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Mid-Term Evaluation of the Cameroon River Blindness (Ivermectin Distribution) Program

October 4 - 22, 1993

by

Philip Boyle
Gilbert Burnham
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VBC Report No. 81505-2

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2

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Acronyms and Abbreviations

CAPP	*Centre d'Approvisionnement Pharmaceutique Provinciale*
CBD	Community-based Distributors
CMO	Chief Medical Officer
DEC	Diethylcarbamazine
GOC	Government of Cameroon
IDMS	Ivermectin Distribution Management System
IDP	Ivermectin Distribution Program
IEC	Information, Education and Communication
IEF	International Eye Foundation
KAP	Knowledge, Attitudes and Practices
MOPH	Ministry of Public Health
NGO	Non-Governmental Organization
NOC	National Onchocerciasis Coordinator
NOP	National Onchocerciasis Program
PCV	Peace Corps Volunteer
PHC	Primary Health Care
PHCC	Primary Health Care Coordinator
PVO	Private Voluntary Organization
RBF	River Blindness Foundation
RPHC	Reoriented Primary Health Care
SESA	*Soins de l'Enfant dans le Sud et de l'Adamaoua*
USAID	U.S. Agency for International Development
WHO	World Health Organization

Table of Contents

Executive Summary

1. Introduction 1

Background of the IDP Program 1
Evaluation Design 2

2. Major Findings 4

Epidemiological Surveys 4
Training of Community-based Distributors (CBDs) 6
Training of MOPH Staff and Supervisors 7
Educational/Motivational Activities 9
Record Keeping Capabilities 11
Adverse Reactions 14
Cost Recovery 16
Program Institutionalization 17

3. Discussion 20

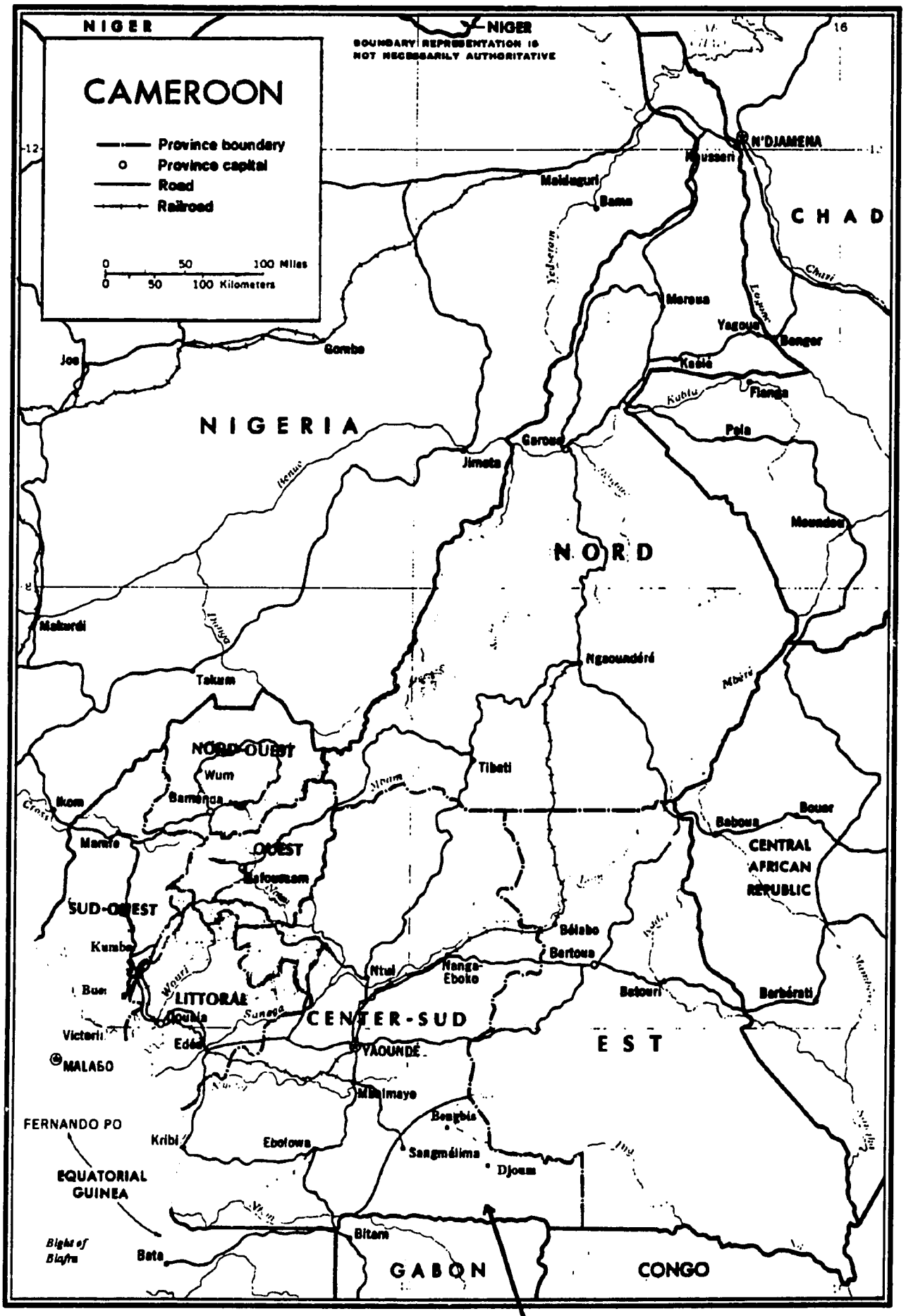
Epidemiological Surveys 20
KAP Survey 21
Record Keeping and Information System 21
Cost Recovery 22
Training of Health Workers 24
Training of CBDs 24
Health Education/Motivation 24
Distribution of Ivermectin 25
Adverse Reactions 26
Project Supervision/Management 27
Project Integration 28

4. Mid-Course Lessons Learned 29

Annexes

1 - Statement of Work 31
2 - Map of Cameroon Illustrating Major Known Foci of Onchocerciasis 44

3 - Evaluation Schedule 45
4 - In-Country Contacts 47
5 - Demographic and Health Statistics of Cameroon 50
6 - Organizational Chart of Provincial Ministry of Health 52
7 - Proposed Organizational Chart of Provincial Health Fund 53
8 - IEF/Cameroon Project Objectives 54
9 - Plan for Reorientation of Health Centers in Division of Dja et Lobo through 1996 56
10 - Actual Timeline of Project Activities 59
11 - Sample Revised Project Information Forms 61
12 - Project Forms 63
13 - Cost Recovery Analysis 71
14 - Related Documents 99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Bitam
Bight of Biafra
Bata
GABON
CONGO

Dja et Lobo

4

Executive Summary

The Cameroon River Blindness (Ivermectin Distribution) Program is a three-year project implemented by the International Eye Foundation (IEF) with $423,414 in funding donated by the U.S. Agency for International Development (USAID), $148,977 by the River Blindness Foundation (RBF), and $119,850 by IEF and the Ministry of Public Health (MOPH) in cash and in-kind assistance respectively. The purpose of the project is to assess the feasibility of using U.S.-based private voluntary organizations (PVOs) to strengthen the institutional capacity of indigenous health institutions to provide cost-effective and sustainable delivery of ivermectin for the control of onchocerciasis.

This debilitating disease is caused by the parasitic microfilarial worm, *Onchocerca volvulus*, transmitted by blackflies of the genus *Simulium*. Chronic, intense infections of the savanna strain of the parasite often lead to blindness. The vector typically breeds in fast flowing water courses, thus the more common name, "river blindness." The pharmaceutical manufacturer, Merck & Co., generously agreed to donate ivermectin for health-related programs in developing countries under the trademark, mectizan®. Results of clinical field trials worldwide have proven ivermectin to be the safest and most effective drug available for treatment of onchocerciasis and prevention of onchocercal blindness.

The project got underway during troubled times in the history of this sub-Saharan African country. At the same time as project activities commenced in early 1992, Cameroon was placed on the USAID watch list to be closely monitored concerning reform of its economic and political performance. The project site is located in the Division of Dja et Lobo, South Province on the periphery of the greater Congo river basin, one of the largest tropical rain forests in the world.

The project was adversely affected by poor communications and logistical infrastructure, an economy in sharp decline, and the social discord surrounding the presidential election held in October 1992. Under this constellation of obstacles, it was difficult to conduct project activities as planned. Survey work was often delayed, and some scheduled training and supervisory visits had to be postponed or cancelled for safety reasons.

In spite of the unforeseen circumstances that emerged during the course of the evaluation, the USAID/Cameroon mission was able to provide capable support to the evaluation team. The USAID/Cameroon health officer accompanied the team at one phase, provided a competent in-country field perspective, and contributed significantly to the successful outcome of this evaluation. Finally, analysis of the project budget was not included in this report since this was not part of the scope of work.

Conclusions

Under the circumstances described, it is commendable that the project was still able to attain most of its objectives. Other than the coverage rate for distribution of ivermectin, the project has the potential to achieve all other objectives by its completion date. Project accomplishments include:

- Both intensive and rapid epidemiologic assessment to establish the endemicity of onchocerciasis in the division of Dja et Lobo;

- Completion of the Knowledge, Attitude and Practices (KAP) survey to design, test, and deliver appropriate health education materials and messages;

- Development of the delivery protocol, materials and methods for tracking project progress;

- Successful treatment of approximately 17,800 persons for onchocerciasis during the first round of ivermectin distribution; and

- Training/supervision of health personnel (more than 100) in all MOPH facilities in Dja et Lobo Division.

It was further remarkable that these project accomplishments were achieved using only limited MOPH staff (one U.S.-trained Cameroonian physician). In spite of the unfortunate timing of the project, the integration of ivermectin delivery into the primary health care system is unique in the history of onchocerciasis. It may present the most pragmatic approach in the long term for disease prevention and control due to its high potential for integration into the indigenous health system.

Also, the inherent cost-effectiveness of this model will contribute to a program that is both sustainable and replicable.

Weaknesses, however, persist in some project components. The coverage rate for the first round of distribution was about 20%, well below the original goal of 80% of the eligible population. There were several inter-related factors that may have contributed to this shortfall:

- The mode of distribution (people had to be informed to seek out, travel to, and pay for treatment services at health facilities);
- Reduced time frame for development of consumer awareness and actual distribution; and
- The possible lack of demand for the drug in hypoendemic areas.

By August 1993, 34/42 of the reoriented health centers in the Division had treated about 17,800 persons with ivermectin, although exact numbers are lacking due to delays in collection of reports from the field. Consolidation and analysis of the data was hindered after the project computer became dysfunctional shortly after its arrival in-country. Also, the onchocerciasis treatment forms (oncho cards) were not sequentially numbered so that even manual tallys could be ambiguous at times. At the time of evaluation, project data was not maintained in one central location. Instead it was divided between the MOPH office, the project house, and elsewhere. Some data (and most of the analyses) were with the former project director who was completing his doctoral dissertation in the U.S.A.

After the initial epidemiologic surveys were conducted utilizing both intensive "skin snip" biopsy and rapid assessment techniques, the latter became the standard mode of assessment. Ophthalmic methods for establishing prevalence of blindness to correlate with onchocerciasis were not successful. It was surmised by the epidemiologists on the team, however, that even if a blindness survey were employed, the likelihood of finding a significant proportion of onchocercal blindness in this area would have been negligible considering the low intensity of infection reported and the presumed predominance of the less invasive forest strain of the parasite.

One proviso of the intensive assessments was that all participating villages would be treated with ivermectin by a mobile health team. Forty-eight of these villages were identified as high priority, with prevalence rates above 40%, and about half received active treatment. This activity was conducted appropriately during the project director's presence. During the brief tenure of the project assistant seconded by the MOPH, however, distribution was not carried out according to plan. Any resulting shortfalls were to be addressed during the remainder of the project with the principal focus being on the complete integration of the distribution process as part of the reorientation of the primary health care (RPHC) system of the MOPH.

Health education messages concerning guidelines for exclusion from treatment (pregnancy, breast-feeding, children less than 15 kg, or severe concurrent illness, etc.) and protocol for handling adverse reactions require reinforcement and standardization. Ironically, considering that ivermectin is one of the safest drugs available, persons may have withdrawn unnecessarily from treatment in some instances due to overly rigorous exclusion criteria. For example, the team observed that one health center warned the public to abstain from tobacco, alcohol, and sexual activity for a three-day period before and after treatment with ivermectin — obviously the independent action of a misinformed, over-zealous worker.

Also, an earlier concern raised during the preliminary epidemiologic investigations was that concurrent loiasis (another common filarial infection in the area) might increase the likelihood of severe adverse reactions to ivermectin. However, this was not observed in the project area, probably due to the low intensity of onchocercal infection and/or the less invasive nature of the forest strain of the parasite found in the Dja et Lobo area.

The oncho cards developed by the project have been sold for a fee of 200 FCFA (approx. $0.75 to cover a 10-year treatment period). This is a hypothetical time frame that takes into consideration the lifespan of the adult worm. However, based on the cost recovery analysis by M. Khan (Annex 13), the full cost of annual treatment via facility-based distribution was 114 FCFA not including fixed costs and staff salaries. Thus, it was recommended that an annual fee of not more than 100 FCFA be considered. This might not prove to be as great of an obstacle as some project staff may assume since Khan found that 98% of respondents interviewed would be willing to pay an annual retreatment fee. Moreover, the listed fees for more serious (life-threatening)

diseases in the area are significantly higher, e.g., the cost of the treatment regimen for an episode of malaria is 400 FCFA. Thus, in Cameroon, fees for retreatment may prove acceptable to a public that is accustomed to paying for health services.

Decisions need to be made as soon as possible regarding the use of cost recovery funds already collected, which for the most part, remain unused in postal accounts. These accounts were to have been set up by committees within health centers that were to be formed under the guidelines of the RPHC system. However, the active participation of some of these committees appeared to have faltered. This is most probably due to lack of supervision and motivation, since there were not always comparable guidelines established for the co-management of these funds. Thus, in some instances, sub-division medical officers established these accounts based on the advice of the former project director.

The new chief medical officer (CMO), appointed to head the MOPH of the Division of Dja et Lobo, recently returned after completing a graduate public health degree in the U.S.A. Already the new CMO has demonstrated considerable initiative and commitment to work with the PVO project staff toward meeting all mutual objectives.

While a new project director is being identified — the previous director having been transferred to another province, an interim management system appears to have been arranged between IEF and the Divisional CMO on an *ad hoc* basis. This should ensure that project continuity is maintained until new project management arrangements are formalized. This transition, fortunately, is taking place during the least active period of the distribution cycle.

Major Recommendations to IEF

If the major recommendations of this evaluation are addressed, the project should be able to fully integrate ivermectin distribution into the RPHC system by the revised date for the end of the project. No further donor assistance for this activity will be required, nor can be envisioned. The following recommendations are not necessarily listed in order of chronology or priority:

- A **plan** for the prompt **turnover of funds** already collected from the sale of oncho cards at health facilities in the project area should be developed immediately in coordination with provincial

health authorities, and for fees for services for ivermectin distribution by the MOPH in the future.

- Included in this plan should be a strategy for **phasing-out** all separate project forms and **phasing-in** only the essential information from these forms into the existing management information system of the provincial RPHC system, e.g., monthly activity reports, individual treatment cards, "carnet des soins," and *Centre d'Approvisionnement Pharmaceutique Provinciale* (CAPP) inventory reports.

- To strengthen health education messages to the public, standardized messages need to be formalized. This should be readily accomplished via an **integrated plan for retraining and supervision**. Thus, in-service training of health workers in health education, record keeping, distribution, treatment of adverse reactions, and supervision should take place on a regular schedule and monitored by project staff accordingly.

- Ivermectin should continue to be made available to all reoriented hospitals and health centers in the project area through the CAPP. However, **remaining stock** stored at project headquarters should be **turned over to and accounted for by** the RPHC program's provincial distribution system, CAPP, as soon as possible.

- **In spite of previous difficulties, the project computer should be replaced**, preferably with a reliable 386 notebook variety that has sufficient disk space and RAM memory to utilize the ivermectin distribution management system software (IDMS) already developed by VBC for all IDP projects. The new project director should become thoroughly oriented with the IDMS system in order to be able to train host country counterparts, e.g., the CMO of Dja et Lobo. In collaboration with the MOPH, the project director should determine by the end of the project exactly what data elements from the information system are to be incorporated into the RPHC information system.

- It is essential that IEF **hire a new project director** as soon as possible. Considering the current shortage of qualified in-country personnel and the remaining time in the project, it would be preferable if the person selected were an expatriate with sufficient primary health care experience, management skills, and cross-cultural maturity to work effectively with the new Division CMO

to ensure the complete integration of the project within the RPHC system by the revised project completion date. Previous experience in a similar capacity in a Francophone sub-Saharan African country is particularly recommended.

Major Recommendations to MOPH/Cameroon

- The provincial MOPH should consider **upgrading health centers** to reoriented status in sub-divisions that are hyperendemic for onchocerciasis (e.g., Bengbis and Djoum); however such a decision depends on multiple factors — the size of the population served, presence of a village health committee, accessibility to the area, etc. The project has already helped to accelerate the reorientation process by facilitating the formation of health committees at non-reoriented health centers that have distributed ivermectin and providing transportation (motorcycles) to improve access to these areas.

- Related efforts by other **private institutions** (e.g., the mission clinic in Oveng and the Nden private hospital) in the area are an important asset to the public health of the community. An appropriate mechanism should be developed to integrate these facilities into the RPHC cost recovery system whenever feasible. This would be both cost-effective and preclude needless duplication.

- The **IDMS software** could prove to be very useful in the computerization of data for the emerging National Onchocerciasis Program (NOP) in particular and the health information system of the RPHC. Since both of these systems will contain sufficiently large data sets and similar relational database designs, this type of system would be ideal, both in terms of its power and ease of use. Copies of the IDMS software and documentation were given to the national onchocerciasis coordinator and the director of the RPHC (SESA Project) for their perusal. If adaptation of this type of system becomes a priority, then limited additional assistance will be needed in order that these systems can be customized to meet the specific needs of programs.

- A **comprehensive plan** for the **full integration** of ivermectin distribution into the RPHC system should have been drafted at the two-year planning session for South Province held on October 25,

1993, in coordination with both project and provincial MOPH representatives.

- Lessons learned from this project can assist in integrating ivermectin delivery into primary health care activities in other areas of Cameroon, but **appropriate epidemiological assessments** should be conducted **well in advance of** any new project implementation. All prospective surveys should take place under the coordination of the NOP which has already begun the epidemiologic mapping of Cameroon based on a protocol developed from previous studies. New survey findings must be incorporated into the NOP database, which in turn should filter into the RPHC information system in order that policy makers can make appropriate public health program decisions based on the best available data.

- Considering the concomitant burden of life-threatening diseases and the established mode of delivery already in place in Cameroon (i.e., fees for services), it is likely to prove necessary that **a high prevalence rate of blinding onchocercal infection is a prerequisite to create sufficient demand for ivermectin** and the rationale for its inclusion as an essential drug in hyperendemic areas. Hence, ophthalmic surveys to determine blindness must be conducted in concert with rapid epidemiologic assessment methods to determine the priority warranted. Such an approach is essential in order that the limited resources of service providers and consumers may converge. Hence, the demand created can then be sustainably addressed over the longer term.

1. Introduction

Background of the IDP Program

The USAID-sponsored Ivermectin Delivery Program (IDP) is a pilot effort in selected endemic areas of Africa and Latin America. The purpose of the three-year program is to assess the feasibility of using U.S.-based PVOs to strengthen the institutional capacity of indigenous health systems to provide cost-effective and sustainable delivery of ivermectin for the prevention of river blindness.

The IDP is a collaborative effort comprising PVOs, host country Ministries of Health, USAID missions, and the Office of Health, Bureau for Global Programs and Field Support, USAID/Washington. The PVO is responsible for implementing the IDP within the framework of the host country's national onchocerciasis program. Program management and oversight is normally the responsibility of the USAID mission, except in Guatemala where the program is managed directly by USAID/Washington.

The mode of ivermectin distribution may vary significantly by location depending largely on national policies already established, e.g. in Guatemala delivery is based exclusively on active distribution by mobile teams, while in Cameroon it is facility-based. Whatever the mode, appropriate epidemiologic surveys are required prior to commencement of distribution activities. These assessments establish the levels of endemicity of the disease in order to target villages for appropriate intervention with ivermectin. In the case of Cameroon, the PVO facilitates the formation of local committees, initiates the training of personnel at health facilities in the intervention area, and conducts the requisite IEC activities necessary to create an awareness and subsequent demand for the treatment regimen.

The early rounds of drug distribution are managed by the PVO, after which the entire process is gradually integrated into the established health care system. Because the mode of delivery is established largely by local government policy, coverage rates for distribution of ivermectin cannot be used exclusively as a comparable indicator of success in these projects. Given the limited time frame for these pilot projects and the chronic difficulties facing indigenous health care facilities, particularly in sub-Saharan Africa, the greatest challenge for the PVO will be to find

17

the appropriate mechanism for the transition to total integration within the existing health care system.

Originally, joint mid-term evaluations for the IDP projects in Nigeria and Cameroon had been planned for July 1993. The political upheavals in Nigeria prevented USAID participation, however, and resulted in postponement. As a compromise solution, the Cameroon evaluation was followed by a joint-Nigeria/Cameroon IDP workshop on the topic of "institutionalization" that took place in Northern Cameroon as scheduled (see VBC Report 81505-3). A map illustrating the location of the project site, and the currently known major foci of onchocerciasis in Cameroon is found in Annex 2. Descriptive demographic and health statistics for Cameroon are located in Annex 5.

Evaluation Design

Mid-term evaluations are purposely formative by design. Such an approach is preventive in that basic assumptions are reappraised soon enough in order to recommend appropriate mid-course corrections. While it is useful to highlight the positive project achievements to date — of which there were many — the emphasis of such an evaluation must serve to elucidate those issues of most importance to successfully implementing the project.

The evaluation team consisted of three external evaluators (two epidemiologists with tropical diseases and PHC systems development experience, and an institutional development specialist). The three internal evaluators included: the national onchocerciasis coordinator, the PHC coordinator for the Cameroon MOPH, and IEF onchocerciasis program coordinator. Persons contacted and/or interviewed in-country are listed in Annex 4.

All issues were discussed at length by the team. There were occasions when the external and internal groups did not reach consensus on key recommendations, particularly regarding integration — to what extent and at what speed should project integration be accomplished. The external team unanimously saw the need for complete integration and as soon as possible. The internal evaluators more closely attached to the project did not want to see some of the previous efforts discontinued, e.g., the oncho treatment and adverse reaction forms. Such a response is understandable considering the efforts made in the development of the

13

project reporting system, and the concern that the MOPH might not be completely able to fulfill its own responsibilities in the process of integration.

A

2. Major Findings

Project objectives outlined in the project detailed implementation plan are delineated in Annex 8. Based on these objectives, a number of questions were outlined by category.

Epidemiological Surveys

Were surveys undertaken to establish the degree of onchocerciasis prevalence in all communities where the disease might be endemic?

Epidemiologic surveys may have been conducted in an appropriate manner based on the protocol presented in project reports. They were limited in scope out of necessity to include areas considered to be potentially endemic in the vicinity of the Dja/Lobo river system where the *Simulium* vector was thought to predominate. Degrees of disease prevalence were established by both intensive skin biopsy and rapid epidemiologic assessment techniques, but without the use of confirmatory ophthalmologically-sensitive blindness surveys. These activities took place under the supervision of the former project director, a Cameroonian physician with U.S. public health training in epidemiologic methods, and some guidance from his faculty advisor and the IEF onchocerciasis program coordinator.

The method of rapid surveillance developed by Brian Duke and validated by WHO/OCP was based on the presence of subcutaneous nodules or leopard skin. This procedure requires the examination of a sample of 30 men (more than 20 years of age) in a specific community. It involves less time and technology than established epidemiological methods. It was noted, however, that the sample size for these rapid surveys in Dja et Lobo was often below the sample's minimum number, thus reducing the statistical power for inferences to be made. Also, the criteria for the cut-off point for "high priority" villages were not available to the evaluation team along with the data analysis. Although less sensitive alone, rapid assessment may prove more appropriate when used in conjunction with a blindness survey for establishing levels of endemicity in the public health setting of sub-Saharan Africa.

20

Were the rapid assessment surveys adequate to classify communities by degree of infection, and were they conducted in time to guide program implementation?

The rapid assessment surveys did establish relative endemicity of onchocerciasis but were not accompanied by ancillary ophthalmologic surveys to establish prevalence rates for onchocercal blindness. Although there were delays encountered in this process, they were still conducted in time to guide project implementation. The focus shifted to the treatment of symptoms of onchocerciasis in general rather than the targeting of villages with disease-related blindness.

Were the targeted communities selected from these results?

Levels of endemicity were established based on survey results, although the rationale for these decisions was not available to the evaluation team. In villages where intensive assessments (skin biopsies) were performed, not all targeted to receive ivermectin via the mobile team received treatment. Apparently this was due to an aberration in protocol that occurred when the former project assistant distributed ivermectin indiscriminately in his own village in Sangmelima.

Can local officials and health professionals continue the use of these surveys to monitor disease prevalence in existing or future project communities?

Although this may not be applicable in South Province, the use of such surveys in the future would be appropriate in other areas that are both hyperendemic and have a high intensity of infection, e.g. in Adamaoua Province adjacent to the Nigerian border (as illustrated in the map in Annex 2).

Conclusions

The epidemiological assessments conducted from March 1992 through May 1993 appear to have followed the appropriate protocol for these activities. This cannot be stated definitively since the evaluation team did not have access to either all of the raw survey data or the subsequent analyses. However, an important deficiency in the epidemiologic investigation process was the lack of an ancillary ophthalmic survey to

correlate prevalence of disease-related blindness with onchocercal infection.

It is important to note that some of the delays encountered in the process were the result of the social discord surrounding the presidential election held in October 1992 and the poor condition of local roads, both beyond the control of project management. The complete data set and analysis of the data that apparently remained with the previous project director and his graduate school advisor. They were not available to either the IEF onchocerciasis program manager, MOPH, or USAID at the time of the evaluation.

Training of Community-based Distributors (CBDs)

Were CBDs trained?

No. This was due to the established policy decision of the MOPH that had to be complied with by provincial MOPH and project staff. However, initially the project staff had considered the possibility of utilizing CBDs in the distribution of ivermectin based on successful experiences observed in related projects (e.g. Africare/USAID/RBF Adamawa/Taraba Onchocerciasis Project), but plans were adjusted according to the previously mentioned policy decision.

How will long-term distribution activities be conducted in the absence of community-based distributors? Is this alternative reasonable?

Distribution is based on community demand for the drug. As ivermectin becomes introduced as an essential drug in the inventory of the RPHC system, however, distribution can continue as long as there is demand for treatment. This alternative is not only reasonable, it may be the only viable option in the longer term. Without intensive public awareness efforts, such an approach is not likely to yield coverage rates as high as when the drug is actively distributed by CBDs.

Does the decision to abandon CBDs seem well-founded in retrospect? What is the potential for employing CBDS after all?

This is impossible to determine because the deployment of CBDs was not attempted during the project. The MOPH became discouraged after previous attempts to utilize community health workers based on the Alma Ata model for primary health care were not satisfactory due to problems related to incentives and supervision. Hence, that model was abandoned in favor of the current mode of a facility-based cost recovery scheme derived from the Bamako Initiative.

Conclusion

The long-term potential for employing CBDs cannot be evaluated in Cameroon in spite of the impressive short-term successes observed in the neighboring Nigerian IDP model. In the larger context, considering the heavy burden of disease in sub-Saharan Africa, the use of CBDs solely for ivermectin distribution might be impractical and unethical. On the other hand, CBDs (with the appropriate training, incentives, and supervision) could conceivably become the viable conduit for primary health care intervention at the community level, and thus extend essential primary health care services beyond the reach of the district health facility.

Training of MOPH Staff and Supervisors

Did the training of health supervisors occur in a timely manner and have the new skills been applied appropriately in the field?

Yes these activities occurred in a timely and appropriate manner, but there is further need for consolidation, standardization, and regular monitoring.

Do MOPH officials have the capacity to appropriately supervise local MOPH and PVO personnel in the financial and managerial maintenance of the ivermectin delivery system?

Yes, although this was not evidently a priority of the out-going CMO, who apparently refrained from supervision activities in the sub-divisions. The recently appointed CMO has already demonstrated supervision capacity.

Hopefully training will continue, although any training beyond the life of project will by definition have to be integrated into the in-service training of the RPHC system. However, these details still need to be developed as part of the overall project integration plan.

Has the use of Peace Corps volunteers (PCVs) as counterparts to PHC coordinators been effective in improving the coordinators' performance in supervising ivermectin distribution and its integration into the primary health care system?

No, although the presence of PCVs as counterparts became an important part of project implementation, their presence had often limited utility in improving the performance of PHCCs. In some cases the PCV actually managed the forms and stock of ivermectin at the health facility instead of the PHCC. Although the role of a counterpart is stipulated in a PCV's job description, it is difficult to predetermine the outcome of such arrangements since they depend mostly on the initiative of the host country institution for compliance. Where morale is low (as witnessed in the project area), the PHCC might be tempted to rely on PCVs to perform their job for them. The PHCCs seem to hold no official MOPH responsibility toward the success or failure of the project in their sub-division. However, some PHCCs were found to be exceptionally motivated and effective, e.g., the PHCC in Djoum. In contrast, the PHCC in Sangmelima appeared to be disengaged.

Conclusion

At least one health worker was trained in each functional health center of the five sub-divisions in the following activities: distribution of ivermectin; motivation and education of the population; treatment of adverse reactions; and record keeping. This was accomplished after a three-day training in each sub-division. Additionally, five PHCCs and three PCV counterparts were trained in rapid epidemiological assessment methodologies in March 1993. MOPH staff motivation may prove to be a critical factor during the rest of the project, particularly if health personnel do not receive their salaries. Current realities in the Cameroonian government's personnel system make it practically impossible to hire or fire an individual based on their performance. Usually the only action taken is that a worker is transferred to another province (as was the case with the out-going CMO).

Educational/Motivational Activities

Was a KAP survey conducted to assess the level and form of public awareness of onchocerciasis and to identify appropriate methods to educate and motivate target communities to sustain participation in the ivermectin distribution program?

Yes, after field testing in February 1992, the KAP survey was conducted in July 1992 in areas of Djoum and Sangmelima sub-divisions. The survey provided some insight regarding community behavior and perceptions regarding filarial diseases. The local communities appeared to be more familiar with loiasis (another common filarial disease) than onchocerciasis which is understandable considering its more obvious symptoms — adult worms can be seen migrating across the conjunctiva of the eye. The results of the KAP were used largely to develop IEC messages to increase awareness of onchocercal disease and ivermectin. Since prevalence rates appeared to be higher within proximity of the Dja river, it became known on the oncho brochure as "maladie du Dja."

Has an effective IEC program been mounted to inform communities of the symptoms and dangers of onchocerciasis?

The IEC activities could be deemed ineffective, perhaps, considering the low coverage rates after the first round of distribution. However, one must also consider the mode of distribution (persons must seek and pay for treatment at health centers), the reduced time frame for development of consumer awareness and actual distribution (less than a year), and the possible lack of demand for the drug in some hypoendemic areas. The distance between potential users and the health facilities may also be a critical contributing factor.

Has an appropriate IEC program been carried out to promote public acceptance of annual doses of ivermectin?

Yes, and IEC campaigns in each sub-division are planned by the MOPH through the life of the project. It is unlikely, however, that there will be a uniform high demand for ivermectin in all project sub-divisions that will be sufficient to prompt a return for a repeat treatment over the recommended 10 years.

25

How have health center staff and local organizations been involved in IEC activities?

In general, the IEC messages and oncho brochures are delivered at the health facility, although additional IEC activities were carried out during active distribution by mobile teams. Also, promotional activities were conducted at schools in the area, and the private sector has been involved (e.g., the mission in Oveng). Recently, the new CMO took the initiative to mount an IEC campaign in the Sangmelima sub-division with the cooperation of the local government. Plans have been made to expand this activity to cover all of the remaining sub-divisions of Dja et Lobo in 1994.

Has a sustainable incentive system been created to motivate field work by public and private health workers in the absence of CBDs?

The creation of an incentive system was not considered necessary because all staff at health facilities are supposed to be paid monthly salaries. However, this has been temporarily disrupted due to the current financial difficulties of the Government of Cameroon (GOC) which has precluded the disbursement of staff salaries at the MOPH for several months.

Will the IEC and incentive systems outlive the departure of IEF?

IEC activities can only be continued as part of the overall IEC strategy of the RPHC system. Thus, considerable advocacy will be required by IEF to ensure that IEC activity relevant to onchocerciasis is included in training modules for the reoriented health centers.

Conclusion

IEC activities consisted primarily of community mobilization for the onchocerciasis campaign and a major health message delivered at the time of treatment. Health workers were to explain the cause of the disease, treatment protocol for ivermectin, possible adverse reactions that could be encountered, and where to seek treatment for the latter. This message was complemented by a well designed "oncho" brochure that was given to each recipient during treatment via active or passive distribution. There remained problems to be resolved, however, regarding messages involving cost recovery, exclusion criteria, and

adverse reactions, albeit based on a limited sample of recipients interviewed.

Record Keeping Capabilities

What are the report forms used by IEF in the conduct of its program? Do these reports capture appropriate information efficiently?

Forms include the oncho treatment form (oncho card), adverse reaction form, and supervision form (see Annex 12). Although the information appears to have been collected efficiently by health personnel, the process is time consuming and in the long run a separate information system is not likely to be sustainable by the MOPH.

Are the health workers correctly using ivermectin treatment records and the report form for adverse reactions?

In general, the workers appear to have used the forms correctly, although there is considerable room for consolidation of these skills. Enumeration of the forms would have made filing considerably easier.

How is health information generated and is it transmitted in a timely manner to key program managers?

One oncho card is given to the client and a copy is maintained at the health facility. Also, adverse reaction forms are kept at the facility. There have been delays in the past in the process of information from these forms reaching the central office due to difficulties in transportation. This problem should be ameliorated with the recent introduction and/or repair of motorcycles in the sub-divisions and the implementation of a system of regular supervision.

Is the health information system computerized?

No, the project computer system broke down shortly after arrival in-country, and the laptop that was sent to replace it also failed to work. As a result, the former project director found it necessary on a number of occasions to travel to the capital, Yaounde, in order to use the computer at the MOPH (SESA) office. Also, the previous computer was an older version (pre-386) that could not utilize the IDMS system

27

software developed for the project. It remains to be seen if IEF will bring out a suitable 386 laptop with the IDMS system installed in order that it can be transferred to the MOPH by the end of the project.

What techniques of assembling and disseminating information are now used by local public and private health workers?

Summary reports from the cards maintained at health facilities were hand tallied and consolidated by the project director in Sangmelima. Results were then forwarded in quarterly reports to IEF headquarters in the U.S.A.

Is there a financial monitoring system appropriate for transfer to local government officials and health workers?

No, not yet. Funds from sale of oncho treatment cards are being held mostly in postal accounts set up by health center committees. Such a system should be in the process of development after the October meeting of the South Province MOPH delegation.

Is there a monitoring and evaluation system for project impacts separate from ivermectin distribution data or financial and logistical monitoring? Are follow-up surveys planned or being carried out in treated communities?

No. It is unlikely that follow-up surveys will be carried out after the project is completed. It is doubtful that a follow-up impact survey would yield any useful new data considering the short time frame for actual distribution, and the low intensity of infection generally observed. Also, it is unlikely that the National Onchocerciasis coordinator would resurvey areas already identified as endemic, since there is the higher priority to survey all new areas where onchocerciasis may have serious public health implications. Also, this activity has only limited external support, i.e., a small grant from the Tropical Diseases Research Branch of the World Health Organization (WHO) and possibly from NGOs in the area.

Conclusion

A simple data collection system was developed using appropriate indicators based on the Mectizan Expert Committee and Cameroon National Onchocerciasis Program guidelines. At this time, however, the

information system has not been automated due to equipment failures. Thus, it has not been fully utilized to ensure effective project supervision and management. A mechanism has not yet been established for the integration of project data into the RPHC information system.

Was the eligible population effectively reached in all endemic communities?

This cannot be assessed definitively considering that distribution has only taken place for about a year. The mode of distribution assumes that an awareness and demand for ivermectin is created, resulting in treatment obtained at a local MOPH facility. Thus, one would have to assess the local demand for treatment to determine the effectiveness of distribution. Considering the compressed time frame for IEC and distribution activities, this might be more feasible at the time of the final evaluation.

What plans have been made to ensure that local transportation and infrastructure can sustain distribution beyond the project?

The project purchased a 4-wheel drive vehicle for the central office in Sangmelima, and motorcycles were provided in each target sub-division. This was considered essential considering the poor condition of the roads and the limited number of vehicles available to the MOPH. There were some concerns raised that motorcycles might be too dangerous to use during the peak of the rainy season, but that could be true for any vehicle.

From the IEF experience in Cameroon, what indicates that PVOs can mount campaigns to distribute ivermectin in a cost-effective, sustainable manner?

Under difficult circumstances, IEF was able to ensure that in less than one year more than 17,800 persons were successfully treated for onchocerciasis. This was largely achieved by the purchase of treatment directly at a community health facility managed by MOPH personnel. [Note: this is not a particularly appropriate question, since campaigns by nature are generally not sustainable.]

Conclusion

The coverage rate for the first round of distribution was about 20%. That is, 17,800 of 92,000 eligible recipients (65% of total population of 142,000) were treated between August 1992 and August 1993. However, as would be expected, the coverage rate for the older population groups (more than 50 years of age), those more prone to have severe onchocercal infection, was significantly higher, roughly 40%. Also, of the total recipients treated, 20% were reached by active distribution and 80% treated passively. Active treatment was conducted in all sub-divisions except Zoetele, an area of low prevalence of infection.

By August 1993, 81% of MOPH health facilities were distributing ivermectin (34/42), although a few private mission dispensaries were also included. The correct dosage of the drug appears to have been maintained by health workers, but the criteria for exclusion from treatment was not always correctly understood. The common message, for example, to refrain from alcohol and tobacco consumption for three days before and after taking the medicine may have reduced the number of recipients. Some individual workers even suggested abstinence from sex. About 50% (17/32) of the higher infection rate villages identified received ivermectin via active distribution as had been planned. Ivermectin was made available at all sub-division hospitals; however, access via either active or passive distribution was uneven.

Adverse reactions

Were the Merck guidelines understood, communicated, and properly observed in all project communities? If not, how can they be more fully observed?

Yes, in general. However, there were anomalies observed at some health centers. A regular schedule of in-service training and supervision will be required to ensure a consistent, standardized approach.

What evidence exists that the Merck guidelines will be observed fully after the project is ended?

The majority of the health services providers in the area have already been trained regarding the guidelines for treatment of onchocerciasis with

ivermectin. Plans for the incorporation of an onchocerciasis training model into the RPHC in-service training program would ensure that new workers receive appropriate training regarding these guidelines.

Conclusion

Ivermectin appears to be one of the safest drugs available in the primary health care system inventory. In perspective, it is important to note that to date there have been less serious adverse reactions reported from ivermectin as from the common childhood immunizations. In Dja et Lobo, a few mild adverse reactions (less than 1%), and no serious adverse reactions were reported, although the passive mode of distribution would have contributed to under-reporting of mild reactions. This under-reporting of mild cases may actually benefit the over-worked health facilities in question, according to one evaluator.

As is commonly observed in distribution programs of this type, several unfounded rumors emerged regarding the drug during distribution rounds. It is notable that no deaths were definitively linked with ivermectin. Even so, it is important that a system is in place whereby rumors are dealt with promptly in order to prevent unnecessary withdrawals from the program. Adverse reactions are currently recorded on project forms maintained at the health facilities. It would be unrealistic to expect the MOPH to continue to track mild reactions to ivermectin, mainly pruritis, considering the constellation of more serious health priorities facing rural Cameroonians. It may also prove unnecessary to separately track individual treatment regimens, if this is included in the *carnet des soins*. According to one evaluator, it is unlikely that a person would acquire a significance increase in risk of adverse reaction by taking the drug more than once in the same year.

The presence of concurrent loiasis (another local filarial infection commonly reported in the area) did not appear to contribute significantly to adverse reactions, according to a sub-study carried out on a small sample of four villages in Bengbis sub-division. This study, however, lacked sufficient statistical power to draw conclusions. Again, the full data set and final analysis were not available at the time of the evaluation.

Non-reoriented health centers lack the ancillary medicines to treat adverse reactions, i.e., aspirin and antihistamines. These drugs,

31

however, were provided on occasion by the project during active distribution campaigns. Recipients were asked to report back if necessary to their respective distribution sites one or two days later, where the mobile team would be available to treat adverse reactions. Thus, where distribution has been conducted via the passive mode, these centers can only refer adverse reactions to the nearest reoriented health. Some centers are more than a day's walk away.

When the project director was in-country, the project had the capability to effectively deal with misinformation regarding adverse reactions. But the initial message is clearly not sufficient in some cases, and lack of supervision could lead to distorted messages and possibly reduced coverage rates, e.g., the message to abstain from tobacco, alcohol, and sex three days before and after treatment.

Cost Recovery

Was distribution carried out at least cost?

Definitely yes, at least in comparison with other modes of distribution (see Annex 3, Table 8 for figures) and considering that fees were collected for treatment.

What were the various options and their costs for carrying out the desired distribution program?

Considering the national RPHC policy regarding fees for services and the discontinuation of the use of village-based health workers, the only option available to the project was the passive distribution mode already in place at health facilities in the division. The limited active distribution that took place by mobile health teams was meant to be a one-time event as a reward to persons who participated in the skin biopsy survey. The start-up cost for the project were extremely modest, and the vehicles and equipment introduced by the project will serve the MOPH for years to come. One internal evaluator did note that during the first year of the project a disproportionate amount of funding was used by Tulane University. This was corrected later on in the project.

Have cost recovery schemes been employed and with what likelihood for sustainability?

Yes, a fee of 200 FCFA was charged for the treatment card. It was suggested that an additional reduced fee (e.g., 100 FCFA) may be required for each repeat treatment, according to the economic analysis study undertaken for the project.

Conclusion

In accordance with the MOPH policy mandating cost recovery in its RPHC system, the project developed a cost recovery system for treatment of onchocerciasis with ivermectin. An initial fee of 200 CFA was charged to cover costs of the oncho cards and delivery of ivermectin to the recipient for a 10 year course of treatment. Early on, the project facilitated the formation of health committees in accordance with initial RPHC plans to decentralize use of funds generated by sale of medicines at health facilities. Revisions to the RPHC system were made after the first year of the project resulting in the more centralized and effective management of revolving funds via the new provincial pharmacy system, CAPP.

Collection of fees for oncho cards generally took place as planned. There remained some uncertainty regarding use of these funds by personnel at peripheral health facilities due to the lack of clear guidelines. However, most of the funds generated from the sale of the oncho cards remained unused in sub-division postal accounts. The one exception was Sangmelima sub-division where most of these funds were unaccountable during the brief tenure of the project assistant, who was promptly fired (i.e., transferred back to the MOPH) upon the return of the project director.

Program Institutionalization

Has IEF demonstrated a progressive shift in responsibility from PVO staff to Cameroonian counterparts in the implementation of the IDP?

The bulk of project responsibility for project implementation has always resided with MOPH staff, which is a unique feature of this project in the history of the Ivermectin Distribution Program.

Do these counterparts demonstrate the ability to continue the IDP at the end of the IEF project?

There appears to have been a lack of commitment by the former CMO of the Division, project assistant, and by the PHCC in Sangmelima. With the arrival of the new CMO, who has demonstrable skills, motivation, and commitment, however, the MOPH should readily have the capability to continue IDP activities as an integrated part of the RPHC system as long as he is retained in Dja et Lobo.

Is there a structure in place that promises a successful transfer of project responsibilities to local counterparts?

Not yet, although the October 25 planning meeting of the provincial MOPH developed a plan for such a transfer to take place via the integration of all project activities in to the RPHC system by June 30, 1994.

Is there evidence that IEF may succeed in assisting in putting in place such a structure?

Yes, that is, if IEF is able to find a new project director relatively soon and follows the guidelines established by the plan.

What training needs remain and what plans have been made to complete them by the project's end?

Retraining will be needed at all reoriented health facilities, and particularly those that have not yet distributed ivermectin. If new PCVs arrive (this is uncertain) to replace those who are completing service, they will need training as well. The new project director will need to have an intensive training orientation to the program.

What evidence exists that the PVOs were cost-effective and efficient agents for institutionalizing sustainable systems and procedures at the local governmental and community levels?

The PVO has been extremely cost-effective considering that all of its staff were local-hire Cameroonians or seconded from the MOPH. In fact, its over-reliance on MOPH personnel (admirable in principle) in the early phases of operation probably reduced its short-term effectiveness. Currently it needs that critical mass of institutional presence in-country to ensure that integration proceeds according to plan.

Was the three-year time frame for the project realistic for accomplishing full integration of ivermectin distribution activities into the primary health care system?

In retrospect, no, considering the delays encountered in project implementation have reduced the actual time frame for complete integration to about two years. Also, the current rate at which health facilities in the division are being reoriented means that the project will have to integrate into a smaller system if the current rate of reorientation is maintained.

What progress has been made by the project in integrating ivermectin distribution into the USAID-funded primary health care program in Dja and Lobo Division of South Province?

Progress has been substantial, but much work remains to be accomplished. Formative decisions were to have been made among officials from USAID/Cameroon, the provincial MOPH, and project affiliates at the October provincial meeting to develop an overall plan for the integration of project activities by the revised close of project date. These decisions would most probably include: integration of ivermectin into the RPHC CAPP system, essential project information collection into the RPHC information system, treatment of onchocerciasis at reoriented (and newly reoriented) health facilities, and training, supervision/monitoring activities within the RPHC system as related to the project.

3. Discussion

Epidemiological Surveys

Since the national onchocerciasis policy is driven by overall MOPH policy, this dictates that ivermectin must be distributed at health facilities based on both user demand and fees for services. Under these conditions, significant coverage rates to control the disease might only be achieved where there is a comparably higher proportion of blinding onchocercal disease, and/or where the disease is given the highest priority among the local inhabitants. Results from the KAP study suggest that many respondents were unaware of onchocerciasis, and/or confused it with the more common *loa loa* infection. Persons who had been present for active treatment sessions claimed to know about simuliid blackflies, but they could not differentiate these with the much larger (and aggressive) tabanid *Chrysops* fly of loiasis. Based on all focus interviews with MOPH staff and villagers alike, it became clear that onchocerciasis held a lower priority compared with the major health problems of the area such as *P. falciparum* malaria.

Lessons learned from this project can assist in integrating ivermectin delivery into RPHC activities in other areas of Cameroon, but appropriate epidemiological assessments should be conducted well in advance of any new project implementation. All prospective surveys should take place under the coordination of the NOP which has already begun the epidemiologic mapping of Cameroon based on protocol developed from previous studies. New survey findings need to be incorporated into the NOP database, which in turn should filter into the RPHC information system so that policy makers can make appropriate public health program decisions based on the best available data.

Considering the concomitant burden of life-threatening diseases and the established mode of delivery already in place in Cameroon (i.e., fees for services), it is likely to prove necessary that a high prevalence rate of blinding onchocercal infection is a prerequisite to creating sufficient demand for ivermectin and the rationale for its inclusion as an essential drug in hyperendemic areas. Otherwise, there could be too many competing demands on the limited resources of service providers and consumers.

36

The complete data set and analyses of all epidemiologic assessments made during the project should be retrieved from the former project director. A descriptive summary of all project data to date should be made available to the MOPH/Cameroon and USAID as soon as possible. This could be a task for the new project director, but may require assistance from IEF management.

KAP Survey

The previous KAP survey served its purpose in general. It is not recommended that another KAP survey be repeated during the remaining time left to project.

Record Keeping and Information System

Included in the overall project integration plan should be a mechanism for phasing-out all separate project forms and phasing-in only the essential information from these forms into the existing management information system of the provincial RPHC system, e.g., monthly activity reports, individual treatment cards, *carnet des soins,* and CAPP inventory reports. Thus, it would not be appropriate to recommend that the provincial health office maintain a separate information system solely for tracking the distribution of ivermectin after an adequate system is fully in place.

One evaluator prepared a sample health center monthly treatment record that simplifies the information in preparation for the eventual integration of ivermectin distribution into the RPHC system (see Annex 11).

A method of reporting needs to be developed by the project which will alert the National Onchocerciasis Coordinator when stocks are low. This is a requirement of the Mectizan Expert Committee.

It may be useful to have "ivermectin" stamps made for health center pharmacy clerks to record in their distribution ledgers, since this would be more cost-effective than having the ledger reprinted for the inclusion of one new drug and more formal than a hand-written entry.

In spite of the previous difficulties encountered by IEF, the project computer should be replaced, preferably with a reliable 386 notebook

variety that has sufficient disk space and RAM memory to utilize the ivermectin distribution management system software (IDMS) already developed by VBC for all IDP projects. In collaboration with the MOPH, the project director should determine by the end of the project exactly what data elements from the project information system are to be incorporated into the RPHC information system. It was observed that the CMO has considerable computer literacy; in fact, he even has his own 386 notebook. A viable 386 laptop computer could provide critical service for implementation of the developing RPHC information system beyond the life of the project.

The IDMS software could also prove to be very useful in the computerization of data for the emerging NOP in particular and the health information system of the RPHC in general. Since both of these systems will contain sufficiently large data sets and similar relational database designs, this type of system would be ideal, both in terms of its power and ease of use. Copies of the IDMS software and documentation were given to the national onchocerciasis coordinator and the director of the RPHC (SESA Project) for their perusal. If adaptation of this type of system becomes a priority, then limited additional assistance will be needed so that these systems can be customized to meet the specific needs of respective programs.

Cost Recovery

The project cost-sharing system for ivermectin delivery should be integrated into the RPHC system by the end of the project. It is already in existence in the Dja et Lobo Division of Southern Province. At the non-reoriented centers, the likelihood of continuing the distribution of ivermectin beyond the life of the project is extremely low considering that these facilities essentially lack all supplies and their staffs have not being paid their salaries for much of 1993. Under these circumstances, even if they were provided with a stock of ivermectin and drugs for adverse reactions, it is uncertain whether they could be expected to supervise and manage the proceeds from sales of oncho cards. It would be more appropriate for non-reoriented health facilities to refer clients with potential onchocerciasis symptoms to reoriented health facilities. Considering the less invasive nature of the forest strain of the parasite and the lower worm loads observed in this area, it would be highly

unlikely that anyone who was referred to another facility and defaulted would suffer from onchocercal blindness as a result.

Non-reoriented health centers, however, could be reoriented wherever feasible in all areas of Dja et Lobo that are hyperendemic for onchocercal infection. These newly reoriented health centers could profit more from efforts to organize their health area committees which ultimately would serve to prioritize the health needs of the communities and to provide a "voice" in the larger reoriented health care system. These decisions should be thoroughly delineated in the plan for integration of the IDP into the RPHC.

A fee for retreatment of 100 FCFA should be considered and tested on a trial basis. If proven successful, a standard fee should be integrated into the reoriented center's consultation list and posted with the rest of the fees. Funds collected in the reoriented centers should be merged with other funds via the CAPP. Fees collected in the non-reoriented centers will also be delivered to the district hospital CMO for merging with reoriented funds into the CAPP. Some portion of these funds should be earmarked by the CAPP to the district hospital for coverage of fuel costs for outreach and delivery of ivermectin to outlying, non-reoriented health centers.

Private health dispensaries, including those of religious missions, should be fully integrated into the IDP reporting and treatment fee system. Their funds should be collected and merged into the RPHC system. Some provision should be made to allow these organizations to defray the cost of fuel in distribution activities. Ivermectin should be delivered to them by the district or divisional CMO or PHC coordinator.

Money from all existing postal savings accounts and other account mechanisms should be turned over to the CAPP as soon as possible. These monies should, however, be reserved for reorientation of remaining health centers in each district. Monies collected in non-reoriented centers in the future will be supervised and collected by the district PHC coordinators or CMO's and combined with reoriented monies at the district capital where they will be taken over by the CAPP teams. Monies generated by sale of oncho cards at reoriented health centers should be automatically merged into the overall CAPP system.

Training of Health Workers

To strengthen health education messages to the public, standardized messages need to be formalized. This should be readily accomplished via an integrated plan for retraining and supervision. Thus, in-service training of health workers in health education, record keeping, distribution, treatment of adverse reactions, and supervision should take place on a regular schedule and monitored by project staff accordingly.

These refresher training courses should be conducted periodically. On-the-job training in ivermectin delivery should be conducted in health centers as part of supervision activities by district and divisional officers. This training will need to be integrated into the provincial PHC refresher training courses. By the end of the project a training module on onchocerciasis needs to be developed in collaboration with the MOPH for inclusion in the RPHC training program.

Training of CBDs

This should not be anticipated during the project considering the established policies of the MOPH that preclude the utilization of CBDs.

Health Education/Motivation

To strengthen health education messages to the public, standard messages need to be formalized. This should be readily accomplished via an integrated plan for retraining and supervision. Thus, in-service training of health workers in health education, record keeping, distribution, treatment of adverse reactions, and supervision should take place on a regular schedule and monitored by project staff accordingly.

A set of ivermectin messages for use with the public should be standardized and printed for health workers. There is particular need for a standardized, clearer message regarding what should be done in the rare event of a severe adverse reaction and how to differentiate a severe and mild adverse reactions. Standard language messages should be developed for the following areas: 1) nature of the disease; 2) frequency of treatment required; 3) treatment exclusion criteria; and 4) potential adverse reactions and their treatment.

Besides the excellent oncho brochures already distributed, appropriate and durable wall posters should be developed (or adapted from other related projects in the region), since the former are too small for this purpose. Also, a concise, durable (laminated) one-page handout describing the protocol for treatment of potential mild and serious adverse reactions to ivermectin should be produced for the use of health center personnel.

Posters should be displayed in community centers in district capitals and in other prominent places, such as schools, bus stops and public gathering places. The project should develop and distribute these posters by the end of the project.

Funds permitting, the existing stock of brochures should be replenished at the project's end. Schools should be targeted for distribution of present handouts in addition to individuals and religious missions.

The diagnosis and treatment guide should be updated to include accurate standard guidelines for diagnosis and treatment of onchocerciasis. Some errors related to dosage were found in earlier drafts.

Distribution of Ivermectin

The second round of ivermectin distribution should be completed during the remaining life of the project with a focus on priority areas missed during the first round. Emphasis should be placed on the retraining of MOPH personnel. An attempt should be made to inform and mobilize the population well in advance to raise the coverage level beyond that achieved last year.

A plan for the prompt turnover of funds already collected from the sale of oncho cards at health facilities should be developed immediately in coordination with provincial health authorities and for prospective funds to be generated.

Ivermectin should continue to be made available to all reoriented hospitals and health centers in the project area through the RPHC program's provincial distribution system, CAPP.

41

The provincial MOPH should consider upgrading health centers to reoriented status in sub-divisions that are hyperendemic for onchocerciasis (e.g., Bengbis and Djoum). Such a decision will depend on multiple factors, i.e., the size of the population served; the presence of a village health committee; and accessibility to the area. The project has already helped to accelerate the reorientation process by facilitating the formation of health committees at non-reoriented health centers that have distributed ivermectin.

More active involvement of the private sector should be encouraged in second-round IDP activities. The project director in coordination with the MOPH/CMO should explore mechanisms for integrating the private sector (e.g., mission clinics and hospitals) in ivermectin distribution. Cost recovery sharing arrangements should be worked out for disposing of funds generated. This might involve the retention by these organizations of some funds for fuel if necessary.

Remaining stocks of ivermectin being stored at project headquarters should be turned over to and accounted for by the CAPP as soon as the project can be assured that the drug will be accounted for appropriately and that there will not be any stock disruptions at reoriented health facilities as a result.

It was recomended by one evaluator that the national onchocerciasis coordinator should consider developing guidelines for appropriate use of ivermectin and/or diethylcarbamazine (DEC) for the treatment of onchocerciasis and other filarial diseases, i.e. loiasis, since these diseases exist concurrently in areas such as the project site. Although it is outside the scope of this evaluation, it is would be highly useful that the NOC be able to access technical support to that end. It is important to note that although the NOC is extremely capable, his access to outside technical resources is very limited.

Adverse Reactions

A way may need to be found to provide medicine for serious adverse reactions to non-reoriented centers. The new project director should work out a means by which these drugs are available during second round distribution. Arrangements by which small amounts of drugs can be purchased by centers from reoriented district hospitals should be determined at the provincial planning meeting.

42

An earlier concern raised during the preliminary epidemiologic investigations was that concurrent loiasis might increase the likelihood of severe adverse reactions to ivermectin. This was not observed in the project area, however, probably due to the low intensity of onchocercal infection and/or the less invasive nature of the forest strain of the parasite found in the Dja et Lobo area.

Project Supervision/Management

Supervision activities have been weak due to the previous shortage of key project staff and the lack of involvement of the part of the MOPH. PCVs provided interim supervisory support during the project. Since the arrival of the new division CMO, supervision has been strengthened significantly. During the remainder of the project, joint supervision should be carried out between project staff and MOPH counterparts. Supervision should include all RPHC activities at the health facility, not just ivermectin distribution.

It is essential that IEF hire a new project director as soon as possible. Considering the current shortage of qualified in-country personnel and the limited amount of time remaining in the project, it would be preferable at this juncture if the candidate were an expatriate with sufficient primary health care experience, management skills, and cross-cultural maturity to work effectively with the new division chief medical officer to ensure the complete integration of the project within the RPHC system by the revised project completion date. Previous experience in a similar capacity in a Francophone sub-Saharan African country is highly recommended. Some basic computing skills would be useful in order to transfer use of project software to MOPH.

This full-time IEF staff member should remain in-country for the duration of the project, maintain regular communications via telephone or fax with IEF management in the U.S.A.; coordinate all activities closely with the CMO of Dja et Lobo; and make sure that the provincial health office, national onchocerciasis coordinator and the USAID/Cameroon health office are periodically appraised of project progress. By strengthening its institutional presence in-country in this manner, the PVO will increase the likelihood of meeting most of its objectives by the revised project completion date.

43

The newly introduced project supervision form, although adequate by itself, should be integrated with the supervisory checklist of the RPHC system whenever that is developed.

Results of meetings with project staff in the Dja et Lobo Division and provincial health managers should be recorded and forwarded to IEF. Meetings should take on a regular basis, either weekly or biweekly during the remaining phase of the project. The project might request that the divisional CMO provide his own quarterly progress report regarding the integration process in order to identify any misperceptions quickly. Quarterly progress reports reflecting results of monthly activities should be forwarded to IEF, MOPH, and USAID.

Project Integration

A comprehensive plan for the full integration of ivermectin distribution into the RPHC system should be discussed at the two-year planning session for South Province and ultimately drafted in coordination with both project representatives and provincial health authorities. This should take the form of an action plan with time lines established for all activities.

Related efforts by other private institutions, e.g., the mission clinic in Oveng and the Nden private hospital in the area, are a very important asset to the public health of the community. An appropriate mechanism should be developed to integrate these facilities soon into the RPHC cost recovery system whenever feasible. This would be both more cost-effective and would preclude needless duplication.

4. Mid-Course Lessons Learned

Major conclusions and essential lessons learned are presented below and may also be found in more detail in the findings of the Garoua Evaluation Workshop (VBC Report 81505-3), which focuses on both the Adamawa/Taraba and South Province ivermectin delivery programs.

- High coverage rates are unlikely to be achieved by a system which depends on passive distribution based solely at the health facility without commensurate outreach activities and collaboration with the private sector.

- Planning for integration needs to begin before active distribution starts. Distribution and information systems need to be developed with the intent of integration, not allowed to develop at random with no thought of integration until the end of the project.

- Integrating ivermectin distribution into a PHC system requires a mature, well-functioning system at the beginning of the project. Expecting a PHC system to have reached a suitable stage for integration by the time an ivermectin distribution project is scheduled to conclude is fraught with perils.

- Ivermectin distribution cannot be effectively integrated into a weak or semi-functional PHC system and expect realistic coverage to result.

- This project can succeed only if it builds on community awareness concerning onchocerciasis. Where the perceptions are unfocused, concerted efforts are needed to develop a perception of the need for treatment.

- PVOs often have the flexibility, potential for efficiency, and access to resources that MOPH services do not have. However, being performance-driven, the PVO may be less willing to downshift their approach to less efficient modes of operation that are generally observed in the public sector in sub-Saharan Africa. The PVO may cling to its own more efficient system for fear of seeing its efforts disappear into a

45

semi-functional local system even if it accepts the objective of local integration in principle.

- If an information system is developed that utilizes a computer, it must first be able to run well in a non-computerized (paper) form. However, before an M/HIS system is developed there must be a clear understanding of its purpose and utility. Once an HIS system is created, it takes time, effort, and cooperation to get it to run successfully.

- The PVO needs to take whatever steps are necessary to establish an institutional presence in-country. The management of public health sector in sub-Saharan Africa has become too tenuous to expect successful collaboration with the PVO from afar.

- The PVO needs to have a critical mass of staff derived from both the private and public sector to successfully complete all project objectives and purposes.

- Roles and responsibilities of the PVO, host government institution, and project sub-contractors must be clearly established before the inception of the project. Where management ambiguities arise, these must be clarified as soon as possible (preferably in writing) by all parties concerned.

46

Annex 1. Statement of Work

Statement of Work

MIDTERM EVALUATION OF THE IVERMECTIN DELIVERY PROGRAM

of

International Eye Foundation: South Province, Cameroon

Table of Contents

1. Activities to be Evaluated
2. Purpose of the Evaluation
3. Background
4. Key Evaluation Issues
5. IEF/South Province Program Objectives
6. Priority Evaluation Information
7. Key Documents
8. Schedule
9. Evaluation Team Composition
10. Reporting Requirements
11. Contacts

1. Activities to be Evaluated

* **International Eye Foundation:** Mass Distribution of Ivermectin to Control Onchocerciasis in the Department of Dja and Lobo, South Province, Cameroon

* Cooperative Agreement Number: 631-0091-A-00-1035-00

* Start Date: October 1, 1991
  Completion Date: September 30, 1994

2. Purpose of the Evaluation

The purpose of the evaluation is to determine what progress has been made toward achieving program objectives and to provide guidance for the remaining period of implementation. The emphasis of the midterm evaluation will be to identify program strengths and weaknesses and make recommendations for improvement.

3. Background

The A.I.D. Ivermectin Delivery Program (IDP) is a pilot ivermectin distribution program in targeted countries in Africa and Latin America. The purpose of the three-year IDP is to assess the feasibility of using U.S.-based private, voluntary organizations (PVOs) to strengthen the institutional capacity of indigenous health systems to provide cost-effective and sustainable delivery of ivermectin.

The IDP is a collaborative effort involving U.S PVOs, their host country counterparts, USAID missions, and AID/W. The U.S. PVO is responsible for implementing the IDP within the framework of the host country's national onchocerciasis program. Program management and oversight is normally the responsibility of the USAID mission, except in Guatemala where the program is managed directly by the A.I.D. Office of Health.

The challenge for the PVO rests primarily in establishing the program within the existing health care infrastructure. The PVO guides the initial scientific work, establishes the mode of drug delivery, initiates the training of personnel, begins education efforts, and establishes collaborative mechanisms with the local government and private agencies. The early rounds of drug distribution are initiated by the PVO, with eventual complete assumption by national public and private counterparts.

4. Key Evaluation Issues

The midterm evaluation of the IEF/South Province program will be formative. This is the usual role of the midterm evaluation, since by the final evaluation it is too late to help correct errors and emphases. While it is valuable to stress the positive achievements of these programs, of which there will be many, focus should be brought to bear on those issues of most importance to objective and purpose achievement, in order to catch problems and to reappraise basic assumptions soon enough to recommend mid-course corrections.

Key focus areas of the evaluations, thus, will center on objectives enumerated in the detailed implementation plan issued with project start-up. The **central question** of this evaluation for A.I.D. is whether the agency can employ PVOs to install a self-sustaining process of community demand and government or private supply of ivermectin in needful communities. What is most important to the present evaluation, as opposed to any internal evaluation activities IEF may conduct for its own purposes, is the degree to which IEF can effectively strengthen the institutional capacity of the state, local, and private health systems to carry out "cost effective and sustainable delivery of ivermectin."

The success of IEF in institutionalizing effective and sustainable programs of ivermectin distribution is thus a separate issue from its own ability to assess population needs and treat needy community members in a dependable and cost-effective manner. Evidence of the transfer of skills and organizational procedures to local health officials and community-based distributors (CBDs) will be necessary to judge whether IEF has carried out its mandate successfully. There is, in fact, some contradiction in this: what A.I.D. is asking is for IEF to work itself out of a job by the end of three years.

What is meant by the terms "institutional strengthening", "cost effective", and "sustainable", and how do we know that IEF, assuming it has created a cost effective ivermectin delivery system, can leave systems and procedures in place for the long term? To answer these questions it will be necessary to examine the financial, personnel, and logistical structures planned or in place on the ground and assess whether it is likely that they can be taken over by the Cameroonian public (or private) sector over the remaining life of project.

The nature and degree of the present involvement of Cameroonian health professionals and community workers is obviously key in judging the likelihood of successful institutionalization by program end. Since integration of the ivermectin delivery program with the primary health care system in South Province is an important institutional objective, it

will be necessary to appraise the extent to which the local PHC system presently exists and its potential for incorporating the IDP. The degree to which the IDP can contribute to building or improving the PHC system should also be addressed during the evaluation.

5. IEF/Cameroon Program Objectives

The detailed implementation plan lists the following objectives:

* Epidemiological assessment: To map the prevalence of infection in the entire Division of Dja and Lobo by July 1992, in order to set distribution priorities. Methods will range from traditional skin-snips to rapid assessment surveys.

* KAP survey: To determine the knowledge, attitudes, and behavior of the population regarding onchocerciasis by July, 1992, in order to establish appropriate health education messages.

* H/MIS: To develop a system for the processing and dissemination of information collected over the course of the project, as well as to develop a set of indicators by which to report on a regular basis.

* Health worker training: To capacitate at least one staff member per health unit in the entire project area to distribute ivermectin, including diagnosis of onchocerciasis using one of the rapid assessment methods, community motivation/education, supervision of community-based distributors (CBDs), handling of adverse reactions, and program record-keeping.

* Training of CBDs: To train at least one CBD per community eligible for mass distribution to distribute ivermectin, conduct community motivation/education, handle adverse reactions, keep basic records.

* Health education/motivation: To maximize population acceptance of and demand for ivermectin by community-level motivation and health education.

* Distribution: To deliver the appropriate dose of ivermectin to at least 80% of the eligible population of the hyper-endemic areas of the sub-divisions of Bengbis, Djoum, Minton, and Oveng in Year 1 (first round). In Year 2 these four sub-divisions will receive their second round of treatment and the remaining three sub-divisions (Meyomessala, Sangmelima, and Zoetele) will receive their

first round. In Year 3 while Bengbis, Djoum, Mintom, and Oveng receive their third round of treatment, Meyomessala, Sangmelima, and Zoetele will receive their second round.

* Adverse reactions: To monitor, document, and manage adverse reactions to ivermectin.

* Program compatibility: To collaborate closely with Cameroon MOH officials to insure program fit with the reorientation of primary health care in Cameroon.

* Sustainability: To maximize program sustainability through appropriate integration into the existing PHC system, including compatibility with the cost-recovery strategy.

6. Priority Evaluation Information

The various categories of information needed for this evaluation are well outlined in the detailed implementation plans. They can be summarized, however, as follows:

1. **Epidemiological Surveys**

   * Were surveys undertaken to establish the degree of onchocerciasis prevalence in all communities where the disease might be endemic?

   * Were these rapid reconnaissance surveys adequate to the task of classifying communities by degree of infection and were they conducted in time to guide program implementation?

   * Were the targeted communities selected from these results?

   * Can local officials and health professionals continue the use of these surveys to monitor disease prevalence in existing or future project communities?

2. **Training of Community-based Distributors (CBDs)**

   * Why was the idea to work with CBDs abandoned? Was this decision discussed with local and MOH officials?

   * How will long-term distribution activities be conducted in the absence of community-based distributors? Is this alternative reasonable?

   * Does the decision to abandon CBDs seem well-founded in retrospect? What is the potential for employing CBDS

52

after all?

3. **Training of Supervisors**

* Was a training needs assessment conducted among health center staff prior to the training course?

* Did the training of health supervisors occur in a timely manner and have the new skills been applied appropriately in the field?

* Do MOH officials have the capacity to appropriately supervise regional ministry and non-governmental officials in the financial and managerial maintenance of the ivermectin delivery system?

* Will this training continue to be offered after the departure of IEF? If so, who will do it, when, and where?

* Has the use of Peace Corps volunteers as counterparts to PHC coordinators been effective in improving the coordinators' performance in supervising ivermectin distribution and its integration into the primary health care system?

4. **Educational/Motivational Activities**

* Was a KAP survey conducted to assess the level and form of public awareness of onchocerciasis and to identify appropriate methods to educate and motivate target communities to sustain participation in the ivermectin distribution program?

* Has an effective IEC program been mounted to inform communities of the symptoms and dangers of onchocerciasis?

* Has an appropriate IEC program been carried out to promote public acceptance of annual doses of ivermectin?

* How have health center staff and local organizations been involved in IEC activities?

* Has a sustainable incentive system been created to motivate field work by public and private health workers in the absence of CBDs?

* Will the IEC and incentive systems outlive the departure of IEF?

5. **Record Keeping Capabilities**

* What are the report forms used by IEF in the conduct of its program? Do these reports capture appropriate information efficiently.

* Are the health workers correctly using household ivermectin treatment records and the report form for adverse reactions?

* How is health information generated and transmitted in a timely manner to key program managers? What are the key indicators for this monitoring process? Is this system computerized?

* To what degree are these techniques of assembling and disseminating information now used by local public and private health workers?

* Is there a financial monitoring system appropriate for transfer to local government officials and health workers?

* Is there a monitoring and evaluation system for project impacts separate from ivermectin distribution data or financial and logistical monitoring? Are follow-up surveys of onchocerciasis endemicity planned or being carried out in treated communities?

6. **Distribution System**

* Was the eligible population effectively reached in all endemic communities?

* Was distribution carried out at least cost?

* What were the various options and their costs for carrying out the desired distribution program?

* Have cost recovery schemes been employed and with what likelihood for sustainability?

* What plans have been made to ensure that local transportation and infrastructure can sustain distribution beyond the project?

* From the IEF experience in Cameroon, what indicates that PVOs can mount campaigns to distribute ivermectin in a cost-effective, sustainable manner?

* Were the Merck guidelines understood, communicated, and

properly observed in all project communities? If not, how can they be more fully observed?

* What evidence exists that the Merck guidelines will be observed fully after project end?

7. **Program Institutionalization**

* Has IEF demonstrated a progressive shift in responsibility from PVO staff to Cameroonian counterparts in the implementation of the IDP?

* Do these counterparts demonstrate the ability to continue the IDP at the end of the IEF project?

* Is there a structure in place that promises a successful transfer of project responsibilites to local counterparts?

* Is there evidence that IEF may succeed in assisting in putting in place such a structure?

* What training needs remain and what plans have been made to complete them by project end?

* What evidence exists in the IEF experience that PVOs are cost-effective and efficient agents for institutionalizing sustainable systems and procedures at the local governmental and community levels?

* Was the three-year time frame for the project realistic for accomplishing full integration of ivermectin distribution activities into the primary health care system.

* What progress has been made by the project in integrating ivermectin distribution into the USAID-funded primary health care (PHC) program in Dja and Lobo divisions of South Province. This will include a review of efforts to: integrate ivermectin into the PHC medical supply logistics system; integrate ivermectin information into the PHC information system; include ivermectin program monitoring in integrated PHC supervision of health facilities; and integrate onchocerciasis treatment and follow-up into the PHC cost recovery program.

8. Key Documents

The following documents will be provided for the evaluation.

1. "Project Design and Implementation of the Ivermectin Delivery Program." J. Madison Seymour, VBC Report No. 81239.

2. "Ivermectin Distribution Program: A Pilot Project for the Control of Onchocerciasis in the Division of Dja and Lobo, South Province, Republic of Cameroon." Proposal submitted by the International Eye Foundation. March 1991.

3. "Mass Distribution of Ivermectin to Control Onchocerciasis in the Department of Dja and Lobo, South Province, Cameroon: A Detailed Implementation Plan." International Eye Foundation. March 1992.

4. Mass Distribution of Ivermectin to Control Onchocerciasis in the Department of Dja and Lobo, South Province, Cameroon: The First 6-months Report. International Eye Foundation. March, 1992.

5. Onchocerciasis Control Project in the Division of Dja and Lobo, South Province, Cameroon. Annual Report. International Eye Foundation. October, 1992.

6. Onchocerciasis Control Project in the Division of Dja and Lobo, South Province, Cameroon. Work Plan for Year Two. International Eye Foundation. October, 1992.

7. Onchocerciasis Control Project in the Division of Dja and Lobo, South Province, Cameroon. Reports for Quarters 3 and 5 (March-June, 1992 and September-December, 1992). International Eye Foundation.

8. Onchocerciasis Control Project in the Division of Dja and Lobo, South Province, Cameroon. Report for Quarters 6 and 7 (January-June, 1993). International Eye Foundation. August, 1993.

9. Economic Analysis of Ivermectin Distribution Program in South Province, Cameroon. Khan, Mahmud. Tulane University for the International Eye Foundation. August, 1993.

10. Maternal/Child Health and Child Survival II Project. Project Paper. USAID/Cameroon.

11. Ivermectin Delivery Program, Workshop Report, J. Madison Seymour, Ph.D., VBC Report No. 81239

12. Workshop on Future Directions in Health Education for Ivermectin Delivery Programs, VBC Report No. 81340.

9. Schedule

September 8-15	Finalize scope of work and team composition
September 13-15	Finalize evaluation dates and send cables
September 13-15	Plan TPM and distribute agenda
September 16	Conduct team planning meeting
Oct. 4-16	Conduct evaluation in Cameroon
October 18-19	Hold midterm workshop in Garoua
November 5	Submit draft to AID/H
November 19	Submit final evaluation report
November 29	Debrief AID/Washington.

9. Evaluation Team Composition:

Charles Oliver, co-team leader
AID/R&D/H/CD
SA-18, Room 1234
Washington D.C. 20523
phone (703) 875-4507
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Philip Boyle, co-team leader
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Christine Witte
Onchocerciasis Program Coordinator
International Eye Foundation
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Bethesda, MD 20814
phone (301) 986-1830
fax (301) 986-1876

Pierre Ngoumou
MOH Onchocerciasis Coordinator
Ministry of Public Health
Yaounde, Cameroon

10. Reporting Requirements

1. **Written report:** Will address the elements outlined in the scope of work. The completed document is to be submitted to A.I.D. within one month after the follow-up workshop in Garoua, Cameroon (October 18-19). Final printing will be done by VBC.

2. **Briefing to A.I.D:** A briefing on lessons learned and evaluation outcomes is to be made to A.I.D. and interested parties within 10 days of submission of the completed evaluation report. The evaluation team will also provide a briefing on evaluation findings to the health/population officer and other interested personnel in USAID/Cameroon.

3. **Role of the team leaders:** The evaluation team leaders will be the principal external evaluators of IEF/South Cameroon and will be responsible for addressing the issues and questions contained in Section 6 (priority evaluation information) of this scope of work. They will also be responsible for presenting preliminary findings, lessons learned, and recommendations to the Chief Medical Officer in Sangmelina, the MOH in Yaounde, and the follow-up workshop in Garoua, Cameroon, between October 18-19. Following comments on the draft by workshop participants, the VBC co-team leader will finalize the report for submission to AID/RD/H/CD for review not later than November 5. The final draft will reflect this review and be finalized in VBC beginning no later than November 19. VBC will format, publish, and distribute the report following the AID briefing in late November.

4. **Follow-up workshop:** The evaluation team will join principal evaluators from the AFRICARE/ATOP in Garoua between October 18-19 to discuss lessons learned and future actions for both projects. The theme of the workshop will be progress made

toward assuring the institutional and financial sustainability of ATOP and the IEF/Cameroon IDP.

11. Contacts

A.I.D./Washington:

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A.I.D./VBC Project

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phone

IEF/Washington:

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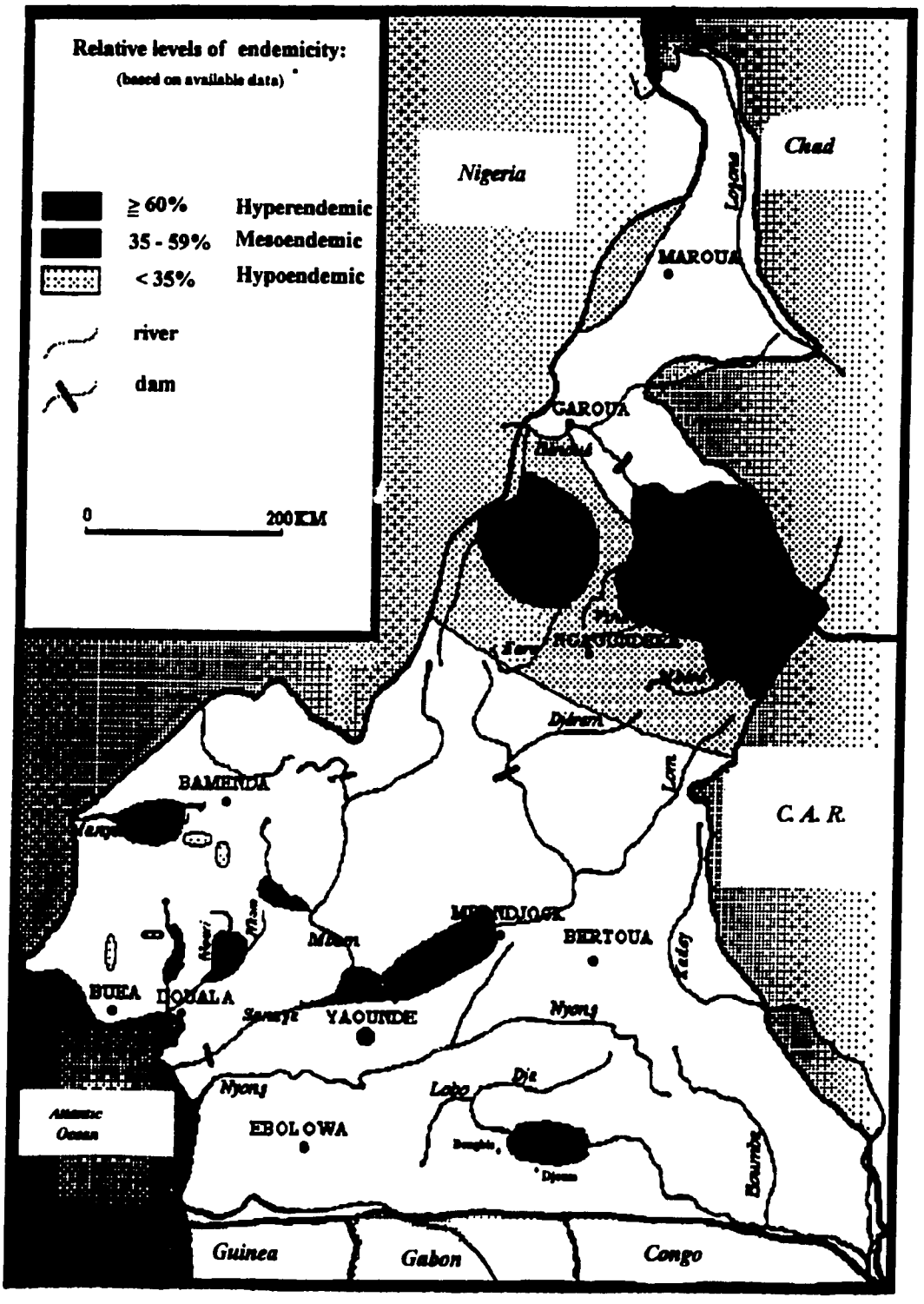
7801 Norfolk Avenue
Bethesda, MD 20814
phone (301) 986-1830
fax (301) 986-1876

Annex 2. Map of Cameroon Illustrating Major Known Foci of Onchocerciasis



60

Annex 3. Evaluation Schedule

September 8 - 15, 1993	Finalize scope of work and team composition
September 13 - 15	Finalize evaluation dates and send cables
September 13 - 15	Plan team planning meeting, distribute agenda
September 16	Conduct team planning meeting
October 6	AM - Yaounde Briefings: USAID/Cameroon (R. Greene and staff) MOPH (Dr. Chouaibou Ncharre) Directeur Adj., DMPR SESA (Dr. Claude Bodart), AMA (Eric Treffers) Peace Corps APCD (Deborah Agbor-tabi) PM - AMA (Mr. Treffers)
October 7	AM - South Province (Ebolowa) Dr. Ngoufor (Delegue Province Sante Pub.) Prov. Drug Supply Center PM - Sangmelima
October 8	Dja et Lobo, Sangmelima Arondisement CMOs (Dr. Marcel Nzie, Dr. Charles Nsom) BSP Office (Mr. Jean Mbia Mbia), PHC Coordinator, Peace Corps Volunteer, IEF Staff (Patrice Nkwelle) Team visits to Two IDP distribution sites Focus interviews with nurse distributors
October 9-10	Dja et Lobo, Sangmelia Team writing sessions
October 11	Dja et Lobo, Team trip to Djoum and Oveng Arondissements, Visit hospital, health centers Meetings with PHCC, PCV, focus interviews with village clientele
October 12	Team discussions, Sangmelima

October 13	Dja et Lobo, Arondissement Observe use of health education materials, interview service providers
October 14	Dja et Lobo Team discussions, Sangmelima
October 15	AM - Early visit to Zoetele Arondissement Interview with PHCC, PCV Arrive Yaounde by mid-day PM - Yaounde: debriefing with USAID/Cameroon Debriefing with MOPH/Cameroon (include six from province for one day)
October 16-17	Team writing session, preparation for Lessons Learned Workshop on Institutionalization of IDP
October 18	AM - Garoua: Workshop begins - the Nigeria experience PM - The Cameroon experience
October 19	AM - Conclusions: Joint lessons learned PM - Workshop closure: Preparation of workshop summary
October 20	Team departs Garoua for U.S.A.
November 26	Final draft of Evaluation and workshop reports sent for review by USAID and PVOs
December 14	Final reports printed, disseminated

62

Annex 4. In-Country Contacts

Yaounde

USAID/Cameroon

Richard Greene
Chief, Health/Population Office

Ministry of Public Health

Dr. Rene Owona (Director, Rural Preventive Medicine)
Dr. Sam-Abbenyi (Sub-Director, Epidemiology)
Dr. Pierre Ngomou (Sub-Director, Communicable Diseases)
Mr. Benoit Etoa (Sub-Director, Primary Health Care)

Projects, NGOs

Dr. Claude Bodart (Coordinateur National)
SESA: Projet Sante de l'enfant du Sud et de l'Adamaoua

Erik Treffers (Charge d'Etudes)
Atelier de Materiel Audio-Visuel

Jean-Marc Macé
Administrator
River Blindness Foundation
Garoua, North Province

South Province (Province du Sud)

Dr. Antoin Mouangue (Chief of Service for Hospital Medicine)
Provincial Delegate of Public Health (acting)
Dr. David Mevoula (Provincial Chief DMPR)
Mr. Gilles Mendouga (CAPP Coordinator)
Mr. Onana (Provincial Chief of Service for Health Statistics)
Md. Ndjeng (Provincial Chief of Service for Family Health)

Division Dja et Lobo

Hon. Jean Michel Mengoumou (Prefet)

Dr. Marcel Nzie (outgoing Chief Medical Officer)
Dr. Charles Nsom (incoming Chief Medical Officer)
Dr. Jeremy Nsso (Chief of Hospital Medicine)
Md. Akoumba, Tchialeu (nurses), Protection Maternelle Infantile
Mr. Jean Mbia (Chief, Bureau Sante)
Mr. Japhet Ondoua (IEC Responsable)
Mr. Samuel Etoa (Hospital Commissary, pharmacy clerk)
Mr. Laurent Effemba (PHCC, Sangmelima)
Ms. Kennon Harris (PCV, Sangmelima)

Sangmelima Arrondissement

Appolinaire Tiam (Chief of Oveng-Yemvak Health Center)
Health Center Commissary (pharmacy clerk)
Nurse Aide, PMI Nurse

Djoum Arrondissement

Sub-Prefet Djoum
Mr. Nkodo (PHCC - Oveng Health Center)
Sister Marie Gallagher (mission clinic - Oveng)
Dr. Eyenga (CMO - Djoum)
Mr. Abate (PHCC - Djoum)
Ms. Sheila Crabtree (PCV - Djoum)

Meyomessala Arrondissement

Sub-Prefet Meyomessala
Dr. Essomba (CMO - Meyomessala)
Mr. Aboe (PHCC - Meyomessala)

Zoetele Arrondissement

Dr. Abela (CMO - Zoetele)
Mr. Aba'a (PHCC - Zoetele)
Ms. Melissa Olivette (PCV - Zoetele)

Bengbis Arrondissement

Dr. Mvogo (CMO - Bengbis)
Mr. Edang (PHCC - Bengbis)

Commissary (pharmacy clerk)

Other villages/institutions visited

Sangmelima: Oveng-Yenvak
Zoetele: Nkolfong
Nden Private Hospital

Bengbis: Ngoundayos
Melan I

Oveng: Oveng Village

Annex 5. Demography and Health Statistics of Cameroon

OPTIONS COUNTRY PROFILE

June 1992

CAMEROON

II- SOCIOECONOMIC CHARACTERISTICS

World Bank Index of Economic Development, 1991	MIDDLE/LOWER MID-INCOME ECONOMY
Gross National Product per Capita, 1990 ($US)	940
Percent of Government Expenditure on Health, 1989	3.4 %
Percent of Government Expenditure on Education, 1989	12.0 %
Percent of Government Expenditure on Defense, 1989	6.7 %
Percent of Men (15-64) in Non-agriculture Labor Force, 1985	41 %
Percent of Women (15-64) in Non-agriculture Labor Force, 1985	29 %
Adult ~~Literacy~~ Illiteracy Rate for Both Sexes (as % of age 15+), 1985	44 %
Adult ~~Literacy~~ Illiteracy Rate for Women (as % of age 15+), 1985	55 %
Secondary School Enrollment Ratio for Both Sexes, 1988	27
Secondary School Enrollment Ratio for Women, 1988	21
Persistence to Grade 4 (% of cohort) for Men, 1984	86 %
Persistence to Grade 4 (% of cohort) for Women, 1984	85 %
Population per Physcian, 1984	
Population per Nursing Person, 1984	
Percent of Births with Trained Attendant, 1985	%
Percent of Babies with Low Birth Weight, 1985	13 %
Daily Calorie Supply per Capita, 1989	2,161
Percent of Children still Breastfed at 12-24 months, 1986-90	%

Percent of Population with Access to:

	Total	Urban	Rural
Health Services, 1985-88	41	44	39
Safe Drinking Water, 1988-90	47	43	50
Sanitary, 1988-90	42	100	2

Year Women Were Given the Right to Vote 1946

OPTIONS PROJECT
Population Reference Bureau, Inc.

66

OPTIONS COUNTRY PROFILE

June 1992

CAMEROON

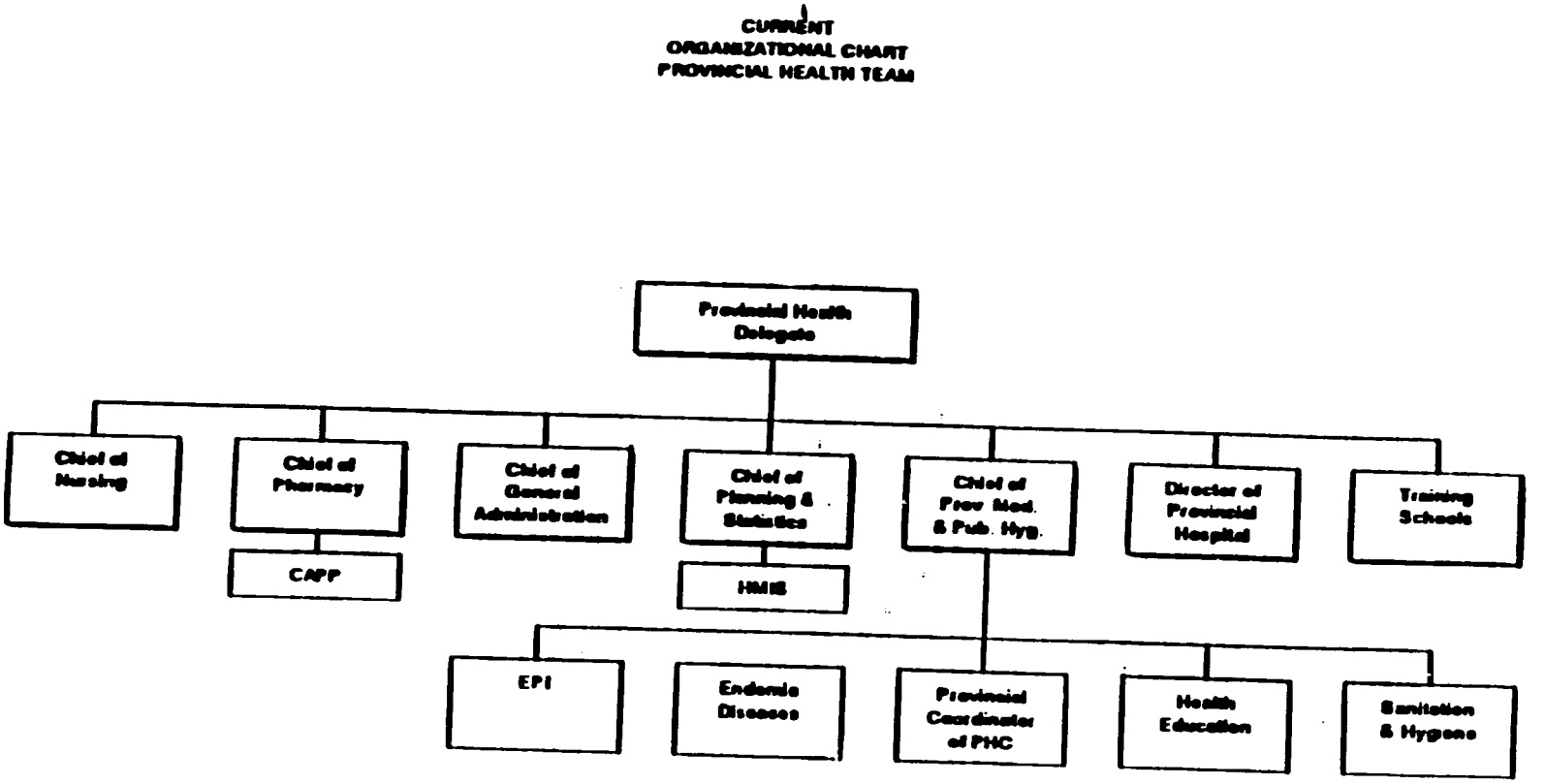
Region Name:	AFRICA	Total Area (sq. miles):	183,570
Subregion Name:	MIDDLE AFRICA	Percent of Cultivated Land:	15
A.I.D. Region Name:	AFRICA	Percent of Pasture Land:	18
A.I.D. Funded Country:	YES	Percent of Forest & Woods:	54
Capital City:	Yaound		

I- DEMOGRAPHIC INDICATORS, 1992

Total Population Estimate, (in 1000)	12,658
Population per Square Miles	69
Crude Birth Rate (per 1000)	44
Number of Births	556,952
Crude Death Rate (per 1000)	12
Number of Deaths	149,364
Rate of Natural Increase (percent)	3.2 %
Natural Increase (in 1000)	407,588
Population Doubling Time (years)	22
Population Projected to 2010 (in 1000)	23,112
Population Projected to 2025 (in 1000)	36,331
Life Expectancy at Birth for Mem (yeas)	54
Life Expectancy at Birth for Women (years)	59
Infant Mortality Rate (per 1000 live births)	85
Number of Infant Deaths	47,341
Mortality Rate of Children Under Age 5 (per 1000 live births), 1989	150
Maternal Mortality Rate (per 100,000 live births) (Year: 1980s)	430
Total Fertility Rate	6.4
Singulate Mean Age at First Marriage for Women, (Year: 1978)	18.8
Estimated Population of Married Women Age 15-44 (in 1000), 1990	1,702
Projected Population of Married Women Age 15-44 (in 1000), 2010	2,305
Population Below Age 15 (percent)	46 %
Population Below Age 15 (number in 1000)	5,861
Population Age 65 and Over (percent)	3 %
Population Age 65 and Over (number in 1000)	380
Average Household Size (Year: 1976)	5
Urban Population (percent)	42 %
Urban population (number in 1000)	5,367
Population of Foreign Born/Foreign Nationality (percent), (Year: 1976)	3 %
Census Year 1980 Round	1976
Census Year 1990 Round	1987

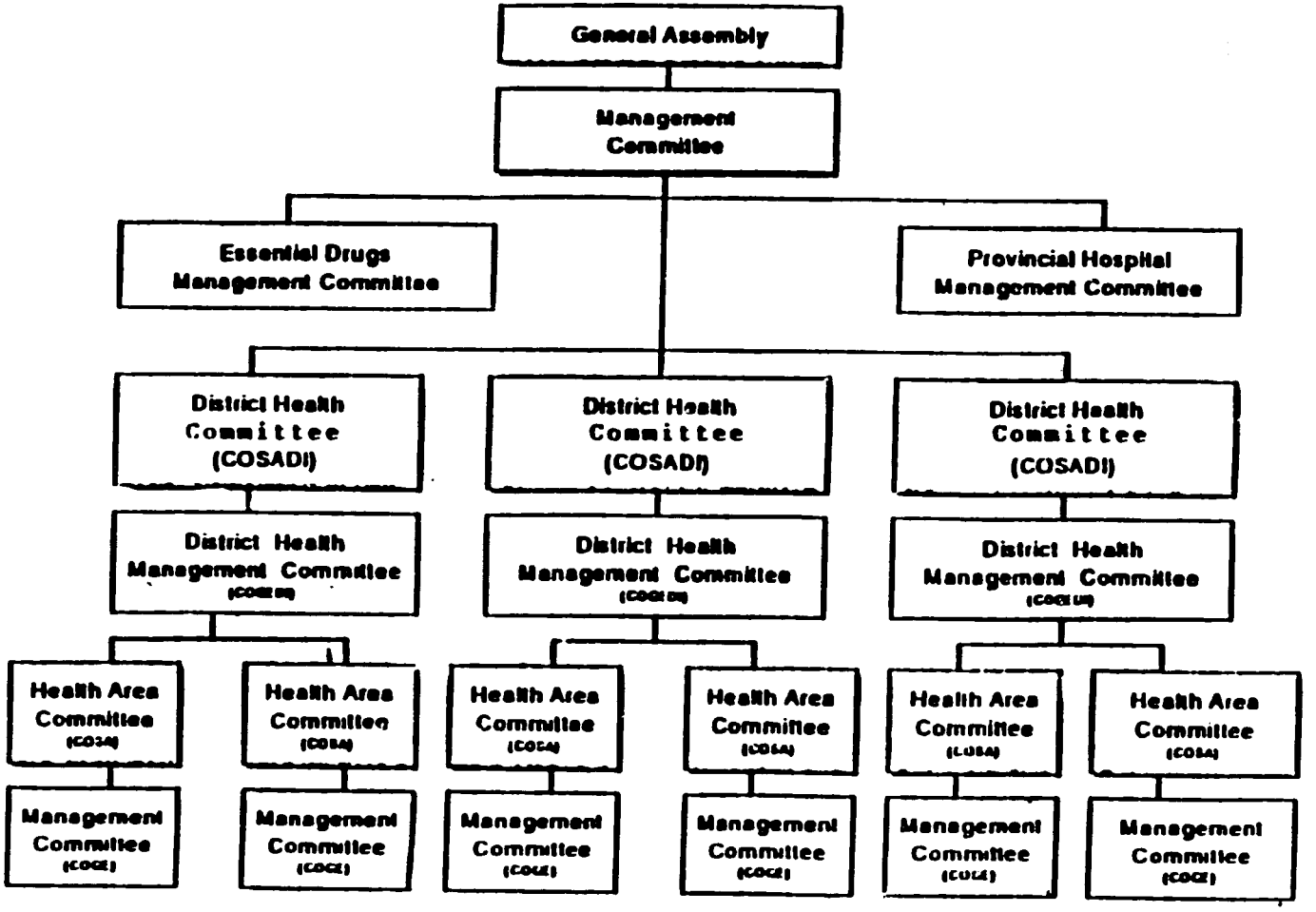
OPTIONS PROJECT
Population Reference Bureau, Inc.

Annex 6. Organizational Chart of Provincial Ministry of Health



Annex 7. Proposed Organizational Chart of Provincial Health Fund

PROPOSED
ORGANIZATIONAL CHART
PROVINCIAL HEALTH FUND
(FSPS)



Annex 8. IEF/Cameroon Project Objectives

The detailed implementation plan lists the following objectives:

- Epidemiological assessment: To map the prevalence of infection in the entire Division of Dja and Lobo by July 1992 to set distribution priorities. Methods will range from traditional skin-snips to rapid assessment surveys.

- KAP survey: To determine the knowledge, attitudes, and behavior of the population regarding onchocerciasis by July, 1992 to establish appropriate health education messages.

- H/MIS: To develop a system for the processing and dissemination of information collected over the course of the project, as well as to develop a set of indicators by which to report on a regular basis.

- Health worker training: To identify at least one staff member per health unit in the entire project area to distribute ivermectin, including diagnosis of onchocerciasis using one of the rapid assessment methods, community motivation/education, supervision of community-based distributors (CBDs), handling of adverse reactions, and program record-keeping.

- Training of CBDs: To train at least one CBD per community eligible for mass distribution to distribute ivermectin, conduct community motivation/education, handle adverse reactions, keep basic records.

- Health education/motivation: To maximize population acceptance of and demand for ivermectin by community-level motivation and health education.

- Distribution: To deliver the appropriate dose of ivermectin to at least 80% of the eligible population of the hyper-endemic areas of the sub-divisions of Bengbis, Djoum, Minton, and Oveng in Year 1 (first round). In Year 2 these four sub-divisions will receive their second round of treatment and the remaining three sub-divisions (Meyomessala, Sangmelima, and Zoetele) will receive their first round. In Year 3 while Bengbis, Djoum, Minton, and Oveng receive their third round of treatment, Meyomessala, Sangmelima, and Zoetele will receive their second round.

- Adverse reactions: To monitor, document, manage adverse reactions to ivermectin.

- Program compatibility: To collaborate closely with Cameroon MOPH officials to insure program fit with the reorientation of primary health care in Cameroon.

- Sustainability: To maximize program sustainability through appropriate integration into the existing PHC system, including compatibility with the cost-recovery strategy.

Annex 9. Plan for Reorientation of Health Centers in Division of Dja et Lobo through 1996.

HEALTH CENTERS TO BE REORIENTED

Année	AS Proposées	Population actuelle	Commentaire sur l'état du CS équipement et personnel
94-95	Meyomessi	4352	Bon état du Centre Personnel en place Non convenablement équipé
	Avebe Esse	3824	Batiment à refaire Personnel en place Moyennement équipé
	Nkolotou'outou	3113	Bon état du centre Personnel en place Non convenablement équipé
95-96	Mezesse	2,359.00	Batiment à refaire Personnel en place Non convenablement équipé
	Meyomadjom	2,400.00	Batiment en bon état Personnel en place Non convenablement équipé
	Elom	2,391.00	Batiment à refaire Personnel en place Non convenablement équipé
96-97	Akon	14,157.00	Batiment à refaire Personnel en place Non convenablement équipé

DISTRICT DE NDEM

Arrondis.	Année	Aire de Santé	Population	Commentaire sur l'état du CS équipement et personnel
Bengbis	94-95	Mbometa'a		Batiment en bon état Personnel en cours d'affectation Encours d'équipement
ZOETELE	94-95	FIBOT	3850	Batiment en bon état Personnel en place Moyennement équipé
		EKOMBITIE	2015	Batiment en bon état Personnel en place Bien équipé
	95-96	EBAMINA	3251	Batiment à refaire Personnel en place Moyennement équipé
		NDELE	4142	Batiment à refaire Personnel en place Moyennement équipé

HEALTH CENTERS TO BE REORIENTED

Année	AS Proposées	Population actuelle	Commentaire sur l'état du CS équipement et personnel
94-95	Meyomessi	4352	Bon état du Centre Personnel en place Non convenablement équipé
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	Meyomadjom	2,400.00	Batiment en bon état Personnel en place Non convenablement équipé
	Elom	2,391.00	Batiment à refaire Personnel en place Non convenablement équipé
96-97	Akon	14,157.00	Batiment à refaire Personnel en place Non convenablement équipé

DISTRICT DE NDEN

Arrondis.	Année	Aire de Santé	Population	Commentaire sur l'état du CS,équipement et personnel
Bengbis	94-95	Mbometa'a		Batiment en bon état Personnel en cours d'affectation Encours d'équipement
ZOETELE	94-95	FIBOT	3850	Batiment en bon état Personnel en place Moyennement équipé
		EKOMBITIE	2015	Batiment en bon état Personnel en place Bien équipé
	95-96	EBAMINA	3251	Batiment à refaire Personnel en place Moyennement équipé
		NDELE	4142	Batiment à refaire Personnel en place Moyennement équipé
	96-97	Nkolbang	2445	Case santé en bon état Personnel à pourvoir A équiper
MEYOMESSALA	94-95	Nkolyeng	4210	Batiment à refaire Personnel en place Moyennement équipé
		Ngoasse	5675	Batiment à refaire Personnel en place Moyennement équipé
	95-96	Biba-Yemfek		Batiment à refaire Personnel en place Moyennement équipé

	96-97	Nkolbang	2445	Case santé en bon état Personnel à pourvoir A équiper
MEYOMESSALA	94-95	Nkolyeng	4210	Batiment à refaire Personnel en place Moyennement équipé
		Ngoasse	5675	Batiment à refaire Personnel en place Moyennement équipé
	95-96	Biba-Yemfek		Batiment à refaire Personnel en place Moyennement équipé

14

Annex 10. Actual Timeline of Project Activities

CAMEROON IDP: ACTUAL TIMELINE

91		
OCT	**NOV**	
Project accord signed	Project Director hired	
92		
JAN	**FEB**	**MAR**
Pilot KAP: Bengbis/Djoum Djoum	Equipment/vehicle arrive, PC damaged	PCVs arrive: 1st IA survey: Djoum (3/27-4/4) fax machine dies
APR	**MAY**	**JUN**
	laptop arrives Orientation meeting: decision 200F/10Y	Mectizan arrives oncho cards made locally (5-10,000) Printshop St. Paul, Yaounde
JUL	**AUG**	**SEP**
KAP survey: 1) Djoum 2) Sangmelima (7/12-7/24) IA survey: Sangmelima	1st active treatment: Djoum (8/24-30) IA survey: Sangmelima town	P.A. (Ndo) arrives Mectizan dispersal begins in Sangmelima --->
92		
OCT	**NOV**	**DEC**
30,000 oncho cards arrive C.W. arrives ---------->		
annual report made Kollo leaves---------->		
	TRNG: HC of Sangmelima PHCC /PCV of other Arrondissement (C.W./P.N.)	

93

JAN	FEB	MAR
P.N. visit supervise distribution Sangmelima	C.W. arrives (2 wks) phone out Nat. Oncho meeting P.N. visits w/WHO Bengbis hospital, Mekas Oveng-Yemvak reoriented	Kollo returns Trng for RA surveys photocopier/typewriter break down brochures ordered: A.M.A.

APR	MAY	JUN
PCV Bengbis leaves RA surveys ---------->		Bengbis Loa loa study: 12 villages active treatement
P.A. (Ndo) fired Dr. Nsom begins to assist project	50,000 brochures arrive	Djoum/Meyomessala /Zoetele reoriented

JUL	AUG	SEP
Active treatment: 5 vil. - Meyomessala Project Director leaves	3 motorbikes arrive: Djoum/Meyomessala/ Zoetele	new supervision form begins----------> P.N. - supervision Kollo leaves Dr. Nsom officially Chief, Depart. Dja/Lobo

OCT	NOV	DEC
<100 2nd treatment identify new P.I ---------->		

94

JAN	FEB	MAR

APR	MAY	JUN

76

Annex 11. Sample Revised Project Information Forms (English versions)

A. Health Centre monthly Ivermectin treatment record

A tick or check would be entered for each patient treated, and the total tallied up and entered at the end of the month

Ivermectin treatment record

Clinic _____ Month of _____ 19___

patients receiving first treatment	patients receiving repeat treatments	patients treated from outside catchment area	adverse reactions requiring treatment

B. Health Centre monthly Ivermectin stock record

Monthly Ivermectin stock record

Enter the number of tablets on hand at the beginning of the period	
Subtract the number of tablets dispensed to clinics during this reporting period	
The number of tablets remaining in stock	

C. Monthly ivermectin report to the National Onchocerciasis Coordinator

MONTHLY/QUARTERLY/YEARLY IVERMECTIN TREATMENT REPORT

(strike out inappropriate)

Number of persons treated

Number of persons treated during this period	

Adverse reactions

Number of adverse reactions reported which required treatment	

Stock movement

Enter the number of tablets on hand at the beginning of the period	
Subtract the number of tablets dispensed to clinics during this reporting period	
The number of tablets remaining in stock	

Basis for this report

Number of clinics reporting during this reporting period	
Number of clinics which did not submit complete reports during this reporting period.	

Active treatment

Number of persons treated through active treatment (or outreach) sessions	

18

Annex 12. Project forms

1. *L'onchocercose La Maladie du Dja.* Educational folder for prevention and control of onchocerciasis. International Eye Foundation, Projet de lutte contre l'onchocercose du Dja et Lobo, Atelier de materiel Audio-Visuel, Yaounde, Cameroon, 1992 (French).

2. Onchocerciasis Treatment Card, IEF/Cameroon, 1992 (French).

3. Adverse reaction form.

4. *Grille de supervision pour la distribution l'ivermectine.* (project distribution supervision form). IEF/Cameroon, Sangmelima, 1992. (French).

19

L'ONCHOCERCOSE

ONCHO

Cette brochure vous informe sur

LA MALADIE DU DJA

(LA CECITE DES RIVIERES)

et le traitement du

MECTIZAN

INTERNATIONAL EYE FOUNDATION
PROJET DE LUTTE CONTRE
L'ONCHOCERCOSE DU DJA ET LOBO
B.P. 98 - PMI de SANGMELIMA - CAMEROUN

ONCHO

L'Onchocercose ou "ONCHO" est une maladie due aux filaires

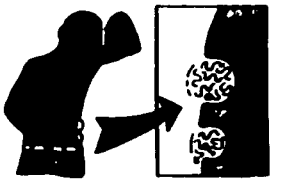
Ceux qui deviennent malades, risquent de devenir aveugles.

On contacte l'Oncho par les piqûres d'une petite mouche noire, la SIMULIE.

Cette mouche vit près des eaux courantes, comme les fleuves et les rivières C'est pour ça qu'on appelle l'Oncho aussi **"LA MALADIE DU DJA"** ou **"LA CECITE DES RIVIERES"**.

LES FILAIRES

La petite mouche noire injecte dans la peau humaine des filaires de l'Oncho. Les filaires se développent, et deviennent adultes. Les adultes vivent sous la peau dans des "boules" appelées **"NODULES"**.
Les petites filaires se déplacent dans le corps. Elles peuvent monter aux yeux et causer des dommages graves. A la fin le malade pourrait devenir aveugle.



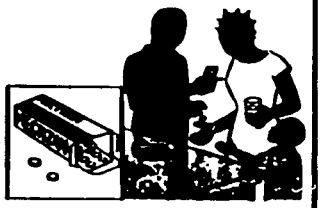
La maladie commence avec des démangeaisons quand on a l'Oncho. Les démangeaisons sont causées par les petites filaires qui se déplacent dans le corps. Le malade se gratte beaucoup, au niveau des pieds, des bras, du dos et partout dans le corps.

LA PEAU

Souvent, la peau des jambes d'un malade de l'Oncho change et devient sèche et noire.On peut également voir des tâches blanches ou roses. Quand les tâches et le changement de la peau sont bien visibles, on parle de "la peau de léopard".
La peau de léopard se voit au niveau des jambes.

Tout le monde (femmes, hommes,enfants) habitant où sévit la mouche noire de l'Oncho, court le risque de devenir malade de l'Oncho.

LE TRAITEMENT



Le Mectizan est disponible dans votre zone dans tous les dispensaires. On reçoit une dose selon le poids de la personne.
Le maximum est de 2 comprimés par personne et par an.
Le Mectizan vous protègera contre l'Oncho toute l'année.

QUI ?

Tout le monde peut prendre le MECTIZAN à condition de :

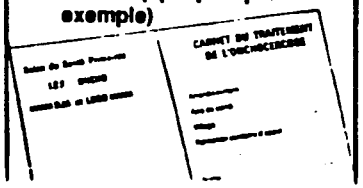
1) - Avoir sa carte de traitement

2) - Avoir eu moins 15 kg de poids

3) - Ne pas être enceinte au moment de la prise du MECTIZAN

4) - N'avoir pas un bébé de moins de 8 jours

5) - Ne pas être gravement malade (épilepsie par exemple)



IL FAUT REPETER

LA PRISE DES COMPRIMES

CHAQUE ANNEE

PENDANT AU MOINS 10 ANS

Le retraitement au Mectizan donne une protection durable. Par contre, une interruption du traitement vous expose au risque d'être à nouveau malade. Et de devenir aveugle.

EFFETS INDESIRABLES DU MECTIZAN

Si vous notez l'un des signes ci-dessous, dans la semaine suivant la prise du MECTIZAN, **ALLEZ SIGNALER A L'INFIRMIER !**

- vertiges
- gonflement de la peau
- urticaire (rash)
- difficulté pour respirer

INTERNATIONAL EYE FOUNDATION
PROJET DE LUTTE CONTRE L'ONCHOCERCOSE
DU DJA ET LOBO
B.P. 98 - PMI de SANGMELIMA, CAMEROUN

Soins de Santé Primaires

I.E.F. - ONCHO

DJA et LOBO

CARNET DU TRAITEMENT DE L'ONCHOCERCOSE

- Arrondissement : _____
- Aire de santé : _____
- Village : _____
- Formation sanitaire d'appui : _____

_____

- Noms : _____
- Prénoms : _____
- Chef de ménage : _____

NUMERO D'IDENTIFICATION

Sexe [ ] Age [ ] Ans

Poids [ ] kg Taille [ ] Cm

TRAITEMENTS PAR IVERMECTINE

	Dates	Nombre de comprimés par jour		Dates	Nombre de comprimés par jour
1	..../..../....		6	..../..../....	
2	..../..../....		7	..../..../....	
3	..../..../....		8	..../..../....	
4	..../..../....		9	..../..../....	
5	..../..../....		10	..../..../....	

N.B. : Retraitement, une fois par an !

FICHE DE RAPPORT DES REACTIONS LEGERES

(Voici la fiche utilisee par l'infirmier quand il traite les patients qui viennent a la clinique se plaignant des reactions legeres apres une dose d'Ivermectine.)

NOM de la Clinique.....

Date d'Ouverture de la Fiche..... Date de cloture de la fiche.....

Si quelqu'un se plaint d'un malaise apres une dose d'Ivermectine, tu dois lui demander les 3 questions suivantes :

1- es-tu si etourdi que tu es tombe? OUI/NON

2- es-tu si etourdi que marche est difficile pour toi? OUI/NON

3- as-tu une respiration difficile? OUI/NON

Si la reponse a ces questions est OUI tu dois remplir la "Fiche de Rapport pour Reactions Serieuses"

NOM DU PATIENT	QUESTION1	QUESTION2	QUESTION3	PLAINTE	MEDICAMENT et DOSE	DATE
	OUI/NON	OUI/NON	OUI/NON			
	OUI/NON	OUI/NON	OUI/NON			
	OUI/NON	OUI/NON	OUI/NON			
	OUI/NON	OUI/NON	OUI/NON			
	OUI/NON	OUI/NON	OUI/NON			
	OUI/NON	OUI/NON	OUI/NON			
	OUI/NON	OUI/NON	OUI/NON			
	OUI/NON	OUI/NON	OUI/NON			
	OUI/NON	OUI/NON	OUI/NON			
	OUI/NON	OUI/NON	OUI/NON			
	OUI?NON	OUI/NON	OUI/NON			

FICHE DE RAPPORT POUR REACTIONS SERIEUSES

(Fiche utilise par l'infirmier ou le Docteur quand il prend soin d'un patient avec des reactions sericuses apres une dose d'Ivermectine)

NOTE : Remplir cette Fiche Pendant que tu traites le patient
Pense aussi a remplir la "Fiche officiel des experiences hostiles"

1- Nom du Professionel de la Sante.....

2- Nom du Patient.....

3- Le Patient vient de quelle Communaute.....

4- demande "etais-tu si etourdi que tu es tombe?" OUI/NON

5- demande "etais-tu si etourdi que tu as eu des difficultes pour marcher ? OUI/NON

6- demande "as-tu une respiration difficile" OUI/NOM

7- Quel est le rythme de respiration ?.....

8- Quel est le rythme du Pouls ? .....

9- Entends-tu du bruit quand tu ecoutes avec un stethoscope? OUI/NON

Si tu entends du bruit et la personne a des difficultes de respiration. donne lui une Injection Sous-Cutanees d'Adrenaline.

(suivre la demarche donnee dans le "protocole pour les Injections d'Adrenaline sur le Terrain")

Prends le temps, le rythme respiratoire, le Pouls et les bruits chaque fois que tu donnes une Injection d'Adrenaline et utilise le tableau suivant pour garder tes donnees.

TEMPS	RITHME RESPIRATOIRE	POULS	BRUIT OUI/NON	DOSE D'ADRENALINE
.....	.....	.....	OUI/NON	cc
.....	.....	.....	OUI/NON	cc
.....	.....	.....	OUI/NON	cc
.....	.....	.....	OUI/NON	cc

10- Quel es la quantite totale d'Adrenaline administree? cc

11- Tension position couchee ...../.....

12- Tension position debout ...../.....

Note: Si la personne est tres etourdie, que pour se mettre debout est un probleme prendre la tension de la personne en position assise. Apres avoir pris sa tension, demande lui de se recoucher.

Si tu reponds "oui" a la question 13 ou a la question 14, commence a donner une Infusion. (suivre la demarche du "protocole pour donner une Infusion Intraveineuse sur le terrain")

Reprend la mesure du pouls et de la Tension (position couchee) toutes les 30 minutes jusqu'a ce que le patient puisse marcher sans etre etourdi. Utilise ce tableau pour enregistrer le Temps, le Pouls, la Tension et le Total des Infusions donnees.

TEMPS	POULS	TENSION	VOLUME DES INFUSIONS
.....	.....	.....	CC
.....	.....	.....	CC
.....	.....	.....	CC
.....	.....	.....	CC

15- Quel est le volume total des Infusions donnees? CC

Si tu repond "Non" a la question 13 et 14, demande au patient de boire du liquide comme du Jus de Sel ou de Sucre. Reste avec le patient jusqu'a ce que le ou la patiente puisse marcher sans sentir les etourdissements. Prendre le Pouls et la Tension en position couchee toutes les 30 minutes et enregistrer les resultats dans le tableau ci-dessus.

Si le patient commence a se sentir tres mal, prendre sa ~~xxxxxx~~ tension en position debout (ou assise) et repondre une fois de plus aux questions 13 et 14 , pour decider si oui ou non le patient a besoin d'une infusion.

84

GRILLE DE SUPERVISION POUR LA DISTRIBUTION

L'IVERMECTINE

Date : _____ N. _____/_____/_____

Formation Sanitaire : _____

Responsable de la formation Sanitaire : _____

Superviseur : _____

I. Cartes

a. Stock initial des cartes : _____

b. Montant en CFA du stock : _____

c. Nombre de cartes vendues : _____ Total depuis le debut : _____

d. Montant vendu : _____ Total depuis le debut : _____

e. Stock actuel : _____

f. Nombre de cartes livrees par le superv : _____

g. Nouveau stock : _____

h. Montant somme prelevee par le Superviseur : _____

i. Commentaire : _____

II. Fiche de stock de l'ivermectine

a. Stock initial de l'ivermectine : _____

b. Nombre de personnes traitees : _____ Total depuis le debut : _____

c. Total de comprimes distribues : _____ Toyal depuis le debut : _____

d. Nombre de comprimes disparus : _____ Total depuis le debut : _____

e. Stock actuel : _____

f. Nombre de comprimes livres par le Superviseur : _____

g. Nouveau stock : _____

h. Commentaire : _____

85

III. Rapport de la formation sanitaire sur la distribution de l'ivermectine.
Prendre 5 noms par fiche de traitement au hasard.

a. Est-ce que les fiches sont correctement remplies?

_____Oui_____Non_____ % de reussite

b. Est-ce que le dosage est correctement calcule?

_____ Oui_____Non_____% de reussite

c. Commentaire:_____

IV. Effets secondaires

a. Legeres

- nombre enregistre_____
- prurit_____
- oedemes_____
- urticaire_____
- autres_____

b. Graves

- nombre enregistre_____
- vertiges_____
- marche difficile_____
- difficules a respirer_____
- autres_____

Commentaire:_____

V. Etat du materiel

a. Pese-personne

bon etatt_____
endommage_____
autre_____

b. Seau

bon etat_____
endommage_____
autre_____

c. Gobelet

bon etat_____
endommage_____
autre_____

Commentaire:_____

VI. Commentaire final:_____

a. Evaluation:_____

b. Suggestions:_____

VII. Signature

a. Superviseur:_____

b. Responsable de la formation:_____

86

Annex 13. Cost Recovery Analysis

Economic Analysis of Ivermectin Distribution Program
in South Province. Cameroon

First Draft

Prepared by

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Address:
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New Orleans. La 70112.

Prepared for:
The International Eye Foundation
Under a sub-contract with Tulane University.

August 1993

Economic Analysis of Ivermectin Distribution Program in South Province, Cameroon

I. INTRODUCTION

Controlling onchocerciasis is often considered a priority activity in many countries of Africa. Although the world prevalence of the disease is much lower than the rate for other tropical diseases (estimated at about 17 million in 1990 compared to about 200 million for schistosomiasis), social cost of onchocerciasis infection is found to be relatively higher. One study (Prescott 1984) in Burkina Faso found that the village blindness rate can be as high as 130 per thousand in onchocerciasis endemic regions. The average age at onset of blindness was found to be 39 years in hyperendemic areas and in low prevalence areas, it was about 50 years. Therefore, considerable years of productive life can be lost due to high prevalence of the disease. Prescott estimated that the cost of onchocerciasis control per productive year of healthy life added is very similar to immunization for measles. In fact, if discounted, productive year of healthy life added is used as the outcome indicator, controlling onchocerciasis becomes more cost-effective than adopting a program for immunizing children against measles.

Due to this high social cost of the disease and as 95% of all onchocerciasis cases occur in Africa, a large scale control program has been adopted which covers 11 countries of West Africa (WHO report, 1991). The strategy followed by the program initially was to control the vectors. In general, vector control activities successfully reduced the prevalence of the disease. However, the vector control activities had limited effectiveness in certain areas. These regions as well as other areas outside the control program were brought under the new drug distribution program. An international pharmaceutical company has promised to provide ivermectin for onchocerciasis endemic countries. It is estimated by the WHO meeting that about 500,000 ivermectin tablets will be distributed under this program.

This report examines the Ivermectin Distribution Program (IDP) being carried out in South Province of Cameroon. The main purpose of the IDP is to distribute ivermectin. The reduction in the prevalence of onchocerciasis and the strengthening of the primary health care through ivermectin distribution are two important associated outcomes. If the drug distribution is targeted towards the infected individuals, distribution of ivermectin should reduce the prevalence of onchocerciasis.

II. THE PROJECT AREA

The South province was selected for the IDP. Map 1 shows the project area. Total population of the province, according to 1987 population census, was about 374,000. Assuming a population growth rate of 2.8% per year, total population in the province in 1993 should be about 443,000. Population density of the area is very low, about 7.5 persons per square kilometer. More than 72% of the population of the province are rural. The ratio of men to

98

women for this area was found to be 0.96 in 1987 indicating relatively higher rate of out-migration of male members. About 46.5% of the population were of age 14 years or lower and another 5.7% were older than 60 years. Defining these two age groups as dependents, the dependency ratio becomes 1.09.

The major crop sector activities in this area are the production of cocoa, maize, cassava, peanut, plantain and onion. The peak period for crop sector activities in this area are August and September for cocoa harvesting and June, July for cassava weeding and harvesting. Recently, commercial poultry farming has also been established in this province. Wage employment for agricultural work is almost non-existent. However, when workers are employed on a contract basis (to cut grass for reclaiming land, harvest or pre-harvest operations), wage paid is relatively high. Clearing one hectare of land may cost as high as 7,000 FCFA in labor charges. Two to three individuals should be able to clear a hectare of grass land in one day. However, discussions with the local agricultural office suggests that the income of an average worker in the region should be around 25,000 FCFA per month. Assuming that an average household size is about 5.5 members with 1.3 male workers, the mean household income of a poor family should be about 32,500 FCFA per month.

The reorientation of the primary health care in Cameroon is being implemented in this province. Table 1 reports the number of villages with the number of newly restructured primary health care centers by arrondissement in this province. Note that out of 32 public health centers, only eight centers have been reorganized.

Table 1

Number of Villages, Population and Health Centers by Arrondissement, Department of Dja and Lobo, Cameroon

Arrondissement	No. of villages		Population	Number of Health units		
	Total	# > 150 pop.		Public	Private	Reorient
Bengbis	63	30	11,432	2	1	2
Djoum	98	48	27,119	5	0	2
Meyomessala	98	62	35,157	6	1	1
Sangmelima	115	90	58,749	12	5	2
Zoetele	57	53	39,480	7	2	1
TOTAL	431	283	171,937	32	9	8

The principal breeding site for the flies in this area is the river Dja. The flies lay their eggs on tree trunks or rocks partially submerged in the water. The larvae need both water and air for survival and the fast-flowing river Dja provide all these necessary preconditions. The breeding in the river could be year round or seasonal depending upon the climatic conditions and water level. Even though the breeding site is relatively localized, larviciding may not be as effective in this dense forest area than in other parts of the world.

III. OBJECTIVES OF THE STUDY

The purpose of this project is to identify and develop appropriate methodology for analyzing the economic aspects of ivermectin distribution in the department of Dja and Lobo. The methodological discussion will also help identification of data requirements.

More specifically, this applied policy research will examine the following issues:

1. Costs of different methods of ivermectin distribution in the department of Dja and Lobo.

2. Effectiveness of the proposed strategies for ivermectin distribution. How the effectiveness may change with changing prevalence rate of the disease.

3. Examine methodologies to determine the impacts of onchocerciasis related health education program on the demand for treatment.

4. Discuss possible mechanisms of incorporating the ivermectin distribution program within the reoriented primary health care program of the country.

5. How to set the user fees for the drugs to make the program financially self-sustaining. The purpose is to identify charges to be imposed in order to recover the costs associated with the ivermectin distribution and provide incentives for the adoption and continuation of an effective distribution program.

III. IVERMECTIN DISTRIBUTION STRATEGIES AND RELATED QUESTIONS

In general, three types of drug distribution systems has been proposed. The strategies are:

1. The mobile team strategy
2. Community based distribution
3. Passive mode of delivery

The IDP has experimented with the mobile team and passive delivery systems since its inception in 1991. The community based distribution strategy has not been tried yet. The first two strategies can also be grouped together as the "active" mode of delivery.

The active distribution strategy directly delivers the drug to the infected individuals or to a target group in the communities. When the mobile teams are organized, they usually travel from the department center to the health facilities for diagnosing and treating the patients. Since the mobile team resides in the area only for a short period of time, the exact date, time and location of the visit must be prearranged and communicated to members of the region. The community based distribution is another form of active distribution strategy but in this case a local health worker (or a group of assigned individuals) takes the responsibility of diagnosis and distribution of the drug.

The third strategy, the passive mode of delivery, makes the drug available at local clinics and pharmacies. Infected individuals can obtain the drug from these distribution points if they are willing to treat onchocerciasis. The passive system assumes that private demand for the drug already exists and therefore, direct delivery will not be required.

The passive approach uses the existing marketing or distribution facilities which potentially can reduce the cost of delivering the drug. If the private demand is less than a critical minimum level, this approach may fail to reduce prevalence and intensity of the infection significantly. On the other hand, the direct distribution system is likely to have a higher fixed and recurrent costs per treatment than the indirect approach. The advantage of the direct approach is its ability to ensure achievement of a target level of treatments.
Since, both the approaches deliver ivermectin to the population, policy makers will be interested to know the cost of delivering the drug by these two approaches and their respective effectiveness. The effectiveness can be measured by the following indicators: amount of drugs distributed, the number of persons treated and/or percent of infected individuals receiving treatment. Clearly, the benefits of treatment will be higher in a community where the prevalence rate as well as the intensity of infection are relatively high. Assuming a relative benefit scale for prevalence and intensity, one can estimate a set of prevalence-intensity combinations above which the "active delivery" approach will become more cost-effective than the "passive approach". Clearly, this information will be extremely useful to devise appropriate delivery strategies for different regions of the country.

The relative cost-effectiveness of the delivery approaches can change significantly due to the impact of health education. For example, if health education messages increase the demand for ivermectin significantly, the effectiveness of the passive approach will increase. Another impact of health education could be to increase the utilization of rural health care delivery system. Higher use of the facilities will reduce its average cost of operation and will produce additional external economies by encouraging better utilization of the health centers.

Economic evaluation of the distribution program should examine the extent to which the local infrastructure has been used in the distribution chain. Incorporating the ivermectin distribution within local infrastructure only adds costs at the margin. Therefore, using the local infrastructure should reduce distribution cost. Possible cost savings achieved and prospects for additional cost-savings can be identified by examining the local delivery system.

The drug distribution program can be made sustainable in the long run if the community is willing to participate in the management and financing of the program. To estimate the level of financing required, we need to carry out a detailed cost analysis of the distribution system. An attempt will be made to obtain some rough estimates of costs so that the user fee to be charged for ensuring cost recovery and sustaining delivery of the drug at a certain level can be calculated.

IV. THE IDP ACTIVITIES IN THE REGION

This section provides a brief description of the activities carried out by the project since its inception in September 1991.

The activities of the project can be subdivided into two categories: one-time or special activities and on-going activities. For example, distribution of Ivermectin is an on-going activity while the Knowledge, Attitude and Practices (KAP) survey is a special activity.

Several surveys were carried out to help proper implementation of the project. The surveys are of two types: the epidemiologic surveys and the KAP survey. The epidemiological survey was carried out to try to determine the rapid assessment method to map the entire division and to classify the communities according to their degree of endemicity. The survey also tried to identify some indicators which can be used to predict population prevalence and severity.

One of the basic problem in the diagnosis of the disease is that the skin-snip method, the most reliable test for determining the presence of microfilaria, may not be practical when rapid assessment of the situation is required. Skin-snip method needs special equipments and skilled personnel and since it is an invasive procedure, there is always a risk of exposure to infections. Therefore, an alternative indicator, if available, will be useful in targeting regions and population groups for ivermectin distribution. The first survey selected 13 villages from Djoum. The choice of the villages were based on data availability from other earlier studies. In other words, these 13 villages were not selected randomly. All males of age 20 years or above was defined as the population for sampling and 287 individuals were selected for the study. Apart from skin-snip tests, the survey noted reported cases of itching, presence of nodules and leopard skin, blindness etc. The skin-snip results for the sample indicates extremely high prevalence of the disease in the region. In all villages, the prevalence rate was found to be more than 84 percent. Only three out of 13 villages showed a prevalence rate of less than 90 percent.

Due to this low regional variability of the prevalence rate, it was decided to survey another sub-division likely to have a higher degree of variability than Djoum so that meaningful statistical tests can be carried out. The Sangmelima sub-division was chosen for this second survey. All villages in Sangmelima was stratified by size and by health zone. Out of 11 health zones of the area, the urban health zone of Sangmelima was excluded from the survey. The survey was carried out in 20 villages, two villages randomly selected from each of the health zones. Again, all males of age 20 or above who have lived in the villages for at least an year and have not received any anti filaria treatment during the past 12 months were defined as the population to

be surveyed. The sample size of this second epidemiological survey was 846. The survey was actually carried out by the principal investigator of the project (a physician) with the help of two nurses and two laboratory technicians.

From these survey results, it was decided to use the presence of nodules and/or leopard skin as the rapid indicators. A simple statistical procedure (estimated by Kollo) indicates that if the prevalence rate using these two indicators exceed 20%, the actual community prevalence of onchocerciasis should be around 80%. This cut-off is being used by the project to identify villages or regions where an active drug distribution strategy will be carried out.

The KAP study was carried out in 1992 to understand the knowledge of the population about the disease and their willingness to pay for treatment and control. A total of 212 households were interviewed in six villages and one city area. A structured questionnaire was used to collect information on symptoms of onchocerciasis and other filarial diseases, mode of acquisition, treatment options and outcomes etc.

The most important activity of the project, is of course, the distribution of the drugs. As a preparation for devising an efficient drug distribution strategy, the project mapped the villages in the region on the basis of estimated village prevalence rates. Using the rapid assessment method, 194 villages were mapped and out of these villages 32 was classified as high priority for drug distribution purposes. For the priority villages, active distribution strategy is being employed. All the 32 priority villages are expected to receive drugs by the end of August, 1993. Other health centers of the region have also received drugs for distribution.

The rapid assessment of the villages are being carried out on a continuous basis to determine the mode of delivery of the drugs. With the drug distribution activity, the training of health personnel is another continuing activity of the project. Availability of ivermectin is only one aspect of the drug distribution program. To improve the effectiveness of the program, the drug must be prescribed and used in appropriate doses. The health personnel should also be made aware of the procedures developed for monitoring ivermectin distribution and record keeping, and managing possible adverse reactions. The training sessions are arranged to convey this information to the health center personnel.

V. COST OF DELIVERY

(a) Mobile Team Approach

The activities related to mobile team approach in the IDP are as follows:

1. Initial rapid assessment for mapping or deciding whether to use the active or passive method of distribution.
2. First visit to arrange a date, time and location of the village meeting.
3. Diagnosis, treatment and health education activities
4. Follow-up visits to monitor adverse reactions and to manage them.

The effectiveness of the mobile team approach depends upon the coverage rate of the target population. Therefore, before examining the costs, we need to estimate the number of population eligible for treatment and how successful was the approach in reaching the target group.

The number of individuals eligible for treatment represents the upper limit the active delivery approach could have achieved. The eligible population has been derived by assuming that the age distribution of the population in these 12 villages is same as the age distribution of the population in the South province. The following additional assumptions were used for estimation purposes: (i) All children below five years of age weigh less than 15 kg cut-off weight (ii) 20% of children in between 5 to 9 years and 10% of children between 10 to 14 years weigh less than 15 kg (iii) Percent of women in the age group 15 to 44 years pregnant or with a baby less than 8 days old is derived by dividing the number of children borned in the country in a year by total number of women in the age bracket. Including the 10% infants that die every year, the ratio is found to be about 0.2556.

Table 2 shows the results of the calculation. For the 12 villages treated by the IDP, the table estimates the age distribution of the population, number of eligible population, number treated and the participation rate by age groups. Note that the participation rate of the younger age groups are very low. For example, even for the age group 20-24 years, only about 15% of the eligible population received treatment. For older groups, the participation is virtually 100%. These estimates will be used for cost-effectiveness analysis.

Table 2

Estimation of Eligible Population and Percent Participation in Ivermectin Distribution in Benybis, Cameroon

Age groups (in years)	National percrage	Number in 12 vill.	Eligible Population	Number Treated	% of Pop.	% of Elig.
0-4 years	17.9	579	0	0	0	NA
5-9	17.5	566	452	46	8.13	10.17
10-14	13.6	440	440	60	13.65	13.65
15-19	9.2	297	268	48	16.14	17.94
20-24	6.5	210	182	28	13.33	15.41
25-29	5.0	162	140	34	21.04	24.32
30-34	5.2	168	145	46	27.37	31.64
35-39	4.2	136	117	39	28.73	33.21
40-44	3.9	126	109	43	34.11	39.44
45-49	3.0	97	97	50	51.57	51.57
50+	14.0	452	452	438	96.90	96.90
All groups	100.00	3232	2402	832	25.74	34.64

94

Mapping of the villages to identify target areas has the following cost components:

Number of villages covered in a day:	5
Number of individuals in the villages:	1000
Number examined randomly:	150
Delivery of initial letter	
Per-diem for driver	2,000 FCFA
Per-diem for official	5,000
Transport/automobile related costs	
Fuel cost	6,000
Maintenance	1,350
Insurance	500
Depreciation	2,600
Clinics paid for delivering letters to village	3,000
Initial rapid assessment	
Per-diem for driver	2,000 FCFA
Per-diem for others(2)	6,000
Transport/automobile related costs	
Fuel cost	6,000
Maintenance	1,350
Insurance	500
Depreciation	2,600

Total initial assessment costs:	38,900 FCFA
Initial assessment cost/village:	7,780 FCFA

[The depreciation is based on the assumption that the cost of a pick-up truck in Duala is about $25,000. The insurance cost of the vehicle is 135,000 FCFA per year. The maintenance cost per day is estimated by examining records on maintenance of the vehicle since it was acquired. Upto July 1993, total maintenance expenditure was 532,000 FCFA. This total cost was distributed equally over the full 18 month period].

If the prevalence rate is found to be above the cut-off point, a date and time is set for a treatment session. However, the letter for the revisit must be sent to the health center and cost of doing that is same as the cost of delivering the initial letter mentioned above.

The cost of diagnosis, treatment and follow-up visits is based on the actual costs incurred during the active delivery in priority villages in Bengbis. The active distribution was carried out in 12 villages or areas of Bengbis over the period June 28 to July 10, 1993. The details of the costs are given in Table 3 below.

Not all individuals present at the village meeting are treated with ivermectin. The rule of eligibility followed are: the patient must weight 15 kg or more, not pregnant, if breast-feeding the baby must be at least 8 days old, and the patient is not suffering from any known neurological disorder. Each patient receiving drugs pays a fee of 200 FCFA to obtain two yellow cards. The cards are valid for 10 years of treatment. The individuals are weighed and given the appropriate number of tablets to take on the spot in presence of health care personnel. The treated individuals are monitored for the next two days. If any adverse reactions occur, drugs are supplied free of cost to manage the problems.

Table 3

Cost of Active Distribution: Mobile Team Approach
Actual costs associated with delivery in Bangbis
(June-July, 1993)

Per-diem fee		
Project director	5,000 FCFA/day for 14 days	70,000
Project driver	2,000 FCFA/day	28,000
PHCC Bengbis	1,000 FCFA/day	14,000
Chief, health center	5,000 FCFA/day	70,000
Lodging for the personnel	@2,000/day for 42 days	84,000
Other materials used		63,950
Drugs for adverse reactions		47,310
Transport/automobile related costs		79,300
Paid to PHCC to deliver letters	3,000 FCFA	
Fuel	22,150	
Maintenance	14,800	
Insurance	11,250	
Depreciation	28,100	
TOTAL COST		456,560
Cost per village		38,047

Table 3 continued....

Cost of initial letter delivery and mapping/village	7,780
Total cost for mobile teams per village	45,827
Cost per person(population 3232 in 12 village)	170
Cost, per person eligible for treatment (2402 in 12 villages)	229
Cost per person treated (832)	661

(b) Community based Distribution Approach

The community based distribution approach is very similar to the mobile team method described above but rather than using a mobile team traveling from the center, the village communities or health centers take the responsibility of distributing ivermectin and managing the side-effects. The IDP has not used this approach for drug delivery yet. But, we can estimate the costs likely to be associated with ivermectin distribution program if carried out by a primary health care coordinator.

The community based ivermectin distribution strategy assumes that the community member in charge of distribution has been trained for this purpose. The mass distribution of ivermectin itself is very simple. The eligibility conditions are straightforward and determining the dosage from the chart is quite simple. A health worker should be able to carry these activities once trained for ivermectin distribution.

Managing the adverse reactions will require much more intensive training and practical experience. However, most of the reactions are easy to deal with, ranging from headache, fever to itching and rash. Active treatments by mobile team found adverse reactions in 24% of cases while if the patients are not monitored, the adverse reaction rate was found to be about 10 percent. The lower rate of adverse reaction for passive distribution does not necessarily imply lack of management skills of the health care workers or lack of knowledge of the patients. In active follow-up even the minor side-effects will be noted which may be ignored in a passive mode. Given the nature of the side-effects, health center personnel should be able to manage most of the side-reactions effectively. Table 4 reports the cases of adverse reactions found during the active distribution in Bengbis. The rate of adverse reactions appear to be higher for older age groups. For age group 30 years or above, about 30% reported adverse reactions to ivermectin. None of these cases required continuous monitoring of the patient's condition.

91

Table 4

Number of Adverse Reaction Cases found During Active Distribution in June-July, 1993, by Age Groups

Age groups (years)	Total treated (number)	Adverse Reactions (number of cases)	Percent of total
5- 9	46	3	6.52
10-14	60	3	5.00
15-19	48	10	20.83
20-29	62	12	19.35
30-39	85	25	29.41
40-49	93	22	23.66
50-59	178	54	30.34
60+	260	76	29.23
All groups	832	205	24.64

For carrying out ivermectin distribution by community health workers (assumed to be the primary health care coordinator), the central authorities need to arrange a training session every three years and deliver the drug at the center with other drugs necessary for managing adverse cases. For distributing the drugs, each PHCC is assumed to be provided with a motor bike.

Cost of training sessions (once in three years)

Based on the budget for training in Bengbis.
Number of participants: 18 from nine health centers
Duration of training: 2 days.

Per-diem for participants:	@1,000 for 36 days	36,000
Lodging:	@2,000 for 36 days	72,000
Per-diem for trainers:	@2,000 for 6 days	12,000
Fee for trainers:	@6,000 for 4 days	24,000
Transportation:	@1,000 for 18	18,000
Materials supplied		15,500
Fuel		10,800
Maintenance		2,700
Insurance		1,000
Depreciation of vehicle		5,200

92

Total cost of training		197,200
Training cost per health center		21,911
Training cost per center per year (assuming 10% long term interest rate)		8,010
Drug delivery costs from department seat to health centers. Should be same as letter delivery assuming two centers can be covered in a day.		10,225
Actual distribution of ivermectin and follow-up (for 12 villages, as in mobile team distribution)		
Per-diem for PHCC @1,000 for 10 days		10,000
Per-diem for another person		10,000
Lodging for two @2,000 for 10 days		40,000
Other materials		63,950
Drugs for managing adverse reactions		47,310
Costs associated transport/motor bike		17,100
Initial visit for arranging village meeting	3,000	
Fuel	4,000	
Insurance/lisc.	1,600	
Maintenance	2,500	
Depreciation	6,000	
Cost of treatment, and follow-up in 12 villages (population covered 3232)		188,360
Population per health center in Dja and Lobo		5,400
Cost of treatment, follow-up for 5,400 persons		314,710
Cost of treatment, follow-up per village (13.5 villages)		23,312
Training cost per village (center cost/13.5)		593
Drug delivery cost per village (center cost/13.5)		757
Cost of initial letter delivery and mapping/village		7,780
Cost per village (13.5 villages/health center. See table 1)		32,442
Cost per person (5400 individuals)		81
Cost per eligible individual (4013)		109
Cost per person treated (assuming 34.6% of eligible)		315

(c) Passive Distribution Approach

In the passive distribution system, drugs are made available at the clinic or pharmacy without trying to reach the patients actively. In this approach, it is assumed that the patients will demand treatment to control the symptoms and the disease. Health education activities obviously can affect the demand for ivermectin. The cost of the passive method is simply is the cost of delivering the drugs at the center, cost of training of the personnel at the clinics and pharmacies, and the cost of diagnosis, treatment and managing adverse reactions. Since the adverse reaction cases are also managed in a passive manner, the cost of managing the side-effects will depend upon the number of treated cases returning with complains.

To understand the present use of passive distribution system by the population, we can examine the number of patients treated in different centers. Time series of the number treated is available only for Sangmelima hospital. Graph 1 plots the number of cases over the ten month period September 1992 to June 1993. Immediately after the passive system of distribution started, a large number of patients turned out for treatment. According to the hospital records, during the first month of passive distribution from the hospital, number treated was 60% higher than the number covered by active system in 15 days. In fact, during the first three months, the hospital treated more than 60% of the patients treated over the 10 month period. Since the number treated remains distributed over the whole year, the yearly follow-up treatment will be much more difficult to arrange or monitor compared to an effective active distribution system.

The costs associated with the passive system of distribution are listed below:

Non-patient related variable costs	
Cost of delivering the drugs	10.225
Cost of the forms delivered	5.000
Training of health center personnel	8.010
Patient-related variable costs	
Cost of treatment/diagnosis per 100 cases (diagnosis using physical exam only) @6 minutes/case	
Two individuals in one day, Salary	5.000
Cost of managing side effects, for 100 cases at 10%	2.310
Forms or cards, 9 FCFA each	900
Record keeping	1.000

100

Fixed costs	
Weighing scale per 100 cases (cost 9.000. life:5 yrs. CI/yr 2252)	10
Buckets per 100 cases(3.000 FCFA.economic life: 2 years)	7
Cups. 250 FCFA (economic life: 2 years)	1
Shelf for cards at arrondissement. cost per 100 cases (29.000 FCFA.life: 5 years. 7 centers/arrondissement)	5
Use of health center for a day	1.500
Maintenance	100
Total cost per 100 cases (assuming 4,000 cases a year)	
Non-patient related variable costs	581
Patient related variable costs	9.210
Fixed costs	1.623
Cost per case	114

VI. COMPARISON OF THE DISTRIBUTION STRATEGIES

(a) Mobile Team or Community out-reach?

Table 5 below compares the costs of two active approaches using different outcome indicators. Note that the mobile team travelling from the urban center of the department to treat the priority villages costs about 1.5 to 2.3 times more than the community based distribution strategy. In fact, the cost ratios will be even better for community based programs if they can achieve a higher treatment rate among the eligible population. The mobile team treated only about a third of total eligible population in the priority villages. It is expected that the community out-reach will be better able to increase the coverage.

Although the community based approach is clearly more cost-effective, given the present pattern of demand for treatment, one concern is the issue of managing the adverse reaction cases. The physicians in Sangmelima are of the opinion that poor management of severe adverse reaction cases may have significant adverse effect on drug distribution, as happen in another part of the country in the recent past. However, most of the adverse reaction cases reported were very simple and easy to manage. With appropriate training of the health center workers, complicated cases can be referred to upper health facilities of the locality. This will require improvements in referral system.

101

Table 5

Cost-Effectiveness of Two Active Approaches of Distributing Ivermectin in Dja and Lobo Department, Cameroon

Outcome units	Cost per indicator for Mobile team	Community-based	Ratio of costs
Treated villages	45.827	32.442	1.413
Population of the villages	170	81	2.099
Eligible individual in treated areas	229	109	2.101
Number of persons treated	661	315	2.098

(b) Active or Passive Distribution:

Comparing the two active approaches, as has been done in the section above, is much simpler than comparing the mobile team or community based approaches with the passive method. The passive method have no defined target population. Any individual demanding treatment for onchocerciasis are provided with the drug as long as they are willing to pay 200 FCFA. For passive treatment strategy, we can estimate the cost per case rather than treatment costs per village or per community. Moreover, in passive system, greater utilization of the health centers will further reduce the overhead costs associated with a treatment.

The procedure used in the passive treatment method is to examine the patient to determine the infection status. The health worker or nurse weigh the patient and prescribe the medicine. The patient must buy two cards at the pharmacy at 200 FCFA and the tablets are taken orally on spot. The cost of each treatment by passive approach is about 114 FCFA including the opportunity cost of time of the nurses and health workers. Therefore, it is substantially lower than the costs associated with the community based distribution strategy. This is because, the community based out-reach program is assumed to achieve a coverage ratio of 34%, similar to mobile team coverage ratio. If this coverage ratio increases, cost of active approach will decline significantly.

The passive approach can not achieve a target treatment rate without an active health education program for the population. Therefore, at least a part of health education cost should be considered a component of the passive distribution costs. Health education costs will be discussed at a later stage. Since, general health education or health education specific to onchocerciasis provides additional benefits other than changing health seeking behavior, cost of health education should not be included to set prices for the treatment of onchocerciasis.

As mentioned above, the yearly follow-up for an active system is quite simple. The mobile team can revisit the area during the same month of the year in the future. For passive system, the clinic or health centers can not directly monitor the follow-up visit. The patients using the passive system are geographically scattered and even if the health centers arrange the cards on a monthly basis, contacting the patients for reminding their month of revisits will be prohibitively costly in this part of the country.

(c) **Diagnosis and Treatment or Treatment on Demand?**

The IDP now distributes the drug basically on demand. Anyone who appears to be suffering from onchocerciasis is prescribed a single dose of ivermectin. Even in the health centers or hospitals, no reliable diagnosis is carried out. In regions of high endemicity, this appears to be a reasonable approach to follow. However, as the prevalence of the disease declines, diagnosis becomes more and more important.

The cost of diagnosis by physical examination is very simple and require no special tools or equipments. The physical examination for ascertaining the presence of nodules or leopard skip probably takes about a minute. However, prevalence of both presence of nodules and leopard skin is much lower than the prevalence estimated by skin-snip method and therefore most of the cases will remain undetected if these two indicators are used. The patient must be asked about the presence of other known symptoms of the disease. The whole process should take approximately about 3 to 4 minutes. The following table provides an estimate of successful diagnosis using an assumed prevalence of 90% (actual prevalence data from a village survey carried out by IDP)

Total cases examined:	100
Prevalence of oncho by skin-snip:	90
Prevalence by presence of itching:	60
Prevalence by presence of nodules:	36
Prevalence by presence of leopard skin:	18

[Assuming that a set of diagnosed patients are members of next higher indicator based diagnosis as well]

Undetected cases by skin-snip	0
Undetected cases by itching indicator	30
Undetected cases by nodule indicator	54
Undetected cases by leopard skin indicator	72

The cost of performing skin-snips are provided below:

Technician and a helper perform 50 tests in 6 hours

Salary for two persons for a day:	5,000	
Alcohol swabs (2 per test for 50 tests)	900	
Antiseptic (1 box a week, 1200/box)	240	
Saline solution	50	
Biopsy instrument ($300, life 8 yrs)	59	
Microscope ($500, life 8 years)	98	
Cover slides and slides (each used 30 times)	3	
Total cost per 50 tests:		6,350
Cost per test		127

The cost of mis-diagnosing a patient as not infected when in fact the patient is infected with onchocerciasis is not known. Let us assume that the loss due to this misdiagnosis will be 600 FCFA during the year. This number is chosen only for illustrative purposes. If this assumption of 600 FCFA loss per year per mis-diagnosed case is true, total loss for using other three indicators will be: 18,000 FCFA (600 x 30 mis-diagnosed cases). If the skin-snip method is used, the additional cost of diagnosis for 100 cases will be 12,700. Therefore, in this case, benefits of formal diagnosis exceeds the costs. It should be noted that about 24 FCFA per test can be saved if pins and razor blades are used rather than the biopsy instrument.

Table 6 presents a sensitivity analysis for using a range of prevalence rates and a range of yearly loss if the onchocerciasis patients are not correctly diagnosed due to the use of three indicators discussed above (itching, nodule and leopard skin). Note that if the yearly cost of not treating a case is about 425 FCFA, it is better to diagnose the cases by skin-snip method for high prevalence regions. This is because a certain percent of mis-diagnosis implies higher social cost for the area as the number of patients mis-diagnosed will be high. If the cost per year associated with onchocerciasis is about 1200 FCFA (which is less than 5% of income of poor households), even with 30% prevalence rate, performing a skin-snip becomes more cost-effective from social point of view.

104

Table 6

Net Benefits of Performing Skin-snip tests Compared to Using Combination of three Indicators (Presence of itching, nodules Leopard skin) to Identify Presence of Onchocerciasis (for diagnosis of 100 individuals)

Yearly loss due to non-treatment	Net benefits in FCFA if real prevalence is 90%	60%	30%	10%
400 FCFA	-700	-4,700	-8,700	-11,500
600 FCFA	5,300	- 700	-6,700	-10,900
800 FCFA	11,300	3,300	-4,700	-10,300
1000 FCFA	17,300	7,300	-2,700	- 9,700
1400 FCFA	29,300	15,300	1,300	- 8,500
1800 FCFA	41,300	23,300	5,300	- 7,300
2000 FCFA	47,300	27,300	7,300	- 6,700
2500 FCFA	62,300	37,300	12,300	- 5,200

Another alternative distribution strategy is to provide the drug to all eligible individuals without any physical examinations. In this case, the cost is not the loss to the society due to non-treatment of patients but the cost of adverse reactions for the cases who should not have been treated. Let us now consider these two alternatives: mass treatment versus diagnosis and treatment. The mass treatment increases the number of adverse reaction cases compared to treatment of infected individuals only. The second cost of mass treatment is the actual treatment cost of the additional individuals who should not have been treated. On the other hand, the benefit of mass treatment is the savings obtained for not diagnosing the individuals. Table 7 reports the costs and benefits of mass treatment at different prevalence levels. The table is based on the assumption that the managing adverse reaction cases will be slightly higher than the average cost of drugs distributed per adverse reaction case. In active distribution phase, the total value of drugs provided to 205 cases of adverse reactions was 47,310 FCFA. Therefore, per case of adverse reaction costs about 230 FCFA. Since other costs are not included here, we assume that the cost per case will be about 250 FCFA. It is also assumed that 20% of all cases will report adverse reactions. This is simply the average rate of adverse cases observed both for active and passive distribution activities of IDP.

Note from the table that the net benefits of mass treatment relative to diagnosis and treatment increases with increasing prevalence rate. At around 30% prevalence rate, the net benefit of mass treatment becomes positive (cost of diagnosis is the benefit of mass treatment). In other words, if the prevalence rate is above 30%, it is more cost effective to carry out mass treatment of the eligible population rather than trying to identify the infected cases for treatment.

105

Table 7

Costs and Benefits of Mass Treatment Compared to Treating Infected Patients only (for 100 eligible individuals)

Prevalence rates (% of eligible)	Cost of managing add. adverse cas	Cost of treating non-infect cases	Cost of diag. by skin-snip
90	625 FCFA	1,000 FCFA	12,700 FCFA
60	2,500	4,000	12,700
30	4,375	7,000	12,700
10	5,625	9,000	12,700

V. HOW TO INCORPORATE IDP WITH PRIMARY HEALTH CARE SYSTEM?

On May 25, 1993, the Ministry of Public Health, Republic of Cameroon, officially adopted the reorientation plan of the national health system. The reorientation of the health system is based on three key elements: community participation for self-reliance, linking health and development activities and respect for human rights. The reorientation plan has the objective of strengthening the health districts by defining a good referral mechanism from the health centers to the sub-division hospitals. Co-financing of health services is assumed to be an important method of generating funds for delivery of health services, including drugs. Community financing will not be used for training of personnel, construction, equipment, payment of salaries (National Declaration on the Implementation of the Reorientation of Primary Health Care, Republic of Cameroon, 1993).

Although the declaration was made only a few months ago, experimental reorientation has been carried out in certain regions of the country during the last four to five years. As reported in table 1 above, eight of the 32 public health centers have been reorganized to improve community participation.

The structure of the reorganized health centers can be summarized as follows. The health center (arrondissement hospital) is headed by the Chief Medical Officer (CMO), who is usually a physician. Directly under the supervision of the CMO are the three health care personnel: the general supervisor of curative activities, the primary health care coordinator and the financial

and administrative supervisor. The supervisors are usually the senior nurses of the health center. Each center (reoriented centers) also has a pharmacy, which is actually an independent entity. Community appoints the staff of the pharmacies and the CMO only provides technical advice and drug supply requirements.

It is important to note here that the PHCC is in charge of preventive care and out-reach activities of the center. Presently, the IDP is depending upon the PHCC for the distribution of the drug. The services of both the PHCC and the CMO of the centers have been used for active delivery of ivermectin. There are clearly some advantages of using the PHCC for ivermectin distribution. First, the PHCC is the assigned personnel for out-reach and preventive services. The active distribution of the drug requires visiting various villages within the catchment area of the center. The PHCC has or supposed to have access to a motor bike and can travel to distant places to deliver health care services. In our cost estimates for community based delivery, we have assumed using the services of PHCC. However, IDP has not yet carried out any active distribution of drugs using the health center personnel only.

The passive distribution is already utilizing the reoriented health centers. The PHCC and the pharmacy personnel are responsible for distributing ivermectin through the chief of the health center. The yellow treatment cards are kept in the pharmacy. Each patient buy two cards at 100 FCFA each for treatment. Since the pharmacies are already selling the immunization cards, selling cards for onchocerciasis will not require significant reorganization of the activities of the pharmacies. The drug is actually dispensed by the nurse or the physician.

One important activity that has not been incorporated into the primary health care system yet is the delivery of the drugs. The essential drugs, under the reoriented primary health care system, are delivered to the arrondissement hospital from the provincial drug depot. The depot supervisor is the basic link between the center and the arrondissement hospitals. The supervisor travels to the health centers with essential drugs once every two months. The pharmacies buy the drugs they need from the supervisor. Since, this is a regular activity within the reoriented system, ivermectin can also be distributed using this channel. The marginal cost of distributing the drugs using this method should be very low.

In summary, the ivermectin distribution program can be incorporated into the reoriented primary health care system without any significant reorganization or redefinition of activities of health center personnel. The PHCC, who coordinates the activities of the health centers within the arrondissement, is the logical personnel to use for organizing active delivery. The advantages of using the PHCC are: he/she is very knowledgeable about the community, in most cases can speak the local language, and he/she can combine ivermectin distribution with immunization or other out-reach programs to achieve cost economies. It is also possible that the active approach by PHCC can reach a higher proportion of the eligible population. The drug distribution from provincial depot to pharmacies can also be incorporated quite easily. However, if the drugs are distributed without charging any price to the center, the distribution mechanism must define the volume of drugs to be delivered to each of the centers exogenously.

VI. HEALTH EDUCATION AND PRIVATE DEMAND

The health education activities for the population has just started in the project area and so its impact on demand for treatment could not be evaluated. A brochure for health education has been developed and will be distributed soon. In July the project received its order of 50,000 brochures at a cost of 30 FCFA per brochure. The only significant form of health education carried out by the IDP is the information provided by the mobile team in the village meetings. In school curricula, onchocerciasis is being added to make people aware of the disease and the treatment. An onchocerciasis knowledge contest has been arranged for secondary school children.

It is interesting to note that the KAP survey in this region found that the people are well aware about onchocerciasis and the mode of its transmission. For example, 97% of household head reported that a major symptom of the disease is itching. More than 90% were aware that flies transmit the disease. However, about 46% reported that the mosquitoes can transmit the disease as well. More than 90% of the respondents also knew that the disease can damage the eye sight and may result in blindness. About 60% thought that the adults are affected more by the disease than children. As the disease is a cumulative one, it should appear more severe for adults. About 91% of all respondents reported having the disease now or in the past. Those who had the disease in the past, about 68% obtained medicine to cure the infection. Most obtained the drugs from private or public health clinics. The household heads reported that they spent about 540 FCFA on the average for the last prescription for onchocerciasis drugs. About 50% of all respondents noted that they are willing to pay about 100 to 300 FCFA per year for the treatment of onchocerciasis. Another 30% were willing to pay about 300 to 600 FCFA per year while 16% reported their willingness to pay more than 600 FCFA.

The KAP study clearly indicates that most households are well aware about the disease and they are willing to pay for its effective treatment. The widely used drug to treat onchocerciasis before the introduction of ivermectin was noctezine and most households (57%) thought that the drug is not effective. Given the awareness of the population about onchocerciasis, it is unlikely that a health education program will have significant impact on demand for treatment.

VII. FEE FOR TREATMENT AND SUSTAINABILITY

At the present time, the IDP charges 200 FCFA for two treatment cards which are valid for 10 treatments in 10 years. The method of determining the fee of 200 FCFA per treatment by the IDP was quite arbitrary. A planning meeting was arranged to discuss the fee to be charged for treatment. The meeting was attended by local CMOs, primary health care officers, peace corp volunteers, and other government and non-government representatives. The participants of the meeting decided that most individuals in the southern part of the country should be able to pay 200 FCFA for the first treatment. Subsequent treatments should be free of charge to encourage the patients to continue the drug therapy. The KAP study also indicated that most individuals should be able to pay 200 FCFA for the first treatment. However, an estimated 20% of respondents were not willing to pay 200 FCFA.

Since the fee is already set at 200 FCFA per 10 treatments, it is important to ask the question whether the revenue generated will be high enough to sustain a ivermectin distribution program. On a full cost basis, the cost estimates reported above indicates that 200 FCFA is just not enough to run the program even if the price of drug is assumed to be zero. A mobile team approach based on departmental headquarters cannot be sustained with the revenue generated unless it becomes very efficient in reaching the target population. With about 34% coverage rate, cost per treatment becomes too high to be recoverable from a poor society.

Let us now consider the other two approaches of ivermectin delivery: the community based (PHCC based) distribution and the passive distribution. As mentioned in reorientation document, let us assume that all fixed costs and staff salaries will be provided from external funding (not generated from the communities). The cost of one treatment in this case should be:

By mobile team approach	596 FCFA per case treated
By community-based approach	287 FCFA per case treated
By passive approach (no charge for drugs provided to deal with adverse reactions)	71 FCFA per case
If sell the drugs provided to deal with adverse reactions	35 FCFA per case

The cost estimates of mobile team and community based approaches, as mentioned in cost tables above, is based on the assumption that the prevalence of the disease among the target group is very high, above 90%, and the percent of eligible population treated is only 34%. These assumptions (based on the actual prevalence and treatment rates of the mobile team approach of IDP) can be changed to examine the sensitivity of costs with different levels of prevalence and treatment rates.

Table 8 reports the results of this exercise. Note that as the delivery system becomes more efficient in reaching the target population, cost per treated case declines. In fact, even the mobile approach can achieve treatments at about 200 FCFA per case, if the system can reach all targeted individuals without incurring additional costs. If 500 FCFA per treated case is the cut-off point to decide whether to adopt a system or not, mobile team delivery becomes unacceptable if the prevalence rate of the disease among the target group is less than 50%. For community based system, prevalence rates as low as 20% will still remain acceptable if 75% of the population infected can be reached.

Table 8

Cost Per Case Treated at Different Levels of Prevalence and Treatment Rates

Prevalence rate among the Target group	Rate of treatment: treated to infected 34%	50%	75%	100%
Mobile Team distribution				
90%	596	413	275	207
60%	1043	723	481	362
30%	2086	1446	963	725
Community based distribution				
90%	287	147	98	74
60%	502	257	172	130
30%	1004	515	344	259

Let us assume that the active approaches, both mobile team and the community-based, can achieve a rate of treatment of 50%. Even with this level of treatment rate, active approaches costs more than 200 FCFA per case, the fee charged to patients at the present time. The costs reported in table 8 are per treatment costs, not the cost of treating a patient for 10 years. Therefore, the revenue generated from the treatment fee collected will be insufficient to cover even the cost of first treatment by an active approach. Therefore, the fee will not generate the financial resources needed to sustain an active distribution program in the long run.

The cost of treatment of passive approach is much lower, about 71 FCFA per case. Therefore, the revenue generated should be able to sustain the passive distribution strategy for about three years. Since the fee of 200 FCFA is collected for all 10 treatments to be received by the individual, the passive distribution program also can not be sustained with the financial resources generated by the user fee.

It is interesting to note that more than 98% of households, who reported their willingness to pay for onchocerciasis treatment also mentioned their willingness to pay the fee every year. In fact, it appear that the IDP should suggest a fee of 100 FCFA per treatment per year. This should increase the treatment rates due to higher participation by the population due to lower out-of-pocket cost for first treatment. Higher participation in first treatment may also encourage the individuals to come back for future treatments as they personally become aware about the benefits and side-effects of the drug prescribed. The active approaches needs to be subsidized by the government or other agencies.

At present, the 200 FCFA collected for treatment are not being used for delivering ivermectin. The project is providing all the costs of drug transportation and delivery and the drug itself is provided free of charge. Therefore, the clinics and health centers are generating additional revenue due to the presence of IDP. The revenue generated can be used for expanding the drug distribution program itself. Since, record keeping and managing the adverse reaction cases are the responsibility of the health center, retaining 50 FCFA per case at the center should be enough to recover all center specific costs as well as allow a reasonable surplus. The rest, 150 FCFA per case should be used by the provincial level to expand the drug distribution program and training of health workers.

The procedure followed for this revenue sharing strategy can be incorporated into the primary health care system if the supervisor charge a price per card delivered at the health center with the ivermectin tablets. Assuming that the fee to be charged per treatment will be 100 FCFA, the supervisor will sell each card at 25 FCFA. This will ensure that the health center is retaining 50 FCFA for each treatment provided.

VIII. SUMMARY, RECOMMENDATIONS AND POLICY IMPLICATIONS

1. In the project area, most households appear to be well aware about the symptoms and consequences of onchocerciasis. Most also know about the mode of transmission of the infection.

2. The KAP study also indicates that most of the surveyed households know about the relative effectiveness of modern and traditional medicine. The modern drug widely available in this region before the introduction of ivermectin was notezine tablets and most households. Only about 30% of households purchased noctezine but about 60% reported that the drug was not very effective in curing the disease. Only 7% of households thought that the traditional drugs can cure the disease. Therefore, latent demand for effective modern treatment existed in the region before the IDP was introduced.

3. Given the level of awareness of the population about the disease and the knowledge about the treatment options, it is unlikely that health education will have significant impact on the demand for first treatment. However, it may increase the demand for future treatments.

4. The major benefits of adopting active approach based on mobile units are: (i) treatment rate of the target group can potentially be much higher compared to other strategies of ivermectin distribution and (ii) administrative costs of future re-treatments should be lower. The active approach makes an attempt to treat all infected individuals in a geographic area within a short period of time. Therefore, the re-treatment can be carried out in this area in a particular month in future years. The project has treated very high prevalence villages through the mobile teams. However, the treatment rate of the target group has remained less than 35% even though the prevalence of onchocerciasis in the

villages were estimated at more than 90%. If the treatment rate is low, major advantages of adopting an active delivery approach are lost.

5. The active distribution strategy of the project indicates that the treatment seeking behavior of the population is significantly affected by the age of the patient. Almost all eligible individuals of the age group 55 years and above showed up in the village meetings for receiving treatments while for less than 20 year old, the percent participation rate among the eligible population was less than 20%.

6. Adopting mobile team based active drug distribution approach is relatively costly. Given the level of treatment rate achieved by the project, treating a case by mobile teams costs more than 600 FCFA per year. Even if it is assumed that the fixed costs of distribution and salary of the personnel are provided from external sources (not community-financed), the cost per treatment remains high at 596 FCFA per year. This cost can be reduced to slightly above 200 FCFA if the approach can achieve 100% treatment rate. Therefore, the present user fee of 200 FCFA for a total of 10 treatments can not generate enough financial resources to make the mobile team approach a self-financing mechanism.

7. The community-based out-reach approach can potentially distribute the drug at a lower cost. The project has not yet experimented with different forms of community-based active distribution strategy feasible. Assuming that the primary health care coordinator (PHCC) of the health center will carry out an active ivermectin distribution program, the cost per treatment should reduce to 315 FCFA. If the fixed costs and salary component are excluded, the cost of treatment becomes 287 FCFA per year, assuming a treatment rate of 34%. The cost per treatment will decline with improving coverage of the eligible population.

8. If we assume that the present treatment rate of 34% (number treated to total number eligible for treatment) can be increased to about 50% without any increase in the cost of delivery, and if 400 FCFA per treatment is considered the maximum acceptable cost per treatment, mobile team approach will be used only in regions where the prevalence of the infection is more than 90% among the target group. For PHCC based active delivery, the cut-off will be a prevalence rate of 50%.

9. An active approach can either treat only the individuals who are infected or carry-out mass treatment. Given the costs of ivermectin distribution by mobile team approach, all communities with a prevalence rate of 30% or above among the target population should be mass treated.

10. The cost of delivering ivermectin by passive approach is very low. The full cost of treating a case by passive approach is only 114 FCFA. The additional cost of distributing the drug depends upon how the adverse reaction cases are managed. If adverse reaction cases are treated free of charge, the additional cost per case becomes 71 FCFA. On the other hand, if the drugs required to treat adverse reaction cases must be purchased by the

112

patients. the cost of distribution will further decline to about 35 FCFA. Charging a user-fee of 200 FCFA for 10 treatments will be insufficient to cover the cost of passive distribution as well.

11. It is recommended that the user-fee should be set at no more than 100 FCFA per treatment. The KAP study indicates that the individuals who are willing to pay for onchocerciasis treatment are also willing to pay the fee every year. From the consumer's point of view, the first treatment with ivermectin is very uncertain. They have no experience with the new drug to become aware of its effectiveness and side-effects. Therefore, it can be argued that the fee for the first year may be set below the cost to encourage participation. The short-fall during the first year can be recovered in the later treatments. If this argument is accepted, the fee should be set at about 40 to 50 FCFA for the first treatment and can be increased to about 90 to 100 in subsequent treatments.

12. One problem with the passive system of distribution is that the providers have no control on the seasonal pattern of treatments provided. The treatments are scattered all over the year which makes it much more difficult to identify the individuals who fail to show up for subsequent treatments. Another potential problem is the management of adverse reactions. The percent rate of adverse reactions are found to be much higher for active approach than for passive approach. This may indicate either the inefficiency of the passive approach in identifying the adverse reaction cases or more generous definition of adverse reaction used by the active approach. In any case, the adverse reaction cases are of so simple types that the passive system or community based distribution system should be able to deal with the situation effectively.

13. The ivermectin distribution program can be incorporated into the reoriented primary health care system of Cameroon without significant changes in current structure and responsibilities. The most logical approach is to deliver the cards in the pharmacies and the drugs to the health center officials (the CMO or the PHCC). The PHCC can also be encouraged to visit high prevalence regions for treatment. The PHCC, under the new structure, is responsible for the out-reach programs and he/she can combine onchocerciasis treatment with other activities of the center. If the re-oriented system is not yet operational in a region, ivermectin should be made available at the health center for passive distribution.

14. Since the IDP is funding the drug delivery and other costs associated with ivermectin distribution, the full 200 FCFA user-fee is a net surplus for the ministry of public health. The revenue generated due to the subsidy provided by IDP should be shared by the health centers and the provincial/central level of the ministry. Out of the 200 FCFA collected per treatment, the centers should be allowed to retain 50 FCFA and the rest should be used by provincial and central authorities to expand ivermectin distribution program. In fact, this type of revenue sharing should continue to provide incentives at all levels to become involved in the drug distribution program.

113

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115

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117