PART I

EXPERIENCES IN DEVELOPING COUNTRIES

Introduction to Part I: A Brief History of Community-Based Primary Health Care

John Wyon and Jon Rohde

In 1865, Prussia's Chancellor Bismarck, concerned about the quality of recruits entering his army, created the first system of primary health care for a whole nation, providing access to a doctor for all poor families. In 1911, the British parliament, led by Lloyd George and Winston Churchill, passed a National Health Insurance Bill to give every family earning less than 500 pounds a year access to a doctor of their choice. The 1911 law was extended in 1948 to all living in the British Isles. By now, most relatively wealthy countries have similar arrangements for medical care, yet many people around the world are still left out. This book presents experiences in poor and wealthy countries, seeking lessons relevant in both settings.

Where did the concept of community-based primary health care originate? Many historians of health would say from the efforts of John Grant working in China at Peking Union Medical College for the Rockefeller Foundation in the 1920s and '30s. Leaving the compounds of the most modern hospital and medical school in that vast country, Grant established health services based on locally recruited lay workers in rural Ting Hsien county. His effort to reach an entire defined population with major attention to preventive measures to preserve and promote health and only modest efforts to treat disease initiated the

20th-century model of PHC. He teamed up with Jimmy Yen, who carried the literacy movement into rural China, believing that human welfare and progress depended on the ability to read and write. Grant's emphasis on preventive measures and the use of locally recruited and trained paraprofessionals was extended by Dr. John L. Hydrick to the Dutch East Indies and later, by Grant, to India. His work was eventually embraced throughout China in the Barefoot Doctors movement of the 1960s that followed the Cultural Revolution and brought improved health to a population nearing one billion people.

In the early days of the Japanese invasion of China, Grant moved to India, where his efforts, still aimed at serving entire communities, evolved into the concept of a "health center" with both medical care provided by doctors and nurses and preventive measures led by lay outreach workers. This population-based approach became the center of the plan for India's national health system. As the secretary of the Bhore Commission, Grant guided independent India's plan for an organized health care system, which extended from a few villages with small midwife centers, through comprehensive primary health centers to district hospitals and higher levels of referral, a model which has been pursued for the past 50 years and imitated in most developing countries throughout the world. The emphasis on prevention and promotion of health, the use of low-level workers, and the definition of an entire population for which the health services are responsible were common features of Grant's models. These principles of population-based PHC still hold good today.

During the early 1940s, Sidney Kark in South Africa, following the report of the Gluckman Commission that identified striking disparities in health among different ethnic and racial groups, established a rural health center as a learning and teaching environment for the provision of comprehensive health promotion and care in Pholela, Natal. Kark, his wife, Emily, and their colleagues focused more on the social aspects of health, recognizing distinct determinants of health and health behavior in the different communities around Durban and in rural Natal. Home visits and community meetings enabled the workers to better understand the cultural context of nutrition, reproduction, hygiene, and social interaction and poverty, which were clearly shown to be the major determinants of health and disease in this population.

Kark called his approach community-oriented primary care (COPC). Drs. Mervyn Susser and Zena Stein, students of Kark, carried the model to the slums of Johannesburg, where they developed the Alexander Community Health Model as perhaps the first large population-based health care system in urban slums. The strong recognition of social, economic, and cultural factors in determining health and the need to address these factors to improve it landed Kark and his colleagues into trouble with the apartheid government, which labeled such concerns "communist" and therefore subversive. By 1960, Kark and others had fled, carrying their lessons to the United States, Israel, and other more receptive environments. The concern about the social determinants of health became an integral part of PHC projects in many nations.

After World War II, increased attention was paid to the technologies of health that could be applied to diseases of entire populations. Epidemiologists had long recognized the role of vectors in the spread of important diseases such as yellow fever and malaria. Although vector control had successfully reduced these scourges in the Western hemisphere, making such engineering accomplishments as the Panama Canal possible, the application of vaccines, insecticides, and new medicines made the prospect of the control of infectious diseases a powerful possibility. In some cases, such as yellow fever, widespread immunization and vector control were largely successful in reducing the burden of illness in large previously infected populations. But an even more ambitious and well-planned global effort to eradicate malaria was confounded by the complexity of the disease epidemiology and of the human environments in which it was found, as well as by the emergence of resistant organisms and vectors, leaving malaria a major scourge even today. Technological approaches can have complex social ramifications.

The widespread application of the oldest vaccine, smallpox, using good epidemiologic surveillance with containment measures, led to the eradication of this disease in the mid-1970s. This triumph continues to lure health planners to the attractiveness of technical interventions, properly applied with good epidemiology, to the needs of world populations. This global success, at a total cost only 5–10 times the annual costs of protecting rich nations from smallpox, fueled enthusiasm for

technical solutions to worldwide health problems that offered ultimate eradication or at least control. James Grant, son of John Grant and Executive Director of UNICEF, saw immunization as the "Trojan horse," the intervention that could bring modern health services to every family and, for the first time, offer the prospect of "health for all." His demonstration of global mobilization behind a common health goal led not only to the polio eradication effort, but also to the concept that progressively more comprehensive services could reach into every home, rich or poor. But while Grant envisioned equity in health by incremental inclusion of well-designed, technically sound universal efforts, his detractors found this approach disempowering, dependency producing, devoid of community input. Limited health for all, James Grant's idea of doing a few essential things that could reach everyone, was seen as a threat to comprehensive health under local control. How does one choose between a few health measures for all and all health measures for a few? This is a central dilemma of PHC.

Meanwhile, the relative success of public health measures in the early decades of the century resulted in burgeoning populations and recognition in the second half of the century that human fertility was itself a major threat to health. John Wyon, one of the organizers of the symposium on community-based health care on which this book is based, showed that there was a broad receptivity to birth control, even in the poor agricultural communities in India where he worked. With the development of oral contraceptives and other modern means of birth control, including surgical sterilization procedures, family planning campaigns were launched on a scale and with an approach comparable to those used to control infectious diseases. These family planning methods had limited success when offered simply as technical interventions, however. The experience of the past 50 years has demonstrated the complexity of social and cultural, as well as physiologic, factors in influencing human fertility and epidemic diseases. Public health —that is, the health of the public—can rarely be manipulated by technology alone.

Research has played an important role not only in developing appropriate technologies that can be applied in the field, but also in the study of populations and increasingly the application of social sciences to enable health programs to engage with the very communities they

wish to help. Technology turns out to be the simplest part of applied public health. The earlier lessons of Grant and Kark have been found to be essential to the success of even the targeted so-called vertical programs. Thus, in the latter third of the century, notable efforts were made to combine both the social population-based preventive thrusts of the earlier pioneers with the newer technologies becoming available as a result of research in the area of vaccines, effective drugs, and contraceptives.

A further key contribution was the demonstration by John Gordon of the importance of community-based epidemiology to the understanding of disease and health determinants in a population. He had demonstrated the value of house-to-house surveillance in documenting an epidemic of scarlet fever in a defined community in Romania in the 1930s, delineating the spread and consequences of the disease. To measure the impact of new birth control technologies on health and fertility in a rural population, he designed the Khanna Study in rural India based on similar household surveillance. Over several years, John Wyon, who led a staff of 30 interviewers, recorded monthly data on each family, revealing not only determinants of fertility previously unappreciated, such as lactational amenorrhea and gender preference, but also the high rates of tetanus, diarrhea, and pneumonia as causes of early childhood death, and resulting high fertility. Surprisingly, over 50 percent of couples of reproductive age used contraceptives at some time during the five years of observation.

In the early 1960s, when US and Pakistani public health investigators opened the Cholera Research Laboratory in East Pakistan (today Bangladesh), they established a field study area in Matlab, a rural riverine district, to study the protective effect of cholera vaccines. A household census of over 100,000 people was conducted on principles developed at Khanna and updated fortnightly to monitor the impact of various health interventions, eventually demonstrating the ineffectiveness of cholera vaccine to control epidemics, as well as defining a wide range of demographic and health parameters. The census continues to be updated every two weeks. This population has grown to 200,000 and is today the most thoroughly studied rural population of its size in the world, the central field laboratory of the International Centre for Diarrheal Disease Research, Bangladesh (ICDDR,B) and its Centre for

Health and Population Research. This field-based study area, with its support hospital and laboratories, has been central to many of the advances made in public health over the past 40 years and features prominently in the story of improved health and declining fertility in Bangladesh, which is described in chapters 4 and 5.

Following the Khanna Study, Carl Taylor demonstrated the affordability of using auxiliary nurses to provide community-based services in Narangwal in the Punjab, lessons which were extended to Companyganj in Bangladesh by Colin McCord and colleagues at the outset of that country's independence in 1972. The larger community-based health systems established by the Aroles of Jamkhed in central India (see chapter 3) and Zafrullah Chowdhury at Gonoshasthaya Kendra near Dhaka demonstrated the importance of doctors gaining people's acceptance through first providing quality medical care for the sick, in both these cases in a simple but effective rural hospital setting. Once the confidence of the community had been gained, the doctors extended preventive and promotive services into the villages, eventually addressing the underlying social and crucial economic determinants of health, which became the central focus of these programs. While the community was surely the prime concern of these dedicated and imaginative doctors, they responded initially to the community's wish to have effective curative care by introducing preventive measures in the fields of nutrition, immunization, and *only later* family planning. They extended activities in both of these large population areas (roughly 250,000 population each) slowly and in consultation with the community by training community members to increasingly provide for the most common problems. Activities progressed from curative medical services, through social and economic interventions, and then preventive health services.

The Indian government, recognizing the importance of the Jamkhed approach, undertook a massive program in the late 1970s, the village health volunteer (VHW) scheme, which eventually recruited and trained more than half a million community workers throughout India. Unfortunately, this initiative was an expensive failure. Although it attempted to extend health services into the community through the use of locally trained volunteers, it made no accommodation for their ongoing training, supervision, motivation, and direct linkage with a

caring and responsive health care system such as that provided by the Aroles in Jamkhed. The government scheme lacked concerned and committed leaders. The assumption that the communities would see the PHC system of the government as caring and responsive was rarely fulfilled, and the community health workers were often left without guidance, motivation, or support. The token payment of 50 rupees (then about US$5) per month became a crushing economic burden when more than 500,000 VHWs became involved and began to ask for wage increases and other benefits. The unsupported volunteers came to see government salaries as the logical fruit of their efforts rather than recognition of service to their neighbors.

A further reason for the failure was the lack of appreciation for all the nonmedical elements of the Jamkhed approach: water supply, improved market access, agricultural inputs, land reclamation, and animal rearing. Had the vision of the community development blocks, the integrated approach to rural development that India initiated in the 1950s across the entire nation, been linked to the community health effort of the VHWs, the synergy of health and economic improvement might well have made the effort a success.

While the conference of 110 national ministers of health at Alma-Ata in 1978 encouraged community ownership, "going to scale" or meeting the health needs of large populations became the challenge of the late 20th century. Programs constantly sought to balance the need to involve the community in both determining and providing the conditions for improved health with the desire to apply available and affordable technologies to vast populations over large areas. The malaria eradication effort had addressed this complexity through a highly standardized approach, recruiting its own staff, including not only field workers but also management. This vertical structure enabled the service to function independently and extend activities from its national headquarters to the most peripheral village. When malaria eradication turned out to be unsustainable, this failure fueled some unwarranted pejorative characterizations of vertical programs.

Similarly, family planning programs, notably in India and Indonesia, and initially in Bangladesh, recruited their own workers, who were accountable through a system independent of the regular Ministry of Health for their performance and through which they received their

salaries, supplies, training, and supervision. In Indonesia, the system reached into all 65,000 villages with family planning field workers. It was then enlarged at the community level through the *posyandu* (village health post) system. This system too depended on support and encouragement from above, but it thrived as an extension of a well-supported vertical family planning program. It was jeopardized throughout the country with the political disruption surrounding the overthrow of President Suharto. The rehabilitation of this community-based volunteer system is a large undertaking presently challenging the Indonesian Ministry of Health. Sustainability of PHC, both in financing and in leadership, has proved a recurring challenge in all PHC models, whether vertical or community based.

Surely the largest effort at provision of community health services was the Barefoot Doctors program of China, a successful effort to apply a mixture of modern medicine, traditional health practices, and promotive health behaviors, designed from above but sustained by local economic self-reliance. While this system, along with the major public health campaigns directed from the central ministry in China, accounted for tremendous improvements in the health and longevity of the Chinese people, it collapsed precipitously with the privatization of health services and the economy in the 1980s. While medical care services are still widely available in China, the preventive and promotive aspects for which the Barefoot Doctors were recognized worldwide have yet to reach previous levels in the new privatized China.

Bangladesh was a latecomer to PHC, with a weak government-operated, top-down system of health services under the Pakistani government from 1947 until independence in 1971. The experiences of many motivated young Bangladeshi health professionals working among the 10 million refugees who fled to India during the War of Liberation, as well as the experiences of many who stayed behind to contribute to the liberation by addressing the most pressing health, social, and economic needs of the population, helped shape the new Bangladesh. Those who returned in 1972 found an ailing country in great poverty with virtually no functioning health care.

Bangladesh, the "international basket case" of Henry Kissinger some 25 years ago, has made more progress in the past 30 years than any other poor country. The rapid fall in mortality, the control of the most

common diseases, the fall in fertility through use of modern contraceptives, in the context of imaginative social and economic development, based on strong research foundations, including efforts to address widespread malnutrition and environmentally conditioned illness, are documented in chapters 2, 4, and 5. These approaches provided the starting point for the discussions at the symposium. They illustrate the concepts of Nobel laureate Amartya Sen, himself a Bengali, in which development is aimed at maximizing the freedoms of the poor: freedom from ill health, from early death, from illiteracy, and from dependency.

This anthology explores the diversity of experiences from Bangladesh and other poor countries in an attempt to unravel the complexity of what works under what conditions and how it can be sustained. The diversity of experiences, mix of approaches, choice of technologies, and indeed the promotion of various ideologies have contributed to the wealth of lessons available. There was not one model forced by government but rather a proliferation of efforts by nongovernmental groups of all kinds, most with a firm base in the community. Experiences range from the national house-to-house education effort by BRAC (chapter 4), teaching every woman how to prepare oral rehydration solution to treat diarrhea, the most common killer of children, to the efforts by the ICDDR,B to entice the villages of Chakaria to take full control of their health through planning and providing health services as they see fit in their own villages (chapter 5). These examples are followed by experiences from as far abroad as Haiti (chapter 7), where the experience of the Hôpital Albert Schweitzer has for over 40 years provided a defined population with a high quality of health care. This care has produced a measurably improved life expectancy and quality of life for those fortunate enough to live in the hospital's catchment area. The story of Andean Rural Health Care (chapter 8) provides experience with the interface of government, NGO, and community, and the tensions that emerge when control is vested in the community. Chapter 9 on Nepal reflects on how information systems can drive performance and involve community members in seeking higher levels of participation in their own health.

With the emergence of the HIV epidemic in the 1980s, the challenge to PHC has become profound. Even the wealthy nations discovered the

necessity of engaging the people themselves in a full understanding of the determinants and consequences of this infection. The most difficult challenge in public health is changing behaviors, and those underlying HIV infection are the most difficult of all. During the last decade of the 20th century, as tens of millions became infected with this deadly virus, over 90% of these living in poor countries, some communities learned to deal with the devastating threat of AIDS through education, local action, and compassion. The story of community action in Boston (chapter 14) could be repeated from communities across the United States, Uganda, Thailand, and numerous other countries, showing the power of community action in the face of ineffective private and government health services.

The failure of health care systems to stem the AIDS epidemic has left communities to fend for themselves. Success has often grown upwards from grassroots efforts, through which various approaches are providing care for those suffering from AIDS as well as decreasing new infections. Global public health has no greater challenge than its response to this unprecedented epidemic. The only solution in view at the outset of the 21st century is a sound, community-based PHC approach. Only the application of the principles enunciated in the symposium on a universal scale will stem this terrible epidemic. This publication is a small contribution to that end.

1 Origins, Evolution, and Prospects for Primary Health Care in a Changing World

John H. Bryant

One of the authors of the Alma-Ata declaration describes the wavering of major agencies in guiding the world from the principles that led to the optimism of "health for all" to today's increasing attention on private services and medical care. Can the new attention to medical care from the World Bank and WHO along with marketplace economics really place knowledge and technology in the hands of all people to make health for all possible? Equity then becomes the critical issue to establish a floor below which no one should fall. Community-based primary health care still offers the best strategy.

—*Jon Rohde*

This chapter focuses on the place of primary health care (PHC)—past, present, and future—in the larger health system context in which it functions, keeping in mind its global reach. Those who might benefit often live in desperate circumstances. How do global deliberations and declarations affect their lives?

The broadest issues of PHC—the health system, the global context, and equity of access to services—include:

- the origins and evolution of PHC, beginning with the Alma-Ata meeting, including a lively example of PHC at work;
- new concepts and components of health system development: WHO's new Framework for Measuring Health System Performance, the Surveillance for Equity and the Equity Gauge, and Benchmarks of Fairness for health care reform;
- how these evolving and emerging concepts and methods fit into or shape our understanding of health system development.

THE ORIGINS AND EVOLUTION OF PRIMARY HEALTH CARE

PHC was first defined at the meeting in Alma-Ata, Kazakhstan, in 1978:

> PHC is essential health care based on practical, scientifically sound, and socially acceptable methods and technology, made universally accessible to individuals and families in the community through their full participation, and at a cost the community and the country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination.

In 1998, 20 years after Alma-Ata, a meeting in Almaty (same city, different name) brought together a number of the original participants. The consensus statement of the participants reaffirmed their belief in:

> the values of equity, participation, and intersectoral development which are expressed in the 1978 Declaration of Alma-Ata. They are as valid today as they were twenty years ago. We also believe that the understanding and implementation of PHC needs to be revitalized in view of the changes taking place on the threshold of the 21st century. The challenge will be to operationalize the values of Alma-Ata by developing, on the one hand, sustainable health systems for managing PHC and by establishing, on the other hand, complementary systems for governance that will ensure equity and intersectoral response to health needs of people, thereby, effectively uniting PHC and health for all (Primary Health Care 21, 1998).

Dr. Gro Harlem Brundtland, Director General of WHO, supported the meeting in Almaty with the following statement: "PHC remains a key strategy in implementing the policy of HFA. We will continue to work with our partners in UNICEF as well as new partners including the World Bank, UNDP and UNFPA in ensuring that the PHC movement continues and builds on the lessons learned and the gains achieved and the leadership and commitment of the many who have tirelessly worked to make PHC a reality."

The meeting concluded that the insights of 1978 into health problems and societal responses were strikingly accurate, and the proposed solutions have proven to be highly appropriate. These insights included:

- Human values (such as equity, fairness, and gender sensitivity) play a critical role in the pursuit of health for all and PHC;
- Accurate information about problems and the effectiveness of responses to them is essential;
- Community participation is important for improving the health and well-being of communities;

- Weaknesses in health systems research and research capacities must be addressed.

Not surprisingly, however, some problems of the time were less apparent and came more fully to light as the struggles to pursue health for all and PHC continued. Examples of these problems are:

- the limitations of governmental capacity to carry out comprehensive approaches to health care;
- the need for health services to be integrated with other sectors, with PHC as the centerpiece of health development;
- the social and cultural parameters of identifying and addressing health problems in particular societies;
- the challenge of incorporating PHC into health systems, which requires health care reform in virtually every nation, whatever its level of development.

There were yet other problems in the health sector that were unpredictable. Some examples are:

- emerging and re-emerging diseases, such as HIV/AIDS;
- dramatic advances in market orientation and information technologies that have led to the globalization of interactions across the world, benefiting some immensely, but aggravating inequities for others;
- armed conflicts at local levels and widespread civil disorder emerging as threats to peace and human well-being;
- in increasingly pluralistic societies, the call for PHC to embrace the major components of different lifestyles and environments, for example, through programs in schools and workplaces.

EMERGING AND EVOLVING EXAMPLES OF HEALTH SYSTEM DEVELOPMENT

As Dr. Jo Asvall (previously Regional Director for WHO/Europe) noted, the Alma-Ata concept of PHC in Europe is very much "alive and

kicking," steadily growing in comprehension and depth, solidifying its position as the most sensible way forward for the 51 member states of our region as they enter the 21st century. It has also been successfully applied in countries as diverse as Haiti and Kenya.

PHC and the Hôpital Albert Schweitzer in Haiti

The Hôpital Albert Schweitzer (HAS) was founded by Larimer and Gwen Mellon 50 years ago in rural Haiti, inspired by Albert Schweitzer and his philosophy of reverence for life. In the early years, the hospital responded to those who came seeking care, but it later expanded its vision and mission to include the health and well-being of all of the 285,000 people in the Artibonite Valley, most of them living in poverty. The hospital is committed to equity-oriented health and development, with three interactive programs: hospital, community health, and community development.

The health and development programs are largely funded from gifts and grants from outside Haiti, with communities sharing the costs in ways that do not dissuade them from seeking care. The entire program costs $16 per capita per year, with hospital services at $10, community health at $5, and community development at $1. Twelve percent of the costs are recovered through patient fees.

It is useful to see the impact of HAS programs over the years—health status and service indicators are considerably better in the HAS service area than in rural Haiti more generally (Table 1).

The HAS recently undertook an evaluation and visioning exercise to ensure that equity and quality of care were being pursued. Working

TABLE 1
Health Status and Health Care Indicators

	HAS Service Area	*Rural Haiti*
Infant mortality rate	51.6	88.9
< 5 mortality rate	68.2	144.3
Total fertility rate	4.8	5.9
Immunizations	78%	26%

with the government of Haiti and other partners, the hospital developed a monitoring and evaluation system for health status and other health-related indicators. One of the findings related to the physical structure of the valley. About three-fourths of the population lives on the plains of the valley, which is generally flat and reasonably fertile, and has roads. The remainder of the population lives on the mountainside, which is extremely rugged, and where, with few exceptions, the only transport is by foot or donkey. The evaluation process revealed that those living on the mountainside are seriously disadvantaged relative to those on the plains (Table 2).

It is interesting that HAS and its community partners have decided that, while all of the indicators noted in Table 2 need to be addressed, priority will be given to education to reduce illiteracy. Based on the widely accepted understanding that education is a fundamental requirement for health, this decision is consistent with the principle of justice that calls for protecting the opportunity to be healthy (Daniels 2002).

The experience of HAS is an example of PHC that has matured over the years to a health care system that reaches virtually everyone, poor though they may be, with care according to need, as called for by the commitment to equity. And there is an openness to new ideas and to discovering oversights (such as the differences between the mountains and the plains), and the place of a principle of justice in shaping decisions for rationing health services. Additionally, the need to scale up throughout the country is constantly recognized. The Director of HAS, Dr. Henry Perry, has also shown how complementary approaches to

TABLE 2
Health and Education Indicators in the Artibonite Valley

	Mountains	*Plains*
< 5 mortality rate	90	50
Malnutrition	48%	23%
Illiteracy	65%	33%
Total fertility rate	6	3.6
> 2 hours to care	80%	20%

PHC have produced great progress in health for all in Bangladesh (Perry 2000).

WHO's Framework for Assessing the Performance of Health Systems

WHO's Framework for Assessing Health System Performance is a fresh conceptualization of health, described in the *Bulletin of the World Health Organization* (Murray and Frenk 2000) and elaborated in WHO's *World Health Report 2000.* It has generated considerable debate on its methodology for international comparisons of health attainment. It also represents an encompassing perspective of the function of health systems at the national level.

World Health Report 2000 provides a conceptual description of the framework, including the statistical base for national indices and detailed descriptions of health system realities. It also presents the defining goals of the health system, including:

- improving health of the population, both the average level and the distribution of health;
- enhancing the responsiveness of the health system to the expectations of the population;
- fairness in financing and financial risk protection for households.

Pursuing these goals gives rise to three critical concepts:

- quality: the level of goal attainment for health and responsiveness;
- equity: fair distribution of health, responsiveness, and financial burdens;
- efficiency: achievement of the socially desired mix of the goals compared to available resources.

Stewardship is a key factor in defining strategic directions for the entire health system. It focuses on the changing role of the state in health system development and includes the notion of good governance and policymaking that serves the public interest.

At a meeting of the APHA in 1999, Julio Frenk, one of the authors (along with Chris Murray) of the WHO framework, made the following comments: "We hope this Framework will help in reaching to the future with a constructive perspective. We see the commitment to health for all as persisting and permanent, and we see our understanding of PHC undergoing positive changes as we advance our capabilities for assessing system performance."

In short, WHO's framework provides a fresh conceptualization of how health services need to be organized and managed to achieve equity, quality, and efficiency. I agree with Julio Frenk in seeing a place for PHC in the framework. However, I am willing to be a bit provocative by insisting that, for the framework to achieve its goals of health attainment with a fair distribution of health improvements, increased responsiveness to the expectations of the population (again with fair distribution), and stewardship that defines strategic directions for the entire health system, effective approaches to PHC must be included. The capacity of PHC to reach out to entire populations with basic services and participatory interactions is foundational for the WHO framework. Having said that, I also see the framework as providing a place for PHC in a variety of health systems across all levels of socioeconomic development.

Surveillance for Equity and the Equity Gauge

Surveillance for Equity, championed by Carl Taylor for many years, brings special insights to this field (Taylor 1992). Seeing equity as the distribution of benefits according to demonstrable need, Taylor goes further by insisting that equity is not only morally right, but that it can also help make PHC more effective and efficient. Thus, Surveillance for Equity is a management tool that fits synergistically with a moral imperative. From a practical perspective, sustainable PHC depends on continuing dialogue between health workers and community leaders, supported by health information that includes a concern for equity.

Equity, so often mentioned but so seldom measured and monitored, is now the subject of extensive development of such measures. The South African Equity Gauge Project, under the leadership of the Health Systems Trust in Durban, is developing indicators for equity.

They observe that equity has a number of different meanings, and the Equity Gauge is based on the following broad meaning: Equity means "fair shares" and "fair opportunities" in the distribution of and access to resources and services (Ntuli, Khosa, and McCoy 1999).

The clusters of Equity Gauge indicators include the following:

- private versus public sector;
- health status;
- health financing in the public sector;
- access (distribution of personnel in the public sector and distribution of services);
- quality of care;
- race inequalities in South Africa;
- rural-urban inequity.

These indicators are being tested through the participation of an Equity Gauge Network. Some 100 researchers in 14 countries, supported by the Rockefeller and Henry J. Kaiser foundations, are working in collaboration. We see here important advances in the pursuit of equity. Because inequities are often relative to the context in which they are being studied, the approach of the Equity Gauge invites further exploration of indicators in various social, cultural, political, and economic settings. Certainly these indicators invite interaction with the other health system components under discussion.

Benchmarks of Fairness for Health Care Reform

Norman Daniels, philosopher at Tufts University in Medford, Massachusetts, has long been concerned with interactions of justice and health. His writings have included *Just Health Care* (Daniels 1985) and *Am I My Parents' Keeper?* (Daniels 1988). In 1996, working with the Clinton Task Force on Health Care Reform, he and colleagues published *Benchmarks of Fairness for Health Care Reform* (Daniels, Light, and Kaplan 1996).

While health care reform in the US has remained somewhat stagnant, the benchmarks attracted the interest of a number of us who are interested in justice and health in developing countries. Over the past

three years, a cluster of colleagues from Asia, Africa, and Latin America has been working toward adapting the benchmarks to the realities and needs for reform in those countries, using the benchmarks as a new tool for health care reform (Daniels et al. 2000).

The benchmarks are seen as promoting change related to fairness at the local and national levels through policy change. Fairness is viewed as a multifaceted concept, broader than equity and including:

- equity in health outcomes, access to all forms of care, and financing;
- efficiency in management and allocation (inefficiency can be costly to efforts to promote equity);
- accountability, in order for the public to have influence over health care.

There are nine benchmarks:

- intersectoral public health
- financial barriers to equitable access
- nonfinancial barriers to access
- comprehensiveness of benefits and tiering
- equitable financing
- efficacy, efficiency, and quality of health care
- administrative efficiency
- democratic accountability and empowerment
- patient and provider autonomy

The intent is not to provide a blueprint of health care reform calling for insistent action following a fixed pattern. Rather, the benchmarks are a tool for facilitating deliberation and reflection on reform options. The following brief examples illustrate some of the emphases of four of the benchmarks:

- intersectoral public health
  - basic education and health literacy
  - improvements in social determinants of health
- nonfinancial barriers to access

- reduction in geographical maldistribution
- reduction in gender and cultural discrimination

- efficacy, efficiency, and quality of health care
  - focus on PHC with community participation
  - implementation of evidence-based practice
- democratic accountability and empowerment
  - explicit procedures for resource allocation with transparency
  - strengthening civil society and advocacy groups

Reflecting for a moment on some of the most serious aspects of poverty and despair, we should note that the benchmarks reach well beyond the health sector as such, calling for assessment of fairness across sectors and with respect to social determinants of health.

The benchmarks make it possible to score reform options in terms of their fairness. We developed a scale of –5 to +5 to judge reform options according to the fairness of their assessed intent or impacts. The scoring can be applied to the national, district, and local levels.

Two examples of applications of the benchmarks follow. First, in Thailand and Pakistan, the results of workshops on the benchmarks were presented to policymakers, who then invited follow-on field projects using the benchmarks to facilitate consideration of health system change. Those follow-on projects are underway.

Second, in Kenya, graduate students studying health policy and management applied the benchmarks to health sector reform actions promoted by the Ministry of Health. After analyzing and scoring the reform options, they engaged health system personnel and policymakers in dialogue about the benchmarks. There was both agreement and disagreement over interpretations of the intention of the reforms, and lively debate about scoring the extent of fairness of the reforms at local, district, and national levels. This process was constructive for all parties: policymakers, health system managers, students, and faculty.

INTERACTIONS OF HEALTH SYSTEM COMPONENTS

We have examined four sets of ideas and processes that are components of health system development:

- Primary Health Care
- WHO Framework for Assessing Health System Performance
- Surveillance for Equity and the Equity Gauge
- Benchmarks of Fairness for Health Care Reform

An overarching observation is that none of these four stands alone, functioning in isolation, in the context of addressing the health needs of populations. Each is defined to a considerable degree by the context in which it functions. They are interdependent. Each needs a health system context. Each brings essential strengths to that health system context. These are not necessarily the only four candidates for such system roles, but they are exemplary of such system components.

Figure 1 shows that the WHO framework can provide an encompassing structure for addressing the health and development needs of populations at a national level. For it to do so with the measures it pro-

FIGURE 1

Potential Interactions among Health System Components

poses for assessing health system performance calls for including other components.

The four components are interactive, and there is an interdependence between the framework and the three health system components. Without PHC, the Equity Gauge, and the Benchmarks of Fairness, the task of stewardship under the framework would be difficult indeed. PHC is an essential component without which the other components would have great difficulty achieving their intentions. For example, in relation to the framework, PHC can achieve total coverage of populations, including their participation, as would be required by the goals of health attainment as well as responsiveness to expectations.

Surveillance for Equity and the Equity Gauge provide mechanisms for ensuring equity in the fair distribution of health services, responsiveness, and financial burdens, which are central to the framework. These approaches to equity also complement the intentions of PHC and the benchmarks.

The Benchmarks of Fairness are intended to promote change in the interest of fairness across the system, and from bottom to top. They provide a tool for considering reform options that can be applied in a wide variety of circumstances: developed and developing countries; national, district, and local settings; and public and private sectors. The benchmarks clearly complement the other components.

CONCLUDING OBSERVATIONS

This chapter has examined the components of health care systems and their potential interactions. Let us consider what history has shown. The world converged at Alma-Ata to take action in the interest of human well-being. We emerged with a set of ideas—health for all and PHC—based on fundamental human values and on the most practical perspective of the time with respect to advancing community health care.

The ideas were not perfect, but they broke new ground, reached out to all nations, and advanced critical dimensions of health care. Complexities emerged that were unforeseen: changing roles of governments, lack of support of higher levels of health systems, increasingly complex and costly health care, and inequities that accompany privatization. There were also some very positive examples of PHC: the

Aroles' work in India, BRAC in Bangladesh, and Hôpital Albert Schweitzer in Haiti.

Now, the world has moved onward, benefiting from the lessons of Alma-Ata, and recognizing important problems of health and development that call for new dimensions of understanding and action. The four health system components discussed in this chapter are not a final answer. But there is no final answer—there will only be steps toward improved answers, and the health system components represent such steps.

Given the complexity of health-related factors in our world that must be addressed, and given the complexity of health systems and related responses, we are continually building structures and processes for ensuring health and well-being. Seeking constructive interactions of the components that lie before us is an example of that never-ending process.

The key question remains: Can the health and well-being of all the people be enhanced by an international determination to achieve a convergence of the best current knowledge to shape health system development?

While there are many uncertainties, we believe it is reasonable at least to address this question and bring these four components together into some form of synergy and interdependence. Step by step, an integrated system can emerge as a real possibility. If this is such a possibility—at this time in our history of global health that is tinged with such inadequacy and uncertainty—is this not a time to take some definitive steps of inquiry and exploration toward a more fully integrated system?

Is It Time for Another Alma-Ata?

Would it be helpful to have another Alma-Ata conference? The striking thing about Alma-Ata was that it brought the nations of the world together to focus on health problems that were not being adequately addressed, and to do so through the development and application of new concepts of health care buttressed by the moral values of equity and justice. It was also clear that while Alma-Ata did not have final answers to the health problems of the world, it provided important steps toward coping with current as well as emerging problems. We

now have long lists of pressing problems. Is there among them a set of challenges comparable to those that called forth the international response of Alma-Ata? Three examples of gross health system inadequacies illustrate the extreme scope of change necessary and the need to develop a strategy to effect this change.

First, the field of public health has always been pulled in two directions: towards a broad focus on the underlying social and economic causes of death and disease, and, in contrast, towards a narrow focus on medical technology and the needs of individuals. Currently, public health movements, including epidemiology, in most countries are heading down the narrow, disease-focused route; only serious and concerted effort will divert public health to a broader perspective. Clearly what is needed is a combination of concerns—for disease entities and for broader population well-being. Public health is described as being at a crossroads (Beaglehole and Bonita 1997).

Second, the problem of HIV/AIDS reaches beyond all other problems of our time in terms of human suffering and difficulty of effective and affordable management. This is surely so in Africa, and with seriously increasing burdens in Asia. There is no doubting the importance of grappling with the complexities of the disease itself. At the same time, there must be actions to ameliorate the devastating impacts of this disease on the larger society—the massive loss of productive lives of young adults, the burden on the remaining elderly, and the helplessness of AIDS' orphans, who will number 35 million by the year 2010. Concerns for equity are largely submerged by the scope of tragedies. Mutually supportive actions at the community level are often the only responses that touch households and afflicted families.

Third, limited resources have led the governments of many developing countries to limit their involvement in the provision of health care. In doing so, they have often fallen short of ensuring that other arrangements (such as through privatization and nongovernmental organizations) meet the basic health needs of populations. This failure reveals deep-seated flaws in economic and social system management as well as a diminished expression of moral responsibility for the well-being of the people.

We have also described two sets of challenges. The first is that of bringing about a constructive convergence of the four contemporary

components of health system development: community-based PHC, WHO's Framework for Assessing Health System Performance, Surveillance for Equity and the Equity Gauge, and the Benchmarks of Fairness for Health Care Reform. The second is the challenge of corrective actions to address the three problem areas described above.

It is clear that serious consideration of this range of actions would require coherent international deliberation with readiness for far-reaching policy change. This process could readily build on the insights and commitments of Alma-Ata—community-based PHC and health for all remain cornerstones for further action. But, of course, they are only a beginning. Constructing the process for bringing together the ideas, resources, and commitments for addressing these issues represents dramatically new terrain. The rewards in terms of human well-being could be immense.

Is it time for another Alma-Ata? Why not?

REFERENCES

Beaglehole, Robert, and Ruth Bonita. 1997. *Public Health at the Crossroads.* Cambridge: Cambridge University Press.

Daniels, Norman. 1985. *Just Health Care.* Cambridge: Cambridge University Press.

———. 1988. *Am I My Parents' Keeper? An Essay on Justice between the Young and the Old.* New York: Oxford University Press.

———. 2002. "Justice, Health and Health Care. An Essay." Tufts University. Forthcoming.

Daniels, Norman, Donald W. Light, and Ronald Kaplan. 1996. *Benchmarks of Fairness for Health Care Reform.* New York: Oxford University Press.

Daniels, Norman, et al. 2000. "Benchmarks of Fairness for Health Care Reform: A Policy Tool for Developing Countries." *Bulletin of the World Health Organization* 78: 740–50.

Murray, Christopher J. L., and Julio Frenk. 2000. "A Framework for Assessing the Performance of Health Systems." *Bulletin of the World Health Organization* 78: 717–31.

Ntuli, Antoinette, Solani Khosa, and David McCoy. 1999. *The Equity Gauge.* Durban, South Africa: Health Systems Trust.

Perry, Henry B. 2000. *Health for All in Bangladesh: Lessons in Primary Health Care for the 21st Century.* Dhaka: University Press.

"Primary Health Care 21, Everybody's Business." 1998. An International Meeting to Celebrate 20 Years after Alma-Ata. Almaty, Kazakhstan, November 27–28, 1998. Organized by WHO, Geneva, and the WHO Regional Office for Europe, Copenhagen.

Taylor, Carl E. 1992. "Surveillance for Equity in Primary Health Care: Policy Implications for International Experience." *International Journal of Epidemiology* 21: 1043–49.

World Health Organization. *World Health Report 2000.* Geneva: World Health Organization.

2 Primary Health Care in Bangladesh: Challenges, Approaches, and Results

Henry B. Perry

The post-independence proliferation of small NGOs in Bangladesh is doing much to meet the varying health needs of communities. Meanwhile, large programs such as BRAC (formerly the Bangladesh Rural Advancement Committee), CARE, and the government Ministry of Health address the most pressing problems of population growth, common infectious diseases, and environmental health, yielding good results on a population-wide basis. This is an optimistic chapter that looks at the progress in primary health care in the world's poorest large country.

—Jon Rohde

There is perhaps no country in the world that has made more progress in achieving health for all with fewer resources during the past three decades than has Bangladesh. Hence, it is appropriate that this chapter focus on the challenges that Bangladesh faced at the time it obtained nationhood in 1971, to review the approaches that were taken to address these challenges, to point out some of the remarkable results that have been achieved, and to consider a few of the underlying factors that made these achievements possible.

BANGLADESH IN 1971

Bangladesh is located on a large river delta. Annual flooding from the Padma, Jamuna, and Meghna rivers, which drain the Himalayas, produces very rich farmland. At the time of independence in 1971, Bangladesh had just over 70 million people (Bangladesh Bureau of Statistics 1984), and it was one of the most rural countries in the world, with less than 5% of the population living in urban areas (Bangladesh Bureau of Statistics 1998).

The gross national product in 1971 was US$80 per capita (Haq and Haq 1998). (See Figure 1 for a comparison of the GNP in Bangladesh and Pakistan between 1973 and 1999.) Seventy-six percent of the adult population was illiterate, comprising 91% of women and 53% of men (Haq and Haq 1998). Women were not allowed to travel more than a short distance from their homes because of social customs.

The infant mortality rate was 150 deaths per 1,000 live births (Figure 2), and one-quarter of live-born infants died before reaching the age of five years (Haq and Haq 1998). The life expectancy at birth was

FIGURE 1
Comparison of GNP per Capita
in Bangladesh and Pakistan, 1973–99

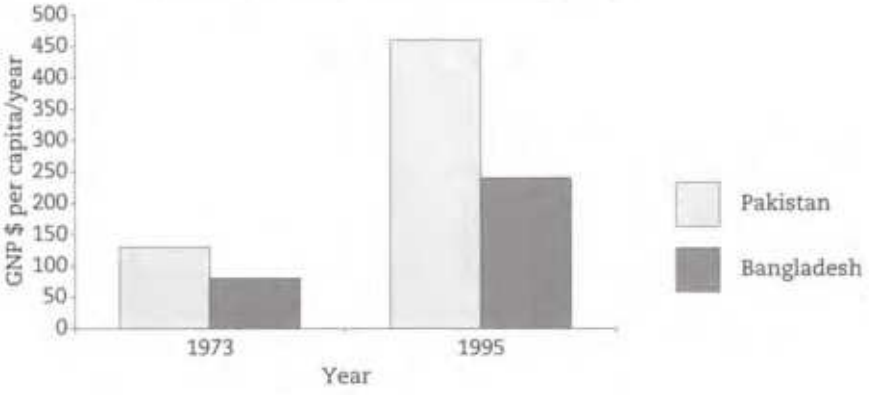
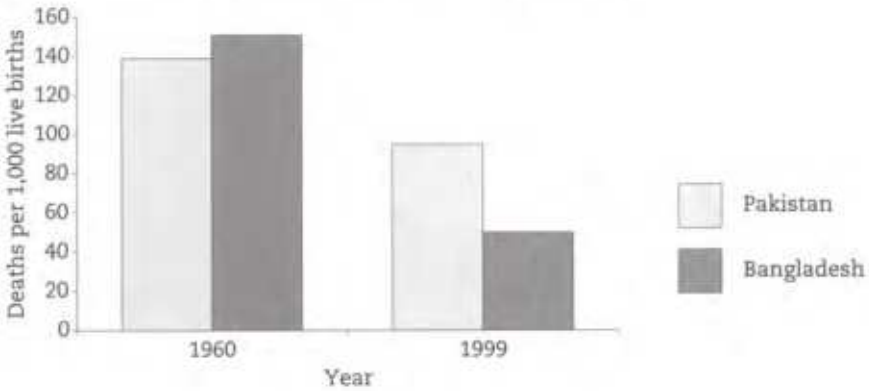


FIGURE 2
Comparison of Infant Mortality Rates
in Bangladesh and Pakistan, 1960–99



only 40 years (Haq and Haq 1998). The total fertility rate was 6.2 births per woman (Haq and Haq 1998, Figure 3). Fewer than 2% of children were fully immunized (Figure 4) and fewer than 2% of newborns were protected against neonatal tetanus through maternal immunization (World Health Organization 1995, Expanded Programme on Immunization 1998). Fewer than 5% of women of reproductive age were

FIGURE 3
Comparison of Total Fertility Rates
in Bangladesh and Pakistan, 1960–99

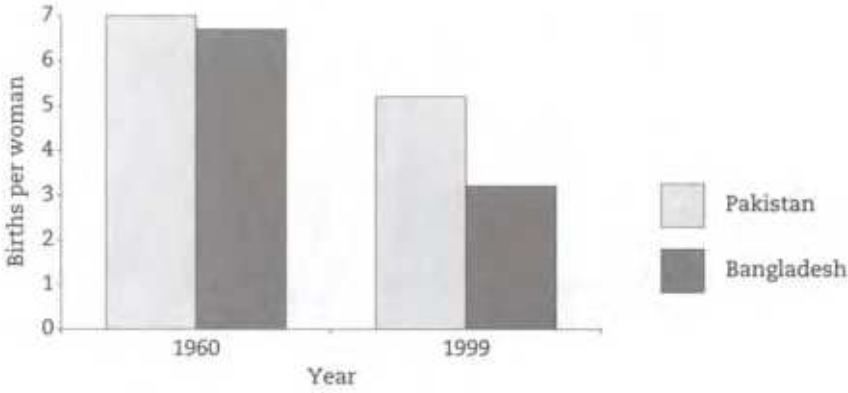
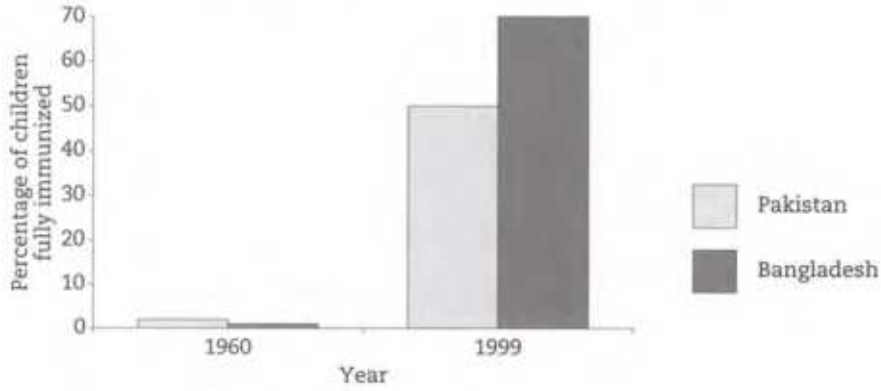


FIGURE 4
Comparison of Childhood Immunization Coverage
in Bangladesh and Pakistan, 1960–99



using a modern method of contraception (Mitra et al. 1997, Figure 5). Childhood malnutrition, cholera, and smallpox were rampant, as were neonatal tetanus and measles. Thirty thousand children were going blind in both eyes each year because of vitamin A deficiency, often precipitated by measles (Keiss 1999).

In spite of pervasive ill health, by 1971, the population had begun to

FIGURE 5
Comparison of Contraceptive Prevalence Rates in Bangladesh and Pakistan, 1960–99

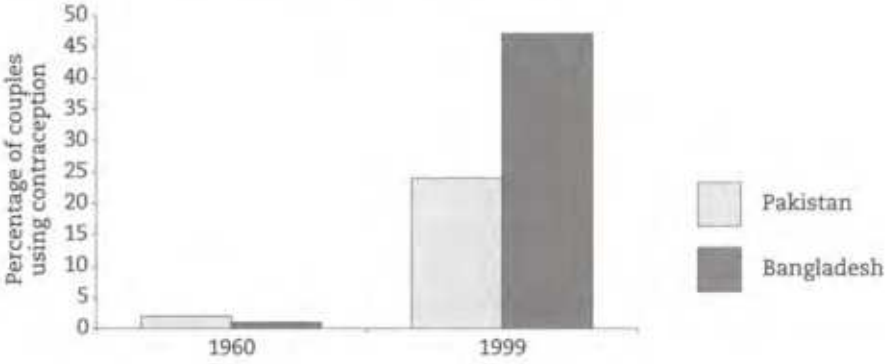
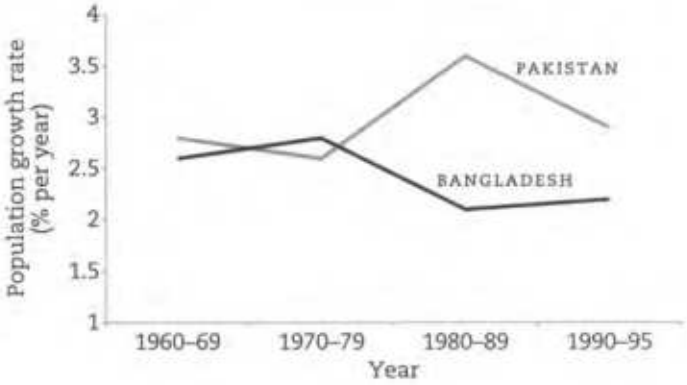


FIGURE 6
Comparison of Annual Growth Rates of the Population in Bangladesh and Pakistan, 1960–99



grow rapidly because of a rapidly falling crude mortality rate and only a minor fall in the crude birth rate (Figure 6). The annual growth rate was 2.8% (Haq and Haq 1998).

Much of the country's infrastructure, including many health facilities, had been destroyed in its war of independence with West Pakistan —a war during which up to three million Bangladeshis died. The

physician-to-population ratio was 1:65,000 (Cash 2000). Health care providers with training in modern methods of medicine and public health were virtually nonexistent outside of urban areas.

Thus, the new country of Bangladesh in 1971 faced a daunting set of challenges in socioeconomic development, including health and family planning. Henry Kissinger, United States Secretary of State at that time, referred to Bangladesh as an "international basket case." No doubt, the needs of the people of Bangladesh were among those that N. R. E. Fendall was thinking of when he wrote his famous statement about the state of health care around the world: "If I were asked to compose an epitaph on medicine throughout the 20th century it would read: 'Brilliant in its scientific discoveries, superb in its technological breakthroughs, but woefully inept in its application to those most in need'" (Fendall 1972).

The leaders of the independence movement in Bangladesh, along with their 70 million Bangladeshi supporters, fervently believed that, with political freedom, abject poverty would be eliminated and health care would become available to those most in need.

APPROACHES TAKEN

Bangladesh's initial progress in socioeconomic development was difficult, partly because of the large numbers of very poor people throughout the country. The new government gave high priority to slowing the rate of population growth. In 1975, the government proclaimed population growth to be its most important development problem (Haider et al. 1995), and international donors also gave priority to this problem. A bifurcated Ministry of Health was established with a semi-independent family planning "wing," which received most of the country's international donor assistance for family planning. In 1976, the Government of Bangladesh established the ambitious goal of reaching near-replacement fertility (that is, a total fertility rate of 2.6) by 1985 (Government of Bangladesh 1976).

In 1982, Bangladesh adopted its first national drug policy, largely due to the leadership of Dr. Zafrullah Chowdhury (Chowdhury 1996). This policy promoted the use of essential drugs and restricted the use of drugs with no scientifically proven efficacy. This bold and far-reach-

ing policy provoked, and still provokes, criticism from the Bangladesh Medical Association and from the international pharmaceutical community (Chowdhury 1996).

In 1988, a four-member committee (including Dr. Chowdhury) established by the government proposed a national health policy calling for the decentralization of the Ministry of Health's activities, integration of the two "wings" of the Ministry, and limitation of the widespread private practice of physicians in government hospitals and in government medical colleges. This proposal provoked a storm of protest from the Bangladesh Medical Association; in fact, the proposed policy and the opposition to it, led by physicians, was the beginning of the downfall of the government then in power, which was planning to adopt the proposed policy (Chowdhury 1996).

The lack of a strong government infrastructure and service delivery system throughout the country and the slowness in developing this system after independence left a void that was increasingly filled by what has become one of the most dynamic NGO sectors in the world. Organizations such as the Bangladesh Rural Advancement Committee (BRAC) and Gonoshasthaya Kendra (which Dr. Zafrullah Chowdhury founded) began to grow and received world-class technical assistance and international financial support.

Beginning in 1971 and continuing over the next three decades, Bangladesh was able to build an extensive government infrastructure of rural health facilities, train and deploy 44,500 government field workers in health and family planning, establish 108,000 government EPI outreach sites and 34,000 satellite clinics, and increase the number of physicians per population tenfold, from 1:65,000 to 10:65,000 (Perry 2000).

In addition, more than 4,000 NGOs began to work in the health, population, and nutrition sector (Perry 2000). An environment developed in which the government came to view NGOs as partners that are vital to the achievement of health and development goals for the country, and the government encouraged their work in many ways. Two of the most important NGOs in Bangladesh are BRAC and the Grameen Bank.

BRAC has become the largest nonsectarian national private agency in the world (see chapter 4). It has 25,000 full-time employees, 34,000

part-time teachers, and 25,000 nonsalaried community health workers, called *shasthya shebikas*. BRAC carries out multisectoral development activities in 50,000 of the country's 86,000 villages, and its programs serve more than 38 million people (Perry 2000).

The Grameen Bank of Bangladesh, world-famous for originating the microcredit programs of poverty alleviation for women that are now in place around the world, has more than 11,000 employees and a network of more than two million borrowers in 34,000 villages. The Grameen Bank is now beginning a national system of community-based health services. One of the main reasons for this major undertaking is that illness as well as the cost of medical care are major reasons for loan default, and often families pay for treatments that have no actual benefit (Perry 2000).

In support of this growing health partnership between government and NGOs, a unique institution was founded in 1962: the Cholera Research Laboratory. The large number of cholera cases in East Pakistan made it an ideal site for research into this devastating epidemic disease. Because of the interests of the United States and its allies in preventing cholera among its troops should they be called into duty in areas where cholera is endemic, the US Department of Defense supported a biomedical research lab for cholera in Dhaka with a field research station in a rural area called Matlab, where field trials to test new cholera vaccines could be carried out.

To assess the effectiveness of new vaccines against cholera, a method had to be developed to compare mortality rates from diarrhea among people who had received the vaccine and among similar people who had not. The pioneering community epidemiological research carried out in India just prior to that time by two Harvard School of Public Health faculty members—Dr. John Gordon, then Professor of Epidemiology, and Dr. John Wyon, then a project field director working in India under Dr. Gordon—was adapted for the cholera vaccine trials in Matlab.

The research of Wyon and Gordon, summarized in their classic volume entitled *The Khanna Study* (Wyon and Gordon 1971), was based on prospective visitation of all homes in the population under study and the recording of vital events (that is, births, deaths, and migrations) that had taken place since the previous visit. This method was

adopted for the cholera vaccine assessment, and all homes in a population of 200,000 people were visited every two weeks to record vital events. One-half of the population was in an intervention area where new cholera vaccines could be administered and the other half was in a control area—similar in all respects except that no cholera vaccine would be administered there. These studies demonstrated the ineffectiveness of the vaccines then widely in use.

In 1975, the Cholera Lab expanded its activities in Matlab, which became a field research site for testing innovative approaches for family planning and soon thereafter for child health. These inquiries had strong community-based components studied by Bangladeshi researchers with academic researchers from other countries. The family planning approaches developed in Matlab served as the prototype for Bangladesh's renowned family planning program (Perry 2000). Because of the proven effectiveness in Matlab of community health workers visiting the homes of every woman of reproductive age every two weeks to promote family planning and to distribute birth control pills and condoms, a national family planning program was gradually established in which community-based family planning workers called Family Welfare Assistants visited the homes of women of reproductive age. With the introduction of injectable contraceptives, which rapidly became the most popular method, the frequency of visits was reduced to a manageable two months. Later, NGOs throughout Bangladesh adopted this approach, so that by the late 1990s, over 30,000 community-based family planning workers were carrying out more than 50 million home visits per year to promote and provide family planning services. These workers took on a few other important simple activities as well, such as routine immunizations and participation in polio and vitamin A-deficiency eradication campaigns (Perry 2000). The scaling-up of this community-based family planning program took place gradually and with careful monitoring and evaluation of the process.

The Cholera Lab (as it was called initially) achieved international renown for its development of oral rehydration therapy (ORT) for diarrhea and for documenting its effectiveness through field trials in the late 1960s and early 1970s. Many consider this one of the most significant scientific achievements of the 20th century. The development of ORT and the extensive practical experience with its use at the

Cholera Lab (now the International Centre for Diarrhoeal Disease Research, Bangladesh, ICDDR,B) made it possible for BRAC to develop and implement the BRAC National Oral Rehydration Therapy Project between 1979 and 1990. Through this project, ORT workers visited every home in the country to teach mothers how to prepare home-based ORT (Chowdhury and Cash 1996). The project's activities were "taken to scale" gradually. A strong monitoring and evaluation program made it possible to identify weaknesses that could be corrected before scaling up to the next level. Eventually, women in 13 million households were taught how to make and use ORT.

Progress in improving immunization coverage stalled until the mid-1980s, when the Government of Bangladesh made a commitment to establish the Expanded Programme on Immunization (EPI) and actively sought the participation and collaboration of NGOs such as BRAC and CARE in its immunization efforts (Huq 1991). Much of the later progress of EPI in Bangladesh was built on the lessons from the smallpox eradication program in Bangladesh during the 1960s and early 1970s, with strong elements of the Matlab home visitor program.

RESULTS ACHIEVED

Bangladesh's achievements over the past three decades using the approaches described above are admired around the world. I will point to only a few.

The infant mortality rate has fallen by two-thirds, from 150 to around 50 deaths per 1,000 live births (Figure 2), and the total fertility rate has fallen by half, from just over six to just over three births per woman (Figure 3). This is the most rapid fall in fertility ever observed in a country where social, economic, and institutional circumstances have been so unfavorable (Perry 2000).

The percentage of children who are fully immunized increased from less than 2% to 70% (Figure 4), and the percentage of newborns protected through maternal immunization increased from less than 2% to 86% (World Health Organization 1995, Expanded Programme on Immunization 1998). The percentage of children receiving high-dose vitamin A capsules at the time of biannual campaigns increased from less than 2% to 80% (Keiss 1998).

The percentage of women of reproductive age using a modern method of contraception increased from 5% to 47%, and the rate of increase still shows no signs of slowing (Figure 5). The national EPI has prevented an estimated 1.2 million deaths from neonatal tetanus, pertussis, measles, and polio (Khan and Yoder 1998). The number of children going blind as a result of vitamin A deficiency has declined from 30,000 per year to 6,000, and the lives of an estimated 25,000 children are being saved each year through the mortality reduction effects of high-dose vitamin A supplementation (Keiss 1998). The total number of active cases of leprosy has fallen from 136,000 to 30,000, and virtually all newly detected cases are receiving multidrug therapy (Lobo 1997, 1998).

At the time of the completion of the BRAC National Oral Rehydration Therapy Project in 1990, 90% of all 12.5 million mothers of young children knew about and could prepare oral rehydration salts (Chowdhury and Cash 1996). More recent studies have documented that the ORT use rate for cases of childhood diarrhea is over 50% and, in cases of severe diarrhea, it is 80% (Chowdhury et al. 1997b).

These achievements have all taken place with a minimal amount of financial resources. In 1996–97, only US$8.63 per capita was spent on primary health care services and US$1.97 was spent on hospital services (Health Economics Unit and Data International 1998).

Some of the results of the BRAC community health care program, made possible through the work of shasthya shebikas, merit special attention. These include the following:

- In a pilot area of "only" 4.8 million inhabitants, shasthya shebikas, with the help of a strong training and supervisory program, were able to reduce the rate of tuberculosis to half that of comparison areas. This was made possible through an aggressive case-detection strategy and through a home-based, directly observed treatment program in which 85% of patients completed their full course of therapy (Chowdhury et al. 1997a).
- In a project area of approximately 10 million persons, shasthya shebikas were trained to implement the World Health Organization protocol for diagnosis and treatment of pneumonia. Of

60,222 cases of acute respiratory infection detected by shasthya shebikas, 18,609 cases of uncomplicated pneumonia were treated, and 181 cases of severe pneumonia were identified and referred. The cure rate for the cases of uncomplicated pneumonia treated with antibiotics by shasthya shebikas was 98% (BRAC 1998, Haque 1999).

Comparisons of Bangladesh's progress with that of Pakistan have generated particular interest because of the fact that they are both South Asian countries and they have a common political and religious heritage. Although the gross national product (GNP) per capita increased substantially less in Bangladesh than in Pakistan between 1973 and 1999 (Figure 1), the decline in infant mortality has been much more pronounced in Bangladesh (Figure 2). Improvements in childhood immunization coverage rates have been much greater in Bangladesh than in Pakistan (Figure 4). The decline in the total fertility rate has also been much greater (Figure 3). The increase in the contraceptive prevalence rate has also been much greater (Figure 5), and the annual growth rate of the population has become substantially less (Figure 6).

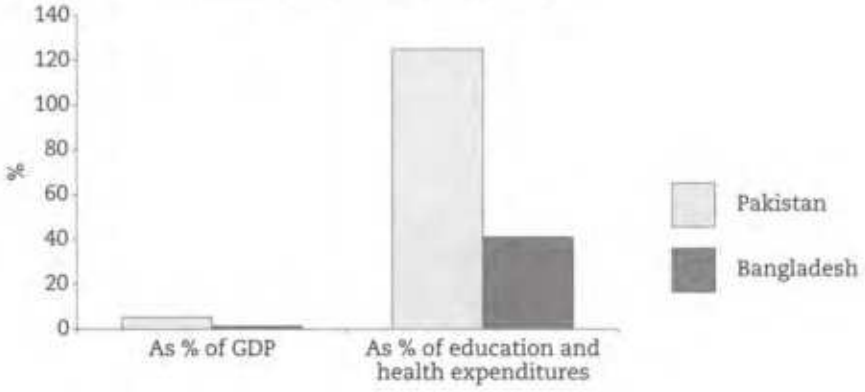
Pakistan has a notably higher level of military spending than Bangladesh. Pakistan spends four times more, as a percentage of GNP, for military purposes than Bangladesh does. For every rupee spent in Pakistan on education and health, 1.25 rupees are spent for military purposes, while in Bangladesh, only 0.41 taka are spent for military purposes for each taka spent on education and health (Figure 7).

ACCOUNTING FOR BANGLADESH'S PROGRESS

Accounting for Bangladesh's progress is not simple. Nevertheless, a number of factors taken together appear to provide a reasonable explanation:

- There has emerged a strong partnership among the Government of Bangladesh, NGOs, and communities for the provision of basic primary health care services. The government has actively pursued partnerships with NGOs, and both govern-

FIGURE 7
Comparison of Military Spending in Bangladesh and Pakistan, 1995



ment and NGO health services have worked actively with communities to carry out their programs.

- There is a tradition in Bangladesh of high-quality field and operations research that has guided changes in government and NGO programs. This tradition has also made it possible to scale up several programs nationally, a feat that has failed in many other countries. BRAC and ICDDR,B have played important roles in these activities.
- The government has been open to international donor support for its own health and family planning programs, and it has encouraged international donor support for NGO programs as well. The international donor community has responded generously. There has been a healthy balance of expatriate and Bangladeshi technical expertise.
- There has emerged a tradition of strong outreach services down to the household level, particularly for basic health and family planning services. The tradition of home visitation in delivery of basic health and family planning services is one that, in my opinion, deserves much more recognition as a reason for Bangladesh's progress than it has received. Home visitation has been an essential ingredient in Bangladesh's success in reducing childhood mortality and in reducing fertility—

both essential steps in achieving health for all. This tradition of home visitation partly owes its intellectual roots to John Gordon and John Wyon, who demonstrated the viability of this approach as a demographic and epidemiological tool with which to prospectively measure rates of mortality and fertility, and effects of health and family planning interventions within a population (Wyon and Gordon 1971).

- High-impact primary health care services, namely immunizations and family planning, have been emphasized.
- Multisectoral approaches have helped Bangladesh to move more quickly toward the goal of health for all.

CONCLUSION

Enormous progress at modest cost can be made in reaching health for all when community-based approaches designed to reach the entire population are led by government–NGO partnerships and if strong political and professional leadership is present. A "friendly" policy environment promotes success. That is, when the government supports collaboration with the NGO sector and with communities and when the government is open to new ideas based on solid field research, the probability of success will be greater.

The historian Arnold Toynbee remarked, "The 20th century will be chiefly remembered in future centuries not as an age of political conflicts or technical inventions, but as an age in which human society dared to think of the welfare of the whole human race as a practical objective" (quoted in UNICEF 1995). Perhaps no other extremely poor country of the developing world has made more progress in such a short time in improving the welfare of its people. This remarkable achievement is a tribute to the hard-working and deeply motivated people of Bangladesh. This remarkable achievement is also a tribute to the international donor and public health community, which has worked hand in hand with the Bangladeshi people.

REFERENCES AND RESOURCES

Bangladesh Bureau of Statistics. 1984. *Bangladesh Population Census: 1981.* Volume 1.

———. 1998. *1997 Statistical Yearbook of Bangladesh.* Dhaka: Ministry of Planning.

———. 1999. Data supplied by Hamidul Hoque Bhuiyan.

BRAC. 1998. *Annual Report of the Reproductive Health and Disease Control Project, 1997.* Dhaka: BRAC.

Cash, Richard. 2000. Personal communication.

Chowdhury, A. Mushtaque R., and Richard A. Cash. 1996. *A Simple Solution: Teaching Millions to Treat Diarrhoea at Home.* Dhaka: University Press.

Chowdhury, A. Mushtaque R., et al. 1997a. "Community Health Workers Can Control Tuberculosis: The BRAC Experience in Bangladesh." *The Lancet* 350: 169–72.

Chowdhury, A. Mushtaque R., et al. 1997b. "The Status of ORT: How Widely Is It Used?" *Health Policy and Planning* 12: 58–66.

Chowdhury, Zafrullah. 1996. *The Politics of Essential Drugs. The Makings of a Successful Strategy: Lessons from Bangladesh.* Dhaka: University Press.

Expanded Programme on Immunization. 1998. *Findings of the National Coverage Survey.* Dhaka: Expanded Programme on Immunization, Directorate General of Health Services, Government of the People's Republic of Bangladesh.

Fendall, N. R. E. 1972. "Auxiliaries and Primary Medical Care." *Bulletin of the New York Academy of Medicine* 48: 1291–1300.

Government of the People's Republic of Bangladesh. 1976. *Bangladesh National Population Policy: An Outline.* Dhaka: Population Control and Family Planning Directorate, Ministry of Health and Family Welfare.

Haider, Syed J., Kim Streatfield, and Md. Azizul Karim. 1995. *Comprehensive Guidebook to the Bangladesh Family Planning-MCH Program.* Dhaka: Research Evaluation Associates for Development; The Population Council; Ministry of Health and Family Welfare.

Haq, Mahbub ul, and Khadija Haq. 1998. *Human Development in South Asia, 1998.* Dhaka: University Press.

Haque, Raisul (BRAC). 1999. Personal communication.

Health Economics Unit and Data International. 1998. *Bangladesh National Health Accounts 1996/97.* Dhaka: Ministry of Health and Family Welfare and Data International, Ltd.

Huq, Mujibul, ed. 1991. *Near Miracle in Bangladesh.* Dhaka: University Press.

Keiss, Lynnda. 1999. Personal communication. Dhaka: Helen Keller International.

Khan, M. Mahmud, and Richard A. Yoder. 1998. "Expanded Report on Immunization in Bangladesh: Cost, Effectiveness, and Financing Estimates." Technical Report No. 24. Partnerships for Health Reform. Bethesda, MD: Abt and Associates.

Lobo, Derek. 1997. "National MOHFW Tuberculosis and Leprosy Programmes." Unpublished documents.

———. 1998. Personal communication. Dhaka: World Health Organization.

Mitra, S., et al. 1997. *Bangladesh Demographic and Health Survey 1996–1997.* Dhaka: National Institute of Population Research and Training; Mitra and Associates; Calverton, MD: Macro International Inc.

National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ORC-Macro International. 2000. "Bangladesh Demographic and Health Survey 1999–2000: Preliminary Report." Dhaka: NIPORT and Mitra and Associates; Calverton, MD: ORC-Macro International.

Perry, Henry B. 2000. *Health for All in Bangladesh: Lessons in Primary Health Care for the 21st Century.* Dhaka: University Press.

Rashid, Haroun Er. 1991. *Geography of Bangladesh.* Dhaka: University Press.

UNICEF. 1995. *The State of the World's Children, 1995.* New York: UNICEF.

World Bank. 1998a. "National Nutrition Program (NNP) Identification Mission, July 4–16, 1998." Aide-mémoire. Dhaka: World Bank.

———. 1998b. *Project Appraisal Document on a Proposed Credit in the Amount of SDR 185.5 Million (US$250 Million Equivalent) to the Government of the People's Republic of Bangladesh for a Health and Population Program Project.* Report No. 17684-BD. Washington, DC: World Bank.

World Bank and Bangladesh Centre for Advanced Studies. 1998. *Bangladesh 2020.* Dhaka: University Press.

World Health Organization. 1995. *Global Programme on Vaccines and Immunization Information System.* Geneva: World Health Organization.

Wyon, J. B., and J. E. Gordon. 1971. *The Khanna Study: Population Problems in the Rural Punjab.* Cambridge: Harvard University Press.

3 The Comprehensive Rural Health Project in Jamkhed, India

Mabelle Arole

The Jamkhed program in central India represented the best primary health care model available at the time of Alma-Ata. Dedicated leadership, strong community involvement, and self-reliance led to dramatic declines in mortality, fertility, and malnutrition. Unfortunately, when India tried to duplicate this program throughout the country, the national program collapsed due to lack of a full understanding of the critical elements of leadership, integration with an effective health care system, and involvement of the people in the community. While Jamkhed continues, the national expansion was a failure.

—*Jon Rohde*

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A quarter-million marginalized men and women in Maharashtra, India, realized the potential within themselves to improve their own health. They have learned how to better their lives and those of the people around them. Infant mortality (a standard indicator of health) has been reduced from over 175 to 18 per 1,000 births, and the birth rate has fallen from over 40 to 17 per 1,000 within the last two decades.[1]

Lalanbai Kadam is a woman in Jamkhed, Maharashtra. She says, "I am a Dalit widow. I used to think that I was a nobody. I lived in constant fear because I was treated worse than an animal. My son died when he was less than three years old, and I was blamed for it and sent away by my husband. My parents made me marry an old man who had tuberculosis, and he also died. I returned to the village in shame. I lived in darkness. To support myself, I swept and cleaned the village and did hard manual labor and received a pittance. Even dogs were welcome in the house, but I, as a Harijan, was not. Then, along with many other women, we decided not to accept this anymore."

As young doctors, my husband and I made a commitment to each other that we would devote our lives to improving the health of the poorest of the poor in rural India. After preparing ourselves, we

1. The infant mortality rate in project villages declined from 176 (deaths per 1,000 live births) to 17–20 between 1972 and 1992 (Mabelle and Rajanikant Arole, *Jamkhed: A Comprehensive Rural Health Project*, London: Macmillan, 1994, chapter 16). In 1992, 5% of children suffered from malnutrition (weight for age), versus 40% in the survey 20 years earlier. The crude birth rate in 1992 was 19, compared to 40 in 1972.

worked in a rural hospital in western Maharashtra. We were competent, skilled, and hardworking. The hospital flourished and expanded. We went into the villages and held village clinics. We were successful as professionals.

Our commitment, however, was to the poor, and we asked ourselves constantly if our work and services made a real difference to the health of the people. To my dismay we found that our work was having little impact on the health of the people. Infant mortality continued to be high. Most diseases we encountered were preventable. Children were brought in dehydrated, malnourished, and with diarrhea, and many women had problems such as obstructed labor. Often they came in too late. Further analysis proved that only a few people out of the total population were coming to us. Traditional cultural practices, high cost, poverty, and distrust of modern medicine prevented people from coming to the hospital. We started questioning the top-down, doctor- and hospital-centered approach to health care. This led to a search for a more relevant and equitable health care system. Learning from the collective wisdom of many pioneers with similar concerns, we planned a health program. The program was to be people based, and communities would participate at all stages in its development and implementation. It was to be a health program that would respond to the needs of the people, particularly the poorest of the poor.

THE BEGINNING

As we looked around for an area where people were interested in starting such a health program, an enlightened political leader at Jamkhed (a community development block in Ahmednagar district in Maharashtra) invited us to visit. He and other leaders expressed the need for a hospital to take care of obstetric and other emergencies. They perceived health care to be mainly a provider of relief from pain and suffering. We explained our intention of working with the people to improve health through preventive programs. The leaders were not impressed. However, they emptied a veterinary dispensary in the middle of a cattle market and provided a couple of sheds to start the "hospital." We accepted what the people had and made the place safe for surgical care.

Soon we were called upon to prove our skills. A woman was brought in with a ruptured uterus and we had to operate on her to save her life. This time we were able to follow up by developing direct linkages with villages.

THE STORY

Using curative services as an entry point, we came in more contact with the people. It soon became evident that poor people were not interested in health. They were interested in relief from unbearable pain. Other illnesses were mere irritations. "We need water, we need jobs so that we can buy food to kill the hunger pangs, and then we will not have to migrate to cut sugar cane" was a repeated comment. "You ask us to wash hands, to use soap. Where is the water? Do you know the cost of soap?" they challenged us.

It was we who had to change first. Their questions forced the medical team members to think about poverty. How can we share scientific information in a meaningful way unless we understand people's problems? We decided to live on Rs45 (or about US$7) per month (the prevailing average wage at that time). We were in for surprises. Soap costs almost two days' wages. Water needed to flush a toilet was more than a month's wage. Our eyes were opened to reality. The poor people taught us how they cope with the situation, [through means] born out of experience. Their felt needs of food and water were more relevant than our health interventions.

Setting aside our agenda for health promotion, we responded to the need for safe drinking water. We identified an NGO involved in drilling tube wells and received a grant to drill tube wells. The Dalits were concerned that they would not have access to the water if the well was in the main village. A traditional practice was used to solve the dilemma. A water diviner was taken into confidence and asked to walk through the whole village but divine water only in the Dalit section. Over 150 tube wells were drilled in the Dalit areas of villages. Everyone, rich and poor, needed water, and it was too precious [for anyone] to object! More importantly, we had gained the confidence of the poor people. We were in!

The participation of only leaders was obviously insufficient. Health improvement in the whole village needs total community participa-

tion. For example, the physical environment of a village has to be protected by the whole community. Eradication of harmful social practices requires community action. Much starvation and undernutrition were due to social attitudes toward women and children. To change people's attitudes toward women and children, the reality had to be faced that religion, caste, and politics divided both rich and poor people. The device of starting volleyball games solved the problem of getting people to talk together. Socially minded people from all groups and factions were invited to volleyball games in their own villages. After the game, both onlookers and players stood around and talked. It soon became the meeting place for more serious discussions on village development.

Informal groups were then organized into the Farmers' Club. All members were not necessarily farmers. Many were landless poor people. According to their interests, seminars were arranged on subjects such as agriculture, dry land farming, and veterinary medicine. Poor people were more interested in the health of farm animals than [in] their own health or that of their children. In each village men were trained to provide primary veterinary care. Government extension workers helped us in these meetings and training. This led to people becoming interested in human health.

ASSESSMENT AND ANALYSIS BY THE PEOPLE LEADING TO COMMUNITY ACTION

Farmers' Club members, along with project staff, surveyed the health situation. A villager recalls, "The survey helped us to understand the health problems in the village. Five or six of us were involved in the first survey. We realized it was for our own good, so we did an accurate survey. Each of us took one area of the village and filled in all the preliminary information. No family was left out. The questionnaire was not difficult to complete. There were questions about immunization of children and whether they had been ill in the past two weeks. We were to report any child's death in the past 12 months and details of how the child had died. We learned to assess the nutritional status of the child by measuring the arm circumference. To our surprise, many children we thought had severe illness turned out to just lack adequate food!

There were questions on pregnancy and family planning. We knew who was missing at the time of the survey, so we went back and completed the survey.

"We analyzed the results with the help of project staff. We learned a lot and began to understand the causes and effects of disease. We had always believed that children did not thrive because of a curse from God. When we understood that the problem was lack of food and preventive care, we organized a community kitchen. We learned to monitor the growth of our children, by regular weighing every month and plotting weight on a 'road to health' card."

Another action was improving sanitation. Many of the families had repeated attacks of fever and chills. Diarrhea was common. Another villager describes the discussion that took place regarding the frequent attacks of illness. "We discovered that 80% of the families had at least three episodes of fever with chills (which we presume was malaria) in the past year. We realized that if we got rid of the puddles made by wastewater and composted the rubbish heaps, then much of the breeding of mosquitoes and flies would be eliminated and the frequency of diseases reduced. With each attack we spent close to Rs10 to go to a doctor, or Rs30 per year. Imagine the amount we were spending for something we could prevent? Moreover, we learned that even if we did have such illnesses, we did not need injections and expensive medicines to be cured. Why not clean up the village? The social worker showed us several methods of draining wastewater. The soak pit, with water draining underground, appealed to us most. We appointed people to mobilize the whole village to build soak pits. Most families showed interest. We, the Farmers' Club members, dug the pits and the owners provided the filling of sand, broken bricks, and a plank to place over the pit. It made a great difference to the frequency of illness in our village."

In each village, the Farmers' Clubs showed enthusiasm in doing the health survey. It helped the people to assess their own priorities. Such discussions eventually led to a demand from the Farmers' Club members to involve women. They requested us to train their own village women to be health workers. "Educators, professionals from the city do not understand our problems, our traditions. They speak another educated language. Our women have never been to school; they will accept someone from their own community that they trust."

STATUS OF WOMEN AND HEALTH

As the Village Health Workers (VHWs) discussed each health topic, the relationship between women's status and health became apparent. They also realized how much their own lives had been affected by the social pressures and norms imposed on them. Sarubai, a VHW, was particularly vocal when she described her own experience:

"I was married when I was a child. I got pregnant when I was 14, and, as is the custom, I came to my mother's house in Rajuri for delivery. I was in labor for three days. Finally a dai arrived and said that the baby was too big and I would not be able to deliver normally. The only way to save my life was to remove the baby piecemeal. I recovered but remained weak and ill for months. During that time I never heard from my husband. Later he sent word that he did not want a woman who could not produce a living child. As a woman left by her husband, I became an outcaste looked down on by society. I was unwanted, uncared for, living at the mercy of my brother.

"Why did all this happen? All because we women have no value in society. Because I was a girl, my parents were interested in getting me married off as soon as possible. I was not old enough to bear a child . . . I was only 14. Then, like a piece of property, I was thrown off by my husband."

Another VHW replied, *"At least you lost your baby. My daughter has two healthy children. She needed a Cesarean operation and now her husband has sent her away. He feels that she may not be able to do hard manual labor and carry heavy loads because of the operation."* The mother welcomed her daughter home and worked on changing the attitude of the husband.

ORGANIZING WOMEN OF THE VILLAGE AND OVERCOMING CASTE BARRIERS

The village women were not permitted to socialize with women from other castes. They were unwilling to break caste prejudices, since the women were also the keepers of tradition in their society. Centuries of subservience had made them accept their secondary role; they were trained to suffer in silence. This attitude had to be changed. But how could a lone Village Health Worker do it?

The VHWs expressed their conviction that other women in the village should experience the kind of liberation that they themselves had experienced as part of their training. Though the Farmers' Clubs helped them in their work, the VHWs needed the support of other women. A counterpart to the men's Farmers' Club was needed to address women's issues. The Farmers' Clubs supported the idea and encouraged their wives and sisters or mothers to be part of the new women's groups.

The VHWs began to meet with women of their villages once every week or fortnight. In the beginning, only 8 or 10 women in a village were interested in meeting for a couple of hours. They were never sure whether their coming together would raise the wrath of their husband's family, so they made sure to abide by traditional social customs. It was unconventional for women from different castes to meet at all.

Sarubai, one of the VHWs, told how she organized women in her village. *"I was able to convince only seven women to come together in the beginning. We gathered together in one of the women's homes, to sing songs and listen to each other. In between, I taught them child care."*

More and more women began to attend these informal meetings in different villages. They decided to call their informal groups Mahila Vikas Mandals (MVMs, Women's Development Associations). Discussions on health and social conditions were not enough to hold the women's interest for long. The need for money was a constant preoccupation. Sometimes their children needed food or medicines. Older children needed books and school uniforms. They always had to request money from their husband or mother-in-law. They needed their own income and control over the money. The association began to think about income-generating activities.

Traditionally, village women had participated in a self-financing credit plan called a *bhishi*. In the bhishi system, the women in a group each contribute a small amount of money periodically. The contributions are pooled and the person whose name is drawn gets the total amount for a particular period. Ultimately everyone gets her turn. The MVM started a modified bhishi. Instead of having the women draw lots, the MVM gave the money to the most needy in turn. Often the money was used to buy food or treat a sick child. Others used the money to raise poultry, market vegetables and dried fish, or improve a

farm. Organizing women around their self-interest in earning money brought stability to the MVMs. The bhishi system built a sense of trust and helped women to be sensitive to one another's needs.

The MVM became a platform on which a VHW could build her health activities. As the members increased and attended meetings regularly, they began to realize they had more power together as a group than as individuals. The VHWs gradually introduced social issues that had affected their health, especially problems of women and girl children. They began to ask questions about why they treated their daughters differently from their sons, or why girls were not fed properly or sent to school like their brothers. They talked freely about alcoholism, wife beating, and harsh treatment of unwed mothers. They discussed how these problems could be solved.

VILLAGE WOMEN UNDERSTAND THE ROLE OF LOCAL GOVERNMENT FUNCTIONARIES

By 1978, 31 villages had such associations. Women used to be afraid of government workers. They feared the government functionaries, who tended to exercise their authority rather than serve. They were terrified at the thought of entering a court, police station, or other government offices. For village women, these officers were the rulers. Various strategies were adopted to remove these fears. We arranged for the women to meet with high-level police and revenue officers, local judges, jailers, bankers, and others. Contrary to their expectations, they found that these well-educated officers were cordial and showed real interest in their work and welfare. These experiences helped women to be bold and confident and to understand their own worth in a free democratic society. Exposure to high officials exploded the myth that village government employees were the rulers. Now, the women understood that these workers were there to serve the village people.

They soon had opportunities to deal with these local bosses. Bank officials in the villages treated women in a condescending and derogatory manner. They were used to providing credit to rich businessmen and farmers. They did not want to bother with the paperwork for small loans to scores of women. However, the Government had a special program for extending credit at low interest rates to women and marginal-

ized people. The MVM members in Rajuri were the first to apply for such credit. They knew the rules and were sure they had met the criteria. At first, the village bankers refused to give the loans. They used many excuses: the women had no property and no collateral security and were illiterate. They harassed the women through bureaucratic procedures, but the women did not give up because, according to government policy, they knew they were eligible for the loans. They would not leave the bank until the banker made a decision to either grant them the loan or give his reasons for refusal in writing. Sensing the power and determination of this organized group, the manager relented and granted the loan.

The women triumphantly shared their story with women in other villages at their regular gatherings. The women used the loans to enhance their incomes. They bought chickens and goats for breeding. Others went into small businesses, buying and selling bangles, dried fish, or vegetables. Some improved their farms by digging wells for irrigation or buying a pump set or a pair of bullocks to help in farming operations. One woman bought a small canopy, loudspeaker, microphone, and record player, which she rented out for functions like weddings, elections, and the numerous festivals that take place in the village. She was able to repay her loan in six months. Lalanbai leased fruit trees that grow by the roadside from the government. During the season she sells the fruit and makes a profit of Rs1,000–2,000 every year. Soon other banks started taking women seriously and extended credit to them.

Access to credit made the MVMs very popular. Over the years, these successes helped women gain self-confidence. Over 3,000 women who had never had any hope of getting out of poverty took out loans and improved themselves economically. Their performance attracted the attention of top bank officials at the state headquarters, and the women were invited to workshops to share their experiences with bankers in other parts of the state.

Women who were once poor, marginalized, and weak became empowered to determine their own lives. Increased food production, safe drinking water, and increased access to money and earning capacity were their primary felt needs. The MVMs had begun with a focus on increasing income and health, which widened into areas of social

and ecological development that make healthy lives possible. With funds from their cooperative enterprises, the MVMs increased support for the VHWs. They took more and more responsibility for health in the village. In many villages, the Farmers' Club gave over most of the health responsibilities to the MVM. Planting thousands of trees and [constructing] small dams reduced the frequency of drought and the need to leave the villages during drought seasons to find outside work.

COMMUNITIES TAKE RESPONSIBILITY FOR THEIR HEALTH

Sarubai explains the women's group involvement in health in her village. "*We have divided the village into four sections, and one MVM member is responsible for the health section. She ensures that all the children are immunized and that all the pregnant women are receiving prenatal care. The other women in her section help her in the activities. We have also trained three women to be in charge of deliveries when I am not around.*

"*Every year we conduct a house-to-house survey to find out the health and economic status of the village. Both the Mahila Vikas Mandal and the Farmers' Clubs participate in this. The survey helps us plan our program and understand what we have to emphasize.*"

The MVM has "keep the village clean" drives. They get rid of allergenic weeds that are harmful to people, they construct drainage pits and encourage the use of toilets. They help the VHWs follow up on patients with tuberculosis and leprosy, and assist in the rehabilitation of these patients and their families. Tuberculosis patients need adequate nutrition in addition to medicines. Often such patients starve in the village, since they are unable to work. The MVM members take turns in providing vegetables and grains to patients, based on their needs. MVM members assist with health education. They plan the programs according to special needs and invite health personnel to guide them. In the beginning, the health professionals had to go from house to house and ask mothers to accept prenatal care. Now the women are knowledgeable enough to invite health personnel when necessary.

Most village women had never been to school. They had never been involved in decision-making. Someone else had always controlled their

thinking and their time. Now they are beginning to think for themselves. They have learned to work together to share responsibility and to trust each other.

We have acted as catalysts for the various development activities introduced into the area, encouraging and forging partnerships among people and with different sectors of government. The health center has also functioned as an information bank for the women. Health alone would not have sustained the women's long-term interest.

Every MVM has its own history. It has its own individuality, created by the uniqueness of the women who make up this vital vehicle for social change. Active participation and awareness among men and women have led to a dramatic improvement in the health indicators. Men and women constantly assess, analyze, and act to improve their lives.

EXPANSION

The project team was involved in the first 30 villages. As the village men and women realized the changes taking place in the villages, they contacted their relatives and friends and organized Farmers' Clubs and MVMs and selected VHWs to expand the program to 250,000 people. As the people became more self-reliant, over 300 volunteers went to other remote villages to start new programs. In their turn, the village people are becoming facilitators for change. It has become a people's movement, with village people not only encouraging other village people to start programs, but also training medical professionals and social workers from all around the world to start projects in their own countries. These villages are the base for a training institute that is now running formal courses for people from many countries.

Though it started with health, the program has addressed all aspects of development. Through frequent seminars and meetings, government personnel interact with the poorest of the poor as they provide services. They work closely with the social forestry department in developing plant nurseries and reforestation. They are involved with NGOs and government in watershed management programs. Health awareness has led both to demand for health services from the government and partnership with them. Small families have become an accepted social norm, with 70% of couples using family planning.

LESSONS LEARNED

People are the key actors in health and human development. Poor people have coping mechanisms based on collective experience and wisdom. It is important to recognize this and enhance their skills and knowledge so as to increase their choices.

Addressing economic poverty and building large infrastructures alone will not lead to better health. Health depends on individual and community action. The knowledge to acquire and maintain health is a human right. Professionals need to change their attitudes and demystify medical knowledge. They should share knowledge freely, not by providing a few filtered messages that they think are best for the people. Knowledge should be shared in such a way that people can be empowered to assess, analyze, and make the right choices. The knowledge should liberate people and not intimidate them. It should lead to building self-esteem and confidence in oneself and others. It is necessary to address the basic causes of problems and share values leading to greater humanity by showing concern for the dignity of others with equity and justice. It is necessary to respect and trust people and facilitate the process of awareness building.

In the words of a village woman, "*People are like wick lamps, simple, inexpensive, and unattractive. But unlike the expensive chandeliers (which professionals are), the wick lamp has a tremendous energy. It is capable of lighting another lamp and another and another . . . to cover the whole planet.*"

Hundreds of thousands of people, not only in Maharashtra but through training and visits to Jamkhed and similar NGOs, have realized this energy and potential and are responsible for a worldwide movement for social change.

AFTERWORD

Mabelle and Raj Arole continued their pioneering work at Jamkhed, training and inspiring thousands of villagers, hundreds of health workers from across India, and scores of visitors from around the world. Mabelle was convinced to become the UNICEF Regional Advisor for South Asia and soon thereafter died a premature death. She is mourned by friends, admirers, and especially village women, and her work in Jamkhed is ably carried on by her daughter, Dr. Shobha Arole.

—Jon Rohde

4 The Impact of Development Interventions on Health in Bangladesh

A. Mushtaque R. Chowdhury

The story of BRAC (formerly the Bangladesh Rural Advancement Committee) is provided in several books and studies documenting the success of national programs in oral rehydration, immunization, treatment of tuberculosis, and dealing with the threat of arsenic in ground water. This chapter evaluates the comprehensive development package aimed at improving the livelihoods of the poor and shows that the provision of rural credit, schools, and empowerment of women have direct and measurable effects on health and fertility. While BRAC is a highly directive and standardized program, it is designed in a culturally sensitive fashion to reach the poorest of the poor and guided by ongoing research and modification of its components.

—*Jon Rohde*

This chapter has two parts: the first presents data from a carefully conducted study of the impact of (nonhealth) development interventions, including literacy, education, credit, and livelihood skills on health. The interventions were part of the standard Rural Development Program of BRAC, carried out in some 65,000 villages and focused on the poorest families.

The second part explores trends in development indicators in Bangladesh since its independence in 1971. There is abundant evidence of a substantial improvement in human development over the past 30 years, a result of synergies between government, nongovernmental organizations (NGOs), and international assistance that have strengthened community action and self-reliance. But much remains to be done to bring the population of Bangladesh to acceptable levels of human development, the "freedoms" described by Amartya Sen.

PART I: DEVELOPMENT FROM THE VILLAGE UPWARDS

Since Bangladesh's independence in 1971, numerous government and nongovernmental organizations have been implementing development programs in various sectors. Many of these programs have earned a reputation within and outside Bangladesh for their innovation, effectiveness, and scale. These programs include the Association for Social Advancement, Bangladesh Academy for Rural Development (BARD), BRAC, Grameen Bank, Proshika, and many others. Evaluations of such programs have traditionally looked at their success in increasing the income levels of participants but less often on the broader

goals of human well-being, particularly health. This section looks at the poverty alleviation program of BRAC, a large NGO in Bangladesh, and examines its impact on selected outcome indicators of health.

The BRAC Programs

BRAC started work in isolated rural areas when millions of refugees who had fled to India during the 1971 war of liberation returned. Housing, food, and employment, as well as health, were obvious needs. BRAC workers set out to help villagers reconstruct their lives. While initial efforts were directed at entire villages—providing materials to rebuild homes, supporting fishing infrastructure and agriculture, using locally trained male paramedical workers to provide rudimentary health services—BRAC soon learned that efforts must be directed to the most deprived. In spite of the best egalitarian efforts of BRAC workers, the social structure of rural Bengal society led to exploitation of the poor by those who were better off and to dependency on outside help. Thus, landless women and their families became the focus of BRAC, which established a broad range of development initiatives aimed to empower them as individuals and as an important part of the larger community.

The central effort was called the Rural Development Program. It emphasized group formation, functional literacy using a Freire-type of conscientization (Freire 2000), training in rural income projects, and credit offered without collateral. Today, these efforts have grown to embrace a major rural banking scheme, huge cooperatives in silk production and marketing, milk and other agricultural produce, printing, over 35,000 village schools, and management training on a vast scale. BRAC is now the world's largest NGO in terms of the scale and diversity of its interventions (see Table 1).

The poverty alleviation program functions in over 50,000 of Bangladesh's 84,000 villages and involves over 3.5 million poor women representing as many families. BRAC takes a holistic view of poverty: poverty is not only insufficient income or an absence of employment opportunities but a complex syndrome that manifests itself in many different ways. In the words of Amartya Sen (1995), "The point is not the irrelevance of economic variables such as personal incomes, but

TABLE 1
A Brief on BRAC
(August 2000, US$)

Full-time staff	25,378
Part-time staff	29,000
Participants in poverty alleviation program	4.1 million households
Amount of loans disbursed to the poor	$1.3 billion
Percentage of loans repaid	98%
Amount saved by village organization members	$74.0 million
Total primary schools run by BRAC	33,527
Total students enrolled	1.1 million (67% girls)
Mothers taught oral rehydration for diarrhea	13.0 million
Cases of tuberculosis treated in villages	45,377
Total budget (annual)	$152.0 million
Villages with BRAC poverty alleviation program	60,000 of 86,000
Number of field offices	1,070
Number of districts with BRAC program	64 (of 64)

their severe inadequacy in capturing many of the causal influences on the quality of life and the survival chances of people."

In addition to establishing programs to foster income and employment generation, BRAC aids the poor in forming self-help organizations, encourages conscientization, awareness raising, and gender equity, and provides human resource development training. The logic of these programs is the creation of an "enabling environment" in which the poor can participate in their own development and in improving the quality of their lives.

BRAC works through a process of social mobilization, delivery of inputs such as adult education, microfinance, and skills training, and creation of an environment of choice for the poor. Like most other poverty alleviation programs in Bangladesh (Hashemi et al. 1996, Pitt and Khandker 1996), BRAC defines the poor as those having half an acre of land or less. The process of social mobilization in a village begins with the identification of those who fit this definition. As soon as an adequate number of eligible individuals show definite interest, an institution of the poor, called a village organization (VO), is formed. In Bangladesh, about half of the households meet the BRAC eligibility criteria, and about 30 to 40% of the eligible villagers in the areas where

BRAC has a presence have so far joined the VOs. The gender ratio has changed dramatically over time in BRAC: in the 1990s, most VOs were composed of men only, whereas now 98% of the members are women. A VO has 40 to 50 members. Within a month of formation, VO members are allowed to apply for loans. The impressively high proportion of loans that are repaid (98%) is the result of a combination of members' consciousness, peer-group pressure, and BRAC staff supervision. BRAC bank staff are trained as extension agents to ensure the viability of village-based income production projects ranging from fish culture to silk production, from weaving to cattle and milk production, from power-pump rental for small irrigation to the sale of approved medicines by village health workers.

BRAC's education program runs nearly 34,000 primary schools, which enroll a total of 1.1 million pupils. Teachers are recruited from among women in the village, who are provided with a standard curriculum to follow for a three-year course. Two-thirds of BRAC school attendees are girls from the poorest sections of the community, to whom the formal public-sector schools are the least accessible. The effectiveness of the BRAC schools in terms of dropout rates (less than 5% over three years of study), attendance (nearly 100%), achievement (high pass rates on standard exams), and costs (some $18 per child per year) is truly remarkable (Ahmed et al. 1993, Chowdhury, Chowdhury, and Nath 1999).

While improved health of communities has been an objective of BRAC efforts from the start, health care, though important, has been seen as only one element. Although BRAC initially trained paramedics to deliver simple curative care, referring more difficult cases to doctors in fixed clinics, the use of paramedics soon became more prevalent. People neglected prevention. Nonetheless, BRAC areas had the highest use of and continuation rate for family planning, even in the early years. Turning its attention to the largest killer of children, diarrhea, BRAC undertook to teach every household in the country how to make and use oral rehydration therapy (ORT), a technology developed in Bangladesh but not widely known. Over a decade, BRAC workers visited some 13 million households in almost all of the country's 86,000 villages to instruct and demonstrate to each mother how to prepare ORT with home ingredients. This is the largest effort of its kind in the world and has contributed to the fall in infant and young child mortal-

ity. ORT has now become a part of Bangladeshi culture (Chowdhury and Cash 1993).

BRAC has applied similar mass approaches to improving immunization levels, in partnership with government health services; improved nutrition through village-based growth promotion; and strengthened the availability in communities of family planning and maternity services for women. Most recently, in response to the arsenic contamination of groundwater in a large proportion of the eight million shallow wells providing drinking water in the country, BRAC has developed field-testing procedures enabling identification of unsafe pumps, which are then painted red to warn villagers not to drink the water. Simple filters have been designed and tested for home use, and patients with symptoms of arsenic poisoning are being treated. The current health program also provides essential health services to villagers through trained women who charge a low fee and emphasize women's health and combating specific diseases such as tuberculosis (Chowdhury et al. 1997, Chowdhury 1999).

Since its early days, BRAC has maintained a research and evaluation division, whose role has been to investigate both the design and impact of BRAC programs. With more than 100 employees at present, it produces 30–40 reports each year, providing a continuous flow of information to modify and strengthen programs. Both qualitative approaches to sociocultural issues as well as quantitative studies of programs' impact are published and used to refine BRAC activities. While most studies are descriptive and not controlled, the collaboration with ICDDR,B has made possible a more rigorous evaluation of the impact of BRAC development efforts on health outcomes.

Studying the Impact of BRAC Programs on Health

Although BRAC works throughout Bangladesh, the data for the present analysis come from one subdistrict called Matlab, the field station of the ICDDR,B. Located 50 kilometers south of Dhaka in a riverine area of Chandpur district, the ICDDR,B has maintained this surveillance area since 1963. The many demographic studies and action research conducted there are testimony to its worldwide reputation (Van Ginneken et al. 1998, D'Souza 1984). Given the high quality of community

data collected routinely throughout the Matlab study area, BRAC and ICDDR,B initiated a research project to examine the impact of development activities on the health and well-being of the population. This effort became known as the BRAC-ICDDR,B Joint Research Project.

In 1992, BRAC moved to Matlab, where the population of 250,000 was divided into four study cells. Two cells, one inside and one outside a protective embankment to prevent flooding, received BRAC programs, and two similar cells did not. The BRAC inputs introduced in the villages included VO formation and organization of the poor, microcredit, training of VO members in human and legal rights and vocational skills, and nonformal primary education for children. In the 75 villages where BRAC initially started, a total of 164 VOs were formed with 6,736 members (all women), covering over half of the villages' poor households (all poor households were offered the chance to join). Since 1993, BRAC VO members have saved over $300,000. In addition, a total of $3 million in loans has been disbursed to them, with a 99.7% recovery rate. BRAC opened 81 nonformal schools, which enrolled 2,658 students.

Data Sources

The data used in the present analysis came from the following sources:

Baseline survey. Prior to BRAC's interventions in 1992, a survey of more than 12,000 households (over 60,000 people total) in villages belonging to the four cells referred to above collected quantitative information on assets, expenditures, education, nutritional status, health-seeking behavior, women's empowerment, family planning, and involvement with development activities.

Seasonal surveys. Three rounds of seasonal surveys were carried out in a subsample of the baseline population in 1995–96. These surveys collected the same information as did the baseline surveys.

Ethnographic surveys. Several ethnographic and other qualitative investigations were carried out using in-depth interviews, focus group discussions, and observations focusing on women's status and intrahousehold food distribution.

Demographic surveillance. The Demographic Surveillance System (DSS) of ICDDR,B provided mortality information on all households

in the villages under study. ICDDR,B collects data on births, deaths, in- and out-migration, and marriage through monthly household visits.

Management information. BRAC maintains a management information system for its projects. Information from households joining the BRAC program about the inputs received from BRAC, such as date of joining, amount of loans received, repayments, participation in education or vocational training, is linked with the DSS information.

Figure 1 illustrates the conceptual framework linking expected health impacts to inputs and processes in the BRAC program in Matlab, Bangladesh.

Impact of BRAC Programs on Family Planning

The Matlab area is noted for a highly successful family planning program, based on house-to-house delivery of services and coupled with good health care at the ICDDR,B rural hospital and its outlying clinics. Table 2 shows that the current use of family planning methods is greater among married BRAC members than among poor nonmembers ($p < .05$). BRAC members actually had higher rates of use of family planning than the nonpoor nonmembers did.

Impact of BRAC on Nutritional Status of Children

The BRAC-ICDDR,B project collected data on mid-upper-arm circumference (MUAC) in 1992, when the BRAC intervention was about to start, and in 1995, when the intervention was about three years old. Table 3 looks at severe protein-energy malnutrition (PEM, represented as MUAC < 12.5 cm) in children 6–72 months of age, according to their mothers' participation in BRAC. The prevalence of severe PEM has significantly declined among children of BRAC-member households, but there has been no such change among the children of nonmembers.

The pattern in intrafamily food distribution was explored through observations of 25 households having both girls and boys. It showed that among BRAC-member households, girls more often received equal treatment. Still, boys were more favored in terms of being given culturally preferred/superior parts of the fish, chicken, meat, etc. (Roy et al. 1998). When analyzed by gender, the MUAC data showed a signif-

FIGURE 1

Conceptual Framework Linking Expected Health Impacts to BRAC Inputs and Processes

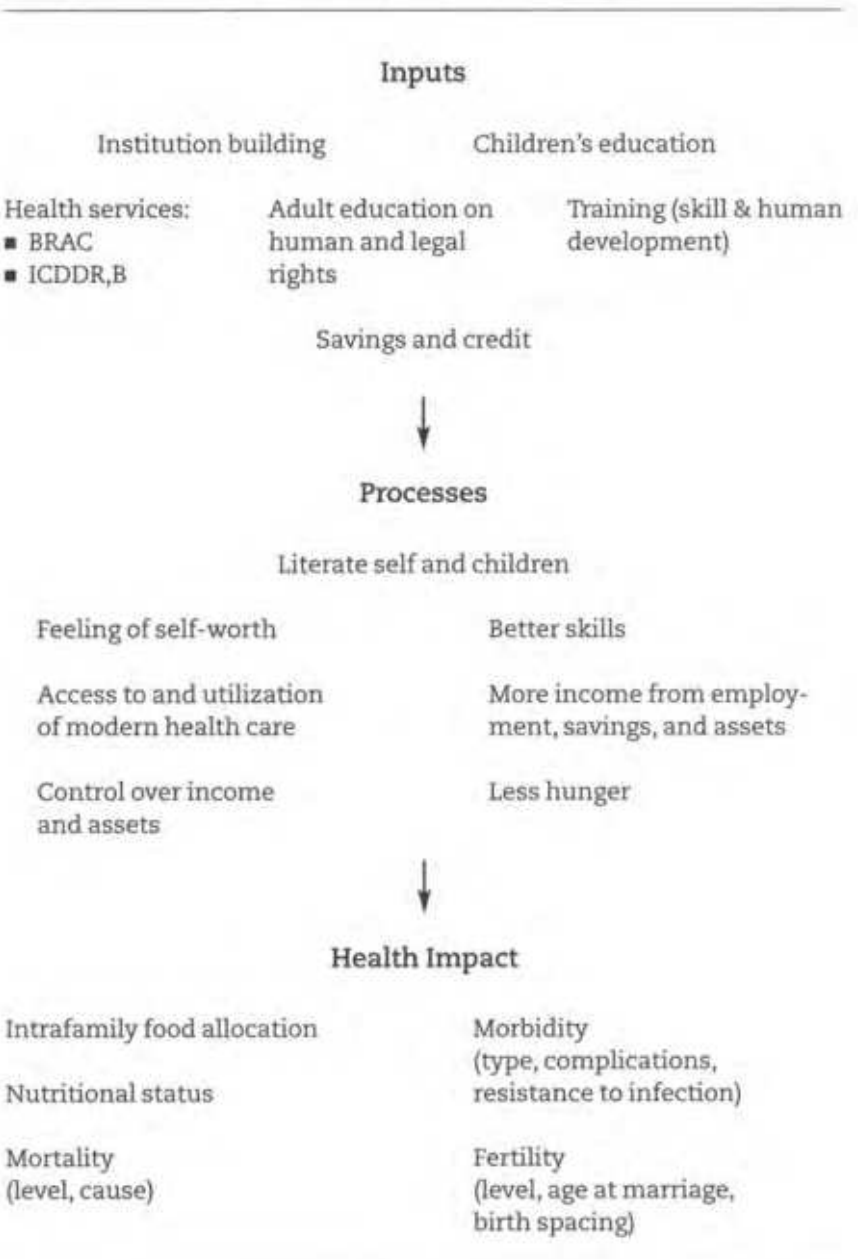


TABLE 2
Current Use of Family Planning by BRAC Members

BRAC Membership	No. of Respondents	Current FP Use (%)
Member	500	57.9
Poor nonmember	1,194	49.6
Nonpoor nonmember	1,088	51.3

TABLE 3
Prevalence of Severe Protein-Energy Malnutrition in Children by BRAC Membership Status before and after Intervention

Malnutrition	Year of Survey				Significance	
	1992 Baseline Poor Individuals (n = 827)	1995 BRAC Member (n = 273)	1995 Poor Nonmember (n = 707)	1995 Nonpoor Nonmember (n = 538)	1 vs. 2	1 vs. 3
% Severe PEM (MUAC < 12.5 cm)	23.2	12.1	21.2	11.5	$p < .01$	NS

Source: Khatun et al. 1998

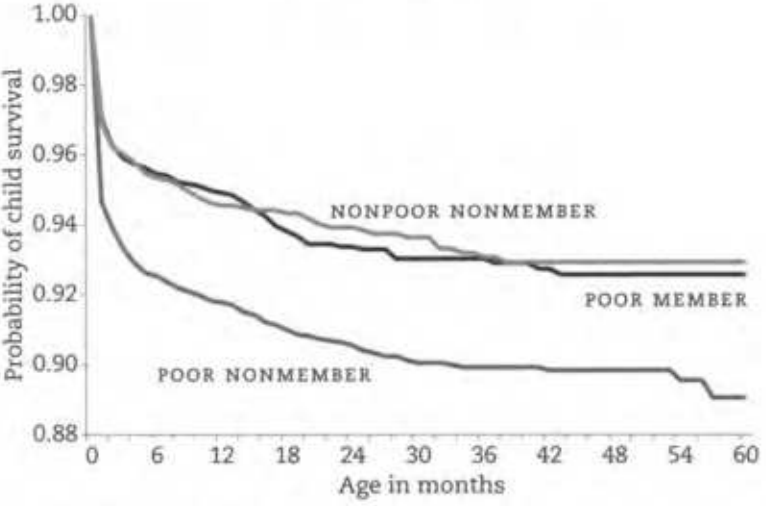
icantly higher prevalence of severe PEM in females among both BRAC members and poor nonmembers, but not among nonpoor nonmembers. Gender bias is hard to overcome!

Impact of BRAC on Child Survival

Survival rates of children belonging to BRAC-member households in comparison to poor nonmember and nonpoor nonmember households are shown in Figure 2. It shows that survival of children in BRAC-member households is better than that of children from poor nonmember households and is in fact similar to survival of children from nonpoor nonmember households.

The pronounced survival advantage of children of poor members compared to poor nonmembers is seen for girls as well as for boys. It is striking that the survival advantage associated with BRAC member-

FIGURE 2
Life Table Probability of Survival of Children in Households of BRAC Members, Poor Nonmembers, and Nonpoor Nonmembers



Source: Bhuiya et al. (2001)

ship among the poor was largely the result of mortality differences in the first few months of life, particularly in the neonatal period.

Impact of BRAC on Violence against Women

The prevalence of self-reported violence against women was also studied. A total of 2,038 currently married women aged 15–55 years were interviewed using a structured questionnaire. Each woman was asked about the occurrence of violence in the previous four months. Table 4 compares the incidence of reported physical violence against women in BRAC-member and nonmember households. It shows a higher incidence of violence among BRAC members than among nonmember households. When the incidence figures were analyzed according to length and "depth" of membership (Chen and Mahmud 1995), however, the prevalence of violence tended to decrease with increasing membership length. The peak in violence is reached when credit is introduced but tapers off when other inputs (such as training) are

TABLE 4

Incidence of Violence against Women in Last Four Months by Characteristics of BRAC Membership, Matlab 1995

	Physical Violence (%)
BRAC Membership	
BRAC member (n = 438)	8.9
Poor nonmember (n = 1,550)	5.8
X^2 *significance*	$p < .05$
Length of BRAC Membership	
≤ 2 year (n = 185)	10.8
2+ year (n = 260)	7.3
X^2 *significance*	NS
Depth of BRAC Membership	
Poor nonmember (n = 1,595)	5.6
Only savings (n = 56)	5.4
Savings + credit (n = 268)	11.2
Savings + credit + training (n = 119)	3.4
X^2 *significance*	$p < .01$

Source: Khan et al. 1998

offered. It appears that the initial "threat" to male hegemony within the family, brought about by women's preferential access to credit, diminishes over time, presumably as the obvious benefits to the overall welfare of the family become apparent.

Conclusions

While BRAC health interventions have been shown to improve survival and nutrition and contribute to reduced fertility in BRAC participants, this study was designed to investigate the health and fertility impact of nonhealth efforts of the overall BRAC Rural Development Program: group formation, credit, schooling, and employment skills. Participants were limited to the poorest households in the communities chosen and were compared to the nonparticipating poor as well as the nonpoor living in the same communities. Survival benefits to children accrued particularly to girls and tended to decrease the typical

gender bias that reduces the nutrition and life expectancy of girls. The use of family planning by BRAC beneficiaries was higher, even in comparison to the nonpoor. While women's empowerment, and especially access to credit, seemed to be associated with more acts of domestic violence, this effect diminished over time, as the benefits of the program to the entire family became evident.

The BRAC development efforts clearly contribute to a better life for the poor, even measured by independent survival and quality of life measures.

PART II: NATIONAL TRENDS IN DEVELOPMENT INDICATORS

Having reviewed the evidence of improved health and well-being associated with participation of poor families in the BRAC Rural Development Program, we turn to the broader cumulative impact of development efforts in Bangladesh in the past 30 years.

Poverty Levels

Bangladesh is one of the poorest countries in the world. The GDP per capita (purchasing power parity, or ppp) of US$1,361 is one of the lowest in the world, lower than that of most other South Asian countries. Table 5 compares Bangladesh's per capita income with that of several other countries in the region and with that of the United States.

Whatever pessimistic picture one may draw from Table 5 does not negate the possibility of a better future for this country. In fact, a look at the trends points to a better future. Figure 3 shows the proportion of people in urban and rural Bangladesh who were below the poverty line (the so-called head-count ratio) in various years since independence. This line is based on the "fixed-bundle method"—the expenditure necessary to obtain 2,112 calories per person per day. The figure shows a nearly constant decline in urban and rural poverty, with the improvement in urban areas being faster than in rural areas. This translates into a long-term poverty reduction of 1.55% per year, which is slower than that experienced in East Asian economies but is nevertheless encouraging for Bangladesh (Sen 2000).

TABLE 5
GDP per Capita in Bangladesh and Selected Other Countries

Country	GDP per Capita (ppp US$) in 1998
Bangladesh	1,361
Bhutan	1,536
India	2,077
Nepal	1,157
Pakistan	1,715
US	29,605

Source: UNDP 2000

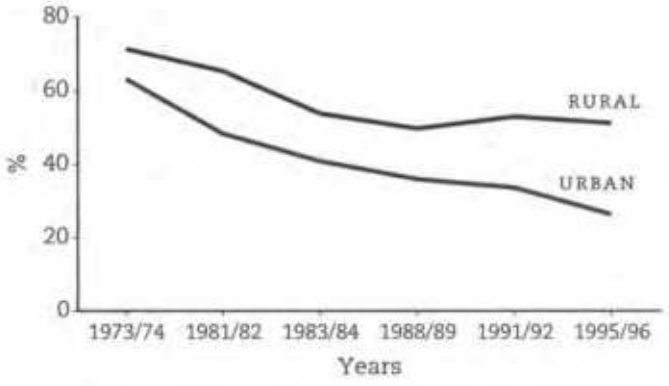
Economists have also looked at the trends in the depth and severity of poverty over the years. As Table 6 indicates, the depth of poverty, as represented by the "poverty-gap index,"[1] and its severity, as represented by the "squared poverty-gap index,"[2] also decreased, implying improved distribution of wealth as well as a reduction in overall poverty.

Food Production and Consumption

Bangladesh has made commendable progress in food production over the years. In spite of the runaway population growth in the 1970s and 1980s, the average availability and consumption of food grains has remained more or less unchanged (Table 7). This has been made possible by an increase in agricultural production through increased use of technology. For example, between 1984 and 1995, the use of fertilizers in the country more than doubled (from 1.25 million to 2.9 million

1. The poverty-gap index is the mean distance below the poverty line as a proportion of that line. This measure counts the nonpoor as the zero poverty gap.
2. The squared poverty-gap index is the mean of the squared proportionate poverty gaps. The squaring of the poverty-gap index reflects changes in the severity of poverty in the sense that it is sensitive to inequality among the poor.

FIGURE 3
Trends in Rural and Urban Poverty (1973/74–1995/96)



Source: Ravallion and Sen 1996, Sen 2000

metric tons), and the size of irrigated areas also almost doubled. The cropping intensity (the number of times a piece of land is cultivated in one year) also increased over these years, from 168 to 175%. However, the gross cropped area decreased during the same period, from 34.7 million acres to 33.3 million acres, mainly because of population increase and an already low land-to-population ratio[3] (Abdullah and Shahabuddin 1997).

Nutritional Status

Bangladesh also has one of the largest proportions of malnourished citizens in the world. It is estimated that around 80% of Bangladeshi children are malnourished to some degree. Table 8 shows the proportion of children under six years of age who are severely malnourished, as measured by a mid-upper-arm circumference of 12.5 centimeters or less. Nationally, 12.7% of children are severely malnourished, with the situation being worse in rural than in urban areas. The slight improve-

3. Bangladesh is the most densely populated country in the world, with more than 900 people per square kilometer.

TABLE 6

Depth and Severity of Poverty

	Poverty-Gap Index		Squared Poverty-Gap Index	
Years	Urban	Rural	Urban	Rural
1983/84	11.4	15.0	4.4	5.9
1988/89	8.7	13.1	2.8	4.8
1991/92	8.4	14.6	2.8	5.4
1995/96	6.0	14.1	1.9	5.5

Source: Ravallion and Sen 1996, Sen 2000

TABLE 7

Per Capita Daily Availability and Intake of Food Grains (1990–95)

Year	Availability (gm)	Intake (gm)
1990–91	458	461
1991–92	453	451
1992–93	439	449
1993–94	433	440
1994–95	404	434
1995–96	421	432

Source: Abdullah and Shahabuddin 1997

TABLE 8

Nutritional Status of Children
(Measured by Mid-Upper-Arm Circumference) (1985–95)

	% Children with MUAC < 12.5 cm		
Year	Urban	Rural	All
1985–86	9.90	14.90	14.40
1989–90	8.50	11.00	10.70
1992	8.40	13.20	12.60
1995–96	8.50	13.90	12.70

Source: Bangladesh Bureau of Statistics (1985–86, 1989–90, and 1992), Institute of Nutrition & Food Science (1995–96)

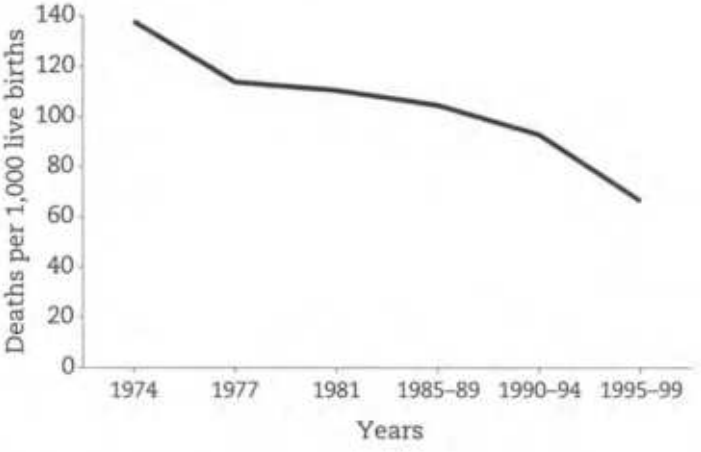
ment from 1986 to 1996 is of little significance and indicates a persisting problem. The country has the highest estimated level of low birthweight in the world: about 50% of newborns weigh less than 2.5 kilograms. These distressing figures are reflected in a secular trend of decreasing adult height in the entire population. This has profound implications for physical work capacity as well as an adverse impact on childbearing.

Health and Fertility

At independence in 1971, Bangladesh was one of the poorest and most unhealthy countries in the world. Nearly 140 of every 1,000 newborns died in their first year, and many more died before age five. Smallpox epidemics ravaged the country, and cholera was endemic. Malaria and kala-azar (an often-fatal tropical fever caused by a blood parasite and spread by a sandfly bite) plagued many areas. The health infrastructure provided care largely in district hospitals. All this fueled one of the highest fertility rates in the world, with over six births per woman.

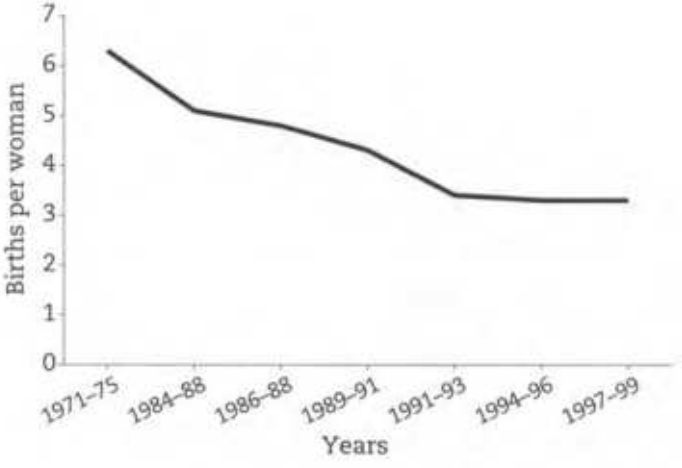
Extensive external assistance contributed to building *thana* (subdistrict) health centers and, later, smaller clinics in unions (lowest-level administrative units). The global smallpox eradication program concluded its success in Asia with the last case of variola major in Bangladesh in 1975. Efforts to provide safe water through hand pumps were spearheaded by UNICEF and many other donors, as well as by the government. As a result, every hamlet had access to safe water by the early 1980s. In recognition of the role of childhood diarrhea as the major cause of child mortality, BRAC supported a national oral rehydration therapy (ORT) program. Program staff taught a woman in each of 13 million households to make and use homemade ORT—a *labon-gur* (salt-sugar) solution. A coalition of NGOs helped government vaccinators achieve high coverage of routine immunization in infants. A twice-annual dose of vitamin A was added to this regimen. Meanwhile, a major government effort focused on providing modern family planning services, delivered conveniently and reliably in or near women's homes. The combined effect of these health measures is dramatically shown in the decreases in the infant mortality rate and total fertility rate in Figures 4 and 5.

FIGURE 4
Trends in the Infant Mortality Rate



Source: Bangladesh Demographic and Health Survey, Dhaka 2001

FIGURE 5
Trends in the Total Fertility Rate



Source: Bangladesh Demographic and Health Survey, Dhaka 2001

While mortality appears to be dropping continually, the cessation of the decline in fertility over the last decade is a cause of concern. Bangladesh's demographic transition cannot be considered complete until there is further substantial decline in both these parameters.

Education

Bangladesh is also seriously disadvantaged in terms of the literacy and education status of its population. The country has made progress over the years but at fairly slow pace. As Table 9 shows, the literacy rate rose barely 10 percentage points between 1974 and 1994. The recent claim by the government that it has reached 62% is not borne out by any independent source. On the other hand, the country did make important headway in increasing the access of its children to primary schooling. Recent independent studies show that the gross enrollment ratio (number of children of any age enrolled at the primary level per 100 children) has now reached 107%. The net rate (number of children of primary school age who attend primary classes) has also increased but is still 77%. More significant is the elimination of gender disparity in primary enrollment; in fact, girls now outnumber boys in primary schools. However, the issue Bangladesh still faces concerns the quality of the education. When a very elementary test[4] was administered to children finishing the five-year primary cycle, only 57% qualified, indicating a serious waste of resources and missed opportunities (Chowdhury, Chowdhury, and Nath 1999).

The improvements in both literacy and access to education have been rather slow, and the quality of education is not encouraging. However, when one analyzes such improvements in more depth, important trends surface. Figures 6 and 7 show the share of different socioeconomic groups in the increase in access to primary education. The data show clearly that it is the hitherto-excluded groups that are gaining disproportionately more. The gain has been confined to girls, children from rural areas, and those belonging to socioeconomically disadvantaged groups. This has been possible because the government and NGOs have instituted several policies that favor these groups.

4. Assessment of Basic Competencies (ABC): This measure tests children on basic literacy, numeracy, and life skills (Chowdhury et al. 1994).

TABLE 9
Trends in Adult Literacy Rates and Primary Enrollment

Year	Literacy Rate (%)	Primary Enrollment (Gross) (%)
1971	NA	45
1974	25.8	58
1981	29.2	63
1990	24.8	78
1994	35.3	95
1998	NA	107
2000	62.0	NA

Sources: UNDP (various reports); "Literacy Rates Now 56%," *Daily Star* 1999; Chowdhury, Chowdhury, and Nath 1999

Environment: Arsenic, Iodine, and Other Issues

Unfortunately, few data are available to evaluate the trend in the environmental situation in Bangladesh. The country has few forests; only 8% of the land is wooded. However, a recent UNDP report (2000) suggests that the annual rate of deforestation in the country declined from 1.8 to 0.9% during the 1980s.

Three decades ago, a national nutrition survey found goiter only in the hilly border areas near India, confirming the classical location of iodine deficiency in high-rain and runoff areas. By the end of the 1980s, goiter was increasingly found on the plains, affecting women and children with predictable effects, including mental retardation, deaf-mutism, and probably lowered IQs. Fortunately, effective measures were taken to iodize all salt at the source from which some 200 distributors supplied most of the country. However, the reasons for this emerging public health epidemic of iodine deficiency have not been fully studied. It appears likely that the intensified agricultural practices of the recent decades have disrupted the replenishment of iodine in the soils through seasonal flooding and silt deposit originating from the high Himalayas. Floods are now controlled by riverine embankments, and most water for irrigation is pumped from the ground. Puddling of

FIGURE 6

Changes in Basic Educational Achievement by Sex and Residence, 1998 versus 1993

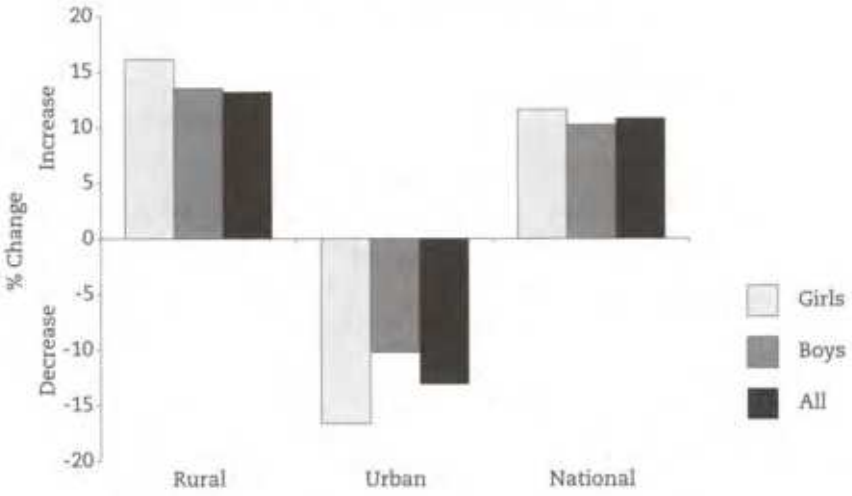
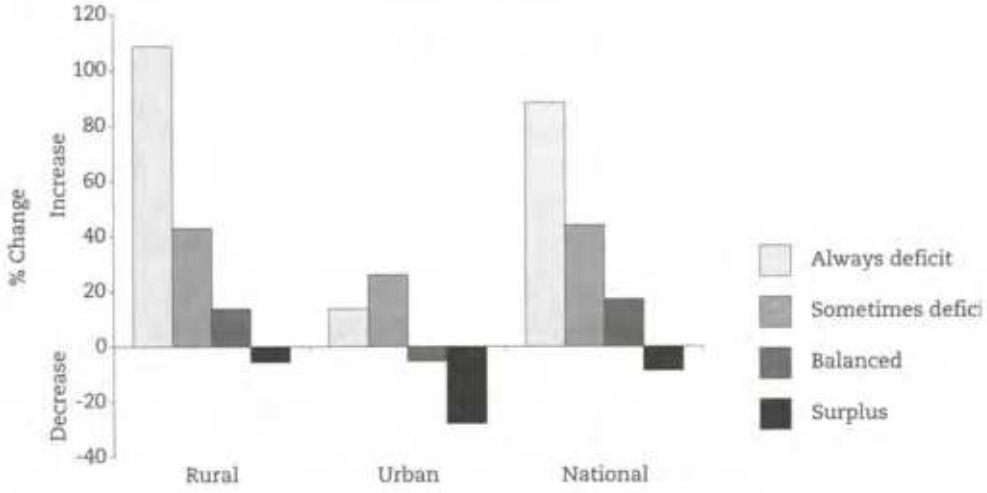


FIGURE 7

Changes in Basic Educational Achievement by Self-Perceived Economic Status and Residence, 1998 versus 1993



rice paddy fields with tractors effectively washes the soil and may remove other micronutrients as well. The ultimate effects of this intensified agriculture could be far reaching.

Experts foresee other kinds of environmental disasters. Bangladesh was a success story in the provision of safe drinking water to its population. Over 90% of the population had access to tube wells that pumped pathogen-free water out of shallow aquifers. Suddenly, it was found that many of these wells had impermissible levels of arsenic. Arsenic has been detected in areas that constitute about a quarter of the country. This means that about 30 million people are exposed to drinking arsenic-contaminated water. Many experts believe it to be one of the worst environmental disasters in history. Unfortunately, the country is not ready to face this situation. Bangladesh has neither the expertise nor the resources to deal with it. In addition, policymakers are procrastinating. There is a $42-million project supported by the World Bank for arsenic mitigation, but with less than a year to go before its end, only about 10% of the funds have been spent. There are already reports of hundreds of arsenic-related deaths in the country; this problem may increase to epidemic proportions over the next few years. The five main challenges in the arsenic crisis are:

- Find out the reason(s) for the contamination of the ground water; it is unclear whether it is leached from the soils or is related to falling water tables and oxidation of rock layers.
- Test all tube wells for arsenic; there are over eight million such wells in the country. BRAC has conducted a large demonstration of the feasibility of testing and denoting wells that have dangerous levels of arsenic by painting them bright red—thus warning against use for consumption (bathing is permissible).
- Provide alternative safe water options to people; no option has been discovered that is safe, culturally acceptable, technically feasible, environmentally benign, and affordable for most people.
- Identify and treat patients affected by arsenicosis (the disease caused by arsenic poisoning); there is no proven treatment regimen for this condition, nor is the health system prepared to face this disaster.

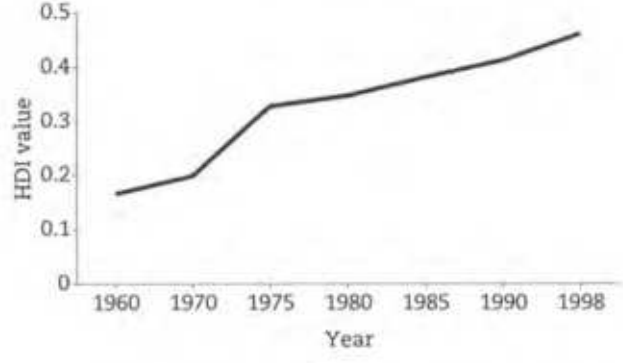
- Research the level of environmental contamination of the surface that is caused by arsenic; there are unconfirmed reports that the food chain has already been affected.

Fortunately, there are a few projects that are trying to address these issues, at least on a small scale. Initial results suggest that the arsenic crisis may be tackled successfully if concerted and coordinated efforts are mounted rapidly (BRAC 2000). For now, avoiding use of these wells for consumption is urgent.

Trends in the Human Development Index

The human development index (HDI) is a composite index that measures a society's human development record. Input factors include the expectation of life at birth, adult literacy rate, combined gross school enrollment ratio, and GDP per capita. Of the 174 countries for which the HDI is available, Bangladesh's place is a poor 146th (UNDP 2000). As shown in Figure 8, Bangladesh is making progress in terms of human development, but the country's HDI rank has hovered between 145th and 150th for almost 40 years. This means that other countries have also made comparable progress.

FIGURE 8
Trends in the Human Development Index (1960–98)



Source: Sen 2000 (for 1960 and 1970), UNDP 2000 (for other years)

Thus, while Bangladesh has made some notable progress in health and education, and held the line against deteriorating nutritional status, there is far more to be done. Many would suggest that persisting poverty is an absolute barrier to further improvement in human development parameters. The experience of BRAC demonstrates, however, that greatly improved human well-being is possible, even in the face of persisting economic poverty. Holistic, community-based strategies that are centered on women and emphasize self-reliance have shown that not only good health but also humane and acceptable living standards can be achieved through decentralized, affordable development.

REFERENCES AND RESOURCES

Abdullah, A., and Q. Shahabuddin. 1997. "Recent Developments in Bangladesh Agriculture." In R. Sobhan, ed., *Growth or Stagnation!: A Review of Bangladesh's Development.* Dhaka: University Press.

Abed, F. H., and A. M. R. Chowdhury. 1997. "How BRAC Learned to Meet Rural People's Needs through Local Action." In Anirudh Krishna, Norman Uphoff, and Milton J. Esman, eds., *Reasons for Hope: Instructive Experiences in Rural Development.* West Hartford, CT: Kumarian Press, pp. 41–56.

Ahmed, M., et al. 1993. "Primary Education for All: Learning from the BRAC Experience." Washington, DC: Academy for Educational Development.

Bhuiya, A., et al. 2001. "An Interventions Study of Factors Underlying Increasing Equity in Child Survival." In Timothy Evans et al., eds., *Challenging Inequities in Health: From Ethics to Action.* New York: Oxford University Press.

BRAC. 2000. *Combating a Menace: Early Experiences with a Community-Based Arsenic Mitigation Project in Bangladesh.* Dhaka: BRAC.

Chabot, C., et al. 1993. *Primary Education for All: Learning from the BRAC Experiences.* Washington, DC: Academy for Educational Development.

Chen, M. A. 1993. *A Quiet Revolution: Women in Transition in Rural Bangladesh.* Rochester, NY: Shenkman Books.

Chen, M. A., and S. Mahmud. 1995. "Assessing Change in Women's Lives: A Conceptual Framework." Working Paper No. 2. Dhaka: BRAC and International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) Joint Research Project.

Chowdhury, A. M. R. 1999. "Success with the DOTS Strategy." *The Lancet* 353: 1003–4.

Chowdhury, A. M. R., and A. Alam. 1998. "BRAC's Poverty Alleviation Efforts: A Quarter Century of Experiences." In G. Wood and I. Sharif, eds., *Who Needs Credit?: Poverty and Finance in Bangladesh.* London: Zed Books, pp. 171–94.

Chowdhury, A. M. R., and A. Bhuiya. 2001. "Do Poverty Alleviation Programmes Reduce Health Inequity: Evidence from Bangladesh." In David A. Leon and Gill Walt, eds., *Poverty, Inequality and Health: An International Perspective.* Oxford: Oxford University Press, pp. 312–32.

Chowdhury, A. M. R., and R. A. Cash. 1993. "Cultural Incorporation of the ORT Message." *The Lancet* 34: 1591.

———. 1996. *A Simple Solution: Teaching Millions to Treat Diarrhoea at Home.* Dhaka: University Press.

Chowdhury, A. M. R., R. K. Chowdhury, and S. R. Nath. 1999. *Hope Not Complacency: State of Primary Education in Bangladesh.* Dhaka: Campaign for Population Education and University Press.

Chowdhury, A. M. R., M. Mahmud, and F. H. Abed. 1991. "Credit for the Rural Poor: The Case of BRAC in Bangladesh." *Small Enterprise Development* 2: 4–13.

Chowdhury, A. M. R., et al. 1994. "Assessing Basic Competences: A Practical Methodology." *International Review of Education* 40: 437–54.

———. 1995. "Effects of Socio-Economic Development on Health Status and Human Well-Being: Determining Impact and Exploring Pathways of Change." Proposals for Phase II of the BRAC-ICDDR,B Matlab Joint Project 1996–2000 AD. BRAC-ICDDR,B Working Paper No. 6. Dhaka: BRAC and International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

———. 1997. "Control of Tuberculosis by Community Health Workers in Bangladesh." *The Lancet* 350: 169–72.

Chowdhury, F. I., and Chowdhury, A. M. R. 1978. "Use Pattern of Oral Contraceptives in Rural Bangladesh." *Bangladesh Development Studies.*

D'Souza, S. 1984. "Small Area-Intensive Studies for Understanding Morbidity Process: Two Models from Bangladesh—The Matlab Project and the Companion Health Project." In *United Nations Databases for Mortality Measurement.* Papers of the Meeting of the United Nations/World Health Organization Working Group on Databases for Measurement of Levels, Trend, and Differentials in Mortality. Bangkok, October 20–23, 1981. New York: United Nations Dept. of International Economic and Social Affairs, pp. 146–58.

Freire, Paulo. 2000. *Pedagogy of the Oppressed.* 30th anniversary ed. New York: Continuum.

Hashemi, S. M., S. Schuler, and P. Riley. 1996. "Rural Credit Programs and Women's Empowerment." *World Development* 24: 635–53.

Husain, A. M. M., ed. 1998. *Poverty Alleviation and Empowerment.* Dhaka: BRAC.

Khan, M. R., et al. 1998. *Domestic Violence against Women: Does Development Intervention Matter?* Joint Project Working Paper No. 28. Dhaka: BRAC and International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

Khatun, M., et al. 1998. *Women's Involvement in BRAC Development Activities and Child Nutrition.* Joint Project Working Paper No. 30. Dhaka: BRAC and International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

"Literacy Rates Now 56%." 1999. *Daily Star.* Dhaka, June 26, 1999, p. 11.

Lovell, C. H. 1992. *Breaking the Cycle of Poverty: The BRAC Strategy.* West Hartford, CT: Kumarian Press.

Pitt, M. M., and S. R. Khandker. 1996. *Household and Intra-Household Impact of the Grameen Bank and Similar Targeted Credit Programs in Bangladesh.* Discussion Paper No. 320. Washington DC: The World Bank.

Ravallion, M., and B. Sen. 1996. "When Method Matters: Monitoring Poverty in Bangladesh." *Economic Development and Cultural Change* 44: 761–92.

Roy, R. D., et al. 1998. *Does Involvement of Women in BRAC Influence Sex Bias in Intra-Household Food Distribution?* Joint Project Working Paper No. 25. Dhaka: BRAC and International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

Sen, Amartya. 1995. *Mortality as an Indicator of Economic Success and Failure.* London: London School of Economics, The Development Economics Research Programme.

Sen, B. 2000. *Bangladesh Poverty Analysis: Trends, Policies and Institutions.* Dhaka: Bangladesh Institute of Development Studies.

United Nations Development Programme. 2000. *Human Development Report.* Oxford: Oxford University Press.

Van Ginneken, J., et al. 1998. *Health and Demographic Surveillance in Matlab: Past, Present and Future.* Special Publication No. 27. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

5 Community-Led Primary Health Care Initiatives: Lessons from a Project in Rural Bangladesh

Abbas Bhuiya, Claude Ribaux, and Peter Eppler

This chapter reports on a rare trial of true community participation, with inputs only in helping the community define its own problems and priorities and possible resources from within and without to meet them. The difficulty of maintaining "restrained generosity" in the face of obvious need results in a program that may indeed be sustainable, beyond the presence of well-meaning outsiders. But how far can such self-reliance meet the needs? And who will be left out? This challenging example leaves some important questions unanswered.

—*Jon Rohde*

Achieving community participation in health matters remains a major challenge. This chapter presents lessons learned since 1994 from indigenous, village-based self-help organizations in Chakaria, a remote rural area of Bangladesh.

There has been a growing realization that the myriad problems which the population of Bangladesh faces, especially in relation to health and environment, may be so large and complex that no governmental or nongovernmental machinery can address them adequately without effective participation from community members. A main tenet of primary health care philosophy, community participation has been on the agenda of health programs of governmental and nongovernmental agencies since the Alma-Ata Conference in 1978 (World Health Organization 1978). Although it was expected that community members would be involved in planning, organizing, and managing primary health care activities, in fact, in the mid-1980s, governmental or nongovernmental agencies planned most such activities with little or no community participation (Morley, Rohde, and Williams 1983). By the early 1990s, community participation in health activities was reported from some places in the developing world (Rohde, Chatterjee, and Morley 1993).

In Bangladesh, community participation has been largely limited to obtaining community support for government immunization drives, providing housing for satellite clinics, and forming village health committees in some localities in response to persuasion either from the government or nongovernmental organizations (NGOs). A systematic attempt to achieve effective community participation in health matters has largely been ignored (Chowdhury 1990, Lovell and Abed 1993).

While most people concerned with health matters see the potential benefit of effective community participation, progress so far has been limited, perhaps due to a lack of understanding about how this can be achieved.

Rural Bangladeshi society has been traditionally rich in community initiatives, in building educational institutions, roads, playgrounds, orphanages, mosques, temples, and cultural organizations. Currently, there are 893 colleges, 9,822 secondary schools, 45,783 primary schools, 5,766 *madrashas* (religious schools), 131,641 mosques, and 58,126 *maktabs* (nonformal religious schools) attached to mosques. Of these, 76% of the colleges, 97% of the secondary schools, 18% of the primary schools, and almost all madrashas and maktabs are managed by the community, with little or no support from the government (Bangladesh Bureau of Statistics 1991). Almost all primary and secondary schools were established by community initiatives. This effort involved over 6,000 registered, village-based, voluntary social welfare organizations, formed and managed by communities (Government of Bangladesh 1985). So far, however, community initiatives for health have been rare, although not totally absent. Despite this social tradition, it is not understood why community initiatives for health have not developed, as have many other aspects of community life (such as education). Health has remained the responsibility of government, outside agencies and, of course, the private sector (both formal and informal), where the provision of medical services is big business.

To examine the possibility and feasibility of activating community initiatives for the improvement of health through existing indigenous self-help organizations (SHOs), the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) started a community development-oriented health project in 1994 in Chakaria, a rural area of Bangladesh. The project began its work in three unions (lowest-level administrative units) with a total population of 60,000. Subsequently, the activities were extended to another three unions and now cover a population of 130,000. Two adjacent unions with a population of around 60,000 have been designated as a comparison area. This chapter presents an overview of the achievements of the project since its initiation in 1994, including an exploration of the project's implementation, problems faced, solutions suggested, and lessons learned.

THE STUDY AREA

Chakaria is located on the southeast coast of the Bay of Bengal. Administratively, it is a *thana* (subdistrict) in the Cox's Bazar district, which has a population of 400,000 in 19 unions. It covers an area of 643 square kilometers, including 100 square kilometers of rivers and canals (Bangladesh Bureau of Statistics 1994). The highway from Chittagong to Cox's Bazar passes through Chakaria. The east side of Chakaria is hilly, while the west side is low along the Bay of Bengal.

The climate of Chakaria from May to September is characterized by tropical monsoons and heavy rainfall and is mostly dry during the remainder of the year. Because of its location, Chakaria is very vulnerable not only to regular monsoon flooding but also to cyclones and tidal floods, the most recent in 1991, when a large number of inhabitants and cattle were killed. Innumerable houses and other properties were damaged as well (Hossain, Dodge, and Abed 1992, Cox's Bazar Foundation 1991).

Despite its vulnerability to natural calamities, externally financed development efforts in the area have been scarce. However, after the 1991 cyclone, Chakaria began to receive some attention from development agencies. Efforts were made to improve roads, build cyclone shelters, and plant trees. Traditionally, the main economic activities in the area have been agriculture, forestry, and sea fishing.

The population comprises mainly Muslims and a small number of Hindus and Buddhists. Traditionally, the area is strongly influenced by Islam, and the population is not very open to modern ideas or to outsiders. The nationwide anti-NGO backlash in 1994 originated in this area, occasionally resulting in physical assaults on NGO workers, especially female workers. Security in Chakaria is quite precarious, with incidences of banditry being observed during the study period. Disputes over land sometimes result in violence and murders.

The study area is also one of the poorest performing in the country, in terms of health and family planning indicators. Despite the commendable success of the national family planning and Expanded Programme on Immunization (EPI) efforts during the last decade, the area has lagged far behind the other parts of the country in contracep-

tive prevalence and immunization coverage. The contraceptive prevalence rate for rural Bangladesh in 1993–94 was 43.4%, but for Chakaria it was only 20.8% in 1994. The coverage rates for DPT1, DPT2, DPT3, and measles vaccination among children between the ages of 12 and 23 months in rural Bangladesh in general during 1993–94 were 82.9, 76.1, 64.5, and 67.8%, respectively. For Chakaria, it was 77.8% for DPT1, 72.5% for DPT2, 66.4% for DPT3, and, for measles, only 47.7% (Bhuiya 1995, Mitra et al. 1994, Bhuiya and Ribaux 1997).

PROJECT STRATEGY AND METHODS OF IMPLEMENTATION

Project Staff

The project started with a team of six community organizers (three female and three male), two self-help trainers, two applied social researchers, and a field team leader. They were supervised by a social scientist, with assistance from an expatriate anthropologist throughout —a trainer at the beginning and a resident anthropologist at a later stage. The project started with nonmedical personnel. This was done intentionally, so that the field staff could in no way start offering curative health services to the community. This would have undermined the promotion of preventive health activities and raised undesired expectations.

After a year of operation, two paramedics and a public health physician joined the team. Six community health workers with a minimum of 12 years of schooling, recruited from the locality, joined the project later. The public health physician was mainly responsible for ensuring the quality of the health messages transmitted and for defining the contents of preventive and curative health initiatives. Subsequently, the number of public health physicians was increased to two, and they began to provide curative services. The paramedics, who started with health education activities, later became involved in running the village health posts. The trainers continued to develop training curricula, as well as train the project staff and volunteers. The trainers were also responsible for conducting People's Participatory Planning sessions. The community organizers were responsible for establishing links with SHOs and the community members for eventual mobilization of the

community members through the SHOs. The community health workers have continued to maintain contact with the SHOs and are gradually carrying out the work that used to be done by the community organizers. Now all the female community health workers are trained in community midwifery and in treating diseases with nonprescription drugs; they are emerging as a new cadre of female health workers in this male-dominated society. The applied social researchers have been engaged in monitoring, evaluating, and providing feedback to the program and to community members. The field team leader has been responsible for overall supervision in the field, and for maintaining links with the government and NGO activities in the area.

Training of the Project Staff

All project staff went through an orientation program before starting work in the field. This orientation consisted of a participatory exercise to review the experience of the staff with respect to sustainable development in Bangladesh. The orientation also included discussions about establishing relations with the community, its social and power structures, locating casual meeting places in rural areas, the role of indigenous SHOs in the society, and key people and resource persons. (A key person has power and influence in the community. A resource person is knowledgeable about and interested in community development but does not necessarily have power and influence in the community.) The training program combined various methodologies, including role-playing, field visits, and self-evaluation.

After reviewing the status of initiatives in the villages, all members of the staff reached the conclusion that initiatives taken by the villagers are the only ones sustainable in the long run. Thus, if health can somehow be brought onto the agenda of these existing initiatives, it will not only cause them to initiate health activities, it will also foster adoption of health- and hygiene-related behavior, in turn leading to improved health status of client populations. The issue of creating new organizations and sustaining them—a major concern in any development initiative—does not arise because the village organizations have already been in place for years and are being managed by the community.

During the project orientation, participants also developed a defini-

tion of SHOs and an instrument for collecting information about them. Organizations started by the villagers without any external input were considered SHOs. Thus, NGOs were excluded by this definition.

During the training, a consensus was reached for describing the objectives of the project: "We are here to learn about the health problems you face and what you do about them. We are also here to assist you, if you want to do anything to solve your own health problems. We are here for demonstrative purposes only, that is, we will try to provide technical information to you if you would like to take initiatives." The members of the staff were clearly instructed not to say any more than this and to be careful not to create false hopes or raise expectations, since the project was not designed to provide resources or curative services.

Knowing the Community and Building Confident Relationships

After initial training, members of the project staff began visiting villages in Baraitali, one of the unions. They walked through the villages and tried to explain the purpose of the project when asked. They started talking about health problems, the location and number of schools, mosques, clubs, and other community organizations, and key and resource persons in the locality. They also started making maps of the villages. They applied participatory research methodologies to draw village maps and mobility maps showing where people go for health care, to rank diseases, and to carry out group discussions about health problems. These activities helped them to understand the major health problems, health beliefs, care of the sick, and feeding practices of the villagers. Villagers were involved in these activities from the start, enhancing and building a relationship of mutual trust.

During this process, the project staff also participated in a two-week, school-based maternal and child health (MCH) program sponsored by the government. There, they talked about MCH issues with high-school students from the project area. These schoolchildren spoke highly of the project staff and the program to their parents, thereby facilitating access of field staff to the students' families. This experience helped the project staff realize the potential of school-based programs, and similar programs have been incorporated into regular project activities.

Identification of Indigenous Organizations

Data collection. After four weeks of relationship-building activities, the project staff compiled a list of indigenous village organizations and key and resource persons. Detailed information about these people and organizations was collected using a questionnaire developed during the orientation.

Seven college-educated members of the project staff conducted a survey of indigenous organizations. Field visits were made to identify the existing SHOs and initiatives. This was done through discussions with local people casually encountered on the road, at the market, and in restaurants, shops, and educational institutions.

Project staff made a list of the organizations and initiatives mentioned by the villagers and then visited the organizations. Occasionally, new signboards were hung on dormant or newly created organizations. These organizations, which appeared to expect that financial or material help might be forthcoming from the project, were excluded.

Data were collected during visits to individuals whom villagers considered to be associated with or well informed about the organizations. Cross-checks with at least three different sources were made before a final recording of the information. In cases of discrepancies in information from various respondents, attempts were made to cross-check the information with the respondent through repeated visits, before the project staff made a final recording of information.

Data analysis. Fifty-four organizations were listed in one union. However, information from only 45 was collected because the existence of the remaining organizations was doubtful. Almost all the organizations were established locally, most within the last 10 years, by middle-class or upper-class villagers. Their purpose was usually economic improvement, but several had founded schools or programs for religious training. Most had written bylaws and almost all had elected committees, serving up to 5 years. Only 10% had more than 20 active members. Funds were collected from members, government organizations, and other contributors. Most maintained some form of accounting.

Selection of organizations. A one-day workshop was organized with project staff to analyze the data and to select the possible organizations

and the key and resource persons for cooperation. After a critical re-examination of all the organizations, four were short-listed for cooperation. The selection criteria included existence of a committee, ongoing activities, and financial resources. From the list of key and resource persons, a list of supportive and neutral (not hostile to modern ideas) key and resource persons was prepared. Project staff also decided to maintain contact with other organizations and with key and resource people. The organizations selected had maximum community representation in terms of membership, community support, regularity in convening meetings, ongoing activities, and resources at their disposal. The four organizations chosen included a mosque committee, two temple committees, and one cultural organization run mostly by youth. Subsequently, project staff continued to maintain a close relationship with the selected organizations and key and resource persons.

Putting Health on the Agenda

None of the organizations had had health on their agenda, so encouraging them to include health issues was a major challenge. The discussion started with the context of well-being, which was a priority for all the organizations: some emphasized economic well-being, others the afterworld, social order, or human values through education. The villagers were requested to identify the most economically disadvantaged individuals and households in the village. Quite often, the most disadvantaged households were those in which family members were in poor health or in which the only wage earner had died young. Those households usually had had to liquidate whatever assets they had to meet the medical costs of their family members. The families fell into a vicious cycle of poverty from which they were not able to emerge.

It was easy to draw the conclusion that, in many cases, poor health was responsible for economic disadvantage. Even the religious groups saw the importance of good health to regular religious activity. The educational institutions too could very easily see a relationship between poor performance at school and the poor health of students. Thus, all the indigenous organizations realized the importance of good health (in its narrow sense—freedom from disease and disability) for human development, be it material or spiritual. However, they had no

idea about what could bring about good health. So far, tackling health problems through preventive measures, such as immunization and epidemic control, was viewed solely as a government responsibility. Curative services, on the other hand, could be obtained for a small fee from the government facilities or for a larger fee from private sources. The community members could not identify a role for themselves in health matters.

At this stage, the project staff introduced the villagers to the possibility of prevention by avoiding harmful behaviors. The problem of diarrhea was raised, and an attempt was made to explain its mechanisms of transmission and ways to break the transmission route. Villagers were not aware of the scientific causes and routes of transmission of diarrhea. The need for and advantages of preventive behavior were further emphasized through a participatory discussion about the consequences of illness on health and economic well-being. As one villager said, "This [prevention] is most important for us, especially those of us who are not economically well off. Illness makes one unable to work and dependent on caregivers for treatment, which costs money. Thus we need it [prevention] most."

Thereafter, members of the project staff were invited to participate in meetings held by the organizations. During these meetings, it became clear that an orientation of community members to common health problems, their causes, transmission, and appropriate management would significantly increase the popularity of the meetings.

The project, in collaboration with the SHOs, arranged three orientation sessions in three unions with 15–20 participants from each SHO. Each session lasted one day. The orientation sessions were facilitated by project staff and attended by a medical officer from the *thana* health complex. The representatives of the SHOs were asked to share with the rest of the participants what they considered the major health problems in the locality, what they thought those problems were caused and transmitted by, and what they thought would be the best ways to manage them. Diarrheal diseases, respiratory illness, malaria, complications relating to delivery, and lack of curative services were the most commonly cited health problems.

After explanations from the medical officer, the sessions concluded with an invitation from the project members to the participants to go

back and discuss their experiences with other members of the SHOs. If they thought that the knowledge should be disseminated, they should find a way to do this. The project would be willing to provide technical support. The project staff also indicated that they were willing to participate in any meetings that the SHOs might organize.

People's Participatory Planning and Actions

The project staff attended some of the meetings of the SHOs. These discussions were like the earlier ones and focused on major health problems, the importance of maintaining good health, the possibility of preventing disease through behavior modification, and the role of individuals and the community in improving health. The project staff mentioned that if the SHO members decided to take any initiatives, the project could provide technical assistance. If they met again to discuss the matter among themselves, the project staff would be happy to be present, if invited. They requested that the project staff talk to some of the female members of the community about a strategy for disseminating health messages to women. Eventually, commitment from a number of male and female volunteers was obtained, and the project started training these volunteers at the village level. The only material support provided by the project was to cover the cost of tea and lunch on the days of training.

A similar exercise has also been carried out in secular primary and high schools. Progress has been limited in religious educational institutions, due to their lack of interest in the activity. In the high schools, the students in each class have chosen 1 volunteer per 10 students. One teacher was put in charge. In primary schools, the volunteers came from classes four and five only. Formal approval from the thana education officer was obtained to carry out these school-based activities.

ACHIEVEMENTS

During the first six months of the project, members of the staff were able to establish a good relationship with the villagers. In the beginning, villagers resisted allowing female community organizers even to meet village women. The situation improved significantly over three to

four months, so work could proceed. Participatory research methods could be used and group discussions on health issues could be held. During the first six months of field operations, a quantitative baseline survey was also carried out in the three intervention and two comparison unions by locally recruited female field workers. The villagers cooperated fully, with a few isolated exceptions.

Regular contact with key personalities in the union was established. Representatives of the self-help organizations participated in health orientation sessions organized by the project. Staff of the project and the SHOs jointly organized more than 50 People's Participatory Planning sessions. Participants discussed health issues and possible solutions. The sessions were held mostly at night. Action plans were developed for implementing health education programs by village health volunteers, female health volunteers, and school health volunteers. During the first two years, the SHOs and neighborhood clusters of women nominated more than 1,000 volunteers. Most of them participated in training programs organized by the project, without receiving any material or cash incentives from the project.

Currently, volunteers disseminate health messages to the community, school volunteers communicate health messages to fellow students, and both groups take the messages to their homes and share information with their family members and immediate neighbors. The male village health volunteers disseminate health messages in mosques during Friday prayers and in informal gatherings at tea stalls and at other casual meeting places. Female volunteers share health information with women in nearby households through cluster meetings.

The SHOs have also started to engage in health matters beyond simply the dissemination of health messages. In three villages, the SHOs, in collaboration with government health authorities, have implemented a program to control malaria by using insecticide-impregnated mosquito bed nets. The project facilitated this government-community collaboration. The project helped the SHOs obtain free growth monitoring charts from the government's Institute of Public Health and also provided them with locally made weighing scales. Members of the project staff trained the volunteers to weigh children, record weights in the chart, interpret the results, and provide nutrition counseling to the mothers.

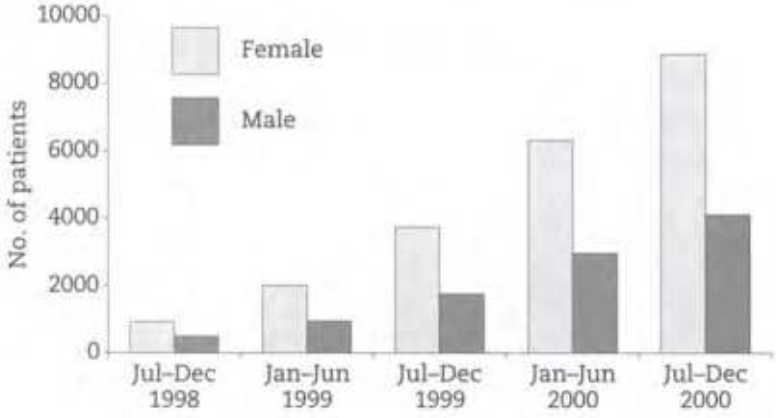
At the end of the first year of collaboration with the project, five organizations took initiatives to establish village health posts. The local people provided the space and furniture. The SHOs selected one village doctor (allopathic practitioner) for each village health post to provide services with assistance from the volunteers. Currently, there are seven health posts in six intervention unions. Weekly service sessions are carried out by qualified medical doctors, with assistance from a paramedic, community midwife, and SHO volunteers. A family health card system has been introduced whereby a family can buy a card for US$1 that entitles family members to consultation with a medical doctor once a week in the health post for US$.50. For individuals without a health card, a consultation fee of US$.80 is charged. Drugs are available at a price 7% higher than cost and 7% lower than the market price. All the money generated from the operation is being deposited in the bank accounts of the health posts. Recently, a lower level of health post serving a population of around 6,000 has been established. These sub-health posts are staffed by paramedics and operate five days a week. Figure 1 presents the numbers of patients attending the health posts in different quarters since the beginning of the health post services. Women have been the dominant users of the health posts.

By 2001, nearly 33% of the families had subscribed to the health card. After realizing that the family health cards were being disproportionately procured by rich people, the health posts' committees arranged to provide health cards at a lower fee to poor families (13%), and visits to the doctor are provided free to the poorest members of the community. Currently, 8% of the poorest families use the health post services. A health fund for the poor has also been launched to support drug costs for the poor. All these have improved the utilization of the health post services by patients from socioeconomically disadvantaged families.

By the first quarter of 2001, a total of US$7,500 had been earned and saved by the health posts through their services. In each of the six unions, land for the health posts had been either bought or donated by the members of the community. Of the six posts, three are now permanent structures with brick buildings constructed with resources from the community.

In terms of immunization coverage, the intervention areas have been doing better than the comparison areas. Figure 2 presents the per-

FIGURE 1
Number of Male and Female Patients Attending Village Health Posts, 1998–2000



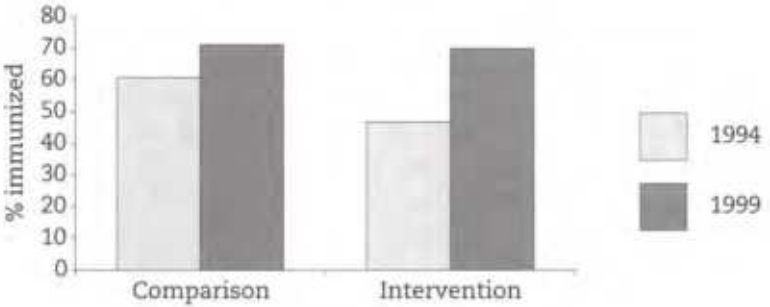
centage of fully immunized children aged 12–23 months before (1994) and after (1999) the initiation of self-help health activities in the intervention and comparison unions. Over the years there has been an improvement in both areas; however, the improvement has been much greater in the intervention areas than in the comparison areas (52% and 15%, respectively). It should be mentioned that despite the high level of awareness about immunization among the villagers (dissemination of information about immunization was one of the activities of the project), immunization coverage could not increase further, due to the constraints of public-sector service delivery (government program personnel delivered EPI services).

PROBLEMS FACED AND SOLUTIONS OFFERED

During the first two years of operation, the project confronted many problems. These included keeping the project personnel centered on the project philosophy, maintaining the project philosophy in the face of the current development trends emphasizing external material support, and responding to the needs of the community without creating dependency on the project in the community. A description of these problems and the strategies developed to address them follows.

FIGURE 2

Percentage of Fully Immunized Children Aged 12–23 Mos. in Comparison and Intervention Areas before and after Intervention



Morale of Project Staff and the Need for Philosophical Clarity

Despite the project's philosophy of promoting self-help, some members of the project staff were apprehensive that nothing much would happen without material support from the project. Given these circumstances, it was necessary to reassure the staff that the process would likely be slow at the beginning. It was also reiterated that if the project provided material support, it would be like any other development activity in the country and would suffer from similar limitations, thus encouraging dependency. The activity would have little chance of becoming sustainable. Staff were further assured that even if the project failed, the documentation of the procedures adopted and reasons for failure would be a valuable contribution. Thus, slow and/or minimal achievement of goals, or even failure, would not result in early closure of the project, and no one would be held responsible for it.

Distrust among Villagers and the Need for a Slow, Transparent Approach

Since the project is located in a very conservative, Muslim-dominated area with a history of opposing development NGOs (especially around the time when this project was launched), it was particularly difficult to earn the trust of the community members. Project personnel were

challenged on many occasions about their intentions, and health was seen by some community members as a means for the project to enter into the community and eventually to engage in antireligious activities, as the East India Company did before the British colonized the country. Obviously, this was quite serious and led to discouragement, especially among expatriate colleagues who wanted to visit the project area.

The project adhered to its philosophy of not initiating anything on its own, and the villagers never saw the project staff as very proactive. The control of all initiatives always resided with the SHOs. Project personnel participated only if invited. Initiatives came only from an SHO's activities, and there was little reason for villagers to suspect outside control or ulterior motives.

Project staff provided training of volunteers only if the SHOs asked them to. Contact was always maintained with key and resource persons, who were often involved with the SHOs. The participation of the project staff in school programs brought student support for the project and helped promote acceptance of the project in the community.

The project's attention to the problems identified by the villagers themselves also contributed to the development of trust and respect. Bringing the government malaria control program into some villages also demonstrated the project's adherence to its philosophy of linking the SHOs with a third party to mitigate health problems. In addition, participation in other government initiatives, such as the national immunization days, MCH fortnight (promotion of MCH services at schools and other community forums), leprosy control program, and disaster relief operation, also demonstrated the acceptance of the project by government authorities and the respect it has earned from government officials.

More recently, the project's commitment to provide technical support in managing the village health posts established by the SHOs has also helped the project earn community trust.

Countering the Relief Mentality by Emphasizing Respect for Self-Help

The expectation of the villagers that they will receive external material support has been a problem to cope with in promoting self-help for health. Because the area has experienced many cyclones and tidal

surges in the past, it has often received relief from outside agencies. It was difficult for the villagers to believe that no material support would be forthcoming from the project. They continued to request free tubewells, latrines, curative services, hospitals, allowances for participating in health education training, and so forth. Project staff politely clarified the project's position in this regard and maintained this position constantly. In one village, the demand for free medicine was strong, especially from a person who had been identified earlier by the project as a resource person. The situation was difficult, because at that time a local NGO was distributing free medicine to the villagers. At a meeting with the mosque committee of this village and some expatriate visitors, the spokesman of the committee demanded two sanitary latrines for the mosque from the project. The project spokesperson responded by making a suggestion that to establish latrines what one needs is labor for digging holes and for constructing wooden or bamboo platforms and fences. Volunteers could complete such a project in a day or two. Occasionally, this kind of intervention had to be made to combat the relief mentality. Nevertheless, the project staff maintained relationships with the committee and the person behind the demand but did not give in to the demand (Lanzenderfer, Boulter, and Yahia 1995).

In addition to maintaining the project's philosophy of not providing financial and material support to the community, the project maintained a very low profile in terms of allowing project staff to use vehicular transportation. The male staff members used motorcycles, and female workers used local public transport and pedal tricycles. This helped limit the expectations of community members.

Staying Out of Village Feuds

At the beginning of the project, internal village disputes did not seem to be a hindrance, especially in initiating health education programs. But later, when there was an effort to establish a village health post in one locality, a conflict between two groups of villagers disrupted the agreement and the initiative failed. An investigation of the causes revealed that there was a long-standing dispute within the village and that the villagers could not work together. Some individuals in the village suggested that the project call a meeting with both parties to help

the villagers remove the barriers that had developed. The project strategy, however, has been one of nonparticipation in such meetings. The project viewed the conflict as a lack of readiness of the villagers and decided to wait until the conflict was locally resolved.

Underscoring the Participation of Women and the Poor

Although the strategy of promoting health initiatives seems promising, it lacks participation by the poorest segment of the community, especially women. There is virtually no direct representation of the poor and women in the SHOs. The school health education program also does not cover children from very poor households. The mosque-based program, to some extent, includes male members from poor households. To reach women and individuals from poor households, it was decided to start health education among women in neighborhood household clusters using female volunteers. Women's groups formed by development NGOs for the poorest of the poor have also been brought into the health education program. However, it is not yet clear how effective the village health posts will be in meeting the needs of women and individuals from very poor households.

Explaining What the Demand for Curative Services Entails

During initial discussions with members of the SHOs, participants almost always focused on curative services and asked about the technical background of the project staff. The issue of curative services was their only consideration in mapping the project's role as a promoter of community health. After listening to the participants, project staff sought the opinion of a medical doctor, and he shared scientific concepts about the prevention of major diseases with the participants. It became clear to the participants that, by modifying their behavior, they can avoid diarrheal diseases and that appropriate management of diarrhea with oral rehydration therapy can save lives. It was emphasized that once someone gets sick, he or she loses working days and becomes dependent on healers. This costs the patient in terms of both money and physical strength. Thus, prevention is better than cure for the rich, and even more so for the poor, who have fewer resources. Although the

benefit of preventive measures was clear to the villagers, the interest in curative services continues.

During the first year of project activities, the staff did not show any signs of responding to the demand for curative services, despite the finding that there has been a dearth of curative services in most of the villages and that women have been the most deprived. The availability of health facilities and government health personnel was always mentioned in the health education sessions. There has been a growing realization among the villagers that despite all preventive measures, illness will occur and the project will not supply any services. The SHOs, in collaboration with the villagers, have started to come forward with proposals that show they are serious about establishing health facilities in their locality with their own resources, but that they will need technical assistance from the project. (In the meantime, the project also had two paramedics and one public health physician on the project team, to ensure the appropriateness of the contents of the health messages and to continuously orient staff members on health matters.) The project staff responded by explaining to SHO representatives what it means to establish a health post, what is feasible, and what resources are needed. With this detailed picture, if the organization still chose to establish a health post, the project indicated that it would supply technical support by procuring weighing scales, growth monitoring charts, and training for volunteers, and by negotiating with local health authorities so that nominees of SHOs can obtain training in curative services and management.

This process has led to the establishment of a number of health posts in the villages. The villagers themselves have provided accommodations, furniture, and a modest sum of cash for meeting initial expenses. All the health posts are named after the village, and the project does not request any mention of the ICDDR,B contribution. Eppler, Bhuiya, and Hossain (1996) provide a detailed description of the process of establishing the health posts.

CHALLENGES AHEAD

The community initiatives taken by the SHOs hold great promise. Nevertheless, there are many challenges that must be met before they become effective.

Keeping the Wheel Moving by Showing Benefits

One of the challenges will be to sustain the enthusiasm of the villagers to keep the initiatives going. This will not be possible if the villagers do not perceive any benefit from the initiatives. To have significant health benefits, the program, including the health posts, should be effective and well managed. In this regard, technical support from outside will be needed.

Maintaining the Tradition of Linking the Public and Private Sectors

Traditionally, community initiatives in Bangladesh eventually receive partial public-sector support. Schools and roads, which were first established through community initiatives, were later subsidized or fully managed with public-sector resources. Thus, the villagers expect that the health posts they have established will some day receive assistance from the government. One way to achieve this would be to link the village health posts with existing government facilities; another would be to convert them into government community clinics. An example of beginning such a link is the hosting of EPI sessions and satellite clinics run by government workers at these village health posts. Other options may evolve as time passes. This linkage will not only make these initiatives sustainable but will also make the government programs more effective.

Extending the Process by Demonstrating the Example

The replicability of this model beyond the project area is another challenge to be faced. Once these local community initiatives are well grounded, the example can be demonstrated elsewhere, and interested

parties can make visits and receive guidance and encouragement to initiate similar activities. Extension of the process will not be difficult.

Another possibility for extension is through the relevant government departments under which the SHOs fall. In most cases, these government departments have their branch offices at the thana level. Thus, the extension activities beyond the project area could be carried out under the supervision of the government departments.

WHAT MADE THIS PROJECT SUCCESSFUL?

Given the current trend in development activities, which are largely implemented by outsiders, the SHOs' achievements in initiating health activities on their own have been impressive. The major factors that made these achievements possible are discussed below.

Not Invitation But Participation

One of the most important strategies of the project was to augment the agenda of the existing SHOs rather than invite the villagers to participate in activities designed, implemented, and managed by outside agencies. The processes of relationship-building, needs assessment, health orientation, planning, and implementation were carried out in a participatory manner, resulting in community involvement from the beginning. Leadership from the SHOs was a precondition for the project to provide technical assistance. Thus, leadership of the initiatives has remained with the SHOs.

Usually, development agencies invite community representatives to participate in development activities by asking them to be members of a committee or to attend meetings. The outside agency, however, designs, implements, and manages the project. In such a model, community members do not learn that they do not have an effective role in program management or in control over resources and that decision-making is always led by the agency. What is achieved in relation to community participation in such a circumstance is, in fact, a kind of politeness on the villagers' part to respond to the request for participation from educated urbanites.

In the approach practiced in this project, the project does not invite

villagers to participate in the project activities. Rather, the project participates in the initiatives undertaken by the sustainable SHOs created and nurtured through effective community participation. Thus, sustainability of the organizations and community participation will no longer be issues to look for in the future; rather, they are the foundation of these new health initiatives.

Restrained Generosity

The other important strategy the project adopted while working with the SHOs has been to observe restraint in providing material and financial support even in the face of strong demands from the community. Giving in to such pressure could very easily dampen the self-help spirit of the community and produce a dependent relationship. In this age of resource-driven development assistance, this strategy has been difficult to implement, but it has started to show signs of success.

Not Overtaking But Following the Community

Another essential factor was to allow time for the community to establish its own momentum and then for the project to support this momentum. Allowing the project to overtake the community could overpower community initiatives, permanently damaging the community's will to help itself. The project did not have its own time frame; it was set by the community.

Using Curative Services as a Platform for Health Promotion

Despite the project's best efforts, it was not possible to avoid support to curative services. Ignoring community demand would mean poor-quality service and a missed opportunity to use the momentum generated in the community. It was also observed that clients are treated more respectfully in the community-established health care facilities where practitioners are paid for services provided, than in those of the public sector. Thus, user fees should not only be viewed as a means of cost recovery but should also be viewed as a strategy to ensure effective community participation.

CONCLUSION

During implementation, the project faced minor problems related to motivation of project staff, relief mentality of the villagers, access to women, and suspicion of outside agencies. However, we concluded that existing village-based SHOs can undertake health-related initiatives. Health awareness and knowledge of hygiene and water and sanitation, and management of common illnesses have improved. EPI coverage has also increased in the intervention area compared to a comparison area. The process of generating interest and activities in health is a long one, but self-reliance and sustainability are ensured.

Community-led and self-help initiatives exist throughout rural Bangladesh. At times, community members united in formal or informal organizations undertake health initiatives. These organizations can also be activated through participatory processes to undertake such initiatives. These processes may lead to the community's no longer being viewed as a passive recipient of government and NGO services; rather, the government and NGOs will participate in community-generated initiatives. Activities carried out in this way will have a better chance of sustainability and effectiveness.

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REFERENCES AND RESOURCES

Arole, Mabelle, and Rajanikant Arole. 1994. *Jamkhed: A Comprehensive Rural Health Project.* London: Macmillan.

Bangladesh Bureau of Statistics. 1994. *Statistical Yearbook of Bangladesh.* Dhaka: Government of Bangladesh, pp. 537–95.

Bhuiya, Abbas. 1995. *Health Knowledge and Behaviour in Five Unions of Chakaria.* Special Publication No. 52. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

Bhuiya, Abbas, and Claude Ribaux. 1997. *Rethinking Community Participation: Prospects of Health Initiatives by Indigenous Self-Help Organizations in Rural Bangladesh.* Special Publication No. 65. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

Bhuiya, Abbas, et al. 1997. *Community Participation in Health, Family Planning and Development Programmes: International Experiences.* Special Publication No. 59. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

Chowdhury, A. Mushtaque R. 1990. "Empowerment through Health Education: The Approach of an NGO in Bangladesh." In Pieter Streefland and Jarl Chabot, eds. *Implementing Primary Health Care: Experiences since Alma-Ata.* Amsterdam: Royal Tropical Institute, pp. 113–20.

Cox's Bazar Foundation. 1991. *A History of Cox's Bazar.* Cox's Bazar, Bangladesh: Cox's Bazar Foundation.

Eppler, Peter, Abbas Bhuiya, and Moazzem Hossain. 1996. *A Process-Oriented Approach to the Establishment of Community-Based Village Health Posts.* Special Publication No. 54. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

Government of Bangladesh. 1985. *Directory of Voluntary Social Welfare Organizations in Bangladesh.* Dhaka: Bangladesh National Social Welfare Council.

Hossain, Hamida, Cole Dodge, and Fazle Hassan Abed. 1992. *From Crisis to Development.* Dhaka: University Press.

Lanzenderfer, M., Arnold Boulter, and Mohammad Yahia. 1995. "Report: Review of the Improvement of Health through a Community Development Oriented Programme in Rural Bangladesh (Chakaria Community Health Project)." Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

Lovell, C., and F. H. Abed. 1993. "Scaling-Up in Health: Two Decades of Learning in Bangladesh." In Jon Rohde, Meera Chatterjee, and David

Morley, eds. *Reaching Health for All.* New Delhi: Oxford University Press, pp. 212–32.

Mitra, S. N., et al. 1994. *Bangladesh Demographic and Health Survey, 1993–1994.* Calverton, MD: National Institute of Population Research and Training (NIPORT), Mitra and Associates, and Macro International, Inc.

Morley, David, Jon Rohde, and G. Williams. 1983. *Practicing Health for All.* Oxford: Oxford University Press, pp. 319–27.

Rohde, Jon, Meera Chatterjee, and David Morley. 1993. *Reaching Health for All.* New Delhi: Oxford University Press, pp. 501–17.

World Health Organization. 1978. *Primary Health Care: Report of the International Conference on Primary Health Care, Alma-Ata, USSR, 6–12 September 1978.* Geneva: World Health Organization.

6 Scaling Up Community-Based Primary Health Care

Carl E. Taylor and Henry G. Taylor

The acknowledged leader of primary health care over the second half of the 20th century, Carl Taylor, describes his experiences at the community level, starting with studies in Nepal in the late 1940s. He proceeds to Narangwal in India, showing how the Bhore Commission model can work, and from there to his years in China promoting UNICEF programs. Then he reviews specific community programs in Tibet, Peru, and Nepal. He advocates using sound epidemiological techniques and evidence gathered by the people and in community surveys. Taylor and his son Henry describe how communities resolve their own problems and how their successes make scaling up to larger populations possible. Patience is required, as he has demonstrated through over 50 years of community practice.

—Jon Rohde

A continuing problem in communicating about health work in poor communities is that, in learning from the communities we have been privileged to partner with, each of us has a compulsion to develop new terminology for what we do. It was an advance that, during the past 10 years, under John Wyon's leadership, those of us that he brought together each year[1] to share our interest in this topic agreed to call what we were doing community-based primary health care (CBPHC). The evolution of that term requires clarification of three definitions that cause confusion:

Primary medical care (PMC). This term is appropriately applied by clinicians to first-contact treatment of illness, which is the foundation on which the medical care pyramid is built. Referral to institutional, specialist therapy at secondary, tertiary, and higher levels follows if required.

Primary health care (PHC). PHC is an integrated system of preventive, promotive, and illness care. This term is appropriately used by both clinical and public health specialties for efforts to bridge the gaps separating the two. In the Alma-Ata documents of 1978, we widened the definition to include community participation and intersectoral action. In spite of this expanded definition, most PHC practitioners continue to limit their discipline to activities within the health system, or what health workers do in PMC: treatment plus health promotion and prevention. The term "selective PHC," coined in 1984, led to a wave of single-focus campaigns using specific health interventions. These

1. This committee is the Working Group on Community-Based Primary Health Care, a Committee of the International Health Section of the American Public Health Association. Dr. Henry Perry now chairs this group.

work best when new technology fills a gap in health services, but for cost-effectiveness and sustainability the selective interventions must eventually be integrated into comprehensive PHC.

Community-based primary health care (CBPHC). This term can be defined as two-way action for health, at the interface between communities and health services. It emphasizes that communities must ultimately have joint ownership in their own health care. Health professionals then become partners responsible for building community capacity so people can participate in solving their own problems, while health services also provide timely and cost-effective services and referral within the health system. We have defined community as any group of people who have something in common, a shared identity, and the capacity for joint action.

These definitions lead to a major concern about the current obsession with privatization, promoted internationally by major donor agencies and focusing mainly on primary medical care. Publications on health care reform have been concentrating mostly on financing techniques to cope with the bottomless pit of demand for PMC, especially as populations age and become more affluent. Privatization encourages greed for commercial gain through globalized sales of drugs and sophisticated technological services. Efforts to contain costs are focusing on providing care for those who can pay, mainly through insurance mechanisms. The US health care model is being widely copied in developing countries even though it results in gross inequity and leaves over 40 million Americans with no insurance coverage. These trends are extremely damaging to several decades of effort to build CBPHC in developing countries, especially in association with the disastrous impact of International Monetary Fund economic adjustment policies. The Bangladesh experience emphasized in this book demonstrates a practical alternative through community-based action, as summarized in Henry Perry's book (Perry 2000). (See also chapters 4 and 5 of this book.)

REASONS FOR FAILURE OF HEALTH CARE REFORM EFFORTS

For several decades, we have known how to make CBPHC work in local projects. In the 1930s, John B. Grant, C. C. Chen, and Jimmy Yen gave us the first practical demonstration of CBPHC at Ting Hsien (now Ding Xian, 100 miles south of Beijing). A decade later, the breakthrough concepts were confirmed in second-generation projects such as Pholela in South Africa. This project was transplanted after apartheid became the national policy, and key pioneers started projects for PHC in the Office of Economic Opportunity health centers in the US with Jack Geiger and colleagues, and in Israel with Sidney Kark. There were other projects in Indonesia, Chile, Kerala (India), and Sri Lanka. Most people do not realize that PHC started only seven decades ago, and we have learned much in a very short time about how these field methods work in discrete projects. But, as Jim Grant used to say in defending the campaign approach, "those good local projects don't go to scale." This observation was confirmed in the final chapters of Jon Rohde's excellent casebook on successful CBPHC (Rohde et al. 1993).

This chapter focuses first on some principles that help explain why scaling up CBPHC has been difficult and then briefly describes some successes in scaling up CBPHC. The most consistent reason for failure of PHC has been that public health experts still insist on using a blueprint model of scaling up. We treat human populations as inanimate objects that have no decision-making capacity and that can be manipulated by social engineering. We study successes and impose our findings, while donors provide large chunks of money attached to targets and precise deliverables. But people, in all their uniqueness and perversity, always do something different. There are few silver bullets that will fill gaps in existing services, and for them the blueprint approach may be a little quicker in vertical campaigns than in building them into health systems. But eventually even those must be integrated into comprehensive PHC. The first principle of CBPHC is: *There are few universal solutions that can be applied using top-down blueprints, but scaling up depends on finding a universal process to help local communities apply appropriate solutions to their own problems. The community must participate to develop some ownership of the process.*

Another reason for consistent failure is the tendency of officials and experts to polarize issues as they make decisions about funding. This is especially true of the chronic polarization around the top-down vs. bottom-up debate, which has paralyzed progress. As academics, we mostly do deductive research, polarizing complexities into "either/or" issues, since that yields clear statistics and is easiest to publish. Eventually, we also must make inductive discoveries showing that truth is usually not either/or, but both, and in a shifting balance. A second principle is: *CBPHC requires a flexible partnership balancing bottom-up local control by communities with top-down support by officials and outside-in stimulation by experts (perhaps better called empower-mentors).*

But in our field experience the most important reason for failure in scaling up is the obsessive compulsion of officials and experts to keep total control. Rather than respecting partners in the community, we blame them for our failures. As physicians, our arrogance is particularly destructive of community empowerment as we extrapolate into community relationships the usual practices in clinical doctor-patient interactions and try to exert doctor-population control in public health. A favorite indicator of our relationship with people is that terrible word "compliance." Think for a moment what that means—whether the people we "serve" fully obey what we tell them to do. But the question remains, Do we listen to them? For two decades after Alma-Ata we did quite well in building health systems by extending networks of primary health centers in developing countries, but now the health center movement is collapsing because international funding has shifted primarily to promoting privatization. Instead of community participation, we have become very good at community manipulation. Intersectoral collaboration has always been mostly symbolic in trying to get other sectors to help our services.

That brings us to the principle that a good way for officials and experts to show communities respect and gain trust is to help communities collect and analyze their own data. A consistent finding is that communities get close to 100% coverage in their own household surveys, and they also tend to include the families in greatest need, who are often the non-responders in sophisticated surveys done by professionals because they are remote and difficult to reach. Principle three is: *Communities should learn to use participatory methods to collect and*

analyze their own data, set their own priorities, do their own causal analysis, organize self-reliant action, and evaluate their own results. If communities could do all this on their own, they would have become empowered long ago. Officials and experts are essential as partners to build community capacity if they support the empowerment process. What they often do instead is produce dependency rather than self-reliance. Many case studies show that building community capacity to carry out these functions is possible and can happen amazingly fast even in very poor communities.

Another common reason for failure in scaling up CBPHC is that, in acting as though public health depends only on health services, we have not focused enough on how to change behavior in communities and among officials and experts. The fourth principle of CBPHC is: *The most cost-effective and sustainable changes are those that occur in family behavior and community social norms. The most obvious changes are the ones the community has to make, but the most important are the new attitudes and values of officials and experts. Behavior change becomes sustainable when all partners adopt, adapt, and support the new social norms. To achieve the goal of integrated social development, people have to learn to balance the goals and inputs needed for healthy communities in this generation while also protecting conservation of the environment for future generations. This leads to true self-reliance and sustainability.*

Equity as a fundamental principle of social and economic development seems finally to be receiving attention as a core value of CBPHC. The growing disparities resulting from globalization demand forthright advocacy for the human rights that are fundamental for survival and development. The Rockefeller Foundation is leading the way with its Health Equity Initiative (Evans 2001), and Amartya Sen has presented economic justifications for paying primary attention to equity in defining development as freedom (Sen 1999). Therefore, the fifth principle of CBPHC is: *CBPHC must start with the clear vision from Alma-Ata of "health for all." A basic epidemiological principle is that to control a health problem, it is important first to find out who in the population has the problem or is at greatest risk and then focus control efforts on them. That is a simple definition of equity, not as a vague moral concept, but as a practical basis for action through surveillance for equity* (Taylor 1992).

The main theme we stress in this chapter is that a process for scaling up CBPHC is possible. A new book to be published by Johns Hopkins University Press in the spring of 2002 focuses on scaling up social development. The tentative title is *Just and Sustainable Change: When Communities Own Their Futures.* The primary author is Dan Taylor-Ide, whose specialty is environmental conservation. Seven years ago, UNICEF published a small monograph we wrote for the Copenhagen World Summit on Social Development, *Community Based Sustainable Human Development: A Proposal for Going to Scale with Self-Reliant Social Development* (Taylor-Ide and Taylor 1995). Jim Grant wrote the foreword as one of his last gifts to us of his wisdom. Since then it has had five printings. We have also been following a series of prospective case studies that demonstrate scaling up and present three of them briefly here as progress reports emphasizing qualitative rather than quantitative results.

CASE STUDIES

Tibet

In Tibet, the Pendeba Project shows what can be done in a pristine situation in building self-reliance in communities. Dan was asked by Chinese authorities to help develop the Qomolangma National Nature Preserve (QNNP), a national park to protect the north face of the heart of the Himalayas around Mount Everest. As far as we know, this was the first park with no wardens other than the people living there. In exchange, we promised to help the villagers with their priorities in social development. Among their top priorities was health, since Chinese government services had never reached these very remote villages. Two of the four counties were officially listed as the two poorest in China. Conservation successes have been dramatic, and now farmers ask what we will do about herds of Tibetan wild ass that eat up barley fields in the night and snow leopards that carry off sheep.

About eight years ago, Carl started to spend a month each summer training about 20–25 *pendebas*—the name in Tibetan means "a person who helps neighbors." We concentrated on the simplest home-based interventions. For instance, local experiments showed that a beer bot-

tle of water, two match boxes of *tsampa* (the roasted barley flour that is the main staple of Tibetan diets) and a large pinch of salt made an excellent and safe cereal-based oral rehydration therapy (ORT) solution. Diarrhea had been the leading cause of death at the start of this project, but three years later the first two groups of trained pendebas reported that in all their villages there was only one diarrhea death in the previous year. Improvement seemed to be occurring also in pneumonia mortality. Immunization rates exceeded 90%. Family planning was in great demand as part of maternal care, in contrast to before the project started, when the survey we did with an international team showed that only 23% of married women knew that there were methods for family planning.

The total population of the QNNP is about 80,000. After four years, there were 87 pendebas working in the four counties, and when Carl arrived for the annual month of training, he found that the governors of the counties had moved in to take over the workshop. They started by saying we were causing a great political problem. This did not surprise us, because from the beginning of the project, we were aware of the delicate situation of working under the autonomous government in Lhasa. The problem, however, was that over 300 villages in the QNNP were demanding pendebas, and government officials had calculated it would take us over 10 years to meet that demand. They said that was unacceptable. They finally agreed to a plan to use members of the first two pendeba classes as teachers. The next year, when Carl arrived, he was told to sit in the back of classes to advise on how the pendebas could improve their teaching. Their self-reliance is amazing. Three years later, they have at least one pendeba in 223 of the 450 villages in the QNNP.

The government in Lhasa has asked for the program to be extended to help establish the new Four Great Rivers Nature Preserve in southern and eastern Tibet, which includes the watersheds of the Yangtze, Mekong, and Salween rivers, and the bend of the Brahmaputra. There is no doubt that the communities own this project. As mutual trust increases, there seems to be more interest in collecting the kinds of definitive data on impact that most international projects start by setting as a first priority.

Peru

In Peru, the Comités Locales de Administración Salud (CLAS) project is an example of scaling up in spite of initial resistance from the existing and well-established government health system. About seven years ago, Carl had a call from the Minister of Health asking for advice. The Sendero Luminoso (Shining Path) guerillas had just been driven out of the Andean villages they controlled, but the people were not letting the government reopen health centers. Carl, with a small Ministry team, spent a month in the region to gather information. In village meetings, which often lasted until midnight in churches and schools, the people said, "it was not the American helicopters that defeated the Sendero, or the Peruvian army, it was our Ronderos, self-defense teams made up mainly of women, who sat in stone pillboxes around the village to shoot Sendero gangs when they came to kidnap teenagers to make them guerillas." They said, "Now we have shown we can look after ourselves. We don't like the way doctors from Lima treated us and we want to run the health centers ourselves." The plan for CLAS was developed and the Minister got an order passed that permitted a committee to be formed to control the centers under approved conditions.

Two years later, Carl was asked to return. With another team, he spent another month visiting health centers. Over 400 health centers had been taken over by CLAS committees. On the door of one regional health office there was a tremendous poster saying "Health Workers Boycott CLAS." Many middle-level health officials were convinced it was dangerous for them to lose control because quality would be jeopardized and financial control would be impossible. One regional health director, however, decided that CLAS was a good idea and every center in his region had a committee, but considerable control was still held by the regional office. Another regional director said, "I am too busy to try to control each health center. I let the local committees go ahead, but I respond if the committee or the staff say there is a problem." Most impressive was the way that CLASes had followed the suggestion that their first activity should be for the committee and health staff together to do a complete household survey in order to set local priorities.

These surveys often had 100% coverage. After completing the surveys, the committees analyzed their data and, with the help of health staff, planned action programs.

The spread of CLAS was rapid as communities took initiative under the guidance of a small team in the Ministry. In four more years, there were about 1,200 CLASes out of the 5,000 health centers and posts in the country. Four formal evaluations by independent Peruvian experts were done, with uniformly positive reports, especially in the improved equity and the use of health services by women and children. Most CLASes were raising money for expanding services. It was remarkable how the transparency of local financing produced few instances of misuse of funds. But there were problems in getting communities to follow official documentation and legal requirements.

The number of CLASes fluctuates and the future of the program shifts with political transitions. In 1999, we helped with an interregional meeting where committee members and doctors from 25 CLASes met in Trujillo for their first chance to talk with each other. The sense of excitement was palpable as they shared experiences. In May 2000, at another regional meeting in Tarapoto in the upper Amazon, plans were worked out for the next stage in scaling up, to form Self-Help Centers for Action Learning and Experimentation. A network of such centers could do action training for all partners, conduct field research to analyze statistics on factors influencing impact, and adapt methods balancing top-down and bottom-up controls to respond to the extreme diversity of Peru.

Nepal

Carl had the privilege of conducting the first published health survey in Nepal in 1949 as the doctor for one of the first scientific expeditions permitted into the country, three years before it opened to the outside world. Fifty years later, we organized a repeat visit to the same villages to document changes in the half-century since Nepal has been exposed to outside influences such as expeditions, foreign aid, hippies, etc. We walked from India to Tibet along the Kali Gandaki watershed, which in the previous year had seen about 70,000 trekkers in the upper half of the route, but very few in the lower half.

We received a Rockefeller grant from the Health Equity Initiative to find out what happened to care for the poorest people during a half-century of massive efforts to develop health services. The measurable cutting of national child mortality by almost half gives plenty of opportunity for the many vertical programs to document their share of the percentage improvement they could claim but quantifying the contribution of changes really made within communities has been harder.

In general, people with money have access to care and are doing quite well. But the poorest quarter of families have benefited much less. Most unexpected was what happened to the carefully designed PHC system, which has been greatly influenced by privatization in the last few years. Public funds can pay only very small salaries for staff, who are now forced to earn their living by selling medicines. Health posts have very few supplies. Next door, staff members run medicine shops, which are well supplied and provide them income. One sustainable preventive program is the UNICEF demonstration from the 1970s that plastic piping can be used to bring spring water into villages. Now bazaar stores have abundant plastic pipe, which people buy because they save time by not having to carry water. The largest vertical programs now are national immunization days (NIDs) for polio eradication, and vitamin A distribution.

The best hope for health equity in Nepal is the Female Community Health Volunteers (FCHV) Program started about 10 years ago, partly because of concern among donors about the sustainability of vertical programs such as family planning and child survival activities. There were then over 46,000 FCHVs serving almost every village cluster. They are the volunteers most responsible for getting out the long lines of mothers walking mountain trails as they go twice a year to polio NIDS and vitamin A distribution points. But there is great frustration among these wonderfully dedicated FCHVs, who serve without compensation. They expressed strong agreement in focus groups and interviews that without their help the poorest families would get little care. A well-planned hierarchy in the Ministry of Health organizes the initial training with manuals, even for illiterate women. The recruitment and training have, however, sustained little evidence of a community base. FCHVs say they get almost no support from the local Village Development Committees or the health posts. They know that all programs

supported by donors will terminate, since the first FCHVs have had to live through such transitions in other campaigns. FCHVs are the best hope for equity, but they need help. Our recommendation is that capacity for sustainable community action be built through a network of Self-Help Centers for Action Learning and Experimentation.

Narangwal

The recent experience in Nepal recalled lessons learned in the Narangwal Project in Ludhiana District in the Punjab between 1962 and 1974. The Narangwal Project grew out of much learning from the Khanna Project, which is described in the introduction. At Narangwal, a five-year study of the rural orientation of physicians in seven of the best medical colleges in India showed that even with carefully developed field-practice training, doctors tended to be overwhelmed by the need for acute medical care and were not reliably mobilizing effective primary care. A highly statistical operations research methodology probed the basic functions required from the health team and the need for role reallocation. To maintain coverage, most activities would have to be moved to the community, home, and family. The Indian Ministry of Health, in the annual conferences held in tents at Narangwal, requested a field experiment to demonstrate the proposed shift to community-based action. Separate sources of funding focused on two parallel field trials to study two high-priority issues at that time: one of the first complete studies of how synergism between care of common infections and child nutrition could be implemented by village workers in practical home-based interventions, and second, whether integration between family planning and maternal and child care might be more efficient and cost-effective than providing separate services (an issue that was not resolved for policy purposes until the Cairo Population Conference in 1994). The community-based field trials were started in the mid-1960s with evolution and testing of specific interventions as they became available and lasted until the project was closed down abruptly in 1974 due to political fall-out after the Bangladesh War of Liberation.

Some of the initiatives that Narangwal participated in are summarized in the two volumes published with World Bank support (Kiel-

mann et al. 1983) and in a more recent review (Taylor and DeSweemer 1997). The demonstration that 90% of both clinical and preventive care could be very well performed by Family Health Workers under supervision was linked to further evolution of the concept at Jamkhed and other projects in India. Definitive findings on synergism between nutrition and infection showed:

- the relative cost-effectiveness of defined packages of integrated interventions;
- entry points where interventions could ease introduction of other interventions;
- interactions building on traditional cultural beliefs;
- that the best ideas usually came from listening to the people.

Practical methodological innovations included:

- the first field use of the verbal autopsy;
- simple laboratory and field procedures for following nutrition, growth monitoring, and child feeding in the home;
- one of the earliest demonstrations of the impact of tetanus toxoid immunization of mothers;
- the fact that the important control of common infections does not need to start by reducing incidence but can focus on reducing prevalence by household surveillance and early treatment in the home and that primary prevention can then follow;
- one of the early demonstrations in total communities of carefully documented growth improvement from nutritional interventions, including especially micronutrients in prenatal care and breastfeeding.

Narangwal had the first published demonstration of a 45% drop in child pneumonia mortality, using what became the WHO/UNICEF case management method by auxiliaries, who learned to observe difficult and rapid respirations. The method was later made more specific by research in New Guinea on actually counting respirations. After the first demonstration of oral rehydration for cholera among refugees in

Calcutta and in parallel with the earliest definitive trials in Dhaka, ORT became routine at Narangwal, with a 50% drop in diarrhea mortality. Similar innovations were occurring in integrating simple methods of family planning, showing the relative effectiveness of combining them with maternal care and with child care. This included carefully calculated comparisons of the total costs of specific alternative packages of interventions when provided separately or together. All these activities were part of the exciting worldwide partnerships in field research that led to the recognition that health for all is indeed possible, with appropriate choices of technology made available to communities through a remarkable spirit of shared understanding. The optimism of Jim Grant's "child survival revolution" was born of the results of field trials based on community action and fueled by simple yet sound information owned and acted on by communities themselves.

CONCLUSION

There is great hope for CBPHC. We have learned much but need to move systematically to not make the mistakes that have been so common in past efforts. Community-based empowerment is fragile.

The best example of that fragility is what has happened in China. Two decades of the Barefoot Doctor system showed dramatic improvements, which surprised outside experts with examples of health benefits almost equivalent to the best rates in the United States (Hinman et al. 1982). The China experience was an important part of the optimistic planning that we wrote into the Alma-Ata documents. Just two decades of rampant privatization have now totally changed the Chinese health system, in spite of intensive international assistance. Last year, in remote areas of poor Western provinces, Carl visited health facilities to personally confirm a concern shared by many that preventive services have been overwhelmed by the need for all health workers to focus on earning income by selling medicines and injectables. Between 1999 and 2000, immunization rates in China as a whole, as reported in the *State of the World's Children* reports, dropped by about 10% for each vaccine (UNICEF 1999 and 2000), and other preventive and promotive activities have fared no better.

The case studies in this chapter show that promoting CBPHC is pos-

sible even under difficult conditions. It has seemed especially important in Tibet to be patient in letting local awareness evolve rather than aggressively pushing outside interests and priorities. The case studies show the importance of nurturing the delicate and sensitive relationship between the Pendeba project and official services. Statistics on results will soon, we hope, become available. As pointed out at the beginning of the chapter, there are still gaps in knowledge about how to generate the realistic support by governments and experts for community empowerment that is essential for sustainability.

REFERENCES

Evans, Timothy, et al. 2001. *Challenging Inequities in Health: From Ethics to Action.* New York: Oxford University Press.

Hinman, A. R., et al. 1982. "Health Services in Shanghai County." *American Journal of Public Health* 72 (Supplement): 1–95.

Kielmann, Arnfried A., et al. 1983. *Child and Maternal Health Services in Rural India: The Narangwal Experiment.* Vol. 1, Integrated Nutrition and Health Care. Baltimore, MD: Johns Hopkins University Press.

Perry, Henry B. 2000. *Health for All in Bangladesh: Lessons in Primary Health Care for the 21st Century.* Dhaka, Bangladesh: University Press.

Rohde, Jon, Meera Chatterjee, and David Morley. 1993. *Reaching Health for All.* New Delhi: Oxford University Press.

Sen, Amartya. 1999. *Development as Freedom.* New York: Knopf.

Taylor, Carl E. 1992. "Surveillance for Equity in Primary Health Care: Policy Implications from International Experience." *International Journal of Epidemiology* 21: 1043–49.

Taylor, Carl E., and Cecile DeSweemer. 1997. "Lessons from Narangwal about Primary Health Care, Family Planning, and Nutrition." In *Prospective Community Studies in Developing Countries,* eds. Monica Das Gupta et al. Oxford: Clarendon Press, pp. 101–32.

Taylor-Ide, Daniel, and Carl E. Taylor. 1995. *Community Based Sustainable Human Development: A Proposal for Going to Scale with Self-Reliant Social Development.* New York: UNICEF.

UNICEF. 1999. *State of the World's Children.* New York: UNICEF.

———. 2000. *State of the World's Children.* New York: UNICEF.

7 People, Processes, and Technology: Lessons from Haiti and Vietnam

Gretchen Glode Berggren

While eliminating neonatal tetanus clearly requires the provision of tetanus toxoid to women, this experience in rural Haiti demonstrates the importance of cultural sensitivity for designing programs that will lead to high-coverage adoption of appropriate health technologies. The Berggrens went on to address the more complex problem of protein-energy malnutrition among the poorest in Haiti and Vietnam, showing that consistent consultation with communities can determine what works in the most varied sociocultural settings. This chapter exemplifies the marriage of selective primary health care interventions with good leadership and cultural sensitivity to community needs, in the spirit of Alma-Ata.

—Jon Rohde

As my husband, Warren, and I progressed from learning about community-based approaches in the Belgian Congo in the late 1950s, to working with communities in rural Haiti in the 1970s, and then to working with communities around the world under Save the Children, community health volunteers and families living in poverty taught us some lessons that are worth sharing.

Most public health practitioners realize that in each cultural setting, one needs to begin by defining the "community" to be served and then striving to understand it, a continuing process. The ethnic background of the people within the communities, their institutions, traditions, and modes of interaction often dictate how they will interact with a program to improve health and survival. An experienced community health team wrote: "Before we can appreciate the problems of a community we must know something about community structure (demography) and function (sociology). We have to learn about its patterns of disease (epidemiology), and the organization and administration of different services that may be provided for the community (e.g. environmental control, immunization, child spacing, nutrition, and education) or for special groups within the community (e.g. mothers and children, school children, workers and the handicapped.)" (Wood et al. 1984, xi).

Despite this knowledge of the primacy of the community, the Western model of medicine is often imposed. To reach a community, people often think first of building and staffing a health facility and then depending on self-selection to achieve coverage. One is not surprised later to find that less than a third of the group targeted for immuniza-

tion, for example, were reached by a fixed facility. Such lack of coverage is unacceptable not only to public health practitioners but also to communities, once they understand what is at stake.

A FRAMEWORK FOR COMMUNITY HEALTH INTERVENTION THAT ACHIEVES COVERAGE

To achieve the goal of improved health and survival of mothers and children and indeed of all community members, one useful approach is to better define, study, and understand three entities:

- the people
- the processes
- the technology

One could also discuss the goals, objectives, inputs, outputs, and indicators needed to help communities combat conditions that lead to high rates of morbidity and mortality, especially among mothers and children. But technology-driven community health interventions that ignore the people, their processes, and their practices are unlikely to succeed. One has only to look at the AIDS epidemic as it continues to affect young women desperate to make a living in Africa and Asia, or the continuing deaths of babies due to tetanus of the newborn in many developing countries.

Health educators and public health practitioners often feel driven to impose the technology that will "save lives" rapidly and at any cost. They imagine that it will take too much time to understand the history of a community, the constraints, the good traditions, and what the people themselves think is important. In our experience, using the tradition of exchanging ideas through women's "gossip" at the marketplace in Haiti served to get an immunization message out to women, who adopted the new health-seeking behavior in less than one year. Gossip conveyed a message more effectively than the written or radio messages. Similarly, it took the process of discovering and tapping the knowledge resource of "positive deviant" poor mothers whose children were well nourished to find the best method to combat malnutrition in Than Hoa Province of Vietnam.

Although these examples from Haiti and Vietnam appear to be disease-oriented "vertical programs," they built the fund of goodwill that allowed a more comprehensive, caring community health approach to evolve.

NEONATAL TETANUS IN RURAL HAITI

In Deschapelles, Haiti, from 1956 to 1967 the Hôpital Albert Schweitzer (HAS) pediatric ward faced an increasing number of cases of tetanus of the newborn. Despite recruitment, training, and equipping of traditional birth attendants (TBAs), more and more tetanus of the newborn was seen at HAS, until the numbers reached over 600 cases per year (W. Berggren 1974a). Reproductive histories taken from all mothers in a registered population in 23 villages nearest the hospital revealed that many had lost at least one child to this disease. The rate of hospital admission for neonatal tetanus from within the HAS district of 94,000 was 64 per 1,000 live births in 1967 (Berggren and Berggren 1971). Tetanus had its own name in Creole, "maladi machwa sere ak cour red" (the fixed-jaw, stiff-back disease), and people had their own explanations of its causality.

Health professionals at the Hôpital Albert Schweitzer had been active in their efforts to combat tetanus of the newborn since the opening of the hospital in 1956 (Earle and Mellon 1958). In addition to training TBAs, the HAS staff had:

- produced a movie that showed a home delivery and explained clean delivery practices, using local actors who spoke Creole;
- used the educational movie in the outpatient clinic and in communities;
- immunized pregnant women in antenatal clinics from 1965 onwards, explaining the purpose of the immunization.

All these activities appeared to have had little effect on the traditional practices that continued to put infants at risk for tetanus, and since less than a third of women attended antenatal clinics, often very late in their pregnancies, immunization had not diminished the case load for tetanus. Local TBAs insisted that, thanks to the equipment and

training provided by HAS, they accomplished clean home deliveries, cut the umbilical cord in a sterile manner, and applied clean dressings. But they admitted that someone in the family of the newborn would apply an unsterile substance to the umbilical cord stump as soon as the TBA left the scene despite their attempts at education. The result would be another case of tetanus (Marshall 1968, G. Berggren et al. 1983).

Dr. Larimer Mellon, founder of the Hôpital Albert Schweitzer of Haiti, decided in 1967 to implement a community health program to solve problems like tetanus of the newborn. At the time, the infant mortality rate in Haiti was estimated at 125 deaths per 1,000 live births, with neonates accounting for more than half the deaths, many of them due to tetanus (Marshall 1968). It was known through small field trials that immunizing all women would eliminate tetanus of the newborn (Newell et al. 1966). To apply this technology to a larger population, one would need to rely on *people*, their *processes*, and the latest scientific *technology*. The community health team had to develop a clear understanding of the people being affected and how they thought of this disease, whether they would accept vaccination as a preventative once they saw that it worked and, most important, where and how women could be reached.

Resource Assessment in Communities Is More Important Than Needs Assessment

The community health team included experienced Haitian leaders who could accomplish a resource assessment. Dr. Mellon discovered and recruited a local woman leader, a former mayor, who commanded respect in all the communities, was familiar with the habits of women in the area, and understood how to inspire her colleagues. Through her efforts and those of other key informants, community volunteers came forth when it was understood that tetanus could be eradicated through immunization.

The strategy to eliminate tetanus of the newborn was not the only one promoted by the community health department of the Hôpital Albert Schweitzer, where daily admissions for severe malnutrition and tuberculosis were second only to tetanus. But it became a priority *because the technology existed to eliminate it quickly and cost effectively* and because interviews with local residents revealed that women

would be likely to comply with an immunization program, once they understood its purpose. The question was where and when? The answer was in the marketplaces of the Artibonite Valley. The life of nearly every Haitian woman dictated that she go to market at least once a week to sell her farm goods and buy provisions for her family. These local markets had a predictable schedule and served rather well-defined communities. Furthermore, there was a great deal of information exchange, often at every crossroads, as women trekked to the marketplace. Rural women would leave their homes before dawn to get a good booth or place to sell and stop along the way to get news. By the time they arrived, they would know the price of corn and beans, and other activities that might happen at the market. As they set out their wares, all this was discussed.

Steps in Planning Marketplace Immunization

- **Meetings with community leaders and key informants.** Community leaders, who are very influential, control local market days. If the market were to have an "immunization booth," then those leaders had to be convinced of its worth and reliability, and were needed to help secure the spot in a convenient place. In addition, community leaders and key informants, such as local schoolteachers, could volunteer themselves and recruit local volunteers to assist the technical support team that would be arriving at dawn to set up the immunization session. Tasks included registering women, supplying them with immunization cards, explaining the purpose of the immunization, ensuring that each understood the date of her next visit, helping to keep people in an orderly line, and cleaning upper arms with alcohol. Offering each candidate for immunization a free photo of herself when she had completed the required number of tetanus toxoid doses was tried and was popular in launching the program, but it was later found unnecessary.
- **Social mobilization.** Our informants and women volunteers got the word out at every crossroads leading to a market. Furthermore, each case of neonatal tetanus admitted to the Hôpital Albert Schweitzer was investigated to find what more could

have been done to help the woman get immunized. The investigators were instructed to pass this word all along the way as they proceeded to the home of the tetanus case. On their return, people came out to hear the result. This generated even more conversation about the marketplace immunizations and their importance.

- **Moving the immunization technology to where the people are.** The process of getting a team on the road to the marketplace before dawn, with cold chain intact, and with all equipment for immunizing women required forethought. Refrigeration, vaccine (alum-precipitated tetanus toxoid), cold boxes, and equipment to give the vaccines had to be in place. An information system was needed as well: Hôpital Albert Schweitzer required not only immunization cards and a register but also the transfer of each immunization record to the HAS chart of every woman.

From among the health volunteers, the community health team chose and trained health auxiliaries. Their training at first was skill-by-skill, on-the-job training focused on immunization. Later, that training was expanded to include a broader spectrum of skills needed for a community health program (G. Berggren et al. 1995). It took a schedule made months in advance to ensure that a dozen different marketplaces would be reached at four-week intervals, often enough that women regularly attending the market could complete the required number of tetanus toxoid doses.[1] The market women pointed out that local trucks plied the dirt roads between markets and could provide inexpensive rides for some of the personnel attached to the community health department. Thus, the purchase of new vehicles and a major delay was avoided. Transport was scheduled by arranging to rent local trucks and use their chauffeurs.

1. Based on work supported by WHO in the 1960s in Colombia and in New Guinea, three doses of alum-precipitated tetanus toxoid given at 4–6 week intervals were known to give 95% protection to prevent neonatal tetanus for five years (W. Berggren 1971).

The Impact of Marketplace Immunizations against Tetanus

Marketplace immunizations continued for more than five years, even while the community health team moved toward local interventions to reach all mothers and children in their villages. With the marketplace immunization program, neonatal tetanus admissions declined rapidly. Retrospective fertility histories taken from 100% of women living in 23 villages in the HAS district revealed that women had lost 136.9 per 1,000 live births due to tetanus in the 1950s before the hospital was opened. This rate dropped to 78.9 when pregnant women were immunized and finally to zero by 1971, when all women had been immunized (W. Berggren, Ewbank, and G. Berggren 1981). By 1991, there were no cases of tetanus of the newborn reported from the entire hospital district of over 175,000 people (Menager and Berggren 1992). Tetanus of the newborn had cost HAS $60,000 a year for treatment in the early 1960s; immunization had cost less than one-third of that amount and had saved several hundred young lives per year since.

From Marketplace to Community: Activities and Results

The fund of goodwill built by the tetanus immunization program paved the way for formation of volunteer community health workers in village after village, and a more comprehensive approach. HAS gradually introduced a community health program with paid community health workers (1 per 2,000 people), assisted by community volunteers, who registered their entire populations and organized regular village assembly posts for preventive services. Their trainers taught simple skills: oral rehydration therapy, growth monitoring/counseling for under-fives, immunization and vitamin A distribution, and early recognition of illness for patient referral. Communities welcomed the technical support team to their village assembly posts, where they helped with and followed up on broader community health activities.

The cost for HAS to add community-based services was $1.62 per capita per year (Taylor 1992, W. Berggren, Ewbank, and G. Berggren 1981). This model was widely adopted by private voluntary organizations in Haiti and is still in use (Augustin 1993). In *Why Things Work,*

Walsh describes details of the methodology; the book *Community-Based Longitudinal Nutrition and Health Studies*, edited by Scrimshaw, describes nutrition activities and results in more detail (Halstead and Walsh 1990, Scrimshaw 1995).

The Hôpital Albert Schweitzer now trains volunteer women as a component of the ongoing community health program that has expanded to bring more comprehensive care to local neighborhoods. These volunteer women (1 for every 20 families) proved to be essential, especially in reducing deaths due to malnutrition, diarrhea, and (in the case of women) obstetrical causes.

HAS achieved a significant reduction in infant mortality with its community-based package of services in its census tract: from an infant mortality rate of 110 per 1,000 live births in 1967, there was a decline to 34 by year five of the program. The age-specific death rate for 1–4-year-olds in the census tract declined from 14 to 6 per 1,000 over the same period. The methods now reach a population of 250,000, and HAS is working with partner organizations in its outlying areas. Perry and his coauthors report that, according to recent survey results in this population, the under-five mortality rate is 68.2 deaths per 1,000 live births, compared to 144.3 for rural Haiti, a 53% reduction. The 12–59 month age-specific mortality rate is 73% lower (16.7 versus 60.8). He estimates that 18,810 deaths have been prevented and 1.3 million years of life have been saved (Perry et al. 2000).

USING THE POSITIVE DEVIANCE CONCEPT AND SKILL-BUILDING "APPRENTICESHIPS" IN COMMUNITY-BASED MALNUTRITION PROGRAMS IN HAITI AND VIETNAM: THE HEARTH MODEL

How Hearths Emerged

Mothercraft centers (1961–78). The problem of malnutrition was particularly severe in rural Haiti, and while rehabilitation in the hospital was clinically successful, it was a long and costly process. Furthermore, it was seen as a "medical cure" and the role of mothers and local feeding practices were not appreciated. Even when mothers were brought onto the wards and trained in feeding their sick children, the setting con-

vinced them that the illness and its cure were magical, rather than within their grasp.

The Mothercraft centers established in Haiti and other countries in the 1960s, which were based on local culture and practices (G. Berggren et al. 1984, King et al. 1978), were a dramatic and cost-saving alternative to hospital rehabilitation. They used locally recruited women as paid nutrition educators to care for and feed moderately and severely malnourished preschool children daily in their own villages for three months. To the extent possible, the mothers of the malnourished children took turns assisting in daily food preparation and rehabilitation, learning lessons along the way. The program used inexpensive local foods and avoided the use of medications, so that the recovery of the child (the main demonstration objective) would be attributed to food alone and not to medicines, as was the case if the malnourished child was rehabilitated in a hospital setting. The long-term objective was for mothers to learn to prevent malnutrition in the younger siblings of malnourished children and thus to reduce the rates of malnutrition in a given community. Once this was achieved, the educator closed the center and moved to another community.

The emotional state of the malnourished child changed dramatically in a well-run Mothercraft center. Most children were transformed from apathetic and listless to mischievous and full of life within two weeks. Later changes, such as weight gain, were less impressive to the mothers, who often failed to attend the sessions after the first month (Burkhalter and Northrup 1997).

In evaluating the centers, King et al. (1978), Warren Berggren (1971), and Beaudry-Darismé (1973) reported improvements in food selection and preparation, family diets, the nutritional status of participating children, and the survival of their younger siblings. Gretchen Berggren et al. (1984) found that the weights and heights of children participating in the program improved significantly more than secular improvements countrywide. Although Mothercraft centers reported mostly good results, the programs were eventually abandoned because of the small numbers of children that could be reached in a given year and because the centers were not thought to be cost-effective.

Foyers de démonstration nutritionnelle in Haiti (1974–78 and 1984–94). Haiti's Projet Integré de Santé et de Population (PISP) intro-

duced a modification of the Mothercraft centers that has proven successful in the hands of private voluntary organizations in Haiti. Community health teams had observed that even severely malnourished children show psychological "brightening" by the end of two weeks of successful recuperation. It was reasoned that mothers of malnourished children might be convinced to continue the rehabilitation process in their own homes if a brief "skill-building apprenticeship" was offered to them for the *first two weeks* of a child's recuperation. During that time, a balanced diet, including snacks, could be demonstrated, using local foods made more calorie-dense. The mothers might judge the recuperation successful when they saw the change in the child and might continue it at home, especially if encouraged by local volunteer mothers who would initiate the process in their own home (*foyers de demonstration nutritionnelle* or FDNs). The PISP project implemented such a trial, comparing results from the more costly Mothercraft centers in one area with FDNs in another, and with a third area where dry rations (the most costly approach) were distributed when children were shown to be moderately or severely malnourished.

Community volunteers and paid health workers learned about the FDN and explained it to the community, reaching a consensus about the need to treat malnutrition with local foods in the village itself. FDNs implemented by the PISP Project and by Save the Children/USA got large groups of malnourished children together (20 or 30 at a time) in a nearby church, schoolyard, or volunteer's home. As in the Mothercraft centers, a *monitrice* directed the activities, convinced local mothers to help her, and asked the mothers of the malnourished children to take turns in the daily FDN routine. Local foods were purchased on the local market to make a nutritious snack and a well-balanced meal, so that malnourished children were offered 700–800 extra calories per day. Mothers were asked to contribute foods for the daily menus. The community health team followed each FDN closely, and children were weighed at the end of two weeks in the FDN, and monthly thereafter until reintegrated into the growth monitoring/counseling sessions. Those not doing well would be referred to health centers to look for hidden illness. Progress could be measured by weighing the children at entry and every month thereafter.

Prerequisites to the village-level FDN program included immuniza-

tions; semestrial "deworming" of children and health education about parasitic diseases; education of parents about how to use oral rehydration therapy; and regular distribution of micronutrients (especially vitamin A) at rally posts. All these services were also available at health centers, but these were miles away and tended to be underutilized due to geographic and financial barriers. Results revealed the FDN to be as effective as the Mothercraft centers and the method described by G. Berggren et al. (1984).

Neighborhood Hearths or Foyers d'Apprentissage et de Réhabilitation Nutritionnelle in Africa and Haiti. In the Foyers d'Apprentissage et de Réhabilitation Nutritionnelle (FARN) program, which began in 1993, more decentralization and community participation emerged. Volunteer mothers under the supervision of the monitrice use their own outdoor kitchens to begin the rehabilitation process for children in their own neighborhoods (usually three to six children from nearby). They use inexpensive local foods based on a positive deviance inquiry (that is, they observe the caring behaviors of the mothers of well-nourished children living in the same community and what they feed their children—these are "positive deviants" in contrast to the "negative" or malnourished). Each participating mother of a malnourished child is required to attend daily and to contribute some food or fuel, or help carry clean water to the site. The volunteer mothers ask participant caretakers of malnourished toddlers not to deny the child any food from the family pot later in the day. For two weeks, the local volunteer mothers invite malnourished children and their caretakers from nearby homes for a few hours of daily skill-building and feeding sessions, and then follow up for two more weeks, making home visits to encourage their participants to continue the extra meal and nutritious snacks. Children not doing well are referred to health centers for detection and treatment of underlying illness. If possible, all caretakers are invited to participate in a poverty lending program.

COMMUNITY PREPARATION AND USE OF THE POSITIVE DEVIANCE INQUIRY IN VIETNAM

Based on experience in Haiti and Bangladesh, Jerry and Monique Sternin (Save the Children/Vietnam) developed a model that was inte-

grated into a community development, health, and poverty alleviation program in Vietnam. The program's mission was to enhance, measurably and sustainably, the quality of life of women, children, and their families through a commune-level development program that could be widely replicated. Families with a malnourished child were automatically eligible for enrollment in a poverty alleviation program at the same time that their community planned for a local approach to nutrition rehabilitation and education using local foods. A local "positive deviance inquiry" became a key ingredient preceding each Hearth application in every village. Save the Children's Poverty Alleviation and Nutrition Program adapted the Haiti model and used it from 1991 onwards. However, there were two major differences: (1) The positive deviance inquiry in each village was emphasized and the whole village participated in interpreting the key findings and (2) project workers made many visits to a village before the Hearth exercise was begun to ensure consensus on the need for it and to make the community the "supervisor" to the greatest extent possible (Sternin and Sternin 1998).

The Vietnam project worked with local governmental organizations. For example, it worked with the Ministry of Health to enhance and expand local health workers' ability to immunize and deworm children, and refer and treat illness. Many of the features of the Haiti program were already in place; villages were well organized, with women volunteers well distributed. However, growth monitoring/counseling was reaching only a fraction of children, and village health workers needed rosters to be sure "no child was left out." Mothers needed more encouragement to breastfeed, and the Ministry of Health asked that nutrition education be carried out in the context of their primary health care program, which included family planning. The project found women volunteers already recruited and trained to help their neighbors as part of Vietnam's communal development.

Sillan (2001) writes: "Starting in four villages for a population of 20,000, the program was adopted by the Ministry of Health of Vietnam and now reaches many villages with a population of two million." Fathers and community leaders as well as mothers attended several meetings before the Hearth program began. The whole village participated in the "community diagnosis" of malnutrition, helping to weigh children. The positive deviance inquiry became a key exercise in each

village. This inquiry taps the existing knowledge and good traditions that must be preserved and built upon in the fight against malnutrition. Child-caring, not just child-feeding, behaviors were sought out, in keeping with more recent findings (Engle 1995).

Vietnam demonstrated that supportive communities are the key to combating malnutrition and that without community participation the Hearth approach will not succeed. Quoting the Sternins, Sillan (2001) points out:

- A malnourished child raises a flag of dysfunction;
- It often flags a dysfunctional family. Something is not working to keep the child well-nourished. There are adjustments needed in either feeding practices, caring practices, or health seeking practices;
- It may further flag a dysfunctional community.

Applying the Positive Deviant Approach

The questions change when using the positive deviant approach to health (see Table 1). It focuses on strengths rather than problems.

Before the Hearth sessions, all children in a community are weighed and each weight for age is plotted on a community graph so that the community can help tabulate the proportion of children who appear well nourished and the number who need rehabilitation. Community leaders in Vietnam (usually fathers) construct a simple pie chart to demonstrate the proportions in each category. Based on this exercise, volunteer mothers and community leaders identify the *well-nourished* children who come from modest homes, and ask permission to visit their homes, observe the child-feeding and -caring practices, and congratulate the successful families. Under the guidance of a trainer (like the monitrice in Haiti) they meet afterwards to reach consensus and tabulate results. Together they discover the foods and caring behaviors most frequently observed in the homes of successful, positive deviant mothers. The interviewers, usually including the volunteer mothers themselves, look for three "goods": good caring behaviors, good health-seeking behaviors, and good child-feeding practices, including the menus.

TABLE 1
The Positive Deviant Approach

Based on Strengths	*. . . Not Problems*
What are your strengths?	What is wrong?
What's working here?	What are your needs?
What are your resources?	What can we provide?
What can we build on?	What is lacking in your community?
What is already present and good?	What's missing here?

Source: Adapted from Sternin and Sternin 1998

A local trainer-supervisor debriefs the community volunteer interviewers and helps them draw conclusions about the skills they have observed. They consider together how to teach these skills to mothers of malnourished children. The supervisor-trainers draw up menus for Hearth sessions from the results of this exercise, and modify them, if necessary, to make the daily extra meal and snack more calorie-dense and well balanced, since the goal is not only to nourish but also to rehabilitate. The poor mothers of well-nourished children have usually chosen inexpensive foods very wisely and have shown that they are sensitive to seasonal availability. In Vietnam, mothers of well-nourished children were using shrimp, freely available in nearby canals, as well as more fruits and vegetables in the diets of their children. Thus shrimp were called the positive deviant food by the village workers, who translated the term into their own language and were delighted with their discovery.

The trainer-supervisor identifies and recruits volunteer mothers who have helped with the positive deviance inquiry and who are willing to use their own kitchens so that mothers of malnourished children can practice new skills. Volunteer mothers in Vietnam were very dedicated to their tasks. They had to be willing to:

- come for training for at least five days in advance of the Hearth sessions for a few hours per day;
- demonstrate their ability to transmit simple messages as well as work with the mothers of malnourished children, so that the rehabilitation process could begin (this means, for exam-

ple, overcoming anorexia by making food more appealing to the malnourished child, who often refuses it at first);
- receive neighboring children in the daily Hearth rehabilitation exercise for a few hours per day for two weeks;
- follow up for two weeks by encouraging the mother of the malnourished child to continue the rehabilitation process in her own home.

The volunteer mother will remain a community resource and is often looked upon as a kind of "auntie" who pays attention to the children in her neighborhood.

At the end of the month (two-week exercise in the daily Hearth and two weeks of follow-up), the community members meet to study their results. How many children gained adequate weight according to the growth chart of each child? How many exhibited catch-up growth? How many did not gain weight? Often in Vietnam, ill children were referred for treatment, and often the community requested that the Hearth exercise be repeated for some of the failing children; Save the Children had the resources to help them do so (Sillan 2001, Wollinka et al. 1997).

OVERALL IMPACT OF HEARTHS

Dubuisson et al. (1994) found, for an area near Maissade, Haiti, that, using weight for age as an indicator, there had been a communitywide decrease of 30.6% in severe malnutrition in a child survival project that used the Hearth method. A two-year follow-up study of the earlier PISP project showed some decrease in malnutrition but a very significant decrease in the mortality of younger siblings of children who had been rehabilitated in Hearths, as compared to the general population of children in that age group in the same geographic area (G. Berggren et al. 1984).

During the 1993–94 Haitian embargo, Menager and Berggren rehabilitated more than 9,000 children in their own villages using the method, with a case fatality rate of less than 1%. Their team trained more than 1,600 Haitian volunteer mothers, each capable of rehabilitating malnourished children in her own home. A retrospective study of children rehabilitated in Hearths during the embargo drew mixed

conclusions. Immediate results showed that 60% of children gained weight as fast or faster than the international standard median after Hearths. In the remaining 40%, half were found to have tuberculosis or other chronic illness, and half were found to come from extremely poor families, in need of a poverty lending program.

The results from Vietnam are also very impressive. Over 7,000 children were followed in the first villages where the positive deviant/Hearth method was applied. Using weight for age as a communitywide diagnostic indicator, severe (third-degree) malnutrition disappeared and moderate malnutrition decreased from 25% to 2%; children falling in the "normal" range increased from 38% to 69% at the same time. The effect was still present two years later when the National Institute of Nutrition in Vietnam compared the villages where Hearth had been applied to villages where there had been none.

CONCLUSIONS

Respecting and learning from the people and their processes has contributed to the success of many community health programs and the better use of modern technology. An example from immediate experience is the use of "gossip" as a tool for social mobilization of rural Haitian market women. They proved willing to be immunized against tetanus if technology was brought to them in their rural marketplaces and if they understood the consequences. The application of marketplace immunization reduced in-district admissions for tetanus of the newborn to zero and was cost-effective. The goodwill generated by the activity paved the way for a more comprehensive community health approach that reduced infant and child mortality rates and cost $1.62 per capita per year (Taylor 1992).

Burkhalter and Northrup describe the Haiti model:

> Hearth programs engage parents in rehabilitating their malnourished children . . . using diets based on local knowledge and resources. *The programs are designed to take place in the context of a comprehensive [community-based] nutrition promotion program that includes growth monitoring, micronutrient supplementation, deworming and treatment for infectious diseases.* Essentially, the

> Hearth program arranges for volunteer community mothers to [begin the rehabilitation process by feeding] malnourished children [in their own neighborhoods] one nutritious meal and snack each day for two weeks in addition to their normal diet (Berggren and Burkhalter 1997, 1).

Menus and lessons for the daily Hearth sessions are drawn from local studies of child-feeding practices and caring behaviors of mothers of well-nourished children (positive deviants) in the same village (Zeitlin 1992; Zeitlin et al. 1990; Sternin, Sternin, and Marsh 1997). Mothers of malnourished children participate daily, provide part of the menu, and agree to continue the daily extra meal under the supervision of the volunteer mother.

The positive deviance/Hearth approach to combat malnutrition allows community health practitioners to better understand, document, and build on those good behaviors crucial to raising well-nourished children. Allowing mothers to participate in a community-level apprenticeship to practice good child-feeding behaviors and helping them interpret the change in their malnourished children have brought about changes in child-rearing practices. The effect apparently endures over the long term, and the approach does not create dependency. The National Institute of Nutrition of the Vietnamese government has recognized the method's usefulness, and it now reaches more than two million people.

REFERENCES AND RESOURCES

Africare. 1999. "Guinea Experience with HEARTH." Training video. Washington, DC: Africare.

Alvarez, M., Gretchen Berggren, and M. Gay. 1993. "Evaluation of the CARE Richesse Program in Haiti." Report to CARE. Port-au-Prince, Haiti.

Augustin, A. 1993. "Report to UNICEF on Child Health and Mortality in Haiti." Port-au-Prince, Haiti.

Beaudry-Darismé, M. M. N. 1973. "Nutrition Rehabilitation Centers: An Evaluation of Their Performance." *Journal of Tropical Pediatrics* 19: 299.

Berggren, Gretchen, and Muriel I. Elmer. 1999. "The HEARTH Program: Mobilizing Communities in Developing Countries to Combat Malnutrition Using a Participatory Adult Education Approach after the Example

of the Good Shepherd." Proceedings of the Ninth World Congress of the International Christian Medical and Dental Association. Durban, South Africa: International Christian and Medical Dental Association.

Berggren, Gretchen, and M. Favin. 1992. "Social Mobilization for the Elimination of Tetanus of the Newborn." Working Paper of the Mothercraft Project. Boston: John Snow, Inc.

Berggren, Gretchen, J. R. Hebert, and C. M. Waternaux. 1985. "Comparison of Haitian Children in a Nutrition Intervention Programme with Children in the Haitian National Nutrition Survey." *Bulletin of the World Health Organization* 63: 1141–50.

Berggren, Gretchen, et al. 1983. "Traditional Midwives, Tetanus Immunization, and Infant Mortality in Rural Haiti." *Tropical Doctor* 13: 79–87.

———. 1984. *The Nutrition Demonstration Foyer, A Model for Combating Malnutrition in Haiti.* Hoviprep Monograph Series No 2. International Food and Nutrition Program of MIT. Cambridge: MIT Press.

———. 1995. "A Prospective Study of Community Health and Nutrition in Rural Haiti from 1968 to 1993." In N. Scrimshaw, ed. *Community-Based Longitudinal Nutrition and Health Studies.* Boston: International Foundation for Developing Countries, pp. 143–73.

Berggren, Warren L. 1971. "Evaluation of the Effectiveness of Nutrition Rehabilitation and Education Centers." In P. L. White, ed., *Proceedings of the Western Hemisphere Conference on Nutrition III, Division of Scientific Activities.* Chicago: American Medical Association Press.

———. 1974a. "Administration and Evaluation of Rural Health Services: A Tetanus Control Program in Haiti." *American Journal of Tropical Medicine and Hygiene* 23: 936–49.

———. 1974b. "The Control of Neonatal Tetanus in Rural Haiti through the Utilization of Medical Auxiliaries." *Bulletin of the Pan American Health Organization* 8: 24–29.

Berggren, Warren L., and Gretchen Berggren. 1971. "The Changing Incidence of Fatal Tetanus of the Newborn: A Retrospective Study in a Defined Rural Haitian Population." *American Journal of Tropical Medicine and Hygiene* 20: 491–94.

Berggren, Warren L., Douglas Ewbank, and Gretchen Berggren. 1981. "Reduction of Mortality in Rural Haiti through a Primary Health Care Program." *New England Journal of Medicine* 304: 1324–30.

Berggren, Warren L., and Barton R. Burkhalter. 1997. "Introduction." In Olga Wollinka et al., eds. *Hearth Nutrition Model: Applications in Haiti, Vietnam, and Bangladesh.* World Relief Corporation and the BASICS Project. Arlington, VA: BASICS.

Burkhalter, Barton R., and Robert S. Northup. 1997. "Hearth Program at the Hôpital Albert Schweitzer in Haiti." In Olga Wollinka et al., eds. *Hearth Nutrition Model: Applications in Haiti, Vietnam, and Bangladesh.* World Relief Corporation and the BASICS Project. Arlington, VA: BASICS, pp. 13–42.

CORE (Child Survival Collaborations and Resources Group) and NGO Networks for Health. 2000. "Community Centered Approaches to Behavior and Social Change." Working Paper for USAID. Washington, DC.

Dubuisson, S. E., et al. 1994. "Impact of Sustainable Behavior Change on the Nutritional Status of Children." In D. Storms, C. Carter, and P. Altman, eds. *Community Impact of PVO Child Survival Efforts: 1985–1994.* Proceedings of USAID-sponsored conference in Bangalore, India, Oct. 2–7, 1994, pp. 51–53.

Earle, A. M., and W. L. Mellon. 1958. "Tetanus Neonatorum: A Report of 32 Cases." *American Journal of Tropical Medicine and Hygiene* 7: 315–16.

Engle, P. L. 1995. "Child Caregiving and Infant and Preschool Child Nutrition." In Per Pinstrup-Andersen, David Pelletier, and Harold Alderman, eds. *Child Growth and Nutrition in Developing Countries.* Ithaca, NY: Cornell University Press, pp. 53–77.

Finlay, S. 1990. "Report on Neonatal Tetanus in Haiti: Special Report to PAHO." Washington, DC.

Halstead, S. B., and J. A. Walsh. 1990. *Why Things Work: Case Histories in Development.* New York: Rockefeller Foundation.

Harvard Center for Population Studies. 1993. "Sanctions in Haiti: Crisis in Humanitarian Action." Progress on Human Security Working Papers. Cambridge: Harvard Center for Population and Development Studies, pp. 5–7.

King, K. W. 1964. "Development of an All Plant Mixture Using Crops Indigenous to Haiti." *Econ. Botany* 18: 311–22.

King, K. W., et al. 1978. "Preventive and Therapeutic Benefits in Relation to Costs: Performance over 10 Years of Mothercraft Centers in Haiti." *American Journal of Clinical Nutrition* 31: 679–80.

Marshall, F. N. 1968. "Tetanus of the Newborn with Special Reference to Experiences in Haiti." *Advances in Pediatrics* 15: 65–100.

Menager, H., and Gretchen Berggren. 1992. "Preliminary Report on the Result of Community Health Outreach Programs at the Hôpital Albert Schweitzer (HAS) in Haiti." Paper presented at the HAS Alumni Association Meeting.

Newell, K., et al. 1966. "The Use of Tetanus Toxoid for the Prevention of Tetanus Neonatorum: Final Report of a Double-Blind Field Trial." *Bulletin of the World Health Organization* 35: 863–71.

Perry, Henry, et al. 2000. "Report to the Grant Foundation on Community Health Impact of Activities of Hôpital Albert Schweitzer." Sarasota, FL: Grant Foundation.

Research Corporation, ed. 1970. Chapters by Warren L. Berggren, W. Fougere, and K. W. King. In *A Practical Guide to Combating Malnutrition in the Preschool Child.* New York: Appleton-Century-Crofts.

Scrimshaw, N., ed. 1995. *Community-Based Longitudinal Nutrition and Health Studies.* Boston: International Foundation for Developing Countries, 1995.

Sillan, Donna. 2001. *The HEARTH Nutrition Model Using the Positive Deviance Approach: An Implementor's Handbook.* Washington, DC: CORE (Child Survival Collaborations and Resources Group), USAID.

Sternin, Jerry, and Robert Choo. 2000. "The Power of Positive Deviancy." *Harvard Business Review,* January-February.

Sternin, Monique, and Jerry Sternin. 1998. *Designing a Community-Based Nutrition Program Using the HEARTH Model and the Positive Deviance Approach: A Field Guide.* Westport, CT: Save the Children/USA.

Sternin, Monique, Jerry Sternin, and David L. Marsh. 1997. In Olga Wollinka et al., eds. *Hearth Nutrition Model: Applications in Haiti, Vietnam, and Bangladesh.* World Relief Corporation and the BASICS Project. Arlington, VA: BASICS, pp. 49–61.

Taylor, Carl E. 1992. "Surveillance for Equity in Primary Health Care: Policy Implications for International Experience." *International Journal of Epidemiology* 21: 1043–49.

Wollinka, Olga, et al., eds. 1997. *Hearth Nutrition Model: Applications in Haiti, Vietnam, and Bangladesh.* World Relief Corporation and the BASICS Project. Arlington, VA: BASICS.

Wood, C. H., J. Vaughn, and H. de Glanville. 1984. *Community Health.* Rural Health Series No. 12. Nairobi: African Medical Research Foundation.

Zeitlin, Marion. 1992. "Child Care and Nutrition: The Findings from Positive Deviance Research." Medford, MA: Tufts University School of Nutrition.

Zeitlin, Marion, et al. 1990. "Positive Deviance in Child Nutrition: With Emphasis on Psychosocial and Behavioral Aspects and Implications for Development." Tokyo: United Nations University.

8 Two Decades of Community-Based Primary Health Care in Rural Bolivia

David S. Shanklin and Nathan Robison

The experience of a community-based nongovernmental organization (NGO) in Bolivia demonstrates the potential for reaching dispersed rural populations with equitable primary health care services that result in measurable and sustained improvements of coverage and impact. This account also highlights the contrast between this more flexible, culturally sensitive NGO model, and more typical national public health approaches. These often neglect difficult-to-reach rural populations, or when attempted, tend to emphasize the provision of a minimum set of standard services in fixed facilities by health professionals who come from outside the community. The NGO model described here emphasizes outreach into the community by local paramedical staff, an approach both possible and affordable. Good record-keeping, family visits, and measurement of health needs are important elements of this vision. Patience, adaptability, and attention to community values and inputs are essential to long-term success.

—*Jon Rohde*

What is today the Consejo de Salud Rural Andino (CSRA) in Bolivia was born as Andean Rural Health Care (ARHC), a nonprofit organization based in North Carolina. ARHC began community-based health work in the highlands of Bolivia in 1981. As of 2001, CSRA supported five Bolivian community health programs, with over 68,000 participants in the highlands and tropical lowlands. In this chapter, we discuss the development of this community-based health care system in Bolivia and its challenges and successes.

THE BACKGROUND OF ANDEAN RURAL HEALTH CARE

"Lost in the wilderness" would be an apt description of our tentative first steps in community-based health care, although our journey resulted finally in the development of an effective methodology of community-based health care: the census-based, impact-oriented (CBIO) approach.

Initially, Dr. Henry Perry, ARHC founder, consulted with Dr. John Wyon, then faculty member at Harvard's School of Public Health, to develop a health project to serve widely dispersed Aymaran Indians living in and around Ancoraimes, a small municipality near Lake Titicaca. They recognized that their approach would need to be a decentralized effort, based on both the measured and the locally perceived health needs of the service population. Primary health services would be based on proven and readily available technologies, and they would be provided by the lowest-level competent health providers whom they could identify and train. These indigenous health providers, in turn, would be supervised by public health-oriented physicians, preferably

Bolivian, who would care for the more seriously ill patients or evacuate them to secondary and tertiary care facilities, with which ARHC would have established written agreements.

Since most people in this region had never experienced reliable access to Western medicine, the services had to be presented in a way that was acceptable to them. Aymaran cultural preferences and beliefs would have to be acknowledged and respected. Because medical practitioners in La Paz, the closest large city, often treated *campesinos* (people of the countryside) with disdain, and because most health services were perceived to be either too costly or of low quality, the rural poor rarely used public hospitals except as places to die. In turn, public hospitals were grossly underfunded, underequipped, and underutilized by those who needed health care most.

For the community health program to work effectively, motivated individuals had to be found in the areas where they intended to work. These community health workers (CHWs) would need to be literate and to have received at the least basic Ministry of Health (MOH) training as auxiliary nurses. Further, their MOH-approved curriculum would have to be extended to include the fundamentals of epidemiology and public health practice, including community health assessment and outreach. A simple model was developed to guide the work of CHWs.

This methodology provided a means of focusing health education, promotion, and prevention, as well as curative services, to the highest-priority unmet needs. These needs were identified both by community members and through epidemiological surveillance. Program staff analyzed the data collected and solicited input from community members in order to adapt program initiatives to the real and locally perceived health needs of their service areas. (Measured and locally perceived health needs were frequently *not* the same.)

Community leaders identified the first group of CHWs.[1] Fifteen individuals were identified and given scholarships to attend MOH training. Upon their return to their community, they received more

1. ARHC now seeks CHWs who present themselves locally through volunteer activities, demonstrating their motivation and interest in community health. ARHC then provides low-cost scholarships for their training.

training and hands-on practice in community health assessment, data collection and recording, and health education techniques.

THE TRANSFORMATION OF ANDEAN RURAL HEALTH CARE INTO CONSEJO DE SALUD RURAL ANDINO

By 1991, the United States-based board of directors of ARHC had decided that its international health programs should be structured for long-term self-direction and corporate autonomy. As a first step, ARHC staff in Bolivia formed the Consejo de Salud Rural Andino (CSRA), which became a nonprofit national organization in 1995, with its own volunteer board of directors and its own corporate identity. ARHC thereafter signed an agreement with CSRA transferring its Bolivian assets and liabilities to that organization.

Since that time, ARHC, on the other hand, has transformed itself from a direct health service provider into an agency whose goal is to equip, train, and assist in-country organizations that wish to replicate the CBIO methodology. With this shift in strategic focus, ARHC has expanded into three additional countries. In 1997, the US Agency for International Development (USAID) awarded its first Child Survival Mentoring Grant to ARHC and three partner organizations working in Haiti. The combined service population of these three partners is now about 70,000 women and young children. In 1999, Rotary International awarded ARHC a grant to support a project in Rio Bravo, Mexico, on the Texas border. The population will reach more than 10,000 individuals by the end of the first three years of project activity. Most recently, ARHC began USAID-supported work in Guatemala in 2000.

THE EVOLUTION OF CONSEJO DE SALUD RURAL ANDINO

Currently, CSRA, the Bolivian NGO, describes its mission as saving lives, by knowing people and working with them to improve their health and well-being. Its managers aim to be the best managers of local primary health care systems in Latin America. Their five-year goal is to achieve health indicators equal to those of Cuba in one rural health district, one urban health district, and five rural municipalities in Bolivia.

Initially, CSRA had envisioned that the MOH would eventually assume management of the local nonprofit health programs, adopting the principles of the census-based approach. Eventually, however, CSRA's leaders realized that the MOH would persist with its traditional means of providing primary health care: through sporadic nationwide vaccination campaigns, occasional growth monitoring with no follow-up, and provision of all other services in health centers. In addition, there was constant turnover of MOH personnel at all levels. Most damaging was the turnover in leadership of local health systems, a role usually assumed by a physician or a licensed nurse. Finally, MOH officials displayed a lack of confidence in the activities of the auxiliary nurses, CSRA's first-line health care providers.

After 10 years, it became clear to CSRA that NGOs could play an important, permanent role in the management of local health systems. NGOs have a crucial role not simply because the census-based approach is somewhat complicated to sustain, but because the Bolivian MOH has not proven itself interested in or capable of sustaining quality health services in isolated rural areas. As these concepts emerged within CSRA, changes began to appear in the national health sector that supported the view that long-term NGO involvement could benefit communities and be financially sustainable.

The first of these national changes was the passing in 1994 of the Ley de Participación Popular, or Law of Popular Participation. This law devolved to municipal governments across Bolivia federal funds to be invested in health, education, sports, and culture and productive infrastructure. In the case of health, it was expected that municipal governments would invest not only in water and sanitation, but also in improving and maintaining health infrastructure, as well as covering certain health system operating expenses (except salaries).

The second major change in the sector came with successive measures to decentralize government services, including health care. Regional governments received increased funding for new salaried positions and increased regional discretion related to their allocations.

The third major change came with the decentralization of decision-making mechanisms. In particular, new legislation created Local Health Boards at the municipal level. CSRA has made great efforts to promote and strengthen these boards, working with municipal governments to

help them understand issues of public health, human development and management, administration roles and responsibilities, and improvements in service quality and access. The Local Health Boards include not only elected municipal authorities and MOH representatives, but also representatives from the communities through the newly created municipal oversight committees (Comités de Vigilancia) and the traditional small farmers' organizations (*sindicatos agrarios*).

The fourth change related to decentralization is the Bolivian government's process of "municipalizing" health services. The municipalization of health (and education) services is controversial, but CSRA is well positioned to offer a model and to provide management services in health to municipal and regional governments. These services include the census-based methodology as a key tool for achieving and demonstrating the results expected.

Under these new circumstances, progress has been made in the joint "management" of the local health systems, or *cogestión*,[2] with the municipalities and the MOH health districts. Bolivian rural municipalities had never before had the resources or the authority to participate actively in local health issues. The new laws and decentralized environment provide CSRA with a legal and institutional framework in which to implement its philosophy of greater community participation in the decision-making processes of local health services.

Six years ago, no more than 10% of ongoing operating expenses were covered through income from local sources in the Bolivian highlands. Now, approximately 55% of recurring operating expenses come from local sources. Over the next five years, coverage for 100% of operating expenses is expected to come from a mix of in-country sources, including municipal funds, regional funds, fees for services, and other NGO-generated income.

Today CSRA maintains written agreements with three rural municipal governments for the management of their health systems. Three more are actively seeking CSRA's services.

2. Cogestión comes from *gestión*, which means "to take steps or measures to obtain," in this case to take steps jointly with the municipal and regional governments to obtain a working local health system. This concept does not mean co-administration of the system.

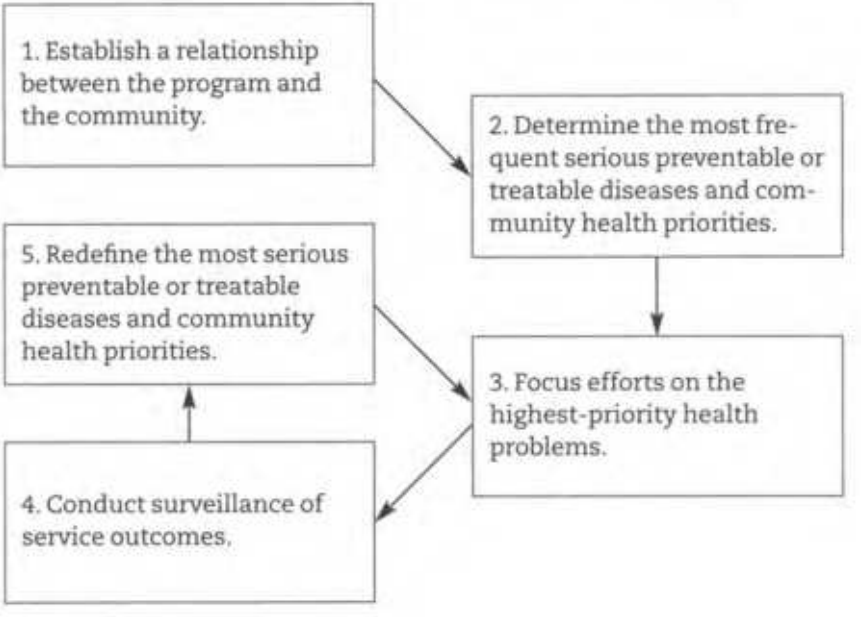
BASIC CENSUS-BASED, IMPACT-ORIENTED SERVICES

The CBIO approach involves the implementation of each of the five steps outlined in Figure 1 and includes visits to each home in a service area, the use of a health information system that allows program staff to track service delivery and vital events by household, the use of community health workers hired to serve their own communities, and multiple locations for service delivery (Perry 1999).

Step 1: Establish a relationship between the program and the community is normally realized through a series of meetings, discussions, and visits between health program leaders, and (usually political) community leaders who solicit the entry of the NGO into their area. These activities frequently take many months or several years to complete. Mutual trust and confidence are prerequisites for progress. This step is formally established through the signing of a time-limited, renewable agreement between representatives of the NGO and the municipality, and separately with the MOH.

FIGURE 1

The Census-Based, Impact-Oriented Approach



Step 2: Determine the most frequent serious preventable or treatable diseases and community health priorities is achieved through activities that vary from one service area to another but include most or all of the following: a health census of the service area; structured interviews and focus group discussions with local residents and traditional and political leaders; standardized surveys of knowledge, practices, and coverage rates of families, especially mothers; and reviews of existing local health data and published regional and national data. Data are analyzed, results presented to NGO staff and community leaders, and decisions made about which services will be offered to address the local health conditions identified. The range of services proposed is often limited or expanded depending on the priorities of funding agencies supporting the health program.

Step 3: Focus efforts on the highest-priority health problems generally is accomplished by implementing services that include preventive health education, and using medical protocols and treatment regimens standard to the country where the program is being implemented. Health education and preventive and curative services are offered through a system of home visitation (described below), and in small health clinics and remote health posts.

The targeting and frequency of home visits is based on a general risk profile that is developed and applied to each household, using the previously collected census and health data, and the priorities established for the community. (During the process of collecting census data, all homes are numbered, local area maps drawn, and household health folders created.) CHWs then visit most frequently the families at greatest risk of preventable or treatable illness or death. In Bolivia, ARHC eventually developed the following guidelines for visitation:

- six visits per year for any family with children under two years of age;
- three visits per year for families with children aged two to about five years and for families with women of childbearing age;
- one visit per year for all households to update the census for use in planning and evaluation.

A set of additional schedules was locally established for selected

health conditions, such as childhood malnutrition (every two weeks) or pregnancy (every month). In addition, CBIO programs offer health education and basic services within group settings (such as mothers' club meetings), at health fairs held at weekly community markets, and in small clinics and remote health posts. The NGO has also collaborated with communities to sponsor complementary community development activities that respond to health-related needs, such as improved access to potable water, and sanitation management.

While home visits remain an important aspect of the Bolivia program, especially to follow up on nonpresenting cases, families are encouraged to seek health care, to reduce the labor costs of home visits. Seeking care is also important for some illnesses, such as pneumonia, when prompt identification of danger signs and appropriate treatment are often essential for survival. Recently, steps have been taken to reduce the number and frequency of home visits, but the impact of this reduction on program coverage rates and impacts has not been measured.

Step 4: Conduct surveillance of service outcomes is a logical extension of the field activities described above and depends on the routine monthly reporting of health service provision and the collection of data on vital events (births, deaths, and migration). Coverage rates and mortality reduction are also periodically assessed, usually within the context of local staff meetings on quality assurance. In addition to other, regularly scheduled reviews of program data (established as part of an annual planning and evaluation process), less frequent surveys and special studies permit the measurement of changes in key behaviors of interest to the program.

Step 5: Redefine the most serious preventable or treatable diseases and community health priorities results from the sharing of the products of Step 4 with community members and leaders, and the development of new initiatives based on perceived and measured health needs of both the NGO and the community. The Bolivian CBIO programs began with a focus on child survival due to the high rates of infant and childhood mortality in the project areas. ARHC has added interventions over the years to address additional unmet health needs. The programs now include health education and promotion on topics such as nutrition, personal and family hygiene, and family planning; preventive services, including childhood and adult immunizations, growth moni-

toring for infants, and prenatal care; and curative services such as oral rehydration therapy, emergency obstetrical interventions, and treatment of acute respiratory infections.

Other high-demand health services, including dental and eye care, have been added over time. These services help defray overall program costs. In the program areas of the Bolivian highlands, such added services have had a negligible impact on overall program cost recovery, since most residents' ability to pay fully for health services is limited. In the lowland urban service areas, cost recovery from fees for services and sale of medicines is now about 40% of total program costs.

Local program staff have supported health-related services by providing training on health leadership to incoming municipal leaders, activities to improve water and sanitation facilities, and establishing village banking services for women. Regularly responding to the community's unmet needs is at the core of the CBIO approach.

RESULTS OF THE CENSUS-BASED, IMPACT-ORIENTED METHODOLOGY

Reductions in childhood mortality have been documented in communities where the CBIO methodology is being applied. A 1994 study of three established intervention sites showed child mortality rates that were 49% lower than those in geographically adjacent comparison sites (103 for the ARHC program sites versus 202 for the comparison sites). The child mortality rates were also 35% lower than the estimate of 159 from the Bolivian Demographic and Health Survey (Shanklin 1994). Both analyses were based on estimates of probability of death, and the reported differences were statistically significant ($p < .05$).

In 1998, Shanklin reported a reduction in childhood mortality rates within five years of start-up of the child survival program. Infant mortality dropped by 74% in two of the program areas but did not decrease in the third area. This reflected a clear dose-related impact; programs where prenatal care and delivery services were available and used experienced much greater reductions in infant mortality than programs where such services were not well utilized. Among one-to-five-year-olds, mortality dropped by 83% in the three program areas. The overall childhood mortality rate dropped from 164 to 63 deaths per 1,000 live

births, or 62%, in the program areas over five years. There was no change in the similar, adjacent comparison areas.

Delivery rates for health services and participant behavior change have also exhibited improvements in the service areas. For example, coverage for full immunization of children between 14 and 23 months was high or much improved in two of the longest-running project sites: 87% in Carabuco and 65% in Ancoraimes (both in the highlands; Espada 2000). This compared favorably to the initial 1992 baseline immunization coverage rate for Ancoraimes of 2% (Perry 1993). The percentage of mothers who introduced solid foods to infants at six months was also high: 86% in Carabuco and 67% in Ancoraimes (compared to 48% at 1992 in Ancoraimes). Likewise, the proportions of mothers who knew about oral rehydration therapy, knew how to prepare the solution properly at home, and had used it recently to treat a child's diarrhea ranged from 60 to 82% in these same two areas during 2000. This compared favorably with the 1992 baseline measure in Ancoraimes of 18%. Meanwhile, in Montero, in the tropical lowlands, program coverage rates for at least one prenatal visit had reached 93% by 1997 (Espada 1998). In the same year, 79% of Montero service area deliveries were attended by a health professional.

SOME LESSONS LEARNED FROM WORKING WITH COMMUNITIES

Over the years, CSRA has pursued two interrelated but separate goals: to improve the health of communities, and to enable communities to improve their own health. Each of these goals requires a different set of strategies and activities. However, CSRA has not been equally successful in meeting both goals. As shown by the key health indicators, CSRA has been relatively successful in improving the health status of communities. Its efforts to enhance the capacity of communities to improve their own health have not been nearly as successful, and they have come up against numerous difficulties, including the following:

- A first principle of empowering communities is that an organization and its staff must respect and proceed at the rhythm of the communities. However, there are important costs associ-

ated with proceeding at this pace, and there appears to be little patience within funding agencies for doing so. Many of CSRA's donors are oriented toward rapid improvements in quantitative goals and coverage, not in the development of the slower community processes necessary for sustained long-term change. For example, representatives of one major funding source recently expressed interest in strengthening community processes, but their internal policies did not allow more than a single four-year funding cycle, a period too short to consolidate and extend the desired results.

- A second principle of empowerment is that it implies change. Change requires that community members take risks (for example, attempt unfamiliar behaviors or assume new responsibilities). The willingness of communities to take such risks is often a function of their perception that so-called change agents (including health programs and their staffs) share these risks. However, government authorities, health system practitioners, auxiliary nurses, and even most NGO employees are generally uninterested in or unable to share those risks. Although CSRA has made progress in making empowerment one of its most important organizational values, it still has much to learn about it, particularly in terms of what it means during day-to-day contacts by staff with community members.
- Most government, church, and NGO interventions remain paternalistic. Their policies have conditioned communities to expect primary health care to be provided, usually free of charge, by entities outside the community. PHC is then perceived to be an external agenda, perhaps tied to some hidden agenda. Furthermore, there is still a surprisingly large number of giveaway programs directed at getting communities to accept health care interventions in exchange for donated commodities or other material incentives. CSRA considers it a major accomplishment to have achieved and maintained high levels of coverage without resorting to these types of programs.
- The paternalism of many organizations is reinforced by the expectation of many communities and individuals that it is the obligation of government and other outside agencies to pro-

vide free or highly subsidized health care (and other social services). It is as though Bolivia's traditional *padrino-ahijado* (godparent-godchild) relationship plays itself out under conditions of dependency rather than the original, more enlightened, concept of mutual reciprocity. In this light, communities continue to look at most NGOs as wealthy outsiders to be squeezed for all they are worth for as long as possible. CSRA continues to foster local ownership of the organization and to be a part of local civil society.

PRELIMINARY CONCLUSIONS

The single most important determinant of whether clients will use health services, both clinical and preventive, is the client's *confidence* in the practitioner. The *effectiveness* of community-based care is improved by using a census-based methodology like the one used by CSRA. This methodology promotes equity by reaching every family, particularly those at highest risk. In addition, it fosters trust between participants and practitioners.

In working within communities, it is essential to share risks with them to engender trust and co-responsibility for change. At the same time that a community-based organization is seeking greater local participation, however, it must still assume responsibility for specialized tasks (such as providing vaccinations) by offering training, support, and supervision. The sustainability of these elements requires an organizational framework that guarantees continuity. Within this framework, issues of ownership, leadership, accountability, stability, and demand for services are at least as important as financial security and technical know-how.

CSRA found that two factors in particular can enhance the long-term sustainability of care. First, mid-level, paid health workers (usually auxiliary nurses) who come from the communities they serve can provide essential technical support and leadership in isolated rural areas, where MOH-sponsored professional health workers typically change frequently. Second, integrating different levels of curative care with preventive care and health promotion contributes significantly to the long-term impact of primary health care.

In the experience of CSRA, decentralization provided an important opportunity for local authorities to become sensitized to the issues of public health and human development. Once authorities' awareness is raised, their commitment to public health and development increases.

Finally, in any health initiative, expansion occurs only with the development of a skilled and motivated work force. This includes, at a minimum, personal commitment, appropriate technical knowledge, and an understanding of the communities' and NGO's goals and strategies.

IMMEDIATE NEXT STEPS

In early 2000, it became clear that CSRA needed to take a fresh look at its future. A consultant who was hired to facilitate the development of a new strategic plan promoted the idea that CSRA needed a new and ambitious view of its future. CSRA decided to create a vision powerful enough to motivate the organization, all the way from the board of directors and management and operational staff to government and local authorities, communities, and families. Further, CSRA has decided that two key strategies will be necessary to reach its goals. First, CSRA will approach its goals like a business, striving for efficiency and quality. Second, it will mobilize communities, families, and authorities by developing and sharing a vision that is common to all.

THE STATUS OF COMMUNITY-BASED PRIMARY HEALTH CARE

Enormous challenges face community-based health care. Most fundamentally, despite clear evidence of success, epidemiologically informed, community-based local health care programming is still not widespread and is the exception rather than the rule. ARHC's nearly 20 years of experience have consistently demonstrated that the causes of preventable and/or treatable disease and death are usually similar in poor communities, but those most at risk must be identified house by house, and the solutions must be tailored to local circumstances. Even in those countries where the public health system recognizes the need for seeking out those most in need for health services, most, if not all,

do not have, nor have they attempted to develop, the mechanism for such outreach.

In reality, community health solutions do not come from top-down approaches. Frequently, those who are most ill do not present themselves to clinic health providers. They suffer and die in their homes, unknown to and unrecorded by the local health system. They often perceive that they will not be welcome at the health facility; they fear that the services will be costly and beyond their means; and they often doubt the quality or efficacy of the services offered. The more traditional way of coping with illness is to "wait and see" or consult family members, friends, or the local healer. Without repeated educational messages from trusted local health providers in a culturally "safe" environment, old behaviors will remain, and unnecessary suffering, sickness, and death will continue.

Related, perhaps causally, is the nature of international and national health funding, which remains focused on a wide range of intervention-specific, vertically funded programs. These programs often do not adequately support community-based health care, the *vehicle* of their intervention. That is, a "vaccination person" (interested in preventing selected communicable diseases) seeks increased recognition and funding for that program. Generally, the person is not concerned so much with *how* these services will be provided, as with *how many* units will be delivered. Further, in any developing country, such a vertical program (whether HIV/AIDS, family planning, or malaria) may compete directly with community-based health care for scarce public health funding. Those in public health often fight for scarce resources for specialized health programming at the expense of the very mechanism that would provide numerous programs in a cost-effective, high-quality, and ongoing fashion.

Another significant barrier to effective community-based health care is lack of community participation, an essential element of the local health system. For health care to be effective locally, the system must have strong ties to the community it serves. Such ties *must* include community assessment and evaluation, community participation in health planning, community feedback about and oversight of services, and open debate about health service alternatives. ("Community" is defined here to include at least the local political and traditional

leaders, as well as the health service clients themselves, especially women.) ARHC has found that working with community-based or indigenous nonprofit organizations helps build local capacity for long-term provision of health services.

For various reasons, working within MOH systems is a much less productive and sustainable means of improving community health, at least in the countries where ARHC has operated. To begin with, MOH-supported health personnel frequently come from outside the communities they serve, are perceived as outsiders, and may not be trusted. The turnover of both MOH health service providers and their superiors is high, leading to what one might describe as "permanent institutional amnesia." This means that training or technical assistance provided to MOH health workers is often lost within a few months or years. In addition, MOH-directed health staff frequently do not hold themselves accountable to communities for service quality, further alienating the community from its assigned health provider.

Working with local nonprofit groups provides a way around these structural problems of MOH-led health care. Health workers can be selected from the communities they serve. They are accountable locally and institutionally for the quality of their work, and they have a long-term commitment to the communities they serve. The CBIO methodology is a professionally rewarding process, once health providers have experienced its effectiveness and see real changes measured in their communities. In this model, the MOH would better serve as the *guarantor* of public health coverage and equity. The MOH could also play important and active roles in providing funding, medicines, and equipment and in offering training to health workers to strengthen the quality, uniformity, and range of local services provided.

By applying the values, principles, practices, and tools of good public health within the context of the CBIO methodology, ARHC and its local nonprofit partners are able to efficiently guide local health assessments and develop effective local health strategies. The top-down and bottom-up approaches meet in a mutually respectful dialogue that allows for modern public health inputs, as well as for local values, sensibilities, and resources. Scaling up, or "going to scale," is possible within this approach and is not the monolithic, one-size-fits-all approach that many national health planners too often prefer. Rather,

the process encourages appropriate local variation in public health programming, management, and support. Ultimately, we believe that this will be the most cost-effective and sustainable means of radically improving global health. In fact, it may be the only way that community-based health will ever really occur.

REFERENCES

Espada, Sara. 1998. "Three-Year Evaluation of the Montero Health Project." Internal program evaluation report of Andean Rural Health Care and el Consejo de Salud Rural Andino. Available on request.

———. 2000. "Mid-Term Evaluation Report of the Child Survival XIII Project." Andean Rural Health Care and el Consejo de Salud Rural Andino. Washington, DC: USAID, Bureau for Private and Voluntary Cooperation, Child Survival Program, January 10, 2000.

Perry, Henry. 1993. "Notas de la Evaluación, Proyectos de Supervivencia Infantil, Programa de Salud en Carabuco y Ancoraimes." Internal report of Andean Rural Health Care, November 15–20, 1993. Available on request.

———. 1999. "Attaining Health for All through Community Partnerships: Principles of the Census-Based, Impact-Oriented (CBIO) Approach to Primary Health Care Developed in Bolivia, South America." *Social Science and Medicine* 48: 1053–67.

Shanklin, David. 1994. "Estimating the Infant/Child Mortality Impact of a Bolivia Child Survival Program." In *Community Impact of PVO Child Survival Efforts: 1985–1994: Proceedings of a Worldwide Conference Sponsored by USAID.* Bangalore, Karnataka, India, October 2–7, 1994. Baltimore, MD: PVO Child Survival Support Program, Johns Hopkins University.

———. 1998. "Dramatic Reductions of Childhood Mortality in Three Bolivian Child Survival Projects." In *Presented Papers: High Impact PVO Child Survival Programs, Volume 2: Proceedings of an Expert Consultation, Gallaudet University, Washington, DC, June 21–24, 1998.* Arlington, VA: BASICS (Basic Support for Institutionalizing Child Survival) and Washington, DC: CORE (Child Survival Collaborations and Resources Group), pp. 45–53.

9 Decentralized Supervision of Community Health Programs: Using LQAS in Two Districts of Southern Nepal

Joseph J. Valadez and Babu Ram Devkota

Using modern tools of statistical quality control, simple field epidemiology can both motivate and lead community health efforts to achieve higher coverage of essential services. Even basic health workers can measure their accomplishments, which motivates all involved to strive toward agreed-upon goals. This effort at the community level reflects global efforts such as the goals of the World Summit for Children, which are measurable and drive action at all levels. The importance of repeated measurement at the local level is well illustrated in this chapter.

—*Jon Rohde*

Community-oriented approaches to organize health programs have been advocated for more than 75 years (Taylor-Ide and Taylor 2002). In the 1980s and 90s, national and international health and development agencies increasingly promoted decentralized service delivery and health systems management, emphasizing bottom-up, community-oriented methods. Several examples of successful community health programs are documented (Wyon and Gordon 1971, Villegas 1978, Rohde et al. 1993, Arole and Arole 1994, Taylor-Ide and Taylor 1995). While the methods used for bottom-up management are not described in detail, it is clear from those published examples that the programs used data about program progress to show management how to improve effectiveness. Planning and program design also require data to ensure effectiveness. John Wyon and other community-oriented primary health practitioners argue that community health workers ought to use epidemiological information to focus local health programs on the most frequent, serious, and preventable causes of death and illness (see the introduction to this book, and Taylor-Ide and Taylor 2002). In their book, Daniel Taylor-Ide and Carl Taylor list seven steps in a community-oriented approach, of which steps 2–5 and 7 involve data collection and analysis:

1. Create coordinating committees and improve their capacity.
2. Identify successes.
3. Study successes and visit other communities.
4. Conduct self-evaluation.
5. Make decisions based on agreed-upon problem areas and priorities.

6. Involve as many people as possible in decision-making.
7. Monitor the momentum to identify gaps in action and to make midcourse corrections.

This chapter demonstrates a simple community data-gathering method, which local supervisors used in two districts of the Terai of Nepal (south of Kathmandu) to increase the impact of their health programs. This method, Lot Quality Assurance Sampling (LQAS), represents a practical alternative to cluster surveys (Henderson and Sundaresan 1982), a widely used method, to obtain objective information about community outcomes.

WHAT LQAS IS AND HOW IT WORKS

During the mid-1980s, health system evaluators explored the applications of industrial quality control methods to assess health worker performance (Stroh 1985, Valadez 1986, Reinke 1988). LQAS received considerable attention as a potentially practical and easy-to-use method for assessing local health systems in developing-world settings. LQAS was originally developed in the 1920s to control the quality of industrially produced goods (Dodge and Romig 1944). The principle is that a line supervisor takes a small random sample of a recently manufactured lot of goods from a production unit such as an assembly line or machine. If the number of defective goods in the sample exceeds a predetermined number, then the lot is rejected; otherwise it is accepted. This allowable number is called the *decision rule*. The number of allowable defective goods is determined statistically (Dodge and Romig 1944, Lwanga and Lemeshow 1991, Valadez 1991) based on a production standard and a statistically determined sample size. The sample size is set so that a manager has a high probability of accepting lots in which a predetermined proportion of the goods are of high quality, and a high probability of rejecting lots that fail to reach the production standard.

In health systems, an example of a *production standard* is a predetermined population coverage benchmark for an intervention such as immunization, communications about how to prepare and use oral rehydration solution, the quality of deliveries performed by a med-

ically trained provider, or promotion of contraceptive use. Health system managers at either the national or district level can set such coverage benchmarks or targets.

In health systems, a *lot* can be the defined community or catchment area of a health facility or of a health worker. In this chapter, the lot used in the demonstration is a *supervision area* (SA). The *production unit* is the set of health workers working under the supervisor who manages the SA. In this setting, the purpose of using LQAS is to determine whether a specific SA reaches a predetermined coverage benchmark and to compare the performance of different SAs.

LQAS judgments about supervision areas have a percentage of error, namely, the probability of misclassifying an SA as either having achieved the benchmark or not having achieved it. In standard statistical nomenclature, they correspond to alpha (α) and beta (β) errors. The α error is the likelihood of rejecting a sample incorrectly—in this case, of falsely determining that the desired level of performance had *not* been met when in reality it had. The β error is the likelihood of accepting an SA as performing adequately when it falls short of the expected performance. These errors correspond to the specificity and sensitivity of the procedure.[1]

To use LQAS, health system managers need to identify two thresholds. The first is the *coverage benchmark*, which is the proportion of the community that health workers ought to reach during a predetermined period, such as one year. The coverage benchmark should increase over time as the program progresses and service delivery improves. In public health terms, a threshold can be an *annual coverage*

1. The α error is a *health system risk*, since the health program would invest unnecessarily to improve the performance of health workers in supervision areas that have actually reached a coverage benchmark. In epidemiological terms, $1-\alpha$ is equivalent to *specificity*, which is the probability of correctly identifying SAs that reach performance benchmarks. The β error is *community risk*, since beneficiaries would receive health services that leave unacceptably large portions of the population uncovered. In epidemiological terms, $1-\beta$ is equivalent to *sensitivity*, which is the probability of correctly identifying supervision areas that cover an unacceptably low proportion of the population. In traditional industrial terms, *health system risk* and *community risk* are *producer risk* and *consumer risk* (Dodge and Romig 1944).

target. The lower threshold is an unacceptably low level of coverage that should provoke managers to identify the problem causing the failed service delivery and to resolve it with a focused investment of time and resources.

Two characteristics have made LQAS attractive to health system evaluators. First, a supervisor needs only a small sample to judge whether a health worker's performance has reached a predetermined level (threshold). With such small samples, data collection does not seriously compete for time for providing health services. Second, the sampling procedures and analyses are rather simple. Because LQAS was originally intended for use by factory supervisors, these procedures could be carried out by a minimally educated person. Managers of international health workers are typically more educated than the line supervisor of yesteryear. Yet this benefit is still welcome to overworked supervisors and health workers, who need management tools that can easily be understood in their own cultural context and are easy to use. These two characteristics in particular make LQAS valuable as a practical management tool for monitoring and evaluation of community health services that seek to include community members in management.

Another attractive feature of LQAS is that the data from individual SAs can be combined into an estimate of a coverage proportion for an entire program area that includes multiple SAs. Weighting the result from each SA by the size of its population and taking the mean of the program area can increase the accuracy of the estimate,[2] particularly in comparison to estimates obtained with the 30-cluster sampling approach.[3]

The growing interest in using LQAS was captured in a review of 34 LQAS applications assessing immunization coverage, antenatal care,

2. Weighting increases precision by a small amount and is not necessary for most applications, because the precision gained typically does not have programmatic implications. See Valadez 1998 for examples.

3. This coverage estimate usually has greater precision than the one obtained with the 30-cluster method (Henderson and Sundaresan 1982), the other commonly used sampling method, because stratified random (or systematic) samples generally have narrower confidence intervals than cluster samples

use of oral rehydration therapy, growth monitoring, family planning, disease incidence, and the technical skills and knowledge of health workers (Robertson et al. 1997). It has also been used to assess the accuracy of health records, outreach of community health workers, and health worker training programs (Valadez 1991, Valadez et al. 1996, Valadez et al. 1997). In Nicaragua, Malawi, and Armenia, networks of NGOs have used LQAS to track national disaster relief and reproductive health programs (Valadez et al. 2001a, 2001b, 2001c). This chapter focuses on using LQAS to assess coverage of SAs with integrated health services in a maternal and child health project in rural Nepal.

This chapter attempts to advance the development of LQAS methodology for community-based public health practitioners and health system managers by:

- presenting a simplified, field-tested LQAS table that community-based public health practitioners can use in any field setting;
- explaining a case application of LQAS used by local supervisors rather than specialized interviewers;
- showing how LQAS can be applied for regular supervision or monitoring;
- summarizing LQAS results collected at four time points to monitor a community-based NGO program in Nepal for maternal and newborn care, child survival, and family planning interventions;
- presenting a cost analysis of LQAS compared to cluster sampling;
- discussing the utility of this system to practitioners.

(Note 3, cont.) of the same size. As others have pointed out, "stratified samples often have narrower confidence intervals than simple random samples. This is because some subjects are selected from each and every strata [*sic*], making it impossible to miss some strata completely" (Robertson et al. 1997, 201). In operational terms, the strata are the SAs. Also, LQAS does not have a design effect, which for cluster samples is usually assumed to be two, due to the intra-cluster correlation resulting from choosing contiguous households within clusters (Henderson and Sundaresan 1982).

PROGRAM AREA: RAUTAHAT AND BARA DISTRICTS, NEPAL

The program area, in the Rautahat and Bara districts, is contiguous with districts in Nepal's Narayani Zone of the Central Development Region in the Terai, south of Kathmandu. The districts border India to the south and include communities of 33 Village Development Committees (VDCs) in Rautahat District and 17 VDCs in Bara District. The VDC is the basic unit of community organization. One VDC contains nine communities or wards. The total beneficiary population in the program area is 140,021 people, including 52,896 women of childbearing age, 39,557 children under five years of age, and an estimated 47,568 newborns expected during a four-year cycle of the program.

The health program is supported by Plan International's field office for the Rautahat and Bara districts of Nepal. Plan International is a child-focused international NGO working in more than 40 nations. It will continue supporting the health program beyond four years because it has long-term commitments to the communities with which it works.

During 1996, the national under-five mortality in Nepal was 118 per 1,000 live births, with an infant mortality rate of 79 per 1,000 live births. Mortality was consistently higher in rural areas. The maternal mortality rate in Nepal was 539 per 100,000 live births (Pradhan et al. 1996). Only 10% of births are attended by medically trained personnel (World Summit for Children indicator, Nepal 1996).

According to Plan International's 1995–96 situational analysis, the under-five mortality rate in the program area was identical to the rate determined by the national Demographic & Health Survey. Among the leading causes of child death listed by the Ministry of Health (MOH) and cross-validated with local clinic records were diarrhea, pneumonia, perinatal causes, malnutrition, and measles. Plan International worked with all 50 VDCs to identify local health priorities. VDCs, district MOH managers, and local Plan International health system managers selected four interventions to implement in the two selected districts: diarrhea case management, pneumonia case management, family planning, and maternal and newborn care. They also agreed to support the MOH to enhance Expanded Programme on Immunization (EPI) and vitamin A coverage.

PROGRAM MANAGEMENT

The program supported services at both MOH health care facilities and the community level by improving supervision, case management, monitoring, drug supply, and community mobilization. This chapter focuses exclusively on the community-level activities. The program area consists of 50 VDCs, each one comprising 9 wards or communities, for a total of 450. Each VDC has one MOH health facility. Each facility has one village health worker (VHW), who is supervised by a senior manager (Health Post In-Charge). Each VHW supervises nine female community health volunteers (FCHVs) and trained traditional birth attendants (TBAs). Supervision of VHWs at the community level had been weak due to lack of transport, incentives, and management systems. Plan International's program was designed to improve community-level supervision and management.

The program area was organized into seven SAs, each one managed by a Plan International field area supervisor (FAS). Each FAS has experience working in the MOH community health system and is qualified as a nurse, midwife, or health assistant. These supervisors work with the MOH district health officer to train VHWs; then they aid the VHWs to train and supervise FCHVs and TBAs. Each FAS trains and supports 7 to 8 VHWs, each of whom is in turn responsible for 9 FCHVs. Therefore, on average, each FAS has at least 63 FCHVs and additional TBAs in his/her supervision area.

FASs train VHWs in management, leadership, and supervision skills, and update VHWs' clinical skills for each intervention. FASs are trained to use a simple supervision checklist to observe FCHVs and TBAs. These checklists determine whether the FCHVs and TBAs are implementing planned interventions, have basic equipment and supplies, and use focus groups to assess community satisfaction. Each FAS aids the VHWs to carry out joint supervision visits two to three times a month to FCHVs as a part of competency-based training.

The program began service delivery in 1997. Plan International introduced LQAS in 1999 for routine community-based monitoring by FASs of mothers, children 0–23 months of age, and women 15–49 years of age to determine whether they received health services and information. All FASs said they would benefit from such empirical information

if data collection were not time consuming and results could be rapidly interpreted and used for supervising FCHVs and TBAs.

METHODS: IMPLEMENTING DECENTRALIZED SUPERVISION

This section summarizes the methods used for setting sample sizes, training, questionnaire development, sampling procedures, and coverage benchmarks. FASs collected LQAS data four times at six-month intervals from June 1999 to January 2001. The FASs and the manager chose this six-month sampling interval. The program regularly measured indicators to monitor knowledge and behavior related to diarrhea case management, pneumonia case management, maternal and newborn care, family planning, and EPI. A few of the results from these observations are reported here. Our purpose is to show how LQAS was used and the type of information it provides, rather than to report the program outcomes.

Sample Sizes and LQAS Tables

A sample size of 19 households was selected for this assessment, allowing specificity and sensitivity of greater than 90% (< 10% error). While smaller sample sizes exist for which α and β errors are also < 10% for some coverage benchmarks (e.g., samples ranging from 10 to 18), we do not recommend these smaller sample sizes, despite the improved feasibility of such smaller samples. If an initial rather low coverage benchmark is selected that allows a small sample size (e.g., 40% coverage and n=15, with a decision rule of 8 correct responses) and the coverage benchmark is subsequently changed, requiring a larger sample and a different decision rule (e.g., 65% and n=17 with a decision rule of 11), the data collector would have to return to the SA to collect the additional data from the larger sample. By selecting a sample of 19, the manager can change coverage benchmarks later without having to collect additional data. In practice, supervisors assess several interventions simultaneously with different coverage benchmarks. Using a standard sample size of 19 yields sufficient data to make judgments about all interventions, regardless of their coverage benchmarks. For interventions intended for narrow age groups (e.g., exclusive breast-

feeding assesses the 0–5-month age cohort) or for individuals with specific characteristics (e.g., use of oral rehydration therapy for children who have had diarrhea in the last two weeks), LQAS judgments are made with sample sizes other than 19 (see Valadez et al. 2001b).

In practice, FASs have been most interested in identifying SAs that reach a coverage benchmark and those that deviate from it substantially. Table 1 is the basic LQAS tool used for making this judgment. Supervisors have been less interested in lower thresholds and have been satisfied with Table 1's display, which has coverage benchmarks only. This simple format has aided supervisors to select decision rules for a variety of sample sizes and a wide range of coverage benchmarks. In practice, Table 1 has been the most useful LQAS tool for field settings and requires a minimal amount of technical knowledge to use. This table was introduced in Nepal during 2000 and was successfully field-tested in other locations (Valadez et al. 2001c).

In addition to reducing the LQAS decision rules to a single page, Table 1 has another important attribute. While previous tables required counting the number of interviewees who did not receive an intervention, Table 1 embraces the opposite logic, because it requires counting the number who received it. Field staff frequently said that they were used to counting positives for numerators (for example, number of children vaccinated) and that counting negatives was confusing.

A supervisor uses Table 1 by following three steps:

1. Identify the coverage benchmark for an indicator from the top row. However, if the table is used to determine whether an SA is below average, then the average coverage, instead of the coverage benchmark, is located along the top row.
2. Identify the sample size in column 1. In most cases, the sample size is 19.
3. Find the cell where the sample size and the coverage benchmark intersect. That is the decision rule. For example, the decision rule for a coverage benchmark of 80% and a sample size of 19 is 13. A supervisor judges SAs as having reached the benchmark if at least 13 of 19 have the behavior or knowledge stipulated in the indicator.

TABLE 1

Optimal LQAS Decision Rules for Sample Sizes of 12–30 and Coverage Benchmarks or Average Coverage of 20–95%

Sample Size	*Annual Coverage Benchmarks (for Monitoring and Evaluation) or Average Coverage (Baselines, Monitoring, and Evaluation)*																	
	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%
12	NA	NA	1	1	2	2	3	4	5	5	6	7	7	8	8	9	10	11
13	NA	NA	1	1	2	3	3	4	5	6	6	7	8	8	9	10	11	11
14	NA	NA	1	1	2	3	4	4	5	6	7	8	8	9	10	11	11	12
15	NA	NA	1	2	2	3	4	5	6	6	7	8	9	10	10	11	12	13
16	NA	NA	1	2	2	3	4	5	6	7	8	9	9	10	11	12	13	14
17	NA	NA	1	2	2	3	4	5	6	7	8	9	10	11	12	13	14	15
18	NA	NA	1	2	2	3	5	6	7	8	9	10	11	11	12	13	14	16
19	NA	NA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
20	NA	NA	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17
21	NA	NA	1	2	3	4	5	6	8	9	10	11	12	13	14	16	17	18
22	NA	NA	1	2	3	4	5	7	8	9	10	12	13	14	15	16	18	19
23	NA	NA	1	2	3	4	6	7	8	10	11	12	13	14	16	17	18	20
24	NA	NA	1	2	3	4	6	7	9	10	11	13	14	15	16	18	19	21
25	NA	1	2	2	4	5	6	8	9	10	12	13	14	16	17	18	20	21
26	NA	1	2	3	4	5	6	8	9	11	12	14	15	16	18	19	21	22
27	NA	1	2	3	4	5	7	8	10	11	13	14	15	17	18	20	21	23
28	NA	1	2	3	4	5	7	8	10	12	13	15	16	18	19	21	22	24
29	NA	1	2	3	4	5	7	9	10	12	13	15	17	18	20	21	23	25
30	NA	1	2	3	4	5	7	9	11	12	14	16	17	19	20	22	24	26

NA: not applicable, meaning LQAS cannot be used in this assessment because the coverage is either too low or too high to assess an SA.
Notes: α and β errors < 10% for all decision rules except where noted. Lightly shaded cells indicate where α or β errors are ≥ 10%. Darker cells indicate where α or β errors are ≥ 15%.

Training and Questionnaire Development

The authors trained the seven FASs and additional support staff to use LQAS to survey 19 households in the VDCs where they supervise FCHVs and TBAs. The manager trained everyone working in the program, including the secretary, accountant, and others, to heighten their involvement. This decision is consistent with the principle of involving as many people as possible in decision-making (Taylor-Ide and Taylor 2002, step 6). Training was carried out over three days, during which time the team reviewed and refined the survey questionnaire and learned LQAS principles, sampling procedures, and how to interpret results. Each FAS or staff person visited 9.5 households on average.

Parallel Sampling and Questionnaire Development

Three short questionnaires were developed, corresponding to the three client groups the program served: women 15–49 years, mothers of children 0–11 months, and mothers of children 12–23 months. Women 15–49 years were sampled to assess their use of family planning methods and to calculate the contraceptive prevalence rate. Mothers of children 0–11 months were selected to assess their knowledge of pneumonia management and maternal and newborn care, including exclusive breastfeeding. Mothers of children 12–23 months were visited to assess EPI and vitamin A coverage, continuing breastfeeding, and diarrhea case management knowledge. Exclusive, complementary, and continuing breastfeeding were assessed with the subsamples of children 0–5 months, 6–9 months, and 12–23 months, respectively. Management of diarrhea was assessed using the stratum of mothers of children 0–23 months whose children had had diarrhea in the last two weeks. The only questions duplicated in the surveys were related to management of diarrhea, because children were needed who had had diarrhea in the previous two weeks; by including related questions in the surveys for mothers of children aged both 0–11 and 12–23 months, sufficient observations were available to measure diarrhea prevalence.

Data were collected using a standard two-stage sampling procedure. In the first stage, 19 wards in each supervision area were sampled in proportion to their size. First, a sampling frame was constructed for each supervision area with VDC and ward names located in column

one, with population sizes for each ward in column two, and a running cumulative summary of the population in column three. Second, a sampling fraction was created by dividing the total supervision area population by the LQAS sample size of 19. Third, a random number between 1 and the sampling fraction was selected. The ward having the corresponding person in the cumulative population column of the sampling frame was selected as the first sampling element. The next ward was identified by adding the sampling fraction to the first randomly selected number. All remaining sampling elements were selected by continuing to add the sampling fraction to the preceding sum. The program manager performed all the steps in the first-stage sampling.

In the second stage, households were selected in the identified wards. The FAS and trained support staff visited the sampled wards in their SA and located its geographical center. The FAS divided the ward into three to five segments and chose one randomly, using a random number table. The FAS then went to that segment and divided it into three to five additional segments, choosing one randomly. He or she continued this process until a small number of houses remained—usually fewer than 15. One house was then selected randomly. For the second-stage sample, some supervisors preferred to use the spin-the-bottle method applied in the EPI cluster sample method (Henderson and Sundaresan 1982, World Health Organization 1996).

Once a single house was selected randomly, the interviewer inquired whether a nonpregnant woman 15–49 years of age and in union lived there. If so, she was asked for her consent to respond to the family planning questionnaire. If a woman in the household had a child of either 0–11 months or 12–23 months, she was invited to answer questions in the corresponding questionnaire. Two children, one from either cohort, were never selected from the same household, since the questions about diarrhea case management required analyzing children 0–23 months. All children for this analysis, therefore, had to reside in different households. Otherwise, the diarrhea management practices of a single household would be overrepresented. Therefore, the minimum number of households that an interviewer visited to carry out a survey in any ward was two; the maximum was three. The use of one random point to start a search for households for each of the three questionnaires independently we call *parallel sampling.*

The questionnaires required little time to complete. The family

planning questionnaire took 5 minutes, the one for mothers of children 0–11 months took 15 minutes, and that for mothers of children 12–23 months took 10 minutes. Similarly, the search for appropriate households required little time. A woman aged 15–49 years nearly always lived in the first house. One child in either age group could also be located rapidly. The sampling took place during the Nepali monsoon, which exacerbated travel problems. Nevertheless, the total time spent in a ward was about one hour. The entire sample of 399 observations (7 SAs x 3 questionnaires x 19 observations) or 133 sets of 3 questionnaires was collected in 2.5 days. Staff said that because community residents knew them, the women did not resist answering questions. Sampling carried out in an area with dispersed rural populations (Valadez et al. 2001b) or underdeveloped roads to remote areas can take longer to complete (Valadez et al. 2001c).

During June 2000, the FASs used a different approach for data collection. Rather than organizing data collection over an intensive 2.5 days, they decided to collect monitoring data while carrying out their normal work in communities. Therefore, at the beginning of the month they identified the communities to be sampled. They selected houses to interview after they finished other duties in the community, such as providing supplies or competency-based training to the community health workers. While the data collection period extended to as much as 19 days, the evaluation cost less, because the FASs were already scheduled to travel to SAs for supervision. The FASs preferred this approach and continued to use it for subsequent monitoring.

Coverage Benchmarks and Decision Rules

Supervisors assessed the interventions with coverage benchmarks they set, based on the 1997 baseline survey collected with a standard cluster sample method. All FASs used the same benchmarks for a given intervention to permit comparison of SAs. Initial coverage benchmarks and corresponding decision rules for each intervention are recorded in the upper rows of Tables 2 and 3. Only a selection of the indicators is presented here to show how the supervision system works.

RESULTS: HOW DATA WERE USED FOR DECISION-MAKING

Selected results are presented in the four parts of this section to demonstrate how the Nepal team used the new LQAS tools. The first part shows how, at one point in time, FASs judged each SA according to a coverage benchmark. The second section presents LQAS results at four points in time to show development trends in the project area. The third section aggregates data from the LQA samples in seven SAs to calculate coverage proportions for the entire program area at four points in time. The fourth one is a cost analysis of LQAS. All LQAS analyses carried out by FASs used hand-tabulated tally sheets to aggregate the questionnaire data. Project managers cross-checked FASs with tables calculated with EpiInfo 6.04. However, computer-generated results were less useful for immediate decision-making than the hand-tabulated results, which were immediately used for decision-making.

All practices, except exclusive, complementary, and continuing breastfeeding, and diarrhea case management, were assessed in each SA using samples of 19. Because exclusive, complementary, and continuing breastfeeding assessments used small subsamples of children, LQAS judgments were not made, since α and β were unacceptably high. Rather, the data were analyzed only in the aggregated form as coverage proportions. For assessment of the behavior of mothers whose children 0–23 months had had diarrhea in the preceding two weeks, subsample sizes varied from 12 to 18. LQAS decision rules for these sample sizes were taken from Table 1.

Assessing Supervision Areas at One Point in Time: A Supervisor's Perspective

Table 2 contains the results for six indicators for maternal and newborn care, diarrhea case management, and family planning. Additional indicators were used to review these services (see Child Survival Technical Support Project and CORE Monitoring and Evaluation Working Group 1999, and Valadez 2000 for a full set of indicators). However, only six are presented to demonstrate how the LQAS method was used in Nepal.

TABLE 2

LQAS Judgments for Selected Community Interventions

	Behavior			*Knowledge*			
	MNC Children 0–11 Mos.	*DCM Children 12–23 Mos.*	*FP Women 15–49 Yrs.*	*MNC Children 0–11 Mos.*	*MNC Children 0–11 Mos.*	*DCM Children 12–23 Mos.*	
	Assisted delivery with trained TBA or clinician	*Correctly prepares ORS*	*Contraceptive use*	*Pregnancy danger signs*	*Postnatal danger signs*	*Dehydration danger signs*	
Baseline Results	Not included in baseline survey	Not included in baseline survey	20.7% §	30.7%	Not included in baseline survey	12.7%	
Coverage Benchmark: Decision Rule	NA	NA	30%:3	45%:6	NA	35%:4	
Avg. Coverage: Decision Rule	43.6%:6	52.7%:8	34.5%:4	51.3%:8	41.8%:6	48%:7	
Supervision Area							*Total No. of Indicators Not Reaching Coverage Benchmarks or Below Avg.*
1	7	7*	5	9	5*	6*	3
2	9	7*	3*	8	8	5*	3
3	2*	12	4	(5*)	5*	12	3
4	13	9	(2*)	(5*)	2*	9	3
5	4*	11	4	15	13	14	1
6	15	16	13	16	16	15	0
7	5*	8	7	6*	3*	4*	4
Total Below Avg. or or Substandard FASs	3	2	2	3	4	3	17

Notes: MNC=maternal and newborn care; DCM=diarrhea case management; FP=family planning; ORS=oral rehydration solution.
§ A cluster sample was used for the baseline survey, which sampled mothers of children 0–23 months of age for all indicators. Therefore, contraceptive use as calculated at baseline is not an accurate measure, since the 15–49-year cohort of women is required.
(◯) indicates an SA that has not reached a benchmark. * indicates an SA with below average coverage.

An SA is judged according to whether it has reached the coverage benchmark and whether it has achieved at least average coverage. SAs not reaching a benchmark are circled. Those below average are marked with an asterisk. SAs having both a circle and an asterisk have the highest priority for improvement. Those marked with either a circle or an asterisk (but not both) are the next highest priority.

The first indicator discussed is *knowledge of pregnancy danger signs,* found in column 5 of Table 2. The baseline measure of September 1997 revealed that 30.7% of respondents knew two or more danger signs. The program members planned to increase the proportion to 45% by June 1999. The LQAS decision rule for this coverage benchmark is 6 (see Table 1). In June 1999, the FASs interviewed 19 mothers and then counted the number who knew two or more pregnancy danger signs. The results are in the rows of Table 2 labeled 1–7 for each SA. Of the seven SAs, two (SAs 3 and 4) did not reach the 45% coverage benchmark, since fewer than 6 women knew two or more danger signs. The FASs drew a circle around them to show their status. They then calculated the average coverage, which was 51.3%.[4] The FASs used the decision rule from Table 1 for average coverage to identify SAs that fell substantially below average coverage. The procedure they used was to round up the coverage estimate to the nearest 5% interval. Therefore, 51.3% rounded up to 55%. The corresponding decision rule is 8. Three of the seven SAs were below average and are marked with an asterisk. SAs 3 and 4, marked with both a circle and an asterisk, were the highest priority for improvement, because their populations had the greatest health risks. SA 7 was the next highest priority for improvement. Although it had reached the benchmark, it was substantially below average coverage. The previous indicator, *contraceptive use,* revealed two priority SAs (2 and 4). SA 4 was the highest priority, however, because it had not reached the coverage benchmark and had substantially below average coverage.

The indicator *knowledge of dehydration danger signs* revealed a different pattern, because all SAs had reached the coverage benchmark of 4.

4. This coverage is actually a weighted coverage calculated by a computer. However, an unweighted or crude coverage calculation done by hand would have been sufficient.

Nevertheless, three SAs (1, 2, and 7) exhibited below average coverage and were thus the areas where improvement would most increase the overall impact of the program. The remaining three indicators did not have baseline values, because the FASs had decided they were important indicators to track after the baseline had been completed. Therefore, the monitoring data were used to identify SAs that were below average. They are identified with asterisks in Table 2.

The marginal totals in Table 2 reveal that SA 7 was identified as a priority four times, and four other SAs were priorities three times. *Knowledge of postnatal danger signs* had the largest number of priority SAs (four), while *assisted delivery, knowledge of pregnancy danger signs,* and *knowledge of dehydration danger signs* were priorities for three SAs. By using these results, the manager knows both which interventions and which SAs should be given time and resources to address community health needs most effectively and efficiently.

Assessing Supervision Areas at Four Points in Time: A Supervisor's Perspective

Table 3 tracks the program's performance for two indicators at four six-month intervals ranging from June 1999 to January 2001. These indicators were introduced after the program began in September 1997, so there are no baseline measures. Nevertheless, a row is included in the table where the baseline value would go. In June 1999, all SAs were assessed to determine whether they ranked below average. Two SAs were below average for *correctly prepares oral rehydration solution* and four were below average for *knows postnatal danger signs.* These SAs hence became the priority SAs for supervisors to focus on to enhance the performance of community health workers. After the first monitoring, the FASs established performance benchmarks for the next six months. In general, they raised the benchmark by about 10–20% above the average coverage. For example, at Time 2, average coverage for the first indicator was 68.2%; FASs set the coverage benchmark for Time 3 at 80%, which is about 10% higher. At each time period, the manager met with FASs and jointly decided on benchmarks for the next period based on what they thought was feasible to achieve.

It is interesting that the SAs that did not reach performance bench-

TABLE 3

LQAS Judgments for Demonstrating Correct Preparation of Oral Rehydration Solution and Knowledge of Postnatal Danger Signs (June 1999–January 2001)

	Correctly Prepares ORS: Children 12–23 Months				*Knows Postnatal Danger Signs: Children 0–11 Months*			
Dates Monitoring Data Were Collected	*June 1999*	*January 2000*	*June 2000*	*January 2001*	*June 1999*	*January 2000*	*June 2000*	*January 2001*
Baseline Results	Not included in baseline survey				Not included in baseline survey			
Coverage Benchmark: Decision Rule	NA	65%:10	80%:13	95%:16	NA	55%:8	70%:11	95%:16
Avg. Coverage: Decision Rule	52.6%:6	68.2%:11	85.7%:15	91.3%:16	41.8%:6	59.6%:9	83.9%:14	92.2%:16
SA 1	7*	(7*)	(12*)	17	5*	17	16	19
SA 2	7*	(9*)	17	18	8	12	19	19
SA 3	12	14	17	19	5*	(7*)	18	17
SA 4	9	13	17	19	2*	19	(10*)	(13*)
SA 5	11	17	18	18	13	15	18	19
SA 6	16	19	19	19	16	14	18	18
SA 7	8	12	15	(13*)	3*	8*	12*	16
Total Below Avg. or Substandard FASs	2	2	1	1	4	2	2	1

Notes: ( ) indicates an SA that has not reached a benchmark. * indicates an SA with below average coverage.

marks for the first indicator were not necessarily those that did not reach it for the second one. For example, for the first indicator, SA 1 was below average for three of four time periods. However, it was below average for only the first time period for the second indicator. In another example, SA 7, for the first indicator, was below average for the last time period only; however, for the second indicator it was below average for three time periods. The assumption is that the service problems in an SA are not necessarily associated with any other intervention. Therefore, all critical parts of the community health program should be monitored at each point in time.

During the last three monitoring periods, coverage benchmarks were established for all indicators. SAs during those time points were judged both on whether they reached benchmarks and on average coverage. SAs displaying both a circle and an asterisk for an indicator are the highest priorities for improvement.

The final observation is that both indicators show a continuous increase in performance over the four time periods. Problems are evident at each point in time but did not persist, very likely due to interventions by the supervisors in response to the data. Each of the key community health indicators can be tracked using a table like Table 3 to manage the program, identify the location of problems, track progress, and identify SAs that excel.

Assessing Supervision Areas at Four Points in Time: A Manager's Perspective

The preceding sections displayed how FASs used LQAS data to identify their SA problem-solving priorities and the performance of each SA relative to other SAs. Both applications helped the FASs and their manager to determine which interventions and locations needed technical assistance. This section shows how the program manager or district health officers can use the same data to track the entire community program over time. The main difference is that the data are aggregated; Table 4 displays the weighted coverage proportions of seven indicators with confidence intervals.

Indicators for safe motherhood, diarrhea case management, and family planning interventions are included. As in the previous section,

TABLE 4
Coverage Proportions and Confidence Intervals for Selected Indicators

Indicator	—Weighted Coverage Proportion and Confidence Interval— Baseline*	Monitoring			
	Sept. 1997	June 1999	Jan. 2000	June 2000	Jan. 2001
Delivery assisted by clinician or medically trained TBA	NA	43.6% (± 7.9%)	59.2% (± 8.3%)	64.5% (± 8.3%)	53.0% (± 8.8%)
Knowledge of two or more pregnancy danger signs	30.7% (≤ 10%)	51.3% (± 8.6%)	77.9% (± 7.1%)	93.5% (± 4.2%)	98.6% (± 2.1%)
Knowledge of two or more postnatal danger signs	NA	41.8% (± 8.5%)	59.6% (± 8.4%)	83.9% (± 6.3%)	92.2% (± 4.6%)
Demonstrates correct ORS preparation	NA	52.7% (± 8.6%)	68.2% (± 8%)	85.7% (± 6%)	91.3% (± 4.9%)
Knowledge of two or more dehydration danger signs	12.7% (≤ 10%)	48.0% (± 8.6%)	75.3% (± 7.4%)	93.7% (± 4.2%)	94.1% (± 4.1%)
CPR, modern method**	20.2% (≤ 10%)	33.4% (± 8.5%)	38.0% (± 8.8%)	61.7% (± 7.7%)	53.4% (± 9%)

Notes: *Baseline data were collected using an EPI cluster sample for which the confidence interval is assumed to be ≤ 10%. Any indicator not included in the baseline is marked as NA.
**The standard EPI cluster sample includes mothers of children 0–23 months for all interventions. Therefore, the baseline measure of the contraceptive prevalence rate is of that group of women, as well, which is not a true CPR estimate, since the family planning method use of that group of women cannot be assumed to be the same as among women 15–49 years of age. The latter group was sampled during June 1999–January 2001.

only a selection of indicators is presented to demonstrate the use of the LQAS data. Three indicators did not have a baseline measure, because they were introduced after the program began. All interventions display an increase in coverage by January 2001, although assisted delivery and contraceptive prevalence showed slight declines between June 2000 and January 2001. However, the confidence intervals do not indicate slippage.

FASs think that coverage decreased for assisted delivery because priorities during June 2000–January 2001 had shifted from safe motherhood to other interventions. In earlier years, all FASs had made it a priority to increase assisted delivery. By June 2000, FASs were satisfied that pregnant women and their families were embracing this practice and shifted attention to other priorities. However, based on the January 2001 results, FASs concluded that safe motherhood interventions needed to be emphasized continuously for the improvement to be sustainable. This may be because there is little transfer of information between different cohorts of pregnant women and their families. Therefore, FASs need to promote the use of trained health workers during delivery for coverage rates to be maintained.

The contraceptive prevalence rate also decreased slightly during January 2001;[5] however, even at that time, a person was 3.75 times more likely to use a family planning method as compared with baseline.[6] In June 1999, most family planning users sought permanent methods (47.5% = tubal ligation, 5% = vasectomy). Twenty-five percent chose hormonal methods (12.5% = injectables, 7.5% = pill, 5% = Norplant), 20% selected condoms, and 2.5% practiced lactational amenorrhea. By January 2001, the pattern of use of family planning methods had changed. A smaller percentage selected permanent methods (21.7% = tubal ligation, 1.4% = vasectomy). Larger proportions of the women used hormonal methods (injectables = 27.5%, pill = 14.5%), and 33.3% used condoms. Only 1.4% said that abstinence was their chosen family planning method. Both the increase in the contraceptive prevalence rate, and the changed pattern of method use, may be due to the increased availability of family planning methods in the program area. Before family planning became a community priority, procurement of family planning methods had been a major challenge that FASs and their manager had to overcome.

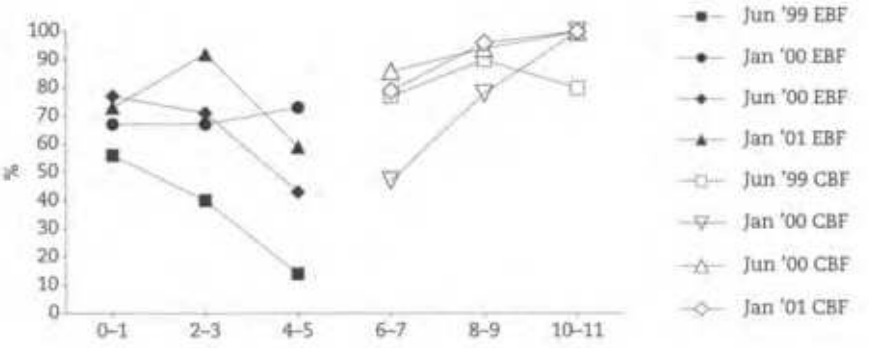
FASs also cited another reason for the decreases in assisted deliveries and contraceptive use in January 2001, namely, the political instability

5. The reduction in CPR in January 2001 could be a regression effect. See Campbell and Stanley 1966 and Valadez and Bamberger 1994.

6. This odds ratio was calculated as part of a trend analysis, not reported here. Because LQAS data, in aggregate, are a stratified random sample, statistical tests can be used, since each observation is independent of every other observation.

FIGURE 1

Exclusive Breastfeeding of Infants 0–5 Months and Complementary Breastfeeding of Infants 6–11 months



and violence in Nepal at that time. These factors could have prevented women from obtaining assistance for deliveries and made family planning methods unavailable.

The final key intervention category is breastfeeding. Figure 1 tracks exclusive and complementary breastfeeding practices at each of four time points. The data show that, at Time 1, only 56% of women exclusively breastfed infants aged 0–1 months. By the time these infants reached 4–5 months of age, only 14% of the cohort was exclusively breastfed. However, by Time 4, 73% of infants 0–1 months were exclusively breastfed, with 59% of the 4–5-month-old cohort being exclusively breastfed. Although the trend lines fluctuate over the four time points, the trend suggests that, by Time 4, more infants in the older stratum were exclusively breastfed. Some of the variation in breastfeeding results over time may be due to the small sample sizes of each monthly cohort. When data for children 0–11 months are broken down into six two-month cohorts, each one has, on average, 22 children. While the confidence interval for each point estimate is wide, some trends are nevertheless evident.

The right-hand portion of Figure 1 displays complementary breastfeeding. Little change is evident when Time 1 and Time 4 are compared, except in the 10–11-month cohort. This result also suggests that women are breastfeeding their children longer.

Other analyses examined exclusive breastfeeding among infants 6–11 months. Results suggest that a reason complementary feeding was

low among infants 6–7 months is that 26.7% still exclusively breastfed; 8% of infants 8–9 months also still exclusively breastfed. This practice may suggest either resource deprivation in these communities or lack of knowledge about the need to provide supplementary food when infants reach 6 months of age. Interestingly, the trend lines with the highest proportions of exclusive breastfeeding of infants aged 0–11 months are in the January measures. This may suggest a seasonal influence.

In conclusion, this section has illustrated the diverse uses of LQAS data at both the community and managerial levels. Some were quite simple, while others were more sophisticated.

Cost Analysis

The total field costs for the cluster sample used at the baseline was $6,548, while the initial LQAS application cost $2,947. The second LQAS application cost $1,180. The baseline and initial LQAS applications included training costs, while the recurrent application included refresher training at lower cost. See Table 5.

However, because LQAS uses FASs who are already employed rather than special interviewers, many costs, such as salaries, were already being paid by the program. If the supervisors had not been participating in this assessment, they would have been carrying out other essential tasks. These represent opportunity costs. The marginal costs columns shows additional money spent for LQAS in both its initial use ($1,585) and recurrent use ($456). None of the cluster sample costs are considered opportunity costs.

The main savings in recurrent costs is the elimination of training costs. The team also reduced costs by shortening the questionnaire. The costs of using expatriate trainers are not included in this analysis of both the cluster sampling and LQAS, because those costs can vary substantially across different organizations. The January 2000–2001 applications included no outside technical assistance.

The total cost for each questionnaire set of the recurrent application of LQAS is equivalent to a 1986 application that estimated $9 (in 1999 dollars) (Valadez 1991). However, the application in Nepal cost substantially less than the $5,000 to $8,000 reported elsewhere, both for other LQAS applications and for cluster sampling (Singh et al. 1996).

TABLE 5

Comparison of the Costs of Cluster Sampling for a Baseline and the Costs of LQAS for Monitoring

	—September 1997—	*June 1999*		*January 2001*	
	Cluster Sample Baseline Costs	*LQAS Costs*	*Opportunity Cost = Marginal Cost*	*LQAS Costs*	*Opportunity Cost = Marginal Cost*
Salaries	$2,498	$1,328	$0	$724	$0
Transportation	$673	$420	$420	$413	$413
Materials	$816	$403	$403	$43	$43
Food/Accommodation	$2,561	$796	$762	$0	$0
Total Costs	$6,548	$2,947	$1,585	$1,180	$456
Total Cost per Set	$21.83	$22	$12	$9	$3
Total Cost per Observation	$21.83	$7.39	$3.97	$2.96	$1.14

The lower costs of this study are probably due to two factors: (1) the monitoring system is decentralized, which minimized travel costs, including food, accommodations, and transport, and (2) local supervisors are able to work more rapidly in their communities than interviewers not known by residents.

Collecting the baseline data for this project using cluster sampling cost more than twice as much as collecting the LQAS data. When only marginal costs are considered for this decentralized LQAS application, then cluster sampling was more than four times more expensive than this decentralized application of LQAS. The reasons are: More data collectors are required for the cluster sample; and centrally organized teams travel to 30 clusters, which results in considerably higher transportation, food, and lodging costs than when seven FASs travel locally to their own communities to visit 133 households. This analysis shows that decentralized monitoring and supervision systems are substantially more cost effective than centralized approaches.

The costs of LQAS were recently analyzed in Armenia, where three organizations used LQAS in a baseline study for their reproductive health program. The average total cost per organization was $2,740, which is comparable to the initial application of LQAS in Nepal ($2,947) (see Valadez et al. 2001a).

DISCUSSION

During the 1990s, LQAS was used for two different management purposes:

1. to collect *population-based data* with a known confidence interval. Health system (α) and community (β) risks were less emphasized. Professionals working in the EPI have driven this development (World Health Organization 1996, Robertson et al. 1997, Bhattacharyya et al. 1998). WHO's training manual embraces this approach (World Health Organization 1996);
2. to assess supervision areas with known health system and community risks. This community-oriented approach emphasized decentralized data collection and analysis using LQAS. Calculating coverage proportions was a secondary interest. *Community-oriented* health practitioners have written about this approach (Stroh 1985, Valadez 1991, Vargas 1998).

This chapter describes a community-oriented application of simplified LQAS tools used by local supervisors at four points in time to improve their programs. Supervisors did not find the concept of coverage benchmarks difficult to grasp, as they already had established coverage targets for the project. Table 1, which displayed decision rules, was more acceptable to field supervisors than other LQAS tables that also showed α errors and β errors. Although the latter (more standard) tables are preferred by epidemiologists and some managers (Lwanga and Lemeshow 1991, Valadez 1991, Valadez 1998), they were confusing to field supervisors.

Training in data analysis used examples such as the results presented in Table 2. FASs saw the benefits of identifying both specific program interventions and SAs that were performing at substandard levels. Pinpointing program interventions that were not successful highlighted the topics on which health workers needed retraining, while identifying SAs that needed specific technical support indicated which supervisors needed this support. Both of these analyses are necessary to improve the management of decentralized health systems.

After data are collected, each FAS and support staff tallied the results from their SA by hand and shared the results in a joint meeting with other supervisors and support staff. It took approximately one-half day to complete this task and to double-check tallies. The joint meeting provided a forum for discussing results and to assist supervisors to observe the performance of their SA vis-à-vis other SAs. Group discussion helped FASs to plan programmatic changes for their SAs and to request technical assistance from other FASs and the manager. Discussions also helped the program manager identify systematic problems that affected multiple FASs and identify specific SAs needing attention. The program manager was also able to identify the supervisors whose SAs exhibited the fewest substandard interventions and use them as technical advisors for other SAs with program problems. Supervisors were motivated by seeing how their SAs compared to those of other FASs.

In our experience, a factor that constrains program monitoring is the time required to collect data. Overworked local staff may view data collection as a waste of time. For this reason, independent interview teams are often employed to carry out surveys. However, the local supervisors participating in this decentralized application of LQAS did not have this reaction. They agreed that the LQAS sample of 19 was

small and did not compete with other responsibilities. Also, in the first application, they noted the importance of visiting beneficiaries in the age ranges of the interventions and hearing for themselves responses to survey questions. By so doing they were able to judge the strengths and weaknesses in their programs and had already begun the reform process before all the data were collected.

From 1999 to 2001, Tables 2 and 3 were the most useful analyses for supervisors and their staff. They also provided the most useful inputs for immediate decision-making by supervisors and the program manager. Table 4, with the aggregate measures of coverage, was useful to the manager to judge the overall progress of the project and to report to his donor and supervisors. It also provided measures to compare with baseline information. However, the coverage proportions did not prove to be of immediate interest to field supervisors, because these figures did not reflect their own individual work in their SAs, as did the LQAS results.

Cost analyses indicate that this decentralized application of LQAS is inexpensive relative to cluster sampling, and when applied regularly, the marginal cost was less than $500. In January 2001, FASs said they would use LQAS as part of their ongoing supervision system every six months and that LQAS has enabled them to steadily improve each intervention.

The Taylors' Seven Steps for Developing Community-Oriented Health Programs

This chapter demonstrates how important a practical and inexpensive yet highly scientific method for gathering, analyzing, and using data at the community level can be for effective supervision and management. The use of LQAS in Nepal resulted in ongoing improvements in the performance of health workers and ultimately in the health of communities. While the LQAS approach was not developed in response to the Taylors' seven steps emphasizing community participation, those seven steps and the LQAS approach can be linked, as follows:

1. **Create coordinating committees and improve their capacity:** In Nepal, these committees included the FASs at a program level.

At an SA level, they included community health workers. Our next task is to involve the community more in using LQAS.

2. **Identify successes:** This is one purpose of using LQAS.
3. **Study success and visit other communities:** FASs who were not reaching coverage benchmarks were able to visit FASs that were successful. However, in most cases they preferred to understand for themselves first why they lagged behind other FASs. Often visiting other communities was not necessary.
4. **Conduct self-evaluation:** This is a central purpose of the community-oriented version of LQAS, as it was applied in Nepal: workers evaluate themselves objectively.
5. **Make decisions based on agreed-upon problem areas and priorities:** FASs met to discuss LQAS results and to identify priorities. Managers used the data as the basis for allocating their attention to priority interventions and supervisors.
6. **Involve as many people as possible in decision-making:** All FASs were involved in decision-making. We have yet to learn how to include community members in the actual decision-making. However, local people were informed of the results and of the priorities for the next six-month period. In this manner, many people were involved.
7. **Monitor the momentum to identify gaps in action and to make midcourse corrections:** The six-month assessment ensured periodic review and revision of action strategies to achieve agreed-on benchmarks, which were progressively raised.

In the context of this collection of experiences with community-based health care (CBHC), this experience in Nepal shows clearly how critical the effective collection and use of data is to improving CBHC services. Because of its low costs, ready acceptance, and ability to be understood by field workers, we think the LQAS approach offers great promise in making ongoing collection and use of data part of the delivery and management of CBHC, rather than being confined to academic studies and generally ignored in the field. Now more long-term applications of LQAS are needed so that additional refinements can be identified and cost analyses can be replicated. We also need to engage

communities more actively in using the data to understand and improve the health of their members.

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REFERENCES

Arole, Mabelle, and Rajanikant Arole. 1994. *Jamkhed.* London: Macmillan.

Bhattacharyya, K., et al. 1998. "Community Assessment and Planning for Maternal and Child Health Programs: A Participatory Approach in Ethiopia." Arlington, VA: BASICS (Basic Support for Institutionalizing Child Survival), Partnership for Child Health Care, Inc.

Campbell, Donald T., and Julian C. Stanley. 1966. *Experimental and Quasi-Experimental Designs for Research.* Chicago: Rand McNally.

Child Survival Technical Support Project and CORE Monitoring and Evaluation Working Group. 1999. "KPC-2000: Knowledge, Practices and Coverage Survey." Calverton, MD: Child Survival Technical Support Project and CORE Monitoring and Evaluation Working Group.

Dodge, H. F., and H. G. Romig. 1944. *Sampling Inspection Tables: Single and Double Sampling.* New York: John Wiley & Sons.

Henderson, R. H., and T. Sundaresan. 1982. "Cluster Sampling to Assess Immunization Coverage: A Review of Experience with a Simplified Sampling Method." *Bulletin of the World Health Organization* 60: 253–60.

Lwanga, S. K., and S. Lemeshow. 1991. *Sample Size Determination in Health Studies: A Practical Manual.* Geneva: World Health Organization.

Pradhan, A., et al. 1996. "Nepal Family Health Survey: 1996." Kathmandu, Nepal, and Calverton, MD: Ministry of Health (Nepal), New Era, and Macro International.

Reinke, W. A. 1988. "Industrial Sampling Plans: Prospects for Public Health Applications." Baltimore, MD: Institute for International Programs, Johns Hopkins University School of Hygiene and Public Health.

Robertson, S. E., et al. 1997. "The Lot Quality Technique: A Global Review of Applications in the Assessment of Health Services and Diseases Surveillance." *World Health Statistical Quarterly* 50: 199–209.

Rohde, Jon, Meera Chatterjee, and David Morley, eds. 1993. *Reaching Health for All.* New Delhi: Oxford University Press.

Singh, J., et al. 1996. "Evaluation of Immunization Coverage by Lot Quality Assurance Sampling Compared with 30-Cluster Sampling in a Primary Health Care Centre in India." *Bulletin of the World Health Organization* 74.

Stroh, G. 1985. "Rationale for the Development and Trial of Q.C. Sampling Designs in Program Evaluation." Personal memo to Donald Shepard.

Taylor-Ide, Daniel, and Carl E. Taylor. 1995. *Community Based Sustainable Human Development: A Proposal for Going to Scale with Self-Reliant Social Development.* New York: UNICEF.

———. 2002. *Just and Lasting Change: When Communities Own Their Futures.* Baltimore, MD: Johns Hopkins University Press, forthcoming.

Valadez, J. J. 1986. "Lot Quality Acceptance Sampling for Monitoring Primary Health Care Coverage." Washington, DC: Pan American Health Organization.

———. 1991. *Assessing Child Survival Programs in Developing Countries: Testing Lot Quality Assurance Sampling.* Cambridge: Harvard University Press.

———. 1998. *A Manual for Training Supervisors of Community Health Workers to Use LQAS: A User's Guide.* Arlington, VA: OMNI Research.

———. 2000. "NGO Networks for Health: Detailed Monitoring and Evaluation Plan." Washington, DC: NGO Networks for Health.

Valadez, J. J., and M. Bamberger. 1994. *Monitoring and Evaluating Social Programs in Developing Countries.* Washington, DC: World Bank.

Valadez, J. J., et al. 1996. "Using Lot Quality Assurance Sampling to Assess Measurements for Growth Monitoring in a Developing Country's Primary Health Care System." *International Journal of Epidemiology* 25: 381–87.

———. 1997. "Assessing Family Planning Service-Delivery Skills in Kenya." *Studies in Family Planning* 28: 143–50.

———. 2001a. "NGO Network for Health in Armenia: Baseline Survey Report for Three Partner Organizations." Washington, DC: NGO Networks for Health.

———. 2001b. "NICASALUD Baseline Survey Results for Eight Partner Organizations." Washington, DC: NGO Networks for Health.

———. 2001c. "Umoyo Network Malawi: Baseline Survey Results for Six Partner Organizations: Adventist Health Services, Blantyre Christian Centre, Ekwendeni Hospital, MACRO, Malamulo Hospital, and St. Anne's Hospital, April–June 2000." Washington, DC: NGO Networks for Health.

Vargas, W. V. 1998. "Assessing Community Based Coverage of Nutritional Interventions in Sri Lanka: An LQAS Assessment." Arlington, VA: OMNI.

Villegas, H. 1978. "Costa Rica: Recursos Humanos y Participación de la Comunidad en los Servicios en el Medio Rural." *Buletín de la Oficina Sanitaria Panamericana* 84: 13–24.

World Health Organization. Global Programme for Vaccines and Immunization. 1996. *Monitoring Immunization Programmes Using the Lot Quality Technique.* Geneva: World Health Organization.

Wyon, John B., and John E. Gordon. 1971. *The Khanna Study: Population Problems in the Rural Punjab.* Cambridge: Harvard University Press.

10 Resources to Get the Job Done: The Sustainability of Community-Based Health Care

William Newbrander

How do we pay for it all? This chapter derives principles from many countries and contrasts the experiences of poor and rich countries. Developing countries that have obtained resources from donors and government are often pressured to shift financial responsibility to users, while in rich countries, foundations and private grants try to shift responsibility to routine government budgets. The author cites important principles of affordability and recommends programs that start small and scale up to ensure that financial constraints do not ultimately bankrupt successful health projects.

—*Jon Rohde*

The community-based health care (CBHC) model is built upon the premise that community-based mechanisms for providing health care must be based on need and provide appropriate technology that is available and affordable in an integrated system of services using qualified, local personnel. The experiences from different countries that are presented in this anthology reaffirm the value of the CBHC model.

CBHC AND SUSTAINABILITY

For the CBHC model to succeed, the resources to implement it must be adequate and reliable over a period that will allow delivery of high-quality services (preventive, promotive, and curative) to which there is equal access. Sustainability requires more than adequate financial resources, however. The sustainability of CBHC comprises two elements, one micro, because it relates to the application of a specific model, and the other macro, because a CBHC model can be reproduced in many places and become the basis for expansion. The micro element focuses on the human, financial, and physical (facilities) resources required over time to keep a particular CBHC model functioning well (as compared to merely surviving). The macro element involves scaling up current models and replicating them in a series of communities. The desired cumulative effect is that CBHC covers large segments of a population.

THE SUSTAINABILITY OF CBHC MODELS IN DEVELOPED AND DEVELOPING COUNTRIES

Current models of CBHC in developed and developing countries have similarities as well as differences, particularly with regard to sustain-

ability. The following principles, based on the experiences presented in this book, must be considered with caution because they are derived from comparing experiences with CBHC in the United States with those in developing countries.

Common characteristics of sustainable CBHC programs in the United States and developing countries include (1) founding by visionaries, (2) funding from many small sources, (3) insufficient human resources, and (4) lack of financial resources to support the use of appropriate technology. These features, discussed below, threaten programs' long-term survival and success.

Founding by visionaries. CBHC programs are usually started by people with a vision of something different from the norm. As the former CEO of Pepsi and Apple Computer, John Sculley, stated: "The future belongs to those who see possibilities before they become obvious" (quoted in Maxwell 1999, 148). CBHC programs are often started by someone, or a small group (like the Aroles), who is dedicated to turning a dream into a reality (see chapter 3). However, visionaries, while setting into motion the operationalizing of a new structure or way of doing things, often have problems with generating sufficient resources to expand the vision or program. After launching a program and making it work, the visionary leader must eventually pass on to others the management and marshalling of resources. The program also becomes too large for one person to adequately manage. A CBHC program started by one person often requires another person or group of people to manage its growth and take it to the next level.

Resources from many small sources. The experience of CBHC programs in both developing- and developed-country settings is that the financial resources needed for not only start-up but also continued operation and expansion require the cobbling together of multiple sources of funds, most of them small relative to the total need. These funds often cover only short periods and the program has to reapply for grants every one to three years. Much of the time of managers is devoted to evaluations and grant renewal applications, often at the expense of program activities. It is common for community-based programs, even those with a demonstrable impact on the target population, to go out of existence because their grant is terminated. A foundation may choose to fund another agency, even one carrying out a

very similar program with the same target population, to "diversify its grant recipients." There may be little concern about the cost of starting up a new operation or about the monetary and social costs of closing down an existing program.

For example, the PACT Project, a community program in metropolitan Boston, has been important and successful in providing health and social services to HIV/AIDS patients in poor communities. (See chapter 14.) Yet its survival is threatened because there is no sustainable funding stream. A former staff member recently articulated her frustration with the resulting situation: "They put us in a position in which, instead of doing our work, we are worrying about money. It takes so much time to look for money and it's so frustrating" (Contreras 2001). This situation is common and poses real sustainability problems, since a program must have an adequate and reliable source of funding to be sustainable.

Insufficient human resources. A CBHC program uses various workers, often volunteers as well as regular staff. Employing volunteers may make it difficult to have an adequate and reliable source of human resources. This reliance on volunteers may mean there are not always appropriate workers for a task. Those who volunteer from poor communities and live at the limits of subsistence cannot afford to volunteer many hours. In Indonesia, for instance, village volunteers in *posyandus* (health posts) are asked to give only one or two days per month, to ensure that they are not overburdened.

Lack of appropriate technology. Most CBHC programs seek to use the most appropriate and affordable technology, rather than technology that is more sophisticated than that needed (but is often used) for the services or programs offered. In many instances, however, lack of financial resources and other constraints may mean that the most appropriate, or even sufficient, technology may be too costly for the program. For example, optimal drug requirements for tuberculosis often exceed communities' resources, even when people are willing to pay for them. Outside resources are essential to achieve public health control of TB in this situation. Vaccines and family planning supplies are also often considered a legitimate cost to governments or donors to support CBHC.

Three differences between sustainable CBHC programs in the United States and developing countries are (1) their origin as public-

or private-sector initiatives, (2) their initial funding source, and (3) their approach to financial sustainability.

Public- or private-sector origin of CBHC. Developing-country CBHC programs often start with encouragement from the public sector and international donors. They seek community input and usually wish to shift the CBHC program from the public to the private sector over time. The public sector is involved initially because essential public health services are considered governments' responsibility. For example, the Basic Minimum Needs approach of Thailand in the 1980s, which included health care, was an initiative of the government to involve communities in their own development and well-being. The government understands that CBHC has a role to play in extending the activities of the health sector in developing countries. It often sees that CBHC can mobilize material and human resources in rural communities, which the formal health system has difficulty in reaching. Hence, public-sector encouragement and involvement in starting CBHC in developing countries is a means for increasing access in the long term through means other than the public-sector health system. By contrast, in the United States, most CBHC programs start as private endeavors. Because they have to assemble grants from foundations and government agencies, they tend to attempt to move into the public sector to guarantee a regular source of resources for their programs.

Initial funding source. CBHC programs in developing countries often receive their initial funds from a single source, often an international donor. In the United States, CBHC programs seek their initial funds from private sources. They may also seek government funding by applying for grants. Since government grants and contracts are usually competitive, these funds cannot be considered regular and will not provide 100% of the programs' funding. Hence, there is the need to cobble together many sources of money and develop staff (specialists in finance, human resources, contracts, proposal management, writing, and editing, as well as support staff) who are expert in developing and producing proposals.

Approach to financial sustainability. In developing countries, the idea of financial sustainability is that most of the finances for the CBHC will eventually come from the community itself or the users of the services or both. The concept of financial sustainability in the

United States is very different from the understanding of sustainability in developing countries. In the United States, there are very few instances in which user fees are charged for services for low-income populations, particularly in community-based programs. These services are covered through government-funded insurance programs, such as Medicaid, special government grants and contracts, and grants from private foundations associated with corporations or wealthy individual benefactors.

Private foundations in the United States believe that sustainability implies a shift to the government sector. Foundations will support a project for a limited time, with the expectation that the project will eventually be included in a local, state, or national government budget. This conviction often leads private foundations to support lobbying by community-based organizations to fund their programs through government budgets. While this approach should also apply in poor countries, their government budgets are generally reserved for government-run services, leaving NGOs to seek sustainable financing from fees and donations for CBHC. This leads to the paradox of the rural poor receiving the least help from government while urban dwellers have access to more costly and sophisticated government-funded services.

CHALLENGES FOR THE SUSTAINABILITY OF CBHC MODELS IN THE FUTURE

Several challenges face CBHC programs seeking to become sustainable: (1) going to scale, (2) integrating CBHC services, (3) training, supervising, and motivating personnel, (4) generating financial resources, (5) managing resources wisely, (6) setting up monitoring and evaluation systems, (7) managing the growth of services, and (8) finding and nurturing effective leaders.

Going to scale. The objective of most CBHC programs is to cover the population they have targeted for the services they provide. After that objective has been achieved, the programs may plan to expand their scale at that location or to offer services in additional locations. An example is PROSALUD, begun in 1985 as a public-private partnership to establish and operate primary health care services in Bolivia. It has evolved through the collaboration of the public and private sectors to

respond to the unmet needs of Bolivia's low-income populations, and it enjoys the active participation of the communities it serves. Today it is a nonprofit organization that manages an innovative network of high-quality, low-cost, client-focused services. Since 1985, it has grown from 2 health centers to 33, which employ more than 580 people and serve over half a million low- and lower-middle-income Bolivians, most of whom are underserved by public and private health services, in nine cities (Cuéllar, Newbrander, and Price 2000).

Integrating CBHC elements. The easiest way for CBHC to become established and obtain funding is to develop vertical programs that address one disease or health condition, especially one of concern to large donor agencies. Vertical programs rarely become independent. However, as the experience of the Bangladesh Rural Advancement Committee (BRAC) has demonstrated, even programs begun as vertical interventions can expand into a wider set of services that can meet an expanding array of community needs. These services may eventually provide the breadth of services and interventions needed by the community. This was the strategy behind James Grant's GOBI (growth monitoring, oral rehydration, breastfeeding, and immunization) initiative for UNICEF.

Sustaining human resources. The human resources of a community-based scheme are just as important as financial sustainability, if not more important. Human resource sustainability requires training, supervision, and motivation of staff and volunteers involved in the CBHC program. Without them and their continued growth and satisfaction, the community-based scheme will not be able to operate even if it has sufficient financial resources. BRAC has shown how continued staff development in skills and knowledge leads to sustainable health activities and an increasing array of services. Posyandus in Indonesia started as nutrition promotion activities, then after several years expanded to include family planning, immunization, and treatment of common ailments, adding one function every year or two. Some posyandus have even started monitoring chronic ailments of the aged, such as hypertension.

Generating financial resources. A CBHC program has to be creative in obtaining financial resources. It will need to combine different financing mechanisms. For example, it should consider the possibility

of community financing, which is a local risk-sharing scheme in which the community manages health services while raising financial resources and promoting community responsibility and self-reliance. Such community financing or insurance schemes can provide a portion of the resources needed. The Dana Sehat (local health insurance) program in Indonesia has paid government PHC charges for the rural poor for three decades. Similar schemes have worked in Bangladesh (Gonoshasthaya Kendra) and Bolivia (PROSALUD).

In other cases, community financing may involve targeted user fees. But if a program chooses to use such fees, managers should consider the following principles in establishing them:

- Services should be provided to community members based on need, not ability to pay.
- There should be equity in both the receipt of services and the burden of financing them.
- User fees should not be the only source of revenues for the program.
- People should not have to sacrifice meeting other basic needs to pay for PHC services.
- The quality of services must be the same for all, whether they paid for the services or not.

Another means of encouraging certain services for which fees are charged is cross-subsidization. This financing mechanism involves collecting a fee that, although affordable, is greater than the actual costs for certain services for which there is high demand. Then the excess revenue is used to subsidize the costs of necessary services whose actual costs would make them unaffordable for most members of the community.

Managing resources wisely. Community-based programs can offer comprehensive services without an extravagant amount of financial resources. But to do so they must make the best use of their existing resources. This requires properly allocating those resources and then making the most productive use of them for the purposes for which they were allocated—that is, being efficient. Efficiency depends on good management practices. Efficiency gains mean that a CBHC pro-

gram can provide more services, or services to more people, for the same amount of financial and human resources. For example, in Haiti the Hôpital Albert Schweitzer found that it was less expensive to provide tetanus toxoid to all women than to manage the consequences of tetanus forever (see chapter 7). In urban India, hospitals in the Baby Friendly Hospital Initiative changed their policies to encourage breastfeeding and then maintained it at no ongoing cost. In reality, it saved the cost of formula, even for the hospitals. Oral rehydration of diarrhea cases, developed in Bangladesh and popularized in every household throughout the country by BRAC, is a campaign that cost $25 million over 12 years. But it saves its entire cost in hospitalization (including IV fluids) every year, as well as saving lives.

Measuring the effectiveness of the system. A CBHC program requires a continuous monitoring and evaluation system so its manager can track the resources being used and their impact, and identify new priorities. As part of effective management and stewardship of community resources, CBHC programs also need adequate information systems so they know whether these resources are improving the well-being of the community. Such a system allows the program to ascertain the cost-effectiveness of various interventions or services when there are different options.

Expanding services incrementally. The CBHC program will seek to expand its services to provide a comprehensive package of services that meet the needs of the community. This package must be balanced with the resources available if it is to be sustainable. Hence it is important that program managers not make promises they cannot keep about the services the program will provide when it begins or as it expands. This will help ensure that costs do not outstrip revenue growth. One strategy is to keep costs and expectations reasonable from the start and add services only as they can be paid for. In the beginning, it is useful for the CBHC program to pick interventions it can afford and which have a high probability of success. For instance, choose an intervention such as the eradication of a disease like guinea worm, which has been eliminated in India and Pakistan, or like BRAC, finish teaching everyone how to manage diarrhea at home.

Finding effective leaders. Community-based schemes require leaders who not only have a vision of where the CBHC program is going

but who are also committed to the principle of equity for the members of the community. The leader is needed to galvanize the human and financial resources to move the organization forward but must be flexible enough to share power and eventually vest it in other leaders.

While many governments seek alternative sources of revenue for health services, the ultimate responsibility, especially for promotive and preventive activities affecting the entire population, belongs with government. One of the greatest limitations of community-financed health services lies in their inability to bring about greater equity in health care. Simple fee-based payment systems can exacerbate existing inequities within communities, between communities, and between regions. While cost sharing by individuals and communities can reduce the financial burden on government, tax revenues are generally the most equitable source of funding. Governments must guarantee that receipt of health care is based on need rather than ability to pay. Responsibility for equitable access to health services, especially for the poorest, must not be relinquished in enthusiasm for privatization and the market economy. So even with widespread expansion of CBHC, there remains a major and significant role for the public sector in health care. Health for all remains a public good.

REFERENCES AND RESOURCES

Abel-Smith, B., and A. Dua. 1988. "Community-Financing in Developing Countries: The Potential for the Health Sector." *Health Policy and Planning* 3: 95–108.

Aubel, J., and K. Samba-Ndure. 1996. "Lessons on Sustainability for Community Health Projects." *World Health Forum* 17: 52–57.

Contreras, Maria. 2001. Telephone conversation with Gail Price. W. Roxbury, MA.

Creese, A., and S. Bennet. 1997. "Rural Risk-Sharing Strategies." World Bank Discussion Paper No. 365. Washington, DC: World Bank.

Cuéllar, Carlos, William Newbrander, and Gail Price. 2000. *Extending Access to Health Care through Public-Private Partnerships: The PROSALUD Experience.* Boston: Management Sciences for Health.

Konradsen, F., et al. 2000. "A Village Treatment Center for Malaria: Community Response in Sri Lanka." *Social Science and Medicine* 50: 879–89.

MacIntyre, K., and D. Hotchkiss. 1999. "Referral Revisited: Community

Financing Schemes and Emergency Transport in Rural Africa." *Social Science and Medicine* 49: 1473–87.

Maxwell, John C. 1999. *The 21 Indispensable Qualities of a Leader.* Nashville, TN: Thomas Nelson Publishers.

Mburu, F. 1989. "Whither Community-Based Health Care?" *Social Science and Medicine* 28: 1073–79.

Moskalewicz, J., and G. Swlatkiewicz. 2000. "Malczyee, Poland: A Multifaceted Community Action Project in Eastern Europe in a Time of Rapid Economic Change." *Substance Use and Misuse* 35: 189–202.

Preker, A., et al. 2001. "A Synthesis Report on the Role of Communities in Resource Mobilization and Risk Sharing." CMH Paper Series, Paper No. WG3:4. Geneva: Commission on Macroeconomics and Health.

Shediac-Rizkallah, M., and L. Bone. 1998. "Planning for the Sustainability of Community-Based Health Programs: Conceptual Frameworks and Future Directions for Research, Practice and Policy." *Health Education Research: Theory and Practice* 13: 87–108.

Zakus, J., and C. Lysack. 1998. "Revisiting Community Participation." *Health Policy and Planning* 13: 1–12.