



# Managing Knowledge to Improve Reproductive Health Programs

## EXECUTIVE SUMMARY

Knowledge is a valuable resource that deserves to be—and can be—consciously managed. Using knowledge management (KM) tools, reproductive health program managers can systematically increase the creativity and empowerment of an organization's staff members and the efficiency and effectiveness of its operations. Better organizational performance can, in turn, lead to better health for clients.

### Understanding knowledge management

Knowledge extends beyond data and information. It also includes the judgment and experience needed to take action—to run a clinic, design a behavior change campaign, or serve a client. While some knowledge is written down, most consists of the practical know-how and intuition stored in people's heads. Like written knowledge, this “tacit” knowledge, too, can be managed to increase organizational performance.

KM helps assure that knowledge and information are shared by the right people at the right time so they can make good decisions. It installs systematic processes to help knowledge flow horizontally among service delivery sites, departments, and colleagues as well as vertically up and down the chain of command. It reaches outside the organization to help knowledge flow to and from other organizations, clients, and the community.

People, processes, and technology are the three essential components of KM. People are primary because they implement KM processes as part of their daily work and help shape a knowledge-sharing organizational culture. KM processes include creating new knowledge, gathering and organizing existing knowledge, sharing knowledge with others, and adapting knowledge to fit different situations. While technology—ranging from simple phone directories to computers—can enable and expedite KM, it must be integrated with the way people work, address their real needs, and be appropriate to the setting.

## CONTENTS

Executive Summary .....	1
The Importance of Managing Knowledge . . . .	3
Understanding Knowledge Management . . . .	4
KM Toolbox .....	10
Meeting the Challenge:	
Sharing Knowledge .....	12
Learning from Experience .....	15
Coping with Too Much or Too Little Information .....	18
Next Steps .....	21
Case Studies:	
Sharing Knowledge at the AIDS Competence Programme .....	24
Creating a Poverty Grading System in Bangladesh .....	28
Feedback Form .....	31
Bibliography .....	33



# MAQ PAPERS

This paper was prepared by Adrienne Kols for the Knowledge Management Paper Working Group. Members of the Working Group include: Tara Sullivan, Coordinator, (JHU/CCP), Marcela Aguilar (JHU/CCP), Lissette Bernal (EngenderHealth), Richard Blackburn (JHU/CCP), Bruce Carlson (POPTech), Vanessa Carroll (JHU/CCP), Arzum Ciloglu (JHU/CCP), Adrienne Cox (ORC Macro), Peggy D'Adamo (JHU/CCP), Chris Davis (JHU/CCP), Samantha Ender (Advance Africa), Rachel Fey (JHU/CCP), Michelle Heerey (JHU/CCP), Ani Hyslop (ORC Macro), Sharaz Khan (Rush University), Paige Leavitt (American Productivity & Quality Center), Laurie Liskin (JHU/CCP), Linda Leonard (JHU/CCP), Erin Mielke (EngenderHealth), Susan Monaghan (Public Health Institute), Christine Prefontaine (Abt Associates), Nina Pruyn (Advance Africa), Ward Rinehart (JHU/CCP), Matt Sattah (United States Agency for International Development), Payam Sheikhattari (JHU/CCP), Niranjin Singh (JHU/CCP), Mercedes Torres (Advance Africa), Chris Wright (John Snow, Inc.), and Wesley Vestal (American Productivity & Quality Center).

The two case studies were prepared by Seth Kahan for the Knowledge Management for Leaders Workshop, sponsored by the INFO Project at the Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs, July 17-19, 2004, in association with the 2004 Strategic Leadership in Population and Reproductive Health Seminar sponsored by the Bill and Melinda Gates Institute for Population and Reproductive Health.

The assistance of the following reviewers is appreciated: Gloria Coe, Rachel Lucas, and James Shelton.

This MAQ paper was produced for the MAQ Initiative by the INFO Project at Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs under USAID cooperative agreement GPH-A-00-02-00003-00.



U.S. Agency  
for International  
Development

## Key knowledge challenges for reproductive health

Reproductive health programs face three knowledge challenges. First is sharing knowledge: they must encourage staff members to take advantage of the knowledge, experience, and expertise available in their own and other reproductive health organizations and, at the same time, to share their own knowledge with colleagues. Second is learning from experience: they must draw on proven practices and lessons learned when planning projects and making decisions. Third is coping either with the flood of health information available online and in print—or else with limited access to any and all sources of needed information. KM tools and approaches can help managers meet each of these challenges.

## Launching a KM initiative

Institutionalizing KM, so that it becomes a natural part of everyone's work, requires changes throughout the organization. Thus, a KM initiative might expand job descriptions (for example, requiring experienced providers to coach novice colleagues), add KM indicators to performance appraisals, create project teams that cross divisional lines, make it standard practice for those teams to generate and disseminate lessons learned, strengthen communication channels with distant service sites, encourage staff to routinely consult experts both inside and outside the organization, and establish partnerships with other reproductive health organizations. Such changes often reflect a sweeping change in organizational culture, so that all staff members respect and seek to engage in learning, innovation, collaboration, and evidence-based decision making.

The first step for reproductive health care managers who are interested in KM is to demonstrate to leaders and colleagues that investing in KM offers the organization real benefits. With the support of the leadership, managers can then form an exploratory group to assess how ready their organization is to undertake a formal KM initiative and to help design a KM strategy appropriate to its needs, resources, and situation.

## THE IMPORTANCE OF MANAGING KNOWLEDGE

*The director of an urban clinic wants to keep staff updated about the latest developments in family planning and HIV prevention and treatment. But subscriptions to medical journals are too expensive, Internet access is slow and intermittent, and providers are reluctant to take time away from heavy caseloads to attend seminars.*

*A project team successfully overcame political and logistical challenges to offer reproductive health care to refugees. But colleagues facing similar challenges cannot gain from the experience because the lessons learned were never documented and team members have since moved on to other jobs.*

Each of these problems stems from the same management weakness: the failure to explore and exploit relevant knowledge. Knowledge is a valuable resource that deserves to be—and can be—consciously managed.

Of course, every health care organization already manages knowledge, for example, when it trains pro-

viders, analyzes data from a management information system, or publishes a report. By applying the right knowledge management (KM) tools, however, reproductive health managers can systematically increase (49):

- **Efficiency**, by helping people quickly find the knowledge they need and, in the process, save time and avoid duplicating the efforts of others;
- **Effectiveness**, by making people aware of lessons learned from research and experience and encouraging them to adopt best practices;
- **Creativity**, by exposing people to new ideas and approaches; and
- **Empowerment**, by giving workers at every level the knowledge and confidence to make well-informed decisions.

Together these improvements contribute to better organizational performance and, ultimately, better family planning and reproductive health outcomes.

Consider the problems presented above as examples. The urban clinic suffers from a dearth of information. Simple KM approaches could improve the situation. The clinic director could arrange to pool and share resources with other organizations that provide family planning and HIV services. In-service training by a

**Figure 1: Benefits of Knowledge Management**



Source: Adapted from *Information Management for Development Organisations* (second edition) by Mike Powell (2003) with the permission of Oxfam GB, 274 Banbury Road, Oxford, OX2 7DZ [www.oxfam.org.uk](http://www.oxfam.org.uk).

supervisor or content expert also could ensure that providers are updated routinely. With a stronger and more current knowledge base, providers could then offer clients better care—which ultimately might increase contraceptive use and reduce HIV transmission.

The second scenario illustrates what happens when organizations fail to gather and share their staff members' experience and practical know-how. Once again, KM offers possible solutions. Project teams could meet periodically, throughout the development and implementation process, to review progress and generate lessons learned. Their reports could be made easily accessible to others, either in print or online. The next time a team works on care for refugees, they could learn from these lessons what did and did not work before and plan accordingly. The result: services that work in the difficult circumstances that refugees face, and that meet the full range of their reproductive health needs.

## Using this brief

To help reproductive health care managers understand the rapidly growing field of knowledge management (KM), this brief first introduces key concepts and then considers how KM tools and approaches can help reproductive health organizations meet three common challenges:

1. Sharing knowledge within and between organizations and programs (see p. 12),
2. Learning from experience (see p. 15), and
3. Coping with too much or too little information (see p. 18).

For managers who decide to pursue KM, the closing section offers some lessons about how to design and implement a KM initiative. Two case studies describe how reproductive health programs have applied KM concepts.

## UNDERSTANDING KNOWLEDGE MANAGEMENT

Reproductive health care organizations rely on their accumulated knowledge, experience, and expertise to design and implement programs and to deliver day-to-

day care competently and efficiently. This collective knowledge base is among an organization's most valuable assets, but managers and staff rarely take full advantage of it. Often they do not appreciate the value of their own and others' experience. Therefore they fail to conserve the knowledge generated during the course of their work, to seek out knowledge that could help their projects succeed, or to share what they know with their colleagues. Even when they do recognize its importance, they may not be aware that relevant knowledge exists; they may not know where to look for it; they may not have access to it; or they may get it too late or in a form they cannot use (36). As a result, they may duplicate the efforts of others or repeat mistakes of the past.

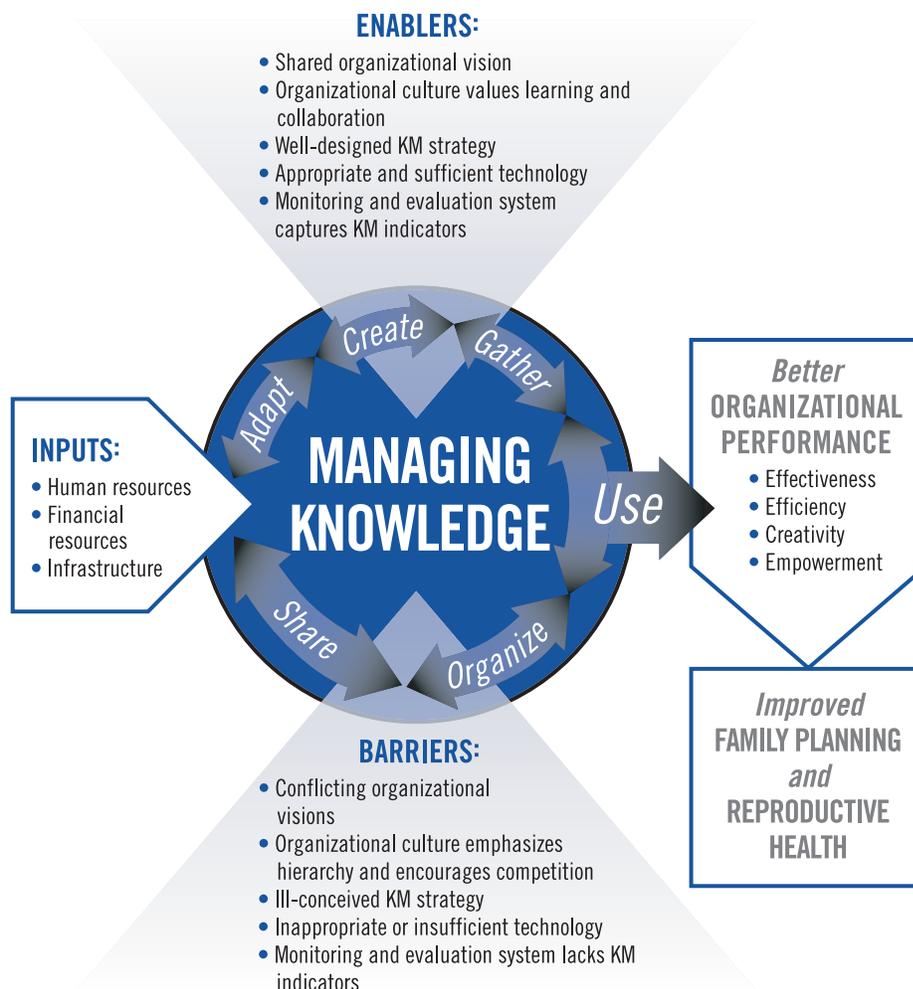
## What is knowledge management?

There are many different definitions of KM. In essence, it means systematically and routinely creating, gathering, organizing, sharing, adapting, and using knowledge—from both inside and outside the organization—to help achieve organizational goals and objectives (38). In other words, KM gets the right knowledge to the right people at the right time so they can work more efficiently and effectively (6).

The framework in Figure 2 illustrates what happens when a family planning/reproductive health organization decides to adopt KM. The organization's human and financial resources and its infrastructure provide a foundation for the initiative. Managers placed in charge of KM build on this foundation to install systematic processes that help staff members create new knowledge and gather, organize, share, and adapt knowledge from co-workers, clients, other health care programs, and outside experts (8). These processes allow staff members at every level to use knowledge routinely during the course of their work. They make it possible for service providers to practice evidence-based health care and for managers to make well-informed decisions about designing and implementing activities (38).

Organizational culture, technology, and monitoring systems are among the many factors that can either enable KM or act as a barrier to it (see p. 8). For example, the organizational culture can promote values that encourage knowledge sharing, such as

**Figure 2: Knowledge Management (KM) Framework for Family Planning/Reproductive Health**



Based in part on O'Dell and Grayson, 1997 (41)

learning and cooperation, or it can foster values, such as competition among individuals and departments, that discourage it. If KM is properly implemented, however, the result is better organizational performance and, ultimately, improved family planning and reproductive health outcomes.

While the KM perspective provides a sharper lens to analyze how organizations create, gather, share, and reuse knowledge, its fundamentals are not new. Every health care organization already manages knowledge, for example, by training employees in new skills and

subjects, collecting performance data in management information systems, updating guidelines and protocols, and holding meetings and publishing reports to disseminate lessons learned (26, 36, 38, 42). KM simply reframes and refocuses practices from a wide range of disciplines—including management, human resources, communication, library science, and information technology—to deal with everyday management problems as well as the challenges and opportunities posed by technological advances, globalization, and other trends.

## Why is knowledge management becoming more important?

Appreciation for the value of knowledge is growing, as demonstrated by the move toward evidence-based practice in medicine (22) and by investment in knowledge-sharing tools across a wide spectrum of organizations and enterprises (27, 32). At the same time, new technologies, such as computerized databases and the Internet, have made collecting, analyzing, storing, and disseminating information and knowledge cheaper, easier, and quicker (34).

For health care organizations, these new practices, tools, and technologies present an opportunity. They face pressures to improve the quality of care while also maximizing efficiency, since health care budgets have generally not kept pace with the rising demand for care. Consciously managing knowledge can help achieve these two objectives by ensuring that effective and efficient work practices are known and used throughout the organization and that lessons learned are shared.

Contrary trends in the workplace make managing knowledge even more urgent, as:

- Frequent reorganizations break the thread of institutional memory;
- Experience is dispersed along with the members of temporary teams when projects end;
- Programs increasingly rely on short-term or contract staff, whose knowledge is less likely to be transferred to the organization; and
- Joint initiatives expect organizations to temporarily set aside rivalries and share knowledge (49).

## What is knowledge?

KM distinguishes among data, information, and knowledge, although all three are essential to the success of reproductive health organizations. *Data* are the raw facts that form the basis for what we know, for example, numbers concerning contraceptive use gathered by household surveys. People transform data into *information* by adding order, context, and purpose. Thus the survey data become contraceptive usage rates that reveal differences by region and women's age as well as trends over time. People

transform information into *knowledge* by adding meaning: they make connections and comparisons, explore causes and consequences, and determine what action should be taken (23, 42). For example, decision-makers could employ information on contraceptive use to design a strategy to counter declining IUD use. In practice, many people use the terms knowledge and information interchangeably.

We typically think of knowledge as what is written down in handbooks, training manuals, policies, protocols, databases, project reports, and other documents. This is described as *explicit knowledge*. Explicit knowledge is what can be captured in words and numbers, whether written or spoken (18). This makes it relatively easy to catalog, copy, and share with others (6).

Explicit knowledge, however, constitutes just a small fraction of our total knowledge (6). Most knowledge resides in people's heads in the form of practical know-how, rules-of-thumb, and intuition based on personal experience. This kind of *tacit knowledge* is less structured and can be hard to articulate, but it is essential to making judgments and taking action (46). Tacit knowledge explains why a veteran family planning provider who has counseled thousands of clients performs better than does a novice following a written protocol. Still, experienced workers may not be conscious of their tacit knowledge or able to express it in a way that can be written down.

While tacit knowledge is often the product of experience, it also can be learned from others. People at the same level or with the same background can easily transfer tacit knowledge to one another, often through stories or demonstration. Experienced workers can transfer tacit knowledge to novices through direct contact and dialogue, for example, by coaching or mentoring (23, 26, 56), and novices can learn by observing.

## How should knowledge flow?

Ideally, knowledge and information should flow in all directions to ensure that everyone in the organization has access to the knowledge that she or he needs (14). Organizational structures, however, tend to transfer knowledge vertically. For example, clinic managers routinely collect and forward information, such as

statistics on clients served and supplies disbursed, up the chain of command to headquarters. Top managers analyze the information and send back policies, procedures, and other directives to local facilities.

Vertical structures tend to ignore and even hamper the horizontal transfer of information and knowledge among colleagues working at different service sites, in different departments, or in different organizations. Yet these horizontal flows are essential: they allow different divisions or organizations to cooperate towards a general goal and help workers at lower levels take on greater responsibilities in decentralized health systems.

Managers can create channels to promote the horizontal flow of knowledge and information either within or between organizations. In Mali, for example, health organizations were duplicating one another's communication activities and disseminating conflicting messages. National planners established a technical committee to serve as a forum for communication specialists working at different health organizations. Here communicators discuss current and planned activities and share expertise. This structure enables different organizations to take on complementary roles and responsibilities in a coordinated nationwide communication effort (11).

Assumptions about what kinds of knowledge are valid and useful may discourage the flow of knowledge from clients and the community to reproductive health programs, even though they have valuable insights (23, 49). In Senegal, for example, women's knowledge of the local culture, customs, and power structure was the crucial ingredient in transforming classroom knowledge on the dangers of female genital mutilation into a successful grassroots movement to end the practice (20).

The case study on creating a poverty grading system in Bangladesh (p. 28) provides a detailed look at how reproductive health programs can tap into the community's knowledge. The Marie Stopes Clinic Society wanted to direct its services and education to the poorest households but had no good way to identify them. Slum residents, who understand the nuances of local living conditions, were recruited to participate in developing a tool that accurately assesses poverty levels.



*Women in Peru write down what they think of local health services. Clients and community members possess valuable knowledge that can help reproductive health programs improve.*

© 1999 Maria Pia Valdivia/CCP. Courtesy of Photoshare

## What are the major components of knowledge management?

KM involves three components—people, processes, and technology. People are primary because they are the sources and users of knowledge and because they drive and implement all of the changes associated with KM. People throughout the organization contribute to a knowledge-sharing culture by their attitudes and expectations. They also learn to carry out new KM processes and use information and communication technologies (42, 49). Some individuals take on entirely new roles and responsibilities as part of a KM initiative. This may range from the prominent appointment of a KM champion for the organization to new assignments such as coordinating a resource center or producing a Web site (14). It is important that everyone appreciates the value of knowledge and acts accordingly, for example, by volunteering to share information with colleagues, actively seeking out and consulting experts, and trying to learn from past projects.

KM processes include creating new knowledge, gathering existing knowledge, organizing knowledge to increase its usefulness, sharing knowledge with others, adapting knowledge to fit different situations, and using knowledge on the job (6). In Brazil, for example, the Sociedade Civil Bem-Estar Familiar no Brasil (BEMFAM) used several KM processes to establish a referral network for health care providers who were trained to screen clients for gender-based violence. For example, BEMFAM gathered information on institutions that provided services for victims of

violence, organized it by state and types of services offered, and shared it with providers in the form of a directory (31).

Technology can enable and expedite KM. For example, calculators can help managers analyze service statistics, while e-mail can help health professionals exchange ideas with distant colleagues. However, KM does not always require technology. Interpersonal interactions—such as informal conversations with colleagues, team meetings, and coaching—are among the most effective and efficient ways to exchange knowledge. Indeed, over-reliance on technology has led to the failure of many KM initiatives. The choice of technology should be driven by the nature of the project. Whatever technology is selected, it must be integrated with the way people already work and address real needs. Otherwise, people will not use it (8, 26, 42).

## What factors enable knowledge management?

Before designing and launching a KM initiative, managers should consider whether key elements of their organizational infrastructure and environment will enable—or pose barriers to—its success (43).

*Shared vision and committed leaders.* Committed and involved leaders communicate the importance of KM for the organization, instill an inspiring vision of the future, and show how to achieve that vision (62). They also help create a receptive organizational culture and supportive environment by funding KM projects, creating a senior position with strategic responsibility for KM, rewarding workers for their efforts to promote and implement KM, and retelling KM success stories (5, 24, 43). Perhaps most impor-

## KNOWLEDGE MANAGEMENT AT WORK: THE SUPPLY INITIATIVE

No matter what their goal, successful KM projects address all three components of KM: people, processes, and technology. KM activities at the Supply Initiative (<http://www.rhsupplies.org>), which works to minimize shortages of reproductive health supplies, illustrate how the three components interact.

Differences in database systems and procurement cycles contribute to the current supply problem: they prevent international donors of reproductive health supplies from consolidating procurement data, coordinating supplies, and directing supplies where and when they are most needed. To address this KM challenge, the Supply Initiative has devised a Web-based information system. RHInterchange will consolidate procurement data from major donors and provide complete, reliable, and timely information on total donations by method and country. Given its reliance on computers and the Internet, RHInterchange is a technology-intensive solution. But it uses technology to carry out three fundamental KM processes: gathering, organizing, and sharing knowledge. Its success

will largely depend on how motivated people are to contribute information to the system.

In contrast, people are the focus of the Reproductive Health Supplies Partnership, a knowledge-sharing community facilitated by the Supply Initiative. Members will meet regularly to discuss reproductive health supply issues, share lessons learned and best practices in addressing supply shortfalls, and coordinate resources. Technology, in the form of the Supply Initiative Web site, will expedite the Partnership's knowledge sharing by capturing, consolidating, and disseminating members' knowledge and experience.

The KM approaches of the Supply Initiative will contribute to more effective and efficient operations at both donor and service delivery organizations. These advances in organizational performance have the potential to improve reproductive health outcomes. For example, as contraceptive shortages are eased, the use of family planning may increase.

tantly, they lead by example, providing a role model of freely sharing knowledge and seeking it from others (42). In the absence of committed leaders, staff members may have different, sometimes conflicting visions about the organization's mission and goals relating to KM, the value of knowledge, and organizational commitment to KM.

**Supportive organizational culture.** The values, beliefs, expectations, and attitudes common to the organization and the country where it operates shape workers' behavior and decisions. This organizational culture often poses barriers to KM (5). For example, if workers presume they will be punished for mistakes, they will hide failures rather than analyze them and then disseminate lessons learned (38). Different cultural challenges arise in different countries. For example, in hierarchical societies workers may be afraid to voice opinions to superiors or to ask them questions, thus cutting off a valuable flow of knowledge (33). In contrast, workers in competitive societies that prize individual achievement may be reluctant to take advantage of existing knowledge. From their perspective, asking for help is an admission of failure, and reusing practices and tools developed by others is a sign of laziness or, worse, cheating (38).

Mutual trust among workers, empathy, willingness to help, nonjudgmental attitudes, and personal courage enable knowledge sharing and knowledge creation (62). Organizations can encourage this kind of learning culture in many ways, both large and small. Key conditions include:

- Valuing collaboration over competition between individuals and departments;
- Defining knowledge-related job responsibilities;
- Recognizing and rewarding staff members based on their knowledge work;
- Encouraging experimentation and treating failures as learning opportunities; and
- Giving workers time and technology for knowledge-related activities (3, 24, 26, 33, 36, 43).

**Well-designed KM strategy.** Successful KM requires a strategy that ties KM to organizational goals, specifies what needs to be done, and sets out a timetable and budget. Also, the strategy must consider all three

components of KM: people, processes, and technology. Thus, a KM strategy should describe how to motivate people and realign the organizational culture, specify which KM processes and tools will be used, and explain how to leverage a supporting technical infrastructure (42). Ideally, the strategy should include initial activities that will yield quick results and build support for KM as well as activities that will develop sustainable KM capabilities over the long term.

**Appropriate and sufficient technology.** While technology can enable KM, new information technologies are not essential and may not be feasible in some countries or programs due to high costs and/or unreliable electricity and phone connections (27, 34, 48). Other factors such as low literacy and gender-based barriers also limit new technologies (19). Older technologies, including print materials and telephones, may be more appropriate for some settings. For example, when an e-mail discussion list linking Peruvian clinics, the Ministry of Health, and global health experts proved technically impossible, a project to improve the treatment of tuberculosis instead created a flexible system of visits, conference calls, and paper mail along with Web pages and e-mail to exchange information and knowledge (10).

**Monitoring and evaluation of KM indicators.** Only by measuring the progress of KM activities can an organization judge which activities work and which do not, make needed adjustments, and build support for KM (8, 42). Assessing how much KM activity is taking place is relatively easy. For example, indicators could include the size and growth of databases, how often people use resource centers, or how many employees belong to knowledge-sharing communities (8, 32, 43). Assessing the impact of KM on the organization's performance and on health outcomes is more difficult. Organizations have tried to measure changes in culture and policies, the number of new practices introduced and problems resolved by sharing best practices and lessons learned, and the time and money saved by leveraging knowledge (8, 32, 43). Impact measurement is an area that needs more work.

# TOOL

## TOOLS FOR GATHERING KNOWLEDGE

### **After-action reviews:**

Hold structured, facilitated discussions at the end of each activity or project to review what happened and why. (See p. 15.)

### **Debriefings:**

Routinely interview staff members at project milestones and after trips to find out what happened and why. (See p. 14.)

### **Electronic discussion lists, newsletters, and information services:**

Subscribe to an e-mail service that broadcasts news and discussion about a reproductive health issue. (See p. 19.)

### **Exit interviews:**

Interview staff members who are planning to change

jobs or retire; ask them for practical advice and tips on how to do their jobs. (See p. 14.)

### **Islands of excellence:**

Identify service delivery sites that perform better than others and analyze why. (See p. 15.)

### **Knowledge harvesting:**

Ask experienced workers about how to do a task and write down their insights in the form of job aids or guidelines. (See p. 14.)

### **Portals:**

Seek out Web pages managed by trustworthy sources to locate relevant and reliable online resources about a reproductive health topic. (See p. 19.)

### **Study tours:**

Send staff members to visit a program with relevant experience, observe its operations, and talk to their counterparts. (See p. 17.)

## TOOLS FOR ORGANIZING KNOWLEDGE

### **Knowledge repositories:**

Collect information and knowledge, organize it in a library, resource center, or online database, and create a directory so that it can be easily located. (See p. 14.)

### **Intranet and extranet:**

Categorize and post information and knowledge of importance to the organization on a computer network accessible only to staff members (an intranet) or to staff, clients, and collaborators (an extranet). (See p. 14.)

### **Information coordinator or reference librarian:**

Assign a staff member to locate, organize, and disseminate knowledge of importance to the organization; to fill information requests; and to direct others to key sources of tacit and explicit knowledge. (See p. 14.)

### **Skills directory, or “yellow pages”:**

List staff members’ areas of expertise and experience along with their contact information in a print or online directory. (See p. 14.)

# BOX

## TOOLS FOR SHARING KNOWLEDGE

---

### **Coaching:**

Assign an experienced staff member to help co-workers develop their skills. (See p. 14.)

### **Communication technologies:**

Use appropriate technologies, such as telephones, radio, or e-mail, to disseminate information to staff working in isolated locations. (See p. 20.)

### **Communities of practice:**

Join or create a group of people who share a professional interest, exchange insights and experiences, and learn from one another. (See p. 13.)

### **Knowledge maps:**

Locate the sources of explicit and tacit knowledge in an organization and chart how that knowledge flows to others. (See p. 13.)

### **Mentoring:**

Assign a senior staff member to advise and support the professional development of a junior staff member. (See p. 14.)

### **Social network analysis:**

Map informal relationships among staff members, including whom they seek information from and share information with. (See p. 12.)

### **Storytelling:**

Develop stories about the organization and its work that convey tacit knowledge and encourage learning. (See p. 14.)

### **Twinning:**

Establish an ongoing relationship with another organization to exchange knowledge and skills. (See p. 17.)

### **Workshops:**

Arrange workshops for practitioners from different organizations and/or countries so that they can exchange know-how and experiences. (See p. 17.)

---

## TOOLS FOR ADAPTING AND USING KNOWLEDGE

---

### **Evidence-based guidelines and protocols:**

Use guidelines, protocols, and practice recommendations developed by experts and based on research findings. (See p. 16.)

### **Lessons learned:**

Before designing and/or launching a reproductive health intervention, ask experienced practitioners about what has and has not worked in the past. (See p. 16.)

### **Proven tools and practices:**

Find tools and practices that have had good results elsewhere and adapt them to the local setting and service delivery structure. (See p. 16.)

# Meeting the Challenge

## 1. SHARING KNOWLEDGE

Frequently, people are not aware of, or lack easy access to, valuable expertise inside their own or other organizations—expertise that not only could make their own work more effective and efficient, but also could expand and enhance the services offered by their reproductive health programs. At the same time, people do not feel responsible for sharing their own knowledge with colleagues. Indeed, they may not even realize that they have knowledge worth sharing.

Encouraging knowledge sharing requires recognizing and addressing some common barriers, including organizational structure and culture, which were discussed on pp. 6 and 9. For example, internal divisions are a frequent obstacle. Each department, field office, service delivery site, or project team tends to focus on its own problems, have limited contact with outsiders, and be unaware of what other subdivisions are doing (8, 43). When offices and service sites are widely dispersed, the cost and inconvenience of travel and long-distance phone calls pose yet another barrier (18).

Another common obstacle is viewing knowledge as a source of power and therefore hoarding it (24). For example, a reproductive health provider who returns from a workshop may closely guard training materials and assume the role of expert—even if the workshop specifically asks participants to share the training with co-workers. As a result, the quality of care offered by their colleagues suffers. Facility managers allow this kind of knowledge hoarding when they fail to set aside time for trainees to share their new skills with colleagues. Similarly, organizations are naturally reluctant to share their expertise with rivals.

Among other benefits, sharing knowledge within the organization helps counteract the impact of staff and contractor turnover. Whenever workers are transferred, promoted, retire, or leave the organization, both their tacit and explicit knowledge may be lost unless the organization makes a concerted effort to assure that it is shared (26). Of course, the broader reproductive health community benefits when workers change jobs. By carrying different perspec-

tives and ideas from one organization to another, these workers prompt innovation and the generation of new knowledge.

### KM tools and approaches:

#### ► **Build personal relationships and social networks that cross organizational boundaries**

Most people turn to a personal contact before searching for knowledge in a database or document, both because it is easier and because they are more likely to get the full story, including negative reports. Social ties promote interpersonal knowledge sharing by creating opportunities for people to interact and by building trust (18).

*Social network analysis* is a KM tool that maps and measures informal relationships among people, groups, and organizations and the movement of knowledge and information that accompanies those relationships. It shows whom people seek information from and share information with. It can identify individuals or teams that are cut off from the flow of knowledge and suggest where increased knowledge flows are most needed (42).

Building social networks—and their accompanying knowledge flows—can be as simple as holding meetings, organizing workshops and conferences, or establishing teams that bring together people who ordinarily have little contact with one another but could share useful insights and experience. This is one of the approaches taken by the DELIVER Project to link its globally dispersed staff (see box) and by the Health Information and Publications Network (HIPNET) (<http://www.hipnet.org>) to strengthen collaboration among organizations. In contrast, the COPE (Client-Oriented, Provider-Efficient) quality improvement process builds social networks at a local level: it brings a clinic's entire staff together to share experiences and insights so that they can better solve recurring problems (13).

The case study on the AIDS Competence Programme (p. 24) shows how a highly organized approach to knowledge sharing between programs

can build human capabilities and benefit reproductive health. Teams from different cities first conducted assessments to discover what knowledge they had to offer others regarding the response to HIV/AIDS—and what gaps they needed to fill. This self-awareness encouraged and guided the teams' efforts to exchange experiences when they later met at a knowledge-sharing workshop.

Another option is fostering a *community of practice*, that is, a network of people with a common interest who come together—face-to-face or virtually or both—to share problems, experiences, and insights and to learn from one another (40, 42). Their interaction can produce new insights and move the entire field forward (8). Communities of practice usually arise informally, although some later gain an organizational sponsor (33). For example, the Safe Motherhood Network in Nepal is a purely voluntary alliance that grew out of a shared frustration with the quality of maternal health care (51). In contrast, organizations such as the World Bank have begun to purposefully establish internal communities of practice. At the Bank about 80 thematic groups, including one on population and reproductive health, link globally dispersed employees with similar skills and responsibilities. Members of these communities of practice help one another adapt practices to local circumstances, solve problems, generate knowledge on good practices, and disseminate knowledge to other Bank staff (7).

#### ► **Help people locate key sources of knowledge**

Several KM tools help workers discover which people and documents—in their own or other organizations—they should consult on an issue. *Knowledge maps* display what explicit and tacit knowledge exists on a certain topic or within a certain organization, and they point out where that knowledge resides—whether that is people, documents, departments, or policies (52, 63). For example, the Kathmandu Sub-Regional Resource Facility (SURF) of the United Nations Development Programme (UNDP) has produced a knowledge map on gender and health and development issues for the nine countries in South and West Asia that it serves (<http://www.undp.org/surf-kathmandu/thematic/>

## SHARING KNOWLEDGE AT THE DELIVER PROJECT

Organizational divisions and sheer geographic distance can pose obstacles to sharing knowledge internally. For example, the staff of the DELIVER Project (<http://www.deliver.jsi.com/>) at John Snow International (JSI) is scattered across field offices in 12 countries and headquarters. Sharing knowledge and experiences from the field thus requires a concerted effort.

To build relationships among staff members and promote the flow of knowledge, DELIVER physically brings them together each year for a technical meeting. There they share lessons learned, promising innovations, and best practices in health logistics. During this annual gathering staff members also participate in a day-long strategy session to identify and prioritize issues for the coming year, and they attend training sessions on new logistics tools and technology, contraceptive security, and other issues.

Knowledge sharing is not limited to the annual meeting. Throughout the year the DELIVER Project collects staff knowledge during debriefing presentations held whenever staff return from technical assistance trips to the field. Issues and lessons learned from these debriefings are shared with field staff in a monthly news bulletin and are archived on the DELIVER IT network, along with all presentations from the annual meeting.

Greater knowledge sharing can lead to increased organizational performance, as shown in the KM Framework for Family Planning/Reproductive Health (Figure 2, p. 5). In particular, the face-to-face interactions at meetings present an opportunity to share tacit knowledge, which can spark innovation. At DELIVER, for example, the effort to share tacit knowledge and experiences from the field has paid off in the form of new ideas and, ultimately, new projects, materials, and tools.



© 2001 Hugh Rigby/CCP, Courtesy of Photoshare

A librarian displays the resources available at the Family Guidance Association of Ethiopia. Information specialists can help people find the knowledge they need.

k-maps/mapgender/mapindex.html). The map provides links to relevant experts, institutions, programs, documents, websites, and knowledge tools.

A simpler but equally useful KM tool for locating tacit knowledge is a *skills directory*. Unlike a regular staff directory, these so-called “yellow pages” list staff members’ expertise, experience, and interests along with their contact information (14, 26, 42). In contrast, directories or maps of *knowledge repositories* help people locate explicit knowledge that has been organized into file cabinets, book shelves, electronic databases, and resource centers. Both types of directories—and knowledge repositories themselves—remain useful only if they are kept up to date.

Two types of computer networks also can help people quickly locate relevant documents and resident experts within an organization. While only an organization’s employees can access an *intranet*, an *extranet* is open to collaborating organizations and individuals as well. Both types of network allow interested parties at different sites to post and share internal reports and materials and to communicate via e-mail and discussion boards (8, 42). For example, staff members at EngenderHealth (<http://www.EngenderHealth.org>) use an intranet to post program presentations and workplans, consult standard operating procedures and travel guidelines, and even submit timesheets. An extranet is a helpful tool for

collaborative projects since it facilitates information sharing with partners in other organizations.

*Information coordinators* or reference librarians staff physical or virtual help desks, libraries, and resource centers. They put people who request information in touch with relevant materials, online resources, and experts (5). They also can create useful and locally relevant content by collating, summarizing, adapting, and translating information from the Web and other sources (30, 44). For example, information coordinators run Learning Resource Centers at hospitals, clinics, and medical schools throughout Central and Eastern Europe and Eurasia. They promote knowledge sharing by filling information requests, disseminating selected information at staff meetings, teaching people how to use online databases and CD-ROMs, translating key documents into local languages, and more (15).

#### ► **Preserve institutional memory**

By encouraging regular knowledge sharing, organizations can reduce the knowledge lost when employees change jobs or retire. For example, employees can be *debriefed* at project milestones or after trips; supervisors and experienced co-workers can *coach* workers on the job; and senior employees can *mentor* junior employees (26). (Mentors actively nurture the professional development of protégés by providing information, encouragement, and career guidance at regular meetings.) Well-designed systems and forms, such as project evaluations and trip reports, also can routinely collect staff experience and make it accessible to others (49).

*Knowledge harvesting* transforms tacit into explicit knowledge. Interviewers ask experienced employees to detail what they do and how they do it. Their responses are organized and packaged into job aids or guidelines that can be widely distributed (42).

*Storytelling* uses a narrative form to express the complexities and emotions of tacit knowledge in a compelling way (42). Of course, not all tacit knowledge can be articulated in job aids or even in stories. Also workers may need incentives to share expertise that may represent years of work and learning.

Whenever a key employee leaves, an *exit interview* can help preserve both tacit and explicit knowledge of how to do the job. Ideally, the person who will be

taking over the job conducts the interview so that tacit knowledge can be transferred directly (26, 42).

Formal training and job aids are essential to transfer explicit knowledge to new workers, but new workers also must be oriented to unwritten rules about how things are done, for example, whom to ask for permission, supplies, or help. Transferring this kind of tacit knowledge requires personal relationships with co-workers, supervisors, mentors, and managers, all of whom can provide tips, coaching, and feedback (26).

## 2. LEARNING FROM EXPERIENCE

Good clinical and program decisions draw on knowledge gained from both experience and research. This principle underlies the worldwide movement towards evidence-based health care and the identification of best practices (4, 25). Like other organizations, however, family planning/reproductive health programs often overlook or ignore lessons learned and proven practices. They waste precious time and resources struggling with the same problems, reinventing the same solutions, and learning the same lessons over and over.

Several factors contribute to the problem. First, managers and providers do not always understand the value of evidence-based decision-making. They may believe that their personal experience is sufficient to make decisions. Second, many programs do not routinely record and disseminate lessons learned and best practices and particularly not in a language or form that others can readily use. Finally, organizational or national culture may discourage people from adopting practices developed elsewhere (the “not invented here” syndrome) (38, 43) or place a premium on developing new strategies or materials that carry the organization’s name (44).

Learning from experience is complicated by the difficulty of defining best practices, which change over time and may vary from one part of the world to another. Indeed, best practices cannot succeed unless they are adapted to local needs and conditions (21, 32, 34, 62). After joining MTV’s Staying Alive campaign on HIV/AIDS, for example, FHI/Senegal found that most of the content was too westernized and too explicit for local audiences. Thus the MTV materials

primarily served as inspiration for a locally developed radio campaign rather than being reused as is (54).

Adopting and adapting best practices helps people master crucial knowledge and gain self-confidence, fosters innovation, and takes advantage of valuable local knowledge (21, 44, 62).

### KM tools and approaches:

#### ► **Collect lessons learned and best practices within the organization**

Routine evaluations, planned from the outset, can help organizations capture lessons learned and make them available to other staff members. For example, *after-action reviews* are structured and facilitated discussions scheduled at the end of an activity, event, or project. Participants discuss what happened, compare it with what was supposed to happen, and generate explicit lessons learned (26, 42). Confidential, individual debriefings also are valuable because they encourage people to speak candidly about problems. In either case, asking the right questions is crucial.

Another approach is to examine variations in performance within the organization (43). For example, a district manager might analyze statistics on the quality and quantity of maternal health services and related health indicators, such as the maternal death rate, to identify one or two service delivery sites that outperform the rest, that is, positive deviants. By analyzing how these *islands of excellence* go about their work, managers can identify successful practices and create a way for staff from top-performing clinics to share their knowledge with others. Identifying and learning from mistakes and failures is also valuable.

#### ► **Search for proven tools and practices outside the organization**

Adapting an existing tool or practice to local needs and circumstances is far more efficient than crafting something brand new. It is also more likely to produce a useful and effective tool. Therefore, people should look outside their own organization and even outside their own region for potentially useful tools and practices. Expert meetings and literature reviews are good sources of information on lessons learned from

## ADVANCE AFRICA'S BEST PRACTICES COMPENDIUM

Program managers can improve or expand reproductive health programs more efficiently and effectively by adapting proven practices and tools to local needs. Deciding which practices and tools should serve as models is not easy, however, given three decades of program experience in international family planning and reproductive health. To help overcome this KM challenge, Advance Africa and its partners have developed the Best Practices Compendium (<http://www.advanceafrica.org/compendium>). The Compendium makes it easy for managers to identify potentially useful tools and practices from around the world and determine whether they can be successfully transferred to the local setting.

Given the lack of consensus on how to define best practices, the first step in creating the Compendium was developing a practical methodology to screen practices. In order to characterize a practice as “best,” the Best Practices Review Board must see evidence that a practice has had an impact related to program objectives as well as evidence that it has been transferred to other settings. When that evidence is incomplete or inconclusive, the practice is labeled “promising.” The Compendium organizes information by a number of search criteria and provides both summary and detailed information so that users can easily access the most relevant information needed. It is based online to give users access to recent submissions, but CD-ROM and printed versions also are available.

By gathering, organizing, and sharing knowledge about “promising” and “best” practices, the Compendium seeks to help reproductive health programs around the world work more effectively and efficiently, and thus improve organizational performance and, ultimately, reproductive health.

research, evaluation, and field experience. For example, literature reviews have assessed best practices in client-provider interaction in reproductive health services (39, 53), to cite just one of many topics.

Even more helpful are *evidence-based guidelines and protocols* that translate research into understandable and practical recommendations for managers and providers (22). For example, an Expert Working Group assembled by the World Health Organization (WHO) has produced practice recommendations on how to provide contraceptive methods (<http://www.who.int/reproductive-health/publications/spr/index.htm>).

To disseminate tested tools and practices more widely, international reproductive health organizations have created *databases of proven tools and practices*. For example, the Health Manager's Toolkit (<http://erc.msh.org/mainpage.cfm?file=1.0.htm&module=toolkit&language=english>) links readers to management tools designed for health and family planning programs, while the Best Practices Compendium covers a broad range of reproductive health practices and tools (see box). Building a database of best practices requires a disciplined and time-consuming process to discover, document, validate, and update proven practices (5, 43).

### ► **Exchange tacit knowledge regarding best practices and lessons learned**

Tacit knowledge includes details about lessons learned—especially concerning what did not work—that are crucial to adapting and implementing best practices but are omitted in most written reports. This makes personal contact within and between organizations and even countries essential to the exchange of lessons learned and best practices. For this reason, databases should supplement explicit descriptions of best practices with a pointer system that directs users to experienced practitioners who are willing to be contacted (43).

Meetings and e-mail discussion lists can promote the personal exchange of knowledge on lessons learned and best practices. For example, the REPRONET-L e-mail list (<http://community.jhpiego.jhu.edu/scripts/wa.exe?S1=repronet-l>) encourages members to share their experiences with reproductive

health training. Communities of practice, such as RHINO (see box), often use a combination of face-to-face and web-based interactions to promote the exchange of tacit knowledge.

To ensure that reproductive health organizations receive the tacit as well as the explicit knowledge they need to implement best practices, the World Health Organization and over 20 other reproductive health organizations have joined together to form the Implementing Best Practices (IBP) Consortium. The IBP initiative sponsors regional and national meetings to create awareness, advocate action, and help country teams match best practices to program needs. Mentoring and supportive follow-up from IBP partners then help country teams adapt, implement, sustain, and assess best practice interventions (28, 55).

► **Learn from another organization with relevant experience**

The most efficient way for one organization to learn from another organization's experience may be for their leaders and staff to meet face-to-face. During a

*study tour* staff members, ideally from all levels, visit other programs and observe and discuss their operations directly (49). *Twinning* establishes an ongoing relationship between two organizations (29). They may exchange information and skills, as is the case with Likhaan Inc. and the Mae Tao Clinic (see box, p. 18). Alternatively, they may work together on a project. For example, professionals from the Colombian family planning association, PROFAMILIA, are working with colleagues at family planning associations in Ecuador, Panama, and Venezuela to transfer and adapt PROFAMILIA's adolescent peer educator strategy and materials to those countries (50).

*Regional workshops* also create opportunities for participants from different organizations and countries to learn from one another (49). For example, professionals from Mali, Madagascar, and Cameroon exchanged know-how and national experiences at symposiums on operationalizing sexual and reproductive health care. The experience was so powerful that they created an informal community of practice to continue the discussion (59).

## ESTABLISHING A COMMUNITY OF PRACTICE: RHINO

Professionals attending a 2001 workshop on the collection and use of routine health information in developing countries found the discussions so productive that they seized the opportunity to establish a permanent forum for knowledge sharing. Today their creation—the Routine Health Information Network (RHINO)—includes more than 600 members worldwide and supports a continuing exchange of tacit knowledge on lessons learned and best practices.

Members of RHINO look to this community of practice for professional support, practical advice, and help in strategic planning, with the goal of strengthening the role of evidence-based decision making in the health sector. A moderated e-mail discussion list enables members to discuss topics of interest, exchange information, share recent

articles, and post job openings. An online forum sponsors 8- to 10-day discussions led by guest experts on special topics, such as developing a culture of information or motivating health workers. Occasional international workshops permit face-to-face meetings. Also, the RHINO Web site (<http://www.rhinonet.org>) plans to post a register of health information professionals and an annotated bibliography of relevant articles.

By using the knowledge made available through RHINO, members can improve the collection and analysis of routine health information in their own programs. Better information systems enable reproductive health managers to make informed programmatic decisions that influence the quality of services, and in turn, the health of clients.

## TWINNING BETWEEN LIKHAAN AND THE MAE TAO CLINIC

For the Mae Tao Clinic, which serves refugee women living on the Thai-Burma border, upgrading the staff's knowledge and skills was key to improving services. The solution to this KM challenge was establishing an ongoing learning relationship with Likhaan Inc., a feminist health NGO in Manila. Likhaan staff have a deeper understanding of the pressures facing the Mae Tao Clinic than other foreign trainers because of their personal experience in bringing health services to marginalized populations during the Marcos regime in the Philippines.

Staff members from Likhaan have conducted four trainings at Mae Tao on reproductive health rights, the psychosocial trauma left by violence and war, and other topics. Also, three women from Mae Tao visited Manila to learn about the work of community health organizations there and to meet women's organizations opposing the practices of mining companies and militarization. The two-week exchange encouraged them to explore possibilities for political advocacy after their return to Thailand. Community health workers from Likhaan are continuing the relationship between these two organizations by doing internships at Mae Tao.

Personal contact between health workers at different organizations, whether through long-term twinning relationships or short-term study tours, is an excellent way for them to share tacit knowledge. Greater knowledge and stronger skills help health workers offer their clients better services.

## 3. COPING WITH TOO MUCH OR TOO LITTLE INFORMATION

Globally, an increasing amount of information is available on reproductive health issues, including technical information, management advice, and statistical data. Print publications and the Internet provide access to research findings, project information, tools, guidelines, conference proceedings, and much more. At the same time, computerized data analysis systems make it tempting to collect ever more data on clients and program performance for monitoring and evaluation purposes. When faced with this kind of *information overload*, reproductive health managers and providers struggle to pick out valid, important, and relevant information from the rest—and to transform this information into knowledge that enables them to take action.

Yet this apparent glut of information may be something of a mirage. Certain kinds of materials are still not widely disseminated, including book chapters, full-text journal articles, and grey literature (44). Also largely missing is knowledge produced by reproductive health and research organizations in developing countries; their experiences and research findings are not widely circulated in either print or electronic form (4, 44).

Unquestionably, reproductive health workers at distant and isolated outposts face a dearth, rather than a glut, of information and have limited access to others' knowledge (30). There are few print materials to consult, no workshops or informational meetings to attend, perhaps not even a telephone line to reach colleagues at other facilities. Even at less isolated sites local libraries often have few and largely outdated materials, connections to the Internet are slow, unreliable, and expensive, and staff members lack the time or resources to attend conferences (22, 32, 44, 48). Faced with an information drought, these health workers struggle to keep learning and to remain up to date.

Whether health workers have too much or too little information, the outcome may be the same: important advances in reproductive health go unnoticed and unused. Organizational performance suffers as a result, and programs miss opportunities to advance family planning and reproductive health in the communities they serve.

## KM tools and approaches:

### ► **Find trustworthy sources to filter, prioritize, and validate knowledge and information**

Consulting a *content expert*, who has experience in the field of interest, is perhaps the quickest and easiest way to discover the most important knowledge and source materials on a subject; an expert can even help frame the questions to be asked (14). Skills directories (see p. 14) can point workers to people who have the knowledge they need, while communities of practice (see p. 13) enable members to canvass a large group of people with relevant experience.

Many organizations also are working to create pathways through the large body of knowledge and information on international family planning and reproductive health. By relying on their efforts, a health care manager or provider can quickly find accurate and important knowledge. For example, each year the World Health Organization (WHO) publishes the Reproductive Health Library (RHL) on CD-ROM (<http://who.int/reproductive-health/rhl/dissemination.html>). RHL includes systematic reviews of the effectiveness of reproductive health

interventions along with commentaries on their practical implications for developing countries and tools for implementation.

Other organizations gather and integrate high-quality resources on international reproductive health issues in a *resource center* such as the Ethiopia AIDS Resource Center (see box) or an actively managed Web site (48). These Web sites can act as *portals*, providing a main point of entry into the World Wide Web. For example, the Reproductive Health Gateway (<http://www.rhgateway.org>) enables health professionals to search a group of Web sites selected for accuracy, authority, and relevance so they can get quick and reliable answers to their questions.

*Electronic newsletters and information services* use e-mail to alert subscribers to news about projects, publications, research results, conferences, and Internet resources. Because e-mail technologies are less expensive and more widely available than Web-based technologies, they are more appropriate for many settings (44). For example, the Pan American Health Organization (PAHO) regularly distributes information on women's issues, including reproductive rights and violence

## CREATING AN AIDS RESOURCE CENTER IN ETHIOPIA

The scale and urgency of the HIV/AIDS epidemic has created a torrent of knowledge, with new research findings and program information emerging almost daily. This makes it difficult for policy-makers and health professionals to pick out valid and important information and to remain up to date. The Ethiopia AIDS Resource Center (ARC) has tackled this KM challenge by creating a single trustworthy source for locally relevant information on HIV/AIDS, sexually transmitted infections, and tuberculosis.

The ARC maintains both a walk-in center in Addis Ababa and a virtual center online (<http://www.etharc.org>). With support from the US Centers for Disease Control and Prevention (CDC) and technical assistance from the Johns Hopkins Bloomberg School of Public Health/Center for

Communication Programs and Constella Health Services, the center has gathered a library of over 2,000 carefully selected materials, created the Web site, and customized databases to the Ethiopian context. The ARC now has almost 1,000 users a month, and the Web site receives 20,000 hits per month. The ARC also is actively working to fill a public information gap in Ethiopia by developing culturally appropriate materials on HIV/AIDS in the Amharic language and by reaching out to journalists.

With easy access to accurate, well-organized, and continually updated information at the ARC, government officials and program managers in Ethiopia can now design more effective activities to prevent HIV transmission and to care for those affected by the epidemic.



© 2000 Surya B. Shrestha/CCP, Courtesy of Photoshare

Health workers in Nepal listen to a distance education program on the radio. Technology can help reproductive health programs share knowledge with staff in isolated locations.

against women, via the e-mail list GENSALUD ([http://www.paho.org/English/HDP/HDW/gensalud\\_about.htm](http://www.paho.org/English/HDP/HDW/gensalud_about.htm)).

► **Ask an information expert for help with retrieving knowledge**

Whether the problem is too much or too little information, *information experts* can help. They are the reference librarians or other persons serving in the role of information coordinators (see p. 14), who likely staff the organization's library or resource center (42). When reproductive health workers are faced with a bewildering flood of information and knowledge, information experts can point them to the key documents, Web sites, databases, and experts. In addition, they can track down materials that are not widely published or easily found. Reports from local research and reproductive health organizations and other developing countries in the region may be especially relevant to the project at hand.

Where knowledge is hard to come by, information experts serve a somewhat different function. They use their experience, skills, professional contacts, and Internet connections to search out and retrieve essential knowledge (44). For example, they may find what is needed on the Web and then summarize and translate it for local use (15). Acting on behalf of their clients, they also may request needed materials from national and international sources. For example, members of the Association for Population/Family Planning

Libraries and Information Centers-International (APLIC-I) share duplicate materials with one another and can request copies of hard-to-find items on the organization's electronic discussion list (9).

► **Carefully plan information-gathering systems to collect only essential data**

It is a waste of resources to collect more data than an organization needs or than its staff is capable of analyzing and reporting. Before a management or health information system is designed, it is important to consider what questions need to be answered and what data that requires. Consulting internationally accepted sets of indicators can be helpful. For example, the MEASURE Evaluation project has created a set of indicators to evaluate reproductive health programs (12), while UNAIDS has devised indicators to assess HIV/AIDS services (58).

► **Create systems to share knowledge with staff at isolated locations**

Reproductive health programs must make a special effort to ensure that workers in isolated locations receive essential knowledge. At a minimum, this means including hard-to-reach facilities in systems of regular *supervision and training* and promptly sending the facilities new guidelines, technical updates, and job aids. In Uganda, for example, the Commercial Market Strategies (CMS) Project has created a business handbook and "Best Practices Bulletin" for scattered, small-scale providers such as midwives and nurses operating private clinics. The project has also arranged training workshops and advisory clinic visits for them (17).

*Communication technology* can help remedy a scarcity of knowledge. For example, a distance education program in Nepal used radio to broadcast reproductive health training to providers working at isolated facilities (57). Likewise, a solar-powered radio telecommunications system has enabled staff at health posts in the Peruvian Amazon to get consultations, report epidemiological data, and request referrals without traveling to the nearest health center—on average, 11 hours away (37). Where computers are available but Internet connections are not, CD-ROMs provide a useful way to distribute training courses, databases, and other information (44).

## Next Steps

Organizations that adopt and institutionalize KM are transformed in a host of obvious and subtle ways. In essence, people think and work differently, and knowledge flows differently.

Perhaps the most visible change is the identification of a KM champion who has direct access to and the respect of senior executives. A KM champion is responsible for:

- Forming and leading a team of KM believers and practitioners who function as knowledge managers throughout the organization;
- Leading the development of a KM strategy;
- Advocating the importance of knowledge and learning within the organization and with its partners;
- Developing methodologies to measure the progress of KM initiatives; and
- Managing relationships with external knowledge providers.

Ideally, every employee becomes a knowledge worker. Job descriptions are rewritten from a KM perspective so that, for example, experienced providers are expected to coach novice colleagues

and librarians are expected to actively disseminate essential knowledge. To reinforce these changes, KM indicators should be added to performance appraisal, reward, and recognition systems.

New policies and procedures are also needed to make KM routine. For example, conducting debriefings, holding after-action reviews, and posting trip reports on the organization's intranet can become standard practice.

New lines of communication must be opened both inside and outside the organization. Knowledge should begin to move horizontally, for example, through project teams or informal communities of practice that draw members from different divisions or sites. Knowledge also should flow more consistently to and from distant field offices and service delivery sites, whether through conventional technologies, such as telephones and radio, or new technologies, such as e-mail and the World Wide Web.

Formal and informal links with other reproductive health organizations can promote the external exchange of knowledge, as can staff participation in

## SELECTED KM RESOURCES ON THE WEB

**Alliance for Health Policy and Systems Research (AHPsr): Training Modules on Health and Knowledge Management**

<http://www.alliance-hpsr.org/jahia/Jahia/pid/38>

**Guerrilla KM: Communities of Practice Tactics and News**

<http://www.guerrillakm.org/ev.php>

**International Network for the Availability of Scientific Publications (INASP) - Health**

<http://www.inasp.info/health/>

**Knowledge Management for Development (KM4DEV)**

<http://open.bellanet.org/km/>

**National Electronic Library for Health (NeLH): Knowledge Management**

[http://www.nelh.nhs.uk/knowledge\\_management/](http://www.nelh.nhs.uk/knowledge_management/)

**Steve Denning: Knowledge and Knowledge Management**

[http://www.stevedenning.com/knowledge\\_management.htm](http://www.stevedenning.com/knowledge_management.htm)

**UNFPA: Knowledge Sharing**

<http://www.unfpa.org/knowledgesharing/index.htm>

**USAID: Knowledge for Development**

<http://knowledge.usaid.gov/>

**World Bank: Knowledge Sharing**

<http://www.worldbank.org/ks/index.html>

global or local communities of practice, consultations with outside experts, and customary use of regional and international knowledge repositories. New, two-way lines of communication also should extend to clients and the community, with the recognition that they possess knowledge valuable to reproductive health programs.

All of these changes reflect perhaps the most fundamental and difficult transformation of all: a shift in organizational culture. Truly institutionalizing KM both requires and reflects a new respect for learning, innovation, collaboration, and evidence-based decision making throughout the organization. People understand the value of knowledge both for broader organizational objectives and for their own work.

The two case studies at the end of this paper (p. 24 and p. 28) illustrate some of these changes.

## Gaining support for KM

How can reproductive health program managers interested in KM spark this kind of transformation? While fully institutionalizing KM is neither quick nor easy, KM advocates can follow a systematic, incremental process to begin moving towards this goal. The starting point is to connect KM with real problems and opportunities at the manager's organization, thus developing a compelling rationale for exploring KM (6).

For a KM initiative to succeed, both the organization's leadership and its managers must buy into KM—preferably from the very start. KM advocates can begin by presenting the case for KM to the organization's leaders and getting their support for an exploratory process. With approval from leadership, advocates can then find interested colleagues, share this paper with them, and invite them to join an exploratory group to investigate whether and why their organization should invest in KM. Group members can learn more about potentially useful KM tools and approaches by consulting resources on the Web (see box, p. 21), reading some of the references cited here, or attending a KM workshop. The exploratory group also can contribute to the wider discussion of KM for reproductive health programs by completing the feedback form on p. 31.

## Assessing the organization's readiness

After the group becomes familiar with KM and its potential benefits, the members' next task is to assess whether the organization is ready to launch a formal KM initiative. They should consider the following five indicators, which can help predict how difficult it will be to implement KM activities and how much impact they will have on organizational performance (16):

1. Does the group have a clear idea of how KM will help achieve organizational objectives? For example, exactly how would the organization's performance benefit if staff did a better job of drawing on one another's expertise or collaborating to solve recurring problems?
2. How much does the organization's culture encourage, enable, and reward learning, knowledge sharing, and collaborative work?
3. Are there already KM activities underway, even though they are not labeled as such? These might be formal activities, such as briefings, trip reports, and shared databases, or they might be informal activities, such as lunchroom discussions and social gatherings.
4. Does the group have a good idea of what gaps exist in the organization's knowledge? That is, what knowledge and information are difficult to access or entirely lacking?
5. Consider all of the technological resources available to support KM in the organization—including both old technologies, such as radio, telephones, and calculators, and new technologies, such as computers and the Internet. How well does the organization use those technologies and the knowledge that they can help access and organize?

If the answers to all five questions are favorable, then the organization is in a good position to launch a KM initiative. If the answers to some of these questions are negative, additional preparation may be needed to create more favorable conditions, implementing KM may take more time and effort, and the group may recommend a more modest or gradual start to the organization's leaders.

## Designing a KM strategy

If the leadership decides to pursue KM, managers must draft a strategy that specifies what will be done, when, and at what cost (42). The first decision concerns the scope, timetable, and budget for KM. Most organizations work on a small scale at first, for example, pilot-testing KM in one or two locations or integrating it into a single project. This permits experimentation with limited risk and disruption and allows managers to identify and address potential problems before scaling up KM efforts (16). While it is possible to implement KM throughout an organization all at one time, this approach is both more difficult and more risky. It requires significant planning, advance work, and plentiful resources.

Regardless of the scale of a KM initiative, the strategy must spell out what organizational objective the initiative supports, which KM processes and tools will be used, what roles technology will play, and how staff members will be motivated to change their ways of thinking and working. Managers should carefully consider the following lessons from development organizations and corporate experience as they design a KM strategy (6, 35, 38, 42, 43):

- **Tailor the KM strategy to the organization.** There is no one-size-fits-all KM solution. Consider the organization's strategic objectives, structure, management, strengths, and weaknesses when devising a strategy and selecting KM methods.
- **Keep things simple.** Use simple language to define KM concepts, and relate those concepts to concrete problems and opportunities facing staff members.
- **Build on existing successes.** Identify and celebrate people and activities that are already creating, sharing, and applying knowledge.
- **Put people first.** KM often requires a fundamental change in organizational culture and everyday work patterns. Focus on changing people's attitudes, expectations, and practices as well as instituting new processes and technology.
- **Let demand drive KM.** Do not assume that employees will use KM tools that managers and

consultants devise. Enable employees and departments seeking solutions to knowledge problems to drive the creation and implementation of KM.

- **Build support with short-term projects.** Quick, simple projects that resolve irritating problems and produce visible results can build support for a larger, long-term KM strategy.
- **Take an incremental approach.** In most circumstances, do not attempt to implement a full KM strategy all at once. Test some processes and tools, assess their impact, and build on the results.
- **Conduct pilot-tests.** Pilot-test KM initiatives in a unit or division before rolling them out to the entire organization. The pilot-test can generate interest, identify mistakes, and offer an opportunity to make corrections and assure that the initiative works.
- **Institutionalize KM.** Sensitize employees to knowledge issues and incorporate KM into policies and procedures, so that KM becomes a natural part of everyone's work.

## Taking action

Once the leaders of a reproductive health program throw their full support behind a KM initiative, managers can begin implementing KM activities. Challenges are bound to arise, but both leaders and managers should remember that the potential benefits of KM are enormous.

A well-designed KM initiative can produce creative and empowered staff members who are able to work more effectively and efficiently than ever before, leading to better organizational performance. This, in turn, helps reproductive health programs reach more people with higher quality services and more effective communication about healthy behavior. Thus KM has the potential to improve family planning and reproductive health outcomes, whether the goal is preventing unwanted pregnancies and HIV/STI infections, averting maternal deaths, or reducing gender-related violence.

**CASE STUDY By Seth Kahan:**

# Sharing Knowledge at the AIDS Competence Programme

The Joint United Nations Program on HIV/AIDS (UNAIDS) and the United Nations Institute for Training and Research (UNITAR) established the AIDS Competence Programme (ACP) in February 2003 to develop the human capacity to respond to HIV/AIDS. Countries, districts, and cities are increasingly taking on the responsibility for confronting the growing threat of HIV/AIDS. The program seeks to provide them with a supportive structure for identifying their unique strengths and working together to achieve greater success.

The program is designed to include many members of society: people from corporations and municipal services as well as people from NGOs and people who live with HIV/AIDS. It enables them to work together to create effective interventions by identifying and drawing on each others' strengths to bring about social transformation. According to an ACP report: "It is about appreciating and revealing local capacity to tackle a local problem. This process

---

*"Knowledge is not just captured or shared, it is also created, discovered, distilled, validated, transferred, adopted, adapted and applied. Knowledge is richer than data and information; it's about familiarity gained from experience."*

—Geoff Parcell and Chris Collison, *Learning to Fly* (45)

---

is universal; it applies equally to rich and poor cities, to low and high HIV-prevalence communities" (2).

When Dr. Jean-Louis Lamboray, Principal Coordinator, was setting up the program, he called on Geoff Parcell to provide advice on how to make knowledge sharing work globally. After an initial visit, Parcell was transferred from British Petroleum (BP) to serve as Knowledge Management Advisor. Parcell says, "I had used KM in a business frame where it saves the company money. I hadn't thought of it in the context where it was saving lives."

In 2001 Geoff Parcell distinguished himself by authoring, along with Chris Collison, *Learning to Fly: Practical Lessons From One of the World's Leading Knowledge Companies* (45). The book was a useful introduction to knowledge management based on the authors' experience at British Petroleum. BP ([www.bp.com](http://www.bp.com)) is one of the world's largest energy businesses, made up of over 100,000 people working in 100 countries across six continents.

## WHAT ACP OFFERS INTERESTED COUNTRIES

- Support to the establishment and operation of a facilitation team, whose members are able to appreciate existing human capacity to respond to HIV/AIDS. The purpose is to build AIDS competence countrywide through learning from local experience and transfer of lessons learned.
- Experiential training in the self-assessment of AIDS competence for local communities, municipalities, NGOs, businesses, organizations of civil society, and of the public sector.
- Support to the exchange of knowledge through

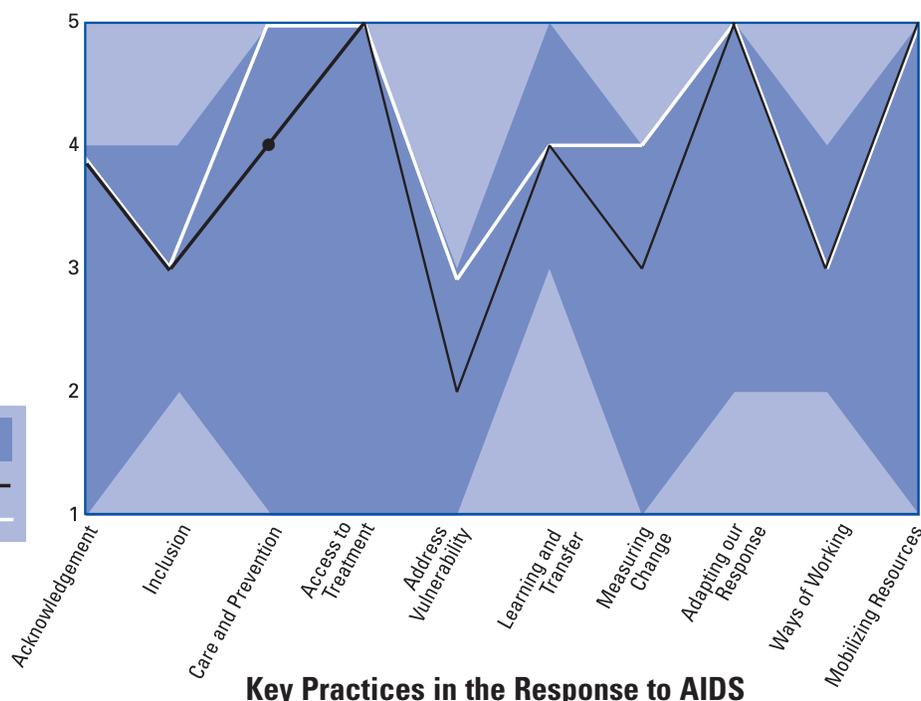
"match-making" between those who have something to share and those who want to learn, and through the synthesis of knowledge generated from global exchanges on key topics.

- Assistance in the use of eWorkspaces (eWs), a collaborative platform for exchange of experiences within and between countries, and to the People Connector (PCO), a "yellow pages" system of all people committed to AIDS competence and willing to share their knowledge.

Source: ACP, 2003 (2)

**Figure 3.****The River of Life**

Range of self-assessment results from teams attending the 2003 Knowledge Sharing Workshop on City Responses to HIV/AIDS, with current levels and targets for the city of Lyon.



Source: ACP, 2003, Annex 7 (1)

**Key Practices in the Response to AIDS****Knowledge-sharing workshop**

KM has contributed to ACP's success in developing human capacity. A closer look at one of the program's activities demonstrates how this works. In October 2003 the program sponsored a four-day knowledge-sharing workshop in Lyon, France, on city responses to HIV/AIDS.

Teams attended from thirteen cities, including: Bangkok, Thailand; Curitiba, Brazil; Ethekewini (Durban), South Africa; Gothenburg, Sweden; Barcelona, Spain; Jinja, Uganda; Kinshasa, Democratic Republic of the Congo; Lyon, France; Mumbai, India; Ouagadougou, Burkina Faso; Parma, Italy; Port of Spain, Trinidad and Tobago; and Simferopol, Ukraine. Each of the three-member teams included a representative of the municipal authority, an NGO worker, and a person living with HIV/AIDS. There was also electronic discussion for representatives from other cities that did not send teams to the workshop; this allowed them to stay current with the workshop and ask questions. A summary of each day's events was posted online, and any questions posed were addressed by participants during the course of the workshop.

**Sharing knowledge assets.** Before the workshop each city engaged in a self-assessment of AIDS competence, using the framework in Table 1 (p. 26). As a

result the teams came to the workshop with a good idea of what strengths they had to share and in what areas they could use guidance for improvement.

All of the cities' assessments were combined into a chart called the "River of Life" (see Figure 3). It illustrates the high and low points of the entire group, which form the banks of the "river." By plotting their own levels against this background, teams could see at a glance where they stood relative to the group. As an example, Figure 3 shows the current levels and targets for the city of Lyon.

During the gathering the teams shared knowledge and experience on five topics, which were chosen to reflect participants' priorities. These included:

- Vulnerability: addressing the gender dimension;
- Measuring behavior change to create an AIDS-free generation;
- Mobilization of resources;
- Prevention of HIV/AIDS among youth; and
- Care and access to treatment.

ACP's 2003 end-of-year report describes the process as follows: "Sharing their experience on these topics, [participants] identified the key advice others could use irrespective of context. This advice, supported by examples based on experience, and references for more detail constitute 'knowledge assets', which others can reuse and build on" (2).

**TABLE 1. SELF-ASSESSMENT  
FRAMEWORK FOR AIDS COMPETENCE**

KEY PRACTICES	Competence level				
	1 (BASIC)	2	3	4	5 (HIGH)
<b>Acknowledgement and recognition</b>	We know the basic facts about HIV/AIDS, how it spreads and its effects.	We recognize that HIV/AIDS is more than a health problem alone.	We recognize that HIV/AIDS is affecting us as a group/community, and we discuss it amongst ourselves. Some of us get tested.	We acknowledge openly our concerns and challenges of HIV/AIDS. We seek others for mutual support and learning.	We go for testing consciously. We recognize our own strength to deal with the challenges and anticipate a better future.
<b>Inclusion</b>	We don't involve those affected by the problem.	We cooperate with some people who are useful to resolve common issues.	We in our separate groups meet to resolve common issues (e.g., PLWA, youth, women).	Separate groups share common goals and define each member's contribution.	Because we work together on HIV/AIDS, we can address and resolve other challenges facing us.
<b>Care and prevention</b>	We relay externally provided messages about care and prevention.	We look after those unable to care for themselves (sick, orphans, elderly). We discuss the need to change behaviors.	We take action because we need to, and we have a process to care for others long-term.	As a community we initiate care and prevention activities and work in partnership with external services.	Through care we see changes in behavior which improve the quality of life for all.
<b>Access to treatment</b>	Other than existing medicines, treatment is not available to us.	Some of us get access to treatment.	We can get treatment for infections but not ARVs.	We know how and where to access ARVs.	ARV drugs are available to all who need them and are successfully procured and effectively used.
<b>Identify and address vulnerability</b>	We are aware of the general factors of vulnerability and the risks affecting us.	We have identified our areas of vulnerability and risk (e.g., using mapping as a tool).	We have a clear approach to address vulnerability and risk, and we have assessed the impact of the approach.	We implement our approach using accessible resources and capacities.	We are addressing vulnerability in other aspects of the life of our group.
<b>Learning and transfer</b>	We learn from our actions.	We share learning from our successes but not our mistakes. We adopt good practices from outside.	We are willing to try out and adapt what works elsewhere. We share willingly with those who ask.	We learn, share and apply what we learn regularly, and seek people with relevant experience to help us.	We continuously learn how we can respond better to HIV/AIDS and share our learning with those we think will benefit.
<b>Measuring change</b>	We are changing because we believe it is the right thing to do, but do not measure the impact.	We begin consciously to self-measure.	We occasionally measure our own group's change and set targets for improvement.	We measure our change continuously and can demonstrate measurable improvement.	We invite others' ideas about how to measure change and share learning and results.
<b>Adapting our response</b>	We see no need to adapt, because we are doing something useful.	We are changing our response as a result of external influences and groups.	We are aware of the change around us, and we take the decision to adapt because we need to.	We recognize that we continually need to adapt.	We see implications for the future and adapt to meet them.
<b>Ways of working</b>	We wait for others to tell us what to do and provide the resources to do so.	We work as individuals, attempting to control the situation, even when we feel helpless.	We work as teams to solve problems as we recognize them. If someone needs help, we share what we can.	We find our own solutions and access help from others where we can.	We believe in our own and others' capacity to succeed. We share ways of working that help others succeed.
<b>Mobilizing resources</b>	We know what we want to achieve but don't have the means to do it.	We can demonstrate some progress by our own resources.	We have prepared project proposals and identified sources of support.	We access resources to address the problems of our community, because others want to support us.	We use our own resources, access other resources to achieve more, and have planned for the future.

Source: AIDS Competence Programme

*Human capacity development.* The workshop helped build human capacity by changing attitudes as well as by sharing knowledge assets. Parcell comments: “In the beginning Lyon was in a position of being a generous host. In half an hour they realized that they were learning from everyone, including Ouagadougou. They were learning particularly about early identification of HIV. One of the issues in Lyon was that there were lots of refugees coming in from Eastern Europe and they only find out they’re sick when they go to hospitals. So they often don’t find out they’re HIV positive at all. Ouagadougou has lots of mobile workers. So they have very pragmatic and cheap processes that they use to identify HIV. Lyon was paying close attention, scribbling furiously and learning from Ouagadougou, and other places, what they could do to improve.

“The self-esteem that Ouagadougou gained from being seen to be useful to Lyon was enormous. That’s part of what we mean by human capacity development: a belief in self, a realization that, ‘Hey, we’ve got something that not only helps us, but helps other people.’ They realize that they don’t have to wait until an expert can come and tell them what to do next. They can learn from each other and take action now.”

## Concerns about subjectivity and validity

Much of the program’s work is based on self-assessment, and this may raise concerns about the subjectivity of the evaluation. Parcell responds, “What the self-assessment does is give the initiative to the person who wants to learn. Rather like you or I, if we were working with Microsoft products and we didn’t know how good we were at Excel or Word. If we had a way of benchmarking how good we were, then we could figure out what we most need. Then we would match up with somebody who is at a higher level and we would start talking to them. At the moment, I may

know only my skills on Excel. If somebody leans over my shoulder and sees something they haven’t done before, they can say, ‘Hey, how do you do that?’ The framework actually gives people a way of calibrating where they think they are and then invites them to say, ‘I want to learn more about that.’”

Skeptics also may raise questions about the validity of the know-how that program participants share with each other. Because knowledge works in one environment, can participants assume that the same knowledge works across the board? According to Parcell, “The process for validating is amongst the people who practice and use the know-how. If people have experience of using it and they say, ‘This is what happened in our situation,’ then it is the experience that is being shared rather than a policy. What’s important is that we connect the advice to the experience. It may be that someone has an experience which runs counter to the advice. But if we get the community of people who are practicing to discuss and then revise the advice, then I think that is more powerful than a set of experts sitting in an ivory tower somewhere.”

---

*“The process is all about developing human capacity. It relies on a facilitative approach, which starts with a shift in leaders’ attitudes, from ‘we believe in our own expertise to provide solutions’ to ‘we believe in people’s strengths to respond’, from ‘we control a disease’ to ‘we facilitate responses’, from ‘we respond to need’ to ‘we reveal strength’, and from ‘you have a problem’ to ‘together, you and we have solutions’.”*

---

– Final Report on Lyon Workshop  
ACP, 2003 (1)

## Conclusion

While ACP is still in the early stages, there is a sense of clarification and progress. At the end of 2003 project staff concluded: “During 2003 we achieved more than we thought possible .... Our process, our offer, and our strategy are now clear. Countries, cities, organisations and businesses subscribe to it enthusiastically. As new groups join we realise that we have the potential to empower many more actors committed to AIDS competence”(2).

Sources: This case study is based on materials found at the AIDS Competence Programme Web site (<http://www.unitar.org/acp>)—including quarterly and end-of-year reports, assessment frameworks, trip reports, and workshop reports—and on an interview with Geoff Parcell, ACP Knowledge Management Advisor, conducted by the author.

**CASE STUDY** *By Seth Kahan:*

# Creating a Poverty Grading System at the Marie Stopes Clinic Society

The Marie Stopes Clinic Society (MSCS), part of the Marie Stopes International Partnership, was established in 1988 in Chittagong, Bangladesh, to provide sexual and reproductive health care and education. Since it began, MSCS has grown to include 23 comprehensive health clinics throughout the nation and an additional 46 “mini-centers” in urban slums. MSCS offerings include family planning education and services; ante- and post-natal care; female sterilization; vasectomy; primary health care; youth services; prevention, diagnosis, and treatment of sexually transmitted infections; and STI/HIV/AIDS awareness-raising initiatives.

As the population and reproductive health indicators in the box suggest, MSCS’s education and services are needed. Bangladesh’s population growth and total fertility rates remain high, despite an increase in the use of contraceptives from 45 percent in 1994 to 54 percent in 2000 (60). Infant and maternal mortality also pose a challenge, as do other reproductive health problems.

MSCS recognizes that poverty causes poor sexual and reproductive health, and vice versa. Therefore the organization seeks to reach the very poor, who are most in need of services. Tanya Huq Shahriar, Knowledge and Social Development Manager of

MSCS, reports: “Around 80,000 clients per month come to our clinics and mini-centers. They are urban poor and vulnerable. This includes the homeless, young people and women of slums and shanty towns, sex workers, drug users, men having sex with men, factory workers, etc.”

Dr. Yasmin Ahmed, Managing Director of MSCS, says: “We have developed several innovative programs to reach and serve. We hope these programs will reach the poorest of the poor. There are many obstacles to reaching them, but the first challenge is to identify them. This is not easy. There is so much to consider, and not all is obvious to the outsider.”

## Identifying the very poor

International and national definitions of poverty often fall short of identifying those most in need of care, because they do not take situational nuances and circumstances into consideration. For example, income conventionally has been used as a measure of poverty, and households falling beneath a certain threshold level have been considered poor. Yet a family may have an income level higher than the defined threshold but be pushed into poverty by other factors, such as a large number of dependents or a major illness in the family. Thus a more holistic approach is needed to identify very poor households. Determining which factors should be taken into consideration is a difficult task. Dr. Ahmed, Ms. Shahriar, and their team designed a strategy in which they turned to the poor for answers.

Ahmed explains: “When it comes to extreme poverty in slums, it varies so much and there is no one criterion which you can use to measure. So we looked at the research. Some sources use income, some use household access. Each was right in its own way, but none captured the whole spectrum of poverty. That is why we decided to go back to the community and actually ask them to grade their own poverty.”

### BANGLADESH: POPULATION AND REPRODUCTIVE HEALTH INDICATORS

<b>Total population, 2004</b> .....	149.7 million
<b>Projected population, 2050</b> .....	254.6 million
<b>Life expectancy (male/female)</b> .....	61.0 / 61.8 years
<b>Contraceptive prevalence: any method</b> .....	54 percent
<b>Contraceptive prevalence: modern methods</b> .....	43 percent
<b>Births per 1,000 women ages 15-49</b> .....	117 per 1,000 women
<b>Maternal mortality ratio</b> .....	380 per 100,000 live births
<b>Infant mortality rate</b> .....	64 per 1,000 live births
<b>Average annual population growth rate, 2000-2005</b> ..	2.0 percent
<b>Total fertility rate, 2000-2005</b> .....	3.46 children
<b>Births with skilled attendants</b> .....	12 percent
<b>Health expenditures, public</b> .....	1.5 percent of GNP

Source: UNFPA, 2004 (61)

## Participatory knowledge development

Those closest to a situation generally have the richest and most relevant knowledge. Ahmed points out: “We used volunteers who were actually members from the same slum. We said, ‘You go ahead and grade households according to whatever you think would be the criteria. Just remember to note why

you categorized each household as you did.’ We sent our volunteers out ... to all the houses in the slums. They categorized them into four groups. Then we had a debriefing session with them.

“They gave us their criteria, and some of the things they came up with were actually things that hadn’t been used before in research. Like the type of fuel they used: whether they used rubbish for cook-

### TABLE 2. POVERTY GRADING SYSTEM

Indicator and ratings	Points	Means of verification
<b>Living space</b>		
Shares one room with other family	1	Observation and question
One small room for whole family	2	
Two small rooms or one large room	3	
Two or more rooms with additional space	4	
<b>House structure</b>		
Bamboo fence, bamboo thatched roof, polythene/kutchra floor or bamboo platform	1	Observation
Bamboo fence, tin roof, kutchra floor or bamboo platform	2	
Tin fence, tin roof, brick floor	3	
Brick wall, tin or brick roof, brick floor	4	
<b>Rental status</b>		
Shares rent, up to Taka 500	1	Question
Rent is Taka 500 – 800	2	
Rent is Taka 800 – 1,200, rents out room/space	3	
Rent is Taka 1,200 – 2,500 or owns structure on rented/occupied land, rents out space	4	
<b>Cooking facilities</b>		
No separate cooking space; waste materials used for fuel	1	Observation
No separate cooking space; wood, kerosene used for fuel or electric heater	2	
Separate cooking space; stove, earthen oven, electric heater or gas oven used	3	
Separate cooking space; gas oven used, rents out gas oven	4	
<b>Average number of meals per day</b>		
One meal	1	Question
Two inadequate meals	2	
Two adequate or three inadequate meals	3	
Three adequate meals	4	
<b>Frequency of quality food</b>		
Occasionally	1	Question
Once per month	2	
Once per week	3	
Two or three times per week	4	
<b>Type of work</b>		
Beggar, daily labor, irregular rickshaw puller	1	Question
Regular rickshaw puller, garment or factory worker, small trader	2	
Motorized taxi driver, shop keeper/owner, tailor	3	
Businessman, driver (taxi, bus, truck, car), owner (rickshaw, taxi, small factory)	4	
<b>Monthly income (average per household member)</b>		
Up to Taka 300	1	Question
Taka 301 – 500	2	
Taka 501 – 1,000	3	
Over Taka 1,000	4	

Source: Pörksen, 2003 (47)

**TABLE 3. RESULTS OF COMMUNITY POVERTY GRADING SYSTEM**

Location	% of households that are:				Number of households graded	Number of ungraded households
	Very poor	Poor	Middle	Rich		
Paris Road slum	76	14	6	4	977	7
Shialbari slum	43	42	10	5	1,228	200
Shikder slum	56	32	12	<1	1,045	314
<b>Total (all 3 slums)</b>	<b>57</b>	<b>30</b>	<b>10</b>	<b>3</b>	<b>3,250</b>	<b>521</b>

Source: Pörksen, 2003 (47)

ing or would go and buy fuel from the market. So they came up with quite a few nifty criteria which we thought really worked well. To make sure that their criteria were valid, we reconfirmed them.”

MSCS then worked with the PRIP Trust (a Bangladesh NGO), which conducted focus groups with slum community members. The community members determined the different indicators of poverty and levels of these indicators for rich, middle, poor, and very poor households in their community. The focus group results were combined, and a four-point rating system for each indicator was developed into a poverty grading tool, which is shown in Table 2. The rating system was used to create four poverty bands, and each was assigned a color:

- Red: very poor (score 8–12),
- Yellow: poor (score 13–20),
- Blue: middle (score 21–28),
- Green: rich (score 29–32).

### Social mapping

After the poverty grading tool was developed, focus groups of community members were convened to draw maps of each of the three slums. Individual households were graded and colored according to the grade developed in the focus groups. This visually identified the location of the very poor and also showed the percentage of households that fell into each poverty level (see Table 3).

Shahriar comments: “Here we have gathered the information about the status of the poor in the slums using the information and knowledge of their own

community. They have mapped the slums themselves. This knowledge was important for us to design a strategy for making our services accessible to the very poor ... or red houses.”

### Conclusion

The poverty grading tool has proved effective at identifying the very poor. It is being used at all of the other MSCS mini-centers in Bangladesh. Ahmed says: “We had done it on an experimental basis in only a few slums. Now we are doing it in all the slums.”

Identifying the very poor was the first step. Next, innovative programs were designed using the information about the number and location of the very poor. To date, these programs have succeeded in reaching a higher percentage of people who suffer from extreme poverty.

Lessons in reaching the very poor have been drawn from this process and are being applied elsewhere in the Marie Stopes International Partnership. The World Bank is financing the development of a training manual for this participatory poverty grading process, which is being field-tested in Yemen. This training manual is available from [research@mariestopes.org.uk](mailto:research@mariestopes.org.uk).

**Sources:** This case study is based on a Marie Stopes International research publication, *Viewpoint: Developing a Participatory Poverty Grading Tool* (47), which can be found on the Marie Stopes International Web site (<http://www.mariestopes.org.uk>), and on written and oral interviews conducted by the author with Tanya Huq Shahriar, MSCS Knowledge and Social Development Manager, and Dr. Yasmin Ahmed, MSCS Managing Director. For further information contact [research@mariestopes.org.uk](mailto:research@mariestopes.org.uk).

# Feedback Form

---

*Please contribute to the growing discourse on knowledge management in reproductive health care by sharing your experiences, challenges, suggestions, and questions. Your comments will be used to revise this paper and to prepare other KM resource materials.*

Fill out the form below and send it to: The INFO Project, Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs, 111 Market Place, Suite 310, Baltimore, Maryland 21202 USA, ATTN: Chris Davis. If you would prefer to respond online, please go to <http://www.maqweb.org/maqdoc/kmfeedback.php>.

1. Is knowledge management new to you and your organization? If not, what knowledge management experiences have you had?

---

---

---

---

---

---

---

2. How do you think KM can benefit your organization?

---

---

---

---

---

---

---

*continued on back*

## Feedback Form continued

---

3. What pressing KM challenges does your organization face?

---

---

---

---

4. Have you found this paper helpful? What changes do you suggest to make this paper more informative and more useful?

---

---

---

---

---

5. What other kinds of KM resource materials would you and your organization find helpful?

---

---

---

---

6. Would you like to receive further information in the future about KM for reproductive health organizations?  Yes  No

Name: \_\_\_\_\_

Address: \_\_\_\_\_

E-mail address: \_\_\_\_\_

## Bibliography

1. AIDS Competence Programme (ACP). Final Report: UNITAR/UNAIDS Knowledge Sharing Workshop on City Responses to HIV/AIDS, Lyon, October 2003. Geneva, UNAIDS and UNITAR, 2003. (Available: <<http://www.unitar.org/acp/OurResourcesFin.htm>>, Accessed Sep. 14, 2004)
2. AIDS Competence Programme (ACP). Report for 2003. Geneva, UNAIDS and UNITAR, 2003. (Available: <<http://www.unitar.org/acp/documents/ACPRreport20032.doc>>, Accessed Sep. 14, 2004)
3. Allee, V. Twelve principles of knowledge management. Alexandria, Virginia, American Society for Training and Development (ASTD), 2001.
4. Alliance for Health Policy and Systems Research (AHPSR). Training modules on knowledge management. Geneva, AHPSR, 2004. (Available: <<http://www.alliance-hpsr.org/jahia/Jahia/pid/38>>, Accessed Apr. 23, 2004)
5. American Productivity & Quality Center (APQC). Hewlett-Packard Consulting. In: Successfully Implementing Knowledge Management. Houston, APQC, 2000. p. 124–145.
6. American Productivity & Quality Center (APQC). Knowledge Management (KM) 101: A knowledge management overview. Participant guide for training course. Houston, APQC, 2003.
7. American Productivity & Quality Center (APQC). The World Bank profile. Best Practices in Knowledge Management. Houston, APQC, 2003.
8. Arora, R. Implementing KM: A balanced score card approach. *Journal of Knowledge Management* 6(3): 240–249. 2002.
9. Association for Population/Family Planning Libraries and Information Centers-International (APLIC-I). About APLIC-International. Research Triangle Park, North Carolina, APLIC-I, 2004. (Available: <<http://www.aplici.org/about/about.htm>>, Accessed May 14, 2004)
10. Bailey, C. Using knowledge management to make health systems work. *Bulletin of the World Health Organization* 81(11): 777. 2003. (Available: <<http://www.who.int/bulletin/volumes/81/11/en/editorial1103.pdf>>, Accessed June 24, 2004)
11. Barker, K. Order from chaos: Organizational aspects of information, education, and communication (A case study from Mali). *Journal of Health Communication* 8: 383–394. 2003.
12. Bertrand, J.T., and Escudero, G. Compendium of indicators for evaluating reproductive health programs. MEASURE Evaluation Manual Series, No. 6. Chapel Hill, North Carolina, MEASURE Evaluation, 2002. (Available: <<http://www.cpc.unc.edu/measure/publications/html/ms-02-06.html>>, Accessed May 10, 2004)
13. Bradley, J. Using COPE to improve quality of care: The experience of the Family Planning Association of Kenya. *Quality/Calidad/Qualite*, No. 9. New York, Population Council, 1998. (Available: <<http://www.popcouncil.com/publications/qc/qc09.pdf>>, Accessed Apr. 30, 2004)
14. Bukowitz, W.R., and Williams, R.L. The knowledge management fieldbook. London, Financial Times/Prentice Hall, 1999.
15. Carnevale, I., and Storey, M. Learning Resource Center (LRC) project best practices and lessons learned: A guide to improving healthcare through information and communication technology. Washington D.C., American International Health Alliance, 2003. (Available: <[http://www.aiha.com/resources/lrc\\_bestpract\\_eng.pdf](http://www.aiha.com/resources/lrc_bestpract_eng.pdf)>, Accessed April 21, 2004)
16. Carroll, V., and Kahan, S. The knowledge management for leaders checklist. Baltimore, Maryland, Johns Hopkins Bloomberg School of Public Health, Center for Communication Programs, 2004.
17. Commercial Market Strategies (CMS) Project. Uganda: Partnering with the private sector to meet Uganda's health needs. CMS Country Profile. Washington, D.C., USAID/CMS Project, 2003. (Available: <[http://www.cmsproject.com/resources/PDF/CMS\\_Uganda\\_profile.pdf?view=#url.view](http://www.cmsproject.com/resources/PDF/CMS_Uganda_profile.pdf?view=#url.view)>, Accessed May 3, 2004)
18. Cummings, J. Knowledge sharing: A review of the literature. OED Working Paper. Washington D.C., World Bank Operations Evaluation Department (OED), 2003. (Available: <[http://lnweb18.worldbank.org/oed/oeddoelib.nsf/DocUNIDViewForJavaSearch/D9E389E7414BE9DE85256DC600572CA0/\\$file/knowledge\\_eval\\_literature\\_review.pdf](http://lnweb18.worldbank.org/oed/oeddoelib.nsf/DocUNIDViewForJavaSearch/D9E389E7414BE9DE85256DC600572CA0/$file/knowledge_eval_literature_review.pdf)>, Accessed Apr. 21, 2004)
19. Curtain, R. Information and communications technologies and development: Help or hindrance? Canberra, Australian Agency for International Development (AusAID), 2003. (Available: <<http://www.developmentgateway.com.au/jahia/webdav/site/adg/share/CurtainICT4DJan04.pdf>>, Accessed Apr. 21, 2004)
20. Eastman, P., and Monkman, K. Malicounda-Bamabar: The sequel. The journey of a local revolution. *IK Notes*, No. 31. Washington D.C., World Bank, April 2001. (Available: <<http://www.worldbank.org/afr/ik/iknt31.pdf>>, Accessed Mar. 24, 2004)

21. Ellerman, D. Knowledge-based development assistance. *Knowledge, Technology & Policy* 12(4): 17–43. 2000. (Available: <<http://www.ellerman.org/Davids-Stuff/Dev-Theory/kdevass3.doc>>, Accessed Mar. 24, 2004)
22. Geyoushi, B.E., Matthews, Z., and Stones, R.W. Pathways to evidence-based reproductive healthcare in developing countries. *BJOG: an International Journal of Obstetrics and Gynaecology* 110: 500–507. 2003.
23. Gill, P.J. On the trail of knowledge. *Knowledge Management Magazine*. January 2001. (Available: <<http://www.destinationkm.com/articles/default.asp?ArticleID=417>>, Accessed Feb. 4, 2004)
24. Goh, S.C. Managing effective knowledge transfer: An integrative framework and some practice implications. *Journal of Knowledge Management* 6(1): 23–30. 2002.
25. Haynes, B., and Haines, A. Barriers and bridges to evidence-based clinical practice. *British Medical Journal* 317: 273–276. 1998. (Available: <<http://bmj.bmjournals.com/cgi/content/full/317/7153/273>>, Accessed Apr. 26, 2004)
26. Haytmanek, A., Leavitt, P., and Lemons, D. Capturing critical knowledge from a shifting work force. Houston, APQC, 2003.
27. Hovland, I. Knowledge management and organisational learning: An international development perspective. An annotated bibliography. Working Paper 224. London, Overseas Development Institute, 2003. (Available: <[http://www.odi.org.uk/publications/working\\_papers/wp224.pdf](http://www.odi.org.uk/publications/working_papers/wp224.pdf)>, Accessed Mar. 24, 2004)
28. Implementing Best Practices (IBP) Consortium. Advocacy materials. Baltimore, Maryland, Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs, 2003.
29. Interagency Coalition on AIDS and Development (ICAD). Beyond our borders: A guide to twinning for HIV/AIDS organizations. Ottawa, Health Canada and ICAD, 1999. (Available: <<http://www.icad-cisd.com/pdf/twinning.pdf>>, Accessed Mar. 24, 2004)
30. International Network for the Availability of Scientific Publications (INASP). Strengthening local capacities to create and adapt health information. Health Information Forum: Workshop 21. Report of a meeting at the British Medical Association, London, January 22, 2002. Oxford, United Kingdom, INASP, 2002. (Available: <<http://www.inasp.info/health/workshop21.html>>, Accessed Apr. 21, 2004)
31. International Planned Parenthood Federation, Western Hemisphere Region (IPPF/WHR). “Attitude Against Violence” project in Brazil. New York, IPPF/WHR, 2004. (Available: <[http://www.ippfwhr.org/programs/program\\_gbv\\_st\\_2\\_e.html](http://www.ippfwhr.org/programs/program_gbv_st_2_e.html)>, Accessed Mar. 25, 2004)
32. Kahn, S. Knowledge management review: Minimizing the degrees of separation between the developed and developing world. Chicago, Rush University. November 2003. Unpublished manuscript.
33. King, K. Towards knowledge-based aid: A new way of working or a new North-South divide? Edinburgh, Centre of African Studies, University of Edinburgh, 2000. (Available: <[http://www.gdnet.org/pdf/923\\_King.pdf](http://www.gdnet.org/pdf/923_King.pdf)>, Accessed Apr. 21, 2004)
34. Laporte, B. Sharing knowledge for development: “Knowledge as a currency.” Washington, D.C., World Bank, 2003. (Available: <[http://www.worldbank.org/ks/PDFs/K\\_is\\_currency.pdf](http://www.worldbank.org/ks/PDFs/K_is_currency.pdf)>, Accessed Mar. 25, 2004)
35. Lesser, E. Driving organizational performance through knowledge. Presented at USAID Knowledge Fair, October 20–22, 2003, Washington, D.C. (Available: <[http://www.usaid.gov/km/USAID\\_v3.pdf](http://www.usaid.gov/km/USAID_v3.pdf)>, Accessed Mar. 19, 2004)
36. Macdonald, M. Knowledge management in healthcare: What does it involve? How is it measured? *Healthcare Management Forum* 16(3): 7–11. 2003.
37. Martinez, A., and Villarroel, V. ICTs for health in the Amazon rainforest. INASP Newsletter No. 23. Oxford, United Kingdom, International Network for the Availability of Scientific Publications (INASP), June 2003. (Available: <<http://www.inasp.info/newslet/june03.html#h3>>, Accessed Mar. 26, 2004)
38. Milton, N. Knowledge management (KM). Guidance Notes No. 5. London, BOND-Networking for International Development, 2002. (Available: <<http://www.bond.org.uk/pubs/guidance/5km.pdf>>, Accessed Mar. 25, 2004)
39. Murphy, E., and Steele, C. Client-provider interactions in family planning services: Guidance from research and program experience. MAQ Papers, No. 2. Washington, D.C., MAQ Initiative, 2000. (Available: <<http://www.maqweb.org/maqdoc/vol2.pdf>>, Accessed Apr. 8, 2004)
40. Murrow, B.D. Techniques for creating communities of practice: you can do this at home. Presented at USAID Knowledge for Development Seminar, October 1, 2003, Washington, D.C. (Available: <[http://www.usaid.gov/km/brianmurrow\\_seminar3.pdf](http://www.usaid.gov/km/brianmurrow_seminar3.pdf)>, Accessed Mar. 19, 2004)
41. Musoke, M.G.N. Maternal health care in rural Uganda: Leveraging traditional and modern knowledge systems. IK Notes, No. 40. Washington, D.C., World Bank, 2002. (Available: <<http://www.worldbank.org/afr/ik/iknt40.pdf>>, Accessed Mar. 25, 2004)

42. National Health Service (NHS) [United Kingdom]. Specialist library for knowledge management. National Electronic Library for Health (NeLH). London, NHS Information Authority, 2003. (Available: <[http://www.nelh.nhs.uk/knowledge\\_management/](http://www.nelh.nhs.uk/knowledge_management/)>, Accessed Jan. 30, 2004)
43. O'Dell, C., and Grayson, C.J. If we only knew what we know: Identification and transfer of internal best practices. Best Practices White Paper. Houston, American Productivity & Quality Center (APQC), 1997.
44. Pakenham-Walsh, N. Strengthening local capacities to create and adapt healthcare information. IICD Research Report, No. 11. The Hague, Netherlands: International Institute for Communication and Development (IICD), October 2002. (Available: <<http://www.ftpiicd.org/files/research/reports/report11.pdf>>, Accessed Apr. 21, 2004)
45. Parcell, G., and Collison, C. Learning to fly: Practical lessons from one of the world's leading knowledge companies. Oxford, United Kingdom, Capstone Publishing Limited, 2001.
46. Polanyi, M. The tacit dimension. London, Routledge & Kegan Paul, 1966.
47. Pörksen, J. Viewpoint: Developing a participatory poverty grading tool. London, Marie Stopes International, 2003. (Available: <<http://www.mariestopes.org.uk/pdf/developing-a-participatory-poverty-grading-tool.pdf>>, Accessed Sep. 14, 2003)
48. Porter, C. Networking for health: A revolution. Using new ICTs to support health professionals in developing countries. Masters Dissertation, Education and Development: Health Promotion, Institute of Education, University of London. 2003. (Available: <[http://www.naschold.de/networking\\_forhealth.pdf](http://www.naschold.de/networking_forhealth.pdf)>, Accessed Apr. 21, 2004)
49. Powell, M. Information management for development organisations, 2nd ed. Oxford, United Kingdom, Oxfam GB, 2003.
50. PROFAMILIA. Salud sexual y reproductiva para adolescentes en cuatro ciudades de Latinoamérica: Aplicando las lecciones aprendidas desde la cooperación Sur-Sur. Bogotá, Colombia, PROFAMILIA, 2004. (Available: <<http://www.profamilia.org.co/SUR-SUR/S2/s2-2.html>>, Accessed Apr. 21, 2004)
51. Putney, P. Best practices case study: The Nepal Safe Motherhood Network. Bethesda, Maryland, Partnerships for Health Reform Project, Abt Associates Inc, November 1999. (Available: <<http://www.phrplus.org/Pubs/BPS-nepal.pdf>>, Accessed May 10, 2004)
52. Rabenstine, J. Knowledge mapping 101. Presented at USAID Knowledge for Development Seminar, September 22, 2003, Washington, D.C. (Available: <[http://www.usaid.gov/km/KfD\\_Seminar\\_2.pdf](http://www.usaid.gov/km/KfD_Seminar_2.pdf)>, Accessed Mar. 19, 2004)
53. Rudy, S., Tabbutt-Henry, J., Schaefer, L., and McQuide, P.A. Improving client-provider interaction. Population Reports, Series Q, No. 1. Baltimore, Johns Hopkins Bloomberg School of Public Health, the INFO Project, 2003. (Available: <<http://www.infoforhealth.org/pr/q01/q01.pdf>>, Accessed June 24, 2004)
54. Savariaud, S. Senegal: Adapted campaign boosts AIDS education. In MTV: Staying Alive 2002 – A Global HIV Mass Media Campaign, by Kathleen Shears et al. Arlington, VA, Family Health International, YouthNet Program, 2003. p. 17–22.
55. Shears, K.H. How are “best practices” identified and adopted? Network 23(1). 2003. (Available: <[http://www.fhi.org/en/RH/Pubs/Network/v23\\_1/nt2313.htm](http://www.fhi.org/en/RH/Pubs/Network/v23_1/nt2313.htm)>, Accessed Apr. 21, 2004)
56. Smith, E.A. The role of tacit and explicit knowledge in the workplace. Journal of Knowledge Management 5(4): 311–321. 2001.
57. Storey, D., Boulay, M., Karki, Y., Heckert, K., and Karmacharya, D.M. Impact of the integrated Radio Communication Project in Nepal, 1994–1997. Journal of Health Communication 4(4): 271–94. 1999.
58. UNAIDS. National AIDS Programmes: A guide to monitoring and evaluation. Geneva, UNAIDS, 2000. (Available: <<http://www.cpc.unc.edu/measure/publications/un aids-00.17e/>>, Accessed May 10, 2004)
59. United Nations Population Fund (UNFPA). UNFPA Knowledge sharing strategy. New York, UNFPA, 2002. (Available: <[http://www.unfpa.org/knowledgesharing/docs/ks\\_strategy.doc](http://www.unfpa.org/knowledgesharing/docs/ks_strategy.doc)>, Accessed Apr. 21, 2004)
60. United Nations Population Fund (UNFPA). Population and reproductive health country profiles: Bangladesh. New York, UNFPA, 2004. (Available: <<http://www.unfpa.org/profile/bangladesh.cfm>>, Accessed Sep. 14, 2004)
61. United Nations Population Fund (UNFPA). State of world population 2002. New York, UNFPA, 2004. (Available: <<http://www.unfpa.org/swp/index.htm>>, Accessed Sep. 14, 2004)
62. Von Krogh, G., Ichijo, K., and Nonaka, I. Enabling knowledge creation. New York, Oxford University Press, 2000.
63. Wexler, M.N. The who, what, and why of knowledge mapping. Journal of Knowledge Management 5(3): 249–263. 2001.

## MAQ PAPERS

MAQ Papers are published by the Maximizing Access and Quality (MAQ) Initiative—an initiative of the United States Agency for International Development (USAID), cooperating agencies, country partners, and other collaborators to apply state-of-the-art methods to maximize access to and the quality of family planning and other selected reproductive health services.



U.S. Agency for  
International Development

Copies of this MAQ Paper may be obtained by contacting:  
The INFO Project,  
Johns Hopkins Bloomberg School  
of Public Health  
Center for Communication Programs  
111 Market Place, Suite 310,  
Baltimore, Maryland 21202, USA  
Telephone: 410-659-6300  
Fax: 410-659-6266  
E-mail: [orders@jhuccp.org](mailto:orders@jhuccp.org)  
Web site: [http://www.maqweb.org/  
macdoc/km/kmsota.shtml](http://www.maqweb.org/macdoc/km/kmsota.shtml)