Abstract

Background. Community-based management of acute malnutrition (CMAM) is an effective strategy frequently implemented by nongovernmental organizations, but handing CMAM over to national health systems and scaling it up remains a great challenge.

Objective. To highlight the challenges to sustainability and scalability of a CMAM program in Burkina Faso.

Methods. We conducted a review of program reports to evaluate program performance and conducted individual interviews with key informants (health system fieldworkers and officials and program staff members) and focus group discussions with beneficiaries (mothers whose children were attending the program, community volunteers, and village leaders) to analyze the required conditions for scaling up using ExpandNet recommendations.

Results. The program coverage rate was 90% among children under 5 years of age in the 180 intervention villages. Between June 2007 and December 2010, 19,009 cases of acute malnutrition (AM) among children under 5 years of age were treated, of which 4,308 (22.7%) were cases of severe acute malnutrition (SAM). The recovery rate was 89.4% for moderate acute malnutrition (MAM) and 86.5% for SAM. The case-fatality rate was 2.8% for MAM and 4.2% for SAM. The default rate was 7% for all cases. The prevalence of SAM decreased between 2008 and 2009 from 5.4% to 1.8%. Barriers to sustainability and scaling up were underlined: management by external personnel from the health system, no financial support for the scaling-up process, insufficient national advocacy, and nonsustainable activities (e.g., free care).

Conclusions. The CMAM program was effective, but the handover conditions and scaling-up requirements were unsatisfactory. We identified poor integration into the health system, lack of resources, and insufficient advocacy.

Key words: Burkina Faso, community-based management of acute malnutrition, scaling up, sustainability
of ready-to-use therapeutic food (RUTF), which provides energy and protein-dense foods and micronutrients, and also the community-based management of acute malnutrition (CMAM) approach [8]. In 2001, Collins et al. [6] argued for the widespread use of outpatient management of SAM, similar to management of MAM. The CMAM approach promotes the treatment of cases of SAM in children under 5 years of age early in the course of the disease and closer to where they live and emphasizes the need to maximize coverage of the program [9]. The approach improves program performance by combining appropriate medical and nutrition protocols with community mobilization aiming at enhancing community participation, better understanding of the program by the community, early presentation, and a low default rate [9]. RUTF, which makes CMAM strategies easier to implement, is a high-energy nutrient spread made from peanuts, dried skimmed milk, sugar, and a specially formulated mineral and vitamin mix, intended to be the nutritional equivalent of the WHO-recommended therapeutic feeding milk, F100 [10–12]. The advantages of RUTF are that it can be kept at room temperature with no risk of bacterial contamination, it does not require cooking at home, and it can be eaten by children directly from the package [13]. Thus, it has become possible to treat SAM at home if the child has an appetite and has no additional infectious complications. CMAM has been found to be cost effective [9, 14] in emergency and nonemergency situations. In 2007, WHO, the World Food Programme (WFP), the Standing Committee on Nutrition of the United Nations, and UNICEF [15] recommended the CMAM approach to manage SAM in developing countries. As often happens with health policies, it takes some time before most countries adopt the approach.

Burkina Faso, a developing country of West Africa, is facing a high rate of malnutrition among children under 5 years of age and women of childbearing age. According to the 2010 Demographic and Health Survey, 16% of children under 5 years of age were wasted, and 16% of women of childbearing age suffered from chronic energy deficiency, with a body mass index (BMI) under 18.5.

In 2006, as a consequence of a food crisis, humanitarian agencies started piloting a CMAM approach in the country. The Red Cross of Belgium, an international nongovernmental organization (NGO), in collaboration with the National Red Cross in Burkina Faso, started a CMAM program in June 2007, and the handover to the Ministry of Health was planned for 2010.

CMAM program design

Intervention areas and target populations

The program took place in 9 provinces (Yatenga, Seno, Oudalan, Soum, Yagha, Bougouriba, Ioba, Noumbiel, and Poni) of 45 in Burkina Faso: 4 in the Southwest region, 4 in the Sahel region, and 1 in the North. In each province, 20 villages out of an average number of 170 (12%) were chosen based on their high prevalence of AM, the low performance of the primary Health Center, and the unavailability of any humanitarian assistance. In total, the interventions involved 180 villages in which children under 5 years of age and pregnant and lactating women were the target beneficiaries. The choice of the intervention areas was made in consultation with the Ministry of Health.

Organization of the implementation (fig. 1)

Community level

In each village, six community volunteers, working for free, were chosen by the villagers to form the Village Committee for Nutrition (VCN). Priority was given to people who could read and write and to those already playing the role of a community health worker. The community volunteers were trained during a 5-day course on screening and treatment of SAM and MAM. The villagers were asked to build themselves a village nutrition center that would host the activities. After the training, the community volunteers made a census of beneficiaries (children under 5 years of age and pregnant and lactating women) and completed a door-to-door AM case-finding by measuring mid-upper-arm circumference (MUAC) and looking for bilateral pitting edema. Mothers and child-carers were invited to attend weekly nutrition meetings with their patients.

FIG. 1. Relations between the coordination structures of the community-based management of acute malnutrition (CMAM) program

| National Department of Nutrition, head of National Consultative Committee on Nutrition |
| Regional Director of Health, head of Regional Coordination Committee on Nutrition |
| Province administrator, head of Steering Committee on Nutrition, including the district medical officer and local leaders of the Red Cross |
| Health center (plays reference role for villages) |
| National Coordination team (staff program officers) |
| Regional coordinator (3 regions and 3 coordinators) acting as program officers |
| Provincial team of nurses for the program (9 provinces) |
| Village Committee for Nutrition (20 per province) |
children under 5 years of age at the nutrition center where treatment and monitoring of cases were done and where nutritional education was offered by community volunteers. Topics related to nutrition included appropriate breastfeeding and complementary feeding practices, foods rich in vitamin A and iron, iodized salt consumption, and women’s nutrition during pregnancy and lactation. Topics in disease prevention and management included nutritional care for malnourished children, vaccination for young children, first aid measures for symptoms such as fever and diarrhea, antenatal care, and timely and adequate use of health services. The community volunteers also made home visits to ensure compliance with the treatment and advice.

In order to support home visits, transportation of nutritional products from the primary Health Center to their villages, and the organization of cooking demonstrations based on local products, each committee for nutrition received a monthly allocation of 41 euros from the program. This compensation is also intended to support collective income-generating activities to increase the financial capacity of the VCN.

The community volunteers were supervised weekly during the first 6 months of the program and fortnightly thereafter by a provincial team of the program composed of three nurses and one local moderator that was in charge of 20 villages. This team also discharged beneficiaries from the program. The discharge criteria of the Ministry of Health require calculation of a weight-for-height indicator, but this is not feasible for community volunteers (see “Ways to improve sustainability” below).

At the beginning of the second year of the program, the nurses of the primary Health Center were asked to participate in the supervision of the community volunteers in order to prepare the handover of the intervention. The Health Centers then received technical training of nurses and material assistance (scales, height gauges, beds, delivery tables) from the program.

Provincial, regional, and national levels

The program was overseen at the national level by a program officer, and there was one regional coordinator for each of the three regions. At the national, regional, and provincial levels, there were program steering committees composed of health system workers and the program staff. At the provincial level, the provincial administrators were the heads of the committees, although they were not health workers. Coordination meetings were organized by the steering committees, but other government senior officers or other humanitarian agencies working in nutrition were also invited.

Community care process (fig. 2)

The admission and discharge criteria followed the guidelines of the Ministry of Health [16]. SAM was diagnosed if MUAC was less than 110 mm or if bilateral pitting edema was found. MAM was diagnosed if MUAC was 110 mm or more and less than 125 mm. Pregnant women were admitted if their MUAC was less than 210 mm, and lactating women were admitted if their BMI was less than 18. Children were discharged with a weight-for-height index greater than 85% of the median reference of National Center for Health Statistics (NCHS) standard growth charts. Pregnant women were discharged when MUAC was at least 230 mm and lactating women were discharged when BMI was at least 18.

Beneficiaries were treated in their villages by community volunteers if there were no complications (good appetite, no fever, no diarrhea, no vomiting, and no other symptom of severe sickness) and if the child was over 6 months old. In case of complications, the patients were transferred to the Health Center and from the Health Center to a Therapeutic Feeding Center in case of life-threatening complications (severe wasting, anemia, respiratory distress, severe dehydration). A child or woman who did not achieve the discharge criteria after 12 weeks was also transferred to the Health Center.

At the community and Health Center level, outpatient treatment was offered consisting of routine medications and RUTF in cases of SAM or corn–soy blend (CSB) flour in cases of MAM. Child-carers received a weekly home ration to feed the child. Children with MAM and admitted women received 1,400 g of CSB, 140 g of oil, and 105 g of sugar, which provided 1,000 kcal of energy per day. The oil was mixed with the CSB flour before distribution. Children with SAM received a weekly ration of RUTF, which provided 175 kcal of energy per kilogram per day.

The routine medications consisted of one dose of vitamin A (100,000 IU for children between 6 months and 1 year of age and 200,000 IU for children over 1 year of age and lactating women during the first 6 weeks after delivery), mebendazole 100 mg (one tablet twice a day for 3 days for children under 23 months of age) or albendazole (one dose of 400 mg for children over 23 months of age and lactating or pregnant women in the second or third trimester of pregnancy), iron tablet (200 mg/week for children over 10 kg until recovery or 200 mg/day for pregnant and lactating women until 45 days after delivery), and folic acid tablet (400 µg per week for children and 400µg per day for the women in combination with iron). In cases of SAM, the routine medications were completed by an antibiotic (amoxicillin 50 mg/kg/day or cotrimoxazole 20 mg/kg/day for 7 days).

As described above, RUTF is currently recommended by WHO for the community-based management of SAM [15]. RUTF was provided by UNICEF. The CSB flour supplied by WFP is a mix of corn (75% to 80%), soybeans (20% to 25%), and micronutrient...
Community-based management of acute malnutrition

It is the recommended product for treating MAM in most nutrition programs, despite some inconveniences (low energy density and micronutrient content, high antinutrient content).

WFP provided transport for CSB and UNICEF provided transport for RUTF from the capital (Ouagadougou) to the Health Centers, and the community volunteers then took charge of the transport to their villages.

In April 2010, we conducted an evaluation to describe the CMAM program model as implemented by the Belgian Red Cross in Burkina Faso and to underline the key issues to be taken into account to improve its effectiveness, sustainability, and scalability.

Methods

Study design

Three methodological approaches were combined for this study.

First, we did a desk review of the program reports to assess the quality of implementation and the program’s performance based on SPHERE standards for CMAM programs.

Second, a descriptive qualitative design was applied to identify barriers to sustainability and scalability of the intervention. Data were collected from 6 to 27 April 2010. Five of the nine provinces were selected to be visited, based on their higher rates of AM. In these provinces, 15 out of 100 intervention villages were selected, also based on their higher rates of AM.

We organized a 1-hour focus group discussion with women in each village. Groups of 10 participants were selected at random among the women present during the on-site nutritional meeting of the village. The selected women were either mothers of children participating in the program or were themselves beneficiaries. In five villages, we organized the focus group discussion only with young women (between 18 and 35 years old) and in the other villages, only with older women (over 35 years). In 3 villages (randomly selected out of the 15), a focus group discussion was organized with village elders and community leaders (groups of six to eight participants who were village chiefs or...
Data collection

The interviews were audiotaped and field notes were taken during observations. Interviews with key informants of the Health Center included questions on their perceptions of the program, the appropriateness of the activities, and which structural changes they thought might be needed to improve the sustainability and scalability of the intervention. The content of the focus group discussions with community volunteers focused on their perceptions of their role and on what was needed for improvement of the intervention and for better community ownership. Questions for women and village elders and leaders were about how they perceived the intervention, how they participated, and what they were able and willing to do for its sustainability.

Data analysis

The lead author (Y.E.S.) transcribed the taped interviews using a summary form specially developed for this study. For each aspect explored, themes and views that emerged from the gathered data were listed. The data extraction exercise began during the course of the survey, and the researcher’s interpretation of the data gathered in the first interviews was confirmed during subsequent interviews.

Data from program reports were compiled to measure performance indicators: program coverage, recovery rate, death rate, and default rate. The program coverage has been defined as the number of AM cases attending the program divided by the number of AM cases found during the last door-to-door screening in each village. The recovery rate was the number of AM cases discharged and cured divided by the number admitted. The deaths and default rates were the number of deaths and defaults divided by the number admitted. The prevalence of malnutrition during screening was calculated as the number of AM cases identified divided by the number of people who had been screened. These performance indicators were compared with the SPHERE standards’ indicators [18].

Third, we used on-site observations to assess the quality of the community volunteer work and educational activities.

The Ministry of Health, the Belgian Red Cross, and the National Red Cross of Burkina Faso gave approval for the study, and informed consent was obtained from all participants prior to the interviews and focus group discussions.

Results

In this section, we first describe the clinical outcomes of the program. We next report on the perceptions of the program by the communities and health workers about the program.

Effectiveness of the program: From program reports

We describe here some clinical indicators and the impact of the program to examine its effectiveness.

Program performance

From June 2007 to December 2009, there were 28,208 admissions, including 19,009 (67.4%) children and 9,188 (32.6%) pregnant and lactating women. Overall, 22.7% (4,308/19,009) of child admissions were due to SAM and the rest were due to MAM. The program coverage determined using attendance figures and screening data (without excluding those from outside the catchment area) for the 180 participating villages was estimated at 90%.

The recovery rate for children was 89.4% for MAM and 86.5% for SAM. The case-fatality rate was 2.8% for MAM and 4.2% for SAM. The default rate was 7.0% for MAM and SAM combined. The weight gain was 3.0 g/kg/day for MAM and 4.4 g/kg/day for SAM. The relapses were not systematically assessed. Seventy-seven percent (14,637/19,009) of child admissions were successfully managed exclusively as outpatients in the community by the community volunteers, while 21.2% (4,030/19,009) were referred to the Health Center for initial management but were afterwards referred back to the community for the completion of the nutrition rehabilitation. Only 1.8% (342/19,009) of the children admitted were referred to the Therapeutic Feeding Center or hospital for inpatient management of SAM.

Among pregnant and lactating women, the recovery rate of AM cases attending the program was 3.0 g/kg/day for MAM and 4.4 g/kg/day for SAM. The relapses were not systematically assessed. Seventy-seven percent (14,637/19,009) of child admissions were successfully managed exclusively as outpatients in the community by the community volunteers, while 21.2% (4,030/19,009) were referred to the Health Center for initial management but were afterwards referred back to the community for the completion of the nutrition rehabilitation. Only 1.8% (342/19,009) of the children admitted were referred to the Therapeutic Feeding Center or hospital for inpatient management of SAM.

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rate was 80.4%, and 9% defaulted. No deaths from malnutrition were reported for pregnant and lactating women.

The on-site observations showed that community volunteers had good competency in screening (measurement of MUAC), diagnosis at admission, and treatment.

**Impact of the intervention on the prevalence of malnutrition and quality of care at the Health Center (fig. 3)**

The data showed that the proportion of AM during screening decreased between 2008 and 2009 from 17.2% to 15.4% for MAM and 5.4% to 1.8% for SAM in the participating villages. Compared with the period before the program was implemented, the number of cases of SAM detected in Health Centers increased from 4-fold to 18-fold, depending on the Health Center. The nurses of the health centers declared that the rates of antenatal visits and use of health services increased in the participating villages, but data were insufficient to quantify the impact of the program on these activities.

We visited four Health Centers outside the program area (selected at random in two provinces) and observed that the nurses in these Health Centers were less skilled and less systematic in screening and management of AM. In comparison with nurses from the program area—who systematically screened all children under 5 years of age and pregnant and lactating women—they only identified some cases of severe wasting in children, and they referred all these SAM cases to the nearest Therapeutic Feeding Center.

**Key messages from focus group discussions, key informant interviews, and on-site observation**

**Perceptions of the performance and benefits of the program**

The care providers at the Health Centers recognized that the program helped to improve the training and equipment of their centers. The nurses’ knowledge of nutrition improved, and they found the program very useful and effective in combating malnutrition.

The health district medical officers also agreed that the program was effective and helped the communities to understand the problem of malnutrition and helped increase the use of antenatal care and health services. The community volunteers, women, and village elders were also of the view that the program was very effective and had a positive effect on the use of antenatal care services.

**Ownership and integration of the program into the health system**

The community volunteers perceived their role as close to that of a health worker in the community. They screened and treated malnutrition and gave advice on nutritional practice and hygiene. The community volunteers were proud of their gains in knowledge and were convinced that their work had been useful for the inhabitants of their villages.

The community volunteers, women, and elders showed good ownership of the intervention and they were ready to do anything necessary to take over the intervention.

Although the program was well appropriated by the communities, this was not the case for the health system actors. One problematic aspect was the lack of Ministry of Health recommendations on how to integrate the program activities into the daily planning. Moreover, they didn't feel the need for this, as the program had its own personnel for the management.

During our field observation, a provincial team of the program on a supervisory visit had been left with no choice but to carry out the nutritional activities of the day in the Health Center, because the nurses were busy with other activities and considered that it was the duty of the program nurses. We also observed that the village nutrition center’s statistics on malnutrition were not integrated into the Health Center statistics.

The nurses of the Health Center and the DMOs declared that a lack of clear guidelines for integration of CMAM into the health system, a lack of funds for training and supervision, and management of the program by an team external to the health system were the main barriers to uptake and sustainability of the program.

Regional Health Officers from the Ministry of Health also declared that they were limited in the recommendations that they could give to the DMOs for integration of the program, as there had been no clearly defined and funded strategy from the national level for the integration of the intervention into the Health Centers.

In fact, the Ministry of Health had developed a national strategic plan for nutrition for 2010–15 and national guidelines for malnutrition management in
2007. The national strategic plan does not provide for the management of AM specifically but has the objective of improving the integration and delivery of nutrition services at the health facility and community levels. The guidelines mentioned that at the community level, screening should be organized by community health workers using MUAC. However, in the field, this is not a reality because the community level is not organized and is not considered as part of the health system.

Ways to improve sustainability

To be clear on the concept of sustainability, we asked the interviewees which activities of the program the community or the health system could continue to conduct even if the program funding stopped. Activities explored were screening and treatment by community volunteers, nutritional product supplies, educational activities in the communities, community fund, free care for malnourished children at the Health Center, and training and supervision of the community volunteers.

According to the community volunteers and program nurses, the first action to take for sustainability is to find another way to discharge patients from the program. Practically, community volunteers used MUAC to admit cases, but for discharge they needed the help of the program nurses to calculate weight-for-height, the official criterion of the Ministry of Health for discharge.

From the point of view of the health system actors, community funds and free care are not sustainable if funding is not sought. Training and supervision of the community volunteers are feasible, but on the condition that the funds allocated to Health Centers increase, particularly in the case of scaling up of the program. The community volunteers have agreed to work without financial reward, but the volume of work (one day per week) leads them to expect financial compensation.

Nutritional products are now supplied by WFP (for CSB) and UNICEF (for RUTF). However, stock disruptions were reported by the program nurses, and a greater involvement of the Ministry of Health was required by stakeholders.

Ways to improve effectiveness

The program is effective in the short term. However, relapses were not evaluated, even though the community volunteers and the program nurses recognized that they were not rare. Most of them proposed finding a solution for poverty to prevent malnutrition. The women interviewed also recognized that they did not always apply the recipes they learned because they lacked money.

The community volunteers interviewed in some villages requested drinkable water and a Health Center not too far from their villages so that the mothers could practice easily the recommendations on hygiene.

Lessons learned

In light of this evaluative research, we learned the following 10 lessons:

» With basic training, communities are able to screen and treat uncomplicated cases of malnutrition in the place they are found, reducing the number of complicated cases and deaths. Moreover, the communities then have a better knowledge of malnutrition and its causes.

» Beyond the nutrition activities, education in CMAM programs can promote utilization of health services and provide a real opportunity to achieve other health goals: vaccination, reproductive health, and bednet use to prevent malaria. But this opportunity was not fully used at the time of the evaluation. The program also gives opportunities for the community members to work together on a collective income-generating activity. It is a good example of solidarity.

» Access to free care is a strong motivation that leads people to adhere to the CMAM program, but this is not sustainable in the health system context of developing countries like Burkina Faso.

» Implementing a program that only partially covers some areas in a country does not help to assess its impact (e.g., it would be easier for impact assessment, to work in a particular province or health district.) This has been criticized by the people we have interviewed in the health system.

» A program intended for scaling up needs to be technically simple and financially sustainable for the local government.

» It is important to plan resources to accompany a program designed to move from pilot to a large-scale stage.

» Designing a pilot program in an emergency context can lead to a pitfall when the program uses its own personnel and resources to achieve good quality for the intervention. In the context of this program, the Ministry of Health required a close supervision of community volunteers in the field during the implementation phase (in a food crisis context), and this led the program staff to recruit their own personnel to ensure the good quality of the intervention. Unfortunately, in a postemergency situation it becomes more difficult to integrate the program into the health system.

» Clear guidelines from the health system officers at the national and regional levels are therefore necessary to achieve a full integration and ownership of the intervention at the Health Center level.

» Strong advocacy is important to convince local decision makers to adopt and scale up a CMAM approach. The advocacy should lead to the development of guidelines with the Ministry of Health for
large-scale implementation and to secure financial support.

A short-term program (3 years in this case) seems inadequate for scaling up a pilot program. Our interviewees have requested a longer duration (at least 5 years) to gradually help the health system to adopt and to scale up the program. In fact, the program should include a phase that is intended only to assist (institutional and technical assistance) the health system after handover to ensure the effectiveness of the intervention.

Discussion

Our objective was to assess the effectiveness of the CMAM program and to highlight the problems regarding its sustainability and scalability. We addressed sustainability, as the program was ending at the time of the evaluation. Some required conditions for sustainability and scalability were then analyzed.

The methods used may have some limitations. Effectiveness was assessed mainly by a review of program reports, and therefore our results depend on the reliability of these data. However, we had the opportunity to observe community activities, and the information from the interviews was consistent with the data we collected through review of the reports. To determine the barriers and constraints to sustainability and scalability, our method was adequate, since we provided an opportunity for beneficiaries (mothers, community volunteers, and village leaders and elders) to give their opinions freely. To enhance their confidence, all the interviews were organized without the presence of the program staff members. We did the same during discussions with health system workers. However, we are aware that we cannot exclude that some statements may have been made out of politeness and a wish not to offend.

The effectiveness of this program has been shown. The total cost of the program amounted to 76 euros per child admission and was still lower than the total cost generated by an institutional approach [14]. Nevertheless, it was higher than the costs of other CMAM programs [8].

The clinical outcomes met the SPHERE Project standards [18] for assessed indicators. Thus, for MAM the recovery rate was more than 75%, the case-fatality rate was less than 3%, and the default rate was less than 15%; for SAM the recovery rate was more than 75%, the case-fatality rate was less than 10%, and the default rate was less than 15%. However, the relapse rate was not evaluated. The proportion of malnourished children decreased during the study period. This positive effect could be attributed to the program, as over the same period in Burkina Faso, cereal production decreased by 17% [21].

In addition to the clinical outcomes, the program was successfully used as a means for nutrition counseling and raising of awareness of health services and use of antenatal care. However, we were not able to quantify this impact. It is important to note that several actions, such as educational sessions, may have had a restrictive impact, given the poverty and weak access of households to essential products required to implement the nutritional recipes taught. Even if prevention of malnutrition is not a primary goal of CMAM programs, it is a prerequisite for sustainable action against malnutrition. We call for intersectoral efforts in this direction. Moreover, the requests of the communities focused on unsatisfied but essential basic needs, such as drinkable water, healthcare services close to their village, and good-quality road systems to facilitate access to Health Centers and access to schools for their children.

The model of this CMAM program of the Red Cross relied on several points: community volunteers could admit and treat a case of malnutrition (including cases of SAM) if there were no complications; community mobilization involved a community fund supported by the program; and children who were admitted to the program were treated entirely free of charge at the Health Center when they were referred. These features were key success factors. Indeed, women appreciated that their children were treated without having to move from their village and that they received free healthcare when they went to the Health Center.

However, some success factors are also challenges to the sustainability of the program. Indeed, actors of the health system have reported that free care and community funds were not sustainable.

The main strategy of program implementation was community capacity-building. But for sustainability of community activities, support from the health system is necessary, particularly after program funding stops. We therefore analyzed the extent to which the program strengthened the main building blocks of the health system [19]. We found that the program helped to improve both the service package offered in the Health Center and the coverage for the management of AM, but failed to improve integration of nutritional statistics into the national health information system. Data were effectively collected each month from the communities in each health district, but they were absent in the national health statistics. The program did not facilitate access to essential medicines even when providing free care to the children suffering from malnutrition. Neither did it serve to finance the health system. Regarding leadership and governance issues, lessons learned from the program were disseminated among stakeholders through the steering committees. Nevertheless, the Ministry of Health has not yet adopted CMAM modalities as a reference strategy for malnutrition control.

Above all, the program appeared to be poorly integrated into the health system even when communities...
reported a good level of appropriation. The program was still perceived by health workers as an external program to the health system. Health system managers at the district (DMO) and regional levels reported that they were limited regarding the instructions that they could give for the integration of the program activities, as there were no clear guidelines and no financial resources to organize activities such as supervision of community volunteers. Moreover, the national guidelines for management of malnutrition have not advocated the treatment of malnutrition in the community, but limited it to hospitals and Health Centers.

Regarding possible scaling up, a series of barriers needs to be overcome that were not taken into account when the program was designed. For example, specific precautions were taken during the emergency phase to satisfy the Ministry of Health recommendations in favor of close supervision of field interventions.

According to the ExpandNet checklist [20], the key points that a program intended for scaling up must fulfill are the following: 1) engage in a participatory process involving key stakeholders; 2) ensure the relevance of the proposed innovation; 3) reach consensus on expectations for scaling up; 4) tailor the innovation to the sociocultural and institutional settings; 5) keep the innovation as simple as possible; 6) test the innovation in the variety of sociocultural and institutional settings where it will be scaled up; 7) test the innovation under the routine operating conditions and existing resource constraints of the health system; 8) develop plans to assess and document the process of implementation; 9) advocate for necessary changes in policies, regulations, and other health-systems components; 10) prepare to advocate for necessary changes in policies, regulations, and other health-systems components; 11) develop plans for how to promote learning and disseminate information; and 12) plan any scaling up cautiously before the required evidence is available.

Although the program has been implemented in an emergency context, the officials of the Ministry of Health at central and decentralized levels have been involved in its planning. The intervention was relevant, as malnutrition is widespread in Burkina Faso and CMAM is an effective strategy recommended by UN agencies [15]. The expectations of different stakeholders were explored, and the Ministry of Health department in charge of nutrition emphasized that community volunteers must be closely supervised in their activities. This led to the decision to recruit external personnel from the health system in each province to supervise the community volunteers. However, this did not help for the integration of the program into the health system. Thus, with regard to ExpandNet checklist point 4, the program was not implemented in the health system setting, but the sociocultural aspects were taken into account, since freedom of choice was left to the communities for the selection of volunteers and the organization of the program. The community leaders were consulted during the implementation stage. The cooking demonstrations of porridge used local ingredients that were socially accepted and usually consumed by the population.

With regard to point 5, the admission criterion was simple but the discharge criterion was not. It would be simpler if the program used the WHO new discharge criterion focusing on weight gain [15], even though a weight gain threshold for discharge still calls for research. This would also give autonomy to the community volunteers in their activities for sustainability.

The program was implemented in three regions and nine provinces. This allowed testing the intervention in different sociocultural contexts as recommended by point 6 of the ExpandNet checklist, but as underlined above, the intervention was not implemented within health system resources and as such, point 7 is not respected. This partially explains why the health workers did not take ownership of the intervention. We also realize that it is not sustainable to replicate on a large scale in the health system a program with fund allocation for income-generating activities and with free health care for children or women transferred from the community. Therefore, these points will need revision before scaling up is possible. To facilitate the planning of a similar intervention and scaling up, efforts have been made to document the different steps of the implementation with their cost.

Point 9 of the checklist is crucial for sustainability and scaling up. In the case of this program, the main donor decided to support an emergency intervention only. Thus, no financial support was planned to facilitate a scaling-up process that required a program of longer duration. Nevertheless, as we have passed the emergency situation, the program team is advocating for other donors and for change to the national policies and has been actively involved in compiling national guidelines for CMAM implementation in Burkina Faso. This document will facilitate lobbying for funds in order to scale up. The steering committees at the provincial, regional, and national levels enabled the program officers to disseminate lessons learned from the program and to advocate for its strengthening.

Point 12 has been addressed, as the evidence of CMAM effectiveness has already been established, but in most cases the community volunteers only have the role of case finding and home visits [7]. Thus, the effectiveness of treatment by community volunteers and the effect of community funding and free care need further evaluations.

The ExpandNet checklist is a realistic tool to use for assessing a program designed to scale up and should be recommended to program implementers. However it is not realistic to test the intervention in all varying sociocultural contexts, as advised by point 6 of the checklist.
It would be resource intensive, and in the context of this program, we learned that it did not help in assessing the impact of the program. It will be relevant only in the case where the program implementer believes, on the basis of previous studies, that the results of the program may change in other sociocultural contexts.

Conclusions

Many aspects need to be considered to ensure implementation of a sustainable and scalable program [22]. First, a clear health policy and financial support beyond the pilot stage are needed. Both issues should deal with how to pay the community volunteers for their work, particularly if they are not considered health workers. Second, the intervention must be technically simple and financially affordable for the Ministry of Health. Third, health system resources must be involved in order to improve ownership and sustainability of the intervention. For instance, in the CMAM program in Malawi, long-term improvements in the treatment of SAM on a large scale were achieved thanks to community-based management of SAM, which has been implemented from existing Ministry of Health structures as a standard part of the primary healthcare package [18]. Fourth, transfer processes must be carefully planned when designing the program. Finally, regular assessments should be carried out during the intervention regarding the capacity of health system workers to ensure the handover and sustainability of the program.

Acknowledgments

We thank the European Commission of Humanitarian Aid and Civil Protection (ECHO) and the Belgian Development Cooperation Agency (DGD) for financial support to the study. We deeply appreciate the dedication and commitment of the staff of the Red Cross (in Belgium and Burkina Faso) and thank them for their help and support during the study. We thank Beverly Bernard for editing this paper. Y.E.S. participated in fieldwork, data collection and analysis, study design, and writing of the manuscript; P.B. and N.E. participated in study design and writing; S.L. participated in data analysis and writing; P.D. participated in fieldwork, data collection and analysis, study design, and writing.

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