeFevre,[a] Robert E Black,[a] Sarmila Mazumder[b]

Training public-sector providers to treat diarrhea in children with low-osmolarity oral rehydration salts and zinc appeared to be effective. Among private providers, drug-detailing visits by pharmaceutical representatives seemed less effective, particularly in improving knowledge of the correct dosage and duration of zinc treatment. Consistent supplies and sufficient attention to training all health care cadres, especially community health workers who may be new to diarrhea treatment and informal-sector providers who are typically excluded from formal training, are critical to improving knowledge and prescribing behaviors.

ABSTRACT

Diarrhea remains a leading cause of morbidity and mortality among children under 5 years of age in low- and middle-income countries. In 2006, the Indian government formally endorsed the World Health Organization guidelines that introduced zinc supplementation and low-osmolarity oral rehydration salts (ORS) for the treatment of diarrhea. Despite this, zinc is rarely prescribed and has not been available in the public sector in India until very recently. The Diarrhea Alleviation Through Zinc and ORS Treatment (DAZT) project was implemented in Gujarat between 2011 and 2013 to accelerate the uptake of zinc and ORS among public and private providers in 6 rural districts. As part of an external evaluation of DAZT, we interviewed 619 randomly selected facility- and community-based public and private providers 2–3 months after a 1-day training event had been completed (or, in the case of private providers, after at least 1 drug-detailing visit by a pharmaceutical representative had occurred) and supplies were in place. The purpose of the interviews was to assess providers' knowledge of appropriate treatment for diarrhea in children, reported treatment practices, and availability of drugs in stock. More than 80% of all providers interviewed reported they had received training or a drug-detailing visit on diarrheal treatment in the past 6 months. Most providers in all cadres (range, 68% to 100%) correctly described how to prepare ORS and nearly all (range, 90% to 100%) reported routinely prescribing it to treat diarrhea in children. Reported routine prescription of zinc was lower, ranging from 62% among private providers to 96% among auxiliary nurse-midwives. Among providers who reported ever *not* recommending zinc ($n=242$), the 2 most frequently reported reasons for not doing so were not completely understanding zinc for diarrhea treatment and not having zinc in stock at the time of contact with the patient. In a multiple logistic regression analysis, recent training or drug-detailing visits and having zinc in stock were associated with reported zinc prescribing ($P<.05$). Recent training among public providers was significantly associated with having correct knowledge of zinc treatment duration and dosage, but the same was not true of drug-detailing visits among private providers. Treating diarrhea with zinc and low-osmolarity ORS is new for public and private providers in India and other low- and middle-income countries. Sufficient training and logistics support to ensure consistent supplies are critical if providers are to begin routinely treating all diarrhea episodes with zinc and ORS.

INTRODUCTION

Diarrhea is the second leading cause of death globally among children aged 1–59 months and accounts for 12.4% of deaths among all children under 5 years old in India.[1] Diarrhea also causes substantial morbidity; children under 5 years old in India experience 2.4 episodes of diarrhea each year.[2] Without prompt and correct treatment, frequent episodes can lead to stunting, which also contributes to cognitive delays.[3,4]

In 2004, the World Health Organization (WHO) released new recommendations for the treatment of

[a] Johns Hopkins Bloomberg School of Public Health, Department of International Health, Baltimore, MD, USA.
[b] Society for Applied Studies, Center for Health Research and Development, New Delhi, India.
Correspondence to Sarmila Mazumder (sarmila.mazumder@sas.org.in).

diarrhea, including the liberal use of low-osmolarity oral rehydration salts (ORS) and zinc supplementation.[5] The Indian Academy of Pediatrics endorsed these guidelines in 2004 and again in 2006.[6,7] In 2007, the Ministry of Health and Family Welfare stated that zinc along with ORS should be available over-the-counter and in the public sector at the community health worker level–that is, among Accredited Social Health Activists (ASHAs) and Anganwadi workers (AWWs).[8,9]

Despite publication of these recommendations nearly 10 years ago, zinc and ORS are not widely used in India for the treatment of diarrhea. In many districts, availability of zinc remains scarce. Exact coverage has not yet been reported in state or national surveys. On the other hand, ORS has been widely available since the 1980s, but it is still not used in 74% of diarrhea cases.[10]

Little is known about the knowledge and prescription practices of public and private providers in India. In this article, we provide a brief description of a project implemented in 2 states of India that aimed to increase use of zinc and ORS to treat diarrhea in children by training public and private providers. We then report results of a survey of public and private providers' knowledge and reported prescription practices after receiving the training.

PROGRAM DESCRIPTION

The Diarrhea Alleviation Through Zinc and Oral Rehydration Salts Therapy (DAZT) project aimed to enhance the uptake of zinc and ORS among children 2–59 months of age over the course of 4 years in 12 districts of Uttar Pradesh and 6 districts of Gujarat in India. The main strategy of the project was to train public and private-sector providers on the appropriate use of zinc and ORS for diarrhea treatment.

Public-Sector Activities

Micronutrient Initiative (MI), an international NGO, led the public-sector aspect of the project in all intervention districts. Public-sector activities focused on increasing the supply of zinc and ORS for diarrhea management and enhancing the diarrhea treatment capacity of all cadres of public-sector health care workers. To ensure the political and policy environment was primed for a public-sector campaign, MI collaborated with state and district governments to develop and promote appropriate diarrhea management policies and to establish a plan to routinely procure long-term zinc supplements. Initially, MI secured zinc and ORS products using its own tender scheme, to ensure the products were available in the intervention areas once training had started, until the state government was able to self-procure the products.

MI worked with the Ministry of Health in Gujarat and Uttar Pradesh to lead the training of all clinic and community health workers, including auxiliary nurse-midwives (ANMs), medical officers (MOs), ASHAs, and AWWs, on appropriate diarrhea management and the introduction of zinc treatment. MI first conducted a training of trainers, and the trainers subsequently trained groups of providers in each health worker cadre. The training continued until all providers in each project district had an opportunity to attend training. The training target was set at 100% of providers.

As part of the DAZT project, public-sector providers received training on appropriate management of diarrhea in children.

The 1-day training sessions were conducted in the local languages (Gujarati in Gujarat and Hindi in Uttar Pradesh) and covered:

- Signs and symptoms of diarrhea and dehydration
- Treatment of diarrhea, including how and why to prescribe zinc and ORS and the appropriate dose and duration of zinc and ORS
- Why to avoid unnecessary antibiotics
- When to refer diarrhea cases to higher-level health facilities

MOs and ANMs were trained together while community-based workers (ASHAs and AWWs) were trained in a separate group. The timing of the training sessions coincided with supply availability in each district so health care providers could start using their knowledge immediately.

Private-Sector Activities

FHI 360, an international NGO, led the private-sector aspect of the DAZT project. The primary goals in the private sector were to increase the supply of zinc and ORS for diarrhea management, as in the public sector, and to provide necessary information to change the prescription practices among private providers in rural areas, including those in the formal sector (trained physicians), those in the informal sector (without formal medical degrees), and drug sellers/chemists.

The DAZT project trained pharmaceutical representatives to provide supplies and information on zinc and ORS to private providers during drug-detailing visits.

FHI 360 worked with selected pharmaceutical companies and local NGOs to ensure quality zinc products were available in the targeted rural areas. To train physicians in the formal sector, FHI 360 conducted continuing medical education sessions on appropriate diarrheal management. Within each community, FHI 360 created lists of the most influential formal providers (i.e., eminent pediatricians and formal providers of the medical community) and then tracked and trained formal providers with smaller practices throughout the course of the project. For private providers in the informal sector and drug sellers/chemists, FHI 360 trained local NGO and pharmaceutical representatives to provide one-on-one drug-detailing visits to these providers, with the ultimate goal of repeat visits and thus ongoing drug-detailing visits throughout the program. During the short visits, the drug detailers distributed information, education, and communication (IEC) materials with basic information about treating diarrhea with zinc and ORS, and they also distributed the actual products themselves. Because rural providers in the informal sector often practice without formal training, this method enabled the project to access providers who did not have qualifications recognized by the government.

The private-sector strategy was based on a cascade of knowledge from the formal to informal sector, and finally to the community to ensure demand creation and long-term sustainability. The project focused first on physicians with formal training because they have long-standing influence in their communities. Reaching informal providers, who are mostly not recognized by the government, was also important because they typically treat the majority of diarrhea patients in rural India. Additional details describing the implementation of the program and other aspects of the evaluation have been published elsewhere.[11]

METHODS

The Johns Hopkins Bloomberg School of Public Health (Baltimore, Maryland) and the Society for Applied Studies (New Delhi, India) conducted an external evaluation of the DAZT project. The external evaluation team was not involved in program decision making or field implementation in any way. One component of the evaluation was a provider assessment survey conducted in 4 project districts in Gujarat state, which we present in this article. The survey was designed to capture the knowledge and reported zinc and ORS prescribing behaviors of providers 2–3 months after training had been completed and supplies were in place in the public sector and drug detailing was completed in the private sector. We interviewed private providers practicing in the targeted districts, as identified by FHI 360, and 4 cadres of public-sector providers: MOs, ANMs, ASHAs, and AWWs. During the interviews, we questioned providers about their knowledge of diarrhea treatment and attitudes toward prescribing zinc for diarrhea. We also assessed current stocks of zinc and ORS.

Study Site

The study was conducted in Gujarat, which is home to more than 50 million people, including more than 4.7 million children under 5 years old.[12] The DAZT project was implemented in 6 of the 26 districts of Gujarat, covering more than 10 million people, or 21.6% of the total population of Gujarat.[12] The under-5 mortality rate in Gujarat was 56 per 1,000 live births in 2010,[12] which was below the Indian national average of 61.3 per 1,000 live births.[1] Until the start of the DAZT project, zinc had not been part of the routine treatment provided by either private or public-sector health care providers in Gujarat.

The provider assessment survey was conducted in 4 project districts (Banaskantha, Patan, Sabarkantha, and Surendranagar) in Gujarat, from December 2011 through January 2012. In the remaining 2 project districts, the public sector had not yet received products or training at the time of the provider assessment and were thus excluded from the assessment.

Sample Size and Sampling Strategy

We calculated sample sizes for each group of providers separately. The sample sizes for ASHAs, AWWs, and private providers were based on anticipated zinc-prescribing of 10%, 10%, and 20%, respectively, and assumed a 10% margin of error, a design effect of 1.365,[10] and a 15% to 20% increase for refusal to participate or for incomplete forms. We thus randomly selected 165 ASHAs, 165 AWWs, and 231 private providers to achieve a minimum of 140, 140, and 188 completed interviews, respectively. For MOs and ANMs, we calculated a Lot Quality Assurance Sample (LQAS) and interviewed 1 MO and 2 ANMs per primary health center (PHC).[13]

We included public-sector providers from 33 of the 236 PHCs in the 4 districts of Gujarat. The

number of PHCs sampled per district was determined using a probability proportional to size (PPS) sampling design, such that the number of PHCs selected was based on the proportion of PHCs in that district to overall PHCs in all districts. We used STATA 12.0 to generate a random sample of PHCs from within the district. We obtained a list of all MOs, ANMs, ASHAs, and AWWs at each PHC in advance. At each PHC, 5 ASHAs, 5 AWWs, 2 ANMs, and 1 MO were selected for inclusion in the study. There were no additional inclusion/exclusion criteria for the providers other than actively practicing as an ASHA, AWW, ANM, or MO. For MOs and ANMs, there were often not more than 1 MO and 2 ANMs from which to choose; if more than 1 MO or 2 ANMs were practicing at the selected PHC, the names were randomly selected. The names of all active ASHAs were collected in advance, and 5 ASHAs were randomly selected from each PHC. In order to aid in the logistics of conducting the survey, we selected the AWW posted closest to the randomly selected ASHA. In the case of MOs and ANMs, if not enough MOs or ANMs were present at the PHC, an additional PHC was visited from the same district to ensure the entire samples size was achieved. For ASHAs and AWWs, the health workers were identified randomly in advance; if the identified health worker was not available during the 2 days of interviews at each PHC, the next ASHA/AWW from the randomization list was included in the survey.

At the time of the provider assessment, FHI 360 had collected the names of 1,337 private providers working in the 4 target districts included in this survey. Private providers were randomly selected in advance from the corresponding villages serviced by the randomly selected PHCs; we selected 7 private providers per PHC area. Locating specific private providers in this informal sector was often challenging. We created a system of asking at least 3 community leaders for the location of the identified provider before accepting his/her absence and selecting the next private provider from the randomization list. If the private provider was not located within 48 hours of the desired interview time or after 3 village leaders confirmed that the private provider did not exist or was no longer present, the private provider was replaced with the next private provider on the randomization list. If the sample size of private providers could not be met in the selected villages, the next randomly selected PHC area and the corresponding private providers were chosen from within the corresponding villages.

Survey Methods

We trained all interviewers using a standard protocol and implemented the survey 2–3 months after completion of training to minimize knowledge loss. Interviewers obtained written informed consent and administered closed-ended survey questionnaires to selected providers. The survey lasted approximately 1 hour and included questions on diarrhea treatment knowledge and practices, as well as access to routinely available ORS and zinc supplies. All questions on knowledge were asked before questions on typical practice. To ensure confidentiality, all interviews took place in private locations (i.e., in the clinic, health facility, or home of community-based workers). All data were checked in the field and inconsistencies/incomplete forms were corrected immediately by returning to the provider for verification before the team moved to another PHC. Data were entered twice (double data entry) into a standardized data entry system; queries and inconsistencies were verified by calling the provider if necessary.

Ethical Approval

We received ethical approval for this study by both the Johns Hopkins Bloomberg School of Public Health Institutional Review Board and the Society for Applied Studies Ethical Review Board. All providers were informed about the risks and benefits of the study, and they signed consent forms before participating in the survey. We also obtained permission from the Government of Gujarat to interview public-sector health workers before starting the survey.

Analytic Methods

We calculated means and standard deviations, medians, and corresponding ranges, as well as proportions for selected characteristics of ANMs, MOs, ASHAs, AWWs, and private providers. We assessed knowledge and reported practices among ASHAs, AWWs, and private providers and calculated the proportions who reported correct responses for key knowledge and practice indicators. We performed a chi-squared test for multiple comparisons to determine if there were any statistically significant differences in responses across provider types. We then conducted a multiple logistic regression to determine if provider

education, experience, training/drug-detailing visits, and product availability were independently associated with provider prescribing practices or knowledge of dose, duration, and/or ORS preparation for ASHAs, AWWs, and private providers. All statistical tests were conducted using STATA 12.0 Statistical Software.[14] For ANMs and MOs, we calculated the proportion of providers who reported correct responses for key knowledge and practice indicators.

RESULTS

We interviewed in total 619 providers: 190 private providers (Figure 1), 165 AWWs, 165 ASHAs, 33 MOs, and 66 ANMs (Figure 2), achieving our desired sample size for each provider category. To achieve the minimum sample size, we had to include providers from 11 additional PHCs/villages (for the community-based workers). While every effort was made to find and interview the provider selected according to the random selection procedure *a priori*, in some cases the individual selected could not be found or too few providers of that provider type were available and working at the selected PHC. For example, to achieve the minimum sample size among private providers, we initially randomly selected 231 providers and then randomly selected an additional 61 providers during a second round, which led to 190 (65%) completed interviews.

More providers reported they had ORS in stock than zinc.

All interviewed ANMs, ASHAs, and AWWs were women while nearly all the private providers (97%) and MOs (82%) were men (Table 1). Community health workers (ASHAs and AWWs) had a median of 10 years of education, and ANMs and private providers had a median of 12 and 16 years of education, respectively. (All MOs were trained physicians who had passed their medical examinations successfully.) Most providers (around 83% to 88%) reported receiving training/drug-detailing visits in the treatment of diarrhea within the last 6 months. Higher proportions of providers of all cadres had ORS than zinc in stock. ANMs were most likely to report zinc in stock (66.7%) while MOs were most likely to report ORS in stock (93.9%); private providers were least likely

FIGURE 1. Flowchart of Private Provider Survey Participants

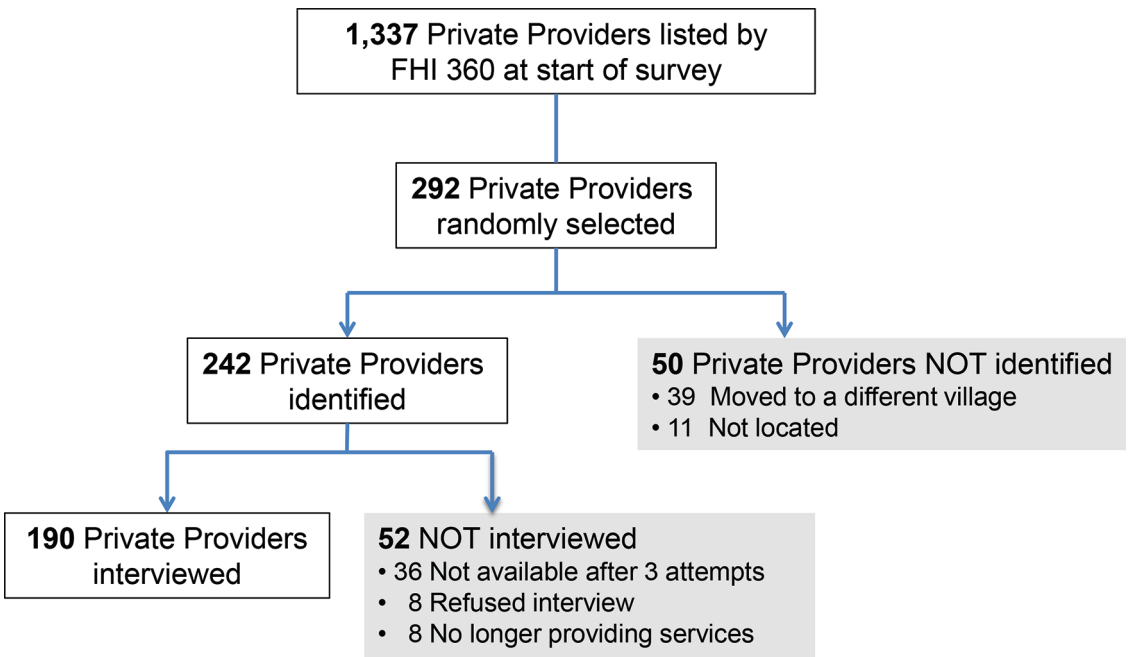
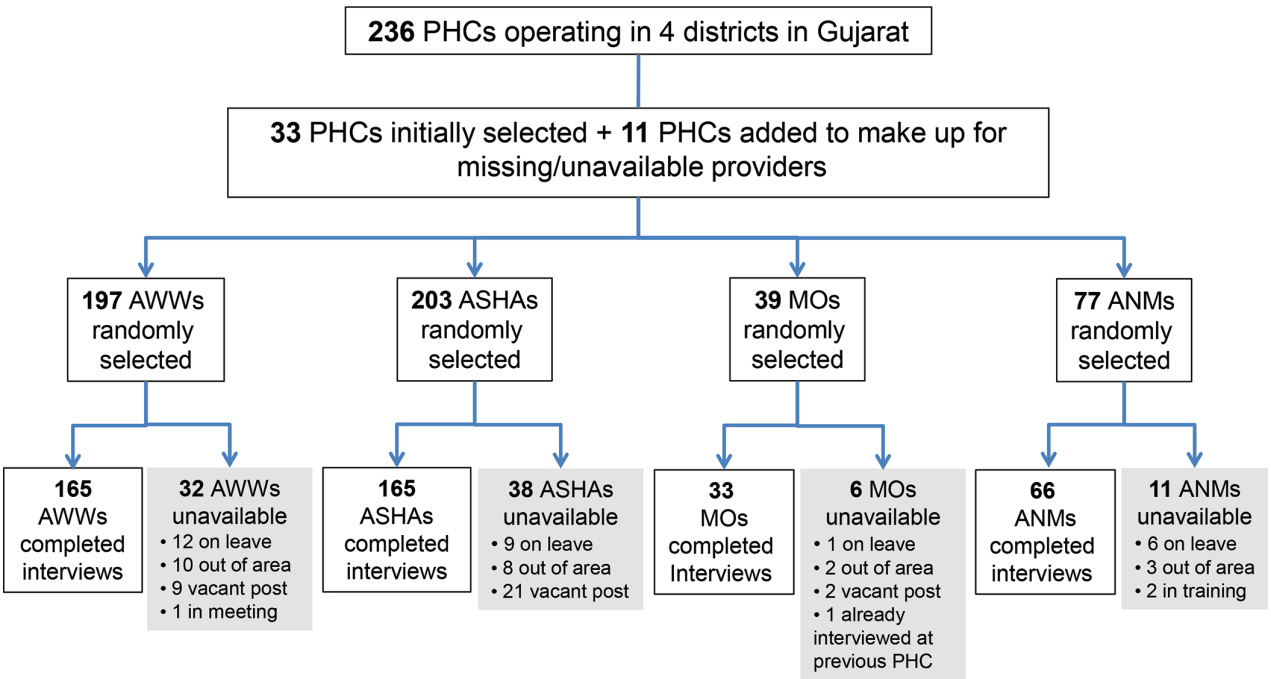


FIGURE 2. Flowchart of Public Provider Participants



Abbreviations: ANMs, auxiliary nurse-midwives; ASHAs, Accredited Social Health Activists; AWWs, Anganwadi workers; MOs, medical officers; PHCs, primary health centers.

to report zinc or ORS in stock (36.3% and 55.3%, respectively).

Most providers answered correctly that children with diarrhea should increase fluid intake, with the highest level of correct knowledge among private providers (77%) (Table 2). Few or no providers in any cadre thought that children with diarrhea should decrease fluid intake. Most providers also answered correctly that children with diarrhea should maintain or increase their food intake, but a smaller proportion of private providers knew this compared with the other cadres (72% of private providers vs. 85% of MOs and about 90% of ASHAs, AWWs, and ANMs). High percentages (85% or higher) of all provider types could recall at least 2 signs or symptoms requiring referral, but much lower proportions (15% to 39%) could name 4 or more signs or symptoms.

The percentage of providers stating they usually prescribed zinc for childhood diarrhea ranged from only 62% of private providers to 96% of ANMs. Among providers who reported ever *not* recommending zinc (n = 242), we asked unprompted questions about why. The two most frequent responses were not knowing of or completely understanding zinc for diarrhea treatment and not having zinc in stock at the time of contact with the patient (Figure 3).

Most providers knew that children with diarrhea should increase fluid intake.

Among public-sector providers, 85% or higher recalled the correct duration of zinc treatment (14 days), but much lower percentages recalled the correct dosage (Table 2). For example, only 36% and 53% of ASHAs stated the correct dosage for children 2–5 months and 6–59 months of age, respectively. Among private providers, only 47% stated the correct duration of zinc treatment and 77% did not know or refused to answer when asked about the correct dose of zinc.

The most commonly reported reasons for not prescribing zinc were lack of knowledge about zinc for diarrhea treatment and not having zinc in stock.

Much higher percentages of providers of all cadres had correct knowledge of ORS and reported routinely prescribing ORS compared with zinc. In fact, reported prescribing practices

TABLE 1. Characteristics of Health Care Providers in 4 Districts of Gujarat, India

	ASHAs (n = 165)	AWWs (n = 165)	ANMs (n = 66)	MOs (n = 33)	PPs (n = 190)
Age, mean (SD), y	29.4 (6.4)	39 (8.2)	39.6 (9.3)	34.3 (7.4)	43.2 (13.8)
Female, No. (%)	165 (100)	165 (100)	66 (100)	6 (18.2)	5 (2.6)
Years of education, mean (range)	10 (4, 17)	10 (4, 17)	12 (10, 19)	NA[a]	16 (9, 22)
Years practicing in current position, median (range)	3 (1, 18)	13 (1, 32)	19 (1, 28)	3 (1,24)	10 (1, 45)
Providers who have received training/ drug-detailing visits for diarrhea treatment in last 6 months, No. (%)	138 (83.6)	144 (87.3)	55 (83.3)	29 (87.9)	168 (88.4)
Providers who had any zinc in stock, No. (%)	93 (56.4)	81 (49.1)	42 (66.7)	21 (63.6)	69 (36.3)
Providers who had any ORS in stock, No. (%)	108 (65.5)	94 (57.0)	51 (77.3)	31 (93.9)	105 (55.3)

Abbreviations: ASHAs, Accredited Social Health Activists; AWWs, Anganwadi workers; ANMs, accredited nurse-midwives; MOs, medical officers; ORS, oral rehydration salts; PPs, private providers; SD, standard deviation.
[a] All MOs were trained physicians who had passed their medical examinations successfully.

for ORS were nearly universal, ranging from 90% of private providers to 100% of ANMs. Nearly all public-sector providers correctly described how to prepare ORS (93% or higher among public-sector provider cadres), but only 68% of private providers described the process correctly.

Recent training or drug-detailing visits was significantly associated with providers reporting regularly prescribing zinc to treat diarrhea.

Correct knowledge of ORS preparation was generally higher than of zinc duration or dosage among all provider cadres.

In multiple logistic regression analysis of factors predicting public-sector provider knowledge and prescribing patterns, receiving training in diarrhea treatment within the last 6 months was predictive of routinely recommending zinc treatment and of generally having correct knowledge of zinc treatment duration and dosage among ASHAs and AWWs ($P < .01$) (Table 3). Similarly, among private providers, receiving drug-detailing visits (and CME training, in the case of formal-sector providers) for diarrhea treatment within the last 6 months was predictive of recommending zinc treatment ($P = .01$) but not for having correct knowledge of the duration or dosage of zinc. ASHAs and private providers who had zinc in stock were also more likely to report routinely prescribing zinc than their counterparts who did not have zinc in stock (odds ratio [OR] = 4.98 and 7.00, respectively). Among private providers, years of education (OR = 1.44), receiving a recent drug-detailing visit (OR = 3.86), and having ORS in stock (OR = 4.12) were all predictive of the provider reporting routinely prescribing ORS. The regression model for the outcome of reported routine ORS prescribing was invalid among ASHAs and AWWs because more than 99% of these providers reported routinely recommending ORS.

DISCUSSION

In our survey of public and private providers' knowledge and reported prescribing practices for treatment of childhood diarrhea, nearly all providers in all cadres correctly described how to prepare ORS (except for private providers, for whom only 68% had such correct knowledge) and reported routinely prescribing ORS to treat diarrhea in children. In contrast, knowledge of the correct duration, and particularly of the correct dosage, of zinc treatment for diarrhea was generally lower among provider cadres. Public-sector providers who had received recent training were more likely to have correct zinc knowledge and reported prescribing practices while private providers who had received recent drug-detailing visits in diarrhea treatment, or recent CME training in the case of formal-sector providers, were more likely to report prescribing zinc to treat diarrhea but not to have correct knowledge of the duration or dosage of zinc.

The results of this cross-sectional survey represent an initial point in time by which all public-sector providers should have received

TABLE 2. Diarrhea Management Knowledge and Reported Prescribing Behaviors Among Public and Private Providers, Gujarat, India

	Public-Sector Providers				
	ASHAs (n = 165)	AWWs (n = 165)	ANMs (n = 66)	MOs (n = 33)	PPs (n = 190)
No. (%) reporting a child with diarrhea should:					
Increase fluid intake* *(correct response)*	106 (64.2)	118 (71.5)	49 (74.2)	24 (72.7)	147 (77.4)
Maintain usual fluid intake	48 (29.1)	40 (24.2)	17 (25.8)	9 (27.3)	40 (21.1)
Reduce fluid intake*	11 (6.7)	7 (4.2)	0 (0)	0 (0)	3 (1.6)
Maintain usual or increase breastfeeding/ food intake* *(correct response)*	146 (88.5)	150 (90.1)	59 (89.3)	28 (84.8)	136 (71.6)
Reduce food intake*	19 (11.5)	15 (9.1)	7 (10.6)	5 (15.2)	54 (28.4)
No. (%) recalling ≥ 2 signs/symptoms requiring referral to higher-level facility*[a]	141 (85.5)	154 (93.3)	65 (98.5)	30 (90.9)	162 (85.3)
No. (%) recalling ≥ 4 signs/symptoms requiring referral to higher-level facility*[a]	40 (24.2)	56 (33.9)	26 (39.4)	5 (15.2)	44 (23.2)
No. (%) reporting *usually* recommending zinc treatment*	137 (83.0)	146 (88.5)	63 (95.5)	29 (87.9)	117 (61.6)
No. (%) correctly stating the dose and duration of zinc syrup or tablet					
Duration of 14 days*	140 (85.0)	144 (87.0)	63 (95)	31 (94)	90 (47.0)
Correct dose for children 2–5 months old *(10 mg/day, i.e., 1/2 tablet or 5 mL)**[b]	60 (36.0)	53 (32.0)	47 (71)	20 (61)	33 (17.0)
Correct dose for children 6–59 months old *(20 mg/day, i.e., 1 tablet or 10 mL)**[b]	88 (53.0)	84 (51.0)	49 (74)	22 (67)	47 (25.0)
Refused to answer/did not know correct dose[a]	18 (11.0)	10 (6.0)	0 (0)	0 (0)	146 (77.0)
No. (%) reporting *routinely* recommending ORS*	164 (99.4)	164 (99.4)	66 (100)	32 (97.0)	170 (89.5)
No. (%) correctly describing how to prepare ORS *(i.e., 1 L packet in 1 L water or 200 mL packet in 1 cup of water)**	157 (95.7)	153 (93.3)	62 (93.9)	33 (100)	114 (67.5)

Abbreviations: ANMs, accredited nurse-midwives; ASHAs, Accredited Social Health Activists; AWWs, Anganwadi workers; MOs, medical officers; ORS, oral rehydration salts; PPs, private providers.

[*] Signifies differences in response by provider type using chi-squared test for multiple proportions ($P < .05$).

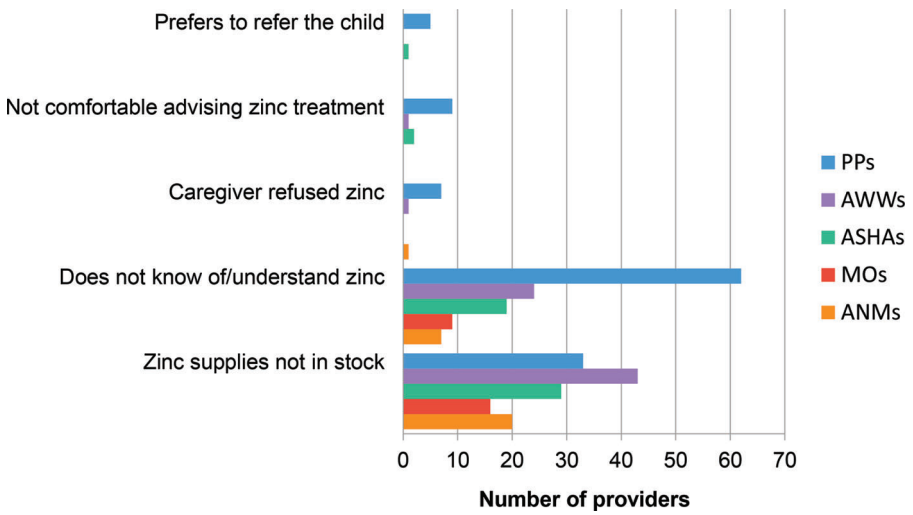
[a] Signs/symptoms included: unconscious, lethargic, convulsions, unable to drink or breastfeed, persistent diarrhea, sunken eyes, skin pinch goes back slowly, irritable/restless, blood in stool, signs of mild dehydration, fast breathing, difficulty breathing, and vomiting.

[b] Government and training documents state infant dosing is from 2 months and up to 6 months of age. We considered 2–5 months and 2–6 months as correct responses. For this reason, we also accepted 6 or 7 months as the lower bound of the older age category. Zinc should be given until 5 years of age, and thus 59 or 60 months were accepted as the upper bound for the older age category.

training and all private-sector providers should have received at least 1 drug-detailing visit. The DAZT project is responsible for reaching scale in these 4 districts, which cover a population of more than 7 million people. This is one of the first surveys to include both public and private-sector providers in a diarrhea treatment program of this scale.

In rural Gujarat, there are many types of private providers loosely categorized as rural medical practitioners including those with little

FIGURE 3. Main Reasons[a] for Not Recommending Zinc Among Providers Who Reported Ever Not Recommending Zinc, Gujarat, India (n=242)[b]



Abbreviations: ANMs, auxiliary nurse-midwives; ASHAs, Accredited Social Health Activists; AWWs, Anganwadi workers; MOs, medical officers; PPs, private providers.

[a] Other reasons (not shown on chart) reported by private providers but no other provider cadre: caregiver could not afford zinc (17); caregivers prefer treatments that provide quick recovery (7); other drugs are better for diarrhea treatment (4); zinc is not widely accepted among providers (3); profit margin for zinc is not as large as for other drugs (2); zinc is not an effective treatment (2).

[b] The 242 providers who reported ever not recommending zinc included 107 private providers, 56 AWWs, 38 ASHAs, 19 MOs, and 22 ANMs.

to no formal education,[14] yet in our survey 76% of private providers had education beyond grade 12. The higher education level of private providers in our survey may represent the early stages of the project's private-sector implementation strategy, which focused on reaching providers who were key opinion leaders; such providers tended to be pediatricians and formal medical providers or very well trained providers in the informal sector. The project expanded to harder-to-reach providers, who were likely less educated, later in the program.

Formal training of private providers on appropriate treatment of diarrhea, instead of relying solely on drug-detailing visits, is probably needed.

The survey found much confusion among providers about the correct dose and duration of zinc. While public-sector training did address zinc dosage and duration, further on-the-job training and distribution of job aids are probably warranted, especially for community health workers (ASHAs and AWWs). Knowledge of the correct dose and duration of zinc was particularly poor among private providers; more than 75% refused to answer the question about zinc dosage or admitted to not knowing the answer. The pharmaceutical package of IEC materials for zinc provided information on dose and duration of treatment, but it may have been overlooked during the detailing visit as a minor detail, especially if time for the visit was cut short. In addition, there are many brands of zinc in both tablet and syrup formulas available in the private sector, which may create an additional level of uncertainty among private providers. Formal training of private providers is probably needed, rather than depending solely on drug detailing by pharmaceutical company representatives.

The DAZT project did not implement demand-side interventions such as community education or social marketing activities. All changes in reported prescribing practices were thus driven by introducing zinc and reinforcing ORS to the providers. Drug detailing among private providers focused on the positive elements of zinc and ORS only, without

TABLE 3. Demographic and Training Variables Associated With Knowledge and Reported Practice Indicators for Diarrhea Treatment With Zinc and ORS by Type of Provider,[a] Gujarat, India

Demographic and Training Variables	Knowledge and Reported Practice Outcome Variables											
	Reported routinely recommending zinc		Knew correct duration of zinc treatment		Knew correct zinc dose for 2–5-month-old child		Knew correct zinc dose for 6–59-month-old child		Reported routinely recommending ORS		Knew correct ORS preparation	
	OR	*P* value	OR	*P* value	OR	*P* value	OR	*P* value	OR	*P* value	OR	*P* value
ASHAs (n = 165)												
Years of education	0.88	.25	1.05	.68	1.01	.94	1.03	.65	NA[b]		1.28	.27
Years practicing as ASHA	0.87	.13	0.92	.40	1.00	.59	0.94	.45	NA[b]		**2.60**	**.02**
Received training in diarrhea treatment in last 6 months	**9.04**	**<.001**	**4.85**	**<.001**	**3.45**	**.04**	**4.80**	**<.001**	NA[b]		1	NA
Zinc in stock	**4.98**	**.02**	**7.20**	**.01**	0.00	.99	**3.52**	**.05**	NA[b]		7.10	.09
ORS in stock	0.38	.22	0.73	.64	0.00	.99	0.37	.14	NA[b]		0.15	.13
AWWs (n = 165)												
Years of education	0.93	.58	1.04	.73	1.04	.56	1.03	.65	NA[b]		1.14	.35
Years practicing as AWW	1.01	.71	1.00	.94	1.03	.17	0.99	.82	NA[b]		1.10	.06
Received training in diarrhea treatment in last 6 months	**16.05**	**<.001**	**5.68**	**<.001**	2.80	.13	**4.85**	**.01**	NA[b]		1.51	.61
Zinc in stock	1.94	.48	**34.82**	**<.001**	2.16	.36	1.18	.81	NA[b]		**6.84**	**.05**
ORS in stock	0.72	.70	**0.15**	**.01**	0.47	.37	1.21	.78	NA[b]		0.27	.13
PPs (n = 190)												
Years of education	**1.24**	**<.001**	**1.20**	**<.001**	1.17	.06	**1.16**	**.04**	**1.44**	**<.001**	0.98	.72
Years practicing as PP	1.01	.57	0.99	.68	1.01	.47	1.00	.86	1.02	.42	0.98	.18
Received drug-detailing visit for diarrhea medications in last 6 months	**3.95**	**.01**	1.96	.21	3.77	.21	2.79	.19	**3.86**	**.04**	0.55	.25
Zinc in stock	**7.00**	**<.001**	**2.51**	**.01**	1.98	.12	**2.29**	**.03**	5.55	.12	1.82	.10
ORS in stock	0.57	.14	0.99	.98	1.05	.91	0.84	.64	**4.12**	**.03**	1.11	.75

Abbreviations: ASHAs, Accredited Social Health Activists; AWWs, Anganwadi workers; NA, not applicable; OR, odds ratio; ORS, oral rehydration salts; PPs, private providers; RMP, rural medical practitioner.

[a] Results are from a multiple logistic regression (MLR) analysis. Statistically significant results at $P \leq .05$ are shown in boldface.

[b] Not applicable in the MLR analysis because 99.4% of ASHAs and AWWs reported routinely recommending ORS for the treatment of diarrhea.

specifically addressing the unnecessary use of antibiotics. A high proportion of private providers reported antibiotics as appropriate treatments for simple acute watery diarrhea (data not shown), highlighting the need for training specifically on this issue. As mentioned above, an alternative approach besides drug detailing by pharmaceutical companies, that have profits in mind and may not want to discuss the potential harm of antibiotics, will be needed to address the issue of antibiotics.

This is especially challenging because in many countries private providers often do not have formal training and are not recognized by the government as legitimate health care providers.

Limitations

In this survey, we interviewed randomly selected providers and emphasized that the interview team was in no way associated with the government or any regulating body. Interviewers encouraged the interviewees to answer questions openly and honestly and reminded them that their answers would not be revealed to supervisors. Despite this, providers may have been swayed to answer practice questions with a known "right" answer even if it did not accurately reflect their true practices. It is possible that by notifying PHCs and MOs in advance of our visit, active brief refresher trainings could have been initiated, although the advance warning was only 1–2 days so it would not have been possible to do anything more than minimal preparation. Additional insights from direct observation would validate and/or challenge the responses provided in this survey.

In addition, drawing the sample of private providers from the same communities captured in the sample of public-sector providers may have reduced apparent reported differences between public and private providers. Furthermore, we are limited in the interpretation of the survey results and attribution of correct knowledge and reported prescribing practices to the DAZT project without a baseline survey to measure change over time. However, because there had been no prior training or drug detailing with regard to zinc in either the public or the private sector, it is likely that zinc knowledge was very limited prior to this program. It also would have been interesting to conduct a survey at the end of the project to measure change in knowledge and reported practices after the providers had had more experience with prescribing zinc and ORS but not necessarily additional opportunities for continued training. Finally, failure to identify all originally selected providers creates possible bias in that we were more likely to exclude harder-to-find providers or those who may not be available to treat patients full time—also the same kinds of providers who would not be present for training opportunities.

CONCLUSIONS

With training about appropriate treatment of childhood diarrhea with both zinc and ORS and access to the products, some providers report prescribing zinc, but long-term sustained use and comfort with the new recommendations will require additional training and distribution of job aids, and possibly other behavior change approaches, to help providers overcome early skepticism and increase familiarization with the correct dose and duration. Overcoming inconsistencies with the supply chain will also be critical to create an early habit of prescription for both community-level workers who are new to community case management, such as ASHAs and AWWs, and private providers who have a history of relying on inappropriate use of antibiotics and antidiarrheals for the treatment of all diarrhea episodes. While the focus of the DAZT project was on improving knowledge and use of zinc and ORS among providers, community-level introduction and public awareness of zinc and ORS for diarrhea treatment could generate a demand-side pull that might also promote correct prescribing practices from both public and private providers. Health systems will need to monitor how barriers to prescribing zinc and ORS change as diarrhea management programs mature and communities become more familiar with new treatment protocols in both the public and the private sectors.

Acknowledgments: The authors thank the providers who participated in the survey. The authors also thank partners at the Micronutrient Initiative, FHI 360, and UNICEF for their feedback with regard to interpretation of the final results. This work was supported by a grant from the Bill and Melinda Gates Foundation via the US Fund for UNICEF. The funder played no role in the analysis or final interpretation and presentation of the data.

Competing Interests: None declared.

REFERENCES

1. Liu L, Oza S, Hogan D, Perin J, Rudan I, Lawn JE, et al. Global, regional, and national causes of child mortality in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis. Lancet. 2015;385(9966):430–440. CrossRef. Medline
2. Fischer Walker CL, Perin J, Aryee MJ, Boschi-Pinto C, Black RE. Diarrhea incidence in low- and middle-income countries in 1990 and 2010: a systematic review. BMC Public Health. 2012;12(1):220. CrossRef. Medline
3. Checkley W, Buckley G, Gilman RH, Assis AM, Guerrant RL, Morris SS, et al; Childhood Malnutrition and Infection Network. Multi-country analysis of the effects of diarrhoea on childhood stunting. Int J Epidemiol. 2008;37(4):816–830. CrossRef. Medline
4. Fischer Walker CL, Lamberti L, Adair L, Guerrant RL, Lescano AG, Martorell R, et al. Does childhood diarrhea influence cognition beyond the diarrhea-stunting pathway? PLoS One. 2012;7(10): e47908. CrossRef. Medline
5. World Health Organization (WHO); United Nations Children's Fund (UNICEF). WHO/UNICEF joint statement: clinical management of acute diarrhoea. Geneva: WHO; 2004.

Co-published by UNICEF. Available from: http://www.unicef.org/publications/index_21433.html

6. Bhatnagar S, Bhandari N, Mouli UC, Bhan MK; IAP National Task Force. Consensus Statement of IAP National Task Force: status report on management of acute diarrhea. Indian Pediatr. 2004;41(4):335–348. Medline
7. Bhatnagar S, Lodha R, Choudhury P, Sachdev HP, Shah N, Narayan S, et al.; Indian Academy of Pediatrics. IAP Guidelines 2006 on management of acute diarrhea. Indian Pediatr. 2007;44 (5):380–389. Medline
8. Ministry of Health and Family Welfare [India]. Notification, New Delhi, the 30th August, 2013, G.S.R. 589(E). Gazette of India: Extraordinary. 2013 Aug 30.
9. Ministry of Health and Family Welfare [India]. Use of zinc as an alternate therapy in the treatment of diarrhea. Delhi (India); Department of Family Welfare, Child Health Department; 2006.
10. International Institute for Population Sciences (IIPS); Macro International. National family health survey (NFHS-3), 2005–06: Mumbai. Mumbai (India): IIPS; 2007. Co-published by Macro International. Available from: https://dhsprogram.com/pubs/pdf/FRIND3/FRIND3-Vol1AndVol2.pdf
11. Shillcutt SD, LeFevre AE, Walker CLF, Black RE, Mazumder S. Protocol for the economic evaluation of the diarrhea alleviation through zinc and oral rehydration salt therapy at scale through private and public providers in rural Gujarat and Uttar Pradesh, India. Implement Sci. 2014;9(1):164. CrossRef. Medline
12. Office of the Registrar General & Census Commissioner, India. Census of India 2011. New Delhi: Ministry of Home Affairs [India]; 2010–11. Available from: http://censusindia.gov.in/
13. Hedt BL, Olives C, Pagano M, Valadez JJ. Large country-lot quality assurance sampling: a new method for rapid monitoring and evaluation of health, nutrition and population programs at sub-national levels. Washington (DC): World Bank; 2008. Available from: http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPULATION/Resources/281627-1095698140167/LCLQAS.pdf
14. Kanjilal B, Mondal S, Samantha T, Mondal A, Singh S. A parallel health care market: rural medical practitioners in West Bengal, India. Jaipur (India): Institute of Health Management Research; 2007. Available from: http://r4d.dfid.gov.uk/PDF/Outputs/FutureHealth_RPC/ParallelHealthResBrief2.pdf

Peer Reviewed

Received: 2014 Nov 17; **Accepted:** 2015 Feb 4; **First Published Online:** 2015 May 7

Cite this article as: Fischer Walker CL, Taneja S, LeFevre A, Black RE, Mazumder S. Appropriate management of acute diarrhea in children among public and private providers in gujarat, india: a cross-sectional survey. Glob Health Sci Pract. 2015;3(2):230-241. http://dx.doi.org/10.9745/GHSP-D-14-00209.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

ORIGINAL ARTICLE

Motivations and Constraints to Family Planning: A Qualitative Study in Rwanda's Southern Kayonza District

Didi Bertrand Farmer,[a] Leslie Berman,[a] Grace Ryan,[b] Lameck Habumugisha,[a] Paulin Basinga,[c] Cameron Nutt,[d] Francois Kamali,[e] Elias Ngizwenayo,[a] Jacklin St Fleur,[a] Peter Niyigena,[a] Fidele Ngabo,[f] Paul E Farmer,[d,g,h] Michael L Rich[d,g,h]

Community members and health workers recognized the value of spacing and limiting births, but a variety of traditional and gender norms constrain their use of contraception. Limited method choice, persistent side effects, transportation fees, stock-outs, long wait times, and hidden service costs also inhibit contraceptive use.

ABSTRACT

Background: While Rwanda has achieved impressive gains in contraceptive coverage, unmet need for family planning is high, and barriers to accessing quality reproductive health services remain. Few studies in Rwanda have qualitatively investigated factors that contribute to family planning use, barriers to care, and quality of services from the community perspective.

Methods: We undertook a qualitative study of community perceptions of reproductive health and family planning in Rwanda's southern Kayonza district, which has the country's highest total fertility rate. From October 2011 to December 2012, we conducted interviews with randomly selected male and female community members (n = 96), community health workers (n = 48), and health facility nurses (n = 15), representing all 8 health centers' catchment areas in the overall catchment area of the district's Rwinkwavu Hospital. We then carried out a directed content analysis to identify key themes and triangulate findings across methods and informant groups.

Results: Key themes emerged across interviews surrounding: (1) fertility beliefs: participants recognized the benefits of family planning but often desired larger families for cultural and historical reasons; (2) social pressures and gender roles: young and unmarried women faced significant stigma and husbands exerted decision-making power, but many husbands did not have a good understanding of family planning because they perceived it as a woman's matter; (3) barriers to accessing high-quality services: out-of-pocket costs, stock-outs, limited method choice, and long waiting times but short consultations at facilities were common complaints; (4) side effects: poor management and rumors and fears of side effects affected contraceptive use. These themes recurred throughout many participant narratives and influenced reproductive health decision making, including enrollment and retention in family planning programs.

Conclusions: As Rwanda continues to refine its family planning policies and programs, it will be critical to address community perceptions around fertility and desired family size, health worker shortages, and stock-outs, as well as to engage men and boys, improve training and mentorship of health workers to provide quality services, and clarify and enforce national policies about payment for services at the local level.

[a] Partners In Health-Inshuti Mu Buzima, Rwinkwavu, Rwanda.
[b] London School of Hygiene and Tropical Medicine, Centre for Global Mental Health, London, UK.
[c] National University of Rwanda School of Public Health, Kigali, Rwanda.
[d] Partners In Health, Boston, MA, USA.
[e] Rwinkwavu District Hospital, Rwinkwavu, Rwanda.
[f] Ministry of Health (Rwanda), Kigali, Rwanda.
[g] Brigham and Women's Hospital, Division of Global Health Equity, Boston, MA, USA.
[h] Harvard Medical School, Department of Global Health and Social Medicine, Boston, MA, USA.
Correspondence to Didi Bertrand Farmer (didihaiti@gmail.com).

INTRODUCTION

At the 2012 London Summit on Family Planning, donors and national governments committed to providing access to modern contraceptives by 2020 to an additional 120 million women around the world who have unmet need for family planning, as well as to focusing on the human rights of women and girls and to launching a reinvigorated global platform for achieving

universal access to family planning. Yet this renewed commitment also highlighted the challenges of achieving universal access to family planning, including in countries such as Rwanda that have seen impressive gains.

Rwanda is among the most densely populated countries in Africa; between 2002 and 2012, the average annual population growth was 2.6%.[1] Population pressures are compounded by the country's young population, with 61.5% under the age 25 as of 2010,[1] highlighting the importance of ensuring access to sexual and reproductive health (SRH) services as the majority of the population enters its reproductive years.

Rwanda's ambitious national development plan, *Vision 2020*, outlines a framework to improve population welfare, including a goal of increasing contraceptive coverage among married women to 70% by 2015.[2] Rwanda's *National Reproductive Health Policy*[3] and *National Family Planning Policy*[4,5] provide a platform for expanding access to modern contraceptives and strengthening service delivery. Further, mass media information campaigns, alongside the decentralization of family planning services to health centers and by Rwanda's roughly 45,000 community health workers (CHWs),[6] have brought behavior change messages close to home, promoting reproductive choice, birth timing, and birth spacing.

Rwanda reports significant gains in contraceptive coverage since 2000. According to the Rwanda Demographic and Health Survey (DHS), use of modern contraception among married women has risen from 5.7% in 2000 to 45.1% in 2010.[7] This increase in contraceptive prevalence has been accompanied by a decrease in the estimated total fertility rate (TFR), from 6.1 in 2005 to 4.6 in 2010,[7] attributed in part by the World Bank to improved education and housing for women.[8] Rwanda's 2012 census showed a further decline in the TFR to 4.0 that year and an average annual rate of decline in the TFR of 6.0% since 2005.[1] Equity gaps in contraceptive use between the wealthiest and poorest women also appear to have shrunk considerably (Figure 1). Furthermore, reported family size preferences among women fell from an average of 4.9 children in 2000 to 3.3 in 2010.[7] Future gains thus seem likely, if access to and retention in family planning services are adequately supported. Yet despite these gains, there remains high unmet need for contraception, at 19% of married women,[7] and households continue to face barriers to accessing quality family planning services, including physical access, cost, lack of accurate information, limited knowledge, side effects, and partner communication.[9–13]

In order to increase uptake and promote retention in family planning programs, it is critical to understand local perspectives on birth, fertility, contraception, and family composition. While social norms have been shown to affect both contraceptive demand and family planning practice in Rwanda,[8] relatively few studies have undertaken qualitative research to investigate factors that affect family planning use in communities, with some notable exceptions.[12] Several recently published studies have provided important qualitative insight into barriers to accessing contraception and benefits of long-acting methods.[13,14] This study adds further exploration of the underlying factors contributing to women's and men's perceptions of family planning within broader understandings of SRH.

The Department of Community Health and Social Development of the NGO Partners In Health-Inshuti Mu Buzima (PIH-IMB) undertook a broad qualitative investigation to explore general public perceptions of reproductive health and family planning in southern Kayonza district, a rural area in the country's eastern province. The study was conducted in partnership with Rwinkwavu District Hospital and the Maternal and Child Health Unit of the Ministry of Health. The main foci of the research included: (1) community perceptions of reproductive health and family planning; (2) quality of services; (3) adherence to and discontinuation of contraception; and (4) barriers to accessing family planning and reproductive health services. This paper describes findings from the first phase of research, which was comprised of interviews with health care providers, CHWs, and community members.

Modern contraceptive use among married women in Rwanda rose from about 6% in 2000 to 45% in 2010.

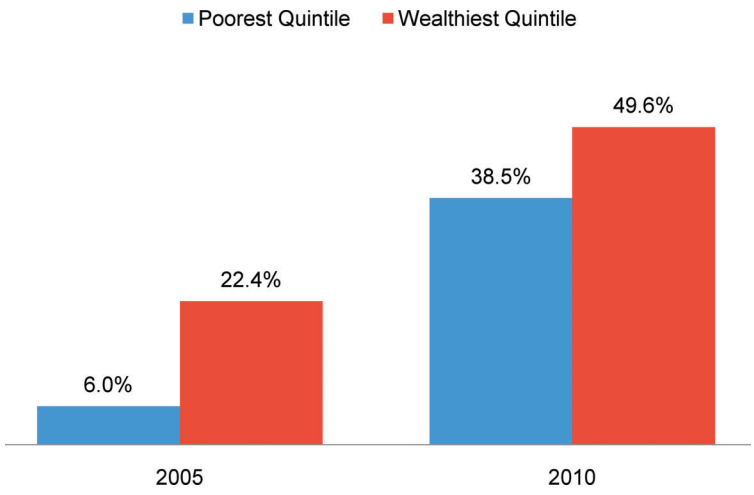
METHODS

Population and Setting

Since 2005, PIH-IMB has worked in partnership with the Rwandan Ministry of Health to provide an enhanced package of health services and support in 3 rural districts in Rwanda. In southern Kayonza district, PIH-IMB works in collaboration with Rwinkwavu District Hospital, 8 health centers, and approximately 1,000 CHWs.

As of 2012, southern Kayonza had a population of 188,363 individuals, including 44,681 women of reproductive age (15–49 years old).[1] In addition to national media campaigns, information on SRH is

FIGURE 1. Use of Modern Contraceptives Among Married Women Ages 15–49 in Rwanda, by Wealth Quintile, 2005 and 2010



Source: Rwanda Demographic and Health Surveys.[7]

available at the community level through village meetings and home-based counseling by CHWs. Family planning services are available at each of the 8 health centers in the catchment area, as well as at the community level through CHWs as part of the national decentralization strategy. Rwanda's southern Kayonza district has a high rate of enrollment in the family planning program, similar to other parts of Rwanda,[7] but also has high rates of contraceptive discontinuation (Figure 2). Given the roughly equal proportion of facility clients who continue and discontinue contraception each month, the critical importance of understanding why women discontinue use was taken into consideration in our study design.

The eastern province in which southern Kayonza is located has Rwanda's highest total fertility rate.

The eastern province in which southern Kayonza is located has Rwanda's highest total fertility rate and adolescent fertility rate, with 16% of women giving birth by the age of 19.[15] Fertility in the eastern province has also fallen more slowly in recent years than in other provinces, a trend that the National Institute of Statistics of Rwanda attributes in part to the relatively young population of the region.[16]

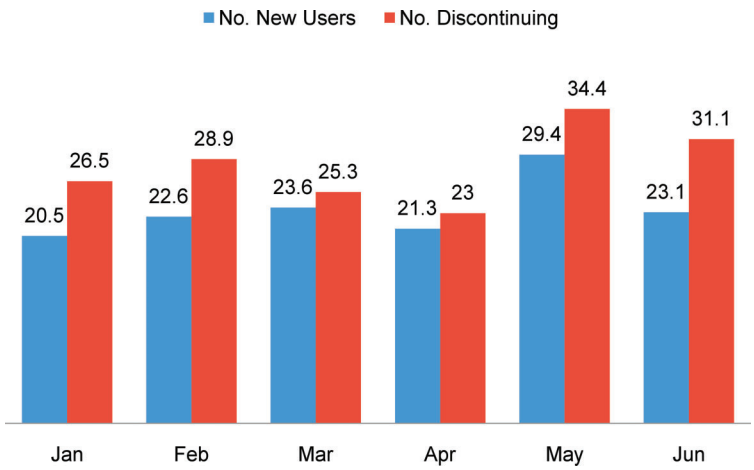
Recruitment and Data Collection

Between October 2011 and December 2012, a PIH-IMB research team conducted a series of semi-structured interviews with adult participants. Interview discussion guides included questions on knowledge of and beliefs regarding fertility, reproductive health, and family planning; the role of religious and other local leaders and health care providers in promoting family planning; experiences using contraceptive methods; and interpersonal relationships with friends, spouses, relatives, and health care providers.

Adult participants were recruited from all 8 health centers' catchment areas in southern Kayonza district. The family planning nurse and maternity nurse were interviewed at each health center. Three villages per health center catchment area were then selected at random, and the 2 maternal and child health CHWs in each village were interviewed. These CHWs keep logs of all households in their catchment areas, including the name and age of each household member. The names of all adults aged 18 or over were compiled from these household logs into a single list, from which 1 male and 1 female adult community member per village were randomly selected for interview. In order to explore the diverse perspectives of community members in southern Kayonza, no upper age limit was imposed.

Participants were compensated 2,000 Rwandan Francs (approximately US$3) for their time. All participants provided informed consent. All focus

FIGURE 2. Average Number of New Contraceptive Users and Discontinuers Across All 8 Health Centers in Southern Kayonza District, January–June 2012



Source: Rwanda Health Management Information System.[15]

groups and interviews were audio-recorded and conducted in the local language, Kinyarwanda, by a team of trained data officers.

Ethical Approval

This study received approval from the Rwanda National Ethics Committee in Kigali, Rwanda, and from the Brigham and Women's Hospital Partners Human Research Committee in Boston, Massachusetts, USA.

Data Analysis

Data were transcribed in Kinyarwanda and translated into English. Data were analyzed using NVivo and Dedoose software. The PIH-IMB research team read through and *in vivo* coded all transcripts to develop lists of preliminary themes using participants' own words. The research team met regularly to discuss emerging themes and to develop a formal codebook, which linked each content area with specific thematic codes. The team then recoded the transcripts following the content areas outlined in the codebook. Seven themes emerged as the key analytical categories under which the team grouped related subcodes. Regular meetings among the coding team allowed discussion of any discrepancies in code definitions and in the application of codes, ensuring the reliability of coded data and consistent coding of transcripts. Identifying information was omitted during data analysis to protect participant confidentiality.

RESULTS

Characteristics of Study Participants

In total, we recruited 159 participants: 15 family planning and maternity nurses based at health centers, 48 maternal and child health CHWs, and 96 community members. The mean age of the 96 community members was 38 years (Table), with a range of 20 to 87 years. Community members reported an average of 4 children, and 86.5% were either married or cohabitating. Most (86.5%) were subsistence farmers, and they had, on average, 4 years of schooling (over half had not completed primary school).

Of the 159 adult participants, 15% (15 community members, 6 CHWs, and 3 health facility nurses) reported never using contraception (Figure 3). Among those who said they (or their partners, in the case of male participants) had used modern contraceptive methods, the most commonly reported contraceptive method currently used was injectables at 45%, followed by pills (19%) and condoms (10%). Implants were used by 3% of the participants and

TABLE. Demographic Characteristics of Study Participants, Kayonza District, Rwanda (N = 159)

	Community Members (n = 96)	Community Health Workers (n = 48)	Nurses (n = 15)
Age, mean, y	38	38	31
Sex, No. (%)			
Male	48 (50.0)	24 (50.0)	7 (46.7)
Female	48 (50.0)	24 (50.0)	8 (53.3)
No. of children, mean	4	4	1.5
No. of years of school, mean	4	7	12
Marital status, No. (%)			
Single/unmarried	4 (4.2)	6 (12.5)	4 (26.6)
Married/cohabitating	83 (86.5)	42 (87.5)	11 (73.3)
Other	9 (9.3)	0 (0.0)	0 (0.0)
Occupation of community members,[a] No. (%)			
Farmer	83 (86.5)	--	--
Other	13 (13.5)	--	--

[a] Community health workers were not asked to describe employment in addition to community health work.

the other long-acting and permanent methods were not used at all.

Four Main Themes Influencing Reproductive Health Decision Making

Many participants had learned about family planning through national messaging.

Four key themes emerged from the interviews: (1) fertility aspirations and perceptions of family planning, (2) social pressures and gender roles, (3) access to quality services, and (4) impact of side effects (Figure 4). These themes were interwoven throughout participants' narratives, influencing reproductive health decision making, including enrollment and retention in family planning programs.

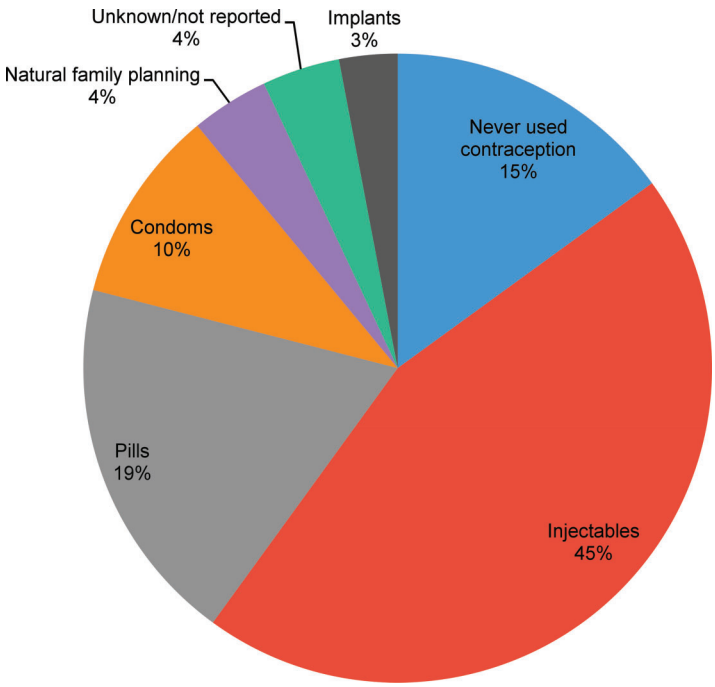
Participants exhibited general awareness of family planning and its benefits; however, many also shared ambitions for large families and related experiences cycling in and out of the family planning program as they navigated between these fertility aspirations. While family planning services are widely available at health centers, participants continued to face barriers to accessing high-quality services, and persistent side effects also affected family planning use. Gender roles and social networks further exerted pressure on family planning use. When spouses, friends, or parents did not support family planning use, many women considered enrolling in the program secretly and without familial support.

Fertility Aspirations and Perceptions of Family Planning

All participants had some knowledge of contraceptive methods, and many had learned about family planning through national messaging, echoing findings from the 2010 Rwanda DHS, in which 70% of married women had heard a family planning message on the radio or television or in the newspaper.[17] Participants often viewed family planning as a means of improving the socioeconomic condition of one's family and community, explaining that contraception facilitates birth spacing and timing, which can, in turn, improve marital relations, sanitation, and hygiene; give a mother time to work and care for her children; and lead to better health outcomes for pregnant women. Further, participants shared that using contraception allows a family to save money in order to feed and clothe their children and to pay school and health insurance fees:

> *Family planning is good … [without family planning] you can give birth to many children*

FIGURE 3. Current Contraceptive Use Among All Participants[a] (N=159)



[a] Current contraceptive method use was self-reported at the time of the interview either by female participants or by male participants about their partner or spouse.

> *and your life becomes very complicated. Now I have only 2 children and their life is very different from if I'd had 5 children. When you give birth to many children … they need soap and clothing and they will often be dirty. So for me, family planning use was good and I would even educate those who are not yet using family planning to start.* (Female community member, 38 years old)

Community members explained that their health care providers and CHWs counseled them about a range of methods. Participants explained that injectables (the most commonly used method among study participants) are preferable to other methods because it is easier to get an injection every 3 months than to take a pill every day. As 1 participant explained:

> *You know taking pills is not easy, since you are always working in your fields, you may forget to swallow your pills … so that is the reason why my wife decided to choose to use injections.* (Male CHW, 36 years old)

Often condoms were used after an unsuccessful trial of hormonal methods. Natural methods such as withdrawal, CycleBeads, and the traditional calendar method were common among participants whose religious beliefs prohibited them from using modern contraception. While some participants had heard of long-acting methods, such as intrauterine devices and vasectomy, these methods were used by few participants and were not routinely offered at all health centers in southern Kayonza district.

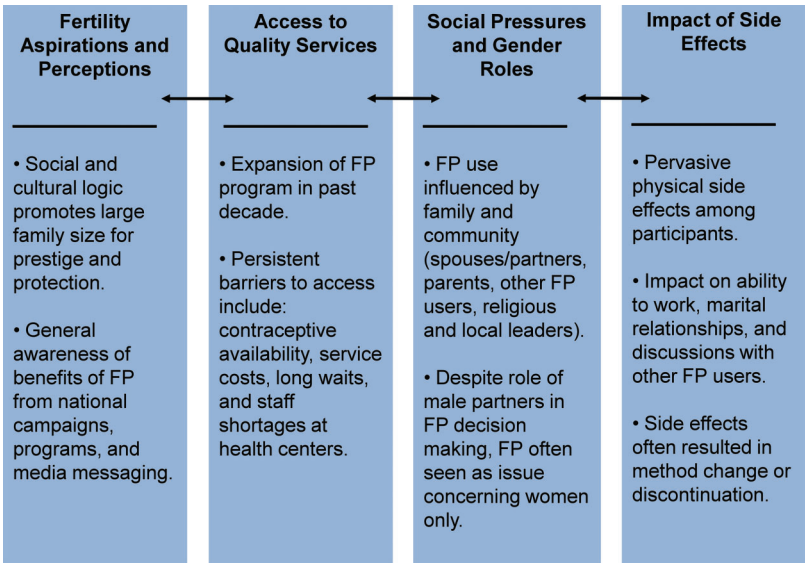
Long-acting and permanent methods were not routinely offered at all health centers in the district.

Family planning was also seen by many as a mechanism for contributing to the nation's development by limiting population strain and land shortages, thereby reducing poverty:

> *When we are in community meetings, they tell us about family planning and about the problems of overpopulation in our country.* (Male community member, 47 years old)

Participants preferred injectables because they thought it was easier to get an injection every 3 months than to take a pill every day.

FIGURE 4. Key Family Planning (FP) Themes Emerging From Interviews



Although participants recognized the benefits of family planning, many also valued large families.

Another participant explained:

> *I don't believe that there are disadvantages to using family planning because we live in different times today than we did in the past. People used to have large plots of land in the past and parents had land to give to their children. But today people have no land to give to their children.* (Male community member, 48 years old)

In addition to reflecting on land shortages and population changes, participants also reflected on changes in the availability and promotion of family planning information and services over time. The 1994 Rwandan genocide often figured prominently in these reflections, as a key turning point in the country's history that reshaped the political and social landscape:

> *In our time there, family planning was not known everywhere. People hear about it now after the genocide. Before the genocide no one used family planning.* (Female community member, 58 years old)

While these changes were often recounted first-hand by older participants, a narrative of change over time in population, land availability, and increased family planning access was also echoed by younger participants.

Although participants readily discussed the benefits of family planning, many also valued large families and high parity. In addition to serving as a status symbol, participants viewed large families as a form of insurance in a context where many had witnessed the loss of a child from childhood illness, due to birth complications, or during the 1994 genocide. As many participants in our study recounted experiences of losing children, having multiple children was often discussed as a means of ensuring the longevity of one's family in the face of future uncertainty. One participant shared:

> *Rwandans say that if you give birth to few children, what will happen if they die?* (Female community member, 58 years old)

Yet she continued:

> *But don't think like that … Today there is malnourishment everywhere. We don't have any land left to cultivate and farm. Many don't eat all day and all night, and children often become homeless … For this reason, family planning is good … You should give birth to few children that you are able to bring up properly.*

Through such narratives, participants weighed the benefits of family planning alongside desires for large families and recounted

experiences cycling in and out of the family planning program as they reconciled these vying fertility aspirations.

Social Pressures and Gender Roles

Gender roles and relationships with family members were critical factors in women's decisions to enroll in the family planning program and structured beliefs about childbirth and fertility. Many female participants explained that without a husband's approval, contraception had to be used in secret. At the same time, family planning was also described as a woman's matter with which men should not be concerned:

> *The problem is that men feel that family planning is only for women … No men ever come to the health center asking for family planning. Men say that family planning is just for women.* (Female CHW, 48 years old)

As a result, CHWs and health facility staff explained that a large part of their role in promoting family planning was educating men on the importance of family planning:

> *Sometimes, husbands and wives disagree. We try to teach men so that they will see that family planning is necessary. But some men don't understand. They say that they don't enjoy sexual intercourse when using contraception.* (Female CHW, 50 years old)

CHWs employed many techniques for reaching male community members, for example, by interacting with men during household visits and at community meetings. In interviews, male CHWs shared that part of their role was acting as an ambassador for promoting family planning to other men in the community, often teaching by example, starting with their own households:

> *I educated my wife about family planning and she understood it.* (Male CHW, 47 years old)

Gendered behavior further influenced reproductive health decision making, as unmarried women were often discouraged from accessing contraceptive services at health centers, both within their communities and by providers themselves. For example, informal rules enforced at some health centers required women to be accompanied by male partners. Participants described both marital status and age as important factors affecting access to contraception. Unmarried and young women often faced stigma if they were interested in accessing family planning services and would rarely go to the health center for fear of judgment—specifically, fear of being labeled "prostitutes." Some providers shared the stigmatizing attitudes of community members:

> *People who aren't married yet don't use family planning, except for those who are prostitutes. Prostitutes are the only ones who come to get family planning.* (Female CHW, 42 years old)

CHWs reported that on rare occasions young people would seek them out to ask questions and access contraception, although this behavior was more common among young men than women:

Participants described family planning as a woman's matter, but men often exerted power when making reproductive decisions.

> *A few young men come to me to ask me for condoms, but as for young women, I have to go looking for them because they think that if people know that they use family planning, people will think they are prostitutes. … Recently, only one young man came to ask me for condoms. I gave them to him, but no young woman has ever come to see me. Maybe they [young women] go to the health center, but generally they are too embarrassed. They explain that they can't go to get family planning when they aren't married.* (Female CHW, 50 years old)

While social pressure in some cases acted as a barrier to access, local leaders and CHWs also used social strategies to reinforce messages surrounding the benefits of family planning use. In community meetings at the village level, local leaders advocated family planning use, and CHWs made home visits and held meetings encouraging families to enroll in the program. Religious institutions offered mixed messages. While some religious leaders endorsed family planning, others promoted only natural methods, and still others prohibited all family planning use:

Some religious leaders endorsed family planning while others did not or promoted only natural methods.

> *Religious leaders do talk about family planning. And some Christians do use family planning methods, but there are others who don't use family planning. Not all people place the same value on family planning.* (Male community member, 45 years old)

Access to Quality Services

Young and unmarried women often faced stigma when accessing family planning services.

Despite national gains in contraceptive availability over the past decades,[17] participants recounted many barriers remaining that inhibited widespread access to quality family planning services, such as transportation, variable quality of care, lack of diversity in the contraceptive methods

Many barriers inhibited widespread access to family planning, including stock-outs.

available at health centers, and costs associated with services. Lack of transport and long wait times upon arrival at the health center, combined with the opportunity cost of lost work, often made going to a health center prohibitive for women in southern Kayonza. Stock-outs at health centers also impacted the quality of services women received:

> *The biggest challenge is stock-outs of medicines and related materials … And many women stop using contraception, not because they've decided to but because of stock-outs. You must understand that when stock-outs occur, women can become pregnant while waiting for contraceptives to be delivered to the health center.* (Female nurse, 28 years old)

Side effects affected marital relationships and women's ability to work.

While family planning services at health centers are free of change, some participants shared that if they did not have *mutuelle de santé* ("mutual health," Rwanda's community-based health insurance system),[18] they felt they could not go to the health center to receive services. Further, despite policies meant to eliminate the cost of family planning services, community members were often asked to make co-payments if they returned to the health center to change methods or to receive monthly contraceptive services:

> *When people come for a family planning method, they are asked to pass through the mutuelle de santé office instead of coming directly to the family planning office. And when they go to the mutuelle office, they are asked to pay 200 Rwandan Francs [about US$0.29], when it is known that family planning services are free of charge.* (Male nurse, 41 years old)

Impact of Side Effects

When women experienced persistent side effects, many discontinued their method rather than return to the health clinic.

Side effects were a salient feature in nearly all interviews with community members, influencing women's decisions to adhere to or discontinue contraceptive use and impacting interpersonal relationships, work productivity, and marital relationships. In the context of minimal counseling, long waits at health centers, and fees for services, many women discontinued their contraceptive methods when side effects persisted, rather than returning to the health center for additional consultations. Participants experienced a range of side effects that they associated with hormonal contraceptive methods, including excessive bleeding, weight fluctuation, headaches and backaches, low libido, and vaginal dryness:

> *Many women deal with frequent side effects. When we go to see them, some tell us that they have a headache or a backache. Another side effect women experience is bleeding heavily; they won't stop bleeding for an entire month. Others say that they no longer menstruate.* (Female CHW, 42 years old)

These side effects affected women's ability to work and their marital relationships. As 1 participant shared:

> *Family planning was killing me. I suffered from headaches, and I would spend like 2 days non-stop with a headache. I suffered from backaches and I could not do hard work.* (Female community member, 39 years old)

Side effects also impacted marital relationships when women felt concerned they were no longer able to please their husbands or maintain their regular sexual activity:

> *Some women who use family planning begin to have headaches. Later, they may experience low sex drive or may not seem sexually desirable to their husbands. And this can cause misunderstandings between husbands and wives … Women may choose to discontinue using family planning after struggling every day with their husbands. When it's time to make love, she doesn't want to.* (Female CHW, 42 years old)

Women managed side effects through a variety of techniques. Some women expressed the importance of "perseverance" in the face of challenges:

> *There are some people who have side effects; they no longer have periods, some gain a lot of weight, they have problems in their bodies, but they persevere.* (Female community member, 37 years old)

Others spoke with their CHW or returned to the health center to switch methods:

> *Community health workers educate people about family planning and people choose the method they want to use. If they find that the method they first chose doesn't work well for them, community health workers let them choose another method until they find the method that works best with their body.* (Male community member, 45 years old)

Yet many women felt the side effects were too great and eventually discontinued family planning use, sometimes after trying several different methods:

> *[Some] women use injections. Then they change and start using pills. Another woman now has an implant, but she also wants to discontinue. She wants to discontinue because she is bleeding excessively. When she has her period it never seems to end.* (Female CHW, 48 years old)

Participants' experiences of side effects were often shaped by rumors and misinformation in the community, coupled with limited opportunities to receive in-depth information and counseling from providers. The combination of negative experiences, misinformation, and rumors contributed to fears that even popular methods of family planning such as injectables could have harmful long-term consequences, such as infertility, cancer, or death:

> *What I can tell you is that there were some rumors among women. Women were saying that family planning causes cancer and that there was a program to inject women with cervical cancer … those rumors spread and many women did not want to try family planning.* (Female CHW, 42 years old)

Upon hearing about negative side effects and potential life-threatening illnesses linked to family planning, many women were wary of joining the family planning program. As 1 CHW explained:

> *There are people who fear using family planning because of information they get from their friends about side effects. When 1 woman experiences a side effect, she may go around to her neighbors and friends talking to them about her problem, and this makes them fear joining family planning.* (Male CHW, 34)

DISCUSSION

In interviews, participants shared both the benefits and challenges of family planning in the context of desires for large families, social pressures, gender roles, side effects, and barriers to accessing services. Our study reinforces that individual and community perceptions exert a strong influence on reproductive health and family planning choices,[19–21] and that understanding providers' and communities' perspectives is critical if family planning program priorities and messaging are to respond to the needs of the local context.[22]

Participants spoke openly about the numerous benefits of family planning to promote poverty eradication, familial development, and better health. The fact that these positive statements of family planning often echoed the messages shared by local leaders, in national campaigns, and on radio broadcasts does suggest that public health information campaigns on family planning are raising awareness in this rural district of Rwanda. However, awareness is not sufficient to ensure behavior change, as is evident in participants' reflections on the pragmatic and sociocultural challenges of adopting and adhering to family planning. This finding is not uncommon among family planning programs.[23]

Rumors and misinformation contributed to fears of contraceptive methods.

Participants shared desires for larger families as a sign of prestige or protection against unforeseen disaster and child mortality. This echoes literature that has shown a strong replacement effect on fertility in Rwanda following the 1994 genocide.[24] Further, although Rwanda has achieved impressive declines in child mortality, in 2010 16.6% of women had experienced 2 or more child deaths.[7]

Over the past decade, Rwanda's family planning program has expanded significantly in national health centers[17] and through national policies that require family planning services to be offered free of charge in order to eliminate financial barriers. CHWs have taken on additional responsibilities to educate communities about family planning, and in pilot districts, CHWs are able to administer some contraceptive methods. Yet structural factors such as hidden costs associated with services, transportation fees, and supply shortages created barriers to sustained enrollment in the family planning program for participants in this study. These barriers are noted throughout sub-Saharan Africa in areas where human resources for health are below recommended thresholds and health system infrastructure remains weak.[25] And while Rwanda has initiated a model program for the scale-up of human resources for health,[26] the country still requires additional health workers to meet national health worker needs. In our study, these human resource shortages were reflected in the long wait times and short appointments with service providers, which often led to insufficient counseling on family planning.

While Rwanda's family planning program has made great strides to improve access to family planning, structural barriers still persist.

In addition, the reach and quality of services can be strengthened by providing training and mentorship for CHWs and health care providers alike to facilitate the delivery of appropriate counseling and services, so that women can make informed choices when selecting

Training health workers to provide appropriate counseling, including proper management of side effects, is critical.

contraceptive methods and better anticipate side effects. CHWs specifically could be provided with side effect management protocols and supplies to distribute throughout their communities to help women cope (e.g., sanitary napkins and pain relievers).

Factors contributing to stock-outs of reproductive commodities have recently been analyzed in Rwanda,[27] and efforts to address these areas will be needed to narrow gaps between national policy and local implementation. Additionally, assuring family planning services are truly free of charge to clients will be instrumental to improving coverage. Clarifying and enforcing national policies regarding payment at the local level are essential to ensure that unnecessary costs are not incurred by program recipients and to encourage individuals to seek care at health centers.

Given these structural challenges, when women faced persistent and significant side effects, many chose to discontinue use, a common theme in the literature on family planning in low-resource settings.[28,29] Negative experiences were often shared through social networks and affected the willingness of others in the community to try contraceptive methods, exacerbating fears of potential long-term negative health impacts. Such fears have been documented as a common reason for contraceptive discontinuation in similar settings.[30,31]

Interpersonal relationships, particularly with male partners, exerted significant influence on reproductive health decision making, with male partners often exercising control over women's reproductive choices, a finding echoed by researchers implementing similar programs in diverse countries throughout sub-Saharan Africa.[32,33] Yet while male partners exerted control over reproductive choices, family planning was often seen as a matter that concerned only women. Recognizing the critical importance and significant benefits of engaging men and boys in reproductive health and family planning efforts,[34] the Government of Rwanda has initiated successful programs to involve male partners in reproductive health services, which could be considered for expansion. These include a national program for the prevention of mother-to-child transmission of HIV, in which 81% of men in 2010 took advantage of HIV counseling and testing services during their female partner's antenatal care visits.[35]

Expanding efforts to engage men and boys in reproductive health programs could be considered.

Further, closing the gap between national policies that target all women of reproductive age (15–49) and local realities that limit the access of young and unmarried women, is essential to ensuring that young women, in and out of school, have access to information and services and the ability to make informed choices about their SRH. Youth-friendly health centers and targeted national messaging can also make an important contribution toward improving access to SRH information and services for young people.

Limitations

These results should be interpreted with limitations in mind. While this study offers a broad overview of perspectives on reproductive health and family planning for a large sample of participants in southern Kayonza, Rwanda, our findings should not be generalized beyond the study population. Although we have described common perspectives shared by many participants in our study, these participants varied significantly in key social and demographic factors such as age and occupation, in their personal experiences and beliefs, and accordingly, in the responses they provided during interviews. Unfortunately these nuances cannot be adequately explored in a single journal article, and further sub-analysis, for example, stratified by age and gender, is outside the scope of this paper. We did, however, identify in this first phase of research a critical need to explore the perspectives of young people in-depth, which was addressed through a second round of data collection with adolescents, the results of which are forthcoming. Finally, the position of the research team must be acknowledged. Data collectors were hired independently of the service delivery personnel of PIH-IMB, and participants were assured throughout the interview and during the informed consent process that their responses would be held in confidence and would not affect the services provided; however, it was impossible to entirely divorce ourselves from any association with this public-private partnership, and such association likely affected the information that was disclosed.

CONCLUSIONS

Although Rwanda has achieved impressive gains in contraceptive coverage, and people generally are aware of the benefits of family planning, our findings suggest that awareness is not always enough to change behavior and expressed desires regarding fertility and family size. Rwanda has

demonstrated strong political will to promote family planning as a pillar of its approach to sustainable development,[36] and the country recently adopted a national target to increase coverage of voluntary contraceptive use among women of reproductive age to 72% by 2018.[37] As Rwanda continues to refine its policies to achieve these goals, it will be critical to ensure that national messaging campaigns address local perceptions and engage men and boys, and that strategies are adopted to mitigate the very real social, economic, and health challenges that women, including young and unmarried women, face in accessing and continuing to use family planning. Without such strategies, it is likely that family planning services will fail to reach all those who could benefit from these services.

Acknowledgments: We would like to thank our national partners in Rwanda for their support of this study, in particular the Rwanda Ministry of Health. We are grateful for the tireless contributions of the Partners In Health data collection team that carried out this study. Finally, we would like to thank the study participants who generously shared their stories and their views on family planning and reproductive health in Rwanda.

Competing Interests: None declared.

REFERENCES

1. Ministry of Finance and Economic Planning of Rwanda; National Institute of Statistics of Rwanda. Fourth population and housing census, 2012. Kigali (Rwanda): The National Institute; 2014.
2. Republic of Rwanda, Ministry of Finance and Economic Planning. Rwanda Vision 2020. Kigali (Rwanda): The Ministry; 2000. Available from: http://www.sida.se/globalassets/global/countries-and-regions/africa/rwanda/d402331a.pdf
3. Republic of Rwanda, Ministry of Health. National reproductive health policy. Kigali (Rwanda): The Ministry; 2003.
4. Republic of Rwanda, Ministry of Health. National family planning policy and its five-year strategies, 2006–2010. Kigali (Rwanda): The Ministry; 2006. Available from: http://www.gfmer.ch/SRH-Course-2010/national-guidelines/pdf/National-FP-policy-MOH-Rwanda-2006.pdf
5. Republic of Rwanda, Ministry of Health. Family planning policy. Kigali (Rwanda): The Ministry; 2012. Available from: http://www.moh.gov.rw/fileadmin/templates/Docs/Rwanda-Family-Planning-Policy.pdf
6. Makaka A, Breen S, Binagwaho A. Universal health coverage in Rwanda: a report of innovations to increase enrolment in community-based health insurance. Lancet. 2012;380:S7. CrossRef
7. MEASURE DHS STATcompiler [Internet]. Calvertion (MD): ICF International. 1985 - . Rwanda demographic and health surveys, 2000, 2005, 2010; [cited 2014 Feb 4]. Available from: http://www.statcompiler.com/
8. Bundervoet T. What explains Rwanda's drop in fertility between 2005 and 2010? Washington (DC): World Bank; 2014. Available from: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/01/08/000158349_20140108083213/Rendered/PDF/WPS6741.pdf
9. Ndaruhuye DM, Broekhuis A, Hooimeijer P. Demand and unmet need for means of family limitation in Rwanda. Int Perspect Sex Reprod Health. 2009;35(3):122–130. CrossRef. Medline
10. Ayad M, Hong R. Levels and trends of contraceptive prevalence and estimated unmet need for family planning in Rwanda: further analysis of the Rwanda demographic and health surveys, 2000–2007/08. Calverton (MD): ICF Macro; 2009. Available from: http://pdf.usaid.gov/pdf_docs/PNADQ640.pdf
11. Basinga P, Moore AM, Singh SD, Carlin EE, Birungi F, Ngabo F. Abortion incidence and postabortion care in Rwanda. Stud Fam Plann. 2012;43(1):11–20. CrossRef. Medline
12. Republic of Rwanda, Ministry of Health. Report of a qualitative assessment of family planning in Rwanda. Arlington (VA): Advance Africa Deliver, Prime II Rwanda; 2002. Available from: http://pdf.usaid.gov/pdf_docs/PNACT535.pdf
13. Brunie A, Tolley EE, Ngabo F, Wesson J, Chen M. Getting to 70%: barriers to modern contraceptive use for women in Rwanda. Int J Gynaecol Obstet. 2013;123(Suppl 1):e11–e15. CrossRef. Medline
14. Tolley EE, McKenna K, Mackenzie C, Ngabo F, Munyambanza E, Arcara J, et al. Preferences for a potential longer-acting injectable contraceptive: perspectives from women, providers, and policy makers in Kenya and Rwanda. Glob Health Sci Pract. 2014;2(2):182–194. CrossRef. Medline
15. Rwanda Health Management Information System, Rwinkwavu Hospital catchment area [dataset]. Republic of Rwanda, Ministry of Health. 2011–2012.
16. Ministry of Finance and Economic Planning of Rwanda; National Institute of Statistics of Rwanda. Fourth population and housing census, 2012: thematic report on fertility. Kigali (Rwanda): The National Institute; 2014.
17. Muhoza DN, Rutayisire PC, Umubyeyi A. Measuring the success of family planning initiatives in Rwanda: a multivariate decomposition analysis. Calverton (MD): ICF Macro; 2013. Available from: http://dhsprogram.com/pubs/pdf/wp94/wp94.pdf
18. Twahirwa A. Sharing the burden of sickness: mutual health insurance in Rwanda. Bull World Health Organ. 2008;86(11):823–824. Medline
19. Dynes M, Stephenson R, Rubardt M, Bartel D. The influence of perceptions of community norms on current contraceptive use among men and women in Ethiopia and Kenya. Health Place. 2012;18(4):766–773. CrossRef. Medline
20. Maticka-Tyndale E, Tenkorang EY. A multi-level model of condom use among male and female upper primary school students in Nyanza, Kenya. Soc Sci Med. 2010;71(3):616–625. CrossRef. Medline
21. Stephenson R, Beke A, Tshibangu D. Contextual influences on contraceptive use in the Eastern Cape, South Africa. Health Place. 2008;14(4):841–852. CrossRef. Medline
22. Mwaikambo L, Speizer IS, Schurmann A, Morgan G, Fikree F. What works in family planning interventions: a systematic review. Stud Fam Plann. 2011;42(2):67–82. CrossRef. Medline
23. Freedman R. Do family planning programs affect fertility preferences? A literature review. Stud Fam Plann. 1997;28(1):1–13. CrossRef. Medline
24. Schindler K, Bruck T. The effects of conflict on fertility in Rwanda. Washington (DC): World Bank; 2011. CrossRef
25. United Nations (UN). Framework of actions for the follow-up to the Programme of Action of the International Conference on Population and Development Beyond 2014. New York: UN; 2014. Available from: http://www.unfpa.org/sites/default/files/pub-pdf/ICPD_beyond2014_EN.pdf
26. Binagwaho A, Kyamanywa P, Farmer PE, Nuthulaganti T, Umubyeyi B, Nyemazi JP, et al. The human resources for health

program in Rwanda--new partnership. N Engl J Med. 2013;369 (21):2054–2059. CrossRef. Medline

27. Chandani Y, Noel M, Pomeroy A, Andersson S, Pahl MK, Williams T. Factors affecting availability of essential medicines among community health workers in Ethiopia, Malawi, and Rwanda: solving the last mile puzzle. Am J Trop Med Hyg. 2012;87(5 Suppl):120–126. CrossRef. Medline
28. Fox K. The impact of side effects on family planning use among female clients of the public health services in Jamaica. West Indian Med J. 2001;50(3):209–213. Medline
29. Henry-Lee A. Women's reasons for discontinuing contraceptive use within 12 months: Jamaica. Reprod Health Matters. 2001;9 (17):213–220. CrossRef. Medline
30. Mansour D, Gemzell-Danielsson K, Inki P, Jensen JT. Fertility after discontinuation of contraception: a comprehensive review of the literature. Contraception. 2011;84(5):465–477. CrossRef. Medline
31. Kaler A. Health interventions and the persistence of rumour: the circulation of sterility stories in African public health campaigns. Soc Sci Med. 2009;68(9):1711–1719. CrossRef. Medline
32. Nketiah-Amponsah E, Arthur E, Aaron A. Correlates of contraceptive use among Ghanaian women of reproductive age (15–49 years). Afr J Reprod Health. 2012;16(3):155–170. Medline
33. Cleland J, Bernstein S, Ezeh A, Faundes A, Glasier A, Innis J. Family planning: the unfinished agenda. Lancet. 2006;368 (9549):1810–1827. CrossRef. Medline
34. Promundo; United Nations Population Fund (UNFPA); MenEngage. Engaging men and boys in gender equality and health: a global toolkit for action. New York: UNFPA; 2010. Available from: http://www.unfpa.org/publications/engaging-men-and-boys-gender-equality-and-health
35. World Health Organization (WHO); Joint United Nations Programme on HIV/AIDS (UNAIDS); United Nations Children's Fund (UNICEF). The global HIV/AIDS response: epidemic update and health sector progress towards universal access. Progress report 2011. Geneva: WHO; 2011. Available from: http://whqlibdoc.who.int/publications/2011/9789241502986_eng.pdf?ua=1
36. Habumuremyi PD, Zenawi M. Making family planning a national development priority. Lancet. 2012;380(9837):78–80. CrossRef. Medline
37. Republic of Rwanda. Economic development and poverty reduction strategy, 2013–2018: shaping our development. Kigali (Rwanda): Republic of Rwanda; 2013. Available from: http://www.minecofin.gov.rw/fileadmin/General/EDPRS_2/EDPRS_2_FINAL1.pdf

Peer Reviewed

Received: 2014 Nov 9; **Accepted:** 2015 Feb 11; **First Published Online:** 2015 May 13

Cite this article as: Farmer DB, Berman L, Ryan G, Habumugisha L, Basinga P, Nutt C, et al. Motivations and constraints to family planning: a qualitative study in rwanda's southern kayonza district. Glob Health Sci Pract. 2015;3(2):242-254. http://dx.doi.org/10.9745/GHSP-D-14-00198.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

ORIGINAL ARTICLE

Predictors of Essential Health and Nutrition Service Delivery in Bihar, India: Results From Household and Frontline Worker Surveys

Katrina Kosec,[a] Rasmi Avula,[b] Brian Holtemeyer,[a] Parul Tyagi,[b] Stephanie Hausladen,[c] Purnima Menon[b]

Only about 35% of sample households reported receiving immunization, food supplements, pregnancy care information, or nutrition information. Monetary incentives for such product-oriented services as immunization improved performance and may have spillover effects for information-oriented services. Immunization day events and good frontline worker recordkeeping also improved service delivery.

ABSTRACT

Background: In Bihar, India, coverage of essential health and nutrition interventions is low. These interventions are provided by 2 national programs—the Integrated Child Development Services (ICDS) and Health/National Rural Health Mission (NRHM)—through Anganwadi workers (AWWs) and Accredited Social Health Activists (ASHAs), respectively. Little is known, however, about factors that predict effective service delivery by these frontline workers (FLWs) or receipt of services by households. This study examined the predictors of use of 4 services: (1) immunization information and services, (2) food supplements, (3) pregnancy care information, and (4) general nutrition information.

Methods: Data are from a 2012 cross-sectional survey of 6,002 households in 400 randomly selected villages in 1 district of Bihar state, as well as an integrated survey of 377 AWWs and 382 ASHAs from the same villages. For each of the 4 service delivery outcomes, logistic regression models were specified using a combination of variables hypothesized to be supply- and demand-side drivers of service utilization.

Results: About 35% of households reported receiving any of the 4 services. Monetary immunization incentives for AWWs (OR = 1.55, CI = 1.02–2.36) and above-median household head education (OR = 1.39, CI = 1.05–1.82) were statistically significant predictors of household receipt of immunization services. Higher household socioeconomic status was associated with significantly lower odds of receiving food supplements (OR = 0.87, CI = 0.79–0.96). ASHAs receiving incentives for institutional delivery (OR = 1.52, CI = 0.99–2.33) was marginally associated with higher odds of receiving pregnancy care information, and ASHAs who maintained records of pregnant women was significantly associated with households receiving such information (OR = 2.25, CI = 1.07–4.74). AWWs receiving immunization incentives was associated with significantly higher odds of households receiving general nutrition information (OR = 1.92, CI = 1.08–3.41), suggesting a large spillover effect of incentives from product- to information-oriented services.

Conclusion: Product-oriented incentives affect delivery of both product- and information-oriented services, although household factors are also important. In India, existing government programs can mitigate supply- and demand-side constraints to receiving essential interventions by optimizing existing incentives for FLWs in national programs, helping FLWs better organize their work, and raising awareness among groups who are less likely to access services.

[a] International Food Policy Research Institute, Washington, DC, USA.
[b] International Food Policy Research Institute, New Delhi, India.
[c] Harvard University Graduate School of Education, Cambridge, Massachusetts, USA.
Correspondence to Katrina Kosec (k.kosec@cgiar.org) and Rasmi Avula (r.avula@cgiar.org).

INTRODUCTION

Globally, undernutrition is the underlying cause each year of some 3.1 million deaths in children under 5 years old (45% of all deaths in this group).[1] Delivering 10 evidence-based essential interventions in

such areas as adolescent and pregnancy nutrition, infant and young child feeding practices, immunization, and micronutrient supplementation at 90% coverage could reduce these total deaths by an estimated 15%.[1]

Community-based strategies are important for delivering health interventions requiring household behavioral changes.

Community-based strategies are recognized as important for delivering such health and nutrition interventions—particularly those that require household behavioral changes.[2] Specifically, frontline workers (FLWs)—paid or volunteer nonprofessional community health care providers[3]—can improve access to essential interventions[4] and have been effective at preventing and managing neonatal childhood illnesses.[5,6] Behavioral change interventions such as promotion of breastfeeding and hand washing,[4] as well as instruction on the value of immunization,[7] micronutrients, and insecticide-treated nets, can be delivered in the community by trained health professionals or by lay workers.[4]

FLW roles are quite diverse; some FLWs provide a wide range of preventive and curative services while others provide only selected services.[8] Careful selection and training, continued support including monetary and non-monetary incentives, establishing routine contact with families in the community, and monitoring are critical for a successful FLW program.[2,8–11] Supportive supervision is also recognized to improve work productivity of FLWs providing preventive or curative services.[12] There is, however, limited understanding of the differing determinants of effective FLW service delivery for preventive vs. curative services. Some researchers have noted that FLW workloads and preferences can play a role in shaping which services FLWs prioritize for delivery.[13–15]

In India, all essential health and nutrition interventions are delivered by FLWs through 2 national programs: the Integrated Child Development Services (ICDS) scheme and the Health/National Rural Health Mission (NRHM). Two types of FLWs are responsible for delivering services to communities: Anganwadi workers (AWWs) and Accredited Social Health Activists (ASHAs) (Table 1).

AWWs are part-time female ICDS workers who receive a fixed monthly honorarium based on their educational qualifications and who may also receive monetary incentives for specific activities such as attending training sessions (payment per training attended) and encouraging families to use immunization and family planning services (payment per beneficiary vaccinated or referred, respectively). AWWs have at least a 10th-grade education and are recruited from local communities. They deliver services through Anganwadi centers (AWCs), serving a catchment area of a population of 1,000. AWWs provide monthly food supplements, facilitate immunization and health check-ups, and provide referral services, non-formal preschool education, and nutrition and health education (including information on pregnancy care and infant and child feeding practices)—both at the AWC and during home visits. Under the supplementary nutrition service, AWWs are responsible for providing ready-to-eat food supplements on the 15th day of every month to all pregnant and lactating mothers and children under 3 years old as well as hot cooked meals on at least 25 days each month to 3–6-year-old children at the AWCs. In Bihar state, this remains a more limited service where guidelines note that supplementary foods are to be provided at each AWC to only 28 malnourished children and to 12 severely and acutely malnourished children aged 6 months to 3 years, 16 pregnant and lactating women, and 3 adolescent girls.[16]

ASHAs are the non-salaried, part-time FLWs of the NRHM. They are literate women from the local communities, who are 25–45 years old and who preferably have at least a 10th-grade education. Once hired as ASHAs, they receive in-service training and attend monthly meetings. ASHAs deliver services in the same catchment areas (population of 1,000) as the AWWs, and receive performance-based incentives for promoting universal immunization, motivating pregnant women to have institutional deliveries, referring clients to Reproductive & Child Health (RCH) and other health care programs, and constructing household toilets.[17] As with AWWs, the incentive amount ASHAs receive for providing a specific service is fixed and paid for each beneficiary who receives the service.[18] ASHAs are expected to motivate families to use immunization, family planning, and institutional delivery; provide information on pregnancy, newborn, and infant care (including nutrition information; and provide other services pertaining to communicable diseases. Additionally, AWWs and ASHAs together plan and organize immunization days as well as Village Health and Nutrition Days (VHNDs) once a month, at which ICDS and health services are delivered.

Despite the systems in place for delivering essential health and nutrition services to communities, the poor state of service delivery for nutrition in India has been noted by several authors,[19,20] and the problem is worse in states such as Bihar—one of India's poorest. For example, only 28% of children under 6 months are exclusively breastfed, only a third

TABLE 1. Roles and Responsibilities of Frontline Workers in Bihar, India

Anganwadi Workers (AWWs)	Accredited Social Health Activists (ASHAs)
Employment Terms	
• Part-time female workers recruited from local communities • Employed by the Integrated Child Development Services • Receive fixed monthly honorarium based on educational qualifications • May receive monetary incentives for specific activities ○ Encouraging families to use immunization ○ Encouraging families to use family planning services ○ Attending training sessions	• Part-time female workers recruited from local communities • Employed by the National Rural Health Mission • Non-salaried but receive monetary incentives for specific activities ○ Promoting universal immunization ○ Promoting institutional deliveries ○ Referring clients to RCH & other programs ○ Constructing household toilets
Education	
• Have at least 10th-grade education	• Literate, preferably with at least 10th-grade education
Catchment Area	
• Deliver services through Anganwadi centers, serving catchment area of 1,000 population	• Deliver services in same catchment area as AWWs through home visits or in AWC
Services Provided	
• Facilitate immunization • Provide monthly food supplements to pregnant women, lactating mothers, and children • Provide nutrition and health education, including information on pregnancy care and infant and child feeding practices, at AWCs and during home visits • Plan and organize immunization days and VHNDs once a month with ASHAs • Provide non-formal preschool education • Facilitate health check-ups • Provide referral services	• Motivate families to use immunization • Motivate pregnant women to have institutional deliveries • Provide information on pregnancy, newborn, and infant care (including nutrition information) • Provide other services related to communicable diseases • Plan and organize immunization days and VHNDs once a month with AWWs • Motivate families to use family planning

Abbreviations: AWCs, Anganwadi centers; RCH, reproductive and child health; VHNDs, Village Health and Nutrition Days.

of children are fully immunized, and only 23% of 6–23-month-old children are fed according to the World Health Organization's recommendations. Furthermore, only 0.6% of pregnant and lactating women reported receiving food supplements, and only 0.2% reported receiving health and nutrition education.[21]

In this context, understanding factors that predict provision and receipt of services can provide direction to improve service delivery. We conducted a study in Bhojpur district of Bihar to examine the use of 4 services delivered through the FLWs of the ICDS and NRHM: (1) immunization services, (2) food supplements, (3) pregnancy care information, and (4) general nutrition information. In this article, we refer to immunization information and services and food supplements as **product-oriented services**, as they involve

a product or the provision of information aimed solely at increasing uptake of a specific product. AWWs and ASHAs are expected to sensitize and motivate families to use immunization services; auxiliary nurse-midwives (ANMs) are responsible for providing the vaccines. Only AWWs provide food supplements, through AWCs. We consider pregnancy care and general nutrition information to be **information-oriented services**, as they require information provision and counseling without a specific product being associated with the information. AWWs and ASHAs are expected to provide this information at the AWCs and during home visits. Understanding the different factors influencing delivery of each service type can help identify strategies tailored to the specific features of a given service, to ultimately help improve its delivery.

Differentiating between product- and information-oriented services can help identify factors influencing delivery of each type of service.

METHODS

Hypotheses

In this analysis, we tested 3 main hypotheses concerning household receipt of specific health and nutrition services:

1. Providing FLWs with monetary incentives for service provision can increase delivery of those and other closely associated services
2. Greater health and nutrition information and knowledge on the part of FLWs will increase delivery of information-oriented services
3. Household characteristics predict receipt of food supplements (given the country's goal for universal access to food supplementation programs but within a targeted approach that identifies the most needy, in the case of Bihar)

Data Sources

The data for this study are from 2012 and come from household and FLW surveys conducted in 400 randomly selected villages located in 14 blocks of Bhojpur district in Bihar State. Similar trends are observed in Bhojpur as in the state of Bihar overall. About a third of the children in Bhojpur are fully immunized. The coverage for DPT3 is about 54% in Bihar, while it is 49% in Bhojpur.[22]

We added a brief module on the receipt of health and nutrition services during the last 3 months to an ongoing household survey that formed the baseline for a recent impact evaluation.[23] The household survey covered 15 randomly sampled households in each village, for a total of 6,002 households. The survey gathered information on household composition, demographics, and food consumption, among other variables relevant to the main impact evaluation.

The survey of FLWs was conducted specifically for this study. We attempted to interview 1 AWW and 1 ASHA per survey village. If a village had more than 1 AWW or ASHA, we interviewed the worker serving the main village. If it was still unclear whom should be interviewed, we randomly chose one of the workers. For the few villages lacking a local AWW or ASHA, we used information on the AWW or ASHA most frequently serving the village. In total, we interviewed 377 of 394 AWWs and 382 of 396 ASHAs. Of the 17 AWWs not interviewed, 15 were not found and 2 were temporarily unavailable. Of the 14 ASHAs not interviewed, 10 were not found, 3 were temporarily unavailable, and 1 refused to participate. The AWW and ASHA surveys provide information on demographics, education, experience, knowledge, training, available equipment and resources, recordkeeping practices, monetary incentives, and the monitoring, support, and supervision they received.

We merged the household and FLW datasets to generate a household-level dataset containing information on both service users and their providers. We focused on outcomes for households with women and young children, thus restricting our analysis sample to between 500 and 2,038 observations, depending on the outcome.

Dependent Variables

The dependent variables were constructed using questions regarding receipt of services from government service centers and at home. The analytic sample for each outcome was restricted to a subset of households, based on their eligibility to receive the services.

- **Outcome 1: Immunization services.** Households that reported receiving any immunization in the last 3 months at the AWC, subcenter, primary health center (PHC), or from an ANM at home. **Sample:** Only households with at least 1 child under 24 months of age were included (N = 1,199), because according to the national immunization schedule,[24] most children in this age range should have received at least 1 immunization in the last 3 months.
- **Outcome 2: Food supplements.** Households that reported receiving food supplements at

the AWC in the last 3 months. **Sample:** Households with at least 1 pregnant woman or with at least 1 child between 6 months and 3 years old (N = 2,038)

- **Outcome 3: Information on proper care during pregnancy.** Households that reported receiving pregnancy care information from an AWW, ASHA, or ANM at home in the last 3 months. **Sample:** Households with at least 1 pregnant woman or with at least 1 child 0–3 months old (N = 500)
- **Outcome 4: Information on general nutrition.** Households that reported receiving breastfeeding, child feeding, and general nutrition information at home from AWWs or ASHAs in the last 3 months. **Sample:** Households with at least 1 pregnant woman or with at least 1 child under 6 years old (N = 1,764)

As the focus of the study was to understand the determinants of *service delivery*, and the household data are from a secondary dataset, data from the dependent variables do not include standard indicators used to assess the *outcomes* of those services (for example, full immunization, actual pregnancy care, and child feeding practices). We also lacked data to construct such indicators.

Independent Variables

For each of the 4 outcomes, we specified a different set of independent variables determined by their relevance to the delivery of the service. Some of the services are primarily the domain of either the AWW (food supplements) or ASHA (pregnancy care information), while others are provided by both (promoting immunization and providing general nutrition information). In addition, it is possible that different factors affect the delivery of product- vs. information-oriented services. For example, delivery of product-oriented services requires specific facilities and equipment (such as weighing scales to give food supplements). The provision of information-oriented services requires specific knowledge on the part of providers (for example, information on recommended breastfeeding practices).

The complete set of control variables comprised:

1. **Education and experience variables:** These include indicator variables for the worker having the median level of education or higher (class 10+ for ASHAs and class 11+ for AWWs) and the median number of years of experience or higher (6+ for ASHAs and 11+ for AWWs).
2. **Monetary environment variables:** All of these variables were constructed based on FLW self-reports of whether they had *ever* received incentives (for immunization, training, or institutional deliveries)—not whether they are eligible to receive them. They were not coded based on whether the FLW received incentives in conjunction with the services provided to any particular household surveyed. The guidelines on payments for ASHAs in Bihar are unclear. Payments for institutional deliveries by *Janani Suraksha Yojana* (JSY) (the NRHM safe motherhood intervention) are made in cash, while payments for other services are made by check or wire transfer.[25] Only for institutional delivery incentives did we know the actual amount received. Furthermore, payment of incentives is not uniform across villages for several reasons. First, receipt of incentives requires knowledge on the part of FLWs about the payments to which they are entitled. An effective system to record and monitor what services FLWs have delivered is also needed, in addition to actually delivering the incentive payments. A breakdown in this process can lead to a failure to receive incentives for work performed. Furthermore, incentives for AWWs in Bihar were meant to be gradually eliminated around 2011–2012, as ASHAs became more firmly entrenched as the FLWs receiving performance-based incentives. Some blocks, and some villages within blocks, appear to have phased out incentives for AWWs more quickly than others for financial and logistical reasons, generating variation in access to incentives by AWWs.
3. **Effort and organization variables:** These include indicator variables for holding designated immunization days and VHNDs, keeping immunization and pregnancy registries, attending monthly FLW meetings, and having a weighing device for food.
4. **Supervision, training, and knowledge variables:** These include indicator variables for FLWs correctly identifying the position their supervisor occupies, receiving training on pregnancy- and nutrition-related topics in either their first or last training, listing pregnancy as one use of iron pills, and

knowing the proper ages to start liquids other than breast milk and solid foods.

5. **Household and village control variables:** These include household head education, household socioeconomic status quintile, variables recording whether the caste of the household head is the same as that of the ASHA and of the AWW, number of pregnant women in the catchment area (10s), and village population (1,000s).

Analysis

Logistic regression models were specified based on theoretical and programmatic considerations for each of the 4 service delivery outcomes, using a combination of variables:

About 35% of households reported receiving any of the 4 health services.

$$log\left(\frac{P_j}{1-P_j}\right) = \alpha_0 + \alpha_1\ AWW/ASHA\ variables_i + \alpha_2\ HH\ variables_i + \alpha_3\ controls_i + \epsilon_i$$

Where P_j is the probability that household i accesses service j and controls included the village population and dummies for the season and block of residence. In all models, standard errors were clustered at the village level, as the availability and quality of health and nutrition services vary at this level and thus influence all household decisions within the village. This corrects for heteroskedasticity and allows for correlation of errors within villages.

RESULTS

Characteristics of Frontline Workers

Monetary incentives for immunization were significantly associated with household receipt of immunization services.

About one-quarter of AWWs reported ever receiving immunization incentives.

Table 2 summarizes the key independent variables across the 377 AWWs and 382 ASHAs for which we have data. AWWs were more experienced than ASHAs; just over half of ASHAs had 6 or more years of experience, while just over half of AWWs had 11 or more years of experience. With regard to the incentive environment, only about 25% of AWWs reported ever receiving incentives for immunizations and 37% reported ever receiving training incentives. That such incentives were received by only selected AWWs is due both to imperfect policy implementation and a slow and non-uniform effort in phasing out AWW monetary incentives, taking place at the time of our survey. About 88% of AWWs held a designated immunization day, and 59% of ASHAs had a registry of pregnant women in the village.

Receipt of Product- and Information-Oriented Services

More households reported receiving product-oriented services than information-oriented services. In the sample used to assess outcome 1 (immunization services), 31% of households reported receiving immunization in the last 3 months, and of those, about 46% reported receiving them at the AWC (Table 3). About 13% of the outcome 2 (food supplements) sample reported receiving food supplements. In contrast, only 11% of the outcome 3 sample reported receiving information on proper care during pregnancy, and only 5% of the outcome 4 sample reported receiving general nutrition information (Table 3). Looking over all households in any one of the four samples—that is, looking at households with either a pregnant woman or a child under age 6—about 35% reported receiving any of the 4 services, either at home or at a government facility.

Correlates of Using Product-Oriented Services

Immunization Services

Among households in the outcome 1 (immunization services) sample, just under a quarter had AWWs who had received immunization incentives, and 38% had AWWs who had received training incentives (Table 4). About half (47%) resided in villages where AWWs reported frequent delays in payments for immunizations. Almost 90% of such households lived in villages where the AWW had held a designated immunization day, while only 8% lived in villages where the AWW had held a VHND.

In multivariate logistic regression analysis of factors predicting household receipt of immunization services in the last 3 months, we found that households that were in villages where the AWW received monetary incentives for providing immunizations had a 55% higher chance of receiving immunization services than did households in villages without such incentives (confidence interval [CI] = 1.02–2.36; $P = .04$) (Table 5). Holding a designated immunization or VHND was not associated with receipt of immunization services, nor was greater educational attainment or years of experience of the workers.

Among household and village characteristics, an important predictor of household receipt of immunization services was the education level of the head of the household. Specifically, households with a head who had completed class 7 or

TABLE 2. Characteristics of ASHAs and AWWs in Bhojpur District, Bihar State, India

	Value	N
Education and experience		
ASHAs who completed class 10+, %	43.5	382
AWWs who completed class 11+, %	39.3	377
ASHAs who have 6+ years of experience, %	52.6	382
AWWs who have 11+ years of experience, %	54.1	377
Monetary incentives		
AWWs who have ever received immunization incentives, %	24.9	370
AWWs who have ever received training incentives, %	37.1	356
Amount ASHAs receive for institutional delivery (100s), mean, rupees	3.91	369
AWWs who have experienced frequent delays in payments for immunizations, %	46.7	360
AWWs who have experience delayed payment for food supplements sometime in last 6 months, %	64.6	370
Primary reason for working is income generation, ASHAs, %	78.3	374
Primary reason for working is income generation, AWWs, %	61.3	372
Worker effort and organization		
AWWs who have held a designated immunization day, %	87.5	377
AWWs who have held a Village Health and Nutrition Day, %	7.4	376
ASHAs who keep children's immunization registry, %	88.2	382
AWWs who keep children's immunization registry, %	97.6	370
ASHAs who keep registry of pregnant women in village, %	58.9	382
ASHAs who attended 6+ meetings in past 6 months, %	74.3	382
AWWs who have weighing device for food, %	89.7	377
Supervision, training, and knowledge		
ASHAs who know who their supervisor is, %	45.1	381
AWWs who know who their supervisor is, %	92.6	377
ASHAs who have received training on pregnancy-related topics, %	70.5	308
ASHAs who have received training on nutrition-related topics, %	45.7	302
AWWs who have received training on nutrition-related topics, %	71.0	365
ASHAs who list pregnancy as one use of iron pills, %	84.6	382
ASHAs who know age to start liquids other than breast milk, %	86.6	382
AWWs who know age to start liquids other than breast milk, %	88.0	376
ASHAs who know age to start food other than breast milk, %	50.0	382
AWWs who know age to start food other than breast milk, %	66.0	377
Household and village variables		
Pregnant women in catchment area (10s), mean	1.52	374
Village population (1,000s), mean	2.07	354

Abbreviations: ASHAs, Accredited Social Health Activists; AWWs, Anganwadi workers.

TABLE 3. Percentage of Households Reporting Receipt of Health and Nutrition Services, Bhojpur District, Bihar State, India

	Service and Surveyed Sample			
	Immunization	Food Supplements	Pregnancy Care Information	General Nutrition Information
	HHs with children 0–2 y (N = 1,199)	HHs with pregnant women or children 6 m–3 y (N = 2,038)	HHs with pregnant women or children 0–3 m (N = 500)	HHs with pregnant women or children under 6 y (N = 1,764)
Received service	31	13	11	5
Received service at government facilities				
AWCs	46	100	NA	NA
PHCs	7	NA	NA	NA
SCs	8	NA	NA	NA
Received service during home visits via:				
ANMs	48	NA	21	NA
ASHAs	NA	NA	72	47
AWWs	NA	NA	15	78

Abbreviations: ANMs, auxiliary nurse-midwives; ASHAs, Accredited Social Health Activists; AWCs, Anganwadi centers; AWWs, Anganwadi workers; HHs, households; NA, not applicable (service not available at that location or through that provider cadre); PHC, primary health center; SCs, sub-centers.

higher had a 39% higher chance of receiving immunization services than did households with a less educated household head (CI = 1.05–1.82; $P = .02$) (Table 5). After adjusting for education, household socioeconomic status did not have a significant impact on receipt of immunization services (OR = 1.04, CI = 0.94–1.15; $P = .41$). The results on whether caste predicted receipt of immunizations were not consistent; when ASHAs and household heads were of the same caste, there was greater likelihood of receiving immunization services (OR = 1.86, CI = 1.05–3.31; $P = .03$), but when AWWs and household heads were of the same caste, there was lower likelihood of receiving immunization services (OR = 0.45, CI = 0.22–0.91; $P = .03$). Finally, a 1,000 person increase in the village population was associated with significantly lower use of immunization services (OR = 0.89, CI = 0.82–0.96; $P < .01$).

Food Supplements

Among households in the outcome 2 (food supplements) sample, almost two-thirds had AWWs who reported receiving a delayed payment for food supplements sometime in the last 6 months. However, 90% of households' AWWs reported having a device for weighing food, and 93% knew their supervisor (Table 4).

In multivariate logistic regression analysis, there was no significant association between households receiving food supplements and any AWW characteristic (e.g., education, experience, knowing their supervisor), contextual factor (e.g., monetary incentives for immunization or training, on-time payment, holding VHNDs, having a food-weighing device), or most household or village characteristics (e.g., caste or education level of household head, or village size) (Table 6). The only factor that was significantly associated with household receipt of food supplements was

TABLE 4. Relationship Between Frontline Worker and Household Characteristics and Household Receipt of Health and Nutrition Services, Bhojpur District, Bihar State, India

	Service and Sample Reporting Receipt of Service			
	Immunization	Food Supplements	Pregnancy Care Information	General Nutrition Information
	HHs with children 0–2 y (N = 1,199)	HHs with pregnant women or children 6 m–3 y (N = 2,038)	HHs with pregnant women or children 0–3 m (N = 500)	HHs with pregnant women or children under 6 y (N = 1,764)
Education and experience, % (95% CI)				
ASHAs who completed class 10+	46 (43–49)	NA	43 (39–47)	45 (42–47)
AWWs who completed class 11+	40 (37–43)	40 (38–42)	NA	40 (38–42)
ASHAs who have 6+ years of experience	56 (53–59)		66 (62–70)	65 (63–67)
AWWs who have 11+ years of experience	56 (53–58)	59 (57–61)	NA	59 (57–61)
Monetary incentives, % (95% CI)				
AWWs who have ever received immunization incentives	22 (20–25)	25 (23–26)	NA	22 (20–24)
AWWs who have ever received training incentives	38 (35–41)	40 (37–42)	NA	44 (42–46)
Amount ASHAs receive for institutional delivery (100s), rupees	NA	NA	3.95 (0.99)	3.88 (0.95)
AWWs who have experienced frequent delays in payments for immunizations	47 (44–50)	NA	NA	NA
AWWs who have experienced delayed payment for food supplements sometime in last 6 months	NA	65 (63–67)	NA	NA
Primary reason for working is income generation, ASHAs	79 (76–81)	NA	76 (73–80)	76 (74–78)
Primary reason for working is income generation, AWWs	60 (58–63)	62 (60–64)	NA	63 (60–65)
Worker effort and organization, % (95% CI)				
AWWs who have held a designated immunization day	89 (88–91)	NA	NA	NA
AWWs who have held a VHND	8 (7–10)	8 (7–9)	6 (4–8)	7 (6–8)
ASHAs who keep children's immunization registry	90 (88–91)	NA	NA	NA
AWWs who keep children's immunization registry	98 (97–99)	NA	NA	NA
ASHAs who keep registry of pregnant women in village	NA	NA	63 (59–68)	NA
ASHAs who attended 6+ meetings in past 6 months	79 (77–82)	NA	83 (79–86)	80 (78–82)
AWWs who have weighing device for food	NA	90 (89–91)	NA	NA

TABLE 4 (continued).

	Service and Sample Reporting Receipt of Service			
	Immunization	Food Supplements	Pregnancy Care Information	General Nutrition Information
	HHs with children 0–2 y (N = 1,199)	HHs with pregnant women or children 6 m–3 y (N = 2,038)	HHs with pregnant women or children 0–3 m (N = 500)	HHs with pregnant women or children under 6 y (N = 1,764)
Supervision, training, and knowledge, % (95% CI)				
ASHAs who know who their supervisor is	46 (43–49)	NA	50 (46–55)	52 (50–55)
AWWs who know who their supervisor is	92 (91–94)	93 (92–94)		92 (91–94)
ASHAs who have received training on pregnancy-related topics	NA	NA	72 (68–76)	NA
ASHAs who have received training on nutrition-related topics	NA	NA	NA	46 (43–48)
AWWs who have received training on nutrition-related topics	NA	NA	NA	73 (71–75)
ASHAs who list pregnancy as one use of iron pills	NA	NA	83 (80–86)	NA
ASHAs who know age to start liquids other than breast milk				89 (88–91)
AWWs who know age to start liquids other than breast milk	NA	NA	NA	87 (86–89)
ASHAs who know age to start food other than breast milk	NA	NA	NA	49 (47–51)
AWWs who know age to start food other than breast milk	NA	NA	NA	69 (67–71)
Household and village variables				
ASHAs and household head of same caste, % (95% CI)	5.0 (3.8–6.2)	NA	5.0 (3.1–6.9)	5.8 (4.7–6.9)
AWWs and household head of same caste, % (95% CI)	5.1 (3.8–6.3)	5.9 (4.9–6.9)	NA	7.2 (6.0–8.4)
Pregnant women in catchment area (10s), mean (SD)	NA	NA	1.55 (0.80)	NA
Household heads who have completed class 7+, % (95% CI)	42 (39–45)	42 (40–44)	43 (38–47)	43 (41–45)
Household socioeconomic status index, mean (SD)	3.20 (1.41)	3.13 (1.44)	3.26 (1.42)	3.06 (1.43)
Village population (1,000s), mean (SD)	2.08 (2.34)	2.11 (2.38)	2.37 (2.75)	2.27 (2.58)

Abbreviations: ASHAs, Accredited Social Health Activists; AWWs, Anganwadi workers; NA, not applicable; SD, standard deviation; VHND, Village Health and Nutrition Day.
Prevalence rates and 95% confidence interval are reported for all binary variables. For non-binary variables, means and standard deviations are reported.

TABLE 5. Multivariate Logistic Regression Model Showing Predictors of Receipt of Immunization Services For Households With Children 0–2 Years, Bhojpur District, Bihar State, India (N = 1,199)

	OR	95% CI	P
Education and experience			
ASHAs who completed class 10+	0.929	0.694–1.244	.62
AWWs who completed class 11+	1.040	0.769–1.408	.80
ASHAs who have 6+ years of experience	0.853	0.636–1.144	.29
AWWs who have 11+ years of experience	1.120	0.786–1.595	.53
Monetary incentives			
AWWs who have ever received immunization incentives	*1.552*	*1.019–2.363*	*.04*
AWWs who have ever received training incentives	0.967	0.719–1.301	.83
AWWs who have experienced frequent delays in payments for immunizations	0.999	0.743–1.344	1.00
Primary reason for working is income generation, ASHAs	0.766	0.538–1.091	.14
Primary reason for working is income generation, AWWs	1.266	0.936–1.711	.13
Worker effort and organization			
AWWs who have held a designated immunization day	1.119	0.764–1.641	.56
AWWs who have held a VHND	1.078	0.695–1.670	.74
ASHAs who keep children's immunization registry	0.860	0.538–1.373	.53
AWWs who keep children's immunization registry	0.742	0.329–1.673	.47
ASHAs who attended 6+ meetings in past 6 months	0.936	0.663–1.322	.71
Supervision, training, and knowledge			
ASHAs who know who their supervisor is	0.999	0.746–1.338	1.00
AWWs who know who their supervisor is	0.906	0.501–1.640	.75
Household and village variables			
ASHAs and household head of same caste	*1.863*	*1.048–3.312*	*.03*
AWWs and household head of same caste	*0.445*	*0.217–0.913*	*.03*
Household heads who have completed class 7+	*1.385*	*1.052–1.823*	*.02*
Household socioeconomic status index	1.043	0.944–1.153	.41
Village population (1,000s)	*0.885*	*0.816–0.959*	*<.001*

Abbreviations: ASHAs, Accredited Social Health Activists; AWWs, Anganwadi workers; CI, confidence interval; OR, odds ratio; VHND, Village Health and Nutrition Day.
Variables shown in italics are statistically significant at $P < .10$.

household socioeconomic status: a 1-quintile increase in the household's socioeconomic status index was associated with a 13% lower chance of the household receiving food supplements (OR = 0.87, CI = 0.79–0.96; $P = .01$).

Correlates of Using Information-Oriented Services

Information on Proper Care During Pregnancy

Among households in the outcome 3 (pregnancy care information) sample, 72% had ASHAs who

TABLE 6. Multivariate Logistic Regression Model Showing Predictors of Receipt of Food Supplements For Households With Pregnant Women or Children 6 Months to 3 Years, Bhojpur District, Bihar State, India (N = 2,038)

	OR	95% CI	*P*
Education and experience			
AWWs who have completed class 11+	1.303	0.931–1.824	.12
AWWs who have 11+ years of experience	0.838	0.581–1.210	.35
Monetary incentives			
AWWs who have ever received immunization incentives	1.220	0.773–1.925	.39
AWWs who have ever received training incentives	0.885	0.633–1.237	.47
AWWs who have experience delayed payment for food supplements sometime in last 6 months	1.022	0.694–1.504	.91
Primary reason for working is income generation, AWWs	1.079	0.781–1.492	.64
Worker effort and organization			
AWWs who have held a VHND	0.847	0.497–1.446	.54
AWWs who have weighing device for food	1.275	0.735–2.211	.39
Supervision, training, and knowledge			
AWW knows who is their supervisor	1.599	0.812–3.151	.18
Household and village variables			
AWWs and household head of same caste	1.011	0.536–1.907	.97
Household heads who have completed class 7+	0.839	0.633–1.112	.22
Household socioeconomic status index	*0.871*	*0.789–0.962*	*.007*
Village population (1,000s)	1.015	0.972–1.060	.51

Abbreviations: AWWs, Anganwadi workers; CI, confidence interval; OR, odds ratio; VHND, Village Health and Nutrition Day.
Variables shown in italics are statistically significant at $P < .10$.

had received training on pregnancy-related topics, and 83% had ASHAs who correctly listed pregnancy as one possible use of iron pills (Table 4). Further, 63% of such households had ASHAs who kept a registry of pregnant women. These ASHAs were paid almost 400 rupees (approximately US$7.50 in 2012), on average, for each institutional delivery under the JSY conditional cash transfer scheme.

Monetary incentives for institutional deliveries were associated with household receipt of pregnancy care information.

In multivariate logistic regression analysis, neither educational attainment nor years of experience of the ASHAs was significantly associated with receipt of pregnancy care information by the target population (Table 7). However, monetary incentives for institutional deliveries was significant: a 100-rupee increase in payment per delivery was associated with a 52% greater chance of households receiving pregnancy care information in the past 3 months (CI = 0.99–2.33; $P = .06$). There was no evidence that ASHAs being primarily motivated by income generation affected households' receipt of pregnancy care information.

Households living in villages where ASHAs kept a register of pregnant women were more than twice as likely to receive pregnancy care information as were households in villages lacking such a register (OR = 2.25, CI = 1.07–4.74; $P = .03$). There was no significant association between receipt of pregnancy care information and any other worker effort, training, knowledge, or supervision factor.

TABLE 7. Multivariate Logistic Regression Model Showing Predictors of Receipt of Pregnancy Care Information For Households With Pregnant Women or Children Under 3 Months, Bhojpur District, Bihar State, India (N = 500)

	OR	95% CI	P
Education and experience			
ASHAs who have completed class 10+	1.113	0.591–2.094	.74
ASHAs who have 6+ years of experience	0.740	0.371–1.473	.39
Monetary incentives			
Amount ASHAs receive for institutional delivery (100s)	*1.519*	*0.989–2.334*	*.06*
Primary reason for working is income generation, ASHAs	1.095	0.535–2.241	.80
Worker effort and organization			
AWWs who have held a VHND	1.097	0.344–3.497	.88
ASHAs who keep registry of pregnant women in village	*2.254*	*1.072–4.740*	*.03*
ASHAs who have attended 6+ meetings in past 6 months	1.355	0.490–3.748	.56
Supervision, training, and knowledge			
ASHAs who know who their supervisor is	1.501	0.761–2.964	.24
ASHAs who have received training on pregnancy-related topics	0.580	0.249–1.355	.21
ASHAs who list pregnancy as one use of iron pills	1.180	0.482–2.888	.72
Household and village variables			
ASHAs and household head of same caste	1.198	0.392–3.659	.75
Pregnant women in catchment area (10s)	*0.495*	*0.260–0.942*	*.03*
Household heads who have completed class 7+	1.099	0.608–1.984	.76
Household socioeconomic status index	1.002	0.790–1.271	.99
Village population (1,000s)	1.076	0.985–1.175	.11

Abbreviations: ASHAs, Accredited Social Health Activists; AWWs, Anganwadi workers; CI, confidence interval; OR, odds ratio; VHND, Village Health and Nutrition Day.
Variables shown in italics are statistically significant at $P < .10$.

Similarly, household and village characteristics were not important predictors of households receiving pregnancy care information except for the number of pregnant women in the catchment area. For every 10 additional pregnancies, households had 50% less chance of receiving pregnancy care information (CI = 0.26–0.94; $P = .03$).

General Nutrition Information

Among households in the outcome 4 (general nutrition information) sample, only 46% had ASHAs who had received training on nutrition-related topics, while 73% had AWWs who had received such training (Table 4). Similarly, only 49% of such households had ASHAs who knew the appropriate age to start foods other than breast milk, while 69% had AWWs who knew the appropriate age.

In multivariate logistic regression analysis, more years of work experience for AWWs (but not for ASHAs) was marginally associated with greater receipt of nutrition information by households: target households with an AWW having at least 11 years of experience had a 59% higher likelihood of receiving nutrition information than did target households with less experienced

Monetary incentives for immunization were significantly associated with household receipt of general nutrition information.

TABLE 8. Multivariate Logistic Regression Model Showing Predictors of Receipt of General Nutrition Information For Households With Pregnant Women or Children Under 6 Years, Bhojpur District, Bihar State, India (N = 1,764)

	OR	95% CI	*P*
Education and experience			
ASHAs who have completed class 10+	0.770	0.466–1.271	.31
AWWs who have completed class 11+	1.181	0.719–1.940	.51
ASHAs who have 6+ years of experience	0.764	0.456–1.279	.31
AWWs who have 11+ years of experience	*1.588*	*0.923–2.732*	*.10*
Monetary incentives			
AWWs who have ever received immunization incentives	*1.919*	*1.081–3.406*	*.03*
AWWs who have ever received training incentives	1.340	0.820–2.190	.24
Amount ASHAs receive for institutional delivery (100s)	0.988	0.748–1.303	.93
Primary reason for working is income generation, ASHAs	1.180	0.674–2.066	.56
Primary reason for working is income generation, AWWs	1.139	0.684–1.895	.62
Worker effort and organization			
AWWs who have held a VHND	1.182	0.432–3.239	.75
ASHAs who have attended 6+ meetings in past 6 months	0.903	0.520–1.571	.72
Supervision, training, and knowledge			
ASHAs who know who their supervisor is	1.179	0.698–1.992	.54
AWWs who know who their supervisor is	0.828	0.324–2.113	.69
ASHAs who have received training on nutrition-related topics	0.982	0.602–1.603	.94
AWWs who have received training on nutrition-related topics	1.300	0.769–2.197	.33
ASHAs who know age to start liquids other than breast milk	1.611	0.586–4.431	.36
AWWs who know age to start liquids other than breast milk	1.081	0.524–2.229	.83
ASHAs who know age to start food other than breast milk	1.093	0.677–1.765	.72
AWWs who know age to start food other than breast milk	0.792	0.487–1.289	.35
Household and village variables			
ASHAs and household head of same caste	1.477	0.524–4.162	.46
AWWs and household head of same caste	0.672	0.229–1.972	.47
Household heads who have completed class 7+	1.286	0.782–2.115	.32
Household socioeconomic status index	1.069	0.912–1.254	.41
Village population (1,000s)	0.957	0.865–1.058	.39

Abbreviations: ASHAs, Accredited Social Health Activists; AWWs, Anganwadi workers; CI, confidence interval; OR, odds ratio; VHND, Village Health and Nutrition Day.
Variables shown in italics are statistically significant at $P < .10$.

AWWs (CI = 0.92–2.73; $P = .10$) (Table 8). There was no significant association between receipt of general nutrition information and worker knowledge. However, receipt of monetary incentives by AWWs for providing immunizations was significantly associated with households receiving general nutrition information (OR = 1.92, CI = 1.08–3.41; $P = .03$).

DISCUSSION

This article describes one of the few studies to differentiate maternal and child health preventive services as *product-oriented* and *information-oriented* services. It examines both supply- and demand-side factors influencing the provision of each type of service using an integrated household and FLW dataset. Overall, results show that receipt of essential health and nutrition services remains low in Bihar, India, with only about 35% of study households (those with a pregnant woman or a child under age 6) reporting receiving any of 4 services: immunization, food supplements, information on proper care during pregnancy, or nutrition information. Although the outcomes in our study are not based on coverage indicators, the receipt of services are in congruence with the coverage indicators reported in other surveys.[21] Receipt of information-oriented services was particularly low even though government program guidelines stipulate that FLWs are expected to conduct regular home visits to promote nutrition and health education. These findings are supported by other studies.[26–28]

Monetary Incentives

In terms of our study hypotheses, first, we found that monetary incentives provided to FLWs for product-oriented services were associated with increased receipt of those services as well as a modest effect on receipt of information-oriented services that could be delivered during the same visit. For example, receipt of monetary incentives by FLWs for immunization was associated with households receiving immunization services as well as information on general nutrition. In addition, receipt of monetary incentives for institutional deliveries was marginally associated with households receiving information on proper care during pregnancy. This suggests possible spillover effects of incentives.

Given the poverty of such FLWs as AWWs and ASHAs,[29] incentives may motivate them,[30] reduce attrition,[8,10] and improve performance.[4] It is also plausible that when FLWs receive incentives to increase immunization and other product-oriented services, they take advantage of the opportunity to provide nutrition and other health information while in contact with these individuals. It is also plausible that incentives motivate FLWs to provide high-quality services and improve their outreach, which more generally raises households' familiarity with FLWs and increases their likelihood of using services—including non-incentivized ones. More research is needed to understand what combinations of FLW incentives and policy or institutional reforms will best strengthen the delivery of health and nutrition services in Bihar, but incentives are likely to play a role.

Given such spillovers from product- to information-oriented services, our findings have especially important implications for cost-effectiveness analysis of performance-based incentives. In the context of overall low coverage of information-oriented services, the spillover effects are modest. Even a large percentage increase in the provision of information on proper care during pregnancy (with a base rate of access of 11%) or on general nutrition (with a base rate of access of 5%) translates to only a small number of additional individuals receiving such services. However, if India continues to provide monetary incentives for product-oriented services, our findings suggest that a large number of people would likely start to gain access to information-oriented services not specifically targeted by the incentives. As immunization incentives are already part of the existing incentive structure within the national program, policy should take into account how they might be best leveraged to improve the delivery of multiple services. Our findings contribute to the ongoing debate on the nature of incentives (i.e., cash, in-kind, or a combination) that are optimal for FLWs.[11]

It is important to note that while incentives for product-oriented services were associated with greater use of some information-oriented services, they were not associated with greater use of other product-oriented services. Future research is needed to understand what factors or service characteristics seem to maximize spillover impacts, which is relevant for designing more cost-effective incentive schemes that fully take into account both direct and spillover impacts of those schemes.

Monetary incentives for product-oriented services improved performance for that service and may also have had spillover effects for information-oriented services.

Frontline Worker Knowledge and Delivery of Information Services

We did not find support for our second hypothesis, that greater FLW knowledge increases delivery of information-oriented services. However, the level of

effort or organization of a FLW was an important predictor of households receiving pregnancy care information. Specifically, households living in villages where ASHAs kept a register of pregnant women were more than twice as likely to receive pregnancy care information as were households in villages lacking such a register. This may suggest that FLW knowledge is already at acceptable levels and that the effort and ability of FLWs are the more binding constraints on service delivery. Alternatively, the findings might suggest that given other constraints on service delivery, information and knowledge gaps of FLWs are not as important.

Household Socioeconomic Status and Receipt of Food Supplements

Lower-income households were more likely to receive food supplements than were higher-income households, suggesting food supplements were reaching those most in need.

With regards to our third hypothesis, household socioeconomic status did impact receipt of food supplements: households with lower socioeconomic status were more likely to receive food supplements, suggesting that food supplements are reaching the segment of population that needs them the most. This is contrary to the intent of the ICDS program of universalizing access to food supplements, but it is in line with the Bihar government's guidelines for a targeted approach.[16] It is important to note that the government's guidelines are unclear on what form this targeted approach should take and exactly how malnourished targeted children should be. Because our study lacked data on child anthropometrics, we can neither confirm that the government has achieved its vision of how targeting should work, nor that child anthropometrics are improving in response to the employed targeting scheme.

Receipt of food supplements was poor overall, which has been highlighted in other studies in Bihar as well. Such studies report the proportion of beneficiaries receiving supplements to be as low as 0.6%,[21] and the total number of days beneficiaries receive supplements to be fewer than program guidelines require.[31] The poor reach of food supplements is likely due to inadequate supplies,[29] poor food quality, or lack of perceived need for additional food. Indeed, at the time of our study, the state of Bihar capped the resources to each AWW to provide food supplements to a fixed number of beneficiaries,[32] likely leading to an ad hoc process of identifying the most needy beneficiaries. Given that only household socioeconomic status predicted receipt of food supplements, our results suggest that changes in the AWW's operating environment itself may not matter much for whether households receive this product-oriented service.

Predictors of Information-Oriented Services

In terms of information-oriented services, FLW experience and level of organization (i.e., keeping records), as well as the number of potential beneficiaries in the catchment area, were important predictors of receiving such services. ASHAs who maintained a registry for pregnant women were more likely to provide pregnancy care information. The need for adequate beneficiary registers to be able to provide necessary services has been recognized previously.[2] In this context, maintaining a pregnancy registry could be indicative of an ASHA's level of engagement with the community as well as motivation to track pregnant women to avail JSY incentives at the time of delivery. The higher the number of pregnant women in the catchment area, however, the less likely it was that pregnant women received information. This may indicate that FLWs' resources and capacity to provide pregnancy information is strained by high demand for services. Areas with higher fertility rates may require additional human resources to ensure that pregnant women get appropriate information and counseling on their pregnancies.

Predictors of Product-Oriented Services

In general, AWW and ASHA education, training, supervision, and experience were not significant predictors of receipt of product-oriented services, according with existing findings that preservice training is not an important determinant of the quality of care provided by FLWs.[33] This finding may be good news because recruiting more educated and well-trained workers to deliver services could be expensive or not feasible. It merits noting, however, that existing literature identifies training and supervision as important factors for successful service delivery,[2] high-quality care and communication by FLWs,[34] and effective FLW performance more broadly.[35] It is possible that we did not find similar effects due to contextual differences unique to India. Training content and its duration, rigor, and implications for service provision are determined by the larger context within which the program operates.[10]

Poor training, staff vacancies, and irregular supervision have been long-standing issues in India's nutrition program,[19] which may explain the insignificant effects in our study.

In terms of household characteristics or demand-side factors, households with more educated household heads were more likely to receive immunization services than those with lower educated household heads, possibly because educated household heads might be more aware of services and knowledgeable of the benefits of using the services. Other studies have found a positive association between maternal education and full immunization,[36,37] according well with our results. Further, well-educated household heads might have the agency to access the services. One implication of our findings is that in the short-term, less educated households might need to be specifically targeted by outreach activities to enhance awareness of services such as immunization.

Our study showed mixed results on the role of caste in receipt of services. Caste match between ASHAs and the household head was a positive predictor of receipt of immunization services, but caste match between AWWs and the household head was a negative predictor of the same service. Families that are of similar caste as AWWs may belong to a higher social group and thus do not avail services from the AWCs or other government facilities, instead choosing to use private providers. On the other hand, ASHAs were introduced into their communities only after 2006 and hence are relatively new compared with AWWs who have been working in the same communities for much longer. ASHAs may prioritize working with families of their caste, since it might be easier for them to approach and convince such families to avail immunization services than families from other castes, given their relatively new role as FLWs in the community. Although our discrepant findings require further inquiry, there is evidence supporting the overall influence of social barriers such as caste, disability, and migrant status on service utilization.[27] Addressing any systemic exclusions of particular groups and building trust requires long-range strategies that incorporate an awareness of any such exclusions.

CONCLUSION

Existing government programs in India have the potential to increase use of essential health and nutrition interventions, but greater efforts are needed to mitigate supply- and demand-side constraints. While our study is narrow in geographic scope, it shows that incentivizing FLWs and helping them organize their work is associated with greater receipt of services by households, suggesting that effective implementation of existing program elements has the potential to provide the necessary momentum to improve the delivery of services. Furthermore, providing performance-based incentives for product-oriented services is associated with improved delivery of those services and may also have important spillover effects on information-oriented services. Given the continued debate on the appropriate incentives for FLW motivation and performance, further research is needed to identify appropriate combinations of incentives tailored to the context of programs.

Acknowledgments: The authors would like to acknowledge the Bill & Melinda Gates Foundation, through Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India (POSHAN), managed by the International Food Policy Research Institute, as well as the Consultative Group on International Agricultural Research (CGIAR) Research Program on Policies, Institutions and Markets (PIM). This paper contributes to the evidence generated by the research consortium Transform Nutrition and is partly funded by UK Aid from the UK government.

Competing Interests: None declared.

REFERENCES

1. Bhutta ZA, Das JK, Rizvi A, Gaffey MF, Walker N, Horton S, et al. Lancet Nutrition Interventions Review Group; Maternal and Child Nutrition Study Group. Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? Lancet. 2013;382(9890):452–477. CrossRef. Medline
2. Perry H, Freeman P, Gupta S, Rassekh BM. How effective is community-based primary health care in improving the health of children? Washington (DC): American Public Health Association; 2009. Available from: http://www.amoshealth.org/wp-content/uploads/2011/12/Review-of-Evidence-on-Effectiveness-of-CBPHC-July-2009.pdf
3. World Health Organization (WHO). Strengthening the performance of community health workers in primary health care. Geneva: WHO; 1989. Available from: http://apps.who.int/iris/bitstream/10665/39568/1/WHO_TRS_780.pdf?ua=1
4. Haines A, Sanders D, Lehmann U, Rowe AK, Lawn JE, Jan S, et al. Achieving child survival goals: potential contribution of community health workers. Lancet. 2007;369(9579):2121–2131. CrossRef. Medline
5. Bang AT, Bang RA, Reddy HM. Home-based neonatal care: summary and applications of the field trial in rural Gadchiroli, India (1993 to 2003). J Perinatol. 2005;25(Suppl 1):S108–S122. CrossRef. Medline
6. Baqui A, Williams EK, Rosecrans AM, Agrawal PK, Ahmed S, Darmstadt GL, et al. Impact of an integrated nutrition and health programme on neonatal mortality in rural northern India. Bull World Health Organ. 2008;86(10):796–804,A. CrossRef. Medline

7. Lewin S, Munabi-Babigumira S, Glenton C, Daniels K, Bosch-Capblanch X, van Wyk BE, et al. Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. Cochrane Database Syst Rev. 2010;28(3):CD004015. CrossRef. Medline
8. World Health Organization (WHO). Community health workers: what do we know about them? The state of the evidence on programmes, activities, costs and impact on health outcomes of using community health workers. Geneva: WHO; 2007. Available from: http://www.who.int/hrh/documents/community_health_workers_brief.pdf
9. Rotz D, Rangarajan A, Borkum E, Sridharan S, Sethi S, Manoranjini M. Promising findings from the frontline health worker team-based goals and incentives intervention in Bihar. Princeton (NJ): Mathematica Center for International Policy Research and Evaluation; 2014. Available from: http://www.mathematica-mpr.com/~/media/publications/pdfs/international/tbgi_bihar_ib.pdf
10. Global Health Workforce Alliance, World Health Organization (WHO). Global experience of community health workers for delivery of health related Millennium Development Goals: a systematic review, country case studies, and recommendations for integration into national health systems. Geneva: WHO; 2010. Available from: http://www.who.int/workforcealliance/knowledge/resources/chwreport/en/
11. Bhattacharyya K, Winch P, LeBan K, Tien M. Community health worker incentives and disincentives: how they affect motivation, retention, and sustainability. Arlington (VA): BASICS II; 2001. Available from: http://pdf.usaid.gov/pdf_docs/PNACQ722.pdf
12. Frimpong JA, Helleringer S, Awoonor-Williams JK, Yeji F, Phillips JF. Does supervision improve health worker productivity? Evidence from the Upper East Region of Ghana. Trop Med Int Health. 2011;16(10):1225–1233. CrossRef. Medline
13. Jaskiewicz W, Tulenko K. Increasing community health worker productivity and effectiveness: a review of the influence of the work environment. Hum Resour Health. 2012;10(1):38. CrossRef. Medline
14. Mason JB, Sanders D, Musgrove P, Galloway R. Community health and nutrition programs. In: Jamison DT, Breman JG, Measham AR, Alleyne G, Claeson M, Evans DB, et al., editors. Disease control priorities in developing countries. 2nd ed. Washington (DC): World Bank; 2006. p. 1053–1074. Available from: http://www.ncbi.nlm.nih.gov/books/NBK11726/pdf/ch56.pdf
15. Kadzandira JM, Chilowa WR. The role of health surveillance assistants (HSAs) in the delivery of health services and immunisation in Malawi. Zomba (Malawi): University of Malawi; 2001. Available from: http://www.unicef.org/evaldatabase/files/MLW_01-04.pdf
16. Integrated Child Development Services [Internet]. Bihar (India): Government of Bihar. Supplementary nutrition; [cited on 2015 Apr 13] . Available from: http://www.icdsbih.gov.in/SupplementaryNutrition.aspx?GL=9&PL=8&SL=1
17. National Health Mission, Ministry of Health and Family Welfare, Government of India [Internet]. The Ministry; c2013. About accredited social health activist (ASHA); [last updated on 2014 Sep 2; cited 2015 Apr 13]; [about 1 screen]. Available from: http://nrhm.gov.in/communitisation/asha/about-asha.html.
18. Goel S, Dogra V, Gupta SK, Lakshmi PV, Varkey S, Pradhan N, et al. Effectiveness of Muskaan Ek Abhiyan (the smile campaign) for strengthening routine immunization in Bihar, India. Indian Pediatr. 2012;49(2):103–108. Medline
19. Gragnolati M, Shekar M, Das Gupta M, Bredenkamp C, Lee Y. India's undernourished children: a call for reform and action. Washington (DC): World Bank; 2005. Available from: http://siteresources.worldbank.org/SOUTHASIAEXT/Resources/223546-1147272668285/IndiaUndernourishedChildrenFinal.pdf
20. Avula R, Kadiyala S, Singh K, Menon P. The operational evidence base for delivering direct nutrition interventions in India: a desk review. Washington (DC): International Food Policy Research Institute; 2013. Available from: http://www.ifpri.org/sites/default/files/publications/ifpridp01299.pdf
21. International Institute of Population Sciences (IIPS). Macro International. National family health survey (NFHS-3), 2005-06, India: key findings. Mumbai (India): IIPS; 2007. Available from: http://dhsprogram.com/pubs/pdf/SR128/SR128.pdf
22. International Institute for Population Sciences (IIPS). District level household and facility survey (DLHS-3), 2007-2008. Mumbai (India): IIPS; 2010. Available from: http://www.rchiips.org/prch-3.html.
23. Banerjee A, Barnhardt S, Duflo E. Nutrition, iron deficiency anemia, and the demand for iron-fortified salt: evidence from an experiment in rural Bihar. In: Wise DA, editor. Discoveries in the economics of aging. Chicago: University of Chicago Press; 2014. p. 343–384.
24. Ministry of Health and Family Welfare (MoHFW) [India]. Universal immunization program. New Delhi: MoHFW; [201?] Available from: http://mohfw.nic.in/WriteReadData/l892s/Immunization_UIP.pdf.
25. Wang H, Juyal RK, Miner SA, Fischer E. Performance-based payment system for ASHAs in India: what does international experience tell us? Bethesda (MD): Vistaar Project; 2012. Available from: http://www.intrahealth.org/files/media/performance-based-payment-system-for-ashas-in-india-what-does-international-experience-tell-us-technical-report/PerformanceBasedPaymentSystemASHAsIndiaReport.pdf
26. Biswas J, Verma JS. Tackling child undernutrition in India: governance challenges need more attention. IDS Bull. 2009;40(4):111–124. CrossRef
27. Citizens' Initiative for the Rights of Children Under Six. Focus on children under six: abridged report. New Delhi: Citizens' Initiative for the Rights of Children Under Six; 2006. Available from: http://www.righttofoodindia.org/data/rtf06focusreportabridged.pdf
28. National Institute of Public Cooperation and Child Development. Effectiveness of health and nutrition education through home visit as a strategy: a study. In: Research on ICDS: an overview, volume 3. New Delhi: National Institute of Public Cooperation and Child Development; 1996. p. 236–238. Available from: http://nipccd.nic.in/reports/icdsvol3.pdf
29. Noznesky EA, Ramakrishnan U, Martorell R. A situation analysis of public health interventions, barriers, and opportunities for improving maternal nutrition in Bihar, India. Food Nutr Bull. 2012;33(2 Suppl):S93–S103. Medline
30. Bajpai N, Dholakia RH. Improving the performance of Accredited Social Health Activists in India. New York: Columbia Global Centers, Columbia University; 2011. Available from: http://globalcenters.columbia.edu/files/cgc/pictures/Improving_the_Performance_of_ASHAs_in_India_CGCSA_Working_Paper_1.pdf
31. Programme Evaluation Organisation, Planning Commission [India]. Evaluation report on Integrated Child Development Services. New Delhi: The Commission; 2011. Available from: http://planningcommission.gov.in/reports/peoreport/peo/peo_icds_vol1.pdf
32. Saxena NC. ICDS Programme in Bihar. New Delhi; Right to Food Campaign; [Unpublished]. Available from: www.righttofoodindia.org/data/saxena-icds-bihar.doc

33. Huicho L, Scherpbier RW, Nkowane AM, Victora CG. Multi-Country Evaluation of IMCI Study Group. How much does quality of child care vary between health workers with differing durations of training? An observational multicountry study. Lancet. 2008;372(9642):910–916. CrossRef. Medline

34. Bryce J, Victora CG, Habicht J-P, Black RE, Scherpbier RW. MCE-IMCI Technical Advisors. Programmatic pathways to child survival: results of a multi-country evaluation of Integrated Management of Childhood Illness. Health Policy Plan. 2005;20 (Suppl 1):i5–i17. CrossRef. Medline

35. Rowe AK, de Savigny D, Lanata CF, Victora CG. How can we achieve and maintain high-quality performance of health workers in low-resource settings? Lancet. 2005;366 (9490):1026–1035. CrossRef. Medline.

36. Abuya BA, Onsomu EO, Kimani JK, Moore D. Influence of maternal education on child immunization and stunting in Kenya. Matern Child Health J. 2011;15(8):1389–1399. CrossRef. Medline

37. Vikram K, Vanneman R, Desai S. Linkages between maternal education and childhood immunization in India. Soc Sci Med. 2012;75(2):331–339. CrossRef. Medline

Peer Reviewed

Received: 2014 Sep 8; **Accepted:** 2015 Feb 19; **First Published Online:** 2015 June 12

Cite this article as: Kosec K, Avula R, Holtemeyer B, Tyagi P, Hausladen S, Menon P. Predictors of essential health and nutrition service delivery in bihar, india: results from household and frontline worker surveys. Glob Health Sci Pract. 2015;3(2):255-273. http://dx.doi.org/10.9745/GHSP-D-14-00144.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

ORIGINAL ARTICLE

PEPFAR Transitions to Country Ownership: Review of Past Donor Transitions and Application of Lessons Learned to the Eastern Caribbean

Abigail Vogus,[a] Kylie Graff[a]

Six key steps for effective transition: (1) develop a roadmap; (2) involve stakeholders; (3) communicate the plan; (4) support midterm evaluations; (5) strengthen financial, technical, and management capacity; and (6) support ongoing M&E. The Eastern Caribbean will need to identify HIV champions; strengthen leadership and management; improve policies to protect key populations; engage the private sector and civil society more; integrate HIV programs into primary care; improve supply chain capacity; and address health worker shortages.

ABSTRACT

The US President's Emergency Plan for AIDS Relief (PEPFAR) has shifted from an emergency response to a sustainable, country-owned response. The process of transition to country ownership is already underway in the Eastern Caribbean; the Office of the US Global AIDS Coordinator (OGAC) has advised the region that PEPFAR funding is being redirected away from the Eastern Caribbean toward Caribbean countries with high disease burden to strengthen services for key populations. This article seeks to highlight and apply lessons learned from other donor transitions to support a successful transition of HIV programs in the Eastern Caribbean. Based on a rapid review of both peer-reviewed and gray literature on donor transitions to country ownership in family planning, HIV, and other areas, we identified 48 resources that addressed key steps in the transition process and determinants of readiness for transition. Analysis of the existing literature revealed 6 steps that could help ensure successful transition, including developing a clear roadmap articulated through high-level diplomacy; investing in extensive stakeholder engagement; and supporting monitoring and evaluation during and after the transition to adjust course as needed. Nine specific areas to assess a country's readiness for transition include: leadership and management capacity, political and economic factors, the policy environment, identification of alternative funding sources, integration of HIV programs into the wider health system, the institutionalization of processes, the strength of procurement and supply chain management, identification of staffing and training needs, and engagement of civil society and the private sector. In the Caribbean, key areas requiring strengthening to ensure countries in the region can maintain the gains made under PEPFAR include further engaging civil society and the private sector, building the capacity of NGOs to take on essential program functions, and maintaining donor support for targeted capacity building and long-term monitoring and evaluation efforts.

INTRODUCTION

The US President's Emergency Plan for AIDS Relief (PEPFAR) has helped introduce lifesaving treatment to 7.7 million people living with HIV (PLHIV) worldwide.[1] Since its inception, the program has shifted from an emergency response against a growing epidemic (PEPFAR I, from 2003–2007) to a more targeted, sustainable approach with greater country ownership (PEPFAR II, from 2008–2012).[2] PEPFAR 3.0 (2013–2019) seeks to maximize the impact of investments by targeting evidence-based interventions for key geographic areas and populations with the highest incidence rates.[3] Its goal is to accelerate progress toward epidemic control and sustain achievements and gains.[4]

The Sustainability Agenda, a key dimension of PEPFAR 3.0's new business model, acknowledges that long-term epidemic control and maintenance of the progress to date will require country-owned responses.[4–5] PEPFAR's new Country Operational Plan (COP) Guidance

[a] Abt Associates, Inc, Bethesda, MD, USA.
Correspondence to Kylie Graff (Kylie_Ingerson@abtassoc.com).

requires countries to assess progress over time in 5 domains of sustainability: (1) availability of current data for decision making; (2) local leadership in service delivery; (3) domestic health financing and resource mobilization; (4) accountability for and transparency of results and spending; and (5) an enabling environment (appropriate policies, laws, regulations, as well as effective planning and coordination) for successful program implementation.[4] Countries must now implement strategies that improve program sustainability and capacity to manage, lead, coordinate, and implement national HIV programs.

In 2013, in preparation for regional PEPFAR planning, the US Agency for International Development (USAID) Mission in Barbados and the Eastern Caribbean requested assistance from Abt Associates in framing the transition of PEPFAR programming to country ownership in the Caribbean with an eye toward greater sustainability (Box). Specifically, we were tasked with gathering and analyzing findings from other donor transitions, including graduation from USAID family planning programs in Latin America and the Caribbean and from current PEPFAR transitions, to identify key themes and lessons learned that might be applied to the Caribbean. The Office of the US Global AIDS Coordinator (OGAC) has since published PEPFAR 3.0 and the revised COP guidance. OGAC has also advised the Caribbean of a shift in the program's strategy, focus, and geographical footprint. Under the new strategy, funding is being redirected away from the Eastern Caribbean toward Caribbean countries with higher disease burden to strengthen services for key populations.

This article helps support these new developments by identifying themes and lessons learned from our literature review to successfully plan, develop, and implement transition strategies that can translate across all PEPFAR countries. Many of the determinants for successful transition identified in the literature closely align with those outlined in PEPFAR's recent guidance.[4] In this article, we place specific emphasis on applying the findings from the literature on successful transition to the Caribbean context in preparation for the shift from the PEPFAR-Caribbean Regional Partnership Framework ("Partnership Framework") (2010–2014) toward programs with greater country ownership.

BOX. Defining "Transition to Country Ownership"

For the purposes of this review, we used the Global Health Initiative's definition of country ownership[5]:

> *… the continuum of actions taken by political and institutional stakeholders in partner countries to plan, oversee, manage, deliver, and finance their health sector. These actions advance sustainable, quality health programs that are locally owned and responsive to the needs of host country nationals.*

We acknowledge that country ownership requires a comprehensive response from the public, private for-profit, private not-for-profit, and civil society communities. We define "transition to country ownership" as the conscientious shifting of donor-led health initiatives to country ownership.[5]

PEPFAR's new business model recognizes that long-term control of the HIV epidemic will require country-owned responses.

PROFILE OF THE CARIBBEAN REGION

Comprised of a series of small island nations and mainland countries, the Caribbean has the second highest regional HIV prevalence rate in the world behind sub-Saharan Africa. Adult HIV prevalence among Partnership Framework countries, namely Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago, is approximately 1%. The epidemic is primarily concentrated among key populations, including commercial sex workers (CSWs), men who have sex with men (MSM), and prisoners.[6] A low regional average masks much higher estimated prevalence rates among these key populations. Research shows that seroprevalence rates among CSWs are 9% in Jamaica and 21% in Suriname.[7] Unprotected sex between men accounts for at least 10% of HIV infections in the Caribbean and as high as 30% of infections in Jamaica.[8]

The HIV epidemic in the Caribbean is concentrated primarily among commercial sex workers, men who have sex with men, and prisoners.

The Caribbean's geopolitical, economic, and cultural context presents unique challenges when planning sustainable, country-owned responses. Although the region is comprised predominantly of middle-income countries, many of the countries rely significantly on PEPFAR funding for HIV programming. For example, recent national health accounts exercises in Dominica and St. Kitts and Nevis indicate that international donors provide 27% and 47% of HIV funding, respectively.[9,10] Over the course of the Partnership

Framework period, this funding has supported counseling and testing services for nearly 175,000 individuals and care and support services for more than 4,000 people.[11] National human and financial resources are oftentimes directed toward chronic noncommunicable diseases, which account for almost 8% of gross domestic product in some Caribbean countries.[12] National budgets also help address emerging health threats such as chikungunya and Ebola. Meanwhile, financial assistance from the US government (USG) to support health initiatives in the Latin American and Caribbean region declined 31% between fiscal years 2011 and 2014.[13] The USG has since communicated its intentions to further divert HIV funding away from Eastern Caribbean countries with lower prevalence rates (letter from Larry Palmer, US Ambassador to the Eastern Caribbean and the Organization of Eastern Caribbean States, 13 Aug 2014).

Small population bases limit the number of qualified health workers available to implement HIV interventions. With the exception of Jamaica (19 per 10,000 population), English-speaking Caribbean countries meet the World Health Organization's benchmark of 25 trained health professionals (physicians, nurses, midwives) per 10,000 population.[14] However, most countries still claim human resource shortages, citing brain drain, particularly among experienced, midlevel health professionals.[14] A 2007 World Bank study estimated a shortage of approximately 7,800 nurses in the English-speaking Caribbean; the shortage is expected to increase to roughly 10,700 nurses by 2025 due to the health needs of a rapidly aging population.[15]

Culturally, small population sizes with largely conservative religious influences reduce confidentiality and cultivate widespread stigma and discrimination against PLHIV. This is exacerbated by conservative public policies that outlaw transactional sex and criminalize homosexuality. The result is largely isolated key populations unwilling or unable to access essential HIV prevention, care, and support services from the public health sector. This has placed the onus of reaching key populations on an NGO sector that is often small and fragmented. Since the beginning of the Partnership Framework, PEPFAR has helped these NGOs deliver HIV prevention interventions to nearly 57,000 individuals in key populations.[11] Many of these NGOs are now heavily reliant upon PEPFAR funding and require additional capacity-building efforts to support long-term organizational viability and continued access to services for key populations.

NGOs, with support from PEPFAR, have been instrumental in reaching key populations with HIV services.

METHODS

We sought to answer the following question:

> *What lessons can be drawn from existing literature to help ensure an effective transition of HIV programs to country ownership, and what determinants can be used to assess the Caribbean's readiness for such a transition?*

To answer this question, we conducted a rapid review of both peer-reviewed and gray literature with expansive search terms to reflect the shifting language and changing contexts around donor transitions to country ownership. We initially focused on articles discussing the "withdrawal" of donor funding but later expanded the search terms to include "country ownership," "graduation," and "sustainability" to address the expanding definition of transition beyond self-financing HIV programs. For example, USAID's transition away from funding large family planning programs in Latin America and the Caribbean is typically referred to as graduation. While the term graduation was also used in early discussions around PEPFAR transitions, there has been a steady movement in the dialogue toward country ownership, country-owned responses, and sustainability. We searched Google and PubMed for English-language publications using combinations of these terms to ensure a more comprehensive literature review (Table 1).

Using these search terms, we scanned existing literature, including reports, case studies, and scholarly journal articles, and reviewed abstracts and executive summaries to determine relevance to the research question. Those selected for inclusion focused on the shifting dynamic of health programming between one or more donor agencies and partner countries and addressed at least one of the following questions:

- What does or could transition to country ownership mean within the PEPFAR context?
- What are key steps in the transition to country ownership?
- What actions make for a successful transition to country ownership?

We identified 48 resources that matched these criteria (Table 2). Then we read and analyzed the full text of the selected resources to determine key steps required to implement a successful transition

TABLE 1. Key Search Terms Used on Google and PubMed

Donor Funding Search Terms (Using "OR" Boolean Operator)		Transition Search Terms (Using "OR" Boolean Operator)		Health Area Search Terms (Using "OR" Boolean Operator)
Donor	AND	Withdrawal	AND	HIV
Development assistance		Graduation		Family planning
Funding		Transition		[none]
		Sustainability		
		Country ownership		

to country ownership and to identify potential determinants of readiness for transition. We also supplemented the findings with anecdotal evidence from our experience working in the Eastern Caribbean to assist USAID/Barbados and the Eastern Caribbean to better tailor its transition-planning process. The initial review was conducted in January 2013 and then updated in May 2014 and February 2015 to prepare for this publication.

RESULTS

Key Steps in Transitioning to Country Ownership

Our analysis of existing literature revealed a series of 6 key steps in planning an effective transition to country ownership: (1) develop a roadmap; (2) invest in stakeholder participation; (3) communicate the plan through high-level diplomacy; (4) support midterm evaluations; (5) provide technical assistance throughout the process; and (6) provide long-term monitoring and evaluation (M&E) support.

1. Develop a Roadmap

Concise roadmaps are necessary to clearly communicate transition goals and processes. Findings from the literature revealed a lack of clarity among stakeholders about what transition to country ownership meant in practical terms. A clear strategy did not exist in the early stages of graduation from family planning programming in

Roadmaps are needed to clearly communicate transition goals and processes.

TABLE 2. Publication Types and Methods of Analysis

Resource Type	No. Reviewed	Citations	Method(s) of Analysis
Reports	25	9, 10, 13, 16–18, 20, 21, 23–25, 28, 31–36, 38, 40, 44–48	Quantitative data analysis, qualitative data analysis, key informant interviews, literature reviews
Scholarly journal articles	10	22, 26, 27, 29, 30, 37, 39, 41–43	Quantitative data analysis, qualitative data analysis, key informant interviews, literature reviews
Policy documents	8	2–5, 7, 14, 15, 19	Policy directives, key informant interviews, literature reviews
Fact sheets	4	1, 6, 8, 12	Secondary quantitative analysis
Online databases	1	11	Secondary quantitative analysis
TOTAL	**48**		

Involving stakeholders in the planning process increases the chances of their buy-in but requires more time for the transition.

the 1990s; a published review of those early graduations revealed that formal strategies were essential to successful transitions, resulting in establishment of a systematic process by 2004.[16] In South Africa, the Center for Strategic and International Studies found that lack of a written plan and clear communication about PEPFAR's transition created substantial resentment and frustration among South African officials.[17,18] The absence also contributed to skepticism among civil society organizations (CSOs) that the impetus of the transition was PEPFAR withdrawal amidst USG budget cuts.[18] South Africa's Partnership Framework made it clear that funding would decrease over time, but it did not specify the pace of the reductions.[18] The plan also focused primarily on the transition of care and treatment but did not discuss what the transition would mean for prevention activities. This resulted in largely underfunded prevention programs and a lack of sufficient focus on high-impact interventions and strategies that were historically funded by donors.[18] Africa's experience highlights the need for clear guidance on *all* HIV program areas. This is a critical lesson for Caribbean roadmap development, as prevention programs are widely supported by international donors.

One potential approach to optimize success is to develop 2 separate roadmaps. The first roadmap could be within PEPFAR to outline the basic process for transition planning. For example, PEPFAR's "FY2014 Sustainability Planning Guidance Document: Advancing Country Ownership in PEPFAR III" ("Sustainability Planning Guidance") outlines PEPFAR's approach to achieving high-impact national HIV responses that maintain service levels and quality under the ownership of "government, civil society, the private sector, and other stakeholders in the partner country."[5] The second roadmap could be country- and/or region-specific and negotiated with country-level stakeholders. These roadmaps could lay out the shared responsibilities between USG agencies and local governments, donors, and other stakeholders, including intended funding levels.[16] This plan could clearly outline expectations, objectives, activities, timelines, and human and financial resource commitments among all stakeholders while indicating the seriousness of donor withdrawal. A mutually agreed upon roadmap of this nature would promote transparency between donor and recipient countries while minimizing misconceptions.[16]

2. Invest in Stakeholder Participation

Stakeholder participation is a vital component of any successful transition-planning process.[18–22] A variety of stakeholders should be involved, including high-level diplomats, officials from the Ministry of Health and Ministry of Finance, CSOs, other donors, and private-sector representatives. Involvement of country stakeholders increases the likelihood that counterparts at all levels buy into the plan, understand its intentions, and accept stakeholder responsibilities.[22] Country counterparts need to own the process of mobilizing new resources and shaping the next phase of PEPFAR-partner country relations.

Intensive stakeholder participation will require a longer time frame for transition. According to Slob and Jerve, no less than 2 years is required to sufficiently involve the full set of key stakeholders in the transition-planning process.[19] In Mexico, family planning graduation was originally planned as a 5-year process. Two additional years were ultimately added to transition full ownership of family planning programs.[26] In South Africa, health practitioners have already cautioned that while country ownership is essential to long-term sustainability, a hasty transition could undercut access to services.[26,27] South Africa's experience to date has shown that the speed of PEPFAR's withdrawal of human resources and funding has seriously disrupted treatment to an estimated 50,000 to 200,000 PLHIV.[18]

3. Communicate Transition Strategies Through High-Level Diplomacy

Leaders from donor and recipient countries should be viewed as active partners with shared, consistent core messaging around why and how transition will happen.[17] Messaging should also acknowledge challenges to successful transition. Donors, for example, should clearly communicate the method in which PEPFAR funds are approved by Congress and the uncertainties this may cause in the resource-allocation process. Early reports from the family planning graduation process found that many countries also experienced mixed messaging from donors about funding timelines. This contributed to unwise resource utilization because of misunderstanding over how long funding would be provided.[16] Developing messaging through high-level diplomacy helps alleviate these issues and strengthens country engagement by encouraging active stakeholder

participation while stressing the seriousness of proposed donor withdrawals.[17,20,21]

4. Support Midterm Evaluations and Allow Flexibility

Midterm assessments provide an opportunity to validate initial assumptions underlying transition plans and to respond to emerging challenges. Early reviews of family planning graduations found that the most successful transition plans were flexible to accommodate changing needs and contexts, oftentimes identified via midterm assessments.[16,21,24] A critical failure identified in South Africa's transition is the lack of a system to track patients who may be lost to follow-up as services shift from NGO partners to government clinics.[18] The lack of a tracking system means that the exact size, scope, and location of the problem is largely unknown, making it virtually impossible to make midcourse corrections. In Brazil, the family planning transition incorporated a midterm assessment, which validated the strategy and recommended additional management components for 2 states.[16] In Mexico, a midterm assessment led to an extension of the phase-out time frame.[16]

5. Provide Technical Support to Implement the Plan

According to Slob and Jerve, institutional capacity to manage donor withdrawal is a key factor in determining transition success. Initial assessments of financial and technical capacity can help tailor an appropriate roadmap for donor withdrawal and reveal which areas require additional support to fully manage HIV activities and integrate them into national health plans.[21] An evaluation of the phase out of family planning support in Mexico revealed that donors should have attempted to institutionalize technical capacity for such key program areas as commodity procurement.[24] Case studies in Botswana and Malawi also highlighted that assessing and addressing capacity issues facilitated more successful transitions.[21] As was suggested for transition in South Africa, PEPFAR should consistently commit to providing capacity-building support to strengthen overall program management and successful program transition.[17]

6. Provide Ongoing M&E Support

A sustainable program is one in which a country can maintain or improve priority health outcomes. The outcomes can be compromised by new health challenges, unexpected instability, or overestimation of in-country capacity after donor withdrawal. Not all countries have the financial resources and technical expertise to measure these outcomes. Population-based surveys, such as the Demographic and Health Surveys (DHS), are usually sponsored by donors. Supporting ongoing M&E will be especially important in the Caribbean where accurate seroprevalence data is scarce. Ongoing funding for research and health outcomes measurement should be incorporated into the transition roadmap to assist the country in monitoring progress, to help measure the USG's own success in transitioning, and to contribute to global health research agendas.[20,24] Cromer et al. note that such support will also reinforce the ongoing partnership between the USG and the partner country after direct program assistance is withdrawn.[16,25]

The most successful transitions are often flexible to accommodate changing needs and contexts identified through midterm assessments.

Determinants of Readiness for Successful Transition to Country Ownership

In February 2015, PEPFAR released new guidance for developing country/regional operational plans, including a "Sustainability Index and Dashboard" (SID) tool to assess sustainability of country programs toward control of the HIV epidemic.[4] The SID tool and Sustainability Planning Guidance are critical in clarifying the proposed process of achieving sustainable, country-owned programs. They more clearly articulate dimensions for successful country ownership, including political ownership and stewardship, institutional and community ownership, capabilities, and mutual accountability, including financing. Other tools such as the "Capacity Assessment Tool for Country Ownership of HIV Care and Treatment" have also offered frameworks to assess the capacity of a country or province to take on greater responsibility in the planning, organization, and management of HIV programs.[5]

This section expands on existing guidance by describing 9 key areas, based on findings from the literature, which should be evaluated when determining readiness for transition to country ownership. We also apply these principles to the Caribbean's unique regional context to assess readiness and potential barriers to success that may require additional support. Examples focus on countries in the Organization of Eastern Caribbean States (OECS) (Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines).

A sustained, country-owned response to HIV requires champions who will be advocates for the cause.

1. Leadership and Management Capacity

Country ownership of the national HIV response requires identifying advocates who will promote the cause.[19,28,29] Government decision makers must identify HIV programming as an essential part of health services and advocate national funding for such programming using accurate and compelling analytics. In the Caribbean, competing health priorities, stigma and discrimination, and relatively small affected populations make it especially difficult to gain the attention of decision makers. While most leaders recognize that care and treatment for HIV is important, it is politically challenging to invest significant resources, financial and otherwise, into their HIV response without first advancing chronic noncommunicable disease programs. Successful transitions will need to identify champions for the process.

Most research on sustainability and country ownership has highlighted the need for increased management capacity. Where PEPFAR has provided more direct provision of services, local partners may need further training in such key management areas as health planning, M&E, procurement, performance management, and financial management.[19–21,26,30] A series of health systems and private-sector assessments in the OECS found that overall management capacity in the region is limited and few officials have planning or health financing backgrounds.[31–36] Organizations such as the Caribbean HIV/AIDS Regional Training Network and Caribbean Health Leadership Institute are building local capacity in leadership and management. However, these organizations rely heavily on PEPFAR funding and require continued financial support to maintain momentum.[23]

Policies that protect the rights of vulnerable populations should be examined when transitioning HIV programs to country ownership.

2. Political and Economic Factors

Political and economic factors have consequences for health outcomes and programming. Jamison et al. note there is a clear economic argument for investing in health. Reductions in mortality account for about 11% of recent economic growth in low- and middle-income countries, and a more comprehensive understanding of the economic value of investing in health provides a strong rationale for improved resource allocation across all sectors.[37] However, economic downturns require governments to make difficult budgetary decisions between and within sectors. Changes in government and policies can also impact health priorities and outcomes. In Mexico, decentralization changed resource allocation needs during the transition plan, but the plan was not flexible enough to accommodate this change.[16,24] Health reforms in Indonesia, which included decentralization, also affected the success of family planning graduation.[25] Political and economic analyses should be undertaken during roadmap development to identify internal and external threats to the transition plan. In the Caribbean, some destabilizing factors include heavy debt burden and dependence on the tourism industry in a time of global austerity.

3. Policy Environment

Policies and laws are important in outlining a country's vision and communicating and regulating the role that local actors can play. Having appropriate policies in place to protect vulnerable populations, regulate the health sector, and provide guidance on the vision for HIV services are key indicators of the readiness of a country for transition. A critical lesson learned from family planning graduation programs is that policies are needed to protect the rights of individuals to access essential services.[16] Cromer et al. note that national policies such as price controls, free distribution campaigns, and advertising restrictions create barriers for private-sector involvement in service delivery. It is also important to examine and strengthen the inclusiveness and data-driven character of the policymaking process.[28]

In the Caribbean, key policy areas to examine during transition are national strategic plans for health (inclusive of HIV), guidance and regulation for private-sector providers (for-profit and not-for-profit) of HIV services, and policies that protect the rights of vulnerable populations. Many Caribbean islands have allowed their strategic plans to lapse and have difficulty resourcing a thorough planning process. Many also lack policies to protect PLHIV and key populations.[39] For example, sodomy laws are still enforced throughout much of the region, and adolescents often lack the right to access services without parental permission. These policies limit access to services among key populations and create barriers for providers working with these communities. Private providers and CSOs serving key populations will require ongoing external support to maintain gains made under PEPFAR until a more supportive policy environment and increases in domestic resources for these groups are available.[26]

4. Alternative Funding Sources

Governments must identify ways to replace donor funding.[25,29,39] This is difficult with even the strongest of government commitments because governments must balance competing priorities.[16,20] Economic instability and increasing health care costs often drive health budgets below desired levels. The private health sector should be actively engaged to complement public services in a way that promotes efficient and cost-effective service delivery.[19]

Most Caribbean countries are undergoing health reforms to identify funding sources for soaring health care costs. Not all have determined what these reforms will look like nor have they conducted the research needed to make informed decisions. Several countries are considering national health insurance schemes and wish to design essential packages of services under those schemes. As a component of investment framework guidance from the Joint United Nations Programme on HIV/AIDS (UNAIDS), OECS countries have conducted quantitative analyses of trends in the HIV epidemic, the impact of prevention and treatment efforts to date, and a projection of possible future programming scenarios and their implications for the epidemic and program costs. The exercise produced strategic information to prioritize resources based on largest impact and spurred dialogue on identifying alternative funding sources in advance of transition.[40] One identified alternative was leveraging private-sector resources, both human and financial. Examples include contracting private providers with specialty services and/or equipment not readily available in the public sector and formalizing arrangements with providers and local corporations to provide confidential, stigma-free counseling and testing services.

5. Integration of HIV Programs

Bossert asserts that the sustainability of donor-funded programs relies on effective integration of programs into existing administrative structures.[39] The evolution of PEPFAR and other large HIV donors has seen a shift away from siloed HIV programs to integrated service delivery models. Incorporating HIV into general Ministry of Health structures facilitates the integration of HIV services into primary care, resulting in improved management of and access to these services. In the Caribbean, most HIV programs have been integrated at least nominally within Ministry of Health structures. In practice, however, as evidenced by HIV-only clinic days in some countries, HIV services are often still separate from other primary care services in a manner that perpetuates stigma. Caribbean islands need assistance to fully integrate programs in a way that supports HIV services and protects the users of those services.

HIV services in the Caribbean are often separate from other primary care services, which could perpetuate stigma.

6. Institutionalized Processes

To encourage sustainability, any process integral to a program needs to be institutionalized and standardized.[29,30,41] Bradach notes that sustainable programs often require systems, structures, and processes to be standardized and articulated.[41] Standardization may require the development of standard treatment protocols, guidelines for service delivery, clear job descriptions, checklists for service provisions and monitoring, standardized indicator sets, or other job-support tools. Standardizing and simplifying procedures also assist in overcoming human resource constraints.[29] Bennett et al. are evaluating a PEPFAR-funded program in India where management shifted from NGOs to the government.[30] Two key areas of evaluation are how well programs have been integrated into existing organizational systems and practices and the extent to which institutional standards guide program management. The evaluation framework assumes that institutionalization and standardization create processes to ensure program quality in activities that will be transitioned from the NGO to the government.

Health systems and private-sector assessments conducted in 6 OECS countries revealed that HIV programs are often more likely to have standardized procedures than programs in other health areas. This is especially true for M&E of antiretroviral therapy (ART) provision because it is driven by donor requirements and funding. Further support may be needed to develop and increase the use of standard treatment protocols and to regulate private facilities, including labs that provide testing for HIV. A Caribbean transition plan could provide further support to integrate and streamline the standards, guidelines, and M&E structures from HIV programs into the overall practice of the Ministries of Health.

7. Procurement and Supply Chain Management

Pharmaceuticals and other commodities are an important part of ensuring access to HIV testing and treatment. This is an area in which

international donors, especially the USG and the Global Fund, have made substantial investments. PEPFAR's Track 1.0 ART program helped Ministries of Health in 13 countries strengthen supply chain management and antiretroviral (ARV) procurement. By 2011, the program had been successfully transitioned to country ownership and was providing ART for more than 925,000 patients.[42] A key component of sustainable procurement and supply chain management involves building the capacity of in-country stakeholders to take responsibility for overseeing logistics and financing procurements.[16,20,25] For example, commodities were largely funded and managed by USAID prior to graduation from family planning programs. Cromer et al. note that early graduates from USAID family planning funding had procurement systems in place but experienced stock-outs because they lacked experience procuring through different systems.[16] PEPFAR's capacity-building efforts in Botswana have increased access to essential drugs from 46% to 78% but have had difficulties addressing issues of poor storage and stock-outs.[20]

The USG has consistently supported procurement and supply chain management efforts in the Eastern Caribbean, including establishment of the OECS Pharmaceutical Procurement System (PPS). While research has shown that pooled procurement does not always result in the expected price drops due to market consolidation and the influence of a smaller number of producers, the OECS has experienced positive gains.[43] Early results of the PPS have included increased bargaining power, average cost savings of 37% on selected purchases, enhanced quality control, and measurable increases in access to medicines.[44] However, delayed payments have placed PPS under threat of collapse, which could lead to major challenges in procuring affordable ARVs when donor funds are no longer available. PPS has been working to improve forecasting and supply chain management, but continued capacity-building efforts are needed. Central Medical Stores in each country often face stock-outs of essential drugs, including ARVs, and testing reagents in part because there is low capacity for forecasting and monitoring of inventory. These challenges are intensified by a lack of cash flow within governments that prevent timely payments to manufacturers. Transition plans should consider building the capacity of PPS and local supply chain managers to improve and expand the current procurement system, including advocating to Ministries of Finance to ensure funding for essential medicines and commodities that are currently procured and supplied by donors but for which funding will be phased out in the near future. Adding these commodities to the pooled procurement system and ensuring timely payment could increase cost savings and improve efficiency similar to gains historically made under PPS.

In many countries, private providers and NGOs play a large role in delivering HIV services, especially to marginalized populations.

8. Staffing and Training Needs

The capacity and retention of skilled workers is essential to ensuring a smooth transition from donor support.[19–21,25,28,39] While PEPFAR often supports seconded staff within Ministries of Health, decreases in funding mean that countries must intensify their hiring, retention, and training of health professionals to fill these gaps. For example, PEPFAR supported nearly 150 positions in Botswana, mainly in planning and strategic information.[20] Decreases in PEPFAR funding meant that the government was faced with filling these positions alongside existing issues of major turnover and lack of key technical competencies in planning and management.[20] Botswana was further constrained by macroeconomic policies that created hiring freezes at the urging of the International Monetary Fund (IMF).[20]

The Caribbean region has long suffered from brain drain, especially among nurses.[14,15] Most Caribbean islands have health worker shortages, and public health management positions are difficult to fill with experienced personnel.[14] Rotational patterns often mean that those who have been trained extensively in testing or other HIV services are rotated out of the facilities that host these services. Most countries in the region are currently working with partners to develop human resources for health strategies and train health workers. However, there will inevitably be a lag in the time needed to fully develop new and train existing cadres of workers. While there are currently few seconded positions in the Caribbean, strategic secondments during the transition process could help fill these gaps and assist in identifying areas for capacity building.

9. Private Sector and Civil Society Engagement

In many countries, private-sector providers and NGOs have played a large role in delivering services, monitoring quality of public services, and/or advocating on behalf of marginalized groups. For example, NGOs and the for-profit private sector have played a large role in providing

contraceptives. As a result, USAID focused its family planning graduation on developing sustainability of and business plans for private-sector providers to continue offering these services.[16,25]

In cases where NGOs or private providers are delivering HIV services, transition will require them either to develop their own sustainability plans or to align with government norms to function under government auspices.[16,30] In some countries, much work may need to be done to identify, establish, and/or formalize partnerships, networks, and roles between the government, private sector, and civil society.[28] Investments in NGOs will help increase the sense of urgency and community engagement around HIV.[20] When already an advocate, additional efforts should be made to ensure civil society has a place at the table for policymaking, especially to represent the needs of marginalized populations. In South Africa, for example, PEPFAR was a primary provider of services for key populations such as CSWs and MSM, often through support to NGOs. However, an initial assessment of transition there has shown that NGOs have suffered decreased implementation capacity and engagement as PEPFAR funding has shifted toward the public sector.[18]

The current and potential role of the private health sector to deliver HIV services in the Caribbean is vast. The NGO community performs a critical outreach function that provides prevention, counseling, testing, and other services to the populations most vulnerable to HIV. This service is often not feasible through public-sector facilities that are challenged by policies that criminalize the behaviors of key populations and prevent youth from accessing services without parental consent. Members of key populations may be reluctant to go to public-sector clinics for fear of limited confidentiality and the stigma associated with seeking services from the few facilities at which HIV is treated. Despite their critical role in national HIV responses, many Caribbean NGOs are either volunteer-based or heavily reliant on donor funding. For example, while the Caribbean HIV/AIDS Alliance (CHAA) was the leading provider of outreach services for key populations on most of the Eastern Caribbean islands, it was more than 95% reliant on PEPFAR funding.[45] Critical NGOs will require support with developing and implementing funding diversification strategies and sustainability plans to ensure long-term viability and continued access to essential services for key populations.

Private health care providers also possess a breadth and depth of experience in providing HIV care and treatment services throughout the region. Oftentimes overlooked, the private sector is poised to play a larger role in filling gaps in HIV programming. Recent mapping exercises of private-sector resources for health in 4 Caribbean countries conducted by the Strengthening Health Outcomes through the Private Sector (SHOPS) project found that the private health sector was much larger than originally understood, and many private providers had training in HIV counseling, testing, or treatment but were not using their skills due to lack of patient demand.[46–48] These providers have the capacity to increase access to essential HIV services while providing the confidentiality that PLHIV seek. Activities geared toward greater private-sector engagement, ranging from fostering sustainable partnerships and policy dialogue to increasing access to training, will be crucial to sustaining health outcomes.

Private providers in the Eastern Caribbean are capable of playing a larger role in the HIV response.

DISCUSSION

Our review of the literature has shown that transitions to country ownership, including some current PEPFAR transitions, face many barriers to success. Transitions have been hindered by donor-imposed timelines; the exclusion of key stakeholders in the planning process; lack of clear communication; and failure to ensure recipient countries have the resources and capacity to successfully maintain gains made under PEPFAR support. PEPFAR has been aiming to reverse this trend with a focus on country ownership in PEPFAR II and sustainability in PEPFAR 3.0. Our findings identified areas of overlap with the latest PEPFAR guidance and suggested additional points to consider for a successful transition.

Key population groups may be reluctant to seek HIV services from the public sector for fear of limited confidentiality and of stigma.

Specifically, PEPFAR's most recent COP Guidance has incorporated a new assessment of sustainability. As a part of the assessment, country programs are asked to "define gaps and bottlenecks, structural and cultural barriers."[4] The guidance suggests looking for gaps in resources, quality, data, efficiency, and structural and cultural barriers—key areas of health systems strengthening. These 5 areas align closely with our findings, which suggest the need to assess financial and human resources, commodity and supply chain management capacity, quality standards including the existence of guidelines for health workers, the use of data for decision

making and program management, laws and policies, and engagement with the private sector and civil society. Based on our analysis, we also recommend assessing the commitment of country leadership in addressing the HIV response, potential threats in the political and economic environment, and integration of HIV programming into existing structures.

Our findings suggest that stakeholder engagement and clear communication are essential steps in a successful transition to country ownership. The new COP Guidance prioritizes stakeholder engagement and offers some insight on how to best engage private-sector stakeholders in program planning. Much of the guidance, however, places local stakeholders in a consultative role rather than prioritizing the primacy of the partner country in determining the way forward.[4] PEPFAR itself has identified primacy of the partner country as a key part of sustainability planning elsewhere.[5] This should be strongly reflected in all guidance documents to ensure sustained, meaningful involvement of country stakeholders. We would recommend that the operational planning process be undertaken with the involvement of national stakeholders from the beginning in roles beyond consultation. Our findings suggest that actively involving these stakeholders in the design and implementation of transition planning will be invaluable in strengthening plan design, ensuring country buy-in and ownership, and fostering a greater understanding of PEPFAR's intentions.

PEPFAR transition guidance should clearly articulate the importance of meaningful involvement of local stakeholders in the transition process.

Limitations

A major challenge in conducting this review was navigating the changing vernacular and perceptions of transition to country ownership among stakeholders. Oftentimes "graduation," "transition," "country ownership," "sustainability planning," and "donor withdrawal" were used interchangeably. The need for broad search terms produced a volume of results that made an exhaustive literature search unfeasible. In the future, a more systematic review could be beneficial particularly as more articles are produced regarding PEPFAR's transition to greater country ownership. The review also relied on the existence of available literature that conformed to the defined research questions. Given the limited availability of scientifically conducted research on the topic area, the majority of available literature was project reports.

CONCLUSION

Lessons learned from past and current transitions from donor-led programs to country ownership suggest that the first step in any successful transition to country ownership is mutually agreeing upon the goal and actions required and then developing and articulating a detailed yet flexible roadmap, in collaboration with relevant stakeholders to ensure buy-in and ownership of the process. Assessing readiness for such transition is challenging and must account for unique contextual factors across all facets of the health system. In the Caribbean, readiness for transition will require strengthening health systems, further engaging the private sector, and building the capacity of NGOs to take on essential program functions. Ongoing donor support for targeted capacity-building technical assistance and long-term M&E will be vital to ensuring that the countries of the Caribbean are able to take a leading role in their HIV responses while maintaining or improving upon the substantial gains made with PEPFAR support.

Acknowledgments: This initial literature review was funded by Abt Associates, Inc's HIV Technical Working Group. Further support for manuscript preparation was provided by the United States Agency for International Development through the Health Financing and Governance Project (Cooperative Agreement Number OAA-A-12-00080) and the Strengthening Health Outcomes through the Private Sector Project (Cooperative Agreement Number GPO-A-00-09-00007).

Competing Interests: None declared.

REFERENCES

1. US President's Emergency Plan for AIDS Relief (PEPFAR). World AIDS Day 2014 update: PEPFAR latest results fact sheet. Washington (DC): PEPFAR; [2014]. Available from: http://www.pepfar.gov/funding/results/index.htm
2. Office of the Global AIDS Coordinator (OGAC). PEPFAR blueprint: creating an AIDS-free generation. Washington (DC): OGAC; 2012. Available from: http://www.pepfar.gov/documents/organization/201386.pdf
3. US President's Emergency Plan for AIDS Relief (PEPFAR). PEPFAR 3.0. Controlling the epidemic: delivering on the promise of an AIDS-free generation. Washington (DC): PEPFAR; 2014. Available from: http://www.pepfar.gov/documents/organization/234744.pdf
4. US President's Emergency Plan for AIDS Relief (PEPFAR). PEPFAR country/regional operation plan (COP/ROP) 2015 guidance. Washington (DC): PEPFAR; 2015. Available from: http://www.pepfar.gov/documents/organization/237669.pdf
5. US President's Emergency Plan for AIDS Relief (PEPFAR). Sustainability planning document: advancing country ownership in PEPFAR III. Washington (DC): PEPFAR; 2013. Available from: http://www.pepfar.gov/documents/organization/217767.pdf

6. Joint United Nations Programme on HIV/AIDS (UNAIDS). Regional factsheet 2012: Latin America and the Caribbean. Geneva: UNAIDS; [2012]. Available from: http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2012/gr2012/2012_FS_regional_la_caribbean_en.pdf
7. US President's Emergency Plan for AIDS Relief (PEPFAR). Caribbean regional HIV and AIDS partnership framework 2010–2014. Washington (DC): PEPFAR; 2010. Available from: http://www.pepfar.gov/documents/organization/143196.pdf
8. Stop AIDS Alliance. HIV and human rights in Latin America and the Caribbean. Hove (UK): International HIV/AIDS Alliance; 2010. Available from: http://www.aidsalliance.org/includes/document/PolicyBriefLACHumanRights.pdf
9. Nakhimovsky S, Brizan-St. Martin R, Cogswell H, Young D, Theodore K, et al. St. Kitts and Nevis 2011 national health accounts and HIV subaccounts. Bethesda (MD): Abt Associates, Health Systems 20/20 Caribbean Project; 2013. Available from: https://www.hfgproject.org/saint-kitts-nevis-2011-national-health-accounts-hiv-subaccounts/
10. Bhuwanee K, Bethelmie D, Cogswell H, Young D, Theodore K, LaFoucade A, et al. Dominica 2010–2011 national health accounts and HIV subaccounts. Bethesda (MD): Abt Associates, Health Systems 20/20 Caribbean Project; 2013. Available from: https://www.hfgproject.org/dominica-2010-2011-national-health-accounts-hiv-subaccounts/
11. PEPFAR Dashboards [Internet]. Washington (DC): US President's Emergency Plan for AIDS Relief (PEPFAR). 2004 -. Caribbean region results, FY 2006–2013; [cited 2015 Feb 18]. Available from: http://data.pepfar.net/country/impact?country=Caribbean%20Region&year=2006&yearTo=2013
12. Healthy Caribbean Coalition. Chronic non communicable diseases (NCDs) in the Caribbean: the facts. Barbados: The Coalition; [200?]. Available from: http://www.healthycaribbean.org/UNHLM-HCC/Caribbean-NCDs-Fact-sheet.pdf
13. Meyer PJ. U.S. foreign assistance to Latin America and the Caribbean: recent trends and FY2015 appropriations. Washington (DC): Congressional Research Service; 2014. Available from: http://fas.org/sgp/crs/row/R43577.pdf
14. Pan-American Health Organization (PAHO). Road map for strengthening the Caribbean health workforce, 2012–2017: draft [abridged version]. Washington (DC): PAHO; 2012. Available from: http://new.paho.org/hrhcaribbean/wp-content/uploads/2012/03/Roadmap-CaricomRH-2012.pdf
15. Kurowski C, Carpio C, Vujicic M, Gostin LO, Baytor T. Towards a regional strategy to strengthen the nurse workforce of the English-speaking CARICOM: international legal instruments, agreements and obligations. Washington (DC): International Bank for Reconstruction and Development/The World Bank; 2011. Available from: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2012/06/07/000425962_20120607130200/Rendered/PDF/693740WP0Box360seWorkforce00PUBLIC0.pdf
16. Cromer C, Pandit T, Robertson J, Newijk A. The family planning graduation experience: lessons for the future. Executive summary. Washington (DC): Population Technical Assistance Project; 2004. Available from: http://pdf.usaid.gov/pdf_docs/Pnadc236.pdf
17. Brundage SC. Terra nova: how to achieve a successful PEPFAR transition in South Africa. Washington (DC): Center for Strategic & International Studies; 2011. Available from: http://csis.org/files/publication/111205_Brundage_TerraNova_WEB.pdf
18. Kavanagh MM. The politics of transition & the economics of HIV/AIDS and PEPFAR in South Africa. Philadelphia (PA): University of Pennsylvania, Health Global Access Project; 2014. Available from: http://www.healthgap.org/_the_politics_of_transition_economics_of_hiv_aids_pepfar_in_south_africa
19. US President's Emergency Plan for AIDS Relief (PEPFAR). U.S. government interagency paper on country ownership. Washington (DC): PEPFAR; 2012. Available from: http://www.ghi.gov/principles/docs/ownershipInteragencyPaper.pdf
20. Stash S, Cooke J, Fisher M, Kramer A. Competing pressures for U.S. PEPFAR in Botswana: rising ambitions, declining resources. Washington (DC): Center for Strategic & International Studies; 2012. Available from: http://csis.org/files/publication/121128_Stash_PEPFARBotswana_Web.pdf
21. Slob A, Jerve AM. Managing aid exit and transformation: lessons from Botswana, Eritrea, India, Malawi and South Africa. Synthesis report. Stockholm: Swedish International Development Cooperation Agency (Sida); 2008. Co-published by the Netherlands' Ministry of Foreign Affairs, Danish International Development Agency (Danida) and the Norwegian Agency for Development Cooperation (Norad). Available from: http://www.cmi.no/publications/publication/?3155=managing-aid-exit-and-transformation
22. Hirschhorn LR, Talbot JR, Irwin AC, May MA, Dhavan N, Shady R, et al. From scaling up to sustainability in HIV: potential lessons for moving forward. Global Health. 2013;9(1):57. CrossRef. Medline
23. Franco L, Miller L, Browne C, Mason G, Sears C. Midterm evaluation report: PEPFAR Caribbean regional program. Arlington (VA): USAID's AIDS Support and Technical Assistance Resources, AIDSTAR-One, Task Order One; 2013. Available from: http://www.aidstar-one.com/sites/default/files/AIDSTAR-One_CaribbeanMidterm_Final_1.pdf
24. Alkenbrack S, Shepherd C. Lessons learned from phaseout of donor support in a national family planning program: the case of Mexico. Washington (DC): Futures Group, Policy Project; 2005. Available from: http://www.policyproject.com/pubs/generalreport/Mexico_Phaseout_of_FP_Donor_Suppot_Report.pdf
25. Betrand JT. USAID graduation from family planning assistance: implications for Latin America. Washington (DC): Population Institute; 2011. Co-published by Tulane University School of Public Health and Tropical Medicine; 2011. Available from: http://www.populationinstitute.org/external/files/reports/FINAL_LAC_Report.pdf
26. Collins C, Beyrer C. Country ownership and the turning point for HIV/AIDS. Lancet Glob Health. 2013;1(6):e319–e320. CrossRef. Medline
27. Vermund SH, Sidat M, Weil LF, Tique JA, Moon TD, Ciampa PJ. Transitioning HIV care and treatment programs in southern Africa to full local management. AIDS. 2012;26(10):1303–1310. CrossRef. Medline
28. Gutmann M, Miller Franco L. Capacity assessment tool for transitioning management and leadership of PEPFAR HIV care and treatment program to local partners: draft. Arlington (VA): USAID's AIDS Support and Technical Assistance Resources, AIDSTAR-One, Task Order 1; 2011.
29. Mangham LJ, Hanson K. Scaling up in international health: what are the key issues? Health Policy Plan. 2010;25(2):85–96. CrossRef. Medline
30. Bennett S, Singh S, Ozawa S, Tran N, Kang J. Sustainability of donor programs: evaluating and informing the transition of a large HIV prevention program in India to local ownership. Glob Health Action. 2011;4. CrossRef. Medline
31. Sulzbach S, Chankova S, Tarantino L, Feeley R, Ingerson K, Narcisse C, et al. Antigua and Barbuda health systems and private sector assessment 2011. Bethesda (MD): Abt Associates; 2012. Available from: https://www.hfgproject.org/antigua-barbuda-health-systems-private-sector-assessment-2011/

32. Hatt L, Altman D, Chankova S, Narcisse C, Peña DL, Riley P, et al. Grenada health systems and private sector assessment 2011. Bethesda (MD): Abt Associates; 2012. Available from: https://www.hfgproject.org/grenada-health-systems-private-sector-assessment-2011/
33. Hatt L, Vogus A, O'Hanlon B, Banke K, Williamson T, Hainsworth M, et al. Kitts and Nevis health systems and private sector assessment 2011. Bethesda (MD): Abt Associates; 2012. Available from: https://www.hfgproject.org/st-kitts-nevis-health-systems-private-sector-assessment-2011/
34. Rodriguez M, O'Hanlon B, Vogus A, Feeley R, Narcisse C. Saint Lucia health systems and private sector assessment 2011. Bethesda (MD): Abt Associates; 2012. Available from: https://www.hfgproject.org/saint-lucia-health-systems-private-sector-assessment-2011/
35. Rodriguez M, Williamson T, Vogus A, Macgregor-Skinner E, Peña DL, Wilson A, et al. Saint Vincent and the Grenadines health systems and private sector assessment. Bethesda (MD): Abt Associates; 2012. Available from: https://www.hfgproject.org/saint-vincent-grenadines-health-systems-private-sector-assessment/
36. Sulzbach S, Ingerson K, Rodriguez M, Williamson T, Hainsworth M, Fairbank A, et al. Dominica health systems and private sector assessment. Bethesda (MD): Abt Associates; 2012. Available from: https://www.hfgproject.org/dominica-health-systems-private-sector-assessment/
37. Jamison DT, Summers LH, Alleyne G, Arrow KJ, Berkley S, Bingawaho A, et al. Global health 2035: a world converging within a generation. Lancet. 2013;382(9908):1898–1955. CrossRef. Medline
38. Health Systems 20/20; SHOPS Project. Literature review on health systems and private sector in the Caribbean Region (draft). Bethesda (MD): Abt Associates; 2010.
39. Bossert TJ. Can they get along without us? Sustainability of donor-supported health projects in Central America and Africa. Soc Sci Med. 1990;30(9):1015–1023. CrossRef. Medline
40. Hamilton M, Musau S. Sustaining the HIV and AIDS response in countries of the OECS: regional investment case analysis. Bethesda (MD): Abt Associates; 2014.
41. Bradach J. Going to scale: the challenge of replicating social programs. Stanf Soc Innov Rev. Standford (CA): Stanford Graduate School of Business; Spring 2003. Available from: http://www.ssireview.org/articles/entry/going_to_scale
42. El-Sadr WM, Holmes CB, Mugyenyi P, Thirumurthy H, Ellerbrock T, Ferris R, et al. Scale-up of HIV treatment through PEPFAR: a historic public health achievement. J Acquir Immune Defic Syndr. 2012;60 (Suppl 3):S96–S104. CrossRef. Medline
43. Waning B, Kyle M, Diedrichsen E, Soucy L, Hochstadt J, Bärnighausen T, et al. Intervening in global markets to improve access to HIV/AIDS treatment: an analysis of international policies and the dynamics of global antiretroviral medicines markets. Global Health. 2010;6:9. CrossRef. Medline
44. World Health Organization (WHO). Multi-country regional pooled procurement of medicines. Identifying key principles for enabling regional pooled procurement and a framework for inter-regional collaboration in the African, Caribbean, and Pacific Island Countries. Geneva: WHO; 2007. Available from: http://apps.who.int/medicinedocs/documents/s14862e/s14862e.pdf
45. Tarantino L, Ingerson K, Chadbourn C. Financial sustainability recommendations for the Caribbean HIV/AIDS Alliance (CHAA): draft report. Bethesda (MD): Abt Associates; 2014.
46. Ingerson K. Private sector resources for health in Antigua and Barbuda: a rapid mapping. Bethesda (MD): Abt Associates; 2012.
47. Tuchman J. Private sector resources for health in Dominica: a rapid mapping. Bethesda (MD): Abt Associates; 2012.
48. Ingerson K. Private sector resources for health in St. Kitts and Nevis: a rapid mapping. Bethesda (MD): Abt Associates; 2012.

Peer Reviewed

Received: 2014 Dec 4; **Accepted:** 2015 Apr 3; **First Published Online:** 2015 June 12

Cite this article as: Vogus A, Graff K. PEPFAR transitions to country ownership: review of past donor transitions and application of lessons learned to the eastern caribbean. Glob Health Sci Pract. 2015;3(2):274-286. http://dx.doi.org/10.9745/GHSP-D-14-00227.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

REVIEW

Action-Oriented Population Nutrition Research: High Demand but Limited Supply

Judy Pham,[a] David Pelletier[a]

Action-oriented research in nutrition, vital to guiding effective policies and programs at scale, is greatly underrepresented in public health journals and, even more so, in nutrition journals.

ABSTRACT

Background: The relatively rapid ascendancy of nutrition and health on policy agendas, along with greater emphasis on accountability and results, has stimulated interest in new forms of research to guide the development and implementation of effective policies, programs, and interventions—what we refer to as action-oriented research. To date, action-oriented research in the nutrition field is thought to be the exception rather than the rule, but empirical evidence to support this claim is lacking.

Methods: We conducted a survey of selected journals in nutrition and public health to assess the extent and nature of population nutrition research published in 2012 that embodied 5 defined characteristics of action-oriented research in relation to: (1) topic(s) of study, (2) processes/influences, (3) actors, (4) methods, and (5) approaches. We identified 762 articles from the 6 selected nutrition journals and 77 nutrition-related articles from the 4 selected public health journals that met our search criteria.

Results: Only 7% of the 762 papers in nutrition journals had at least 1 of the 5 action-oriented research characteristics, compared with 36% of the 77 nutrition-related papers in the public health journals. Of all 80 articles that had at least 1 action-oriented research characteristic, only 5 articles (6.25%) embodied all 5 characteristics. Articles with action-oriented research covered a broad range of topics and processes/influences, including policy, workforce development, and schools, as well as actors, such as program staff, store owners, parents, and school staff. In addition, various research methods were used, such as stakeholder analysis, ethnographic narrative, iterative action research, and decision tree modeling, as well as different approaches, including participant-observer and community-based participatory research.

Conclusions: Action-oriented research represents a small fraction of articles published in nutrition journals, especially compared with public health journals. This reinforces recent calls to expand population nutrition research agendas to more effectively inform and guide the initiation, development, implementation, and governance of policies, programs, and interventions to address the varied forms of nutrition-related problems. With heightened attention to the magnitude and importance of nutrition problems worldwide, there are substantial reasons and opportunities to incentivize and support such expansion.

INTRODUCTION

Nutrition is now recognized as a major cause or contributing factor to a wide range of diseases and to the global burden of disease in developed as well as developing countries.[1] In addition to its role in morbidity and mortality, poor nutrition can increase health care costs, and it contributes negatively to cognitive and motor development, school performance, economic productivity, and national economic growth.[2–6] For these reasons, and as a fundamental aspect of human rights and equity, nutrition has risen on the agendas of international organizations, governments in developed and developing countries, the private sector, and in popular culture.[7–9] This rapid ascendancy of nutrition on policy agendas has some similarities to the ascendancy of global health that began a decade or two earlier.[10] One of the key features they share in common is a greater concern for accountability and results.[11–13]

[a] Cornell University, Division of Nutritional Sciences, Ithaca, NY, USA. Correspondence to David Pelletier (dlp5@cornell.edu).

Universal coverage of existing interventions could reduce child mortality by two-thirds, but 97% of child health research grants focus on developing new interventions.

The concern for accountability and results has revealed a yawning gap in funding between mechanistic or efficacy research and research aimed at delivering results at scale. For instance, the *Lancet* child survival series estimated in 2003 that global child mortality could be reduced by two-thirds through universal coverage of existing interventions,[14] but a separate analysis revealed that 97% of child health research grants are focused on developing new interventions rather than enhancing the delivery of existing interventions.[15]

The recognition of these gaps and the desire to produce results at scale have generated interest in newer forms of research to guide the initiation, development, implementation, and governance of effective policies and programs. Research for these purposes involves research questions, designs, methods, partnerships, and funding that are distinct from the well-developed forms of research, such as randomized controlled trials, used in discovery or efficacy research.[16] The newly emergent forms of research come under a variety of labels such as implementation or delivery science,[17] translational research,[18,19] community-based participatory research,[20] action research,[21] developmental evaluation,[22] and engaged or prospective policy research,[23] among others.[24] Although all these types of research share a desire to create knowledge that can inform and guide solutions to health and nutrition problems, they differ markedly in the geographic scale (communities and countries to global institutions), objects of inquiry (e.g., health workers, managers, mHealth, training and supervision approaches), disciplinary theories and methods (anthropology and management to economics and political science), and the journals in which the findings are published. The advent of *Global Health: Science and Practice* is one manifestation of this growing interest in producing and disseminating practice-oriented knowledge and experience.

New forms of research, referred to here as action-oriented research, aim to guide effective health and nutrition policies and programs.

Action-oriented research involves greater interaction with communities, government, NGOs, and the private sector than conventional science.

While this diversity in action-oriented health and nutrition research is a potential strength and is appropriate given the diversity in contexts where action must take place, it also poses a danger in that results from these emergent forms of research may remain highly particularistic and contextual.[25] If these new forms of research are to gain legitimacy and form a coherent and cumulative body of knowledge about how to address health and nutrition problems in diverse contexts, there will need to be some parallel intellectual work to develop, refine, and share integrative knowledge, theory, frameworks, and methods.[16]

To this end, we recently published a framework for organizing and ultimately advancing the knowledge, principles, and practices related to action-oriented research in population nutrition, most of which deal with the implementation of policies, programs, and interventions.[26] Although that paper focused on nutrition, the framework and principles are equally relevant for global health more broadly and for other domains. The present paper provides a brief overview of the framework and reports on the results of a literature search designed to assess the extent to which and how researchers are currently working at these research frontiers in the case of nutrition.

A FRAMEWORK FOR DEFINING ACTION-ORIENTED NUTRITION RESEARCH

Implementation research and the other newly emergent forms of research in health and nutrition noted above are actually part of a larger transformation in science that is underway at the societal level. In the sociology of science literature, this transformation has been famously termed "Mode 2" knowledge production.[27,28] According to this literature, the conventional production of scientific knowledge ("Mode 1") takes place primarily in academic and scientific institutions and is governed by the norms of scientific disciplines, whereas Mode 2 knowledge production takes place through greater interaction with communities, government actors, NGOs, and/or private-sectors actors. Mode 2 knowledge production is considered an emergent and socially robust form that complements Mode 1 and is especially needed for addressing complex social problems. Its emergence is due to external (societal) trends and pressures, such as the demand for greater accountability, as well as internal forces and incentives within universities and other research institutions.

According to these authors, Mode 2 knowledge production differs from that of Mode 1 in several ways:

- It takes place in the context of application or problem solving (versus theoretical or strictly academic contexts).
- It is transdisciplinary (versus disciplinary or even interdisciplinary), drawing upon whichever disciplinary and contextual knowledge is needed to address the problem at hand.
- It is heterogeneous in its sites, including mission-focused research centers, government

agencies, think tanks, nonprofit agencies, communities of practice, epistemic communities, and community organizations (versus universities and research centers).

- It arises from mutual interaction among these actors and sites (versus interaction mainly among academic peers).
- It involves novel forms of quality control based on economic, political, social, ethical, and utility criteria (versus discipline-based norms and peer review alone).
- As a result of the social interaction, it is reflexive (embracing of multiple perspectives on problem solving versus search for a single truth) and more intentionally socially accountable (versus accountable only to scientific and disciplinary norms).

Based on this earlier work, we proposed 6 dimensions or tendencies that might define action-oriented population nutrition research (Table 1).[26] These dimensions resonate well with the current understanding of implementation research as elaborated elsewhere,[24,29] but the present study did not limit itself to that focus.

The 6 dimensions are:

1. **Why we study ("why"):** the central feature of action-oriented research, influencing all other dimensions. The primary motivation of action-oriented research is to help identify, characterize, and solve practical problems.
2. **What we study ("topics"):** examine food and nutrition issues in a broader context beyond individual-level biology and behavior, including a focus on food systems, social and public health programs and policies, organizational behavior, and change processes at various levels of social organization
3. **Who we study ("actors"):** also moves beyond the individuals directly affected (mothers, infants, consumers, etc.) and instead studies those engaged in food and nutrition efforts directly or indirectly, such as government agencies, policy makers, frontline workers, civil society organizations, academic institutions, and private-sector actors
4. **How we study in terms of methods ("methods"):** a range of qualitative and quantitative methods that may include but go beyond the conventional methods of focus groups, interviews, and/or surveys that measure knowledge, attitudes, beliefs, behavior, and biology
5. **How we study in terms of approaches ("approaches"):** involves interaction between researchers and various social actors, and thus can be described as engaged and participatory as opposed to detached and seeking objectivity
6. **Disciplinary foundations ("disciplines"):** draws upon the conventional disciplines (e.g., nutritional sciences, epidemiology, and behavioral psychology) but also includes perspectives, theories, and collaboration from other disciplines, such as anthropology, economics, law, policy analysis, and management. Importantly, the motivation of creating actionable knowledge often leads to a transdisciplinary orientation, in which the disciplines, theories, and constructs used in a particular case are defined based on the characteristics of the problem in a given context, rather than the disciplinary norms of the researchers and/or their institutions.

According to Pelletier et al.,[26] action-oriented research currently is the exception rather than the rule in population nutrition research, and there is a need to expand in these directions in order to develop more effective, appropriate, and sustainable responses to food and nutrition problems. The purpose of this paper is to provide systematic empirical support for that claim.

METHODS

Based on the 6-dimension framework, we developed and applied a literature coding system to peer-reviewed literature published in 2012 from selected journals in the areas of nutrition and public health. The public health journals were included to provide a contrast with the nutrition journals. We modeled our coding system after a methodology applied to examine the use of social-ecological approaches in the design of health promotion interventions over a 20-year period.[30] We also consulted the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement for guidance.[31]

Purposeful sampling was used to focus on the journals most likely to publish action-oriented research, through consultation with nutrition colleagues familiar with the field.

The nutrition journals selected were:

- *Ecology of Food and Nutrition*
- *Journal of Nutrition Education and Behavior*
- *Maternal and Child Nutrition*
- *Journal of Nutrition*

TABLE 1. Six Dimensions of Action-Oriented Population Nutrition Research[a]

Dimension	Conventional Research	Action-Oriented Research
Why we study	To create generalizable or fundamental knowledge that answers scientific questions	To create knowledge that can help identify, characterize, and solve practical problems of concern to stakeholders, organizations, communities, or publics at various scales
What we study (topics)	Nutrients, food and nutrient intake, consumer behavior, determinants and consequences of nutritional variation, efficacy of interventions	Food and nutrition issues, causes, and solutions in a broader social and action context, including food systems, social and public health programs and policies; processes of policy agenda setting, governance, development, implementation, scaling-up, and evaluation; and community and organizational behavior and change processes
Who we study (actors)	Mothers, infants, children, individuals, consumers, patients	Policy makers, analysts, managers, implementers, frontline workers in the public sector; global, national, state, and local leaders and members of communities, civil society organizations, universities, networks, and coalitions; global, national, state, and local private-sector actors and entities, citizens, academics
How we study: methods	Measurements of knowledge, attitudes, beliefs, behavior, biology, individual and environmental characteristics, and their interrelationships, using a limited range of quantitative and qualitative methods	More eclectic range of qualitative and quantitative methods to inquire into the new topics noted above, including mixed methods, social network analysis, discourse analysis, narrative policy analysis, Q methodology, process tracing, stakeholder analysis and influence mapping, program impact pathways, organizational ethnography, systems dynamics group modeling
How we study: approaches	Generally detached, objectivist, positivist, reductionist, behaviorist, hypothesis testing	More engaged, participatory, action research, community-based participatory research, participant-observer, reflection in action, embedded, critical, social construction, emergent, systems- and complexity-oriented
Disciplinary foundations	Nutritional sciences, epidemiology and biostatistics, biomedicine, psychology, social psychology, consumer behavior	Transdisciplinary, drawing upon our traditional disciplines but also with a greater role for economics, sociology, anthropology, policy analysis, law, urban planning, political science, organizational behavior, management sciences, and systems sciences

[a] In many cases, the distinctions shown in this table are a matter of degree or emphasis rather than discrete categories. Individual studies or research programs may possess many or few of these characteristics, to a greater or lesser extent.

Reprinted and adapted with permission from Pelletier et al., 2013 in *Advances in Nutrition*.[26] Copyright 2013 by American Society for Nutrition.

- *Public Health Nutrition*
- *International Journal of Behavioral Nutrition and Physical Activity*

The public health journals selected were:

- *American Journal of Public Health*
- *Health Policy and Planning*
- *Social Science & Medicine*
- *Journal of School Health*

We used the Thomas Reuters Web of Science database to screen all articles published in 2012 in these journals. After eliminating papers not focused at the population level and/or not focusing on nutrition (described below), the remaining articles were sorted by using a coding sheet initially based on the 6 action-oriented research dimensions. The coding was refined using successive trial runs, and the final coding sheet included 5 dimensions that could be

systematically and objectively identified in the articles.

The final 5 characteristics, which required some modifications to the original 6 dimensions to embrace the actual diversity found in the articles, comprised: (1) topic(s) of study, (2) processes/influences, (3) actors, (4) methods, and (5) approach. Characteristics 3, 4, and 5 are from the original framework. We eliminated the "why" and "disciplines" dimensions from the original framework due to limitations in our ability to identify them without making assumptions about authors' intentions or the nature or extent of any transdisciplinary orientation. Characteristics 1 and 2 in our study corresponded to the "topics" dimension from the original framework but was divided into 2 categories to distinguish papers that focused on entities (e.g., interventions and public programs) from papers that focused on processes or influences (e.g., policy development, community or organizational change).

For the nutrition journals, we first eliminated papers that focused narrowly on topics such as measurement of body mass index, birth weight (without any nutritional correlates), pregnancy cravings, tobacco, physical activity, disease, aging, oral health, or housing, based on article titles and abstracts when necessary. In the second stage, the remaining papers were hand-sorted with the coding sheet by title, abstract, and full text, as necessary. Those embodying none of the action-oriented characteristics were also eliminated. One reviewer (JP) tabulated the titles and abstracts for the final papers included in our analysis according to each characteristic and noted the reason(s) for the tabulation, while another reviewer (DP) reviewed all tabulations. In cases where there was disagreement, the reviewers met to discuss until they reached agreement.

For the public health journals, we identified nutrition-related papers by using the following search terms in the topic search field, using the Web of Science database: *nutrition OR malnutrition OR undernutrition OR food OR obesity OR micronutrient OR supplementation OR nutrient OR diet OR hunger*. Those papers not meeting any of these search criteria were considered non-nutrition articles and were not considered further. The articles meeting the nutrition search criteria were subjected to the same coding and review protocol as the nutrition journal papers, to identify the subset with at least 1 action-oriented research characteristic.

© Dia Sanou

Participants in Mali analyze data on infant and young child feeding practices during a community diagnosis. Such participatory and action-oriented research methods tend to examine health problems in a broader context and involve community actors in the research process itself.

RESULTS

After employing our first-stage elimination strategies in which we excluded articles in nutrition journals with a narrow topic and articles in public health journals that did not meet our nutrition search terms criteria, we identified and reviewed a total of 839 articles (762 from nutrition journals, 77 from public health journals). Overall, less than 10% of these articles possessed at least 1 action-oriented research characteristic and were ultimately included in our analysis (n = 52 from nutrition journals, n = 28 from public health journals) (Table 2). (See the supplementary material for a bibliography of the papers with at least 1 action-oriented research characteristic, which were included in our analysis.)

Nutrition articles were coded based on 5 action-oriented research characteristics: topic, processes/influences, actors, methods, and approach.

Of the 80 articles that had at least 1 action-oriented research characteristic, 5 articles (6.25%) embodied all 5 characteristics. There was a notable difference in the frequency of action-oriented research articles between the nutrition journals (7% with at least 1 characteristic) and the public health journals (36%).

Less than 10% of nutrition articles published in 2012 embodied at least 1 action-oriented research characteristic.

Public health journals had a higher proportion of action-oriented nutrition research articles than nutrition journals.

Action-Oriented Research in Nutrition Journals

Of the 52 articles from nutrition journals that had 1 or more action-oriented research characteristic, 69% fulfilled the criteria for "topic(s) of study," 81% for "processes/influences," 44% for "actors," 31% for "method," and 31% for "approach"

TABLE 2. Nutrition-Focused Papers With Action-Oriented Research Characteristics Published in 2012 in Nutrition and Public Health Journals

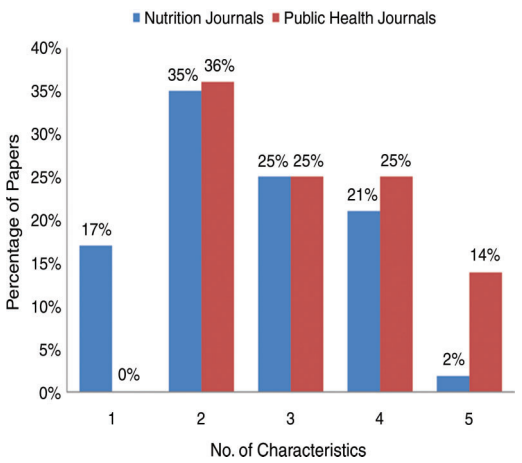
Journal Name	Total No. of Nutrition Papers in 2012	No. (%) of Papers With ≥1 Action-Oriented Characteristic[a]	No. (%) of Papers per Action-Oriented Characteristic[b]				
			Topic(s) of study	Processes/ Influences	Actors	Methods	Approach
Nutrition Journals							
Ecology of Food and Nutrition	19	4 (21.1)	3 (75.0)	4 (100.0)	1 (25.0)	2 (50.0)	2 (50.0)
Journal of Nutrition Education and Behavior	90	13 (14.4)	6 (46.2)	11 (84.6)	6 (46.2)	3 (23.1)	4 (30.8)
Maternal and Child Nutrition	47	5 (10.6)	5 (100.0)	4 (80.0)	5 (100.0)	2 (40.0)	3 (60.0)
Journal of Nutrition	308	7 (2.3)	6 (85.7)	5 (71.4)	1 (14.3)	0 (0.0)	0 (0.0)
Public Health Nutrition	252	22 (8.7)	15 (68.2)	17 (77.3)	9 (40.9)	9 (40.9)	7 (31.8)
International Journal of Behavioral Nutrition and Physical Activity	46	1 (2.2)	1 (100.0)	1 (100.0)	1 (100.0)	0 (0.0)	0 (0.0)
Subtotal	**762**	**52 (6.8)**	**36 (69.2)**	**42 (80.8)**	**23 (44.2)**	**16 (30.8)**	**16 (30.8)**
Public Health Journals							
American Journal of Public Health	24	8 (33.3)	8 (100.0)	7 (87.5)	3 (37.5)	4 (50.0)	0 (0.0)
Health Policy and Planning	4	4 (100.0)	4 (100.0)	4 (100.0)	2 (50.0)	4 (100.0)	3 (75.0)
Social Science & Medicine	26	7 (26.9)	7 (100.0)	5 (71.4)	3 (42.9)	4 (57.1)	3 (42.9)
Journal of School Health	23	9 (39.1)	9 (100.0)	9 (100.0)	4 (44.4)	4 (44.4)	2 (22.2)
Subtotal	**77**	**28 (36.4)**	**28 (100.0)**	**25 (89.3)**	**12 (42.9)**	**16 (57.1)**	**8 (28.9)**
TOTAL	**839**	**80 (9.5)**	**64 (80.0)**	**67 (83.8)**	**35 (43.8)**	**32 (40.0)**	**24 (30.0)**

[a] Percentages are of total nutrition papers per journal.
[b] Percentages are of total nutrition papers per journal with ≥1 action-oriented research characteristic.

(Table 2). Only 2% of the articles embodied all 5 characteristics while 17% embodied only 1 characteristic, 35% embodied 2 characteristics, 25% embodied 3 characteristics, and 21% embodied 4 characteristics (Figure).

The "topic(s) of study" and "processes/influences" covered a broad range of topics, including national policy, workforce development, programs, and schools, among others (Table 3). One illustrative example in workforce development was an article titled, "Using video narratives of women's lived experience of breastfeeding in midwifery education: exploring its impact on midwives' attitudes to breastfeeding," which studied midwifery breastfeeding counseling as the topic of study and the midwives' attitudes toward breastfeeding as the outcome.[32] Another article, "Public health nutrition workforce development in seven European countries: constraining and enabling factors," studied public health nutrition workforce development in 7 European countries as the topic of study and constraining and enabling

FIGURE. Number of Action-Oriented Research Characteristics in Nutrition Papers by Journal Type (N=80)



factors in terms of the policy environment, public health organizations, and workforce compensation as the processes/influences.[33]

The "actor" characteristic in the action-oriented research articles included program staff, private-sector stakeholders, store owners, government employees, parents, school staff, and peer supporters, among others (Table 4). Various research "methods" were used, including stakeholder analysis, onsite receipt collection, ethnographic narrative, and iterative action research (Table 4), and "approaches" consisted of participant-observer, engaged, complexity-aware and prospective policy research, and community-based participatory research (not shown).

Action-Oriented Research in Public Health Journals

Of the 28 articles in public health journals with 1 or more action-oriented research characteristic, 100% fulfilled the criterion for "topic(s) of study,"

TABLE 3. Illustrations of Action-Oriented Research Characteristics of "Topic(s) of Study" and "Processes/Influences" in Nutrition Journals

Key Topics	Topic(s) of Study	Processes/Influences
National policy	US, Ireland, UK, dietary guidelines, growth charts, nutrition in child-care settings, revision process, development process, communications initiatives	Translation at local/regional levels, barriers to and extent of adoption, revisions, evaluation, practitioners' understanding of growth charts, cost implications, public health expenditures
Workforce development	Certification programs, register of nutritionists, required core functions, teaching and training initiatives, midwifery breastfeeding counseling	Constraining/enabling factors, stakeholder consensus on core functions, incorporating cognitive-behavioral techniques into breastfeeding counseling
Programs	Public-private partnerships, church-based, transdisciplinary platforms for interventions, e.g., health, agriculture, market, social protection	Partnership opportunities, changed program practices, cost-effectiveness, challenges for dissemination, new evaluation framework, development of young adult obesity program based on community-based participatory research, implementation fidelity
Schools	Nutrition guidelines, school gardens	Instructional process, decision making, environment, food service offerings, food preparation practices
Global	Immigrant experience, political instability, economic instability, drought, global food system, regional early warning systems	Food nostalgia and cultural symbolism, household provision of care for people living with HIV/AIDS, real cost of food, policy options to improve food security, ability to predict food crises
Other	Media content, employers' attitudes toward mother-friendly work environments, breastfeeding peer support services, grocery store marketing and promotion, WIC-authorized stores	Confusion resulting from media news reporting, eating maps, food store stocking and pricing behavior changes after food assistance program changes, employer readiness to provide breastfeeding accommodations, marketing on packaging

Abbreviation: WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.

TABLE 4. Illustrations of Action-Oriented Characteristics of "Actors" and "Methods" in Nutrition Journals

Actors	Methods
Child care professionals	Consultative workshops
Clinical staff	Emerging policy options with stakeholder input
Community health workers	Health economic analysis
Community leaders	Impact pathways
Food assistance program staff	Implementation pathways
Food service employees	Immersion-observation
Government authorities and advisors	Iterative action research via workshops
Health professionals	Onsite receipt collection
Peer supporters	Policy review
Private-sector employers	Simulation of food intake patterns
Program implementers	Stakeholder analysis
School staff, parents, volunteers	Systematic Internet review
Stakeholders, i.e. academics, practitioners	Thematic analysis
Store owners/managers	

89% for "processes/influences," 43% for "actor," 57% for "method," and 29% for "approach" (Table 2). None of these papers embodied only 1 action-oriented research characteristic, 36% embodied 2 characteristics, 25% embodied 3 characteristics, 25% embodied 4 characteristics, and 14% embodied all 5 characteristics (Figure).

In the public health journals, the "topic(s) of study" and "processes/influences" covered a broad range of topics, as in the nutrition journals, including policy and legislation, schools, and programs (Table 5). The "actor" category included midwives, school principals, community members, and NGOs, among others (Table 6). Some examples of the "methods" included change-making process analysis, exploratory case study, consultative workshops, and decision tree modeling, and the "approaches" comprised participant-observer, community-based participatory research, engaged, and prospective policy research (not shown).

DISCUSSION

> *This paper argues that much health policy [research] wrongly focuses attention on the content of reform, and neglects the actors involved in policy reform (at the international, national and sub-national levels), the processes contingent on developing and implementing change and the context within which policy is developed. Focus on policy content diverts attention from understanding the processes which explain why desired policy outcomes fail to emerge.*[34]

The above quote from 20 years ago refers to the state of research on health policy in developing countries, but it could just as well apply to much of population nutrition research today. The present study, consistent with the claims made by Pelletier et al. in the earlier paper that outlined a framework for defining action-oriented nutrition research,[26] finds a paucity of research on the actors, processes, and contexts within which nutrition policy (or actions in general) is developed and implemented, suggesting that the majority of nutrition research currently being published by nutrition and public health academics contains a relatively narrow range of topics, methods, and approaches. Specifically, fewer than 10% of the reviewed nutrition articles embodied at least 1 action-oriented research

TABLE 5. Illustration of Action-Oriented Research Characteristics of "Topic(s)" and "Processes/Influences" in Public Health Journals

Key Topics	Topic(s) of Study	Processes/Influences
Policy and legislation	Changes in WIC policy, state childhood obesity policies, national nutrition agenda setting, policy formulation and implementation	Predictors of enactment, instruments prescribed to influence school food environment, strategies used to move nutrition agenda forward, enabling/inhibiting factors, levels of commitment, policy diffusion from state- to district-level
Schools	Elementary/high schools, school beverage shipments, school bus advertising, school-based obesity policy, wellness policy requirements, state department of education policy and structural changes to improve nutrition	Beverage industry self-regulation, sugar-sweetened beverage availability, acceptability of specific intervention strategies, changes in wellness policies before and after federal mandates, changes in food options, food service finances, implementation and awareness of guidelines
Programs	Outcomes and cost of community-based management of acute malnutrition, procedural programs to create healthy environments for vulnerable populations, promotional tool for healthy body image	Implementation processes, lessons learned, cost-effectiveness, extent of cooperation, population reach, perceived potential of tool
Other	Food advertising, language of midwives, GDP/Gini Index/GII, climate change, international human rights obligations regarding rights to food and health	National approaches to addressing food insecurity, impacts on gender inequality, global distribution of obesity, impacts on household decision making

Abbreviations: GDP, Gross Domestic Product; GII, Global Innovation Index; WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.

TABLE 6. Illustrations of Action-Oriented Characteristics of "Actors" and "Methods" in Public Health Journals

Actors	Methods
Community members	Change-making process analysis
Frontline staff	Coding of media photos
Government officials	Consultative workshops
Midwives	Decision tree modeling
NGOs, donors, civil society	Discourse analysis
Physical education teachers	Document analysis
Private sector	Exploratory case study
Program administrative staff	Information gathering from practitioners
School health advisory councils	Observation
School principals	Project performance framework
	Systematic review
	Theoretical policy science typology
	Wellness policy coding scheme

© David Pelletier

In Ghana, a group of young men map factors and locations in their community that place youth at risk for HIV. This type of youth action research trains young people in the research process, including using their findings to inform direct change in their communities.

The small set of nutrition research articles that were action-oriented exhibited a rich variety of topics, methods, and approaches, indicating such research is feasible.

characteristic, which itself is a minimalist criterion. Those that did meet this criterion, however, exhibited a rich array of action-oriented research topics, processes/influences, methods, and approaches to study, indicating that this type of research is feasible and can be expanded in the future.

The sizeable difference between the proportion of action-oriented research papers published in nutrition journals (only 7% of reviewed papers had at least 1 action-oriented research characteristic) versus public health journals (36%) suggests that articles in public health journals are more likely to be engaged in problem-solving research and to have expanded their research questions, approaches, and methods, compared with those published in nutrition science journals. It is unclear from the present study whether this difference reflects greater receptivity to action-oriented research papers in public health journals or a preference for action-oriented researchers to publish in those journals. Given the importance of action-oriented research for informing and guiding solutions to high-burden and highly salient food and nutrition problems, the present study suggests there is an undersupply of such research, especially in nutrition journals.

Effective solutions to nutrition problems require application of knowledge from both action-oriented and conventional nutrition research.

In fact, for at least the last 2 decades, the need for more action-oriented research has been recognized[35–37] to answer such problems as how to deliver solutions effectively and sustainably at large scale,[38] how to increase demand for and use of existing nutrition services and products,[39] and how to ensure relevance of nutrition research to policy makers and program implementers.[40] Most recently, the New York Academy of Sciences, in collaboration with the World Health Organization, launched a solution-oriented global research agenda for nutrition,[37] and a new society for implementation research on nutrition is being formed for that purpose.[41]

The literature offers several explanations for this undersupply of action-oriented nutrition research. Allen and Gillespie discuss nutrition researchers' scientific predisposition to address questions of efficacy rather than effectiveness[42]; Garrett points toward nutrition researchers' limited familiarity with other disciplines and the contributions they can make[40]; Shekar cites the real and/or perceived lack of funding for such research[38]; Berg examines the academic culture and training that inhibit interest in applied research[43]; and nutrition stakeholders within sub-Saharan Africa identify a need for better governance of nutrition research, alignment of nutrition research funding with priorities identified within the region, and capacity development for nutrition research. The literature and experience of health policy research concurs with these explanations and also identifies a heavy reliance on international funding for research, an excessive focus on the direct utility of findings from specific studies, and a tendency to undervalue contributions from social sciences.[44]

The interpretation of the findings in this paper requires 2 important qualifications. First, as detailed in the original paper outlining the action-oriented research framework,[26] the focus on action-oriented research is not to dismiss or discount the importance of conventional nutrition research. Rather, as noted elsewhere,[24] the design, implementation, and sustainability of effective solutions to nutrition problems require the integration of knowledge from both forms of research, so that knowledge of intervention efficacy can be combined with knowledge of and strategies for agenda setting, commitment building, policy and program formulation and implementation, and related activities.

Second, the sparseness of action-oriented research in nutrition journals raises the question: Does it matter? Perhaps what really matters is that nutrition researchers and/or researchers from

other disciplines are doing action-oriented research and publishing it in whichever journals are receptive to such research. This may be a practical strategy in the short-term, if the current perspectives and priorities in nutrition science journals are not receptive. However, this short-term strategy would raise concerns if it inhibits the continued intellectual growth and policy/programmatic relevance of the nutrition research community itself or reflects an institutionalized resistance to such growth. In the long-run, it will be important for action-oriented research to become more mainstreamed within nutrition curricula, research agendas, and donor funding. The focus and content of nutrition journals play important gatekeeper, incentivizing, and symbolic functions in that mainstreaming process.

Limitations

The present study has several technical limitations. First, it focused only on a sample of nutrition and public health journals and only on papers published in 2012, in order to provide an initial sense of the current research tendencies. A more comprehensive bibliometric survey would be useful to ensure broader coverage and provide a baseline for examining trends over time. Second, the low frequency of action-oriented nutrition research articles may reflect editorial preferences of the journals rather than the actual volume of such research. The possibility of publication bias cannot be examined with these data sources alone. Third, the data for this research are based on analysis of material provided in the papers themselves, rather than on direct communication with authors, which could have resulted in some inaccurate coding. While acknowledging these issues, it also seems likely that the overall findings are rather robust to such limitations. Finally, while most of the action-oriented research papers identified through the bibliometric search in this paper are focused on topics, processes, and/or actors related to implementation of policies, programs, or interventions, it is important to note that search terms such as "implementation" or "delivery" were not employed in this study. Given the significant and growing interest in implementation research per se, a high priority for future research is to conduct a more comprehensive survey of the literature to establish benchmarks and directions for this growing field of inquiry.

CONCLUSION

Action-oriented research represents a relatively small fraction of papers published in nutrition journals, even when the search is restricted to the journals most likely to publish such research and when a minimal set of criteria is applied. Public health journals, in contrast, are far more likely to publish nutrition research with action-oriented characteristics. Existing action-oriented research exhibits a rich array of topics, methods, and approaches, indicating that this type of research is feasible and can be expanded in the future. With heightened attention to the magnitude and importance of nutrition problems worldwide and the emphasis placed on accountability and results, there are substantial opportunities and obligations for all of parties in the research enterprise, from research institutions and graduate training programs to journals and research funders, to incentivize and support such an expansion.[45]

Acknowledgments: The authors thank Dr. Christine Olson for her assistance in reviewing a draft of this paper.

Competing Interests: None declared.

REFERENCES

1. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet. 2012;380(9859):2224–2260. CrossRef. Medline
2. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet. 2013;382 (9890):427–451. CrossRef. Medline
3. World Bank. Repositioning nutrition as central to development: a strategy for large scale action. Washington (DC): The Bank; 2006. Available from: http://siteresources.worldbank.org/NUTRITION/Resources/281846-1131636806329/NutritionStrategy.pdf
4. Chan M. Investing in early child development: an imperative for sustainable development. Ann N Y Acad Sci. 2014;1308(1): vii–viii. CrossRef. Medline
5. Black MM, Dewey KG. Promoting equity through integrated early child development and nutrition interventions. Ann N Y Acad Sci. 2014;1308(1):1–10. CrossRef. Medline
6. Cawley J, Meyerhoefer C. The medical care costs of obesity: an instrumental variables approach. J Health Econ. 2012;31 (1):219–230. CrossRef. Medline
7. Scaling Up Nutrition SUN [Internet]. New York: SUN; c2013 [cited 2013 Oct 3]. Available from: http://scalingupnutrition.org/
8. 1,000 Days Partnership [Internet]. Washington (DC): The Partnership; c2015 [cited 2013 Sep 23]. Available from: http://www.thousanddays.org/
9. World Health Organization (WHO). 2008-2013 action plan for the global strategy for the prevention and control of

noncommunicable diseases. Geneva: WHO; 2008. Available from: http://www.who.int/nmh/publications/ncd_action_plan_en.pdf

10. Institute for Health Metrics and Evaluation. Financing global health 2012: the end of the golden age? Seattle (WA): The Institute; 2012. Available from: http://www.healthdata.org/policy-report/financing-global-health-2012-end-golden-age
11. Das P. Jim Kim: new President of the World Bank. Lancet. 2012;380(9836):19. CrossRef. Medline
12. World Health Organization (WHO). Keeping promises, measuring results: Commission on Information and Accountability for Women's and Children's Health. Geneva: WHO; 2011. Available from: www.who.int/topics/millennium_development_goals/accountability_commission/Commission_Report_advance_copy.pdf
13. Chan M, Kazatchkine M, Lob-Levyt J, Obaid T, Schweizer J, Sidibe M, et al. Meeting the demand for results and accountability: a call for action on health data from eight global health agencies. PLoS Med. 2010;7(1):e1000223. CrossRef. Medline
14. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS; Bellagio Child Survival Study Group. How many child deaths can we prevent this year? Lancet. 2003;362(9377):65–71. CrossRef. Medline
15. Leroy JL, Habicht JP, Pelto G, Bertozzi SM. Current priorities in health research funding and lack of impact on the number of child deaths per year. Am J Public Health. 2007;97(2):219–223. CrossRef. Medline
16. Shelton JD. Evidence-based public health: not only whether it works, but how it can be made to work practicably at scale. Glob Health Sci Pract. 2014;2(3):253–258. CrossRef. Medline
17. Madon T, Hofman KJ, Kupfer L, Glass RI. Implementation science. Science. 2007;318(5857):1728–1729. CrossRef. Medline
18. Glasgow RE, Emmons KM. How can we increase translation of research into practice? Types of evidence needed. Annu Rev Public Health. 2007;28(1):413–433. CrossRef. Medline
19. Butler D. Translational research: crossing the valley of death. Nature. 2008;453(7197):840–842. CrossRef. Medline
20. Minkler M, Blackwell AG, Thompson M, Tamir H. Community-based participatory research: implications for public health funding. Am J Public Health. 2003;93(8):1210–1213. CrossRef. Medline
21. Schensul JJ. Engaged universities, community based research organizations and third sector science in a global system. Hum Organ. 2010;69(4):307–320.
22. Patton M. Developmental evaluation: applying complexity concepts to enhance innovation and use. New York: Guilford Press; 2011.
23. Walt G, Shiffman J, Schneider H, Murray SF, Brugha R, Gilson L. 'Doing' health policy analysis: methodological and conceptual reflections and challenges. Health Policy Plan. 2008;23(5):308–317. CrossRef. Medline
24. Peters DH, Adam T, Alonge O, Agyepong IA, Tran N. Implementation research: what it is and how to do it. BMJ. 2013;347:f6753 CrossRef. Medline
25. Gilson L, Raphaely N. The terrain of health policy analysis in low and middle income countries: a review of published literature 1994–2007. Health Policy Plan. 2008;23(5):294–307. CrossRef. Medline
26. Pelletier DL, Porter CM, Aarons GA, Wuehler SE, Neufeld LM. Expanding the frontiers of population nutrition research: new questions, new methods, and new approaches. Adv Nutr. 2013;4(1):92–114. CrossRef. Medline
27. Nowotny H, Scott P, Gibbons M. Re-thinking science: knowledge and the public in an age of uncertainty. Cambridge (England): Polity; 2001.
28. Gibbons M. The new production of knowledge: the dynamics of science and research in contemporary societies. London: SAGE Publications; 1994.
29. Peters D, Tran N, Adam T. Implementation research in health: a practical guide. Geneva: World Health Organization, Alliance for Health Policy and Systems Research; 2013. Available from: http://apps.who.int/iris/bitstream/10665/91758/1/9789241506212_eng.pdf?ua = 1
30. Golden SD, Earp JA. Social ecological approaches to individuals and their contexts: twenty years of health education & behavior health promotion interventions. Health Educ Behav. 2012;39(3):364–372. CrossRef. Medline
31. Knobloch K, Yoon U, Vogt PM. Preferred reporting items for systematic reviews and meta-analyses (PRISMA) statement and publication bias. J Craniomaxillofac Surg. 2011;39(2):91–92. CrossRef. Medline
32. Taylor AM, Hutchings M. Using video narratives of women's lived experience of breastfeeding in midwifery education: exploring its impact on midwives' attitudes to breastfeeding. Matern Child Nutr. 2012;8(1):88–102. CrossRef. Medline
33. Kugelberg S, Jonsdottir S, Faxelid E, Jönsson K, Fox A, Thorsdottir I, et al. Public health nutrition workforce development in seven European countries: constraining and enabling factors. Public Health Nutr. 2012;15(11):1989–1998. CrossRef. Medline
34. Walt G, Gilson L. Reforming the health sector in developing countries: the central role of policy analysis. Health Policy Plan. 1994;9(4):353–370. CrossRef. Medline
35. Berg A. Sliding toward nutrition malpractice: time to reconsider and redeploy. Annu Rev Nutr. 1993;13(1):1–16. CrossRef. Medline
36. Pelto GH, Freake HC; ASNS Long Range Planning Committee. Social research in an integrated science of nutrition: future directions. J Nutr. 2003;133(4):1231–1234. Medline
37. New York Academy of Sciences [Internet]. New York: The Academy; c2014 [cited 2014 Feb 18]. The Sackler Institute for Nutrition Science; [about 1 screen]. Available from: http://www.nyas.org/WhatWeDo/Nutrition/Agenda.aspx
38. Shekar M. Delivery sciences in nutrition. Lancet. 2008;371(9626):1751–1751. CrossRef. Medline
39. Leroy JL, Menon P. From efficacy to public health impact: a call for research on program delivery and utilization in nutrition. J Nutr. 2008;138(3):628–629. Medline
40. Garrett JL. Improving results for nutrition: a commentary on an agenda and the need for implementation research. J Nutr. 2008;138(3):646–650. Medline
41. International Society for Implementation Science in Nutrition (ISSN) [Internet]. New York: ISISN; [cited 2015 Apr 15] . Available from: http://www.implementationsciencesociety.org/
42. Allen L, Gillespie S. What works? A review of the efficacy and effectiveness of nutrition interventions. Geneva: United Nations Administrative Committee on Coordination Sub-Committee on Nutrition; 2001. Co-published by the Asian Development Bank. Available from: http://www.adb.org/sites/default/files/publication/27916/what-works-nutrition-interventions.pdf
43. Berg A. Sliding toward nutrition malpractice: time to reconsider and redeploy. Am J Clin Nutr. 1993;57(1):3–7. Medline

44. Bennett S, Agyepong IA, Sheikh K, Hanson K, Ssengooba F, Gilson L. Building the field of health policy and systems research: an agenda for action. PLoS Med. 2011;8(8):e1001081. CrossRef. Medline

45. National Research Council. Using science as evidence in public policy. Washington (DC): The National Academies Press; 2012. Available from: http://www.nap.edu/openbook.php?record_id = 13460

Peer Reviewed

Received: 2015 Jan 11; **Accepted:** 2015 Mar 21; **First Published Online:** 2015 May 27

Cite this article as: Pham J, Pelletier D. Action-oriented population nutrition research: high demand but limited supply. Glob Health Sci Pract. 2015;3(2):287-299. http://dx.doi.org/10.9745/GHSP-D-15-00009.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

FIELD ACTION REPORT

Bedside Availability of Prepared Oxytocin and Rapid Administration After Delivery to Prevent Postpartum Hemorrhage: An Observational Study in Karnataka, India

Corrina Moucheraud,[a] Jonathon Gass,[b] Stuart Lipsitz,[b,c] Jonathan Spector,[d] Priya Agrawal,[a,e] Lisa R Hirschhorn,[b,f] Atul Gawande,[b,c] Bhala Kodkany[g]

Advance preparation and bedside availability of oxytocin before childbirth was significantly and robustly associated with rapid administration of the utertonic, as recommended to prevent postpartum hemorrhage.

ABSTRACT

Postpartum hemorrhage is a leading cause of maternal death worldwide. Rapid provision of uterotonics after childbirth is recommended to reduce the incidence and severity of postpartum hemorrhage. Data obtained through direct observation of childbirth practices, collected in a study of the World Health Organization's Safe Childbirth Checklist in Karnataka, India, were used to measure if oxytocin prepared for administration and available at the bedside before birth was associated with decreased time to administration after birth. This was an observational study of provider behavior: data were obtained during a baseline assessment of health worker practices prior to introduction of the Safe Childbirth Checklist, representing behavior in the absence of any intervention. Analysis was based on 330 vaginal deliveries receiving oxytocin at any point postpartum. Oxytocin was prepared and available at bedside for approximately 39% of deliveries. We found that advance preparation and bedside availability of oxytocin was associated with increased likelihood of oxytocin administration within 1 minute after delivery (adjusted risk ratio = 4.89, 95% CI = 2.61, 9.16), as well as with decreased overall time to oxytocin administration after delivery (2.9 minutes sooner in adjusted models, 95% CI = -5.0, -0.9). Efforts to reduce postpartum hemorrhage should include recommendations and interventions to ensure advance preparation and bedside availability of oxytocin to facilitate prompt administration of the medicine after birth.

INTRODUCTION

Worldwide, greater than a quarter million maternal deaths occur each year,[1] and postpartum hemorrhage (PPH) is the leading direct cause.[2] Incidence and severity of PPH can be reduced by active management of the third stage of labor (AMTSL), which includes early provision of uterotonics such as oxytocin.[3-5]

As a prophylactic intervention, it is essential that oxytocin be administered as quickly as possible after childbirth; current guidelines recommend administration of a uterotonic as part of AMTSL,[3] and the International Confederation of Midwives (ICM) and International Federation of Gynaecology and Obstetrics (FIGO) recommend oxytocin administration within 1 minute of delivery.[4] Unfortunately, many women globally do not receive this recommended preventive intervention.[6] In addition, a multicountry study found that, even when oxytocin is given, there are errors in its administration, most commonly that administration is delayed beyond the recommended 1-minute postpartum time frame.[7]

Multiple studies have quantified poor rates of adherence to recommended AMTSL guidelines.[6-11] In addition, qualitative research has explored possible causes of variation in use of AMTSL (including oxytocin

[a] Harvard T.H. Chan School of Public Health, Department of Global Health and Population, Boston, MA, USA.
[b] Ariadne Labs, Brigham and Women's Hospital and Harvard T.H. Chan School of Public Health, Boston, MA, USA.
[c] Brigham and Women's Hospital, Center for Surgery and Public Health, Boston, MA, USA.
[d] Massachusetts General Hospital, Boston, MA, USA.
[e] London School of Hygiene and Tropical Medicine, Faculty of Epidemiology and Population Health, London, UK.
[f] Harvard Medical School, Department of Global Health and Social Medicine, Boston, MA, USA.
[g] Jawaharlal Nehru Medical College, Women's and Children's Health Research Unit, Karnataka, India.
Correspondence to Corrina Moucheraud (cmoucheraud@mail.harvard.edu).

administration), such as availability of supplies, lack of and low confidence in skills, and challenges in preparing and administering oxytocin rapidly after labor.[12-15] However, little is known about factors associated with the timing of oxytocin use after delivery. In this investigation, we analyzed baseline observational data from a quality improvement study, of the Safe Childbirth Checklist (SCC) program of the World Health Organization (WHO), to explore whether preparing oxytocin injection prior to delivery and making it available at bedside was associated with increased likelihood of its rapid postpartum use in a hospital in India.

METHODS

Study Design

The SCC, developed by WHO, the Harvard T.H. Chan School of Public Health, and other partners, is designed to ensure health care providers' adherence to 29 evidence-based essential birth practices in facility-based peripartum care. A pre-post study of the SCC in a sub-district hospital in Karnataka, India, found that an SCC-based intervention improved adherence to essential birth practices.[16]

Data Collection

Our analysis uses data from the baseline period of this SCC study in Karnataka—prior to any intervention—during the observation period between delivery and 1-hour postpartum. Data for the study were collected via direct observation of health workers providing maternal and newborn care. Trained data collectors observed birth-related events during the intrapartum period, at pre-identified "pause points" between admission and discharge. Of relevance to this analysis, data collectors observed and recorded the timing of childbirth and of oxytocin administration.

Data Analysis

We classified timing of oxytocin administration in one of three ways:

1. Within 1 minute of delivery (per ICM/FIGO recommendations)
2. Up to 2 minutes after delivery (broadened definition of rapid administration)
3. As a continuous value of time (minutes) between the birth event and postpartum oxytocin injection

Oxytocin was considered "prepared and available at the bedside" if it was drawn up into a syringe and available at the bedside antepartum, at the start of pushing.

The sample for this analysis was restricted to women with normal vaginal deliveries who received oxytocin at any point postpartum. Multivariate models were adjusted for delivery time (daytime [10:00-16:00] versus nighttime) and maternal risk factors for hemorrhage (age, parity, and long labor duration, defined as greater than 12 hours prior to admission for nulliparous women and greater than 24 hours for all other women).

Oxytocin should be administered as quickly as possible after childbirth to prevent postpartum hemorrhage.

Univariate analyses were performed using Rao-Scott chi-square tests.[17] Generalized linear regression models, with a binomial distribution and a log link function, were used to examine whether oxytocin was administered within the recommended 1-minute time frame. For time to oxytocin administration as a continuous outcome, we used linear regression modeling.[18] All models included standard errors clustered by provider. Analyses were conducted using Stata 12.1.

Ethical Review

Study protocols were approved by ethics committees at Jawaharlal Nehru Medical College in Karnataka, WHO, the Harvard T.H. Chan School of Public Health, and the Health Ministry's Screening Committee, Indian Council of Medical Research.

RESULTS

Our analyses were based on 330 deliveries. Oxytocin was prepared and available at bedside for 38.8% of deliveries (Table 1). Use of oxytocin within the recommended 1-minute time frame was higher when prepared oxytocin was available at bedside than when it was not prepared and available (15.6% of observed deliveries vs. 3.0%, respectively; $P < .001$). We found similar results when extending the time frame of administration: oxytocin was given within 2 minutes of delivery 43.8% of the time when it was prepared and available at bedside, compared with only 16.3% of the time when it was not ($P < .001$). The average time to oxytocin administration when oxytocin was prepared and available at bedside was 4.2 minutes—significantly shorter than the average time of 7.5 minutes when oxytocin was not prepared and at bedside ($P < .001$).

Oxytocin was prepared in advance and available at bedside for 39% of deliveries.

Regression models assessing the association between bedside availability and rapid oxytocin use suggest that deliveries in which oxytocin was prepared and available at bedside were nearly 5 times more likely than deliveries in which

TABLE 1. Oxytocin Availability at Bedside and Time to Administration Among Vaginal Deliveries Receiving Postpartum Oxytocin, Karntaka, India (N = 330)

	Prepared and Available at Bedside	Not Prepared and Not Available at Bedside	*P* value
No. (%)	128 (38.8)	202 (61.2)	
Received within 1 minute of delivery, No. (%)	20 (15.6)	6 (3.0)	< .001
Received within 2 minutes of delivery, No. (%)	56 (43.8)	33 (16.3)	< .001
Time to administration, mean (SD) [range], minutes	4.2 (4.6) [0–30]	7.5 (6.2) [0–30]	< .001
Time to administration, median (IQR [Q1-Q3]), minutes	3 (25 [0–25])	5 (29 [1–30])	< .001

Abbreviations: IQR, interquartile range; SD, standard deviation.

Advance preparation and bedside availability of oxytocin was significantly associated with administration within 1 minute of delivery.

oxytocin was not available at bedside to have the medication administered within 1 minute postpartum, after adjusting for time of day and maternal risk factors for hemorrhage (adjusted risk ratio [RR] = 4.89, 95% confidence interval [CI] = 2.61, 9.16) (Table 2). When extending the time frame of administration to 2 minutes after childbirth, deliveries in which oxytocin had been prepared and available at bedside were 2.61 times more likely to have oxytocin administered than when it was not ready at the bedside (in the adjusted model, with covariates for time of day and maternal risk factors for hemorrhage) (95% CI = 1.26, 5.41). When time was examined as a continuous variable, deliveries in which oxytocin was prepared and available at bedside had oxytocin administered, on average, about 3 minutes sooner than deliveries in which oxytocin was not ready for administration at bedside, after adjusting for time of delivery and maternal hemorrhage risk factors (–2.9 minutes, 95% CI = –5.0, –0.9).

DISCUSSION

Advance preparation and bedside availability of oxytocin was associated with a significantly increased likelihood of its rapid use postpartum, when considering the ICM/FIGO-recommended 1-minute time frame as well as an expanded time frame of 2 minutes and time-to-use overall. Covariates representing time of day of the delivery and maternal risk factors for hemorrhage did not attenuate this effect.

TABLE 2. Association Between Time to Oxytocin Administration After Delivery and Bedside Availability of Oxytocin: Results From Unadjusted and Adjusted[a] Regression Models Among Vaginal Deliveries Receiving Postpartum Oxytocin, Karnataka, India (N = 330)

	RR (95% CI)	Adjusted RR (95% CI)
Oxytocin administered within 1 minute	4.99 (2.53, 9.84)	4.89 (2.61, 9.16)
Oxytocin administered within 2 minutes	2.70 (1.38, 5.29)	2.61 (1.26, 5.41)
	Minutes (95% CI)	**Adjusted minutes (95% CI)**
Time to oxytocin administration, minutes	–3.3 (–5.2, –1.4)	–2.9 (–5.0, –0.9)

Abbreviations: CI, confidence interval; RR, risk ratio.
Data for oxytocin administered within 1 minute and 2 minutes report risk ratios from generalized linear models with a binomial distribution and a log link function; data for time to oxytocin administration report change in number of minutes, from linear regression models.
All results use standard errors clustered by provider.
[a] Adjusted for time of delivery (daytime/nighttime), mother's age, parity, long labor (i.e., greater than 12 hours prior to admission for nulliparous women and greater than 24 hours for all other women).

Those seeking to implement global guidelines for the prevention of postpartum hemorrhage may therefore want to consider adding operational recommendations to make oxytocin ready for administration and available at bedside—such as ensuring adequate supplies of the medication in the delivery room, preparing oxytocin syringes in advance, and assigning responsibility to guarantee these steps are routinely followed. The advent of prefilled oxytocin syringes (e.g., Oxytocin-in-Uniject devices) may facilitate rapid use after delivery.[15,19] An important constraint is that oxytocin is not heat stable, although recent evidence from Ghana suggests that it may be shelf-stable around the point of care.[20] So until additional evidence confirms the parameters of oxytocin's stability, hospitals should seek to extend the cold chain into the labor ward (using an ice box, for example), so oxytocin can be stored close to the point of use rather than in general hospital drug storage. Behavioral prompts for providers may also be useful, such as keeping an empty needle and syringe near, or prepackaged in, the delivery kit. Finally, use of the SCC may help drive change, as results from the pilot study found that the intervention increased both pre-labor preparation of oxytocin and its prompt administration to women postpartum.[16] Such changes could help increase the likelihood that health workers will deliver this potentially lifesaving intervention to all women in a timely manner.

The findings from this study suggest that health system constraints and opportunities should be considered when developing global protocols. Medical practitioners may be responsible for implementing a number of different clinical guidelines—and policy makers should seek to understand how such guidelines are used in practice, and whether any operational challenges might be overcome with simple procedural solutions. We encourage future research on the barriers and enablers faced by health workers and health systems in implementing clinical guidelines to continue to drive improvement in obstetrics and beyond.

Limitations

This study has some limitations. First, data were observational and collected at only 1 health facility—so we were able to measure only the association between bedside availability and timely use, rather than causality; and the findings may not be generalizable to all settings. Second, there is the possibility of measurement error. For example, without data on facility availability of oxytocin, the bedside availability variable represents both availability within the hospital and preparation at bedside. To explore the impact of possible measurement error in the independent variable, we dropped all births that occurred during time periods when bedside availability was at or below 10% for 3 days or longer—as a surrogate indicator of possible stockouts—and reran the analyses. This restriction did not change the main results (likelihood of use within 1 minute of 3.45 [95% CI = 1.75, 6.81] when available at bedside in the fully adjusted model). Additionally, there were 3 women in the original dataset who had never received oxytocin postpartum; they were excluded from this analysis, but the near-universal administration of oxytocin at some point postpartum suggests that oxytocin was in stock at the facility at the time of all births studied here. Third, there is the possibility of omitted variable bias; however, the results were robust to the inclusion of covariates that represent risk factors for complications (which could theoretically be associated with need for medical care postpartum: maternal age, parity, and labor duration), although we cannot eliminate the possibility of confounding by unobserved variables. Lastly, this analysis did not assess health outcomes—so while we found that time to oxytocin administration was shorter when oxytocin was available and ready for administration at the bedside than when it was not, it was impossible to assess whether such improvements in practice could be expected to result in fewer cases of PPH and lower mortality.

Deliveries in which oxytocin was available at bedside received oxytocin, on average, about 3 minutes sooner than when there was no bedside oxytocin.

Adding operational recommendations to ensure bedside availability of oxytocin at delivery may help prevent postpartum hemorrhage.

CONCLUSION

Adherence to global recommendations on preventing PPH through rapid administration of oxytocin was much higher when oxytocin was prepared and at bedside prior to delivery than when it was not. During the busy immediate postpartum period, under-resourced health systems with overtaxed health workers may have the additional need for such advance planning to enable rapid postpartum oxytocin administration—which also may have spillover effects to newborns, particularly those with urgent postpartum care needs. In resource-limited settings where a single health care worker must care for both mother and infant, advance preparation of oxytocin can facilitate rapid administration and thus avoid interfering with a health worker's ability to promptly address the needs of the infant. Simple interventions, such as advance preparation of oxytocin and other essential birth supplies before delivery, are a core component of the SCC, and

a study is underway to determine the impact of these and other critical components of care on maternal and neonatal morbidity and mortality.

Acknowledgments: The authors express many thanks to all those involved in the development the WHO Safe Childbirth Checklist program and all researchers who assisted with the pilot assessment. This work was supported by grants from WHO and the Children's Investment Fund Foundation (CIFF). WHO provided input on study design, data analyses, decision to publish, and preparation of the manuscript. WHO had no role in data collection. CIFF had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Competing Interests: None declared.

REFERENCES

1. World Health Organization (WHO); United Nations Children's Fund (UNICEF); United Nations Population Fund (UNFPA); World Bank; United Nations, Population Division. Trends in maternal mortality: 1990 to 2013. Estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division. Geneva: WHO; 2014. Available from: http://www.who.int/reproductivehealth/publications/monitoring/maternal-mortality-2013/en/
2. Ronsmans C, Graham WJ; Lancet Maternal Survival Series steering group. Maternal mortality: who, when, where, and why. Lancet. 2006;368(9542):1189–1200. CrossRef. Medline
3. World Health Organization (WHO). WHO recommendations for the prevention and treatment of postpartum haemorrhage. Geneva: WHO; 2012. Available from: http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/9789241548502/en/
4. International Confederation of Midwives (ICM); International Federation of Gynaecology and Obstetrics. Prevention and treatment of post-partum haemorrhage: new advances for low resource settings. [The Hague]: [ICM]; 2006. Available from: http://www.pphprevention.org/files/FIGO-ICM_Statement_English_November2006.pdf
5. Westhoff G, Cotter Amanda M, Tolosa Jorge E. Prophylactic oxytocin for the third stage of labour to prevent postpartum haemorrhage. Cochrane Database Syst Rev. 2013;10:CD001808. CrossRef. Medline
6. Festin MR, Lumbiganon P, Tolosa JE, Finney KA, Ba-Thike K, Chipato T, et al. International survey on variations in practice of the management of the third stage of labour. Bull World Health Organ. 2003;81(4):286–291. Medline
7. Stanton C, Armbruster D, Knight R, Ariawan I, Gbangbade S, Getachew A, et al. Use of active management of the third stage of labour in seven developing countries. Bull World Health Organ. 2009;87(3):207–215. CrossRef. Medline
8. Miranda JE, Rojas-Suarez J, Paternina A, Mendoza R, Bello C, Tolosa JE. The effect of guideline variations on the implementation of active management of the third stage of labor. Int J Gynaecol Obstet. 2013;121(3):266–269. CrossRef. Medline
9. Khalil K, Elnoury A, Cherine M, Sholkamy H, Hassanein N, Mohsen L, et al. Hospital practice versus evidence-based obstetrics: categorizing practices for normal birth in an Egyptian teaching hospital. Birth. 2005;32(4):283–290. CrossRef. Medline
10. Oladapo OT, Akinola OI, Fawole AO, Adeyemi AS, Adegbola O, Loto OM, et al.; Nigerian AMTSL Group. Active management of third stage of labor: evidence versus practice. Acta Obstet Gynecol Scand. 2009;88(11):1252–1260. CrossRef. Medline
11. Vivio D, Fullerton JT, Forman R, Mbewe RK, Musumali M, Chewe PM. Integration of the practice of active management of the third stage of labor within training and service implementation programming in Zambia. J Midwifery Womens Health. 2010;55(5):447–454. CrossRef. Medline
12. Belizan M, Meier A, Althabe F, Codazzi A, Colomar M, Buekens P, et al. Facilitators and barriers to adoption of evidence-based perinatal care in Latin American hospitals: a qualitative study. Health Educ Res. 2007;22(6):839–853. CrossRef. Medline
13. Ith P, Dawson A, Homer CSE, Klinken Whelan A. Practices of skilled birth attendants during labour, birth and the immediate postpartum period in Cambodia. Midwifery. 2013;29(4):300–307. CrossRef. Medline
14. Tsu VD, Luu HTT, Mai TTP. Does a novel prefilled injection device make postpartum oxytocin easier to administer? Results from midwives in Vietnam. Midwifery. 2009;25(4):461–465. CrossRef. Medline
15. Althabe F, Mazzoni A, Cafferata ML, Gibbons L, Karolinski A, Armbruster D, et al.; Oxytocin in Uniject Study Group. Using Uniject to increase the use of prophylactic oxytocin for management of the third stage of labor in Latin America. Int J Gynaecol Obstet. 2011;114(2):184–189. CrossRef. Medline
16. Spector JM, Agrawal P, Kodkany B, Lipsitz S, Lashoher A, Dziekan G, et al. Improving quality of care for maternal and newborn health: prospective pilot study of the WHO safe childbirth checklist program. PLoS One. 2012;7(5):e35151.CrossRef. Medline
17. Rao JNK, Scott AJ. The analysis of categorical data from complex sample surveys: chi-squared tests for goodness of fit and independence in two-way tables. J Am Stat Assoc. 1981;76(374):221–230. CrossRef
18. Davidson R, MacKinnon JG. Econometric theory and methods. New York: Oxford University Press; 2004.
19. Stanton CK, Newton S, Mullany LC, Cofie P, Tawiah Agyemang C, Adiibokah E, et al. Effect on postpartum hemorrhage of prophylactic oxytocin (10 IU) by injection by community health officers in Ghana: a community-based, cluster-randomized trial. PLoS Med. 2013;10(10):e1001524. CrossRef. Medline
20. Mullany LC, Newton S, Afari-Asiedu S, Adiibokah E, Agyemang CT, Cofie P, et al. Cumulative effects of heat exposure and storage conditions of Oxytocin-in-Uniject in rural Ghana: implications for scale up. Glob Health Sci Pract. 2014;2(3):285–94. CrossRef. Medline

Peer Reviewed

Received: 2014 Dec 18; **Accepted:** 2015 March 16; **First Published Online:** 2015 June 12

Cite this article as: Moucheraud C, Gass J, Lipsitz S, Spector J, Agrawal P, Hirschhorn LR, et al. Bedside availability of prepared oxytocin and rapid administration after delivery to prevent postpartum hemorrhage: an observational study in karnataka, india. Glob Health Sci Pract. 2015;3(2):300-304. http://dx.doi.org/10.9745/GHSP-D-14-00239.

GHSP GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

FIELD ACTION REPORT

Successful mLearning Pilot in Senegal: Delivering Family Planning Refresher Training Using Interactive Voice Response and SMS

Abdoulaye Diedhiou,[a] Kate E Gilroy,[b] Carie Muntifering Cox,[c] Luke Duncan,[b] Djimadoum Koumtingue,[a] Sara Pacqué-Margolis,[d] Alfredo Fort,[b] Dykki Settle,[b] Rebecca Bailey[b]

Health workers' knowledge of contraceptive side effects increased substantially after the refresher training. The mobile phone approach was convenient and flexible and did not disrupt routine service delivery. Clear limitations of the medium are participants can't practice clinical skills or have interactive discussions. Also, some participants had trouble with network reception.

ABSTRACT

Background: In-service training of health workers plays a pivotal role in improving service quality. However, it is often expensive and requires providers to leave their posts. We developed and assessed a prototype mLearning system that used interactive voice response (IVR) and text messaging on simple mobile phones to provide in-service training without interrupting health services. IVR allows trainees to respond to audio recordings using their telephone keypad.

Methods: In 2013, the Capacity*Plus* project tested the mobile delivery of an 8-week refresher training course on management of contraceptive side effects and misconceptions to 20 public-sector nurses and midwives working in Mékhé and Tivaouane districts in the Thiès region of Senegal. The course used a spaced-education approach in which questions and detailed explanations are spaced and repeated over time. We assessed the feasibility through the system's administrative data, examined participants' experiences using an endline survey, and employed a pre- and post-test survey to assess changes in provider knowledge.

Results: All participants completed the course within 9 weeks. The majority of participant prompts to interact with the mobile course were made outside normal working hours (median time, 5:16 pm); average call duration was about 13 minutes. Participants reported positive experiences: 60% liked the ability to determine the pace of the course and 55% liked the convenience. The largest criticism (35% of participants) was poor network reception, and 30% reported dropped IVR calls. Most (90%) participants thought they learned the same or more compared with a conventional course. Knowledge of contraceptive side effects increased significantly, from an average of 12.6/20 questions correct before training to 16.0/20 after, and remained significantly higher 10 months after the end of training than at baseline, at 14.8/20, without any further reinforcement.

Conclusions: The mLearning system proved appropriate, feasible, and acceptable to trainees, and it was associated with sustained knowledge gains. IVR mLearning has potential to improve quality of care without disrupting routine service delivery. Monitoring and evaluation of larger-scale implementation could provide evidence of system effectiveness at scale.

BACKGROUND

Strengthening training programs for health workers is pivotal to increasing the number of qualified providers and improving service quality. In-service training reinforces and updates health care providers' knowledge but is often expensive and requires providers to leave their posts.[1]

[a] IntraHealth International Senegal, Dakar, Senegal.
[b] IntraHealth International, Capacity*Plus* project, Washington, DC, USA.
[c] St. Catherine University, St. Paul, Minnesota, USA.
[d] University Research Company, LLC, Bethesda, MD, USA.
Correspondence to Abdoulaye Diedhiou (dr.adiedhiou@gmail.com).

In-service training reinforces and updates providers' knowledge but is often expensive and disrupts services.

The global health field increasingly recognizes the need to expand continuing education of health professionals beyond the classroom setting.[1,2] Spaced education is an approach to distance learning in which content is spaced out and repeated over time in the form of multiple choice questions and detailed explanations. The presentation and repetition of information over time (spacing) and the testing effects inherent in this approach have been found to increase retention of clinical knowledge[3–5] and skills.[6,7]

The spaced-education approach, in which course content is spaced out and repeated over time, has been found to increase knowledge retention.

Health care programs and providers increasingly use mobile phones and devices to deliver health information, collect information, diagnose disease, and improve adherence to clinical protocols,[8–11] as well as to improve health worker performance through the provision of information and training.[12] These types of mHealth applications can provide and expand distance education opportunities in rural and remote settings, where health workers have less access to computers than their urban counterparts or may have less connectivity to the Internet yet have mobile phone connectivity.[12] However, many current mHealth applications to train health workers require smart phones or digital tablets and Internet connectivity,[12–15] which is typically more expensive. Likewise, many mHealth applications use Short Message Service (SMS) text systems to provide training, guidance, and updates,[16–18] but messages must be kept simple due to the limited number of characters that can be sent.

With interactive voice response technology, information can be delivered to any type of phone via audio recordings.

Interactive voice response (IVR) is a technology that uses any type of phone to deliver information via audio recordings and that allows users to provide feedback through their telephone keypad by pressing a number key. Companies frequently use IVR to respond to customer service requests and questions in an automated way. The IVR technology has also been used in medicine for many years in highly industrialized countries.[19–21] Health programs are increasingly using IVR in developing countries to reach and educate populations that have high penetration of mobile phone ownership but low levels of literacy and Internet connectivity.[22–25] Using IVR systems to provide training and support to health workers is less common. One substantive example, however, is the Mobile Academy, implemented by BBC Media Action as part of the Ananya project in Bihar, India, which has used IVR technology to deliver training on maternal and child health to more than 27,000 remote community health workers.[26]

In response to calls to explore and assess more effective ways to deliver in-service training[1] and support family planning health workers with mHealth applications,[27] the Capacity*Plus* project, funded by the US Agency for International Development (USAID), developed, deployed, and assessed a prototype mLearning system, using a combination of simple IVR and SMS, to deliver refresher training on management of contraceptive side effects and misconceptions to health workers in Senegal.

MLEARNING PILOT DESCRIPTION

Participant Selection

Senegal's contraceptive prevalence rate for modern methods remains low, at just over 16% in 2012–2013, and about one-third of married women have an unmet need for contraception,[28] despite significant efforts to improve access to and demand for contraception. Through the Maternal, Neonatal, and Child Health/Family Planning/Malaria Project (2006–2011), funded by USAID, IntraHealth International trained providers in family planning counseling and provision of contraceptives, encouraged facilities to integrate mother-and-child health services with other reproductive health services, and engaged and educated communities through public campaigns.

To test the feasibility of using a simple mobile technology to deliver refresher family planning training to providers, we coordinated with the Senegal Ministry of Health to purposively select 20 nurses and midwives working in public health facilities in Mékhé and Tivaouane districts in Thiès region.

Three criteria guided the selection of providers:

- Informed consent to participate in the pilot project
- Participation in the initial family planning training course conducted by IntraHealth International in 2008/2009
- Possession of a simple mobile phone for the training course

We limited the sample size of participating providers due to financial considerations and to facilitate rapid resolution of any unforeseen technical and logistical issues in the field associated with the first-time application of the IVR mLearning training system.

Course Content

We designed a refresher training course that covered the management of contraceptive side effects and

BOX. Sample Refresher Training Course Content: Management of Contraceptive Side Effects and Misconceptions

QUESTION

Which of the following statements on side effects is important to tell a woman who has decided to have an IUD inserted?

1. She can expect to have heavy bleeding and severe abdominal pain during the first week after insertion, and ibuprofen can be taken to alleviate the discomfort.
2. She can expect to have severe headaches, especially in the first few days after insertion, and aspirin can be taken to alleviate the pain.
3. She can expect some cramping and mild pain, especially in the first few days after insertion, and ibuprofen can be taken to alleviate the discomfort. **[Correct answer.]**
4. She can expect to have fever, chills, and unusual vaginal discharge during the first week after insertion. This is normal and will go away with time.

DETAILED EXPLANATION*

Cramping and mild pain are common side effects experienced during the first few days after insertion by women who have an IUD. Heavy bleeding, severe abdominal pain, severe headaches, fever, chills, and unusual vaginal discharge are NOT common side effects and may in fact be signs of complications that require medical attention.

If a woman has an IUD inserted, reassure her that cramping and mild pain are common, especially in the first few days after insertion. Explain to her that cramping and mild pain are also common in the first 3 to 6 months, particularly during menses. These are not harmful and usually decrease over time.

To alleviate discomfort from cramping and mild pain, suggest that the woman take 200 to 400 milligrams of ibuprofen or take another pain killer. Do NOT offer her aspirin. Women who have an IUD often experience heavier menstrual bleeding and should not take aspirin, because it inhibits clotting and thus can increase bleeding.

If cramping continues or occurs outside of menstruation, evaluate for underlying health conditions, treat and/or refer the woman for treatment. If no underlying condition is found but cramping continues and client finds it unacceptable, discuss removing the IUD with the woman and switching methods. Discuss alternative methods with the woman.

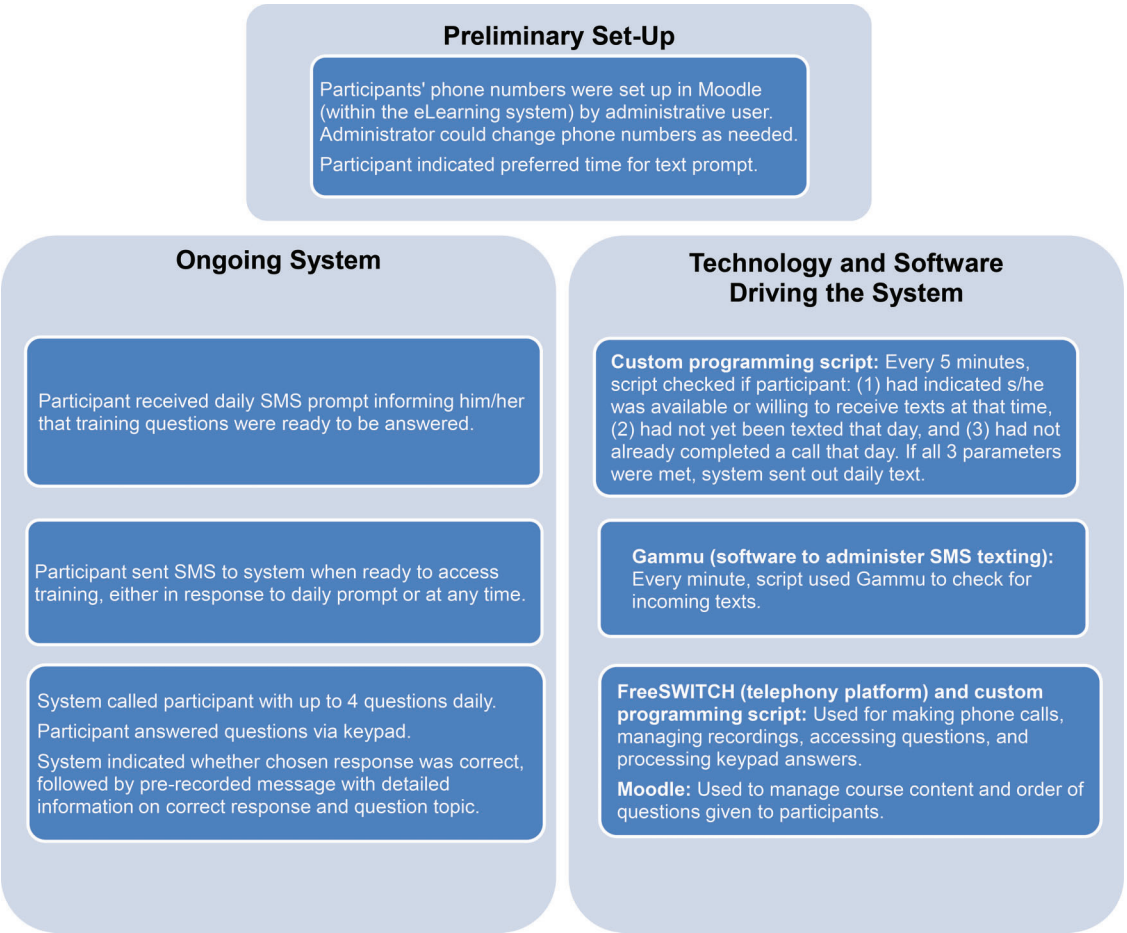
**Learner hears this detailed explanation after selecting a correct or incorrect answer.*

misconceptions, based on initial training and in direct alignment with the Senegal family planning national training curriculum and protocol as well as international guidelines.[29–31] The course content covered general contraceptive side effects and misconceptions as well as specific content related to intrauterine devices (IUDs), implants, oral contraceptive pills, emergency contraceptive pills, condoms, and the lactational amenorrhea method (LAM). Stakeholders in Senegal, including a representative from the Ministry of Health, reviewed and approved the training course. The course content was delivered using the spaced-education approach,[5,32,33] with 17 multiple choice questions and 3 true/false questions along with accompanying detailed explanations spaced and repeated over time. The Box presents an example of a training question and explanation. (See supplementary materials for the full training course packet in both English and French.) The audio questions and explanations were recorded in French by a health professional from Dakar, Senegal.

IVR mLearning Processes

We provided a 3-hour orientation for mLearning participants at the regional medical office in

FIGURE 1. Overview of Interactive Voice Response mLearning Training System



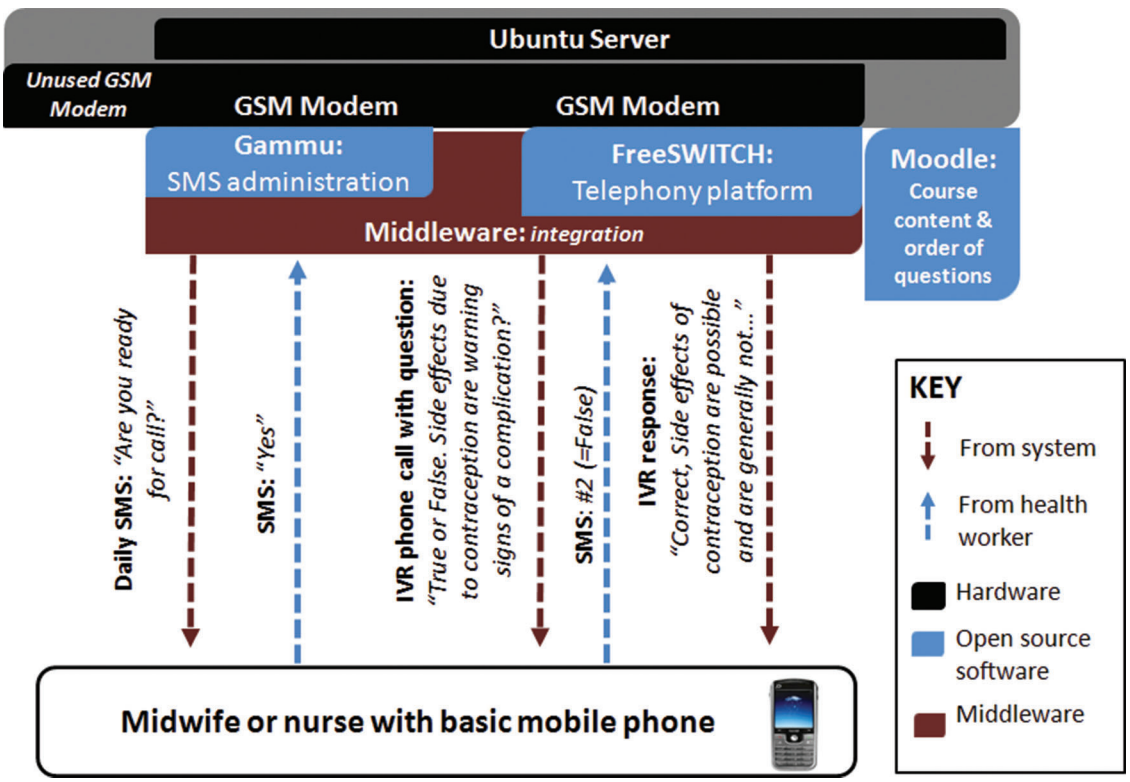
Participants texted the mLearning system when they were ready to engage with course content, and the system immediately called with the recorded voice questions and explanations.

Thiès, Senegal. Figure 1 explains the IVR mLearning processes and the accompanying technology. We set up the participants' personal mobile phone numbers in the mLearning system before starting the course. The system sent a daily prompt via SMS text to participants' phones asking if they were available and ready to engage with the course content. When the participants were ready, even if it was hours later, they texted the mLearning system, and the system immediately called with the recorded voice questions and explanations. The participants selected the answer to each question using their telephone keypad and heard the detailed explanation whether they selected the correct or incorrect answer.

Participants could opt to answer between 0 to 4 questions a day based on their preference and availability, and they could send SMS texts to the system and receive calls at any point during the day as long as they had not already answered 4 questions that day. This feature was included in case participants wanted to access the questions earlier than the predetermined prompt time, had issues with a call, had to hang up for other reasons, or wanted to answer additional questions. Participants received a text when they reached their daily limit of questions.

After participants answered all 20 questions once, they received the same questions and explanations a second time. Once the participants answered a question correctly twice, the question was retired and not asked again. Every day during the second round, participants received questions they answered incorrectly until they answered

FIGURE 2. Interactive Voice Response mLearning System Infrastructure



every question correctly twice, at which point the questions were retired. Participants successfully completed the course when all questions had been retired. After completion of the course, participants received a printed copy of the course content for future reference (see supplementary materials).

IVR mLearning Training System Technologies

Figure 2 shows the basic hardware and software infrastructure used in the IVR mLearning system. The system ran on an Ubuntu server and 2 GSM modems. We developed a set of custom scripts ("middleware") to manage interactions between open source IVR software tools and learning solutions. FreeSWITCH—an open source telephony platform—handled the voice interactions via one modem and Gammu software interfaced with the other modem to administer the SMS texting. Moodle, the predominant open source eLearning system, managed the quiz interactions. We prioritized using open source technologies because of their low cost and ability for local adaptations.

The system logged all the texts that were sent and received and monitored what questions were asked and answered during each call on a daily basis. The project coordinator monitored the IVR mLearning system and contacted any participants who had not accessed the training system in over a week to determine if they were experiencing problems with the system. Identified problems were resolved as quickly as possible.

The project enrolled the IVR mLearning system and participants in a 2-month "friends & family" contract with a Senegalese telecommunications provider at a cost of approximately US$20 per participant per month. The contract allowed participants to send and receive text messages to the IVR mLearning system at no charge and the IVR system to make unlimited calls to participants.

ASSESSMENT METHODS

Design and Data Collection

To assess feasibility, we monitored implementation of the IVR training using administrative data from the mLearning system, such as the number of text messages sent and the duration and time of each IVR call. In addition, trained data collectors visited participants at their health posts within 5 weeks of course completion to administer a survey about participants' opinions and experiences. Finally, we used a pre/post-intervention study design with no comparison group to assess changes in participant knowledge during the initial pilot. The written pre- and post-test consisted of 20 multiple choice and true/false questions. Participants completed the pre-test at orientation (February 2013) and the post-test both during the post-training survey (April 2013) and during a supervision visit 10 months after completing the IVR training course (February 2014). Participants did not receive any additional training, supervision, or mentoring in management of contraceptive side effects or misconceptions during the IVR training course or within 10 months after the course.

The majority of participants completed the mobile training course within 5 weeks.

30% of participants reported dropped IVR calls, often due to poor network reception.

Data Entry and Analysis

We calculated trends and patterns in participant and system activity using Microsoft Excel and Stata 13. The opinions and experiences of providers were expressed as proportions. We used McNemar's exact chi-square statistic for paired binomial outcomes with small sample sizes[34,35] to determine any significant changes in correct answers to individual knowledge questions between the pre- and post-test. To assess the significance of change in the overall knowledge scores (out of 20 questions) on the pre-test and post-test, we used the Wilcoxon signed rank test, a non-parametric test.[34]

Most calls were made outside normal working hours.

Research Ethics

The protocol was reviewed and approved by the national review board for research ethics in Senegal (*Comité National d'Ethique Pour la Recherche en Santé*). All participants provided voluntary and informed consent.

RESULTS

Participant Characteristics

The sample was almost evenly split between men and women (Table 1). Participants were midwives, nurses, nursing assistants, and health agents, the majority of whom (90%) worked in health posts. Most (65%) were from rural areas, and the majority (75%) reported provision of family planning services multiple times a day. All participants used their own mobile phone to access the course, and all had previously used their mobile phones for other work-related activities.

Feasibility of Implementation

All participants completed the course. The majority completed it within 5 weeks while 1 participant required 9 weeks. Administrative data indicate that throughout the course the system sent 620 prompt texts, and participating health workers texted the system a total of 640 times to prompt a call. The system made 619 calls using IVR, although only 496 (80%) of these calls resulted in administration of the spaced-education questions to participants.

Some participants (30%) reported dropped IVR calls, often due to do poor network reception (Table 2).

Three-quarters of participants reported receipt of a daily text prompt, and 90% always or frequently received a return IVR call after accepting the prompt (Table 2). According to administrative data, the system called participants, on average, within less than 10 seconds of receiving a participant's prompt for call. During the first week, we experienced issues with the telephone network contract that affected system functioning, but these problems were quickly resolved. All participants reported the IVR audio recording was easy to understand.

The most common time of day for calls was in the late afternoon and evenings (median time, 5:16 pm) (Figure 3). Although all but 4 participants initially requested not to be contacted by the system after 8:00 pm, approximately one-third of the IVR calls were initiated by participants (through SMS text) after 8:00 pm. The majority of IVR calls were prompted and received outside normal working hours.

On average, participants attempted to answer 2 questions per day. The average call time was 12 minutes and 52 seconds. One call in the second week of the course was logged as lasting 2 hours and 50 minutes; we excluded this from our analyses because we believe it may have been an error in the system.

Acceptability

Participants reported very positive **experiences** with using their mobile phones for training (Table 3).

TABLE 1. Characteristics of mLearning Participants, Senegal 2013 (N = 20)

Characteristic	No. (%)
Diploma/post	
Midwife	7 (35)
Nurse	6 (30)
Nursing assistant	5 (25)
Health agent	2 (10)
Age group, years	
30–34	9 (45)
35–44	5 (25)
45–56	6 (30)
Sex	
Male	11 (55)
Female	9 (45)
Type of facility	
Health post	18 (90)
District hospital	2 (10)
Facility location	
Urban	7 (35)
Rural	13 (65)
Frequency of provision of family planning services[a]	
Multiple times a day	15 (75)
Once a day	3 (15)
Once a week	2 (10)
Contraceptive method most often requested by clients[a]	
Injectable contraceptives	17 (85)
Contraceptive pills	3 (15)
Personal mobile phone used for the course[b]	20 (100)
Previously used mobile phone for any work-related activity	20 (100)
Referred a patient	16 (80)
Requested stock	13 (65)
Received work-related information/guidance	11 (55)
Submitted data to the Ministry of Health or other stakeholders	7 (35)
Scheduled work hours	4 (20)
Training	2 (10)
Other	5 (25)

[a] As reported by provider.
[b] Four participants shared their phone with someone else, although only one reported that it made it difficult at times to complete the course.

TABLE 2. Participants' Reported Experiences With Receipt of IVR mLearning System Calls, Senegal 2013 (N = 20)

Experiences	No. (%)
Received text message prompt from the system every day	15 (75)
Frequency of receiving IVR call after texting the system as ready	
Always (100% of the time)	13 (65)
Frequently (75% of the time)	5 (25)
Sometimes (50% of the time)	2 (10)
Average time to receiving IVR call after texting the system	
Less than 15 minutes	16 (80)
Between 15 and 30 minutes	4 (20)
More than 30 minutes	0 (0)
Frequency of dropped IVR calls	
Never	14 (70)
Infrequently (1–4 times)	4 (20)
Sometimes (5–9 times)	2 (10)
Ability to receive training questions	
Always able to receive	9 (45)
Infrequently unable to receive (1–4 times)[a]	8 (40)
Sometimes unable to receive (5–9 times)[a]	3 (15)
IVR voice recording was easy to understand	20 (100)

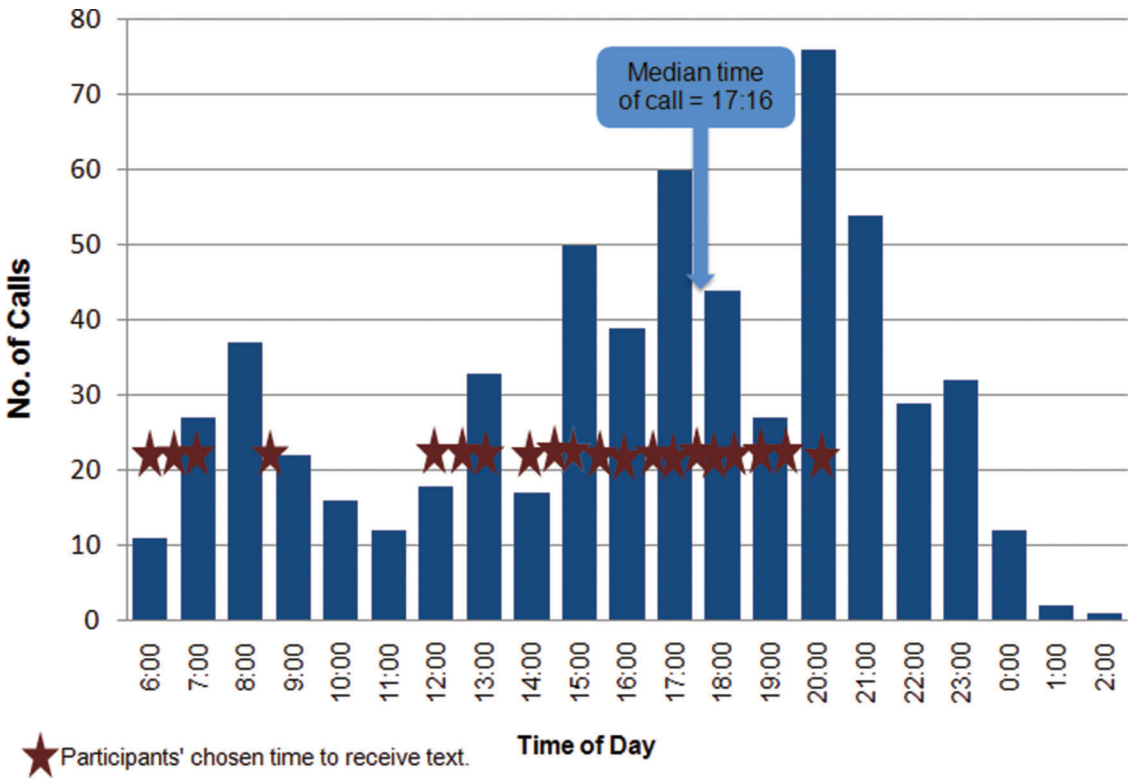
[a] Reasons for infrequently or sometimes not receiving training questions (number of respondents): poor reception (5); no call from system (4); issues with phone number, airtime, or phone charge (3); and inability to hear audio (1).

Participants liked that they could set their own pace and access the mobile course anywhere.

The large majority (90%) noted that using the phone for the course was easy or very easy and that they learned the same or more compared with an in-person course. Participants expressed appreciation for the ability to determine the pace of the course (60%), convenience (55%), and flexibility to access the course anywhere (40%) (Figure 4). The largest criticism was poor mobile network reception (35%). Some participants also noted that the mobile medium did not allow for practical exercises or demonstrations (20%) or interaction with other participants (15%). Most participants agreed or strongly agreed that the course contained new information that they had not learned before (80%) and that the refresher training was pertinent to their jobs (80%) (Figure 5). A large majority strongly agreed that the course improved their knowledge on the subject (85%) and helped them provide better services to their clients (80%).

Table 4 presents participants' **preferences for delivery of training** using the mLearning system. Most participants stated they preferred to receive prompt texts once a day (65%), the ability to answer up to 4 questions a day (65%), and the requirement of 2 correct responses before a question is retired (60%), which was how the course was delivered in this pilot application of the IVR mLearning system. Notably, 45% of participants stated that 20 questions in the course were too few, 45% thought the explanations provided too much information, and 55% noted that the 8-week duration for the course was too long. In an open-ended question for any recommendations, participants most often recommended the extension of the system to other health

FIGURE 3. Timing of Interactive Voice Response Calls Throughout Duration of the mLearning Training Course, Senegal 2013 (N = 619 Calls)



topics (8 recommendations) and the expansion of the family planning course to other health workers (7 recommendations).

Provider Knowledge

The number of times participants answered the training questions correctly varied by topic (data not shown). For example, all participants correctly answered a question about the side effects of pills on both attempts, while incorrect answers were more common for side effects of IUDs and implants.

Overall, participants scored relatively well on the pre-test before the training, answering, on average, 12.6 questions about contraceptive side effects and misconceptions correctly out of 20 (Figure 6). After the training, the average score increased significantly to 16.0 correct questions. There was a slight decline in average knowledge scores 10 months after the post-test (to 14.8), but the knowledge level was still significantly higher than before the training. Between pre-test and the first post-test, significantly more participants answered correctly the questions on side effects of condoms, emergency contraceptive pills, and injectables, as well identifying misconceptions about LAM (results not displayed).

Knowledge scores increased significantly after the mobile training.

DISCUSSION

An innovative mLearning system that delivers refresher training via simple mobile phones using IVR and SMS text was appropriate, feasible to implement, acceptable to health workers, and associated with gains in knowledge in the short-term and 10 months after the training. The IVR mLearning system using the spaced-education approach holds great promise to train health workers across health disciplines using simple mobile phones in areas that do not have good Internet connection. As with other mHealth initiatives, the reliability of cellular networks in remote areas remains a challenge.

mLearning systems using interactive voice response hold potential as a health worker training solution, particularly in low-resource settings without good Internet connection.

TABLE 3. Participants' Opinions About Using Mobile Phones for Training, Senegal 2013 (N = 20)

	No. (%)
Overall experience	
Very good	13 (65)
Good	7 (35)
Neutral/bad/very bad	0 (0)
Ease of using a mobile phone to complete training course	
Very easy	8 (40)
Easy	10 (50)
Difficult	2 (10)
Amount of learning on mobile phone vs. in-person course	
Learned more	12 (60)
Learned the same	6 (30)
Learned less	2 (10)
Would like to take another course on mobile phone	20 (100)

Participants prompted most IVR calls outside of normal working hours, suggesting little or no disruption to service delivery.

Participants prompted the majority of IVR calls during non-regular working hours and the average call time was about 13 minutes, suggesting that the IVR mLearning system training did not disrupt the health workers' service delivery. In comparison, a conventional in-service training workshop would require trainees to leave their posts for a number of days. Participants in this mLearning pilot did have to leave their site of service for the half-day orientation. However, participants noted that the orientation prepared them well for the course, and previous experiences in mHealth initiatives have highlighted the importance of good orientation for participants.[16]

Participants highly appreciated the convenience of the system—the ability to determine when and where to access the training and the pace of completing the course. The IVR mLearning system included some interaction and question repetition—training characteristics that previous studies have found to be effective in self-directed learning, because participants can learn at their own pace and access the information when convenient.[1]

Challenges and Considerations

One of the inherent purposes in our pilot deployment of the IVR mLearning system was to identify issues and challenges requiring improvements before any implementation on a larger scale.

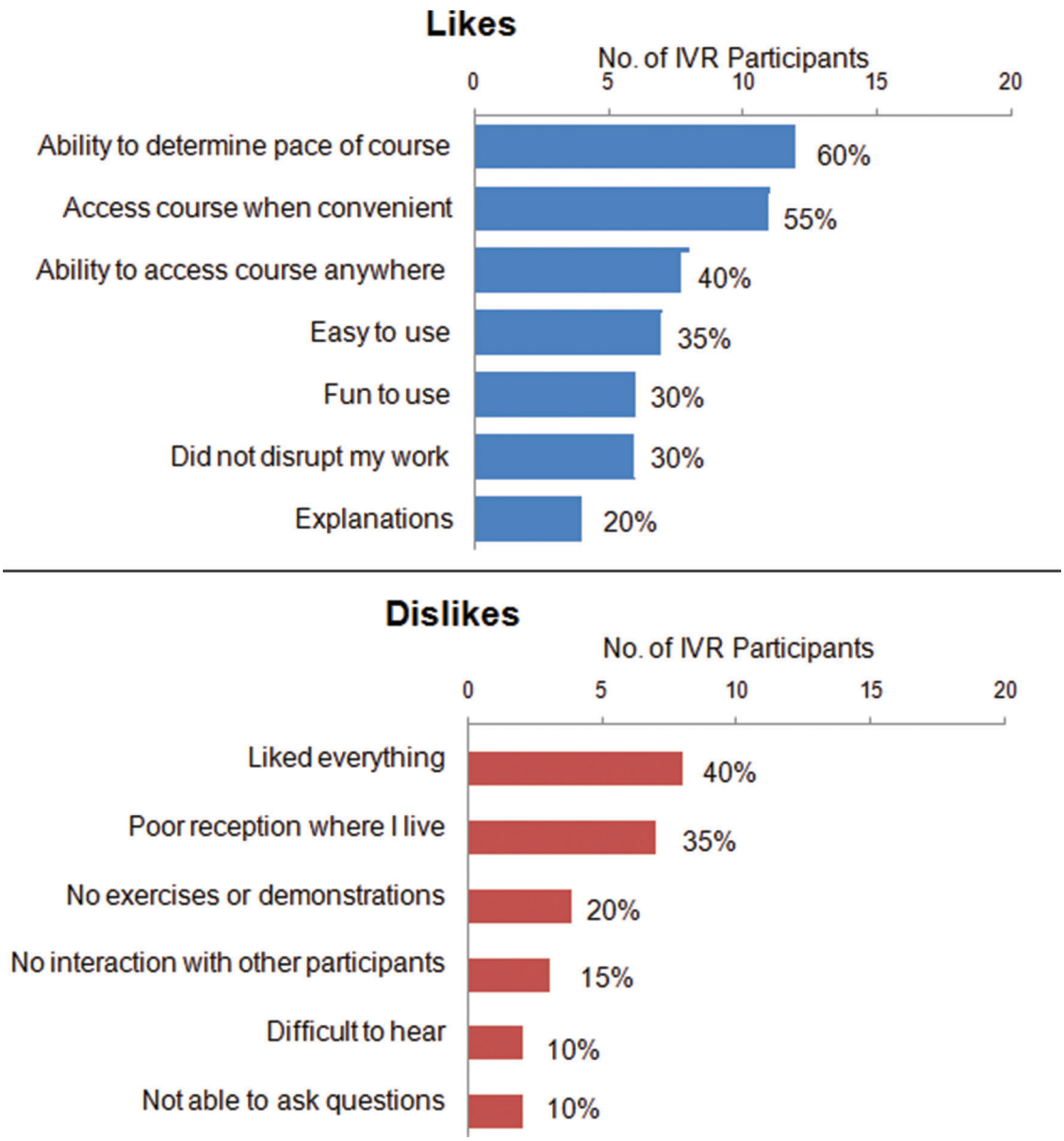
Network Contracts

During the first week of implementation, we experienced challenges related to the contract with the telephone network and loading of credit on the mobile phones for airtime, issues similar to those found in other pilot studies of mHealth applications.[16] We were able to resolve these issues relatively quickly, and a local coordinator facilitated resolution of other issues with the network carrier and participants over the duration of the course. However, future applications should allow sufficient time to test airtime and contract mechanisms to avoid any issues with the network carrier during course delivery.

Cellular Network Coverage

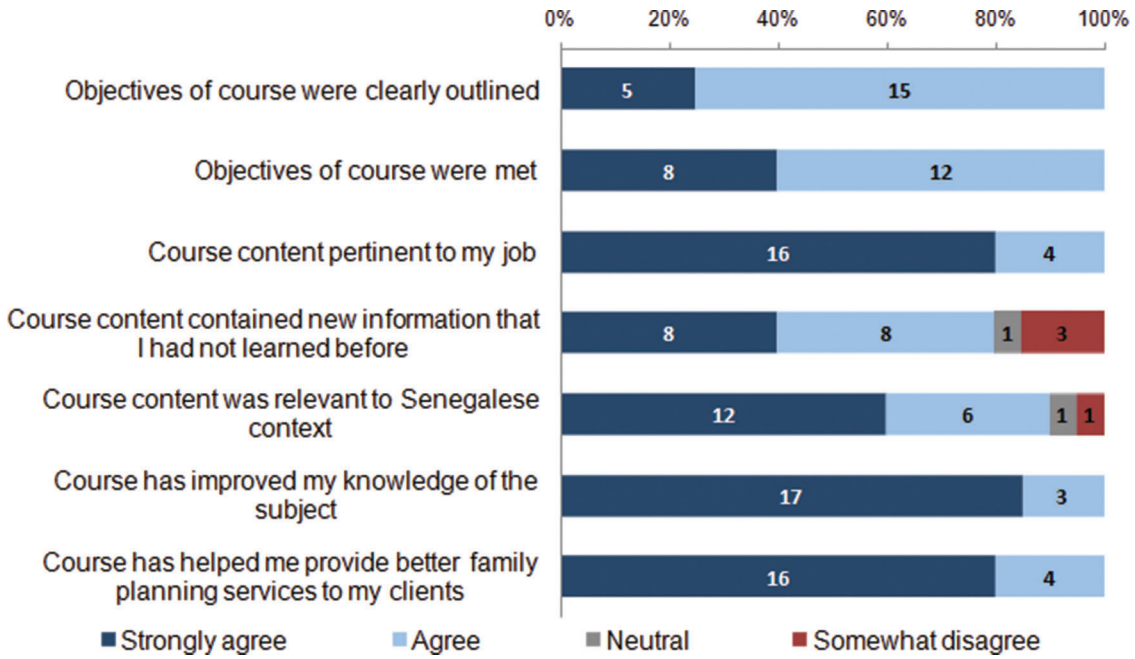
A challenge in our pilot study, as with other similar mHealth initiatives, was the variability of the cellular network. About one-third of participants experienced problems with the cellular network, although all were able to complete the course within the allotted 8 weeks except for 1 participant who took 9 weeks. Future applications might assess network coverage in advance and recommend that

FIGURE 4. Participants' Reported Likes and Dislikes[a] About Using Mobile Phones in the mLearning Training Course, Senegal 2013 (N = 20)



Abbreviation: IVR, interactive voice response.
[a] Participants could provide multiple responses for likes and dislikes. No participants responded that the mobile course was difficult to use or too long to complete.

FIGURE 5. Participants' Ratings of the mLearning Training Course Content, Senegal 2013 (N = 20)[a]



[a] Number shown on bars represents the number of participants providing that rating. No participants "strongly disagreed" with any of these statements.

health workers with limited coverage at their posts access the mLearning system when traveling to areas with better network reception. Additionally, working with multiple network providers, particularly in private-public partnerships, might ensure more reliable cellular reception.

Adaptations to the Operating System

FreeSWITCH, the platform that handled the voice interactions, encountered some issues with accessing multiple voice lines at the same time. This issue may be resolved through incorporation of a server/modem combination to handle individual calls, with one system managing all the interfaces to determine the timing of calls. This set-up would also facilitate the expansion of the system with new telephone lines. In this pilot application, participants found using a text to prompt an IVR call feasible and convenient. Future adaptations of the system for less literate learners might allow participants to prompt an IVR call with a simple call to the system, similar to the Mobile Academy system in Bihar, India.[26] In addition, during the pilot, 1 participant was not aware that he had not completed the course. Future implementation should incorporate a progress report feature to text participants their daily or weekly progression in the course, as well as a planned phone call from the course coordinator to supervise progress and provide participants the opportunity to ask questions.

Course Duration and Content

We found that it was feasible to deliver the spaced-education course within about 8 weeks. More than half of the participants noted that the overall course duration was too long, although other participants took the full 8 weeks to complete the course of 20 questions. Almost half of the participants would have also preferred to have more questions included in the course, especially if the overall course duration remained at 8 weeks. The spaced-education approach relies

TABLE 4. Participants' Preferences for IVR mLearning System, Senegal 2013 (N = 20)

Preferences	No. (%)
Preferred frequency of prompt texts	
More than once a day	6 (30)
Once a day*	13 (65)
Every 2–3 days	1 (5)
20 questions included in the course was:	
Too many	1 (5)
Right amount	10 (50)
Too few	9 (45)
Preferred maximum number of questions to answer per day	
1–2	3 (15)
3–4*	13 (65)
5–9	4 (20)
Preferred number of times question must be answered correctly before being retired	
More than 2 times	6 (30)
Two times*	12 (60)
Only once	2 (10)
Amount of information in the explanations was:	
Too much	9 (45)
Right amount	11 (55)
Too little	0 (0)
Course duration of 8 weeks was:	
Too long	11 (55)
Right amount	9 (45)
Too short	0 (0)

* Asterisked items indicate the frequency or amount used in the pilot mLearning course.

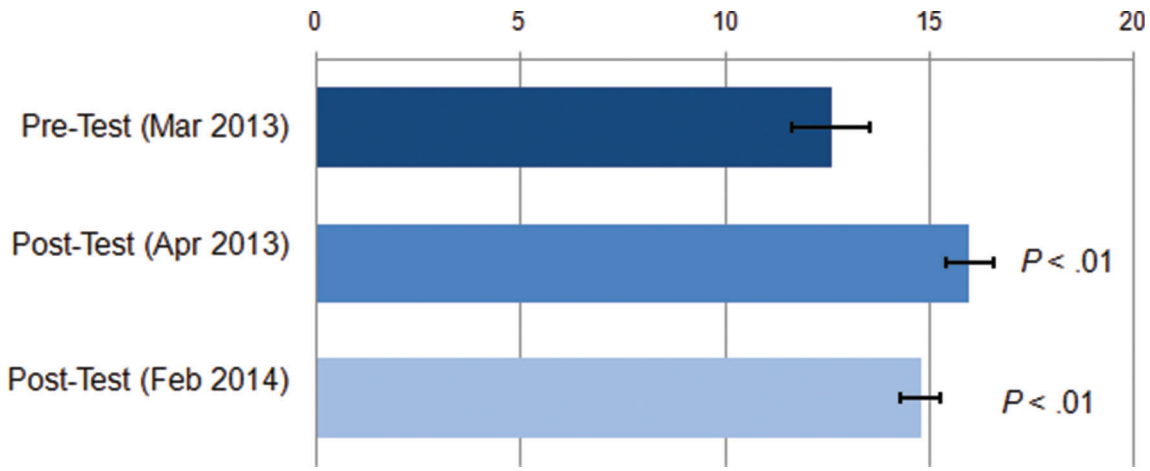
on delivering material over time to increase learning and retention of the content; thus, substantially shortening the course may not result in the same improvements in knowledge. Although the contraceptive side effects and misconceptions course may not require changes to the duration, the IVR mLearning system can and should be adapted for different content and audiences, with shorter or longer course duration and more or fewer questions depending on the training content and needs and preferences of the learners. Future implementation of the IVR mLearning system could compare learning outcomes when the same course is given over different periods of time.

IVR mLearning Within Broader Training Needs

Although our results are encouraging, refresher training through mobile phones should complement—not replace—different approaches within an in-service training strategy and broader health systems support for health workers. Training

Refresher training through mobile phones should complement, not replace, other in-service training approaches.

FIGURE 6. Average Number of Questions[a] Answered Correctly Before (March 2013) and After (April 2013 and February 2014) the mLearning Training Course, Senegal 2013 (N=20)



[a] Total of 20 questions related to contraceptive side effects and misconceptions. Statistical significance (*P* values) calculated using Wilcoxon signed-rank test comparing each post-test to the pre-test.

mLearning could be well suited to meet emerging health training needs requiring rapid dissemination of information, such as Ebola prevention and management.

delivered on simple mobile phones does not permit trainees to interact with the instructor and other participants, perform clinical practice/simulation, or view didactic images such as diagrams, photos, and graphs. Some participants disliked the lack of exercises or demonstrations and the inability to ask questions and interact with other participants. A few participants also suggested more contact with the system and course coordinator, as well as inclusion of written reference materials. Provision of supplementary written materials and incorporation of clinical exercises and/or interactive methods are essential for teaching and learning certain topics, and simple mobile technology may not be appropriate for certain pedagogic objectives. However, hands-on training and use of images are not necessary for all topics. For example, updates on regulations and guidelines for family planning or other health services could be communicated to health workers via a mobile phone, thereby ensuring standardization and quality assurance in communication on the topic. The mLearning system could also be well suited to meet emerging needs, such as Ebola prevention and management, requiring rapid dissemination of information to diffusely distributed health workers.

Costs

The largest cost associated with this pilot application was the technical assistance required to develop and install the IVR mlearning system (about US$42,000 for only the direct cost estimates; no overhead included). Other substantial costs included: (1) developing and revising the training content (about US$12,000); (2) orientation for participants on how to use the system (about US$1,000); and (3) coordination with participants and troubleshooting the system during the 8 weeks of the course (about US$2,000). Each participant received approximately US$20 per month in mobile telephone airtime, which enrolled them in a "friends & family" contract, enabling them to text the system and to send and receive unlimited free calls from and to the system. At the time, this type of contract was the most economical option for a system requiring considerable airtime to deliver IVR calls.

We anticipate that costs could be reduced in future, larger-scale applications. The system and software has now been developed, and costs of curriculum development could be reduced by using the same content or adapting standard training modules or policies, procedures, and norms. Orientation could take place

during routine meetings of health staff and would be unnecessary if participants took a second course using the same system. The cost of telephone air time must be reduced in larger-scale applications. Similar to Mobile Academy in India,[26] a toll-free number could be established, rather than establishing contracts for all participants. Also, many countries are moving toward cellular networks that allow health professionals to communicate with each other for free,[36] and the IVR mLearning system could be incorporated into these networks.

Study Limitations

We deployed and assessed the IVR mLearning system among a very limited number of selected participants. Working with a small sample allowed us to pilot test the IVR mLearning system with limited financial resources and to make changes based on participant feedback before attempting to deliver training with the system at a much larger scale. However, the small sample size, lack of a control group, and lack of any measurement on changes in health worker practices preclude conclusions about the overall effectiveness of the training system. Any larger-scale implementation needs to be accompanied by a rigorous evaluation that includes a comparison group and examination of health worker practices and quality of health services as the primary outcomes, using a comprehensive framework to document and assess the in-service training.[37] We purposively selected providers to receive the IVR training, potentially limiting the external validity of our findings, even within the Senegalese context. Participants worked in both urban and rural settings, and health workers in rural areas did report more issues with cellular reception during the IVR mLearning system pilot (data not shown).

CONCLUSION

The application of an mLearning system using IVR, SMS text messages, and simple mobile phones to provide refresher training to health care workers is feasible, well-liked by participants, and associated with improved participant knowledge. The IVR mLearning platform using the spaced-education approach has the potential to be an effective and efficient approach to providing refresher training and/or updates on national guidelines, policies, and protocols in family planning and other health service areas, and it can conveniently deliver robust refresher training content to remote health care workers without requiring them to leave their posts. It could easily be adapted and adopted to reach health workers with low literacy, since it relies mostly only on voice and numeric interactions, rather than written materials. The system also has the potential to overcome language barriers, as training messages can be recorded in any language or dialect. The system should be scaled-up to other geographic areas and training topics in Senegal, with implementers giving sufficient attention and financial resources to the system architecture, organizational and administrative systems, as well as training and supervision for staff to manage the system.[38] Close monitoring and rigorous evaluation of larger-scale implementation, including considerations of costs and sustainability, can provide robust evidence that the IVR mLearning system is feasible and effective at scale.

Acknowledgments: Funding for the study was provided by the US Government through the USAID-supported Capacity*Plus* project. Non-financial support was received from the Senegalese Ministry of Health (staff time and effort). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript. The IntraHealth International office in Dakar, Senegal, provided support, and we would like to especially thank Babacar Gueye, Hawa Talla, Khadidiatou Lo Mbengue, and Yague Diagne.

Competing Interests: None declared.

REFERENCES

1. Bluestone J, Johnson P, Fullerton J, Carr C, Alderman J, BonTempo J. Effective in-service training design and delivery: evidence from an integrative literature review. Hum Resour Health. 2013;11(1):51. CrossRef. Medline.
2. Bollinger R, Chang L, Jafari R, O'Callaghan T, Ngatia P, Settle D, et al. Leveraging information technology to bridge the health workforce gap. Bull World Health Organ. 2013;91(11): 890–891. CrossRef. Medline
3. Kerfoot BP. Learning benefits of on-line spaced education persist for 2 years. J Urol. 2009;181(6): 2671–2673. CrossRef. Medline.
4. Kerfoot BP, Baker HE, Koch MO, Connelly D, Joseph DB, Ritchey ML. Randomized, controlled trial of spaced education to urology residents in the United States and Canada. J Urol. 2007;177(4): 1481–1487. CrossRef. Medline.
5. Kerfoot BP, DeWolf WC, Masser BA, Church PA, Federman DD. Spaced education improves the retention of clinical knowledge by medical students: a randomised controlled trial. Med Educ. 2007;41(1): 23–31. CrossRef. Medline.
6. Kerfoot BP, Fu Y, Baker H, Connelly D, Ritchey ML, Genega EM. Online spaced education generates transfer and improves long-term retention of diagnostic skills: a randomized controlled trial. J Am Coll Surg. 2010;211(3): 331-7e1.
7. Kerfoot BP, Lawler EV, Sokolovskaya G, Gagnon D, Conlin PR. Durable improvements in prostate cancer screening from online

spaced education: a randomized controlled trial. Am J Prev Med. 2010;39(5): 472–478. CrossRef. Medline.

8. Mendoza G, Okoko L, Morgan G, Konopka S. mHealth compendium, volume two. Arlington (VA): Management Sciences for Health, African Strategies for Health project; 2013. Available from: http://www.jhsph.edu/departments/international-health/_documents/USAIDmHealthCompendiumVol2FINAL.pdf
9. Labrique AB, Vasudevan L, Kochi E, Fabricant R, Mehl G. mHealth innovations as health system strengthening tools: 12 common applications and a visual framework. Glob Health Sci Pract. 2013;1(2): 160–171. CrossRef. Medline.
10. McQueen S, Konopka S, Palmer N, Morgan G, Bitrus S, Okoko L. mHealth compendium, edition one. Arlington (VA): Management Sciences for Health, African Strategies for Health project; 2012. Available from: https://www.msh.org/sites/msh.org/files/2012-usaid-mhealth-compendium-web.pdf
11. World Health Organization (WHO), Global Observatory for eHealth. mHealth: new horizons for health through mobile technologies: based on findings of the second global survey on eHealth. Geneva: WHO; 2011. Available from: http://www.who.int/goe/publications/goe_mhealth_web.pdf
12. Callan P, Miller R, Sithole R, Daggett M, Altman D, O'Byrne D. mHealth education: harnessing the mobile revolution to bridge the health education and training gap in developing countries. Cork (Ireland): iHeed Institute; 2011. Co-published by Dalberg Global Development Advisors. Available from: http://www.cmamforum.org/Pool/Resources/Mhealth-education-mobile-phones-IHEED-2011(2).pdf
13. Columbia University, The Earth Institute. One million community health workers: technical task force report. New York (NY): Columbia University; 2011. Available from: http://www.millenniumvillages.org/uploads/ReportPaper/1mCHW_TechnicalTaskForceReport.pdf
14. Ministry of Health of Uganda. The Ministry of Health of Uganda, AED-SATELLIFE Center, Uganda Chartered HealthNet and the College of Health Sciences of Makerere University and the International Development Research Centre (IDRC) announce the Integration of the Uganda Health Information Network (UHIN) into the Ministry of Health: UHIN strengthens health systems and improves quality of healthcare. Kampala (Uganda): Ministry of Health of Uganda; 2010.
15. AED-SATELLIFE Centre for Health Information and Technology. Mobile health information system: March 2008 – February 2010: final project report. Watertown (MA): AED-SATELLIFE Centre for Health Information and Technology; 2010. Available from: https://www.k4health.org/sites/default/files/MHIS%20FINAL%20Report%20Oct%202010.pdf
16. Riley P, BonTempo J. Mobiles for quality improvement pilot in Uganda. Bethesda (MD): Abt Associates, Strengthening Health Outcomes through the Private Sector Project; 2011.
17. Lemay NV, Sullivan T, Jumbe B, Perry CP. Reaching remote health workers in Malawi: baseline assessment of a pilot mHealth intervention. J Health Commun.2012;17Suppl 1: 105–117. CrossRef. Medline.
18. Zurovac D, Sudoi RK, Akhwale WS, Ndiritu M, Hamer DH, Rowe AK, et al. The effect of mobile phone text-message reminders on Kenyan health workers' adherence to malaria treatment guidelines: a cluster randomised trial. Lancet.2011;378(9793): 795–803. CrossRef. Medline.
19. McDaniel A, Benson P, Roesener GH, Martindale J. An integrated computer-based system to support nicotine dependence treatment in primary care. Nicotine Tob Res. 2005;7Suppl 1: S57–S66. CrossRef. Medline.
20. Mundt JC, Moore HK, Greist JH. A novel interactive voice response (IVR) system for dementia screening, education, and referral: one-year summary. Alzheimer Dis Assoc Disord. 2005;19(3): 143–147. CrossRef. Medline.
21. Abu-Hasaballah K, James A, Aseltine RH Jr. Lessons and pitfalls of interactive voice response in medical research. Contemp Clin Trials. 2007;28(5): 593–602. CrossRef. Medline.
22. Piette JD, Datwani H, Gaudioso S, Foster SM, Westphal J, Perry W, et al. Hypertension management using mobile technology and home blood pressure monitoring: results of a randomized trial in two low/middle-income countries. Telemed J E Health.2012;18(8): 613–620. CrossRef. Medline.
23. Green EP, Bellows B. Baby Monitor: developing and testing a mHealth screening service for pregnant women and new mothers in Kenya. Preliminary draft; 2013.
24. Chamberlain S. A mobile guide toward better health: how Mobile Kunji is improving birth outcomes in Bihar, India. Innovations. 2014;9(3-4): 43–52. CrossRef.
25. Dimagi [Internet]. Cambridge (MA): Dimagi, Inc; c2015. Using incentives to improve health knowledge through IVR mobile phone quizzes; [cited 2015 Apr 15]; [about 1 screen]. Available from: http://www.dimagi.com/ivr-mobile-education
26. Ananya [Internet]. Bihar (India): Ananya; c2014. Making healthcare information accessible through a phone call: the Mobile Academy project lets health workers in Bihar educate themselves about child and maternal health; 2013 May 19 [cited 2015 Apr 15]; [about 3 screens]. Available from: http://ananya.org.in/news-and-press/179-making-healthcare-information-accessible-through-a-phone-call
27. Askew I, Brady M. Reviewing the evidence and identifying gaps in family planning research: the unfinished agenda to meet FP2020 goals. Background document for the Family Planning Research Donor Meeting, 3-4 December 2012. New York: Population Council; 2013. Available from: http://www.usaid.gov/sites/default/files/documents/1864/FP%20Meeting%20Background%20Paper.pdf
28. Agence Nationale de la Statistique et de la Démographie (ANSD) [Sénégal]; ICF International. Enquête démographique et de santé continue (EDS-Continue 2012-2013). Calverton (MD): ICF International; 2013. Available from: http://dhsprogram.com/pubs/pdf/FR288/FR288.pdf
29. United States Agency for International Development (USAID); World Health Organization (WHO); United Nations Population Fund (UNFPA). The Training Resource Package for Family Planning [Internet]. Baltimore (MD): K4Health Project; c2015 [cited 2015 Apr 15]. Available from: http://www.fptraining.org/
30. World Health Organization (WHO). Hormonal contraception and HIV: technical statement. Geneva: WHO; 2012. Available from: http://www.who.int/reproductivehealth/topics/family_planning/Hormonal_contraception_and_HIV.pdf
31. World Health Organization (WHO), Department of Reproductive Health and Research; Johns Hopkins School of Public Health/Center for Communication Programs (CCP). Family planning: a global handbook for providers. Baltimore, (MD): CCP, Knowledge for Health Project; 2011. Co-published by WHO. Available from: https://www.fphandbook.org/
32. Kerfoot BP, Baker H. An online spaced-education game for global continuing medical education: a randomized trial. Ann Surg. 2012;256(1): 33–38. CrossRef. Medline.
33. QStream [Internet]. Burlington (MA): QStream, Inc. How it works; [cited 2015 Apr 15]; [about 3 screens]. Available from: http://app.qstream.com/info/howitworks
34. Siegel S, Castellan N. Nonparametric statistics for the behavioral sciences. 2nd edition. New York: McGraw Hill; 1988.

35. Lachenbruch PA, Lynch CJ. Assessing screening tests: extensions of McNemar's test. Stat Med. 1998;17(19): 2207–2217. CrossRef. Medline.

36. Switchboard [Internet]. San Francisco: Switchboard; c2015. Free calling networks; [cited 2015 Apr 15]; [about 1 screen]. Available from: http://www.switchboard.org/work/

37. O'Malley G, Perdue T, Petracca F. A framework for outcome-level evaluation of in-service training of health care workers. Hum Resour Health. 2013;11(1): 50. CrossRef. Medline.

38. Piette J, Lun KC, Moura L Jr, Fraser HS, Mechael PN, Powell J, et al. Impacts of e-health on the outcomes of care in low- and middle-income countries: where do we go from here? Bull World Health Organ. 2012;90(5): 365–372. CrossRef. Medline.

Peer Reviewed

Received: 2014 Nov 26; **Accepted:** 2015 Mar 13; **First Published Online:** 2015 June 2

Cite this article as: Diedhiou A, Gilroy KE, Cox CM, Duncan L, Koumtingue D, Pacqué-Margolis S, et al. Successful mlearning pilot in senegal: delivering family planning refresher training using interactive voice response and sms. Glob Health Sci Pract. 2015;3(2):305–321. http://dx.doi.org/10.9745/GHSP-D-14-00220.

Knowledge for Health Project
Johns Hopkins Bloomberg School of Public Health
Center for Communication Programs
111 Market Place, Suite 310
Baltimore, MD 21202
Phone: 410-659-6134
Fax: 410-659-6266
Email: editorialoffice@ghspjournal.org
Web: www.ghspjournal.org