Sustaining malaria prevention in Benin: local production of bednets

S RASHED,1,2 H JOHNSON,3 P DONGIER,4 C C GBAGUIDI,5 S LALEYE,6 S TCHOBO,5 T W GYORKOS,7 J D MACLEAN2 AND R MOREAU1,5

1Pediatrics Department, Hôpital Maisonneuve-Rosemont, Montreal, 2McGill University Centre for Tropical Diseases, Montréal General Hospital, Canada, 3Management and Social Dimensions, CAC International, Montréal, Canada, 4Clinique Santé-Accueil, Hôpital Saint-Luc, Montréal, Canada, 5Organisation Savaloise pour la Solidarité et le Développement, Savalou, Benin, 6Centre de Promotion Sociale, Hôpital de Savalou, Benin, and 7Department of Epidemiology and Biostatistics, McGill University and Division of Clinical Epidemiology, Montréal General Hospital, Canada

Through a Benin-Canada participatory research initiative which included both Benin and Canadian non-governmental organizations, a local capacity to produce and market bednets for the prevention of malaria was developed. The development process began following a community-based assessment of local needs and skills. All materials for the manufacture and distribution of the bednets were obtained locally with the exception of the netting which was imported from Canada. The sustainability of the enterprise is enhanced by the community’s recognition of the importance of malaria and the culturally acceptable practice of bednet use.

Introduction

Many studies have shown that insecticide-impregnated bednets are effective against malaria.1,2,3 In a recent meta-analysis of field trials, Choi et al.4 report a 50% reduction in the malaria incidence rate ratio from the use of insecticide-impregnated bednets when compared to control groups using either untreated bednets or no bednets. Despite some evidence demonstrating no increased effectiveness,5 insecticide-impregnated bednets will continue to be an important preventive measure in malaria-endemic areas.

There are two basic types of implementation approaches: one that involves local production of bednets, an approach which might be classified as a ‘grassroots’ type of approach, and one which involves the distribution of bednets made elsewhere and imported into the local population, a type of selective vertical strategy. In this paper, we describe a process of implementing a ‘grassroots’ type of approach to malaria prevention by local production of bednets. The programme was initiated in the region of Savalou (population 19 000) in Benin between July 1992 and December 1994 (Figure 1). The contrast between this type of approach and imported distribution will be highlighted.

The framework for the implementation process is modelled as shown in Figure 2. The conceptual level is designated as the first level of the framework. There are three fundamental principles:

1. Participation of local human resources (the operationalization of the programme would be sustainable with existing local human resources);
2. Self-financing (in order for there to be financial sustainability, the production of bednets would be within the capacity of the local population, it would be self-financing and it would also be a profit-making enterprise);
3. Appropriate action (a comprehensive knowledge of the local setting would inform a culturally acceptable enterprise adapted to local customs).

The second level of the framework lists those ingredients or tools necessary to implement the three concepts. Lastly, on the third level there are the results. These three levels together constitute a sustainable programme of implementation of insecticide-impregnated bednets.
Figure 1. Site location (○) of the Impregnated Bednets Project, Benin

Figure 2. The conceptual framework underlying a local enterprise to produce insecticide-impregnated bednets (participatory research)
It is known that women and children are particularly vulnerable to malaria. Bednet use in many countries is frequently motivated for nuisance prevention rather than disease prevention\textsuperscript{6,7} often leading to preferential use of bednets by household leaders. Preliminary field observations gathered at the outset in this study have indeed shown that bednets were used mainly by adults and often by the elderly: of 1133 users of traditional bednets, 13\% were 0–5 years old and 60.5\% were 20 years old and over (unpublished data). For this reason, we have focused on woman/child units rather than on a more general prevalence of use in order to ensure that appropriate efforts be invested to promote bednet use and to obtain relevant information on use in this vulnerable community group.

This research was evaluated and approved by ethics review committees of the Montreal General Hospital, Montréal, Canada and an ad hoc committee with local representatives in Savalou, Benin.

First and second levels: concepts and tools

Participation of local partners in development

Because of insufficient monetary resources, the state has had to increasingly withdraw from the health sector. Manpower in the public sector, already overburdened, is underpaid, its priorities have been redirected to other competing demands and it suffers from frequent disruptive relocations. It is therefore essential that any sustainable programme in the health sector involves a long-term commitment and motivates the appropriate human resources. It is also essential that the human resources and their affiliated local associations involved in such sustainable programmes originate from the respective regions in which the programmes will be operating. For these reasons, a feasibility study was conducted to identify the available local human resources in Savalou both already involved in development activities and at less risk of being relocated elsewhere.

The partners in the research development project were:

1. OSSD (Organisation Savaloise pour la Solidarité et le Développement): a non-governmental organization with a long-standing presence in development activities in the region. The role of OSSD in the present project was to direct the project locally, to ensure that the communities which were created functioned well, to ensure the supply of materials for the production of bednets and the insecticide and, lastly, to support NYONA (see point 2 below) in administering the project.

2. NYONA: a woman’s group comprising 28 local women who have been involved in volunteer community work in the region for about seven years. Their original community involvement had been in participating in the nutritional follow-up of children registered with the Centre de Promotion Sociale (CPS) of Savalou. The women produced soap to finance their activities and the director of the CPS advised them about appropriate targeted activities. The women belonging to NYONA have a slightly higher level of education than the average for women in the region (3 completing secondary school, 11 completing primary school, 11 with some primary school education and the remaining 3 illiterate), their predominant ethnic group is Fon-Mahis, and most are married (80\%). Catholics are the largest religious group (75\%).

The role of NYONA in the present project was to sew and sell the bednets, to participate in the different committees, to assist in the development of the study instruments (i.e. questionnaires and interviews), to administer the questionnaires, to animate discussion groups, to conduct the interviews and to participate in the follow-up assessment of bednet use.

3. OCSD (Organisation Canadienne pour la Solidarité et le Développement): a non-governmental Canadian organization which supports the work of OSSD.

4. Module EPI-PALU: a grouping of researchers, primarily based at the Montreal General Hospital, who conduct research in malaria. The group is a multidisciplinary one with experts in tropical medicine, epidemiology, biostatistics and community development.

Several committees were created in Benin within the present project to provide direction and support. These committees discussed all aspects of the project and made decisions as needed. The committees also provided the interface for all of the above partners to participate interactively in the administration and conduct of the project.

The coordination committee comprised the president of OSSD, the director of CPS, a physician from the hospital in Savalou, a volunteer from OCSD and the
three co-principal investigators of the project during the time that they were onsite in Benin. This committee oversaw the operation of the project, made all decisions regarding expenses and reviewed suggestions originating from the marketing and survey committees.

The survey committee was composed of NYONA members, a representative of OSSD, an OCSD cooperator and Canadian researchers (when onsite in Benin). This committee discussed the technical aspects of the research, finalized the study instruments, and supervised the conduct of the research (i.e. determined the local perception of the importance of malaria and local practices of prevention and treatment; compared the socioeconomic profiles of users and non-users of bednets; described the use of bednets; determined the costs related to the prevention and treatment of malaria; and evaluated the use of bednets in the study population).

The marketing committee consisted of a representative of OSSD, a villager, a businessman, members of NYONA, an OSCD cooperator and Canadian researchers when onsite in Benin. This committee was responsible for the development of a marketing strategy and for executing any activities related to this development. In addition, based on information gathered from KAP surveys conducted in the study population, and from their own experience and observation, this committee developed the communication tools which would be used to promote bednet use.

Self-financing and fiscal responsibility for the local production of bednets

Our a priori contention was that the local production of bednets be a profit-generating enterprise. Consequently, the members of NYONA were selected to assume the overall responsibility for production of the bednets. This aspect of the project ensured a continuing and sustainable activity.

It is known that much of the sustainability of bednet utilization depends on the quality of the netting (e.g. that it be strong enough to withstand daily use). Because good quality netting could not be obtained locally it was imported from Canada. The netting was polyester (multifilament yarn, denier 70, 156 mesh), and imported in rolls of 200 metres per roll. Several NYONA members were enrolled to make the nets. An extension was built onto the existing building where NYONA was located and nine sewing machines were bought.

In order to be self-financing, the cost of the bednet was calculated to include all recurrent expenses related to the manufacture of the net, the cost of insecticide, transportation and manpower costs. The retail cost of a bednet was set at 3000 FCFA (US$ 10.50). In 1993, a first batch of bednets was made available for sale (approximately 550 bednets). There was great enthusiasm and these were sold quite rapidly. As customers were largely from urban centers, it became clear that subsequent batches should be made accessible to rural residents. However, subsequent to a 50% devaluation in the FCFA in January 1994, there was an increase in the cost of the imported netting. To keep the cost affordable while increasing accessibility to rural residents as had been planned, it was decided to contain the cost of the second batch of bednets until mid-August 1994. In addition, a reduced promotional price of 2500 FCFA (US$ 4.38, post-devaluation) was offered over a two and one-half month period. Subsequently, the price rose to reflect the increase in the cost of the netting. In addition, a price structure was instituted according to bednet size: 4500 FCFA for single bed size (1m x 2m x 2m), 5500 FCFA for double bed size (1.5m x 2m x 2m) and 6500 FCFA for a king size bed (2m x 2m x 2m) (respectively, US$ 8.50, US$ 10.00 and US$ 12.30). These prices included the cost of the initial insecticide impregnation only.

Whenever project activities were held at the village level, bednets were brought along and farmers could directly order and/or buy them on the spot. Bednets from the second batch continued to be sold after the price increased and a third batch is presently being sold. Netting accounts for approximately 65% of the cost of a bednet, transport to Benin 13%, customs fees and transport to Savalou 5%, permethrine 6%, labour 7% and miscellaneous repairs and machine maintenance 5%.

Appropriate action

Before undertaking the large-scale manufacture of bednets and a local advertising campaign to promote bednet use, an in-depth knowledge of the population's beliefs and practices with regard to malaria and malaria prevention was needed. It was also necessary to establish the times of income generation so the people could pay for the bednets.
Different methods were employed to obtain this information. These included semi-structured interviews, in-depth interviews, focus group discussions, a KAP questionnaire, bednet demonstration workshops and direct observation. NYONA and OSSD were both intimately involved in the development and conduct of these information-gathering activities. Modifications to the questionnaires were made in collaboration with the Canadian researchers. NYONA was responsible for the administration of the study instruments.

The experience of the members of the marketing committee, in addition to that of the key local individuals and the knowledge accrued from the KAP study, oriented the advertising campaign to promote malaria prevention activities through the use of bednets. The words and slogans used reflected an in-depth knowledge of the national language (Fon). Local artists were involved in drawing up the illustrations used in the advertisements. The campaign consisted of a mobile theatre, a choral group, posters, calendars, brochures, stickers and T-shirts.

All communication tools were pre-tested in the field so that the messages given would not be misinterpreted. Final versions of the tools were obtained only after repeated discussion and modification.

It was difficult to assess which specific promotion campaign method was the most effective, but field observation indicated that the mobile theatre was very popular. More than the other instruments, this has the greatest potential to reflect the local reality. It allows interactive participation and, if playing on a market day, it can attract huge audiences. Feedback is direct with modifications enhancing subsequent performances. Finally, the cost (which is mostly related to the transportation of the theatre troupe) is quite low and less expensive than posters. There were 18 performances by the theatre troupe costing US$ 600 while the 400 colour posters cost US$ 700.

**Third level: results**

Between May and September 1994, a total of 2000 permethrin-impregnated bednets were sold: 700 to residents of the zone (population 19 000) in which the project was undertaken and 13 000 outside of the project zone, mostly from large cities. Some nets were bought by persons in the study zone to be given to relatives living outside the zone. Bednets were available to people outside the project zone (i.e. in more rural areas) only from June 1994.

Bednet utilization was determined within the parameters of a longitudinal study on bednet use in the project zone in November 1994. In zones where the longitudinal study was not implemented, a prevalence survey was undertaken to establish the rate of utilization among women and children. Table 1 shows that after 6 months of bednet sales, 15% of woman/child units used bednets, at least doubling the estimated pre-study levels of traditional (non-project) bednet use (estimated at 15% for all users, with less than half of users being woman/child units). Reassuring for the success of the project was the greater number of impregnated bednets used by woman/child units rather than by adults alone.

**Participation of local human resources**

According to several indicators, the project's approach in partnership enabled the non-governmental groups to gain experience in the operationalization of a development project, and specifically with its management and implementation. For example, these groups now use focus group discussions to obtain information on other topics such as child nutrition practices. The profile and reputation of the groups was heightened through the project. This resulted in an increase in their credibility with the local population. The human resources in Savalou were enriched by this research experience and the level of local expertise increased. This ensures sustainability not only of the project but of a wider range of development activities in the area.

**Bednet production by the local population themselves**

Gave them pride in their capacity to address an

<table>
<thead>
<tr>
<th>Table 1. Utilization rate of insecticide-impregnated bednets in the urban and rural zones of Savalou, Benin, 1994</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow-up study</td>
</tr>
<tr>
<td>rural</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>urban</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
important health problem and to be respected by the community. This was reflected in the slogans which were locally designed and promoted: ‘In Savalou, we make our own bednets: Made in Savalou’.

In addition to the creation of jobs, we observed an important mobilization of local human resources and natural leaders who participated actively on the different committees.

**Results on self-financing**

Bednets were purchased despite the rather significant outlay of money. Sales of the bednets have already generated some profits for NYONA, demonstrating that their production can be self-financing. Despite the setback of a devalued local currency which seriously threatened the enterprise, self-financing is still considered possible. Bednet production continues and sales continue to increase.

**Results of appropriate action**

The approach used was novel in that the local groups most involved in the production, sale, promotion and follow-up of bednet use were the ones that participated in the research. The participation of key local persons produced tools adapted to the population. This approach facilitated the collaboration of health agents, of group members, of local artists and of businessmen. It integrated practical aspects of the economic sector with the concerns of health agents and mothers. The project increased the local expertise of persons capable of producing pertinent and sensitive materials reflecting local perceptions and creating a sense of involvement.

Also, this process resulted in an easy to produce and acceptable bednet. For example, pre-testing determined that the shape of the bednet was rectangular rather than conical. This is because the local perception was that the conical bednet needed more seams (in fact, no conical bednets were observed to be available in the study area). More seams meant more weak points and a greater potential to tear. They also gave the impression that the bednet was second-hand or of poorer quality material resembling the traditional bednets found at cheaper prices in the local market. The rectangular model conformed to how people also used the traditional bednet (i.e. it was hung by its four corners).

The seamstress preferred a bednet that had a minimum of seams because it was fast and easy to sew.

Two heights of bednets were tested using the double bed size: a smaller rectangular 12 m² one (1.5m × 2m × 1.5m) and a regular 17 m² (1.5m × 2m × 2m) bednet. Participants preferred the larger one, despite its higher price. Such testing of dimensions is important to ensure that the bednet(s) distributed by agencies is culturally acceptable in the target population.

Regular mesh (156/inch²) was preferred to traditional mesh (practically no air circulation like bedsheet material). The material was strong (because of the multifilament yarn) but at the same time supple, and white was the preferred colour. Brown had been suggested as a bednet colour because of the perception that it reduced the dirty look brought about by a dusty environment. Also, a border, made of stronger material, had been suggested. Unfortunately, these suggestions were not retained because of concerns about the price, particularly in immediate post-devaluation times (see above).

Information on the shape, size, material and local costs of bednets enabled the production of a culturally acceptable bednet. The large size was especially appreciated even though this meant a slightly higher cost. Conical or smaller bednets measuring about 8m² would have been less expensive; however, they might have also reduced usage because of a feeling of claustrophobia or a higher temperature. It is possible that smaller bednets might have resulted in increased sales and might be attractive to funding agencies for this reason. However, the risk of reduced (long-term) use cannot be ignored.

From the perspective of disease prevention, bednet size is probably an important issue. The main physical discomforts attributed to bednet use were the increased sensation of heat and the feeling of being confined in a small space. Data comparing use of traditional heavy bednets and this project’s bednets have shown that the latter are more regularly used (unpublished data). During the warmer season and times of lower mosquito densities, smaller bednets are less likely to be used, thus increasing exposure to malaria. Additional observations in different populations would help to clarify the general and specific attributes of effective use.

Economic considerations should not therefore be the only ones taken into account in deciding on which type(s) of bednet to produce. It is essential to recognize that this type of population-specific information needs to be obtained prior to production.
The marketing committee relied heavily on the results of the KAP study in planning their advertising strategy. The fact that even when the mosquito was not considered to be the malaria vector, it was considered a nuisance which prevented a good night’s sleep, was used by the marketing committee in designing the message presented. It was also determined that adults were the main users of the bednets. Up to 50% of men may sleep without children, particularly if they are polygamous (approximately 30% of households), and up to 30% of women may sleep without their children.

To over-emphasize the effect of the bednet in reducing the nuisance factor of the mosquito would perhaps promote differential increased usage among men rather than women and children. The advertising campaign and the theatre shows therefore integrated reduction of the nuisance factor with protection of children and cost minimization. Although it may not be a direct result of our approach, we observed a higher rate of usage among women and children than among adults alone. We believe that the different studies we undertook in preparation for the promotion and production of bednets contributed significantly to the success of the project. Nonetheless, in any bednet programme, it would be important to monitor distribution of use in relation with sleeping patterns.

**Discussion: local production and distribution**

**Effects on human resources**

The worldwide strategy of malaria control incorporates the necessity that each country must assume its own local and competent control activities. It mentions the importance of strengthening local capacity in basic and applied research (where knowledge of the social, ecologic and economic determinants of the disease is essential) and the full active participation of the community.

In the application of participatory research the active involvement of local partners ensures their recognition and reinforces their competence. The interaction of the committees reconciled development objectives with research objectives and the results of the research were rapidly used to inform the development activities.

Local skills in health education, communication and health promotion improved notably. Planning a local community-based enterprise provided a focus for the development of human potential which would otherwise not have been developed. It also provided new information about the local communities and integrated research and development activities with success. A distributive approach for bednets would not achieve the same results (see Table 2 for a comparison of local production versus importation of bednets). This essential element of development, the development of human capacity, was clearly one of the achievements of this project.

Considerable effort was expended throughout the project to increase the management and organizational capacity of local partners. This was considered essential for the sustainability of the bednet initiative. As official partner for the project, the local NGO gained experience in the management of a major initiative, as well as the technical aspects of procurement. The NGO also gained national and international exposure for its work. For its part, the woman’s group was introduced to the techniques of financial and material management. The wide variety of project activities

<table>
<thead>
<tr>
<th>Specific actions</th>
<th>Local production of bednets</th>
<th>Distribution of imported bednets</th>
</tr>
</thead>
<tbody>
<tr>
<td>development of local partners</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>achieving objectives of bednet usage and reduction in morbidity and mortality</td>
<td>slower coverage but longer-term</td>
<td>+++++++ rapid coverage</td>
</tr>
<tr>
<td>local production</td>
<td>+++</td>
<td>+/−</td>
</tr>
<tr>
<td>profit-making with added value</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>profit-making in distribution</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>intervention adapted to local regions</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>improved understanding of the milieu by local partners</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>sustainability</td>
<td>++</td>
<td>+</td>
</tr>
</tbody>
</table>
was instrumental in developing their capacity to organize their human resources.

The local NGO came to the project with greater organizational capacity than the woman’s group. Though both organizations gained new knowledge and experience, the division of project responsibilities between the two did not permit the woman’s group to master many of the management skills needed to continue the enterprise after the end of the project. This factor, combined with intense gender dynamics and the attraction of a potentially profitable enterprise, led the NGO to take exclusive control of the enterprise once project funding stopped. In its favour, the NGO took this action in the name of sound management and durability.

**Economic aspects: self-financing and questions on equity**

Often, despite effective and available means of protection, programmes may not be successful. Vertical programmes oriented from the top down leave little room for involvement and implementation by local officials; examples are programmes of midwives and community health workers, water purification, vitamin A supplementation, family planning, and nutrition centres, among others.\(^9\,10\) The implementation of such vertically oriented programmes probably contributed to the discontinuation of primary health care programmes in many developing countries.\(^9\)

Due to financial constraints health care planners are increasingly resorting to selective vertical programmes.\(^11\,12\) These programmes were devised to target selective diseases with high morbidity and mortality, such as ORS in diarrhoeal diseases, vaccination programmes and vitamin A supplementation. With the recent successes reported from several trials of insecticide-impregnated bednet use in controlling malaria, there is enormous pressure to mount a free distribution programme for bednets, subsidized by the government. While there may be short-term gains, this approach does not offer long-term sustainability. Also, long-term usage is not certain. People tend to use a product differently if they do not pay for it themselves but receive it without charge. The free distribution of bednets would engender this type of passive attitude in contrast to the active attitude and participation offered by the approach presented in this project. Notwithstanding the difficulty in attaining health objectives, a free distribution approach weakens the health system rather than contributing to its maintenance and improvement.

In this project we have rapidly attained a significant degree of bednet use. This happened despite the fact that the bednets were available only in June 1994 whereas the local population’s disposable income was generated in February and March, and the population suffered from a drought with agricultural loss and a lower than expected density of mosquitos. At the pre-devaluation currency level, self-financing of the recurrent costs of the project was clearly possible.

It is therefore possible to locally finance the purchase of bednets in the rural setting. Promotion activities should encourage the community to buy the bednets. The actual sale of bednets should coincide with times when there is disposable income available (e.g. following harvest).

Devaluation of 50% caused a rise in the cost of the bednet cloth and consequently, the bednets. At the pre-devaluation cost of a bednet (3000 FCFA (US$ 10.50) and the 2500 FCFA (US$ 8.70) promotional price) we did not expect any problem with local sales. Economic problems arose post-devaluation as the poor could not easily obtain the money necessary to buy a bednet at the new price of approximately 5000 FCFA (US$ 9.50).

Income disbursements are such that the peasant will spend money when he has it in hand. From the focus group discussions it became clear that the Savalois frequently resort to credits available to them through credit on cash crops (like cotton) or to other credit mechanisms. These promising avenues of credit were not explored within the context of this project.

One ongoing concern is the supply of raw material in Savalou. The process of ordering rolls of netting from abroad posed many challenges. It required many administrative steps, often quite difficult and time-consuming to complete, and it is difficult to envision how small local organizations could maintain this activity. It would be far easier if rolls of good quality material were available in-country. If a multilateral agency would take on this responsibility, it would be able to negotiate lower prices from bigger orders of netting and pass along the lower prices to the clients.

With greater demand by urban residents, care should be taken to set aside bednets for the rural population. Efforts should be made to get the bednets to the
villages. If bednets are seen and available in the villages, then villagers will be more likely to buy them. In future work, we would like to undertake supplementary activities to get the bednets to the village level, for example through itinerant merchants.

Problems of equity associated with the programme are based on cost recovery, such as outlined in the Bamako Initiative. It is clear that despite adapting sales to local habits and customs, there will always be a proportion of the population who will not be able to afford bednets (though the exact proportion in Savalou was not estimated in this study). Complementary programmes focusing on the most disadvantaged segments of the population should be considered to address this problem.

As stated previously, the successful implementation of a development activity must be based on knowledge of the local population, otherwise there is a risk that the development activity will fail.\(^\text{13,14}\) Our project completed an in-depth baseline assessment within the community and periodic contact helped ensure that modifications to study instruments were acceptable. Unfortunately, we were not able to thoroughly study cash flow characteristics. As local credit mechanisms are potentially determinants of bednet use, they should be part of the baseline data base collection.

The alternative subsidized distribution approach does not hinder the development of effective communication tools; however, they have tended to be developed by professionals in capital cities with the end result that they fail to be appropriate for specific populations. Experts in communication in distribution projects may also collect pertinent data on the beliefs and practices of local populations but it would be exceptional for them to be responsible also for the development and implementation of the development activity.

The rationale behind bednet utilization is different from that underlying other community-based initiatives, such as the distribution of condoms to prevent HIV infection. The promotion of the condom relies on a social marketing approach for a highly subsidized product (the condom). This is necessary because the condom is little known, is not considered an acceptable practice, is difficult to manufacture locally and represents one of few available strategies for the prevention of AIDS. Also, it is very cheap and international donors are willing to support supply. On the contrary, the bednet is known, welcomed, widely used and can be made in many malaria-endemic areas. A local strategy of subsidized distribution may be more appropriate for the distribution of condoms than bednets.

**Conclusion**

Is the approach used in our development project replicable? Certainly, the selection of Savalou for the project was made because of the presence of certain prerequisites in the area: 1) malaria was an important health problem; 2) there were local, dynamic, and interested partners willing to participate actively in the project; and 3) there was a health intervention. The first and third prerequisites might be easily found elsewhere as malaria is a public health priority in many tropical regions worldwide and there are several preventive and control measures available. However, the second prerequisite, represented by the specific presence of the women’s group NYONA in our study, who took charge of the actual production and sale of the bednets, is probably not so easy to find in other settings. For the successful implementation of similar projects, we suggest it is essential to intervene in communities where interested local partners exist. It is also essential to maintain flexibility and adapt the project to their capacities and priorities. The absence of these partners could jeopardize the success of the project. We believe that one of the most important results of a development activity is the increased profile of the local partner.

**References**


Acknowledgements

This project was supported by the International Development Research Centre (IDRC), Ottawa, Canada, by the Association des Universités partiellement ou entièrement de langue française (AUPELF)/Universités Réseaux d’Expression Française (UREF) and, in part, by the National Health Research and Development Program through a National Health Research Scholar Award to Theresa W Gyorkos. We would like to thank Eglal Rached for her help in revising the manuscript.

Biographies

S Rashed, MD, MSc, CPSQ, is a pediatrician at Hôpital Maisonneuve-Rosemont and Adjunct Professor at McGill University Centre for Tropical Diseases, Montreal General Hospital. His special interests are tropical diseases and community health.

H Johnson, MA, is a partner with Management and Social Dimensions, CAC International, Montreal, and specializes in community participation.

P Dongier, MD, MSc, is a physician at Clinique Sante-Accueil, Hôpital Saint-Luc, Montreal, and specializes in community health.

CC Gbaguidi is President of Organisation Savaloise pour la Solidarité et le Développement, Savalou, Benin, and specializes in rural development.

S Laleye, BSc, is Director of Centre de Promotion Sociale, Hôpital de Savalou, Benin, with a special interest in women in development.

S Tchobo is project director and local coordinator with Organisation Savaloise pour la Solidarité et le Développement, Savalou, Benin, with a special interest in rural development.

TW Gyorkos, PhD, is an Associate Professor in the Department of Epidemiology and Biostatistics, McGill University, and Associate Professor in the Division of Clinical Epidemiology, Montreal General Hospital. His special interest is parasite epidemiology.

JD MacLean, MD, is Director, McGill University Centre for Tropical Diseases, Montreal General Hospital. His special interest is tropical medicine.

R Moreau, BSc, is a research assistant and cooperant for Organisation Canadienne pour la Solidarité et le Développement in Benin, and is based at the Department of Pediatrics, Hôpital Maisonneuve-Rosemont, Montreal. His special interest is community development.

Correspondence: Dr Selim Rashed, Département de Pédiatrie, Hôpital Maisonneuve-Rosemont, 5415 boul. de l’Assomption, Montreal, Quebec, Canada H1T 2M4