

The promise of a community-based approach to managing severe malnutrition: A case study from Ethiopia

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Abstract

Background. Community-based therapeutic care (CTC) is a new strategy in the arsenal of techniques to manage complex nutritional emergencies in rural communities. The CTC approach uses a newly developed ready-to-use therapeutic food, Plumpynut, to rehabilitate severely malnourished children in their home communities. Emerging literature has suggested the CTC strategy yielded results that were superior to those of programs limited to therapeutic feeding centers, as measured by rates of coverage and numbers of children rehabilitated.

Objective. To compare the effectiveness of the CTC strategy in combination with conventional treatments for acute malnutrition. The expectation was that this program would support the growing consensus on the effectiveness of CTC strategies.

Methods. Data from monitoring the initial phase of program implementation were reviewed to ascertain program impact. The number of children participating and the outcome of their participation were assessed.

Results. Families became key participants in the rehabilitation of their children, and communities became strengthened through the mobilization of local networks

and the improved knowledge base of local health workers. Recovery rates were comparable with international standards, and coverage far exceeded that of traditional center-based care.

Conclusions. CTC is an important tool to effectively address nutritional emergencies and may be a valuable entry point for long-term development, since it fosters capacity building and improvement in local communities. CTC programs may eventually be viewed as the entry point for more sustained development-oriented interventions, thus helping make the transition from relief to development.

Key words: Africa, food aid, nutrition emergency, nutrition rehabilitation, participatory development

Introduction

For several decades, professionals in economic development have debated how to meaningfully empower local people to be participants in development in their own communities, and they have discussed how to engender sustainable development in rural communities. At the same time, there has been a debate as to how to make a bridge from food-aid relief to development activities so that the underlying causes of food shortage are addressed with the hope of preventing future food crises. One possible answer to all of these questions might be the wider implementation of community-based therapeutic care (CTC), since the approach is contingent upon high levels of community involvement and mobilization. CTC has been recently implemented in several contexts of food crisis where severe malnutrition is widespread and where nongovernmental organizations were attempting to achieve the greatest program coverage while minimizing dependency. This paper reports on one such program administered in southern Ethiopia by Save the Children USA. The premise of the CTC approach is that local people can become partners in

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the management even of severe nutrition emergencies and can be primarily responsible for the nutritional surveillance activities that accompany these programs. With a CTC approach, severely malnourished children are monitored and treated at home, with trained community volunteers helping to ensure that parents have the knowledge and resources to successfully rehabilitate their children. The effectiveness of CTC programs is a consequence of local capacity building, timely and sufficient delivery of supplies, and coordinated efforts between nongovernmental organizations and local and national governments.

The challenge of pervasive malnutrition

For many years, professionals in the field of child health have known that malnutrition is an underlying factor contributing to child mortality in developing countries, both by directly causing death and, more importantly, by exacerbating other health problems. Beginning four decades ago, Scrimshaw and his colleagues [1, 2] began describing the ways in which malnutrition has a synergistic relationship with infection: children who are malnourished are more susceptible to infections, and the infections exacerbate poor nutritional status. Pelletier [3, 4] supplemented our understanding by describing the “potentiating” effects of malnutrition on health problems, and recently the global impacts of this negative feedback loop have been quantified. Black et al. [5], in an article provocatively titled “Where and why are 10 million children dying every year,” documented the most common variables associated with preventable child deaths; although they note that the specific causes are highly variable from country to country, undernutrition is a leading variable globally. They report that the greatest proportion of preventable child deaths occurs in sub-Saharan Africa and that “underweight status...and micronutrient deficiencies also cause decreases in immune and non-immune host defenses, and should be classified as underlying causes of death if followed by infectious diseases that are the terminal associated causes.... Relative risks for mortality in children younger than 5 years derived from the ten studies assessed have been used to estimate that 53% of all child deaths could be attributed to being underweight.” This relationship among undernutrition, child mortality, and infection is not surprising and has been documented by anthropologists to be part of the knowledge of indigenous people; for example, the Himba people note that “hunger does not kill, it is sickness that kills” [6].

Within the context of Ethiopia, the problems of food insecurity and subsequent child undernutrition are chronic and well documented. Ethiopia has been prominent in the work of both donors and nongovernmental organizations that target hunger, as well as in the world press, as epitomizing the challenge of repeated and

pervasive food insecurity and famine [7, 8]. In attempting to address this chronic problem, Marchione and Novick [9] have called for donors to focus on building greater capacity, resilience, and food production in Ethiopia to reduce vulnerability to food shortage and subsequent dependence on relief aid. They recommend that employment-generating schemes such as food-for-work and cash-for-work programs be greatly expanded to improve public works and infrastructure, not only to provide greater food security during vulnerable periods, but also to improve the access of rural people to adequate sanitation, transportation, and markets and to improve agricultural systems and stabilize ecosystems [9]. Within the context of Ethiopia’s patterns of famine and food aid, Marchione and Novick acknowledge that the emphasis on short-term emergency assistance (which has characterized most aid to Ethiopia) must be shifted to address the root causes of food insecurity in order to establish a safety net for vulnerable rural people. This proposed policy and program shift may be most feasibly accomplished through more widespread implementation of a CTC approach, since CTC programs promote community understanding and participation and facilitate a shift from an emphasis on relief to an emphasis on integrated rural development.

At the same time as this macro-level philosophical debate has continued, a more pragmatic debate has been carried on about the most effective means to ameliorate food emergencies. Previous critiques have focused on problems with timely delivery of aid, the effects of food aid on local economies and production, and the alteration of gender roles, migration, and household resource allocation that can result from food aid programs [6, 7]. Chambers [10, 11] and Sen [12] have called for greater community participation in development planning, noting the failures of programs that have neglected grassroots realities. These broad theoretical issues are relevant when specific strategies to effectively address the needs of hungry children and their families are being examined.

Methods

Strategies to implement CTC

CTC is a recent innovation designed to treat severely malnourished children while having less disruptive effects on their families and household economies than the more traditional approaches that emphasize treatment in hospital-based nutrition rehabilitation units or therapeutic feeding centers. The CTC approach has been implemented only recently, and the published literature on this approach is limited. The basic premise of CTC is that with allocations of therapeutic foods, appropriate medical care and clinical monitoring, and

educational support from community-based volunteers, the majority of severely malnourished children can be rehabilitated while remaining at home with the parents managing the care and feeding of the affected child. The approach is predicated on the assumption that building on community social and governmental structures is the key to rapid, effective mobilization, and that this strategy can ensure greater coverage and timeliness for delivery of nutrition rehabilitation. The severely malnourished children receive a daily ration of 200 kcal per kilogram of body weight of the ready-to-use therapeutic food Plumpynut, which was developed in France by Nutriset [13]. This food represents an important technological advance in the treatment of severely malnourished children, as it provides a nutritious, easily metabolized, energy-dense food that is shelf stable and resistant to contamination. One packet of this product contains 500 kcal in only 92 g of Plumpynut, and it is well tolerated by children, who like the taste. It contains the full complement of micronutrients necessary for rehabilitation of severe malnutrition and is nutritionally equivalent to the therapeutic milk-based F100 formula used in nutrition rehabilitation units and therapeutic feeding centers, but it has the advantage that it requires no mixing and is therefore less prone to bacterial contamination than milk-based formulas. Currently the greatest limitations of Plumpynut as a ready-to-use therapeutic food are its cost and the fact that it must be imported, but local production with local ingredients has begun elsewhere in Africa (Malawi, Niger, and the Democratic Republic of the Congo), and recently (January 2005) in Ethiopia.

The participating children also receive supplemental food rations that typically include a fortified flour, corn-soya blend (CSB), that is premixed with cooking oil and sugar. In order to minimize the sharing of food intended for the sickest child, and in acknowledgment of the fact that if there is one severely malnourished child in a household, the other children are likely also to be at increased risk of malnutrition, the supplemental ration is intended to satisfy a portion of the caloric needs of the other children in the family, not just the affected child or children.

One of the first experiences with the CTC approach was in Malawi, where the CTC program was able to cover 73.9% of the affected population, as compared with only 26.3% reached by the conventional inpatient approach [14, 15]. In comparing recent CTC programs in Afghanistan, Sudan, and Ethiopia, Taylor et al. [14, 16] reported that the programs had marked success, with mortality rates ranging from 1% to 8.6%, default rates generally below 10%, and 60% to 81% of children reported as recovering after participation in the program.

The first major published account of CTC programs was Collins and Sadler's [17] retrospective cohort study

of 170 children who participated in a CTC program in Ethiopia. The authors report that 85% of children with severe malnutrition recovered, with 4% mortality, 5% defaulting from the program, and 6% referred to a medical facility—all of which are impressive records of success, and significantly better than the international Sphere Project minimum standards [18]. Overall experience suggests that children in the CTC program gain weight somewhat more slowly and require a longer period of participation than children cared for as inpatients but are at less risk of cross-infection from other sick children and are less likely to be removed from the program by their parents. Given the small but growing body of literature documenting the success of the CTC approach, it is time to scale up this approach for broader application in nutrition emergencies.

Impetus for CTC implementation in the Southern Nations and Nationalities Peoples Regional State, Ethiopia

In 2003, the lowlands of the Southern Nations and Nationalities Peoples Regional State (SNNPR) in south-central Ethiopia, especially the Sidama Zone, were hit by a significant drought, despite the fact that this is an area not usually associated with the drought cycles for which Ethiopia is known. Although the drought was certainly a factor that contributed to the food insecurity that this area experienced, the problems arose as a combination of factors that resulted in these poor communities facing true famine for the first time in many years. The local farmers traditionally grow a combination of crops: maize and *ensete* (*Ensete scitamineae*, or false banana) as their staple foods; *khat* (*Catha edulis*, a mild stimulant common in the region), coffee, eucalyptus, and fruit as cash crops; and some vegetables for home consumption. Agronomists argue that *ensete* has several ecological advantages over cereal grains: the leaves and plant debris rot around the base of the tree, providing a natural mulch; it is beneficial as a shade and windbreak for other plants (especially coffee); and it can be cultivated on slopes to stabilize hillsides and minimize erosion [14, 19]. However, it is far less nutritious than the staple grains that are the major foods elsewhere in the country and thus is not favored by nutritionists.

Landholdings are fragmented and very small per capita, due in part to rapid population growth in this area, and even in the best of years production is not adequate to fully meet the families' needs for the year. Most families must find additional sources of income to tide them over between harvests; local people engage in activities such as basket making, collecting firewood and producing charcoal, chiseling bricks, crushing stone to sell as gravel, and sifting soil to create piles of sand to sell as construction materials. In 2003, the lowlands faced a crisis when drought caused a nearly total failure

of the maize crop and poor production of ensete and vegetables, and the global price for coffee plummeted, resulting in their receiving minimal income for their coffee. With a loss of most of their subsistence base and a cash income from coffee that did not cover their production costs, most families went from a precarious existence to total food insecurity.

The emergence of the problems was identified through a regional early warning system of the Disaster Prevention and Preparedness Commission (DPPC), which then consulted with several donors. The DPPC identified the *woredas* (districts) that were most affected and enlisted the assistance of donors and aid organizations to address this crisis. Coordination meetings began in May 2003 to ascertain the best course of action and to identify which nongovernmental organization would serve in each area, to avoid replication of services, ensure more uniform and effective coverage, and optimize the effectiveness of service delivery.

Save the Children USA implemented programs that provided emergency nutrition intervention and support services in health, water, and sanitation to three adjacent *woredas* within the SNNPR. The districts were several hours away from the regional capital of Awasa by a four-wheel drive vehicle and equally distant from a referral hospital. Each *woreda* is composed of approximately 20 smaller administrative units called *kebeles* (subdistricts), each of which in turn is composed of five to seven villages of several thousand people each. Relief efforts in this area are complicated by the poor infrastructure of the region: the roads are rough dirt, electricity is limited to a few areas, and health clinics and hospitals are under-equipped, understaffed, widely dispersed, and serve large populations. The local population is sizeable; indeed, population pressure is very high and is clearly one of the root causes of the resource inadequacy of the region. Water and sanitation facilities range from poor to nonexistent, and about 80% of the people obtain their drinking water from unprotected springs and streams that are easily polluted by humans and animals.

Implementation of CTC

The initiation of efforts to provide health and nutrition interventions by Save the Children USA started with the opening of 16 therapeutic feeding centers, which were intended to rehabilitate children with severe malnutrition. These children were identified by a weight-for-height ratio less than 70% of the median for a reference population, bilateral pitting edema (severe fluid retention in the feet and extremities that is indicative of kwashiorkor), or a mid-upper-arm circumference (MUAC) less than 11.0 cm (indicative of marasmus and increased risk of mortality). The first therapeutic feeding centers were staffed largely by Ministry of Health staff, supplemented by Save

the Children USA staff. The facilities were often rudimentary tent structures adjacent to existing health centers and were intended to bring critical services to communities that were distant from hospitals. The therapeutic feeding centers were under stress from the outset, since the caseload was very high and the facilities, especially the supply of safe water and sanitation, were not adequate.

In a therapeutic feeding center, the World Health Organization (WHO) protocol for the management of severe malnutrition is to provide a basic medical package to treat infection and to use therapeutic milk-based formulas for nutritional rehabilitation. These milk-based formulas, F75 and F100, developed by Nutriset in France, were used for severely malnourished children because they are easily metabolized. Because these formulas are prepared by trained staff, there is little difficulty in maintaining the proper proportions of formula to water, and there is little likelihood of using unsafe water to mix the formula.

Although therapeutic feeding centers have the advantages of intensive 24-hour care and the availability of trained staff and medical services, they are not without their drawbacks. The problems are due not to the quality of the care they provide, but rather to the nature of the communities they serve. A typical length of stay in a therapeutic feeding center is three to four weeks, and the child must be accompanied full-time by an adult caregiver. This typically means that one parent is away from home for several weeks. The siblings of the child receiving treatment often suffer because they lack the care that they would normally receive, and the income that might be generated by the caregiving parent is lost during this period. If the period of a child's residence in a therapeutic feeding center or nutrition rehabilitation unit coincides with the agricultural cycle, the impact is even more severe because the parent is unable to perform the critical work of planting, weeding, and tending a farm, and the resulting drop in food production increases the risk of food insecurity in the following year. Families typically perceive a stay in a therapeutic feeding center as a significant hardship, and defaulting from the program is common when parents feel compelled to return home. Another problem is that residence in a therapeutic feeding center increases the risk of cross-infection resulting from the crowding of many sick children in a limited space. Children risk exposure to other illnesses that can complicate their recovery and rehabilitation. Because therapeutic feeding centers are fairly complex and expensive to staff and run and are often a long distance from the households of affected children, they typically provide care to only a small proportion of the children who would potentially qualify for such services.

Because of the gravity of the problems, the increased need for nutritional response in the region, and the emerging literature suggesting that CTC offered

comparable success rates with lower per-patient costs and greater coverage, the Save the Children USA emergency health and medical staff, with technical assistance from Valid International, proposed a pilot CTC approach to supplement traditional therapeutic feeding center services. The merits of the approach were presented at a meeting with Ministry of Health representatives. Although most of the participants were skeptical about the effectiveness of the CTC approach and its advantages over other approaches, it was decided to implement this pilot program in the one woreda served by Save the Children USA, and it was eventually expanded to three woredas.

The first and essential step was to enlist the cooperation and participation of the local officials, the traditional healers and birth attendants, and the local communities. The nutritional status of the target population in the affected woredas had been previously assessed in biannual nutrition surveys, which gathered information on acute malnutrition, morbidity, mortality, and food security.

Save the Children USA relied upon a participatory planning process in which local woreda officials, traditional birth attendants, local volunteer community health workers, community-based reproductive health agents, and other local officials were invited to a meeting to discuss the problems of malnutrition in their area and strategies that might be used to address these problems. The outcomes of these initial meetings included the following:

- » To enable the program to be targeted, local leaders identified the kebeles within the overall woreda that were most significantly affected by the drought and nutrition emergency.
- » Local communities identified sites that could be used for weekly weighing of children and twice-monthly distribution of supplemental food, which preferably were attached to an existing health outpost.
- » Local officials helped to identify candidates for the position of outreach worker, at least one of whom would be posted in each community.
- » Local participants agreed to motivate their neighbors and friends to participate in screening of the children and helped to break down barriers to resistance. Local traditions often encourage parents of malnourished children to hide them away in shame or to keep children home who do not have proper clothes to wear, and the local leaders helped encourage community members to overcome their embarrassment for the sake of their children (Save the Children USA and Valid International unpublished documents; M. Gebremedhin, personal communication).

The Save the Children staff then identified local outreach workers to assist with the CTC process. The position of outreach worker was the most critical, because these workers had only minimal daily supervision and were on the front line for intervention in

their communities. The outreach workers were initially required to have completed primary and secondary school (12 grades) to ensure they were fully literate in Amharic, to be respected within their communities, and to pass an examination on health issues designed by the Save the Children staff. As the implementation of CTC progressed, the literacy requirement was eliminated, because it became clear that the motivation and skills of the volunteers were more critical to their success than literacy per se. The outreach workers then received additional training from Save the Children staff on the warning signs of severe malnutrition, learned how to measure MUAC, and received additional weekly training in a variety of health education topics, including hygiene, HIV/AIDS, malaria control, breastfeeding, introduction of complementary food after the age of 6 months, and family planning.

Save the Children also provided training sessions on issues related to health and nutrition for local traditional birth attendants, reproductive health agents, and other volunteers. Complementary multisectoral programming activities trained local zonal officials and supported programs to protect water sources, install new hand pumps, rehabilitate latrines, and distribute insecticide-impregnated bed nets in areas of high malaria endemicity.

By mid-September 2003, the first CTC program was functioning. It was then rapidly expanded to three neighboring woredas. Each of the CTC programs had several components:

- » A stabilization center referred the most severely malnourished children with medical complications, anorexia, or severe edema to a therapeutic feeding center or nutrition rehabilitation unit for inpatient care.
- » Outpatient therapeutic feeding was provided for severely malnourished children who had no significant medical complications, a good appetite, and only minor edema. This program provided routine medication, clinical monitoring, and Plumpynut rations to children diagnosed as severely malnourished and fortified flour to their families.
- » A supplementary feeding program for children with moderate malnutrition and for pregnant or lactating women provided a twice-monthly ration of premixed fortified flour, sugar, and oil and a routine medical package that included measles immunization, vitamin A and iron sulfate supplements, and deworming.
- » At all program sites, health and nutrition education was provided, including demonstrations of the preparation of the premix.
- » An outreach program provided follow-up of vulnerable cases in the home and community-based screenings and community mobilization activities. In each community, parents voluntarily enrolled their children in the CTC program to receive treatment

for undernutrition. The trained outreach workers screened children on the basis of MUAC measurements. Children with a MUAC of 12.5 cm or more were sent home, and the rest of the children were sent for a secondary screening that included other anthropometric measurements. Children with weight-for-height less than 70% of normal, MUAC reading under 11.0 cm, or bilateral edema in their extremities were enrolled in the outpatient therapeutic program. Children with weight-for-height between 70% and 80% of normal were enrolled in the supplemental feeding program, even if their MUAC was close to 11.0 cm.

Children eligible for the outpatient therapeutic program were evaluated at admission by a trained nurse who took a medical history, including skin diseases and recent bouts of respiratory infections, diarrhea, or vomiting. The children then typically received a course of antibiotics and antimalarial drugs, immunization against measles, a dose of vitamin A to boost immune system function and protect vision, folic acid, and other medications, as directed by the WHO protocol for the management of severe malnutrition. A week after admission, an antihelmintic drug was administered. If the nurse found no significant complications or severe edema and the child was responsive and willing to eat Plumpynut, the child was then admitted to the outpatient therapeutic program. Children who did not meet these criteria were admitted to a stabilization center for more intensive care until their condition stabilized; they were then allowed to return home and were followed up in the weekly outpatient therapeutic sessions.

After the medical screening, the caregivers received instruction in the use of the ready-to-eat therapeutic food, Plumpynut. Each child was sent home with sufficient Plumpynut rations to last for one week, plus a supplementary ration of flour, oil, and soap. The addition of the other foods was intended to supplement the household food supply to discourage sharing of the critical Plumpynut ration, so that the target child would reap the optimal benefits. The OTP children were monitored weekly by a trained health worker at one of the community-designated program sites, and those who continued to make progress received the next week's ration of Plumpynut, flour, oil, and soap, as well as health and nutritional education. Failure to thrive might result in medical referrals or more intensive monitoring and health education by the outreach worker, depending upon the child's condition. After a child had attained a weight-for-height of more than 80% of the median at two successive weighings, the child graduated to the supplemental feeding program. Children with MUAC readings below 11.0 cm typically do not show rapid improvement in MUAC and are therefore expected to participate in the program for a minimum of two months.

Children in the supplementary feeding program

either were admitted directly because of moderate malnutrition (weight-for-height between 70% and 80% of the median of the reference) or graduated from the more intensive outpatient therapeutic program. After anthropometric assessment, registration, and a clinical check, the caretaker of the child was given a bar of soap and 4.6 kg of premixed fortified flour. The fact that many families gathered together at the distribution sites made it possible to provide health and nutrition education and conduct cooking demonstrations. Children in the supplementary feeding program also received primary health care services when warranted, such as treatment for illnesses, immunization, and micronutrient supplementation. Many families had more than one child under five enrolled in the supplementary feeding program; the record was five children from a single mother. A child was discharged from the supplementary feeding program after two successive weight-for-height values of at least 85% of the median. The Save the Children staff continuously monitored the aggregated data from the children enrolled in the outpatient therapeutic program and the supplementary feeding program for ongoing evaluation of program effectiveness. These data represent summaries of program results from multiple communities and are thus useful for program evaluation, but they do not represent the results of a controlled clinical trial in which the outcomes for individual children are monitored.

Results

In examining the impact of the initial phase of the CTC program, the effects on several levels should be noted: first, the relative success in effecting improvements in child nutrition, and second, acceptance of the program by the beneficiary community.

Evidence of success of CTC in alleviating malnutrition

The first criterion for evaluation is the outcome of case management for malnourished children. The most controversial component of the CTC approach is the management of severe malnutrition at home by weekly weighings, provision of Plumpynut rations, clinical monitoring, and follow-up by outreach workers who are nonprofessional medical personnel, rather than management in therapeutic feeding programs with skilled-care personnel available 24 hours a day. Many of the professional staff initially assigned to implement the CTC program were skeptical of the efficacy of nonmedical care. They questioned the ability of minimally trained nonprofessionals and a largely illiterate population to manage the complex problems associated with severe malnutrition; but by the conclusion of this experience, the experts in both nutrition and

medicine were largely convinced of the success of the CTC program.

Data from this initial effort to apply a community-based approach demonstrate that the prevalence of malnutrition is reduced both by directly addressing the needs of affected children and by preventing those at risk from a deterioration in nutritional status through preemptive public health services and supplemental food rations. By the 16th week of operations in one *woreda* for which reliable data are available (Arbegona), the program was able to rehabilitate 66.0% of severely malnourished children sufficiently that they were able to graduate out of the outpatient therapeutic program to the less intensive supplementary feeding program, with the remainder continuing in the outpatient therapeutic program. The overwhelming majority of children (87.8%) were discharged after attaining adequate weight-for-height; only 8.8% required referral to a medical facility because of unsuccessful treatment or underlying medical complications. Only 2.3% defaulted from participation (defined as failure of a child to participate in anthropometric monitoring and food distribution for two successive weeks), and less than 1% died. These are all more positive outcomes than the minimums established in the international Sphere Project guidelines for humanitarian response [18]. Survey results obtained during and after the emergency phase showed a marked trend toward the reduction of mortality among children under five years of age (under-five mortality) and in the rate of severe acute malnutrition. In September 2003, the daily under-five mortality was 1.47/10,000 and the rate of severe acute malnutrition was 1.0% (95% confidence interval, 0.5–2.0); by March 2004 these rates had improved to 0.45/10,000 and 0.6% (95% confidence interval, 0.2–0.9), respectively.

When we compare the data from Arbegona with referent data, both positive and negative conclusions may emerge. A study of a previous CTC program in the same area of Ethiopia by Collins and Sadler found higher rates of recovery from malnutrition, but also higher rates of mortality and defaulting [17]. In all cases, the results from the Collins and Sadler study exceeded the Sphere Project guidelines, and in several ways the Arbegona data did not (see **table 1**).

TABLE 1. Outcome of the CTC program in Arbegona, Ethiopia, compared with Sphere Project guidelines and outcome of the CTC program in Ethiopia studied by Collins and Sadler

Outcome (%)	Arbegona	Sphere Project [18]	Collins and Sadler [17]
Death	0.2	< 10	4.1
Default from the program	2.3	< 15	4.7
Recovery ^a	66.0	> 75	85

a. Recovery was determined by graduation to a supplemental feeding program.

There are important differences between the results reported by Collins and Sadler and those from Arbegona that must be noted in trying to interpret the evidence of success in Arbegona. Collins and Sadler's retrospective cohort study intensively tracked a small number of children (170), and therefore it was easier to keep accurate records in their study. It also appears that funding was specifically designated for this research and monitoring, so that care with data collection was an important goal from the outset. In addition, the Arbegona data were obtained from a CTC program only 16 weeks after its inception, while the program was still operating. Since previous research has indicated that the rate of weight gain among children in a CTC program is slower than that achieved with therapeutic feeding center rehabilitation, it is plausible that the rate of recovery would have been higher if data had been available at the point when the CTC program was concluded. The fact that children in CTC programs gain weight somewhat more slowly than those in a medicalized therapeutic feeding center setting is not necessarily a significant drawback of the CTC approach. Because both the child and the parent are able to remain at home, there is less pressure for the child to be discharged from the outpatient therapeutic program so that the parent can return to other responsibilities, and therefore there is greater willingness to continue participation for the full duration of the program.

Despite these qualifications, there is reason to characterize the Arbegona case as successful. First, it reached a very large number of severely malnourished children where the need was apparent, and the great majority of those children improved markedly during the course of the program. The magnitude of the program and the rate of coverage illustrate the effectiveness of this approach, since more traditional therapeutic feeding centers could not begin to manage the volume of cases addressed in the program. The Save the Children programs admitted 5,799 severely malnourished children over a 5-month period, 3,765 of whom (64.9%) progressed sufficiently to graduate to the supplementary feeding program. An additional 7,961 children received services through the supplemental feeding program, illustrating the scope and magnitude of the food insecurity [14, 20]. The default rate was low, indicating community acceptance of the approach. Mortality was extremely low. This is surprising, given the poor health and sanitation infrastructure in the area, which exacerbates the problems caused by the initial malnutrition.

Another measure of effectiveness is the proportion of the at-risk population who received nutrition rehabilitation as a consequence of meeting eligibility criteria. Deconinck [20] reported that a survey to determine the proportion of the acutely malnourished receiving assistance in the Hulla and Arbegona districts found that "the coverage rates were excellent: OTP coverage was 78.3% and supplementary feeding program

coverage 86.8%. The success of the CTC program was largely due to the intensive outreach program where outreach workers closely monitor the children of affected communities and provide health education at the grass-roots level.” This result compares very favorably with the Sphere Project guidelines, which target rural coverage rates at more than 50% [18].

Community acceptance of CTC

Participation by the beneficiary communities was quite robust. The local officials participated in the planning and implementation of the program from the outset, from organizing distribution centers to encouraging their community members to participate. Local leaders encouraged people to bring their children for screening and discouraged them from feeling shame at having a malnourished child by reminding the community members that the welfare of the children was paramount and by enrolling their own children in the CTC program.

The CTC staff held monthly meetings with local leaders to discuss the progress of the program and to fine-tune it as needed. Weekly staff meetings of all the outreach workers in each woreda permitted them to report on their progress, submit their summary data, and receive additional training on issues that they relayed to communities where they were assigned, such as hygiene, malaria control, diarrhea management, and family planning. The outreach workers tried to engage the people in dialogue and to have teachable moments whenever possible during home visits for monitoring enrolled children, in churches, at funerals, in schools, at community gatherings, and over the many cups of coffee that are part of Ethiopian social life.

CTC staff engaged in discussion and training with traditional herbalists and birth attendants in an effort to enlist them in the promotion of health in their communities. A measure of success has been that they brought their own children to the weighings. The herbalists also acknowledged that their medicines were fairly ineffective at treating kwashiorkor (*butama*) and marasmus (*amayesa*). An earlier assessment (J. Lee, unpublished document) suggested that traditional approaches to the treatment of kwashiorkor and marasmus may actually exacerbate these conditions, because herbal purgatives are used to induce vomiting and expel the “harmful germs” believed to cause the ailments. Even if they stood to lose income by losing patients, the traditional healers agreed to refer such cases to the CTC program.

Additional evidence of community acceptance of the CTC program is provided by the high levels of participation and low rates of withdrawal from the program. For example, in Arbegona woreda only 2.3% of the children who were enrolled defaulted, as measured by failure to be weighed at two successive

weighings, and the SFP program had similar success. These results suggest that the CTC program met keenly felt needs among members of the community and that they perceived benefits from continued participation in the program.

Conclusions

Why was the CTC strategy successful? When we examine the timing and nature of aid in this instance, we note that success was attributable in part to the technical expertise and appropriate aid that were directed to these communities, but that social and community-based variables were also important. Local participation in the planning and implementation of the CTC program at many levels accounts for its effectiveness.

- » Reports of problems resulting from drought reached the Disaster Prevention and Preparedness Commission (DPPC), which conducted a rapid assessment and sought assistance from zonal and regional offices, but they were unable to fully respond because of the magnitude of the emerging problem. The DPPC documented the effects of the drought, which included a total loss of cereal crops, a severely diminished harvest of ensete and vegetables, and a drop in income received from cash crops, especially coffee, all of which resulted in a food emergency.
- » Regional and zonal health officials understood the importance of improved coverage and therefore allowed the CTC program to be piloted.
- » Donor agencies and international nongovernmental organizations quickly coordinated and mobilized support for emergency aid.
- » Community leaders and people with influence in local communities participated in the initial discussions and helped identify the communities to be targeted, thus helping to mobilize local support and participation.
- » Community opinion leaders enrolled their own children in the CTC programs.
- » Outreach workers were recruited from the communities that they served.
- » Outreach workers were familiar with the people in the community and were thus able to overcome their reluctance to acknowledge the declining nutritional status of their children.
- » The twice-monthly food ration distributions and the anthropometric assessments were performed in a highly public setting and were based in each targeted community. This ensured transparency in the process, which reinforced the face-to-face familiarity of people who recognized that they shared common problems and reduced possible accusations of favoritism or unequal distribution of resources.
- » Local service providers—traditional birth attendants and reproductive health agents (health workers who

distribute contraceptives and provide HIV/AIDS education)—received additional training that may improve their effectiveness in service delivery in the long term.

- » Outreach workers, community leaders, and members of each community were empowered as they learned that they had the ability to manage a serious local crisis, and this success should be a foundation for effective community-based planning and management in the future.

Although exit strategies should always be part of a plan to deal with an emerging crisis, this program, because of its strong emphasis on community management of problems, appears to be an ideal opportunity to bridge the divide between relief and development. The community mobilization presents an effective entry point for the complementary activities that target improvements in food security, local knowledge of improved health and nutrition practices, and infrastructure. The major crisis in the region has been averted for the time being, but it is clear that long-term nutritional problems persist, since the majority of children remain at least moderately to mildly malnourished. The food security situation remains precarious, and communities may not have sufficient resiliency to prevent another nutritional emergency unless the more fundamental problems of food production are addressed.

For at least 20 years, professionals in economic development have debated about how to meaningfully empower local people to be participants in change in their own communities, discussed what constitutes sustainable development, and pondered how to make a bridge from relief to development. In Ethiopia in particular, Marchione and Novick [9] noted the need to shift the emphasis from famine relief to famine prevention. One way to approach this problem is through wider implementation of community-based therapeutic care, since the approach is contingent upon high levels of community involvement and mobilization. Although high levels of intervention may be necessary at the outset of a nutrition emergency, CTC programs have the potential to bring technical knowledge to local community outreach workers rapidly and to mobilize the necessary supplies. Consequently, this intervention can be articulated as a phase in the process, and not as the end in itself. The issues that remain in SNNPR are many and diverse: water and sanitation systems are woefully inadequate, the high birthrate and small landholdings exacerbate population pressure, poor health infrastructure makes primary health care delivery problematic, and low agricultural productivity in relation to population size makes chronic food insecurity and periodic emergencies inevitable. These are

all problems that development programs can address, and the positive community involvement that the CTC program has fostered is a sound foundation for the implementation of participatory development strategies in a comprehensive development program.

We believe that wider implementation of community-based care has the potential to foster the transition from effective emergency to development programming, and that future application of CTC strategies should examine the feasibility of this goal at the planning stages. Construction of this bridge to longer-term development approaches will require changes in both the donor and the implementing agencies. Young and Jaspars [21] have noted the reluctance of international donor agencies to become involved in food-aid programs unless the situation is dire. As a result, seasonal or mild shortfalls of food may precipitate full-blown famines. In a similar vein, many donor agencies and nongovernmental organizations make sharp distinctions between emergency and development programming. They often have separate funding streams, decision makers and staff, and policy and programming for emergency versus development work. Addressing these logistic and organizational barriers in the international humanitarian community and increasing reliance on community-based strategies may prove an effective strategy for making the transition from relief to development. The strength of CTC is that it builds capacity and coordination within local communities, because they become their own agents of change. As an additional tool in the arsenal of participatory development strategies, CTC may become an effective first step in both nutrition rehabilitation and longer-term development programming.

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