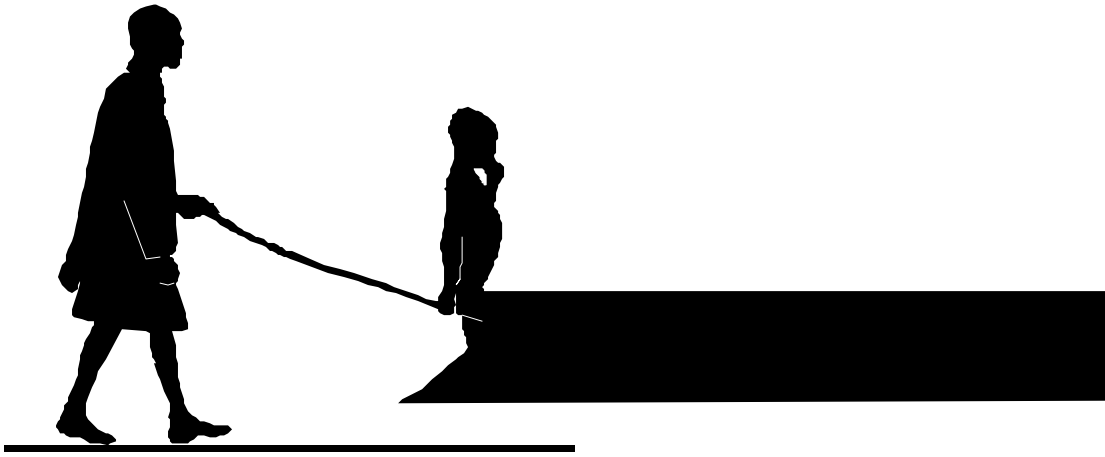

Summary
2001 Program Review for The Carter Center/Lions SightFirst
River Blindness Programs
Cameroon, Ethiopia, Nigeria, OEPA, Sudan, and Uganda
13-15 March, 2002
The Carter Center
Atlanta, GA

THE CARTER CENTER
RIVER BLINDNESS PROGRAM

July 23, 2002

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And to many others, our sincere gratitude

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Acronyms

arv ..... at-risk villages (villages requiring community-wide active mass therapy)
ATO ..... Annual Treatment Objective
APOC ..... African Programme for Onchocerciasis Control
CBD ..... Community-Based Distributors (pre-APOC strategy)
CDC ..... Centers for Disease Control and Prevention
CDD ..... Community-Directed Distributors (APOC strategy)
CDTI ..... Community-Directed Treatment with Ivermectin
CFA ..... Central African Francs
CNS ..... Central Nervous System
earp ..... eligible at-risk population
DEC ..... diethylcarbamazine
FMOH ..... Federal Ministry of Health of Nigeria
GOS ..... Government of Sudan
GRBP ..... Global 2000 River Blindness Program of The Carter Center
GSK ..... GlaxoSmithKline
HE ..... Health Education
HNI ..... HealthNet International
HQ ..... Headquarters
hrv ..... (OEPA term) highest risk villages for morbidity, prevalence of microfilaria in skin greater than 59%
ICT ..... immunochromatographic card test
IDB ..... Inter-American Development Bank
IDP ..... Ivermectin D</MC7 ..... 04 Tc 0..

ABSTRACT

The vector born parasite *Onchocerca volvulus* (causing river blindness) infects about 18 million people in 37 countries, 770,000 of whom are blinded or severely visually impaired. Periodic mass treatment with ivermectin (Mectizan®) in disease-endemic communities prevents eye and skin disease caused by this infection. As part of a global effort to eliminate onchocerciasis as a public health problem by the year 2007, the Global 2000 River Blindness Program (GRBP) of The Carter Center collaborates with the ministries of health of 11 countries, maintains field offices in Guatemala, Cameroon, Nigeria, Sudan, Kenya, Ethiopia and Uganda, and belongs to international coalitions that include the Centers for Disease Control and Prevention (CDC), the World Health Organization (WHO), the World Bank, the Inter-American Development Bank (IDB), Merck & Co., international bilateral donors, and other nongovernmental development organizations (NGDOs). Special GRBP partners include the Lions Clubs International Foundation (LCIF), and the African Programme for Onchocerciasis Control (APOC). In October 1999, The Carter Center and Lions Clubs announced the Lions-Carter Center Sight First Initiative to increase our collaboration in the global effort for onchocerciasis control, including the establishment of a new river blindness control program in Ethiopia.

The Carter Center hosted its sixth annual Review for 2001 program activities of its GRBP on March 13-15, 2002 in Atlanta. The objectives of the Program Review were to: 1) assess the status of each program, 2) identify impediments and problems in program implementation and potential solutions, and 3) promote sharing and standardization of information. Each GRBP-assisted program reported on the number of assisted Mectizan treatments provided, training, research and development activities, and surveillance for adverse reactions to treatment. The African programs also reported on their APOC experiences. The Nigeria program reported on the pilot initiatives for combining lymphatic filariasis elimination and schistosomiasis control with onchocerciasis control activities in Plateau and Nasarawa States. Key aspects of the discussions are summarized in this report.

Since its launching in 1996, GRBP has assisted in providing over 36.4 million Mectizan treatment encounters. In 2001, 8,019,378 persons were treated (95% of the 2001 annual treatment objective [ATO]) in GRBP-assisted programs, a 10% increase in treatments over 2000. This represents 82% of the Ultimate Treatment Goal (UTG) for GRBP-assisted programs. As in previous years, most (60%) GRBP treatments were in Nigeria. Of the treatments in 2001, most (97%) were accomplished in partnership with the LCIF SightFirst Program in Nigeria, Cameroon, Uganda, Sudan, Ethiopia and the Onchocerciasis Elimination Program for the Americas (OEPA). The GRBP ATO for 2002 is almost 10 million treatments, a 14% increase over 2001 treatments. Priorities for GRBP in 2002 include: 1) maximizing treatment and health education efforts to reach ATOs and UTGs, 2) monthly reporting of Mectizan treatments, 3) documenting interruption of transmission in the Americas, 4) sustainaT Tw -2ei21T9rogram fo adverse reactiuge000

EXECUTIVE SUMMARY

The Program Review

The GRBP hosted its sixth annual Program Review on March 13-15, 2002 at The Carter Center in Atlanta, Georgia. The review is modeled after similar reviews developed for national Guinea Worm Eradication Programs by the Carter Center's Global 2000 program and CDC, beginning with Pakistan in 1988. The main purposes of the review, which was chaired by Dr. Frank Richards (Technical Director, GRBP), were to assess the status of each program and to determine impediments and problems in program implementation. In attendance (Annex 1) were GRBP country representatives Dr. Albert Eyamba (Cameroon), Mr. Teshome Gebre (Ethiopia), Dr. Moses Katabarwa (Uganda), Drs. Emmanuel Miri and Kenneth Korve (Nigeria), Dr. Mauricio Sauerbrey (Onchocerciasis Elimination Program for t

& Co. decided to donate Mectizan, for as long as necessary, to all people affected by onchocerciasis. This donation was an important stimulus for the current initiative to globally control onchocerciasis using a strategy of community-based treatment.

The Carter Center and River Blindness: In 1987, Merck approached then executive director of The Carter Center Dr. William Foege for assistance in organizing the global distribution of Mectizan. The MEC/MDP was created in 1988 and housed at the Atlanta-based Task Force for Child Survival and Development, an independent partner of The Carter Center. The global initiative has grown to one that has enabled about 30 million treatments per year since 1996 and over 250 million treatments since the MDP began. Indeed, the donation has stimulated what is widely considered a model of how industry, international organizations, donors, national ministries of health and affected communities can successfully work together toward a common goal.

In 1996, The Carter Center expanded its role in the coalition fighting river blindness by acquiring most of the operations of the River Blindness Foundation (RBF), a nongovernmental development organization (NGDO) founded by John and Rebecca Moores in 1990. The GRBP was established at The Carter Center to assume the field activities of the RBF. GRBP's primary aim is to help residents of affected communities and local health workers establish and/or sustain optimal Mectizan distribution and related health education (HE) activities, and monitor that process. The Carter Center also serves OEPA, which coordinates activities to completely eliminate the infection in all six onchocerciasis-endemic countries in the Americas (Brazil, Colombia, Ecuador, Guatemala, Mexico and Venezuela). In 1997, GRBP expanded to a collaborative program in Sudan (with support of Lions Clubs SightFirst Program) as part of the Carter Center's peace initiative and Guinea worm disease eradication efforts there. In 1999, with expanded support from LCIF (under a new Lions-Carter Center Sight First Initiative), The Carter Center accepted an invitation to assist in onchocerciasis control activities in Ethiopia, and treatments and HE began there in 2001.

Partnerships:

The GRBP of The Carter Center works through partnerships at all levels. The primary partners are the ministries of health (MOHs) and their national onchocerciasis control programs executed within and through the indigenous primary health care system. GRBP and MOH staff work in the field with the rural communities using information, education, and communication techniques (IEC) to improve understanding and empowerment of people to be full partners in the program and the drug delivery process. As mentioned above, GRBP has a long and evolving partnership with Lions Clubs and the Lions' SightFirst Program. Another key partner is the Division of Parasitic Diseases at the CDC, where GRBP technical staff members are housed. GRBP works closely with the MDP, at the Task Force for Child Survival and Development, also in Atlanta.

Partners in the African Programs: In Africa, GRBP partners include the MOHs in host countries (Cameroon, Ethiopia, Nigeria, Sudan, and Uganda), United Nations organizations (WHO, UNICEF, and the World Bank), and other NGDOs. GRBP is a

member of the NGDO Coalition for Mectizan Distribution that includes (among others) Christoffel Blindenmission, Helen Keller Worldwide, Interchurch Medical Assistance, HealthNet International, Lions Clubs International Foundation, l'Organisation pour la Prevention de la Cecite, Sight Savers International, and the US Committee for UNICEF. Another important partner is the African Programme for Onchocerciasis Control (APOC), which is executed by WHO and funded through a trust fund housed at the World Bank. APOC was launched in 1995, and aims to establish, by 2010, "community-directed" river blindness treatment programs in an estimated 19 African countries. The APOC provides funds and technical/managerial support to six-year Mectizan distribution projects carried out by ministry of health/NGDO partnerships. The Carter Center currently has 13 projects assisted by APOC, in five African countries.

Partners in the American Programs: GRBP/The Carter Center provides the administrative framework for OEPA. Headquartered in Guatemala, OEPA is the technical and coordinating body of a multinational, multiagency coalition working for the elimination of all onchocerciasis morbidity and transmission from the Americas by the year 2007. Through the OEPA initiative, GRBP partners with the national programs and MOHs of all six endemic countries of the Americas (Brazil, Colombia, Ecuador, Guatemala, Mexico, and Venezuela). Regional technical and programmatic goals are developed by a Program Coordinating Committee (PCC) with representation from key members of the initiative (and on which The Carter Center holds two institutional seats). GRBP works with the Pan American Health Organization (PAHO), the CDC, and several US and Latin American universities. The Carter Center received partial funding for OEPA from the InterAmerican Development Bank. In 2000, The Carter Center's partnership with Lions Clubs expanded to include OEPA, and LCIF now holds an institutional seat on PCC.

Assisted Treatments

Nomenclature used by the GRBP program: A major focus of GRBP is on routine reporting by assisted programs. The reader is referred to Annex 3 for a discussion of the GRBP reporting process, and treatment indices used by the program and in this report. Important terms include the treatments achieved (TX), ultimate treatment goal (UTG), twice the UTG (UTG[2]), annual treatment objectives (ATO), eligible at-risk population (earp), at-risk villages (arv), and full coverage (defined as 85% achievement of the UTG, or for OEPA, the UTG[2]).

Treatments Assisted by the Program: By 2001, the GRBP program had reached 82% of its overall UTG of 9,913,120 by assisting in Mectizan treatments of 8,019,378 persons (Figure 1). The Nigerian and Ugandan programs reached 96% of their UTGs and OEPA reached 80% of its UTG(2). Programs in need of additional growth included Cameroon (67% of UTG), Sudan (60%), and Venezuela (53%).

In 2001, a total of 8,019,378 eligible at risk persons were treated in 16,065 arv's (95% of the 2001 treatment objective) in the 11 GRBP-assisted country programs, which represented a 10% increase in treatments over 2000 (Figure 2). Summary tables of monthly treatments of eligible at-risk populations (earp) and arv's by program are

provided for the years 2000 and 2001 (Tables 1 and 2). Most (60%) treatments in 2001 were in Nigeria (Figure 3), and treatments in Ethiopia just started in March of 2001. The partnership between LCIF and GRBP has been growing since 1996 and in 2001, 7,790,957 treatments (97%) were accomplished in partnership with LCIF (Figure 4). Since its launch in 1996, GRBP has assisted in providing over 36.4 million treatments with Mectizan (Figure 5), 80% of which have been in partnership with LCIF.

The GRBP Annual Treatment Objective (ATO) for the eligible at-risk population (earp) projection for 2002 is 9,137,672 million treatments with Mectizan (Figure 2). Table 3 shows GRBP ATOs in recent years. GRBP has shown an average growth rate of 14.5% per year since it was launched in 1996, and the program projects a 14% increase in 2001-2002. Many GRBP-assisted programs (Nigeria, Uganda, Mexico, Ecuador, Brazil and Colombia) have reached or are approaching their UTG in their areas of operation, and thus theoretically have attained full treatment coverage. (Once the UTG is reached no further growth would be expected in future years, other than that represented by routine population growth of 2-4% annually). GRBP-assisted areas in need of considerable ATO expansion toward the UTG include Cameroon, Sudan, Venezuela, and Ethiopia. The overall 2002 ATO of 9,137,672 will aim to reach 92% of the GRBP UTG of 9,913,120 treatments (Figure 2 & Table 4). Attaining full coverage quickly is especially urgent in Venezuela because of the goal to interrupt onchocerciasis transmission and eliminate morbidity by 2007 in the Americas.

The cost per treatment in GRBP-assisted African programs was approximately $0.17 in all African countries except Sudan (Figure 6) due to the war. Cost per treatment decreased in 2001 compared to 2000 in Nigeria, Cameroon, and Uganda, but increased in Sudan.

Sustainability of treatment activities: In Africa, Mectizan delivery must icaly f aned indefinitely since the APOC program strategy (annual treatment only in highly endemic villages) does not aim to interrupt all transmission of the *O. volvulus* parasite. Fundamental to APOC, therefore, is establishing “sustainable” Mectizan delivery systems that will continue after the withdrawal of external funding. APOC advocates “Community Directed Treatment with Ivermectin” (CDTI) as the favored distribution method over “community-based” or “mobile distribution.” CDTI focuses on the empowerment of community residents to ma

can be halted.

Adapting Mectizan distribution and health education methods to lymphatic filariasis and schistosomiasis: The main strategies for the control of onchocerciasis and schistosomiasis morbidity and the elimination of lymphatic filariasis transmission are health education and annual mass chemotherapy with the safe oral drugs Mectizan, albendazole, and praziquantel. GRBP is assisting the Federal Ministry of Health of Nigeria in an initiative to incorporate lymphatic filariasis (LF) elimination and urinary schistosomiasis (SH) control into the onchocerciasis control program in Plateau and Nasarawa States. Interventions for SH with praziquantel commenced in villages with a SH prevalence of over 20% in October 1999, and by the end of 2000, 52,480 cumulative praziquantel treatment encounters had been provided since the launching of that intervention. In 2001, the program expanded by two more LGAs (one each in Plateau and Nasarawa States) and 84,147 persons were given praziquantel and health education. Treatment for both onchocerciasis and LF has been carried out since March 2000 with a combination of Mectizan and albendazole. In 2001, the program expanded to 12 LGAs and a total of 675,681 persons received combination therapy. There were no adverse reactions, and so far no negative impact on the coverage of the onchocerciasis program by the addition of LF and SH activities.

GRBP PRIORITIES for 2002

Coverage:

! Seek to reach the UTGs that define “full treatment coverage” of GRBP-assisted areas, especially in Venezuela, and sustain maximum health education and treatment coverage of the earp’s and at-risk villages in areas of GRBP-assisted activity.

Elimination:

! Move toward the goal of interruption of onchocerciasis transmission throughout the Americas, promoting a strategy of semiannual treatment and coverage of at least 85% of UTG in each of two treatment rounds per year.

! Help PAHO/WHO to establish a process by which to certify onchocerciasis elimination.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

NIGERIA

Nigeria is probably the most highly endemic country in the world for river blindness, having as much as 40% of the disease global burden. It is estimated that 27 million Nigerians need treatment with Mectizan® for onchocerciasis (i.e., the Ultimate Treatment Goal [UTG] is 27 million). The National Onchocerciasis Control Program (NOCP) began in 1989 with Mectizan® treatments of about 49,566 persons, progressing to provide over 16 million treatments by 2001.

The Global 2000 River Blindness Program (GRBP) in Nigeria has offices in Jos, Lagos, Owerri, Benin City, and Enugu. The primary activities consist of: 1) direct assistance for treatment activities in nine of the 32 onchocerciasis endemic states in Nigeria (Abia, Anambra, Delta, Ebonyi, Edo, Enugu, Imo, Nasarawa, and Plateau States) (Map 1), 2) helping to implement nationwide onchocerciasis control in partnership with the Nigerian government and the National Onchocerciasis Task Force (NOTF) through a coalition of nongovernmental development organizations (NGDOs) including GRBP, Helen Keller Worldwide, Christoffel Blindenmission, MITOSATH**,** International Eye Foundation, SightSavers, and UNICEF, 3) working to implement and evaluate the African Program for Onchocerciasis Control (APOC) strategy of Community-Directed Treatment (CDTI) programs. A major GRBP-partner in Nigeria has been the Lions Club International Foundation (LCIF) SightFirst Program. The Lions Clubs District 404, with LCIF support, is actively involved in mobilization, health education, and treatment activities.

Treatment Activities: In 2001, GRBP Nigeria helped provide health education and Mectizan® to 4,782,280 persons (Table 5), 102% of the ATO for 2001 (4,676,586). GRBP-assisted treatments represented 29% of the 16,512,550 treatments provided in Nigeria in 2001 (Figure 7)**.** Mass treatment activities took place in 10,085 at-risk villages. The number of persons being treated annually in GRBP-assisted projects in Nigeria is approaching the UTG for those areas. Treatments by state are shown in Figure 8. The 2002 annual treatment objective (ATO) earp for GRBP is 4,793,500 Mectizan® treatments. Since the UTG for GRBP Nigeria program is 5,000,000 treatments, the 2002 ATO aims to reach 96% of that full coverage goal.

Training/Retraining: Training for 18,697 health workers involved in Mectizan® distribution and health education activities was conducted in all nine states in 2001. This represented 95% of the training target for the year. Most of those trained (15,913 or 85%) were community-level distributors. Also trained were 42 State Onchocerciasis Coordinators, 602 Local Onchocerciasis Control Coordinators, and 559 District Health Staff. In addition, numerous advocacy visits were made to decision makers in all assisted states and Local Government Areas (LGAs) to solicit their support for the program. Training of staff was conducted at three different levels: state (for training of SOCTs); LGA (for training of LOCTs, DHSs, and HFS); and community (for training of CDDs). The use of the IEC materials improved the performance of CDDs, as seen by improved recording and reporting. CDDs were taught in 2001 to calibrate their measuring sticks used in determining dosage. Also new in the training curriculum for 2001 was an overview of the importance of counterpart funding and financial control.

Mectizan®: All Mectizan® for mass treatment in Nigeria is imported by UNICEF and stored at the UNICEF warehouse prior to distribution to the various partners, including GRBP. In 2001, GRBP received a total of 14,030,000 3-mg Mectizan® tablets. The (3-mg) tablet per person index was calculated to be 2.99 for the Nigeria GRBP program. There were no severe adverse reactions reported in GRBP-assisted programs in Nigeria, including in Delta State, where the filarial parasite *Loa loa* is known to occur (Note: persons heavily infected with *Loa loa* are at risk of having more adverse reactions when treated for the first time with Mectizan® - see Annex 4). A total of 10,197 mild adverse events were reported or 0.21% overall (Figure 9 and Table 6). No severe adverse events were reported. Close monitoring for secondary reactions according to MDP recommendations will continue in these states, although all these areas are now entering into fourth and fifth round therapy, so the risk of reaction is low.

Impact of Mectizan on transmission: In May of 2001, 11 onchocerciasis endemic villages in Plateau and Nasarawa states were assessed by onchocerciasis antibody (against Ov-16) card tests and lymphatic filariasis ICT antigen tests (using Og4C3). Most of these villages had been receiving Mectizan for nine years. All children age 2-5 were selected from each village. Overall, 747 children were examined and only 7 (1%) were found to be positive for onchocerciasis antibodies. Only four of the 11 villages had young children with antibodies: three villages had only one child positive, and one village (Bayan Dutse) had four children positive. In 1994, 20% of the children in these villages were positive by skin snip (a much less sensitive test). In Bayan Dutse, where transmission of onchocerciasis was once particularly intense, infection rates in young children have decreased from 18-20% to 6% (Table 7). *The low level of onchocerciasis antibodies detected in children in 2001 suggests that mass treatment with Mectizan may have interrupted O. volvulus transmission in some, but not all, villages.*

These same 747 children were tested by the LF ICT card test, and 17 (2%) were positive for LF antigen. This suggested that Mectizan alone might not be interrupting transmission of LF. In addition, the prevalence in this age group was not sufficient to allow it to be used as an indicator group to measure impact of combined treatment. Further assessments need to be carried out to determine the appropriate age range to measure impact (see Annex 5).

APOC: All GRBP projects in Nigeria have now transitioned to the APOC CDTI strategy.

Jos Training Center: The Sustainable Management Training Center (SMTC) is a project carried out in collaboration with the CDC and Emory University with the goal of developing better management skills for project planning and implementation (e.g., problem solving, financial management, the use of data in decision making, and logistics). To date, the SMTC has trained 268 participants in all states of Nigeria, with the exception of Akwa Ibom and Rivers. SMTC was supported by a grant by the Shell Oil Company Foundation through 1998. Unfortunately, as a result of decreased funding, the SMTC held few management training workshops in 2001, although it continued to provide follow-up support to ongoing student projects.

Sustainability Indices:

Community support: In previous years, the degree of participation of community members to the CDTI process has been a challenge, and communities have seen the program as belonging to the government rather than to them. However, in 2001, 100% of the communities were involved in planning and implementation of CDTI. Lack of community support for CDDs remains a problem, as only 45% of the communities supported their CDDs. CDD attrition has also been a problem, with 34% of CDDs not returning to CDTI in 1999, and 36% of CDDs not returning in 2000 (Figure 10).

Government support: All CDDs, selected by their respective communities, were supervised by governmental primary health care (PHC) workers in 2001. Generally, Local Government Areas (LGAs) made more monetary contributions than did the States (Figure 11). In addition, some GRBP-assisted LGAs included a line item for onchocerciasis control in their 2001 budgets, but only 44% of these endemic LGAs released funds for onchocerciasis control activities. The best GRBP experience with LGA support has come in Delta, Ebonyi, Enugu, and Edo States (Figure 12). Of the 66 LGAs in those states under mass treatment, 33 (50%) have released at least some funds towards the support of Mectizan® treatment activities. Although the LGAs in Imo State contributed less than the LGAs in most other states, all 24 of their LGAs contributed something. State government support for onchocerciasis control activities has been especially poor. Of the nine GRBP-assisted states, only five budgeted for onchocerciasis activities. Actual releases of funds only occurred in four of those states (Figure 13).

Cost per treatment: The overall cost per treatment in GRBP-assisted states in Nigeria was US $0.20 in 2001. This was a slight decrease compared to 2000 at US $0.21 (Figure 6).

Lymphatic filariasis/schistosomiasis initiative in Plateau and Nasarawa States: With financial support since 1998 from GlaxoSmithKline, the manufacturer of albendazole, GRBP Nigeria has worked with the Federal Ministry of Health of Nigeria (FMOH) and local and state governments to provide annual combination Mectizan® /albendazole treatment for lymphatic filariasis (LF) and praziquantel treatment for urinary schistosomiasis (SH) in Plateau and Nasarawa States. Health education is an integral part of both components of this initiative. A discussion of the 2001 assessment activities for LF and schistosomiasis treatment activities in Plateau and Nasarawa is provided in Annex 5.

Challenges to the Onchocerciasis Program:

! State and LGA financial support for the program remains a serious problem for future sustainability of onchocerciasis control in Nigeria. Without government commitment, the challenges remain to devolve the program to state and local governments and to maintain treatment coverage.

- Other primary health care programs pay community based heath workers. This puts the CDTI strategy of APOC at a disadvantage, and threatens the sustainability of the program.

Map 1

Figure 7

Figure 8

Figure 9

Figure 10

Figure 11

Figure 12

Figure 13

Table 5

Table 6

Table 7

UGANDA

Onchocerciasis affects about 1.8 million persons residing in 18 (out of 39) districts in Uganda. Currently, GRBP-assisted programs are active in 11 endemic districts: Kisoro, Kabale, Kanungu[1], and Kasese in the Southwest focus bordering the Democratic Republic of Congo (DRC); Nebbi, Moyo and Adjumani in the West Nile focus bordering Sudan and DRC), Gulu and Apac (the Middle North focus); and Mbale (now including Sironko District) in the Mount Elgon focus in the east, bordering Kenya (Map 2, which does not show the new districts of Kanungu and Sironko). GRBP-assisted districts in Uganda operate at full coverage.

Treatments: The program helped to treat 932,147 persons, which represents 99% of its 2001 ATO, which is the equivalent of the ultimate treatment goal (UTG) (Table 8). GRBP assists 65% of all Ugandan treatments (1,466,562) (Figure 14). Mass treatment activities took place in 1,977 at risk villages. All eleven districts achieved over 90% coverage of the eligible population in 2001, compared to eight in 2000. In 2002 GRBP plans to assist in treating 974,900 persons in Uganda with Mectizan®, an increase of 3% compared to the 2001 ATO (Table 3). In addition, 11,869 persons were treated passively (clinic-based) and 12,677 visitors were treated.

Training/Retraining: A total of 21,276 community heath workers were trained in 2001, 52% of whom were female (Figure 15). Most of those trained (20,334) were community-directed distributors (CDDs). Of the 942 community supervisors, 30% were women.

Health education was carried out at the kinship level through drama groups, posters, radio, and video.

Mectizan®: In 2001, a total of 2,855,492 3mg Mectizan® tablets were distributed by GRBP. The overall average (3 mg) tablets used per person treated in 2001 was 2.98.

***Lions Club International*:** In 2001, former President Jimmy Carter traveled to Uganda and met with members of the Lions Clubs of Uganda in Kampala. They discussed issues relating to the Global 2000 River Blindness Program, including the history of Lions' involvement in onchocerciasis control activities. He thanked the Lions for their involvement in monitoring the program and advocacy issues at the district level through local Lions Clubs.

[1] Rukunjiri district was divided into two districts: Kanungu and Rukunjiri. All oncho endemic communities are located in Kanungu.

RECOMMENDATIONS 2002 for GRBP UGANDA

- Continue to select new CDDs and supervisors. Monitor attrition rates of male and female CDDs.

- The program could easily integrate LF and SH activities into CDTI, as is being done in parts of the Nigeria program.

- Continue to encourage districts to provide monetary support to the program.

- Complete the training of district onchocerciasis coordinators in computer skills and research methods.

- Continue to publish GRBP operations research work with a focus on sustainability issues.

Map 2

Figure 14

Figure 15

Table 8

Table 9

goal for GRBP Cameroon is 1,615,216 treatments per year, meaning that the 2002 ATO (1,291,112) aims to reach 80% of that full coverage goal.

Treatment activities in North Province in 2001 increased by 7% to 228,421 treatments from 214,254 (Figure 17). All targeted health districts in the North achieved at least 80% of their ATO in 2001. The North program increased its 2002 ATO to 239,550, an increase of 12% from 2001 (235,864). The UTG for North Province is 239,550.

The treatment activities in West Province increased by 13% to reach 698,223 (Figure 17). Expansion through the three phases of the original 1996 action plan was

cot ac Semeetg thi districts inFigure 179. Thewohobse

in 2001 all had conducted Mectizan distribution using the CDTI strategy (Figure 20). In 2000, GRBP Cameroon obtained APOC support for West Province to fund a similar transition process into CDTI. In 2001, 35% (894) of the communities implemented CDTI. In 2002 the program plans to add 982 villages, a 10% increase from 2001. All GRBP-assisted villages will be under CDTI by the end of 2003.

Sustainability Indices:

Community involvement: In the North province in 2001, all communities treated had village health committees that assisted in Mectizan distribution. The communities were also involved in the design and implementation of the program in all but two districts (Lagdo and Touroua). Community-based workers have become more involved with delivering treatment. A local NGO in West Province, MOJE, has shown itself to be a promising channel for sustainability, playing a role in community mobilization/sensitization. Use of local NGOs still needs operational research, as well as additional APOC funding.

Government involvement: The integration of the program into the National Primary Health Care system has been relatively successful, but little money has been released by the government in support of the program.

The cost recovery system in the North and West provinces resulted in the collection of 17,619,920 CFA (USD 25,171) in the West, and 4,992,550 CFA (USD 7,132) in the North. GRBP is not involved in the management or accountability of these funds.

Cost per treatment: Cost per treatment in 2001 averaged US $0.19 (US $0.17 in the West and US $0.24 in the North). However, this figure excludes cost recovery monies and the Ministry of Public Health contribution. Compared with 2000, costs decreased slightly overall (from US $0.20 to $0.19). They were stable in the West but decreased in the North (from US $0.29 to $0.24).

Challenges & Constraints:

RECOMMENDATIONS 2002 for GRBP CAMEROON

North Province (APOC):

! Consider an evaluation of the effectiveness of the cost recovery policy.

West Province:

! Maintain surveillance for *Loa loa*-related adverse experiences; patients identified should be managed in accord with TCC/MEC guidelines.
! Expand program to reach the UTG. Monitor ATO figures carefully (noting that in 2001 rural districts treatments commonly exceeded ATO in 2001).
! Establish the needed administrative structure to allow full and effective utilization of APOC and Lions resources.
! Consider new approaches to meet the challenges of urban mass treatment.

Mectizan:

! Early completion and submission of Mectizan orders to MDP is critical. The Cameroon program should avoid requests for “amendments” and repeated shipments of Mectizan.

Map 3

Figure 16

Figure 17

Figure 18

Figure 19

Figure 20

Figure 21

Table 10

GRBP-assisted NGDOs in Operation Lifeline Sudan (166,889). Another 119,986 treatments were given by other NGDOs operating within the SSOCP (Table 13). Thus, the total treatments provided by SSOCP in rebel held areas in Sudan in 2001 numbered

Government involvement: The onchocerciasis control program is viewed at the highest governmental levels as an example of a successful health delivery system. Onchocerciasis control supervisors are knowledgeable and work well with the community health department. CDTI fits well into the Sudanese health policy that now stresses maximizing community ownership and participation.

The integration of the onchocerciasis control program into the primary health care system has progressively strengthened the PHC system, despite the war. Due to a shortage of health staff, onchocerciasis coordinators are often coordinators of other programs, and many of the CDAualth

- In 2001, the program recognized that some areas of southwestern Sudan were coendemic for *Loa loa.*

RECOMMENDATIONS 2002 for SUDAN

- Flexibility and creativity must be employed whenever possible when applying WHO/APOC guidelines and Mectizan® delivery strategies under the conditions that currently exist in Sudan. Some creative activities may include: training of military personnel to be distributors; oncho clubs; “CDD of the year;” and certificates of appreciation.

- APOC should provide more technical assistance to the Sudan program, especially in the south. A Sudan technical advisor was suggested for SSOCP/SSOTF.

- Health education materials should be established with the aim of reducing the fear of potential side effects from Mectizan®.

- Refine the eligible at-risk, total population, ATOs, and UTGs as a continuous exercise.

- Improve monthly reporting of data by GRBP-assisted programs in Sudan, perhaps through clear reporting guidelines, schedules, and a Memorandum of Understanding with participating NGDOs.

- Monitor the impact of the demands on CDDs by other programs and higher health prioriMC/s;32 1 Tf-0/MCID 11 >>BDCBT/5Aaed programs in Sudan etgw 12Mg0Aeuf the demands

Map 4

Map 5

Figure 22

Figure 23

Figure 24

Table 11

Table 12

Table 13

ETHIOPIA

Ethiopia is the largest, most populous country in the Horn of Africa, with over 60 million people and an area of 435,000 square miles. Onchocerciasis was first reported in southwestern Ethiopia in 1939 by Italian investigators. The northwestern part of the country was reported to be endemic in studies conducted in the 1970's. Onchocerciasis endemicity was further evaluated in Rapid Epidemiological Mapping of Onchocerciasis (REMO) exercises conducted in 1997. REMO was completed in 2001, and the results indicated that out of 6 regions surveyed, all regions were endemic for onchocerciasis and 4 out of the 5 had areas that were meso- or hyperendemic (Map 6). Currently, it is estimated that 7.3 million persons are at risk of onchocerciasis, and 1.4 million are infected.

The National Onchocerciasis Task Force (NOTF) was established in 2000 and functions through the Ministry of Health's (MOH) Malaria and Other Vector Borne Disease Control Unit (MOVDCU). Mr. Teshome Gebre, Global 2000 country representative, is secretary of the NOTF. A National Plan of Action for onchocerciasis control activities in Ethiopia was drafted at a workshop in Nazareth on September 14, 1999, with assistance of many partners, including The Carter Center. The plan proposed phasing the delivery of Mectizan® tablets and health education into onchocerciasis endemic areas identified in the 1997 REMO exercise. Table 14 shows the schedule for CDTI project development by phase in Ethiopia, according to the National Plan. In December 1999, the MOH invited The Carter Center to be its partner in an application to the African Programme for Onchocerciasis Control (APOC) for support of treatment activities in Kaffa/Sheka zones of the Southern Nations Nationalities and Peoples' Region (Map 6).Regi20 12 7353 further evligie at-and 1populs endemi24 Twtion 7.209, 12 0 0 12 288.

took place in 504 endemic villages in 5 different woredas and two zones. In 2002, GRBP plans to expand the program in Kaffa and Sheka zones and to treat 548,437 persons. This is 78% of the ultimate treatment goal for Kaffa Sheka of 700,000 treatments.

Training:

data from satellites, and have not been validated as yet through field parasitologic surveys.

RECOMMENDATIONS 2002 for GRBP ETHIOPIA

- Expand treatment and health education in line with objectives set for 2002.
- Encourage more frequent NOTF meetings.
- Ethiopia team to visit Uganda to observe best practices in that program.
- Assist MOH in submission of new APOC proposals for Bench-Maji and North Gondar.
- Follow MEC and APOC recommendations for verification of presence or absence of *Loa-loa* in GRBP-assisted areas.

Map 6

Figure 25

Table 14

Table 15

ONCHOCERCIASIS ELIMINATION PROGRAM FOR THE AMERICAS (OEPA)

The Onchocerciasis Elimination Program for the Americas (OEPA) is a regional coalition working to eliminate both morbidity and transmission of onchocerciasis in the Americas through sustained, semi-annual (i.e., every six months) distribution of Mectizan. The OEPA initiative began shortly after passage in 1991 of Resolution XIV of the 35th Pan American Health Organization (PAHO) Assembly, which called for the elimination of onchocerciasis as a public health problem in the Americas by the year 2007. The OEPA coalition includes ministries of health of the six countries (Brazil, Colombia, Ecuador, Guatemala, Mexico, and Venezuela), The Carter Center, PAHO/WHO, the Inter-American Development Bank, the Mectizan Donation Program (MDP) and the Centers for Disease Control and Prevention (CDC). A Program Coordinating Committee (PCC) gives representation for all of these partners, and broad directives to the OEPA office, which is based in Guatemala City, and staffed through The Carter Center. The Center also coordinates the financial assistance to the coalition as part of the Carter Center-Lions SightFirst Initiative.

Treatment Activities: Treatment coverage in 2001 was reported to OEPA as a percentage of the total number of persons estimated to be eligible for treatment (the Ultimate Treatment Goal [UTG]). For the current UTG of 439,887 for the American region, 369,093 persons were treated in the first half of the year (a UTG coverage of 84%), and 332,780 persons (75.7%) were treated in the second half (Table 16). Records are not kept at the individual level, so it is impossible to calculate how many persons received treatment in the first, second, or both rounds. However, at least 369,093 persons (those treated in the first half of the year) were treated at least once (Figure 26). Figure 27 shows coverage by community, by semester in the region. Fewer endemic communities reached 85% coverage of eligibles in the second round (1,133) compared to the first round (1,499). All untreated endemic communities were in Guatemala and Venezuela.

Since 2000, OEPA has used the UTG(2) to monitor the success of programs in providing two treatments per year to all at-risk eligible individuals. The UTG(2) is defined as the number of individuals in the region who require ivermectin treatment (the Ultimate Treatment Goal) multiplied by two (since each individual should be treated twice during the course of a calendar year). A total of 701,873 ivermectin treatments were provided in 2001, resulting in an overall UTG(2) coverage for the region (using the denominator of 879,774) of 80% (Table 16). The region made considerable progress during 2001 by increasing UTG(2) coverage by 12.5% compared to 2000 (Figure 28), and reaching the coverage goal of 85% in four of the six countries (Colombia, Ecuador, Brazil, and Mexico). Only Guatemala and Venezuela were unable to reach the 85% coverage goal.

Country details of the 2001 treatment accomplishments follow:

! Brazil provided 11,488 ivermectin treatments to its eligible population of 6,382 in the northern states of Roraima and Amazonas. Coverage for the first time exceeded the 85% UTG(2) coverage goal (Figure 28), demonstrating the feasibility of delivering

treatment to migratory Yanomami communities in the remote jungle areas.

antibody positivity in children suggests little to no active transmission (adults may have antibody from exposure decades ago). ICT tests conducted on 936 persons in 23 communities of Northern Chiapas, Mexico in

treatments in an endemic area, new diagnostic tests were needed that could confirm the model predictions that viable adult *O. volvulus* worms had been completely eliminated.

The most important recommendations from IACO'01:

(1) All programs should reach or sustain two treatments per year [with at least 85% coverage of the UTG(2)] in all communities known to be endemic by the end of 2002. Special support is needed for Guatemala and Venezuela to reach that goal.
(2) OEPA should focus monitoring on communities where treatment coverage is below 85%.
(3) The SIMONa mathematical model should be adapted to the transmission dynamics and vector species in other countries.
(4) Additional financial and political support is needed to help the country programs reach the goal to stop new transmission of onchocerciasis throughout the region by year 2007, and maintain this state through the certification process.

OEPA effort reviewed by the International Task Force For Disease Eradication

At its June 2001 session of the International Task Force For Disease Eradication (ITFDE) convened at The Carter Center in Atlanta, Georgia. The OEPA regional initiative was carefully reviewed by the committee. They concluded:

1. The scientific feasibility of eliminating ocular morbidity and interrupting onchocerciasis transmission in the Americas, using currently available tools, is clear.

2. The primary remaining concern is whether all siDgrn is hc 0 1sMr 7, ao reach region

RECOMMENDATIONS 2002 for OEPA:

Treatments:

- All programs should provide two treatments per year (with at least 85% coverage of eligible populations in each round). This would require that all programs report their treatment data by treatment round and by community.
- OEPA should continue to develop data management processes so as to evaluate treatment coverage in each of the known endemic communities in the Region.
- Guatemala should strengthen community-based ivermectin delivery (through the use of community volunteers) in areas where transmission continues, and attain >85% of its UTG (2). Such community-based ivermectin delivery might also be applicable to Chiapas State, Mexico, where transmission continues.
-

Map 7

Figure 28

Figure 29

Figure 30

Table 16

Table 17

ANNEXES

ANNEX 1: LIST OF PARTICIPANTS

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Dr. Ali Khan - Division of Parasitic Diseases, CDC
Dr. James Maguire - Division of Parasitic Diseases, CDC
Dr. Rebecca Teel Daou - Lions Clubs International Foundation
Dr. Tom Unnasch - University of Alabama, Birmingham

ANNEX 2:

AGENDA
Sixth Annual Program Review Meeting
Global 2000 River Blindness Program
The Carter Center, Cecil B. Day Chapel
March 13-15, 2002

Wednesday, March 13

8:00	Shuttle pickup at hotel	
8:30 - 9:00	Continental Breakfast	
9:00 - 9:15	Welcome, introductions and remarks	Dr. Frank Richards (Chair)
9:15 - 9:30	The 'State' of GRBP: Reporting	

1:00 - 2:00	Lunch in Allen Foyer	
2:00 - 3:00	Ethiopia: Discussion/Recommendations	

Sudan

3:00 - 4:00	Sudan presentation (Part 1, GOS)	Dr. Mamoun Homeida
4:00 - 4:15	Khartoum Office Reporting Issues	Mr. Mark Pelletier
4:15 - 4:30	Coffee Break	
4:30 - 5:30	Sudan presentation (Part 2, SSOCP)	Ms. Irene Mueller
5:30-5:45	Nairobi Office Reporting Issues	Ms. Kelly Callahan
5:45-6:30	Sudan: Discussion/Recommendations	

Friday, March 15

8:00	Shuttle pickup at hotel	
8:30 - 9:00	Continental Breakfast	

Uganda

9:00 - 10:30	Uganda	Dr. Moses Katabarwa
10:30 - 11:00	Coffee Break	
11:00 - 12:00	Uganda: Discussions/Recommendations	

OEPA

12:00 - 1:00	Onchocerciasis Elimination Program for the Americas (OEPA) (Part 1)	Dr. Mauricio Sauerbrey
1:00 - 2:00	Lunch in Allen Foyer	
2:00 - 3:00	OEPA (Part 2)	Dr. Sauerbrey
3:00 - 4:00	OEPA: Discussion/recommendations	
4:00 - 5:00	Coffee Break	

Other items

5:00-5:30	Mectizan® Issues	MDP/GRBP staff
5:30-5:45	IRB issues	Dr. Rachel Barwick
5:45-6:15	General conclusions/reflections	Dr. Richards
6:15	Closure of sixth session	Dr. Donald R Hopkins

ANNEX 3: GRBP REPORTING PROCESSES

At Risk Villages (arv's) An epidemiological mapping exercise is a prerequisite to identifying at-risk villages (arv's) for mass Mectizan treatment programs. The assessment techniques used in the mapping exercise in Africa varies from those used in the Americas. Although detailed discussion of the mapping processes is beyond the scope of this document, a summary of the two approaches follows:

In much of Africa, a staged village sampling scheme called Rapid Epidemiological Mapping of Onchocerciasis (REMO) is recommended by WHO to define endemic "zones" that should capture most or all villages having onchocercal nodule rates $\geq$ 20% for mass treatment. The mapping strategy is based on studies that show that the morbidity from onchocerciasis occurs primarily in villages with nodule prevalences of > 20%. In the first stage of REMO, survey villages are selected from areas, which are environmentally likely to support black fly breeding and therefore transmission of *O. REMOnj-0.00018m*

treatments quarterly to the OEPA office in Guatemala City, which then provides a combined regional report to PAHO and GRBP.

The data from monthly reports are supplem

INDICES OF SUSTAINABILITY

GRBP programs are asked to report annually on three sets of indices for sustainability, including: Community involvement, national and local government involvement, and costs (expressed as cost per treatment).

ANNEX 4:

c. Enhance awareness and training of community distributors and all health personnel involved in the program with regard to recognizing and responding to adverse reactions following treatment of *Loa*-infected people with Mectizan.

B. In all other program areas wh

C. Programs that give individual treatments with Mectizan to people with proven onchocerciasis

- **Clinic-based treatments:**

  a. After confirming infection with *Onchocerca volvulus*, but prior to treating with Mectizan, possible co-infection with *Loa loa* should be assessed. In the absence of hematologic diagnostic methods, patients should be asked questions to determine if *Loa loa* is probably present in their community of residence or employment.

  b. Prior to treating with Mectizan, the possibility of adverse reactions after treating *Loa-i*nfected people should be discussed with the patient.

  c. If the patient is at risk of severe adverse CNS dysfunction following treatment with Mectizan, he/she should be monitored by medical personnel as described above in section A, item 2b.

These recommendations are intended to minimize complications following treatment with Mectizan, in known and suspected *Loa*-endemic areas, should they arise. The risk of complications will be further reduced when the distribution of *Loa loa* is delineated and a practical means for determining the intensity of infection is available.

The ultimate decision on how to proceed with community-based mass treatment of onchocerciasis with Mectizan, in a given country, should be made by the National Onchocerciasis Task Force (NOTF) and the Ministry of Health, which has final authority and responsibility for all decisions. Moreover, the decision on how to proceed with the treatment of individuals with onchocerciasis in clinic-based settings is the responsibility of the individual physician.

Map 8

ANNEX 5: THE GRBP NIGERIA LYMPHATIC FILARIASIS (LF) ELIMINATION AND URINARY SCHISTOSOMIASIS CONTROL INITIATIVE

Background:

Lymphatic filariasis (LF) in Africa is caused by *Wuchereria bancrofti*, a filarial worm that is transmitted in rural and urban areas by *Anopheline* and *Culex sp*. mosquitoes, respectively. The adult worms live in the lymphatic vessels, and cause dysfunction often leading to poor lymphatic drainage. Clinical consequences include swelling of limbs and genital organs (lymphoedema and "elephantiasis"), and painful recurrent attacks of acute adenolymphangitis. Microfilaria, which circulate nocturnally in blood, can be almost completely suppressed by annual single-dose combination therapy, with either Mectizan (also donated by Merck & Co. for LF in Africa) and albendazole

The Carter Center is working with the ministry of health in Nigeria to establish LF elimination and SH control programs in Plateau and Nasarawa States (Map 9). For LF, the effort is based on a strategy of health education (HE) and annual combination therapy with the oral drugs albendazole and Mectizan. The manufacturers of these drugs have global donation programs for LF: GlaxoSmithKline donates albendazole, Merck & Co donates the Mectizan. For SH the strategy is similar: HE and mass annual treatments with the oral drug praziquantel. Praziquantel however is not being routinely donated to the program, although in past years The Carter Center has received limited gifts of praziquantel from pharmaceutical companies including Bayer AG, Medochemie, and Shin Poong Pharmaceutical Company, Ltd. The Carter Center has purchased the remainder through funds raised from other donors.

Working with federal, state, and local ministries of health, the GRBP LF effort assists in: 1) ascertaining the distribution of LF and SH in Plateau and Nasarawa States, 2) implementing HE and mass treatment where appropriate, and 3) documenting the impact of these interventions. The states' GRBP-assisted onchocerciasis control programs (which are partially funded by APOC) have been the launching point for the LF and SH programs. Dr. Abel Eigege directs the GRBP assistance activities. Dr. M.Y. Jinadu, the National Program Coordinator for the LF and SH Programs in Nigeria, is actively involved in the GRBP-assisted program.

In 2001, The Carter Center received funding from the Bill and Melinda Gates Foundation for support of its Lymphatic Filariasis Elimination Program. Plateau and Nasarawa States are now 'demonstration projects' that will be important for showing 'proof of concept' that LF transmission can be interrupted on a large scale in Africa.

Progress in 2001

LF: Plateau and Nasarawa were completely "mapped" for disease endemicity in 2000, and it was determined that LF mass treatment was required in all cities and villages of the 30 local government areas (LGAs) of the two states (estimated population 4 million). In 2001, the program therefore began a rapid scale up of treatment activities in a four-phased implementation plan. Phase 1 in 2000 piloted the combined treatment activities in two LGAs coendemic for LF and onchocerciasis, where albendazole was added to

transmission from occurring. Baseline information on infection status in children at the beginning of the program is essential to assess impact at a later date. In May 2001, the Nigerian team carried out ICT assessments for LF in 2,518 children in thirty-four villages in the project area. Children age 2-5 years from each village were tested by the immunochromatographic card test (ICT) for *Wuchereria bancrofti* filarial circulating antigen. Overall, we found that only 2.6% of the children in this age group were positive by ICT, with a prevalence ranging among the villages from 0-12.5%. This low baseline prevalence in this age group was a surprise and will make it difficult to determine statistically significant changes in prevalence over time. Additional data must be collected in older age groups to evaluate impact of the program.

SH: By the end of 2001, six (20%) of the 30 local government areas (three in each state) had been mapped for SH. The slow progress is the result of a lack of an approved rapid mapping approach for large areas of Africa. The current GRBP approach to SH mapping involves a tedious and expensive process of village-by-village urine dipstick assessments for hematuria in samples of school-aged (6-14 years) children. Based on these survey results, villages are stratified as: 1) no treatment intervention (survey hematuria prevalence less than 20%), 2) treatment of school aged children (sample prevalence 20-49%), or 3) treatment of the entire population (prevalence $\geq$ 50%). Despite these challenges, and the relative lack of funds, in 2001 the SH program expanded health education and praziquantel treatments by 87%, from 44,830 in 2000 to 84,147 in 2001 (Figure 32). Since its launching in 1999, 138,098 cumulative praziquantel treatments for SH have been assisted.

The impact of praziquantel treatment on hematuria was measured in two SH sentinel villages in Pankshin LGA that had been offered full community treatment due to baseline hematuria prevalence assessments (Mungkohot village with a prevalence of 83.3% and Timjim village, 50%). Prior to the third round of treatment in 2001, all school-aged children in the village were asked to provide a urine sample for testing. Significant differences (Figure 33) in pre and post treatment observations were made (Chi square>50, $P < 0.001$).

Plans for the future

In 2002, the LF program has a major challenge of increasing treatments into Phase 3 areas, where there is no onchocerciasis treatment infrastructure to build upon. In 2002, an ATO of 2.4 million albendazole/Mectizan treatments, with HE, is projected. The UTG for the program, 3.6 million treatments, should be reached by the end of 2003. With support from the Bill and Melinda Gates Foundation, there will be sufficient epidemiological and entomological data available to judge the impact of this effort on LF transmission.

Expansion of the SH program is more challenging for a number of reasons:

1) The aforementioned process of village-by-village urine dipstick assessments for hematuria.

2) The inability to give simultaneous combination therapy with praziquantel, Mectizan, and albendazole (studies are needed to demonstrate safety).
3) Praziquantel drug costs are considerable (an average 2.6 tablets per treatment, costing about US $0.21). If we extrapolate our experience in these six LGAs to all 30 LGAs of the two states' populations, one million persons would require treatment, with praziquantel drug costs alone requiring US $210,000 per year. Currently, The Carter Center hopes to expand its SH program by one LGA per state per year, or an estimated 50,000 treatments per year (Figure 32), until additional support can be secured.

LYMPHATIC FILARIASIS AND SCHISTOSOMIASIS RECOMMENDATIONS 2002

Lymphatic Filariasis:

- *Going to scale:* In addition to continuing treatment and HE in the twelve Phase 1 and Phase 2 LGAs, expand treatments into 10 non-onchocerciasis endemic LGAs. Projected treatments will increase by 358%, from 670,000 to the 2002 ATO of 2.4 million. The UTG of approximately 3.6 million is projected by the end of 2003.
- *Drug supply:* There must be earlier ordering of the 2003 Mectizan and albendazole supply. The GRBP order should be placed by the end of May, 2002.
- *Monitoring of impact on transmission:* There is a great need to strengthen monitoring, assessment and evaluation infrastructure in Jos. The following needs were identified:

    1) Additional dedicated personnel and transport vehicles need to be hired and trained in 2002.
    2) Obtain baseline epidemiological information from new sentinel villages (never before exposed to Mectizan) in Phase 4 areas. Include nocturnal microfilarial prevalence and density determinations, as well as ICT on LF antigen prevalence in all age groups. It is essential for program to determine the correct age group by which we can ascertain changes in transmission and define impact of the intervention program.
    3) Obtain baseline entomological data in new sentinel villages. Expand mosquito collections and dissections to measure impact of treatments on LF infection rates in the vector into these new sentinel areas.

- *Alleviation of suffering:* Although the workload to go to scale and establish baseline data is extremely heavy on staff, some consideration must be given to a program to alleviate morbidity stemming from LF, if possible.
- *Urban LF:* The approach to mass treatment in urban areas (a great challenge) will be deferred until 2003 or 2004. Epidemiological assessments of prevalence and transmission might be considered in 2003.

Urinary Schistosomiasis:

- Re-treat all SH villages (prevalence >20% in baseline survey of school aged children), and expand assessment, health education, and treatment activities to two more LGAs in 2002 (an estimated 50,000 praziquantel treatments will have to be purchased).
- Work with partners to find better methods for rapid assessment for SH that do not require sampling every village.
- Seek praziquantel and funding for the SH program.

Analysis and Publications:

- Improve data management/handling in Jos by hiring. m 0 0 16geci5a3iaTT7 416019 Tw d 3

- Follow-up LF KAP studies are needed to judge if the HE messages are understood.
- A summary report of this project has been accepted for publication in 2002 in the *Journal of the America Society of Tropical Medicine and Hygiene*. Other important studies should be prepared for publication (entomology, ICT study, hydrocele study).

TRANSMISSION MONITORING: USE OF ICT CARD TESTS TO SIMULTANEOUSLY DETERMINE PREVALENCE OF LF ANTIGENEMIA AND ONCHOCERCIASIS ANTIBODIES IN YOUNG NIGERIAN CHILDREN

Barwick R, Eigege A, Korve K, Mackenzie C, Alphonsus K, Umaru J, Jinadu M, Miri ES, Richards F

Onchocerciasis and lymphatic filariasis (LF) are two important filarial infections and are extremely prevalent in Nigeria where approximately 100 million people are infected with one or both of these parasites. Onchocerciasis can cause loss of vision and blindness, severe pruritus, and disfiguring dermatitis. LF can cause lymphoedema, elephantiasis, hydrocele and periodic lymphadenitis. Mass drug treatment programs for both of these diseases are underway. For onchocerciasis control, ivermectin has been used for over ten years and WHO has recently targeted the elimination of LF in sub-Saharan Africa through annual distribution of ivermectin and albendazole. One criterion of success in these programs is the absence of infection in children who are born into program areas; children free of infection show that the program has prevented transmission from occurring. The objective of this study was to collect onchocerciasis and LF data from children living in 10 villages located in two states included in Nigeria=s onchocerciasis control and LF elimination programs. Eight of these villages have been receiving mass distribution of ivermectin since at least 1993 but combination of ivermectin and albendazole has only been given since 2000. Children aged 2-5 years from each village were simultaneously tested with two immunochr

Map 9

Figure 31

Figure 32

Figure 33

Annex 6: Publications by or assisted by GRBP staff (underlined)

Amazigo UV, Brieger WR, Katabarwa M, Akogun O, Ntep M, Boatin B, N'doyo J, Noma M, Seketeli A. The challenges of community-directed treatment with ivermectin (CDTI) within the African Programme for Onchocerciasis Control (APOC). *Annals of Tropical Medicine and Parasitology* 96(Supp 1): S41-S58, 2002.

Anonymous. Onchocerciasis, Nigeria. *Weekly Epidemiological Record* 71:213-5, 1996.

Anonymous. Onchocerciasis, progress towards elimination in the Americas. *Weekly Epidemiological Record* 71:277-80, 1996.

Anonymous. River blindness (onchocerciasis): Progress in ivermectin distribution, Nigeria. *Weekly Epidemiological Record* 72:221-228, 1997.

Anonymous. Dracunculiasis and Onchocerciasis: Sudan. *Weekly Epidemiological Record* 72:297-301, 1997.

Anonymous. Annual Onchocerciasis Report Afromthe AIntermericasnContference f-71.9999 0 12 112

Eigege A, Richards F, Blaney D, Miri E, Umaru J, Jinadu MY, Mathai W, Hopkins DR. Rapid Assessment for Lymphatic Filariasis in Central Nigeria: A Comparison of ICT and Hydrocele Rates in an area of high LF endemicity. *Journal of the American Society of Tropical Medicine and Hygiene* (submitted).

Homeida MA, Goepp I, Magdi A, Hilyer E, MacKenzie CD. Medical achievements under civil war conditions. *Lancet* 354:601, 1999.

Hopkins D, Richards F. Visionary campaign: Eliminating river blindness*. Encyclopedia*

Annex 7: Contact List of Program Review Participants

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