Improving Aid Effectiveness in Global Health
Chapter 21
Effectiveness of the Census-Based Impact Oriented Approach

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Introduction

In the rural highlands of Guatemala, a community health worker made a routine home visit and encountered a severely malnourished child who had been having repeated bouts of diarrhea and pneumonia. By providing education to the mother to improve the child’s nutritional status, by improving the hygienic situation in the home, and by providing appropriate antibiotic treatment for episodes of pneumonia, the child returned to good nutrition and health. Without this kind of outreach and support, this child would very likely have died. We have seen and heard about many similar cases in which health programs using the framework we will be describing in this chapter have been able to prevent deaths of children and save the lives of mothers with complications related to pregnancy.

Over the course of our respective careers of more than six decades (combined) of experience in planning, managing, and evaluating programs for mothers and children in high-mortality, resource-constrained settings in more than 40 countries around the world, we have found that a framework for program implementation that involves maintaining contact with every household on a frequent basis and delivering evidence-based interventions at the community and household levels is essential for identifying those in greatest need and ensuring the interventions reach those who need them. Such approaches are essential for achieving high levels of coverage, and high levels of coverage are essential for saving as many lives as possible in resource-constrained settings. In addition, it is important to use locally acquired information...
regarding what the leading causes of death are in the program area. This enables most appropriate interventions to be delivered to the program population. In order for such a framework to function, it is essential for the program staff members to develop a relationship with the community that is as bidirectional as possible, since community members often need to volunteer to carry out many of the required activities, and the program staff members are interacting with families in their homes.

Programs that are based at facilities—whether they are hospitals, health centers, or health posts—are unlikely (at least in priority areas of low-income countries) to be numerous enough to be readily accessible to everyone in the population. And there is a very high likelihood that those who live furthest away from the health facilities are those in greatest need of services and are least likely to use them. In 1966, Dr. Larimer Mellor had been running a hospital in rural Haiti for a decade and came to the conclusion that he was never going to make any progress in improving the health of the people served through hospital services alone. He and those who worked with him then developed community-level services that reached every household. The results achieved in the 1970s through this approach set a new standard for what can be achieved through community-based integrated programs (Berggren et al. 1981).

Another reason that facility-based programs alone with little community outreach are inadequate is that—to achieve many of the United Nations Millennium Development Goals (MDGs) for health—household-level behavior change must occur. Deutschman (2007) cites three necessary ingredients for successful behavior change: (1) the person forms a new, emotional relationship with a person or community that inspires and sustains hope; (2) the new relationship helps the person learn, practice, and master new habits and skills that he/she will need; and (3) the new relationship helps the person to learn new ways of thinking about his/her situation and how he/she can improve it. To this list, we would add that barriers to adopting healthy behaviors need to be reduced, and this often requires investigation in the program setting of what these barriers actually are. Therefore, what we call formative research is a priority. The amount and quality of contact between project staff and community members to develop the relationships, skills, hope, and new thinking are often not possible when health promotion is principally done by overworked clinical staff working within health facilities.

Unfortunately, since the mid-1980s, the global health agenda has been driven by short-term, top-down, vertical disease-oriented approaches and programs that do not foster community participation and that do not emphasize extension of services—including health promotion—to the household level. Prior to that time—during the 1970s and early 1980s—there was broad and widespread enthusiasm for primary health care as defined at the International Conference on Primary Health Care at Alma Ata, Kazakhstan, in 1978, with its emphasis on integration, addressing the social determinants of health, inter-sectoral approaches to health improvement, equity, and maximizing community and individual self-reliance and participation (World Health Organization and UNICEF 1978). The concept of primary health care as a comprehensive approach to providing basic health services in partnership with communities (while at the same time addressing epidemiological priorities in the local population) lost favor in the 1980s, in part due to the lack of demonstrated cost-effectiveness and health impact shown by more selective approaches (Walsh and Warren 1979).

The limitations of highly “verticalized” (top-down), selective approaches to health improvement—whether they are focused on child survival, reduction of maternal mortality, or control of HIV/AIDS, tuberculosis, and malaria—are now becoming increasingly apparent. They are heavily dependent on external donors, and long-term financial support becomes difficult to sustain from in-country resources. They can have destructive effects on health systems by creating distortions in funding and draining human resources and programming capability from other programs in the health sector. Finally, and perhaps most importantly, they lead to disempowerment of communities since building partnerships between health programs and communities is not prioritized and because such programs tend to be highly technically oriented and driven from higher levels in the health system.

The need for a “middle way” that can bring back the vision and broad appeal of primary health care inspired by Alma Ata in 1978 while at the same time producing measurable results in health improvement has been recognized by many (Mosley 1988). Some have expressed this as a need for “diagonal” approaches that are neither wholly vertical nor wholly horizontal (i.e., comprehensive programs, with a balanced emphasis that includes top-down, selective elements as well as comprehensive elements) (Sepulveda et al. 2006). Although some have claimed that “we are all ‘diagonalists’ now,” there has not yet emerged a compelling set of principles or overarching framework which fills this need.

The purpose of this chapter is to describe a framework—the census-based, impact-oriented (CBOI) approach—that we believe fulfills this need. Although the CBOI framework can be usefully applied in any setting, we think it is most effective for the most difficult and challenging communities where mortality levels are quite high, where health systems are quite weak, and where resources for providing health services are severely constrained. We will describe what the CBOI approach is, its history, its evolution over the past two decades, examples of CBOI projects and programs (including examples from field programs where CBOI principles have contributed to program effectiveness), and tools that are available to facilitate implementation of CBOI principles.

The Principles of the Census-Based, Impact-Oriented Approach

Goals

The overarching goal of the CBOI approach is health improvement (broadly defined) at the population level. Specific goals are to improve the health of a geographically defined population (a community, set of communities, or larger population) and to
demonstrate whether an improvement in health has in fact been achieved through partnership with the community. The term “census-based” is meant to convey the notion that program-related activities are geared to a population that is enumerated and that includes every person within a defined geographic area. The term “impact-oriented” is meant to convey the notion that program-related activities are oriented toward measurable health improvement. Inherent in the CBIO approach is the idea that health and health behavior within a population will be defined at various points in time, a set of actors will be dedicated to obtaining these measurements, and these actors will be guiding health-related program activities toward health improvement based on these measurements.

Community partnerships are an essential element of the CBIO approach. The scientific evidence base arising from programming for health in high-mortality, resource-constrained settings is quite clear: that effective implementation of “proven” interventions requires community-based programming, community partnerships, and behavior change at the household level. Therefore, if programs are to achieve optimal impact in health improvement, working in partnership with communities is essential. Effective partnerships between programs embracing CBIO and communities involve developing activities that both respond to the perceived health needs of communities and address epidemiological priorities with interventions that have been shown to be effective. Without responding to perceived health needs, it is difficult to develop community partnerships. Epidemiological priorities, which are the most frequent, serious, readily preventable or treatable conditions in the community, set of communities, or otherwise geographically defined population, are usually also community-perceived priorities but not always.

A relationship of trust is essential to develop an effective partnership between the health program and the community. Developing trust requires time and experience in responding to community priorities and in demonstrating success in improving health. Thus, implied in the CBIO approach is a long-term relationship between the health practitioner and the community.

Guiding Principles

To improve the health of the community, it will be necessary for the health practitioner to make a “diagnosis” of what we refer to as the epidemiological priorities. Just as in the practice of the medical care individual patients, the more accurate the diagnosis, the more likely the prescribed “treatment” is likely to improve the health of the population. A community diagnosis needs to be determined at various points in time—every 3–5 years—since epidemiological priorities and the availability of effective interventions change over time.

Locally acquired surveillance data are the best source of information about the epidemiological priorities in the community. Although relatively accurate data are often available at the national and subnational levels (e.g., province, region, or state), there is nonetheless considerable variation in health conditions from one area of the country to another. Therefore, local data should be obtained if possible through partnership with the community. The best way to obtain accurate local surveillance data is through periodic systematic visits by field teams to register vital events, identify disabilities and serious illness, measure baseline levels of health (as defined by rates of mortality, serious illness, and disability), and measure changes over time. Alternative approaches to achieving this goal involve periodic surveys within the community. The advantage of routine systematic visitation of all homes is that it also enables the practitioner to develop a relationship of trust with all members of the community and to provide essential health-related services at the time of the home visit, such as health promotion, provision of basic commodities (e.g., micronutrients, family planning supplies, and insecticide-treated bed nets), identification of malnourished children (e.g., through the use of mid-upper-arm circumference measurement), identification of patients needing acute illness care (e.g., community-based management of childhood pneumonia, diarrhea, or malaria), and referral for facility-based care. Finally, routine visitation of all homes is an effective way of determining what the community’s health priorities are. These data can be complemented by small-sample survey data (e.g., knowledge, practice, and coverage surveys) to identify patterns and changes in behaviors and behavioral determinants.

Another advantage of routine systematic visitation of all households for surveillance purposes is its greater ability to identify high-risk groups. When surveillance is carried out through sampling households, high-risk subgroups are harder to identify. From the public health standpoint, identifying high-risk subgroups and focusing programmatic attention on them are a critical strategy for improving the health of populations. One of the most important aspects of surveillance is identifying deaths that occur—and the age and sex of the person who died and, using standard verbal autopsy techniques developed for children, making an accurate diagnosis of cause of death as possible. And by asking about deaths in the recent past as well as registering births and deaths over time, it becomes possible to establish baseline mortality rates in the program area and observe changes in these rates over time.

Identifying and responding to community health priorities is essential for building a partnership between the community and the health practitioner and for establishing a relationship of trust. Such a relationship is essential for effective health programming and long-term health improvement. In addition to the methods already mentioned, focus group discussions, key informant interviews, and other qualitative methods can be used to assess perceptions of community members regarding their health priorities.

Another important part of this initial diagnosis that has been added more recently is formative research around the determinants of key health behaviors. These are described in the CBIO tools section. This formative research is helpful in designing program interventions that are carefully tailored to the local context.
Initial Steps (in a Pilot area)

The health practitioner needs to establish trust with the community to begin a partnership. As this relationship forms and matures, it will then be possible for the community, working with the health practitioner, to define the community in terms of its geographic boundaries, begin surveillance, determine the epidemiological priorities, and the community’s perceived health priorities (which may be very different from the epidemiological priorities). Most likely, the community’s health priorities are going to revolve around a perceived need for improving the availability of medical care for acute illness. Responding effectively early on to community perceived health priorities is an important means of establishing a partnership of trust between the health practitioner and the community.

Through this emerging relationship, the health practitioner and the community work together to define the community (or communities) of interest, their geographic boundaries, and details about inhabitants and their location. Then, exploratory activities can be undertaken for appropriate methods to determine health problems in the population area and to address them, followed by a pilot project.

Definitive Steps

On the basis of the experience from the initial steps, a definitive community diagnosis can be made. This involves in part determining the epidemiological priorities (defined earlier), determining their underlying causes through formative research (including determinants of key behaviors), and identifying those persons at greatest risk. This is best done by visiting every household, although it could be done through repeated visits to a sample of households to reduce costs. The community diagnosis also involves determining what the community perceives its priorities to be. Again, this can be obtained by visiting every household, a sample of households, or through standard qualitative research methods (e.g., focus group discussions and key informant interviews).

On the basis of the epidemiologically based and community-perceived priorities, a final set of program priorities is created based on a blending of these two categories of priorities. Following that, a determination of the available resources needs to be carried out. These are not only financial resources but also human and physical resources that are available for program implementation. (Community volunteers have been widely used in many projects based on CBIO principles, as will be described later.) With the available resources in mind, it becomes possible to develop a plan for program implementation.

After a period of time—say 3–5 years—there is a need to evaluate the program and repeat the steps necessary to make a community re-diagnosis, redefine the resources available, plan for the next period of implementation, and implement the modified plan (Table 21.1).

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Table 21.1 Basic elements of the census-based, impact-oriented approach

<table>
<thead>
<tr>
<th>Overarching goal</th>
<th>1. Health improvement at the population level</th>
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<tbody>
<tr>
<td>Specific goals</td>
<td>1. Improvement of health in a specific, geographically defined population</td>
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<td></td>
<td>2. Intermittent measurement of population health, with orientation of program priorities toward health improvement</td>
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<td></td>
<td>3. Building partnerships between communities and the health-oriented program(s) is essential for achieving maximal success in health improvement</td>
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<tr>
<td>Guiding principles</td>
<td>1. Diagnosis of epidemiological priorities is essential in order for the health practitioner to “prescribe” an effective “treatment” (and the diagnosis and the prescribed treatment may change over time as health conditions change over time and as effective treatments change over time)</td>
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<td>2. Locally acquired surveillance data (best obtained through visitation of all households or a sample of households) is the most desirable approach to defining epidemiological priorities and to measuring changes in the level of health in the population over time</td>
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<td>3. Choosing the right interventions and strategies for implementing these interventions (especially those that involve behavior change) can be aided by formative research techniques such as focus group discussions, key informant interviews, barrier analysis, and positive deviance inquiry. These techniques are also useful in identifying community-perceived health priorities</td>
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<td>4. Identifying and responding to community health priorities is essential for building a partnership and trust</td>
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<tr>
<td>Initial steps</td>
<td>1. Develop a relationship of trust between the health practitioner and the community</td>
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<td>(in a pilot area)</td>
<td>2. Define the community (geographic boundaries, number and location of inhabitants)</td>
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<td></td>
<td>3. Carry out exploratory and then pilot planning and program implementation</td>
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<td>4. Define community priorities</td>
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<tr>
<td>Definitive steps</td>
<td>1. Determine the most frequent, serious, readily preventable or treatable causes of sickness, disability, and death, their underlying causes (through formative research), and those persons at greatest risk</td>
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<td>(in the complete program area)</td>
<td>2. Determine the health priorities as defined by the community members themselves</td>
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<td>3. Establish program priorities based on epidemiologically defined and community-defined priorities</td>
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<td>4. Develop a work plan based on the program priorities and the resources available</td>
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<td>5. Implement the program</td>
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<td>6. Evaluate the program and carry out a community re-diagnosis (after 3–5 years)</td>
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Historical Antecedents of the CBIO Approach

Epidemiographic surveillance of all households is an approach that dates back to the 1930s, when Dr. John Gordon, then working at the Rockefeller Foundation, directed a study in Romania to detect an outbreak of scarlet fever in a small town. At that time, he set up a system to visit every family twice a week and to swab the throats of all the children to detect the first and subsequent cases of scarlet fever. It was the first epidemic ever studied from beginning to end. This was made possible by carrying out routine visitation of all households to identify the first case and then to follow the epidemic to the last case (Wyon 2001). The approach of visitation of all households for surveillance purposes was later implemented in a variety of settings, including in the Ding Xian program in China (the forerunner of the Barefoot Doctor Program in China) (Taylor-Ide and Taylor 2002) and later in the Khanna Study in north India in the 1950s and 1960s (Wyon and Gordon 1971) and in the Narangwal Project (Kielmann et al. 1983; Taylor et al. 1983), also in North India, in the 1960s and 1970s, where provision of services at the time of home visits was added to surveillance during home visits. The concept of epidemiographic surveillance through home visits was proposed back in 1971 as a means of guiding field programs where conventional health services fail to reach the bulk of the population (Frederickson 1971).

The Narangwal Project added the dimension of community participation and community partnerships to routine systematic home visitation. These concepts were further developed in the Jamkhed Project in central India in the 1970s and 1980s (Arole and Arole 1994), where visitation of all homes and community participation were further extended by engaging marginalized groups (outcaste women who were rehabilitated from life-threatening illnesses such as tuberculosis) in the provision of health services at the village level and by addressing the social determinants of health (e.g., lack of food and water).

In the 1970s, these concepts were also applied in communities around the Hospital Albert Schweitzer (HAS) in Haiti (Berggren et al. 1981) and in the 1980s and 1990s in communities in rural Bolivia (Perry et al. 1998, 2003). CBIO as an approach arose out of the experience in Bolivia and through support from those previously involved in similar activities, most notably John Wyon (in the Khanna Study and through his support to the Berggrens) and Warren and Gretchen Berggren (through their work at the HAS and in Petit Goave in Haiti). Although previous projects and programs had developed many of these principles and implemented them, they were not identified and consolidated as a specific framework and a unified approach prior to that time.

Through a long-term and close professional relationship that the senior author had with John Wyon, the ideas and principles that came to form CBIO slowly came into being during the 1980s and early 1990s through the programmatic experience of field staff in Bolivia and the technical support provided by the senior author with the guidance of John Wyon.

Implementation of the CBIO Approach over the Past Two Decades

In 1993, an Expert Panel reviewed the CBIO approach as it was developed and implemented by Andean Rural Health Care (ARHC) in Bolivia in the 1980s and early 1990s. The Panel—composed of distinguished and experienced leaders in international health at that time, including faculty from the Johns Hopkins and Harvard schools of public health, senior staff members at UNICEF and other leading NGOs, and senior technical staff at USAID—concluded that the approach was promising and should be tried out in other locales in developing countries and should undergo further evaluation of its potential. However, no funding was ever identified to make this possible.

ARHC, the NGO that established the CBIO approach, continued to use CBIO to guide its programs in Bolivia. ARHC eventually changed its name to Curamericas Global as it gradually expanded its programs to Guatemala, Mexico, Haiti, and Liberia. In all locations, Curamericas has continued to rely on CBIO as its guiding framework for program implementation.

CBIO never seemed to gain any traction among international donors, mostly because of its holistic approach, the higher costs per beneficiary compared to narrower selective approaches, and its long-term time frame. Donors were looking to fund projects that were more narrowly focused for shorter periods of time. However, child survival programming did fit nicely within the CBIO framework because it gradually became increasingly apparent that success in child survival programming depends on reaching all households with health promotion to bring about behavior change, and these principles were embedded within the CBIO framework. Thus, Curamericas was able to continue to receive funding from the USAID Child Survival and Health Grants Program for its activities in Bolivia, Guatemala, Haiti, and Liberia.

Over time, NGOs involved in child survival programming around the world have gradually begun to implement certain aspects of CBIO, most notably mapping of all households, taking a census, using verbal autopsies to estimate as best as possible causes of child deaths, and developing a process for reaching every home periodically with a community health volunteer.

During the past decade, a new approach to maternal, neonatal, and child health programming has emerged that builds on CBIO principles. This is the Care Group model. In this model, a program develops an outreach strategy in which a low-level paid staff member (usually called a Promotor) meets every 2–4 weeks with a group of 6–15 female volunteers (called a Care Group) who each take responsibility for approximately 10–15 households. After each meeting, each of the Care Group Volunteers visits the 10–15 households for which she is responsible and delivers a health promotion message. A number of these projects include vital events registration by the Care Group Volunteers.

In some Care Group projects, a baseline retrospective mortality study and qualitative methods are used to identify the community-defined and epidemiological
priorities and patterns in the project area. Some projects also use verbal autopsies (conducted by the Promoter) over the life of the project to identify trends in child mortality patterns.

So, although all the CBIO steps are not followed in the Care Group model, a number of CBIO elements are definitely present. Curamericas Global now combines Care Groups with all of its programs. The Care Group model has shown impressive results as demonstrated in publications (Edward et al. 2007; Perry et al. 2010) and as demonstrated by the outstanding results achieved by a number of NGOs in terms of rapid gain in population coverage of key child survival interventions.

Two pioneering health programs in the developing world are in India, and both have developed and utilized CBIO principles even though they do not actually use the term CBIO to describe their approach to programming. The Jamkhed Comprehensive Rural Health Project (Jamkhed Comprehensive Rural Health Project 2012) in Ahmednagar District of Maharashtra State and SEARCH (Society for Education, Action, and Research in Community Health) in Gadchiroli District of Maharashtra State establish a community diagnosis using CBIO principles and implement a program derived from that diagnosis (SEARCH, 2015). They have both built relationships of trust with the communities they serve, use vital events registration and routine contact with all households to determine epidemiological and community-perceived priorities and to deliver essential services, and both have been global leaders in making progress in achieving the MDGs—not only in maternal and child health but also in women’s empowerment, poverty reduction, and control of tuberculosis (Arole and Arole 1994; McCord et al. 2001; Mann et al. 2010; Bang et al. 1990, 2005b).

The HAS in Haiti began implementing many CBIO principles beginning with the work of Drs. Warren and Gretchen Berggren under the mentorship of Dr. John Wyon in 1967. Routine systematic home visitation by Community Health Workers and attention to epidemiologically as well as community-defined priorities have been a part of the HAS primary health care programs for more than a half-century now, with marked reductions in under-five mortality compared to the rest of rural Haiti (Perry et al. 2007).

Finally, the NGO BRAC in Bangladesh has developed a pioneering maternal, neonatal and child health project in the slums of urban Bangladesh reaching 6.9 million people that maps all households and uses CHWs to routinely visit all households; identifies pregnant women; ensures that all receive prenatal care; provides appropriate birthing support in a local birth hut staffed by trained attendants who are former traditional midwives; and provides home-based neonatal care and community case management of serious childhood illness (A. Kesar, personal communication, 2012). Staff from two organizations in Nicaragua learned about CBIO on their own and chose to use it for program implementation: AMOS Health and Hope program in 27 rural communities dispersed throughout Nicaragua (AMOS Health and Hope 2012) and the Village-based Community Health Promotion Program in the Bilwaskarma/Waspan area of the Autonomous North Atlantic Region (P. Haupert, personal communication, 2012). In both community-based programs, the vital events surveillance registration system has indicated that the infant mortality rates have declined to 0 during the last few years (P. Haupert, personal communication, 2012; L. Parajon, personal communication, 2012).

ARHC’s CBIO Primary Health Program in Montero, Bolivia, has an outstanding track record of reduction in infant and maternal mortality and identification and successful treatment of patients with tuberculosis (Mosham 2011). There has not been a maternal death in this population in more than a decade, the infant mortality rate is 7 deaths per 1,000 live births (compared to 6 in the USA), and the program has been a national leader in its TB control program.1 Importantly, the Montero Primary Health Care Program in Montero is fully funded now from long-term sustainable sources—most notably from the municipal government, the ministry of health, and locally generated income. It has been in operation now for more than two decades, and thus it has been able to achieve what CBIO was originally intended—namely providing a framework for long-term programming.

Usefulness of the CBIO Approach for Accelerating Progress in Achieving the Millennium Development Goals for Health

By its very nature, organizations implementing CBIO are working with communities to undertake a continuous surveillance of the major health problems in the communities and to address together the epidemiological priorities identified through surveillance and the health priorities as defined by community members. The MDGs were adopted in the year 2000 by the United Nations for the purpose of focusing global efforts on challenging but achievable development targets, including goals mentioned in the next section for health and nutrition (United Nations 2000). What evidence is there that the CBIO approach has been useful in accelerating progress in achieving the health-related MDGs?

Goal 1: Eradicate Extreme Poverty and Hunger

This goal calls for halving the proportion of people who suffer from hunger between 1990 and 2015. Numerous projects that have utilized CBIO principles have demonstrated improvements in the nutritional status of children as measured by anthropometry and as measured by improvement in the population coverage of the micronutrient vitamin A. Perhaps the most important of these was a Care Group project implemented by Food for the Hungry in Sofala Province in Mozambique between 2005 and 2010 in a population of 1.1 million people (Davis et al. 2015). The level of undernutrition (defined as weight for age) declined by from 26 to 18% in approximately one-half of the project area where the project worked from the outset and

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1 The work in Bolivia established by Andean Rural Health Care is now directed by a Bolivia NGO, Consejo de Salud Rural Andino (2012).
from 27 to 16 % in the other half of the project area where the project worked for the final 2 years of the project. The rate of decline in malnutrition was more than four times the rate for Mozambique as a whole during the same period. Many changes in nutrition-related behaviors (e.g., exclusive breastfeeding) were seen concurrently.

**Goal 4: Reduce Child Mortality**

This goal calls for reducing the under-five mortality rate by two-thirds between 1990 and 2015. As mentioned above, implementation of CBIO in Bolivia led to a reduction of the under-five mortality rate by half of that for a comparison area (Perry et al, 1998, 2003). The Jamkhed Comprehensive Rural Health Project, using CBIO principles, demonstrated a marked decline in its infant mortality rate from 170 deaths per 1,000 live births in 1972 to 52 only 4 years later (Arole and Arole 1994) while declines in other rural areas in the state of Maharashtra (where the project did not operate) were much smaller. A more recent independent study comparing under-five mortality in the Jamkhed project area with that of surrounding villages found that the 1-59-month mortality area during the 15-year period from 1992 to 2007 (after which most of the decline in under-five mortality had already been achieved) was still 30 % less than in surrounding villages (Mann et al. 2010). The CBIO approach used at SEARCH in Jamkhed has led to a 30 % decline in under-five mortality through the introduction of community-case management of pneumonia (Bang et al. 1990) and a 70 % decline in neonatal mortality through the introduction of home-based neonatal care (Bang et al. 2005a). As a result of this pioneering work and confirmation of the effectiveness of community case management of pneumonia and home-based neonatal care, these interventions are being scaled up in high-mortality, resource-constrained settings at present in India and throughout the world. But, unfortunately, broader CBIO principles are not being embraced at the same time.

The HAS program in Haiti achieved the longest sustained impact on under-five mortality reported in the scientific literature to date, with an under-five mortality rate in the year 2000 that was still less than half that for rural Haiti (Perry et al. 2006). BRAC’s Manoshi Project for maternal, neonatal, and child health in urban slums in Bangladesh is demonstrating that—after 5 years of implementation—the neonatal mortality rate is only one-half of the national rate (A. Kaosar, personal communication, 2012).

The achievement of an infant mortality of 7 deaths per 1,000 live births in a low-income, peri-urban setting in Montero, Bolivia, is a major achievement, especially considering that nationally the infant mortality rate is 42 (UNICEF 2012) and recent estimates of infant mortality for infants born to mothers with no more than a primary level of education, which is the educational level served by the Montero program, are in the range of 56–72 (Instituto Nacional de Estatística (Bolivia) and DHS+/ORC Macro 2004). Figure 21.1 demonstrates the markedly greater rate of decline of the infant mortality rate in Montero compared to that for national, departmental, and urban rates.

**Goal 5: Improve Maternal Health**

MDG 5 calls for reducing by the maternal mortality ratio by three-fourths between 1990 and 2015. Programs and projects that use CBIO principles have demonstrated marked increases in the coverage of antenatal care and marked increases in the percentage of births attended by persons with formal training. This presumably has led to a reduction in the maternal mortality ratio, although few of them have reliable statistics for computing changes in the maternal mortality ratio.

The Jamkhed Comprehensive Rural Health Project reported a maternal mortality ratio of 70 per 100,000 live births at a time when 85 % of births occurred in the home and the national maternal mortality ratio was more than 230 (McCord et al. 2001; UNICEF 2008). BRAC’s Manoshi Project for maternal, neonatal and child health in urban slums in Bangladesh is demonstrating that, after 5 years of implementation, the maternal mortality ratio is two-thirds of the national level (A. Kaosar, personal communication, 2012). And, as mentioned previously, in the Montero, Bolivia, CBIO project, no maternal deaths have been identified in this program area in a decade.

**Goal 6: Combat HIV/AIDS, Malaria, and Other Diseases**

MDG 6 calls for halting and beginning to reverse the spread of HIV/AIDS by 2015; achieving by 2010 universal access to treatment for HIV/AIDS for all who need it; and halting by 2015 and beginning to reverse the incidence of malaria, and other
major diseases. Unfortunately, only limited evidence currently exists on the effectiveness of programs using CBIO principles to control HIV/AIDS, malaria and other diseases. But, to cite one of many examples in which projects using CBIO principles have raised awareness about HIV/AIDS, Food for the Hungry’s Care Group project (which is based on CBIO principles) in Sofala Province, Mozambique, achieved statistically significant increases in the percentage of mothers of young children who could cite at least two known ways of reducing the risk of HIV: from 35 to 76% in one project area and from 44 to 72% in their second project area (Food for the Hungry 2010).

The NGO BRAC operates (in collaboration with the Government of Bangladesh) one of the world’s largest and most outstanding tuberculosis programs, and this is based on the CBIO principles of routine visitation of all homes, identification of symptomatic patients in the home, collection of sputum specimens in the home, and direct observation of treatment, all carried out by community health workers. This program, which now reaches more than 50 million, has reported a prevalence of tuberculosis in the districts where BRAC is working to be only half that in districts where BRAC is not working (Chowdhury et al. 1997). As mentioned earlier, the Montero Primary Health Care Program in Bolivia has received numerous national awards for its outstanding tuberculosis program. Unfortunately, to our knowledge no evidence exists regarding the effectiveness of programs using CBIO principles in controlling HIV transmission or malaria.

The above evidence, derived from many projects and programs using CBIO principles, suggests quite strongly that the CBIO approach is effective in addressing global health goals and, if implemented broadly, could help to accelerate achievement of the MDGs for health.

Examples from Field Programs Which Have Utilized Local Surveillance Data to Enhance Program Effectiveness

One of the early striking findings from applying CBIO in Bolivia in the 1980s was the marked contrast in the epidemiological priorities in the program area in the highlands (on the Northern Altiplano, where communities were situated at 12,500 ft above sea level or height) and in the lowlands, with its tropical climate (in the peri-urban communities of Montero). Through home-based surveillance, we were able to document that leading causes of death in the highlands were respiratory problems occurring during the first 2 months of life while in the lowlands it was diarrhea and malnutrition occurring during the 6–18 month age group (Perry 1993). This led to markedly different program interventions. In Montero, the program focused on hygiene, clean water, nutrition education, and preparation and use of oral rehydration solution. On the Northern Altiplano, it led to more frequent home visits to newborns and early referral for treatment for respiratory infections.

In one program in Gaza Province, Mozambique, malaria was found to be far and away the leading cause of under-five mortality (World Relief 2009) while in another program in Sofala Province, Mozambique, diarrhea and neonatal causes were dominant (Food for the Hungry 2010). In the rural highlands of Guatemala, implementing CBIO made it possible to determine that pneumonia was far and away the leading cause of child death (Curameicas 2007). In rural Haiti, an evaluation revealed that the under-five mortality rate was twice as great in the rural mountains area of the program as it was in the more central plains (Perry et al. 2006). In central India in the 1980s, SEARCH used the findings from its surveillance to determine that childhood pneumonia was the epidemiological priority and then set out to develop a program for expanding access to proper treatment provided by Community Health Workers in the home (Bang et al. 1990, 2005a). Then, in the 1990s, SEARCH determined that neonatal mortality had become the epidemiological priority and then set out to expand access to improved neonatal care by again using Community Health Workers to provide home-based neonatal care.

The potential of using surveillance findings based on routine home visits for strengthening the community diagnosis is apparent in these examples, as is the power of community-based workers well known to families in delivering interventions to the home when they are well trained and appropriately supervised.

The CBIO Approach in the Current Global Health Context

There is now a need for fresh new approaches that enable health programs in high-mortality, resource-constrained settings to be able to not only accelerate progress in achieving the MDGs for health but also serve in the long term to more effectively improve the health of the populations that they serve. Short-term vertical approaches are not the long-term answer. In fact, the authors of the now famous 1979 Walsh and Warren article that led to many of these more vertical approaches considered selective primary health care to be an interim solution. The actual title of their article is “Selective primary health care: an interim strategy for disease control in developing countries.” Before his death, John Wyon wrote in 2001 in an unpublished document the following: “I have come to believe that, through the CBIO approach, the public health profession has unique contributions to make to problems of both excess births and excess deaths” (Wyon 2001).

Tools for Implementing the CBIO Approach

A manual for implementing CBIO is available for download from the CORE Group Web site (Shanklin and Sillan 2005). The Care Group model, utilizing many CBIO principles, is also readily available on the Internet as well (Laughlin 2004), as is a Web site devoted to Care Groups (Care Group Working Group 2012). A
recent manual for prospective vital events registration through routine home visitation has just been prepared and is also available on the CORE Group Web site (Purdy et al. 2012).

A CBIO principle is to use locally acquired data to guide programming. Several tools related to formative research and qualitative assessment are useful adjuncts when using the CBIO framework. One of these is Barrier Analysis, which assesses the importance of determinants from the Health Belief and Theory of Reasoned Action models of behavioral change (Davis 2004, 2012). Another tool is positive deviance analysis, which can help to identify currently successful strategies in place that might be applied more systematically to improve program performance (The Positive Deviance Initiative 2012). Positive deviance analysis was first applied to identify practices of mothers who had normally nourished children in settings where childhood undernutrition is common. This is referred to as the Heath Model. However, the approach has now been applied to many areas of health programming.\(^3\)

**Conclusion**

The CBIO approach describes a framework for public health practitioners and communities to come together to respond to both epidemiological and community-perceived priorities in a way that builds partnerships, utilizes principles of epidemiological surveillance, and capitalizes on the increasingly powerful evidence that interventions delivered in the community outside of facilities can achieve high levels of coverage and demonstrate notable improvements in population coverage of key interventions and reduce the mortality of mothers and children. Given the increasingly urgent need to accelerate progress toward achieving the health-related MDGs in countries with a high disease burden—especially in Africa—and given the strong evidence so far regarding the effectiveness of the CBIO approach, there should be increasing efforts to scale up programs using the CBIO approach, to rigorously monitor the effectiveness of scaled-up applications of the CBIO approach, and to modify implementation strategies based on these assessments. The CBIO approach has an important contribution to make in achieving the MDGs for health in settings where progress to date has lagged.

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\(^2\)For an online tutorial on the method, see http://barrieranalysis.fhi.net. For a narrated presentation on this method, see http://www.caregroupinfo.org/vids/BAVidpad/story.html.

\(^3\)One type of positive deviance study which focuses on nutritional status is the Local Determinants of Malnutrition Study methodology. For a narrated presentation on this approach, see http://www.caregroupinfo.org/vids/LDMVidiPad/story.html.

Mosham, H. (2011). Description and impact evaluation of a model community-based primary health care program in Montero, Bolivia. *Hubert Department of Global Health*. Emory University, Atlanta, GA.


