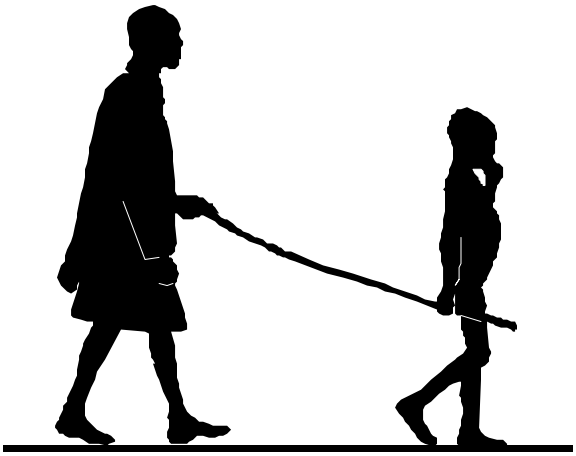

Summary
2003 Program Review for The Carter Center/Lions SightFirst River Blindness Programs
Cameroon, Ethiopia, Nigeria, OEPA, Sudan, and Uganda
1-3 March 2004
The Carter Center
Atlanta, GA

THE CARTER CENTER
River Blindness Program

LIONS CLUBS INTERNATIONAL FOUNDATION

July 12, 2004

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Bruce Wahle
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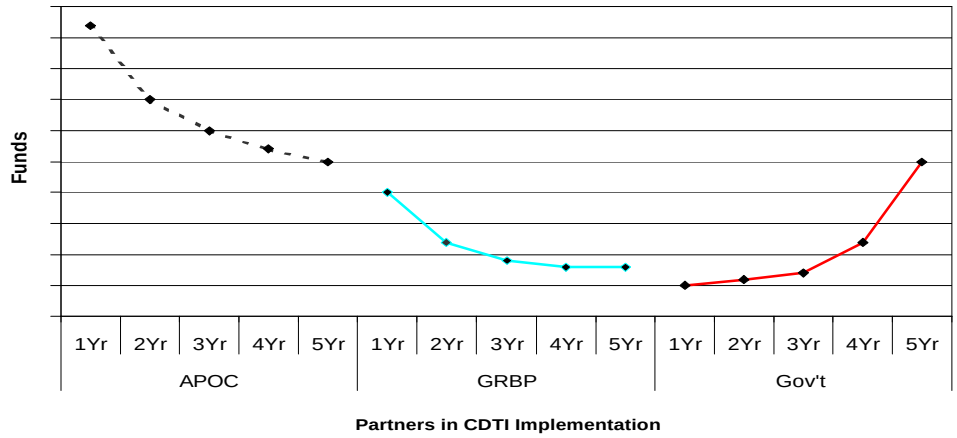
Robert and Mary Yellowlees

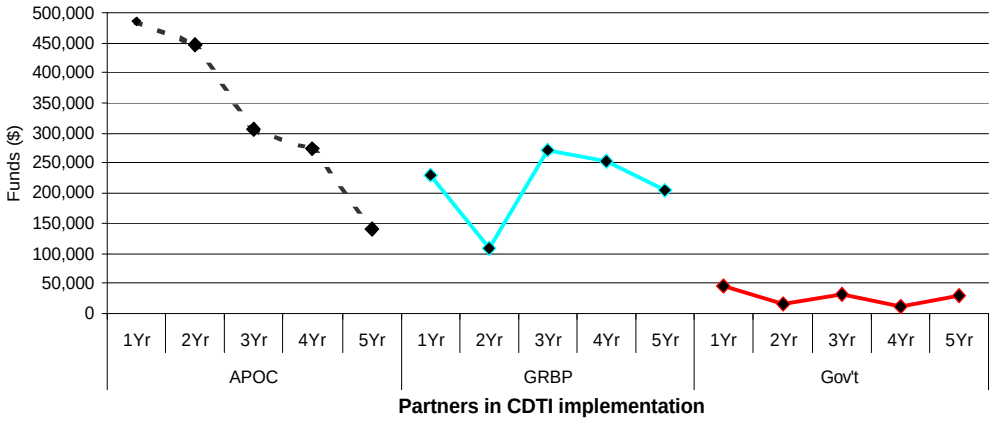
And to many others, our sincere gratitude

Figure A

Model of Sustainability: Projected partner input for a five-year APOC project

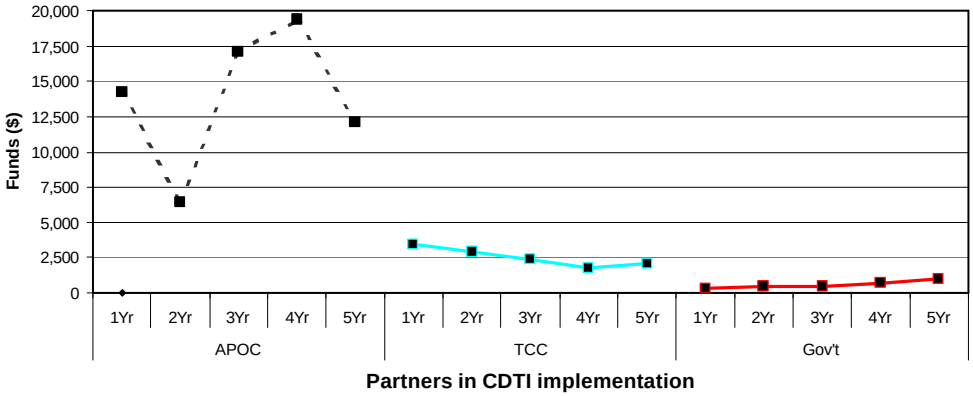


Actual funding for 3 APOC/Carter Center-assisted CDTI projects in Nigeria*



*The three projects include 7 states: Imo/Abia, Ebonyi/Enugu/Anambra, and Plateau/Nasarawa

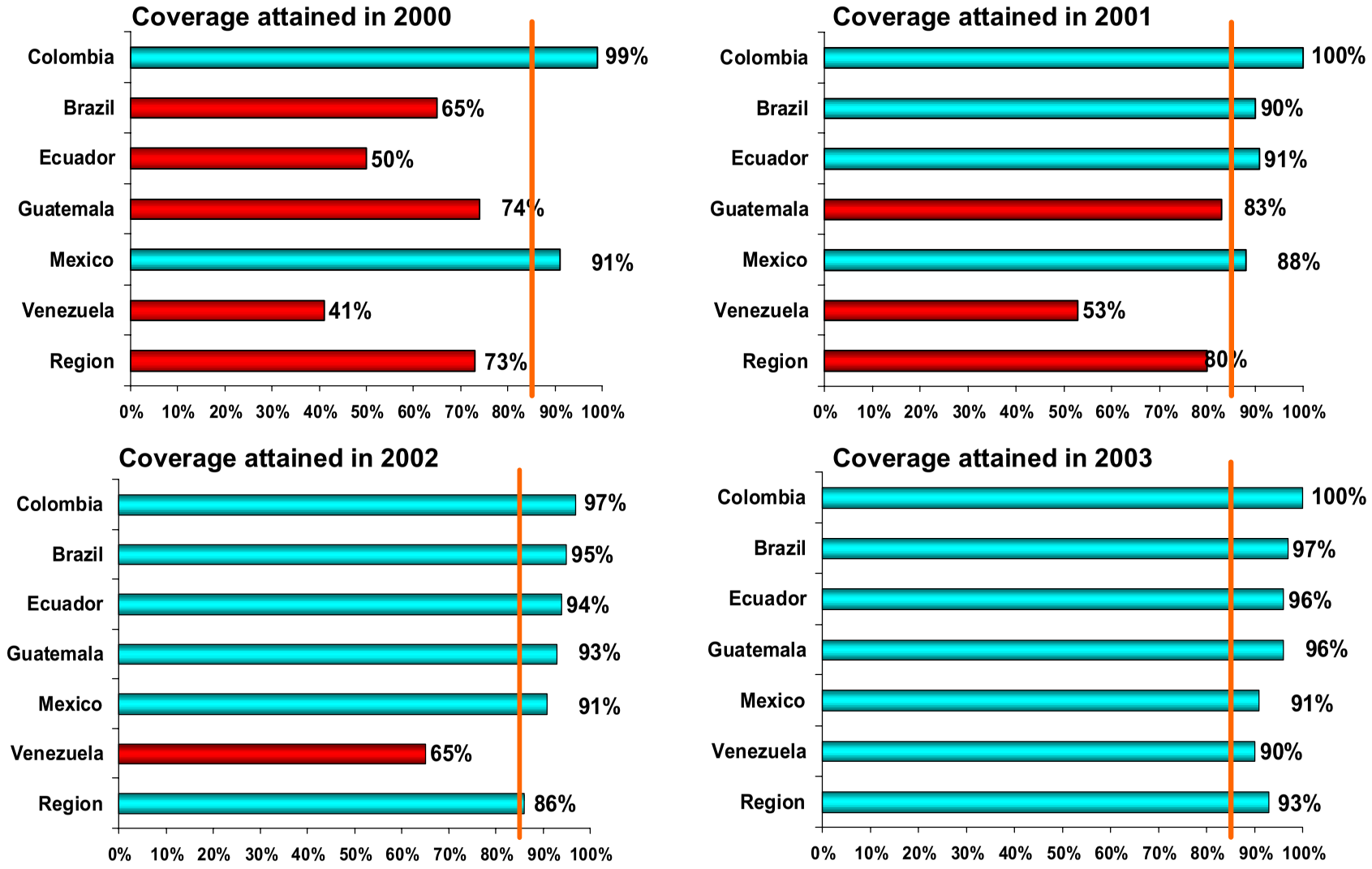
Actual funding for two Carter Center-assisted CDTI projects in Uganda*



*The two projects are the Phase 1 districts of Kasese and Kisoro

Figure B

Evolution of treatment coverage by country in the Americas 2000-2003



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INTRODUCTION AND OVERVIEW

The Global 2000 River Blindness Program (GRBP) of The Carter Center collaborates with the ministries of health of 11 countries (Map 1), maintains field offices in Cameroon, Ethiopia, Guatemala, Kenya, Nigeria, Sudan, and Uganda, and belongs to international coalitions that also include the U.S. Centers for Disease Control and Prevention (CDC), the World Health Organization (WHO), The World Bank, Merck & Co., Inc., international bilateral donors, and other nongovernmental development organizations (NGDOs). Special GRBP partners include the Lions Clubs International Foundation (LCIF) and the African Program for Onchocerciasis Control (APOC). In October 1999, The Carter Center and Lions Clubs announced the Lions-Carter Center SightFirst Initiative to increase our collaboration in the global effort for onchocerciasis control, including the establishment of a new river blindness control program in Ethiopia. See Annex 1 for background information on Carter Center activities.

The GRBP hosted its eighth annual Program Review on March 1-3, 2004, at The Carter Center in Atlanta, Georgia. The review is modeled after similar reviews developed by The Carter Center and CDC for national Guinea Worm Eradication Programs, beginning with Pakistan in 1988. The main purposes of the review, which was chaired by Dr. Donald Hopkins (Associate Executive Director for Health Programs, The Carter Center), were to assess the status of each program and to determine impediments and problems in program implementation. This year, the African programs also focused on sustainability in the post-APOC era, a topic that plays a vital role in program capabilities. In 2003, most African programs assisted by The Carter Center had an external sustainability evaluation using a tool designed by APOC. Presentations at the Program Review included a report on the results of each evaluation. See Figure 1 for the average score per country. An explanation of the monitoring criteria is included in Annex 5, and further details on the results are included in each country section of this document. The Nigerian program also reported on the pilot initiative 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.

Participants (Annex 2) included the following GRBP country representatives: Mr. Teshome Gebre (Ethiopia), Mrs. Peace Habomugisha (Uganda), Dr. Emmanuel Miri (Nigeria), Dr. Mauricio Sauerbrey (Onchocerciasis Elimination Program for the Americas [OEPA]), Mr. Raymond Stewart (Sudan/Khartoum), and Mr. Mark Pelletier (Sudan/Nairobi). Other participants included Professor Mamoun Homeida, (Chairman, National Onchocerciasis Task Force [NOTF], Sudan) and Global 2000 Atlanta headquarters staff. Special guests included Ms. Sonia Pelletreau (LCIF), Dr. Jamie Maguire (Chief, Parasitic Diseases Branch, CDC), Dr. Frank Richards (Division of Parasitic Diseases, CDC) Dr. Steve Blount (Director, Office of Global Health, CDC), Mr. Ross Cox (Deputy Director, Office of Global Health, CDC), Dr. Ed Cupp (Professor of Entomology, Auburn University, Auburn, Alabama), Dr. Tom Unnasch (Professor of Immunology, University of Alabama at Birmingham), Dr. Bjorn Thylefors (Director, Mectizan® Donation Program), and Dr. Mary Alleman (Associate Director, Mectizan® Donation Program), among other observers. See Annex 3 and 4

for a complete contact list and the agenda of this meeting. Dr. Albert Eyamba, GRBP country representative of Cameroon, could not attend because he was not granted a timely visa under the new US Patriot Act provision. Dr. Moses Katabarwa, Program Epidemiologist of The Carter Center's GRBP Atlanta office, presented the Cameroon report.

Infection with the vector-borne parasite *Onchocerca volvulus* (causing human onchocerciasis) is characterized by chronic skin and eye lesions. WHO estimates that about 17.6 million people are infected and 770,000 are blinded or severely visually impaired in the 37 endemic countries. Approximately 123 million people live in endemic areas worldwide and are therefore at risk of infection; more than 95% reside in Africa. Onchocerciasis is transmitted by small black flies that breed in rapidly flowing rivers and streams, thus leading to the common name for the disease, "river blindness." Periodic mass treatment with Mectizan prevents eye and skin disease caused by *O. volvulus.*

A major focus of the GRBP is on routine reporting by assisted programs. The reader is referred to Annex 5 for a discussion of the GRBP reporting process and for treatment indices used by the program and in this report. Important terms include the number of treatments provided (TX), the Ultimate Treatment Goal (UTG), twice the UTG (UTG[2]), Annual Treatment Objectives (ATOs), eligible at-risk population (earp), at-risk villages (arvs), and full coverage (defined as 85% achievement of the UTG, or for OEPA, the UTG[2]).

In 2003, the GRBP assisted in providing a total of 9,658,793 treatments for onchocerciasis (Table 1 and Figure 2), compared to 8,964,429 treatments in 2002. This number constituted 96% of the UTG in the assisted areas (Figure 3), and brought the cumulative number of treatments assisted by the Program since its inception in 1996 to 55,094,374. As before, a majority (52%) of treatments were provided in Nigeria (Figure 4). Nearly all treatments (97%) were supported by LCIF (Figure 5). See Figure 6 for the average cost per treatment in Cameroon, Ethiopia, Nigeria, Sudan, and Uganda.

In the Americas, the goals are to eliminate clinical manifestations of onchocerciasis by 2007 and to interrupt transmission of the disease altogether. Mass Mectizan® treatments are given twice-per-year. Overall coverage has improved from 80% in 2001 to 86% in 2002, to 93% in 2003. Two momentous events occurred in OEPA in 2003: for the first time, all six countries exceeded the target coverage of 85% or more (Figure B), and the program attracted a $10 million matching grant from the Bill & Melinda Gates Foundation. The Program is actively seeking ways to accelerate impact on transmission, such as evaluating four-times-per-year treatment.

In Africa, the goal in assisted areas is to help develop sustained programs with UTG coverage rates of 85% or more, in cooperation with APOC. The Carter Center-assisted regions in Nigeria and Uganda continue to cover a significant portion of those countries' overall UTGs. In line with its rapid expansion, Ethiopia once again had the highest increase in treatments (95% increase over 2002). For the first time, three countries exceeded one million treatments: Ethiopia (the newcomer) Cameroon, and Nigeria. Cameroon and Uganda exceeded 95% of their UTGs. Unfortunately, Sudan showed a

decrease in treatments compared to 2002, possibly a result of decreased funding from APOC. Nigeria has successfully adapted the infrastructure in two of its states for Carter Center- and APOC-assisted health education and annual mass drug treatment against onchocerciasis to also provide similar combined interventions against lymphatic filariasis and schistosomiasis. Schistosomiasis treatment also has begun in two Local Government Areas in the Southeast. Most of the additional support for this pioneering work has been provided by GlaxoSmithKline and the Bill & Melinda Gates Foundation, with some of the praziquantel drug for schistosomiasis donated by Shin Poong Pharmaceutical Co., Ltd. Evidence of the impact of combined interventions against these three diseases is beginning to emerge, and the Nigerian program hopes to document more concrete evidence of this.

The programs also have begun to look more critically at the characteristics of community-directed distributors (CDDs), hoping in the future to learn of possible connections between gender and attrition, or method of their selection and attrition. Some information collected on CDD attrition and cost per treatment in selected areas, as well as CDD gender, can be seen in Tables 2 and 3.

This year's review focused on sustainability in the post-APOC era. This is of paramount importance, as APOC funding has already ceased in 12 project areas, and will soon end in nine others. Certain patterns became clear in this year's presentations and discussions on this topic:

- The projects have achieved excellent coverage of eligible populations.
- As noted last year, the lack or paucity of government financial support for the programs is a major obstacle to achieving sustainability.
- Frontline healthcare facilities, often a weak link in the sustainability chain, are also among the most important.
- Not one project evaluated using the APOC monitoring tool has been determined to be fully sustainable, and the tool itself may not be configured to properly measure sustainability.
- The program already is experiencing problems in some areas where APOC funding has been withdrawn, largely because governments have not provided the level of support that was projected and promised when APOC began.
- It was confirmed that support by the Mectizan® Donation Program in the form of donated Mectizan would continue as long as needed.

At this Program Review, The Carter Center reiterated that it will not abandon its assisted projects, but will also not fill the gap left by the cessation of APOC funding in project areas that have concluded 5 years of activities. The Carter Center has carried out a preliminary examination into the funding projected and released in four projects—three in Nigeria and one in Uganda—that have completed five years of implementation. In this period, local governments have not increased their funding to a level where the CDTI projects can be sustained. Comparing actual funds released over the 5-year period, the government contributions to these four programs amount to 4.7% of the total contributions by APOC; The Carter Center; and the local, state and national

governments.[1] APOC contributed 58.5% over the same period, and The Carter Center, 36.7%. During the five-year periods, APOC released 40% of its projected contribution in Nigeria, and The Carter Center released 86%, while local, state and federal governments released 9%. The comparable figures for the project area analyzed so far in Uganda are 48%, 81% and 10%, respectively. Figure A shows a comparison between a graph approximating APOC's projected financial relationship among partners and the realities of several programs in Nigeria and Uganda. Unless there is stronger government commitment and additional external resources, the sustainability of these programs is questionable. Please see the Nigeria and Uganda Financial Contribution sections for further elaboration on these findings.

APOC has approved Ethiopia's project proposals for Illubabor and Jimma. Due to this geographical expansion, Ethiopia's UTG will once again increase substantially in 2004 to 2,429,644. This is more than double the 2003 UTG of 1,098,501. Combining this increase with adjusted population figures for some countries, the UTG for all GRBP-assisted areas in 2004 is 11,537,042; 15% more than the 2003 UTG of 10,064,441.

In 2004, the GRBP will continue to investigate ways to stimulate governmental contributions to the program activities, in an effort to promote sustainability in Cameroon, Ethiopia, Nigeria, Sudan, and Uganda. The African onchocerciasis programs and their allies will need to continue to seek innovative solutions and advocate strongly for additional sustained support from their own governments, development agencies, and NGDOs. Other potential complementary options include strengthening healthcare systems and infrastructure and/or proving onchocerciasis to be eradicable in Africa (thus programs would not have to be sustained indefinitely). Given the current or imminent end of many projects' funding from APOC, and continued lack of, or inadequate, funding by their respective local and national governments, the programs have begun to consider other potential funding resources.

[1] These data are provisional based on preliminary information provided by program offices.

RECOMMENDATIONS 2003 FOR THE CARTER CENTER

The Carter Center, in cooperation with other NGDO partners and individually, should advocate strongly for long-term support of onchocerciasis control activities in Onchocerciasis Control Program (OCP) and APOC-assisted endemic areas after those regional programs have ceased operations. Such advocacy efforts should be directed or raised at meetings of donors, APOC leadership, the Joint Action Forum (JAF), the Committee of Sponsoring Agencies, the Mectizan® Executive Committee (MEC), The World Bank, NGDOs, and the respective national governments.

Investigate whether incentives help or hurt at the village level.

Look at whether the CDDs selected from and working in their kinship or neighborhood zones in a village decreases overall CDD attrition, and whether increased CDD numbers, female involvement or Add On Interventions (AOIs) have an impact on coverage.

Compare results achieved by CDTI projects evaluated by APOC, and their performance a year after APOC funding has ceased.

Work with other NGOs to come to an agreement on post-APOC roles, at least in areas designated to test the sustainability of Community-Directed Treatment with Ivermectin (CDTI). Thus far, Ebonyi and Imo states have been chosen in Nigeria, as well as Kisoro District of Uganda. Close monitoring of the situation in Sudan (where treatments decreased in 2003 concurrent with reduction of APOC support) is indicated.

All GRBP-assisted programs should continue to seize every opportunity to document the impact of current interventions against onchocerciasis (health education and annual or semi-annual mass administration of Mectizan), on transmission of onchocerciasis, and on clinical manifestations of the disease. Specific anecdotes illustrating Program popularity or benefits should always be noted and reported to GRBP headquarters.

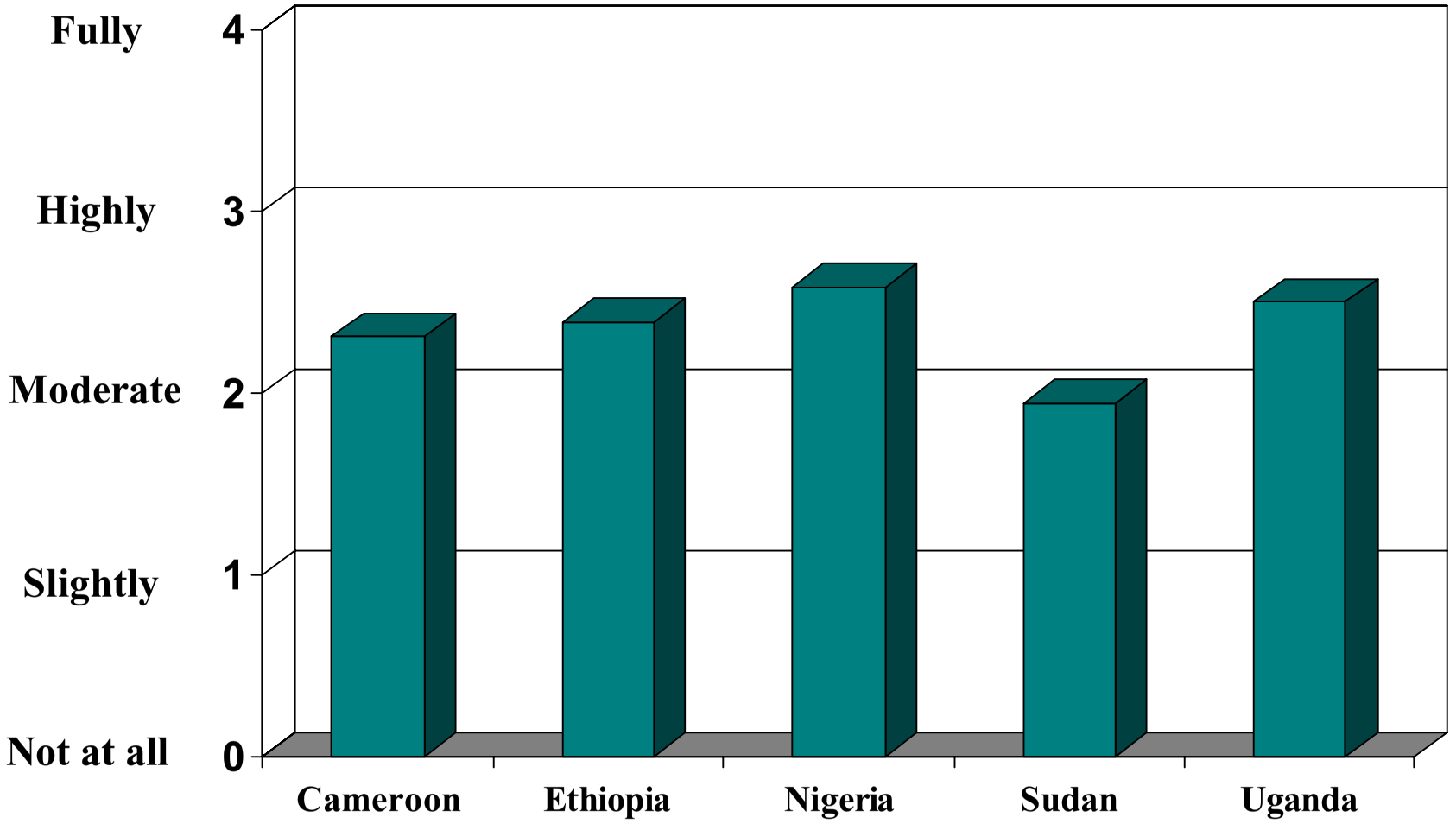
All programs should seek ways to integrate other programs into their current RB activities, as has been done in Plateau and Nasarawa States, Nigeria.

Map 1

Carter Center-Assisted Onchocerciasis Control Programs

Figure 1

APOC sustainability evaluations of GRBP projects, 2003: Mean scores by country*



* Scores are averages per country for: 2 projects in Cameroon, 1 in Ethiopia, 3 in Nigeria, 1 Sudan and 1 in Uganda

Figure 2

GRBP-assisted Programs: Annual Mectizan Treatments 1996 - 2003

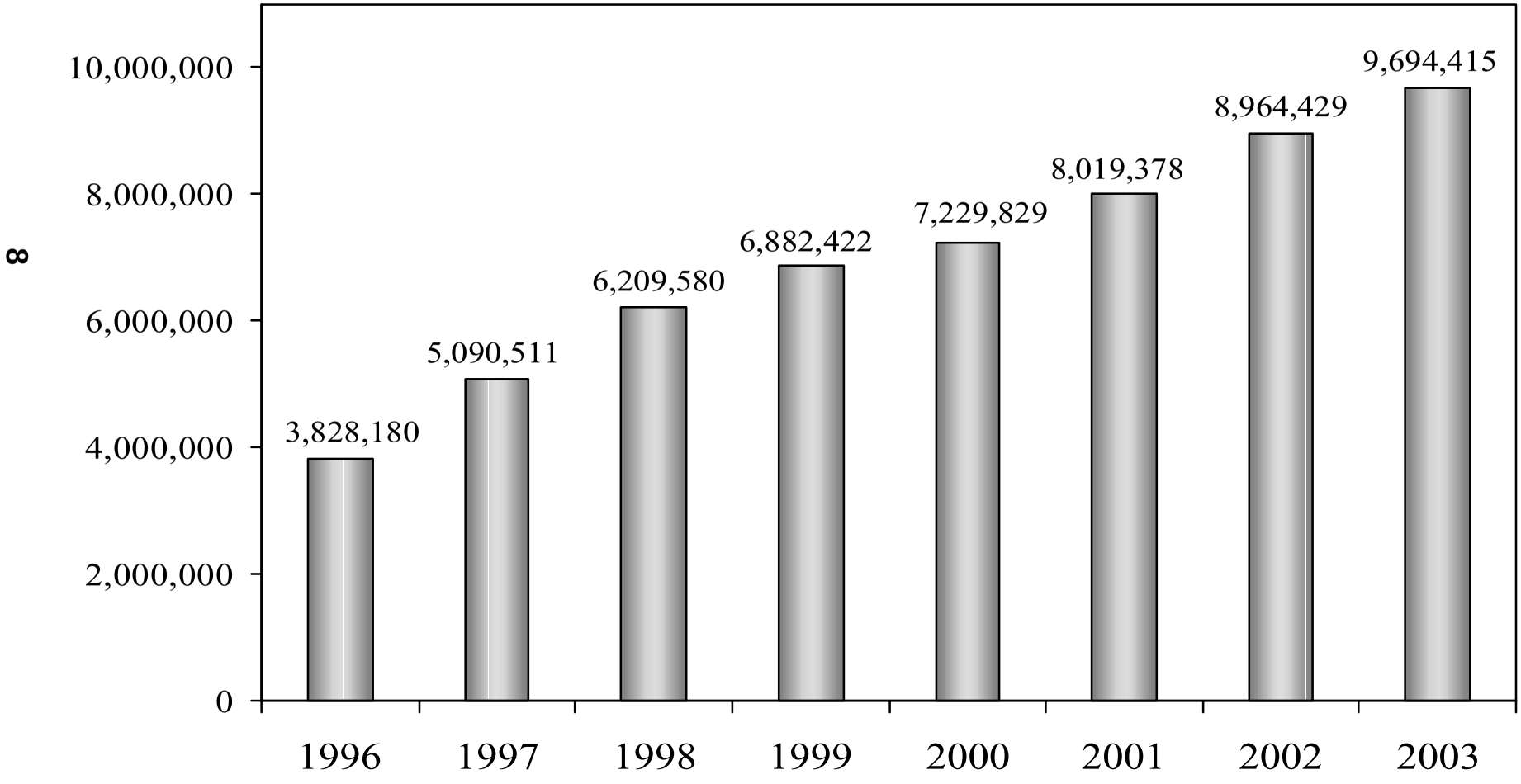


Figure 3

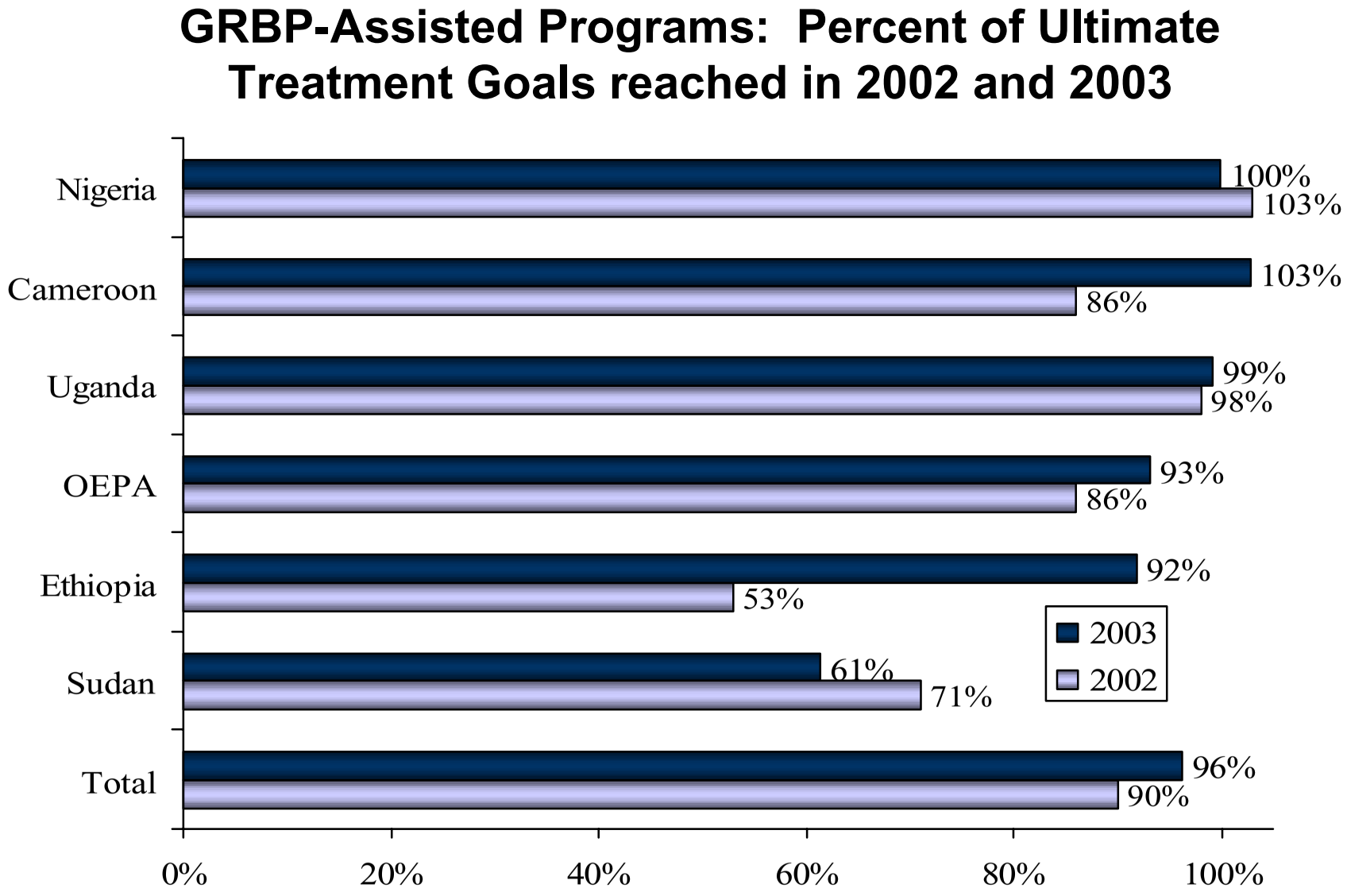

GRBP-Assisted Programs: Percent of Ultimate Treatment Goals reached in 2002 and 2003
Nigeria
Cameroon
Uganda
OEPA
Ethiopia
Sudan
Total
100%
103%
103%
86%
99%
98%
93%
86%
92%
53%
61%
71%
96%
90%
2003
2002
0%
20%
40%
60%
80%
100%

Figure 4

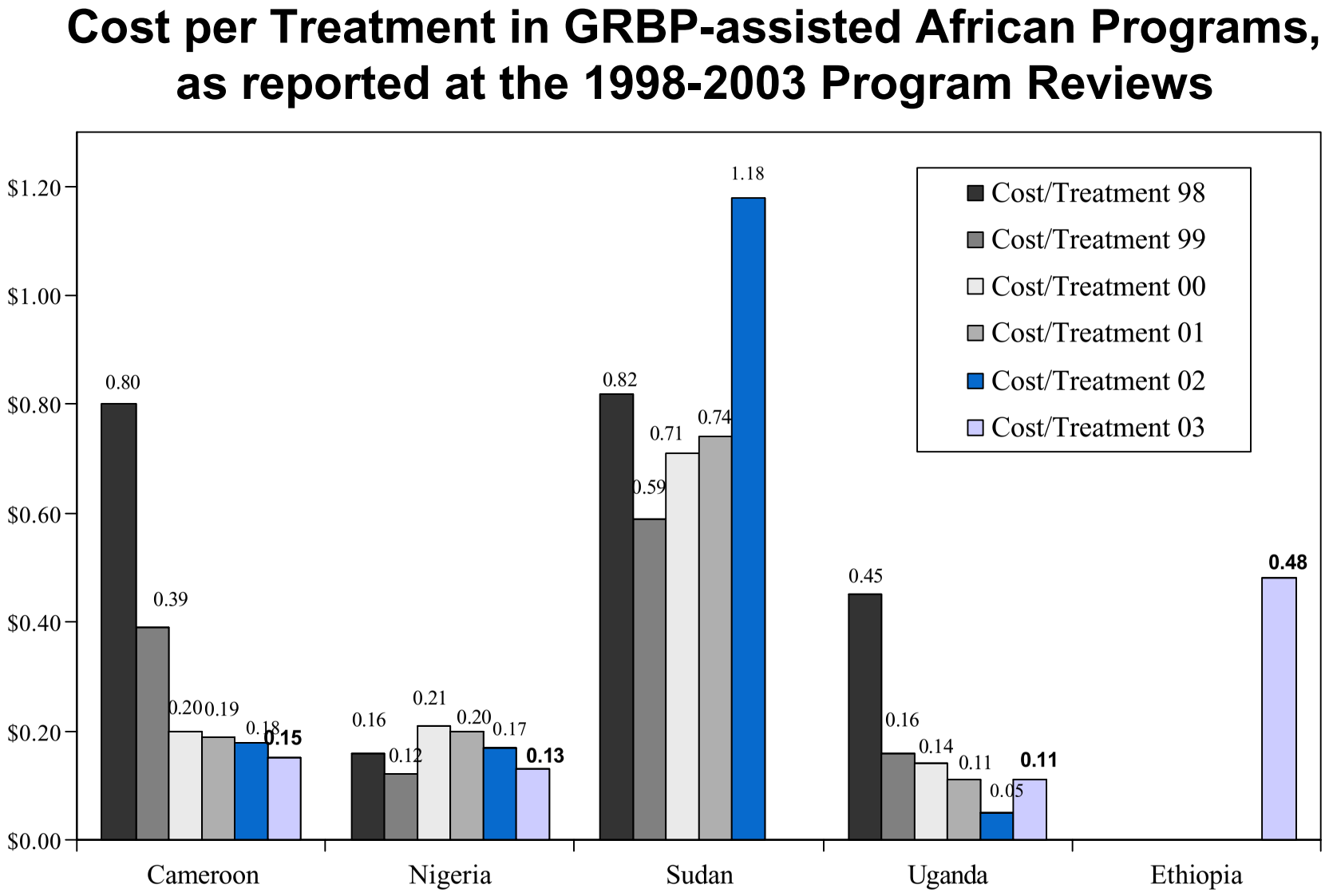

Cost per Treatment in GRBP-assisted African Programs, as reported at the 1998-2003 Program Reviews
$1.20
$1.00
$0.80
$0.60
$0.40
$0.20
$0.00
Cost/Treatment 98
Cost/Treatment 99
Cost/Treatment 00
Cost/Treatment 01
Cost/Treatment 02
Cost/Treatment 03
0.80
0.39
0.20
0.19
0.18
0.15
0.16
0.12
0.21
0.20
0.17
0.13
0.82
0.59
0.71
0.74
1.18
0.45
0.16
0.14
0.11
0.05
0.11
0.48
Cameroon
Nigeria
Sudan
Uganda
Ethiopia

Figure 5

Annual Mectizan Treatments, Carter Center (GRBP)-Assisted and Carter Center / Lions-Assisted Programs

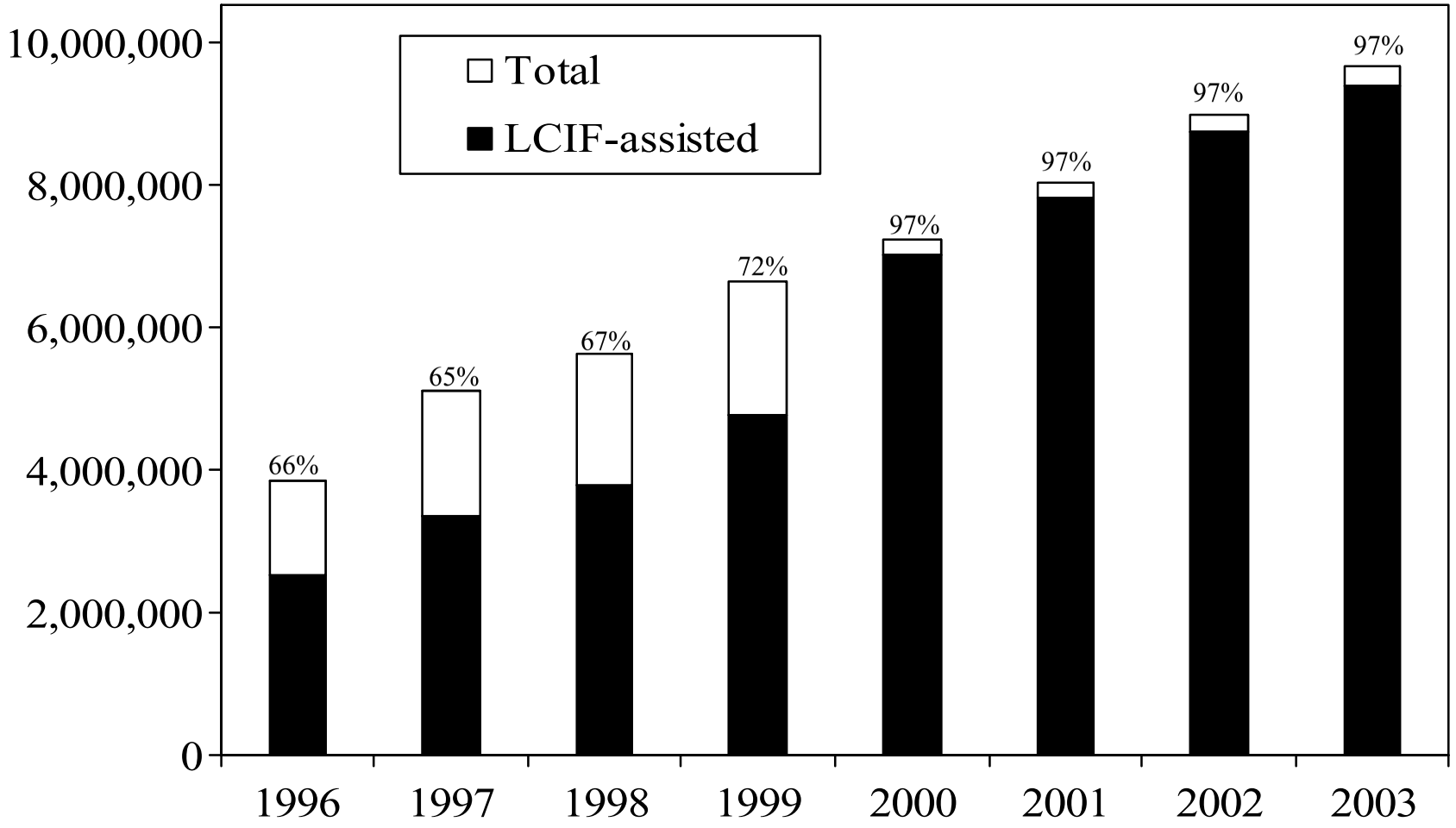


Figure 6

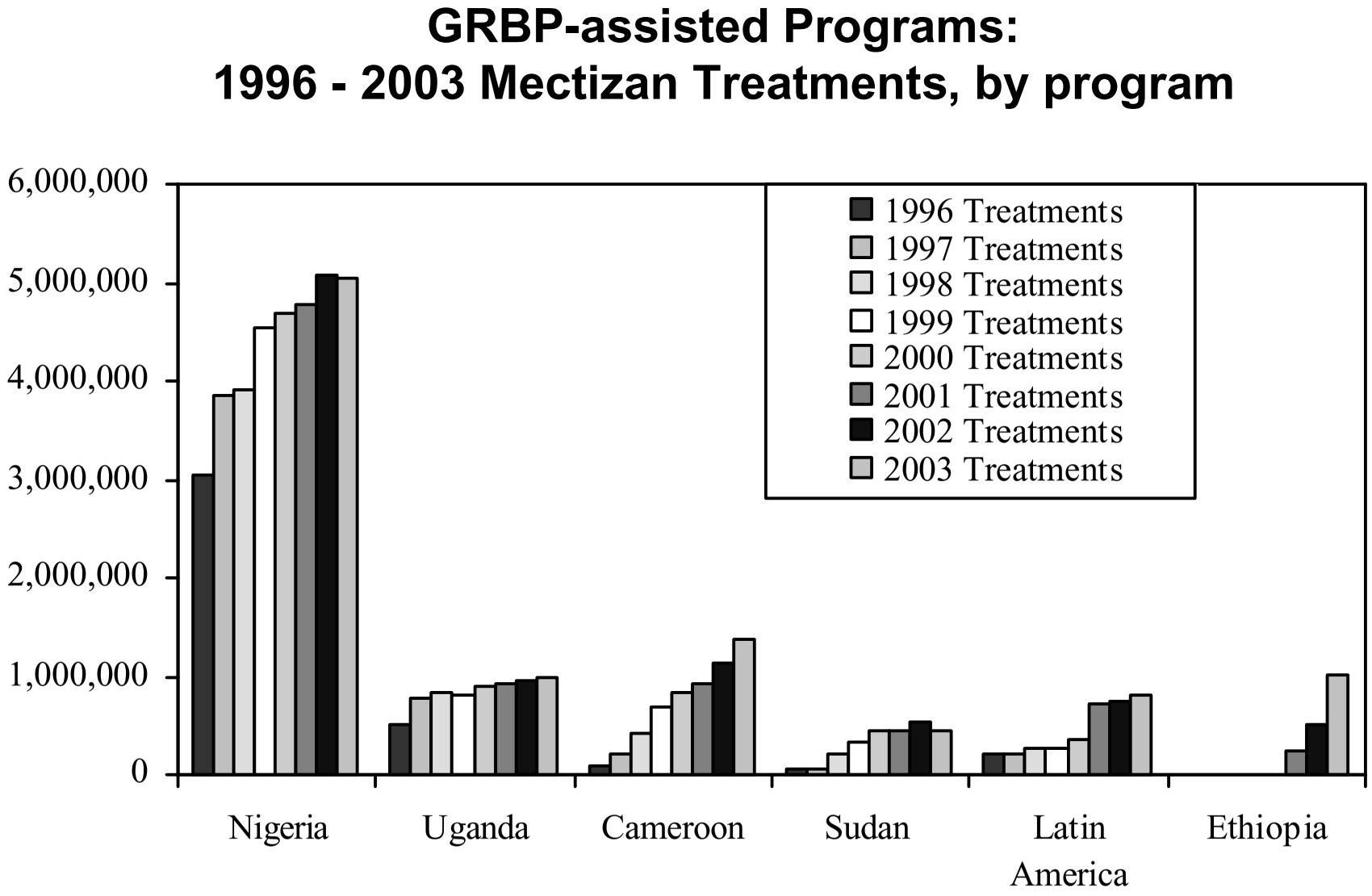

GRBP-assisted Programs:
1996 - 2003 Mectizan Treatments, by program
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1996 Treatments
1997 Treatments
1998 Treatments
1999 Treatments
2000 Treatments
2001 Treatments
2002 Treatments
2003 Treatments
Nigeria
Uganda
Cameroon
Sudan
Latin America
Ethiopia

Table 1: Onchocerciasis: 2003 Mectizan treatment figures for Global 2000 River Blindness Program (GRBP)-assisted areas in Nigeria, Uganda, Cameroon, Ethiopia, and collaborative programs in Latin America (OEPA) and Sudan

Country/Tx Category		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	% ATO	% ALL GRBP TX
NIGERIA	***ATO(earp)=**	**5,047,370**		**ATO(arv)=**	**7,921**											
TX(earp)		0	5,744	115,626	415,660	1,234,162	559,215	640,015	478,725	566,416	492,079	347,770	185,507	5,040,919	100%	52%
TX(arv)		0	24	121	545	1,575	1,156	1,046	900	887	892	525	175	7,846	99%	41%
UGANDA	***UTG=**	**999,275**		**ATO(arv)=**	**2,351**											
TX(earp)		13,397	234,690	189,465	67,251	9,609	11,413	200,148	178,060	82,582	3,219	360	0	990,194	99%	10%
TX(arv)		30	675	728	454	295	227	649	486	824	72	13	0	2,324	99%	12%
CAMEROON	**ATO(earp)=**	**1,265,391**		**ATO(arv)=**	**2,708**											
TX(earp)		0	0	0	0	123,018	702,402	385,676	146,211	3,526	0	0	0	1,360,833	108%	14%
TX(arv)		0	0	0	0				2,343	583	0	0	0	2,926	108%	15%
OEPA**	****UTG(2)=**	**879,774**		**ATO(arv)=**	**1,934**											
TX(earp)		0	0	0	0	0	406,786	0	0	0	0	0	412,280	819,066	93%	8%
TX(arv)		0	0	0	0	0	1,821	0	0	0	0	0		1,821	94%	10%
ETHIOPIA	**ATO(earp)=**	**1,119,063**		**ATO(arv)=**	**4,250**											
TX(earp)		0	0	27,422	139,622	527,149	306,794	6,996	0	0	0	0	0	1,007,983	90%	10%
TX(arv)		0	0					4,250	0	0	0	0	0	4,250	100%	22%
SUDAN	**ATO(earp)=**	**716,870**														
TX(earp)		10,693	14,345	8,661	4,621	45,924	69,977	42,745	32,157	6,054	93,529	78,770	32,322	439,798	61%	5%
Totals	**ATO(earp)=**	**10,027,743**		**ATO(arv)=**	**19,164**											
TX(earp)		**24,090**	**254,779**	**341,174**	**627,154**	**1,939,862**	**2,029,355**	**1,238,889**	**896,525**	**731,294**	**527,620**	**380,452**	**630,109**	**9,658,793**	**96%**	**100%**
TX(arv)		**30**	**699**	**849**	**999**	**1,870**	**1,383**	**1,695**	**3,729**	**2,294**	**964**	**538**	**175**	**19,167**	**100%**	**100%**

GRBP-assisted cumulative treatments = 55,094,374

* **ATO**: Annual Treatment Objective, **UTG**: Ultimate Treatment Goal, **Tx**: Number Treated, **earp**: Eligible At Risk Population, **arv**: At Risk Villages

**OEPA figures reported quarterly, UTG(2) is the Ultimate Treatment Goal times 2, since OEPA treatments are semiannual

Table 2: GRBP Cost per Treatment and CDD information for 2003

	Cost/Tx 2003	CDDs/village 2003	Attrition rate of CDDs 2003
Ethiopia	0.48	1.32	3.7% (for Kaffa & Sheka only)
Nigeria	0.1	3.03	5.43% (Plateau/Nasarawa only)
Uganda	0.11	14	< 2% (exact figure not given)

Table 3: CDD Gender Distribution 2003

		% CDDs that are female	# Female CDDs	Total # CDDs	Coverage
Cameroon		NA	NA	NA	103%
Ethiopia		4.7%	262	5,609	92%
Nigeria	**P/N**	9.5%	243	2,571	94%
	SE	37.7%	4,851	12,877	102%
Nigeria overall		33.0%	5,094	15,448	101%
Sudan	**Government of Sudan**	~28%	NA	NA	59%
	OLS/Southern Sudan	NA	NA	NA	64%
Uganda*		~44%	NA	NA	99%

* info on community directed health supervisors

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 morbidity from 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, Lions Club International Foundation (LCIF), the Bill & Melinda Gates Foundation, PAHO/WHO, the Mectizan® Donation Program (MDP) and the U.S. Centers for Disease Control and Prevention (CDC). A Program Coordinating Committee (PCC) provides representation for all of these partners and gives broad directives to the OEPA office, which is based in Guatemala City and staffed through The Carter Center. The Center also coordinates financial assistance to the coalition as part of the Carter Center-Lions SightFirst Initiative.

OEPA has three main goals:

- To prevent new eye disease attributable to onchocerciasis by 2007 through mass treatment of at-risk populations with ivermectin (Mectizan) donated by Merck & Co, Inc.

- To interrupt transmission of onchocerciasis through high coverage, semiannual mass treatment of at-risk populations with ivermectin. To do so, treatment programs aim to reach at least 85% of persons eligible for treatment who reside in communities known to be endemic for onchocerciasis (Table 4), and sustain treatment coverage for a period of approximately ten years.

- Determine other strategies that might be implemented to hasten the process of elimination, since sustaining the program for such a long time is a major challenge.

Treatment activities in 2003:

Since its inception, treatment coverage has been reported to OEPA as a percentage of the total number of persons estimated to be eligible for treatment: the Ultimate Treatment Goal (UTG). The UTG(2) is defined as the number of persons in the region who require treatment with Mectizan (the UTG) multiplied by two (since each individual should be treated twice during a calendar year).

Ivermectin treatments are reported to OEPA by the six national programs quarterly. Treatment coverage for each semester is calculated as the number of treatments divided by the total number of persons estimated to be eligible for treatment (the Ultimate Treatment Goal -UTG). Annual treatment coverage is the number of treatments divided by the UTG multiplied by two (UTG(2)). Starting in 2000, OEPA has

been using the UTG(2) to monitor the success of programs in providing two treatments per year to all at-risk eligible persons (Table 5).

Annual treatment coverage in the region has increased steadily. In 2003, the six national programs provided 819,066 Mectizan treatments, an increase of 9% over treatments delivered in 2002 (749,182). (See Table 6 and Figure 7.) For the second year in a row regional coverage exceeded the minimum goal of 85%, with 2003 regional UTG(2) reaching 93% of the 889,116 UTG(2) target (Figure 8). Venezuela exceeded the 85% goal for the first time by reaching 90% coverage (compared to 65% in 2002); and all six endemic countries achieved that goal in 2003 (Figure B). Treatment activities occurred in over 90% of the 1,950-targeted communities in both semester treatment rounds.

The treatments provided in 2003 reached 93% of targeted communities in the first round and 94% in the second round, both of which are a marked improvement over 2002 (87% and 85%, respectively).

Details of treatments provided by country are as follows:

Brazil provided 12,488 ivermectin treatments toward a UTG(2) of 13,574 in the northern states of Roraima and Amazonas and annual coverage exceeded 85% for the third year in a row. Coverage was 98% during the first round, and 96% during the second round. The distribution strategy calls for the use of health care centers, staffed by MOH and NGDO personnel, in 17 accessible "polo" base camps. Treatments took place in all 17 endemic "polo bases" in both rounds of treatment. The Brazilian program has continued to demonstrate the feasibility of delivering treatment to the migratory Yanomami communities in the Amazon forest.

Colombia exceeded the 85% UTG(2) goal (2,326) for the sixth straight year in the single known endemic community (Naicioná, in López de Micay municipality, Department of Cauca), by providing a total of 2,234 treatments, despite civil unrest in the area.

Ecuador achieved for the third year a treatment coverage of >85%, providing 38,462 treatments toward a UTG of 40,058. Coverage was 95% in the first round and 97% in the second. All 119 endemic communities received treatment in both treatment rounds. Over 90% of communities reported achieving >85% coverage of their eligible populations in each of the two treatment rounds.

Guatemala provided a total of 308,254 treatments toward the goal of 320,836, thereby surpassing the 85% coverage goal for the second year. The program reported reaching 96% of eligible persons during each treatment round. In the first round, 495 of 518 endemic communities received treatment, and 487 communities received treatment in the second round. Many of the "untreated communities" have been abandoned by the inhabitants due to loss of employment stemming from the very low coffee prices on the global market. The migration of those inhabitants was a major concern for the program.

Mexico achieved >85% coverage for the fifth straight year (283,393 treatments of its UTG(2) of 311,140). All 670 endemic communities were reached in both rounds. In an effort to accelerate the elimination of onchocerciasis, Mexico launched an operational research program to evaluate the feasibility and impact of providing ivermectin four times per year (e.g., quarterly) in 49 of its most endemic communities in the southern focus of Chiapas (Figure 9).

Venezuela, the last endemic American country to launch its national onchocerciasis program, reached the 85% goal for the first time in 2003 by providing 174,145 treatments, 90% of its UTG(2) of 192,612. This was a dramatic increase compared to a coverage of 65% in 2002 and 53% in 2001. Despite political unrest, the program in Venezuela has made incredible efforts to reach the current level of coverage.

Impact on transmission of onchocerciasis: As illustrated in Map 2, four of the thirteen American foci of onchocerciasis are believed to have no transmission, three foci (Lopez de Micay in Colombia, Rio Santiago areas of the Esmeraldes focus in Ecuador, and the Oaxaca focus in Mexico) are close to ending transmission, and significant endemicity remains in six of the foci. OEPA is beginning to investigate options for accelerating interruption of transmission (i.e., increased frequency of mass treatment, limited vector control, etc.). The four-treatment-round approach in Chiapas, Mexico will be monitored to assess impact. Ongoing CDC research is testing the efficacy of short course antibiotic treatment on the viability of O. volvulus adults and microfilaria via impact on *Wolbachia* symbiotic bacteria living in the parasites.

Both Brazil and Guatemala conducted in-depth evaluations in 2003. The previous two assessments for Brazil were conducted in 1995 and 1998. While the microfilariae (mf) prevalence and ophthalmological indicators of disease changed greatly between 1995 and 1998 (from 63% and 31% to 19% and 0.1%, respectively), these figures increased slightly between 1998 and 2003 (to 20% and 3%, respectively). This concerning observation could be attributable to migration of Yanomami groups from Venezuela, where reported treatment coverage has been very low on its side of the border within this focus (Figure 10). Another possibility is that having coverage in the area under study of only 85% during the last three years (2001-2003) has not been sufficient to keep these numbers down.

The Guatemala evaluation revealed that, despite the significant decrease in prevalence of mf in skin (52% in 1994 to 16% in 2003), transmission and morbidity remain. This is evidenced through the positive nodules and biopsies found in children under the age of five in some communities, and mf found in the anterior chamber of the eyes (2.9%) of others in the study.

Review of OEPA's status by the International Task Force for Disease Eradication in 2001 and at the Conference on Eradicability of Onchocerciasis in 2002 both led to the conclusion that OEPA has demonstrated the feasibility of eradicating onchocerciasis in the Americas ("proof of principle"). Through enhanced efforts and increased monitoring, the program intends to accelerate achievement of this endpoint.

IACO 2003: The thirteenth annual conference (IACO 2003) was held in Cartagena de Indias, Colombia, from November 18-20, 2003. The Colombian Ministry of Health and OEPA organized the meeting, with financial support from The Carter Center, Lions Clubs International Foundation, WHO/PAHO and Merck & Co. In addition to representatives from the six national programs and the sponsoring agencies, the meeting was attended by representatives from the Mectizan Donation Program, nongovernmental development organizations (NGDOs) involved in Mectizan® distribution in the endemic areas, CDC, and academic institutions.

IACO'03 celebrated the first achievement of 85% target coverage in all countries of the initiative. Venezuela in particular was congratulated on having reached 90% coverage, but the need was noted to provide continued support to that program in reaching remote communities in the southern focus bordering Brazil. The assembly recommended that cluster coverage surveys be conducted to verify reported treatment levels in several participating countries. All countries were asked to consider several enhanced efforts towards elimination, such as: a four treatment per year schedule, research seeking the elimination of the endosymbiotic bacteria *Wolbachia*, timely treatment during peak transmission seasons, and focal vector control. It was also recommended that Brazil and Venezuela work together to treat the shared focus which overlaps their borders. Continued political and financial commitment to programs nationally and internationally was noted. The OEPA initiative welcomed the Bill & Melinda Gates Foundation as new partners in the campaign.

RECOMMENDATIONS 2004 for OEPA:

On a case-by-case basis, OEPA should consider the potential for adding other interventions (e.g., increased frequency of mass drug administration (MDA), better timing of MDA, and focal vector control) to existing health education and twice-per-year treatments with Mectizan. Such additions might shorten the time required to interrupt transmission in each of the nine remaining endemic foci of onchocerciasis in the Americas. Assistance to Mexico in evaluating four times per year treatment should be offered.

OEPA and The Carter Center should continue to provide all possible assistance to Venezuela in order to help that country's onchocerciasis program to extend its coverage in the southern focus as quickly as possible.

OEPA should continue to develop data management processes so as to be able to evaluate treatment coverage in each endemic community, and the Likert scale should be used in next year's presentations. In addition, coverage surveys to validate reported coverage should be conducted in some countries, particularly Guatemala, Venezuela, and Mexico.

OEPA should work closely with the CDC field station MERTU in related operational research activities in Guatemala, in close coordination with the Ministry of Health. This includes work on evaluating 1) the impact of short course antibiotic therapy targeted at *Wolbachia* symbionts on survival of *O. volvulus* in humans, 2) the validity of WHO ocular indicators for morbidity associated with onchocerciasis, and 3) removal of hypoendemic areas from the mass treatment program, when appropriate.

OEPA should use SIMONa to model transmission dynamics in other areas besides Ecuador. It is important to determine the importance of low-level infection in vector to transmission and to predict parasite elimination.

All programs should seek to involve local Lions Clubs in their activities as much as possible.

All programs should advocate as strongly as possible for support of national programs by government authorities at all levels.

OEPA should seize every opportunity to document the impact of current interventions against onchocerciasis (health education and semi-annual mass administration of Mectizan) on transmission of onchocerciasis and on clinical manifestations of the disease. Anecdotes illustrating the popularity or benefits of the Program should be reported to GRBP headquarters.

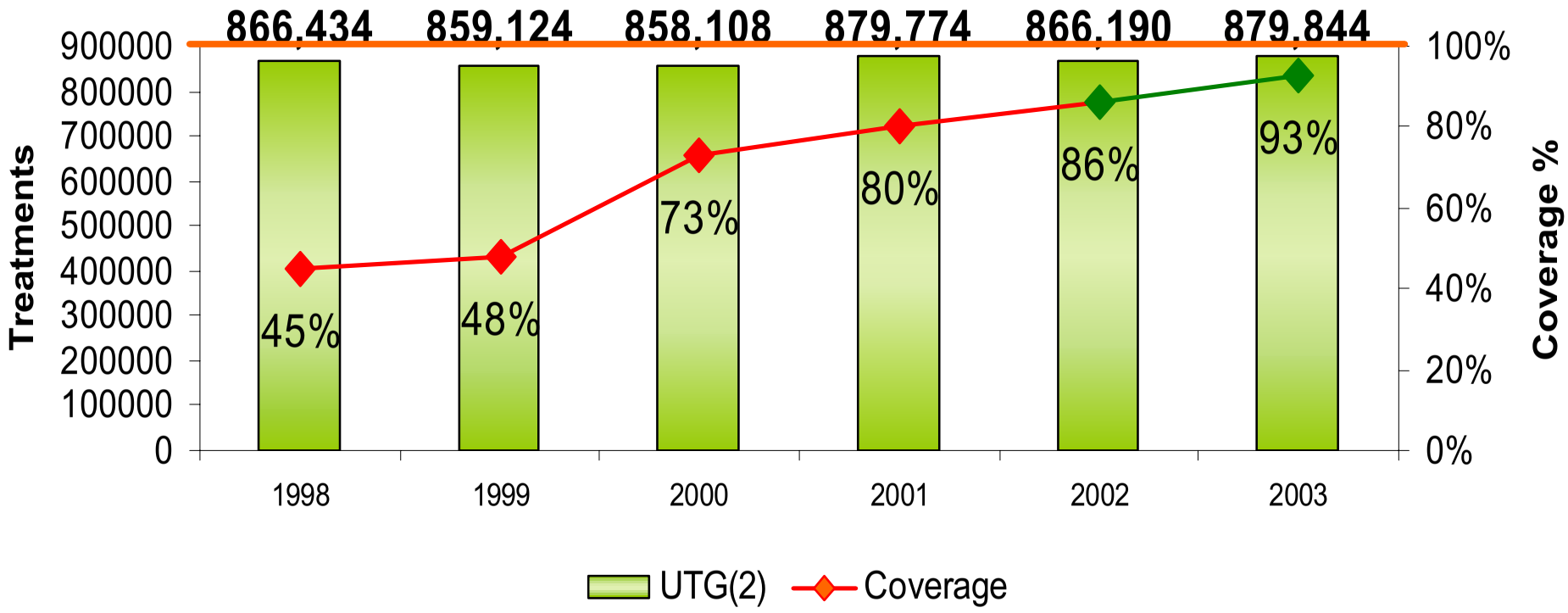
OEPA should determine the importance of treating in hypo-endemic communities. The Program should also determine the accuracy of punctate keratitis as an indicator of ocular morbidity and test the ELISA with Ov16 antigen.

Map 2

Stratification of onchocerciasis foci in the Americas

Figure 7

Regional evolution of treatment coverage in the Americas, in relation to the UTG(2),* 1998-2003



* Ultimate Treatment Goal multiplied by two, each year.

Figure 8

4 times/year treatment exercises in Chiapas, Mexico, 2003

Endemicity	UTG(4)	Population treated	Coverage
Hyper	10,136	8,895	88
Meso	9,704	8,229	85
Total	19,840	17,124	86

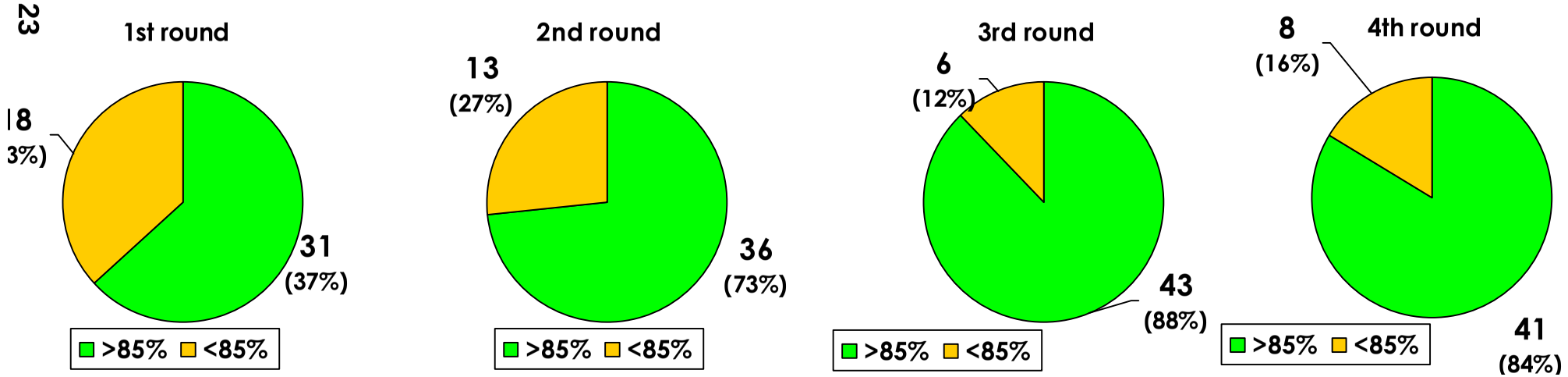
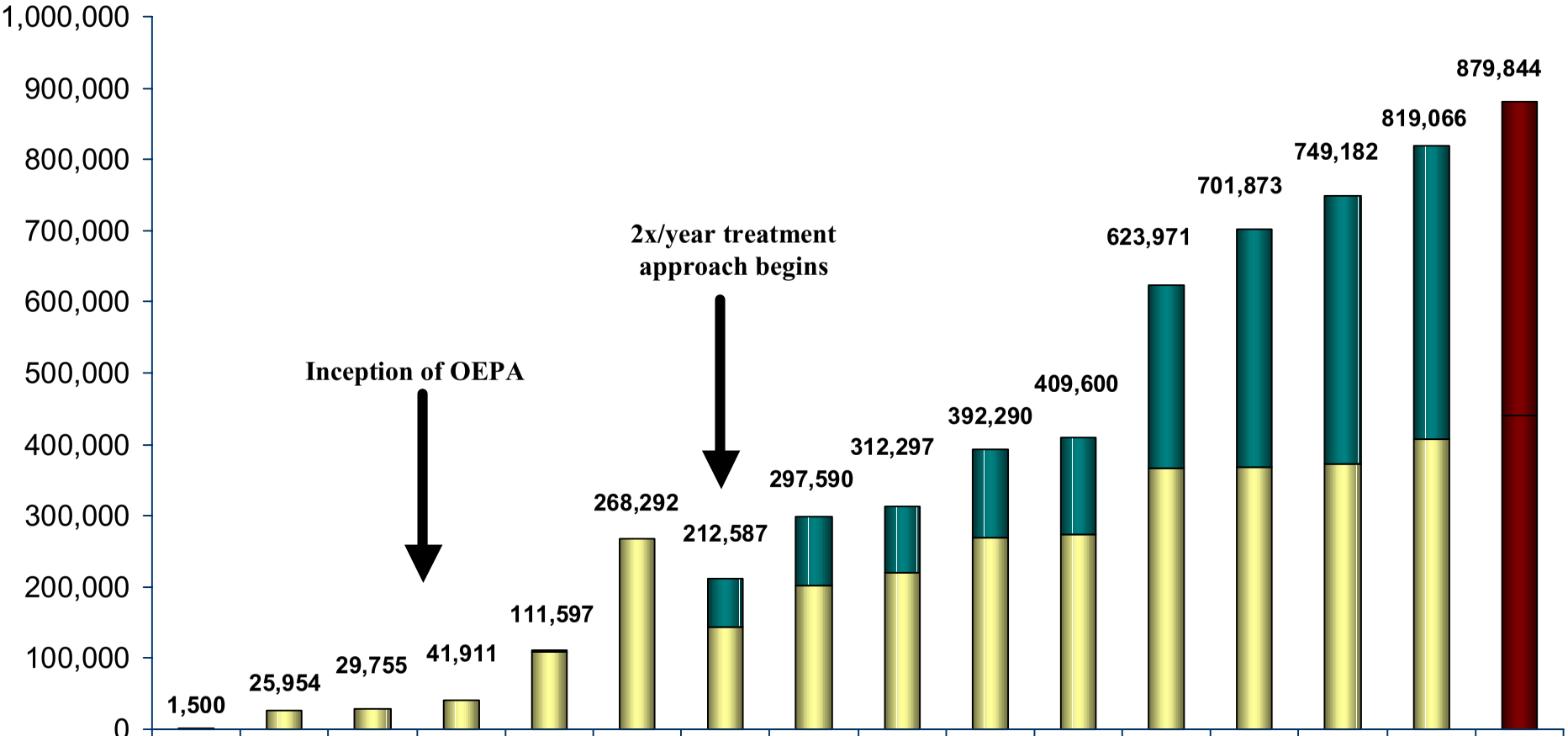


Figure 9

Number of Treatments With Mectizan® in the Americas, 1989-2003, and Ultimate Treatment Goal



	89	90	91	92	93	94	95	96	97	98	99	2000	2001	2002	2003	UTG(2)
2nd Round	0	0	774	1,478	1,526	694	69,130	95,417	92,395	121,872	136,944	258,376	332,780	376,581	412,280	439,922
1st Round	1,500	25,954	28,981	40,433	110,071	267,598	143,457	202,173	219,902	270,418	272,656	365,595	369,093	372,601	406,786	439,922

Figure 10

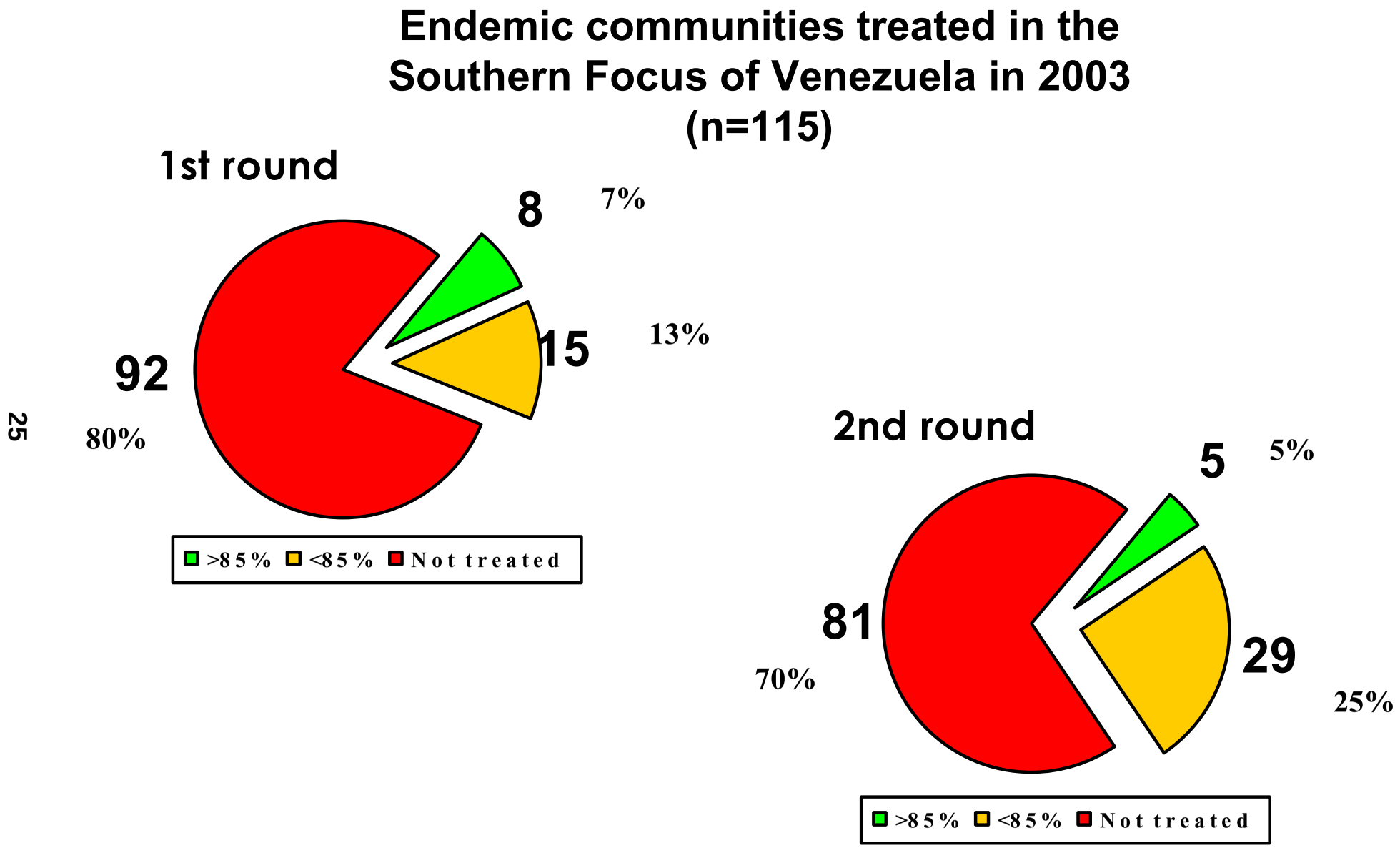

Endemic communities treated in the Southern Focus of Venezuela in 2003 (n=115)
1st round
8
7%
15
13%
92
80%
>85%
<85%
Not treated
2nd round
5
5%
81
70%
29
25%
>85%
<85%
Not treated

Table 4: OEPA: Endemic communities by level of endemicity, 2003

Country	% of endemicity			Total	% by country
	Hyper	Meso	Hypo		
	(=60)	(>20 <60)	(=20)		
Brazil	5	7	5	17	**1%**
Colombia	0	1	0	1	**0%**
Ecuador	42	23	54	119	**6%**
Guatemala	42	15	461	518	**27%**
Mexico	39	220	411	670	**34%**
Venezuela	104	216	305	625	**32%**
TOTAL	**232**	**482**	**1236**	**1950**	**100%**
% of endemicity	**12%**	**25%**	**63%**	**100%**	

Table 5: Treatments in the Americas by country, 2000 - 2003

OEPA 2003

			first round		second round		Total Treatments	
			TX(earp)	(earp)	TX(earp)	(earp)	TX(earp)	(earp)
Countries	**UTG**	**UTG(2)**	**Cum**	**% UTG**	**Cum**	**% UTG**	**Cum**	**% UTG(2)**
Brazil	6,436	12,872	6,304	98%	6,184	96%	12,488	97%
Colombia	1,163	2,326	1,156	99%	1,168	100%	2,324	100%
Ecuador	20,029	40,058	19,044	95%	19,418	97%	38,462	96%
Guatemala	160,418	320,836	154,185	96%	154,069	96%	308,254	96%
Mexico	155,570	311,140	140,185	90%	143,208	92%	283,393	91%
Venezuela	96,306	192,612	85,912	89%	88,233	92%	174,145	90%
Total	**439,922**	**879,844**	**406,786**	**92%**	**412,280**	**94%**	**819,066**	**93%**

OEPA 2002

			first round		second round		Total Treatments	
			TX(earp)	(earp)	TX(earp)	(earp)	TX(earp)	(earp)
Countries	**UTG**	**UTG(2)**	**Cum**	**% UTG**	**Cum**	**% UTG**	**Cum**	**% UTG(2)**
Brazil	6,420	12,840	6,073	95%	6,150	96%	12,223	95%
Colombia	1,163	2,326	1,124	97%	1,140	98%	2,264	97%
Ecuador	20,121	40,242	18,655	93%	19,048	95%	37,703	94%
Guatemala	159,303	318,606	145,299	91%	150,640	95%	295,939	93%
Mexico	158,617	317,234	140,529	89%	146,597	92%	287,126	91%
Venezuela	87,471	174,942	60,921	70%	53,006	61%	113,927	65%
Total	**433,095**	**866,190**	**372,601**	**86%**	**376,581**	**87%**	**749,182**	**86%**

OEPA 2001

			first round		second round		Total Treatments	
			TX(earp)	(earp)	TX(earp)	(earp)	TX(earp)	(earp)
Countries	**UTG**	**UTG(2)**	**Cum**	**% UTG**	**Cum**	**% UTG**	**Cum**	**% UTG(2)**
Brazil	6,382	12,764	5,595	88%	5,893	92%	11,488	90%
Colombia	1,101	2,202	1,091	99%	1,101	100%	2,192	100%
Ecuador	19,788	39,576	17,494	88%	18,492	93%	35,986	91%
Guatemala	160,000	320,000	132,526	83%	132,091	83%	264,617	83%
Mexico	168,124	336,248	154,914	92%	142,588	85%	297,502	88%
Venezuela	84,492	168,984	57,473	68%	32,615	39%	90,088	53%
Total	**439,887**	**879,774**	**369,093**	**84%**	**332,780**	**76%**	**701,873**	**80%**

OEPA 2000

OEPA	**ATO(earp)**	**TX(earp) Cum 2000**	**Tx (earp) % ATO**	**ATO(arv)**	**TX(arv) Cum 2000**	**TX (arv) % ATO**	**ATO(hrv)**	**TX(hrv) Cum**	**(hrv) % ATO**
Brazil	6,781	5,103	75%	19	15	79%	5	4	80%
Colombia	1,101	1,070	97%	1	1	100%	0	0	0%
Ecuador	18,629	16,490	89%	119	106	89%	42	42	100%
Guatemala	138,949	127,978	92%	497	501	101%	40	38	95%
Mexico	158,824	157,291	99%	689	689	100%	39	39	100%
Venezuela	86,760	59,687	69%	618	454	73%	79	39	49%
Total	**411,044**	**367,619**	**89%**	**1,943**	**1,766**	**91%**	**205**	**162**	**79%**

Table 6: OEPA: Communities Treated in the First and Second Rounds, 2003

First Round

Country	Endemic communities	Communities treated				Communities not treated	%
		>85%	%	<85%	%		
Brazil	17	17	100	0	0	0	0
Colombia	1	1	100	0	0	0	0
Ecuador	119	110	92	9	8	0	0
Guatemala	518	410	79	85	16	23	4
Mexico	670	583	87	86	13	1	0
Venezuela	625	365	58	155	25	105	17
Region	1950	1486	76	335	17	129*	7

*31 communities reported as not inhabited: Guatemala has 23, Mexico 1 and Venezuela 7.

Second Round

Country	Endemic communities	Communities treated				Communities not treated	%
		>85%	%	<85%	%		
Brazil	17	17	100	0	0	0	0
Colombia	1	1	100	0	0	0	0
Ecuador	119	109	92	10	8	0	0
Guatemala	518	365	70	122	24	31*	6
Mexico	670	604	90	65	10	1**	0
Venezuela	625	422	68	110	18	93***	15
Region	1950	1518	78	307	16	125	6

*24 of these communities were reported as not inhabited.
** Community of two inhabitants.
***7 of these communities were reported as not inhabited.

NIGERIA

Nigeria is probably the most highly endemic country in the world for river blindness, having as much as 40% of the global disease burden. It is estimated that 27 million Nigerians need curative or preventative treatment with Mectizan for onchocerciasis (i.e. the Ultimate Treatment Goal [UTG] is 27 million). The National Onchocerciasis Control Program (NOCP) began in 1989 by treating approximately 49,566 persons with Mectizan, and has progressed to providing more than 18 million treatments in 2003 (68% of the estimated national UTG).

Background: The Carter Center's GRBP in Nigeria has offices in Benin City, Enugu, Jos, Lagos, and Owerri. Primary activities consist of: 1) directly assisting treatment activities in nine of the 32 onchocerciasis endemic states in Nigeria (Abia, Anambra, Delta, Ebonyi, Edo, Enugu, Imo, Nasarawa, and Plateau States) (Map 3); 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 Christoffel Blindenmission, Helen Keller Worldwide, International Eye Foundation, MITOSATH**,** SightSavers, and UNICEF; and 3) working to implement and evaluate the African Program for Onchocerciasis Control (APOC) strategy of Community-Directed Treatment with Ivermectin (CDTI) programs. The Lions Clubs International Foundation (LCIF) SightFirst Initiative is a major GRBP-partner in Nigeria. Lions Clubs District 404, with LCIF support, is actively involved in mobilization, health education, and treatment activities.

Treatments: In 2003, the GRBP-assisted areas of Nigeria provided health education and mass Mectizan treatments to 5,040,919 persons in nine states (Table 7). This represented 107% of the ATO for those areas, and roughly equaled treatments provided in 2002. Mass treatments were conducted in 7,846 hyper- or meso-endemic villages. Persons in hypo-endemic villages of the same states received 360,112 passive treatments with Mectizan during the year. Thus in 2003, the treatments assisted by GRBP represented approximately 28% of the 18 million total treatments distributed in Nigeria (Figure 11).

No Serious Adverse Events (SAEs) were reported as a result of Mectizan treatments in Nigeria in 2003. Close monitoring for adverse reactions continues in the southeastern states, because of the presence of *Loa loa* in that part of the country (all of those states are now entering their fifth and sixth years of mass treatment, so the risk of reaction is low). The Program also conducted mass mobilizations (health education) of the populations in all at-risk villages targeted during the year.

Mectizan: Nigeria's GRBP received 15,405,153 Mectizan tablets for 2003. It had about 300,000 tablets remaining at the end of 2003. The average number of tablets per person treated was 2.97.

Training/Health Education: The nine states conducted training or retraining for a total of 18,948 health workers involved in Mectizan distribution in 2003. This included 16,167

community-directed distributors (CDDs) at the village level, 2,632 Local Government Area (LGA)-level health staff, and 149 state level health workers. Attrition of CDDs was reduced dramatically in Plateau and Nasarawa States, to 5% in 2003. (Figures for 2000, 2001, and 2002 were 30%, 25%, and 26%, respectively). This reduction was attributed to the popularity of adding intervention against lymphatic filariasis (LF), which increases community respect for the CDD's position. Data were not available for the Southeast for 2003, although attrition rates there in 2001 and 2002 were 5% and 12%, respectively. Competition with other initiatives, such as polio eradication, that pay stipends to village level health workers, has contributed to CDD unwillingness to work on onchocerciasis or other programs without comparable compensation.

Evaluation of Sustainability: Since 2001, all of the onchocerciasis project areas being assisted by GRBP in Nigeria have converted to the CDTI strategy from their previous community-based approach. All the assisted communities are involved in planning and implementing the Program in their villages, and governmental primary health care workers supervise all of the CDDs.

A team from APOC conducted a fifth year evaluation of the projects in Plateau and Nasarawa States from February 17 to March 2, 2003. Similar evaluations took place in five of the southeastern states from June-September, 2003 (Figure 12, Annex 5). The team in Plateau and Nasarawa observed that those programs have achieved high coverage of populations at-risk in the target areas, but there was little or no government financial support for the programs. Plateau, Nasarawa, and Enugu States were deemed to be making moderate progress towards sustainability. The remaining four evaluated states were rated to be making satisfactory progress. As with all projects that have been evaluated, the front line healthcare facilities have received the lowest sustainability ratings.

Financial Contribution: The Carter Center and APOC contributed roughly equal amounts to the Nigeria program in 2003. APOC funding concluded in seven of the nine states in 2003. The Nigeria office has started an evaluation of financial data for the 3 projects that cover these states. In 2003, the government (all levels) contributed approximately 5% of total funds needed to run Carter Center-assisted projects (approximately US $136,000), while APOC contributed 58% (approximately US $1.6 million), and The Carter Center contributed the remainder. The Program will need to see a drastic increase in government contributions over the coming years to fill the gap in funding left by the conclusion of APOC projects (Figure 13).[2]

Approximately 29% of the 7,023 endemic villages receiving treatment in the southeastern states supported their CDDs, in amounts averaging the equivalent of US $4.94 each in 2003 (assuming 120 naira to US $ 1). In Plateau and Nasarawa States, 81% of the 885 endemic communities provided an average of US $6.59 to each of their CDDs in 2003. In all project areas, 60% of the 138 LGAs budgeted 5.5 million naira (US $45,833), but released only 3.2 million naira (US $27,041), for an average of $326

[2] These data are provisional based on preliminary information provided by program offices.

per budgeted LGA. State level performance in providing financial support was weaker than that of the LGAs and endemic communities: three of seven southeastern states budgeted a total of 10.5 million naira (US $87,482), but released only 193,000 naira (US $1,608). At the state level, Plateau budgeted one million naira ($11,719) and Nasarawa budgeted nothing, but neither state released funding for the year. National support is less than state level support. The Federal Ministry of Health (FMOH) provided no direct financial support for the River Blindness Program in any of the nine states in 2003.

Integration: The Program has successfully integrated with the existing health service delivery system. Most people who distribute Mectizan are also involved with other health programs, such as HIV and malaria. CDTI has been integrated into the overall health plan in Nigeria. The demonstration project in Plateau and Nasarawa States continues to show that LF and urinary schistosomiasis (SH) MDA efforts can be complementary to Mectizan distribution.

Gender: Gender distribution of CDDs in 2003 varied between Plateau and Nasarawa States (10% of CDDs female) and the seven states in the southeast (37% female).

Lymphatic filariasis/schistosomiasis initiative in Plateau & Nasarawa States: With financial support provided since 1998 from GlaxoSmithKline, the manufacturer of albendazole, GRBP Nigeria has worked with the FMOH of Nigeria and with the state governments of Plateau and Nasarawa States to provide annual combination Mectizan/albendazole mass treatment for LF and praziquantel treatment for SH in those two states. Health education is an integral part of both components of this initiative, which are implemented in conjunction with established onchocerciasis control activities. In 2001, The Carter Center received funding from the Bill & Melinda Gates Foundation for support of LF activities. Plateau and Nasarawa States are now "demonstration projects" intended to show "proof of concept" that LF transmission can be interrupted on a large scale in Africa. (See Background in Annex 6.)

Plateau and Nasarawa States were mapped for LF in 2000, and it was determined that mass treatment and health education for LF were required in all cities and villages in the 30 LGAs of the two states (estimated population: 4 million). By the end of 2001, nine of the 30 LGAs had been mapped for SH, in tedious village-by-village assessments using urine dipsticks to detect hematuria in samples of children ages 6-14. Another four LGAs were mapped in 2002. Results of these assessments are summarized in Maps 4 and 5.

A total of 3,112,889 persons in the two states received health education and mass treatment for LF in 2003, which was 86% of the ATO of 3.6 million treatments (Figure 14 and Table 8). Of those treatments, 946,410 were given in hyper- and meso-endemic onchocerciasis target areas, and the remaining 2,166,479 in LF-only areas (some of which are hypo-endemic for onchocerciasis). The ATO for the two states in 2004 is 3,496,852 million treatments. It should be noted that distribution began in urban areas in 2003, based on Carter Center-sponsored research (in collaboration with CDC) that showed transmission in these areas.

In 2002, LF treatments were expanded to the remaining 18 LGAs where Mectizan had not previously been distributed, for a total of 30 LGAs. In 2003, one of the thirty LGAs was inaccessible due to instability. Four other LGAs experienced unrest that complicated efforts.

In 2003, monitoring and evaluation of sentinel villages continued, carried out by both Carter Center staff and external consultants. The objective of this monitoring is to show the impact of LF interventions and confirm data accuracy. Hydrocelectomy surgeries continued as part of a pilot intervention effort by state Ministries of Health, along with follow-ups of previous surgeries.

During 2003, the Program distributed approximately 10,000 pieces of health education material (such as posters and brochures) and aired radio jingles in Hausa and English. Local artists performed songs about the Program, which were well received. In 2002, the Program developed and aired an educational television documentary on LF throughout the two states. In 2003, the Program increased the airing frequency, airing the documentary almost daily in October and November. The Program mobilized 2,511 villages for LF activities in 2003. It also trained 99 LF elimination teams and 4,625 community-based distributors (CBDs) in LF-only, non-APOC areas. In APOC areas, these activities were implemented in conjunction with onchocerciasis activities. In LF-only areas, 65% of the target villages supported their distributors. Villagers provided an average of US $4.90 (equivalent) per CBD during 2003.

A total of 196,568 persons in the two states received health education and mass praziquantel treatment for SH in 2003 (Figure 15 and Table 8), which was 97% of the ATO of 203,001. The SH ATO for 2004 is 169,060, contingent on the planned withdrawal of treatment in two LGAs that have received three years of treatment.

The progress of the highly popular SH component of the integrated program is limited mainly by the slow methods available for assessing SH prevalence and by the cost of praziquantel tablets. The Program is researching rapid assessment methods, and is already administering praziquantel by height, rather than by weight. The results of research by WHO to confirm the safety of simultaneous administration of the three treatments (Mectizan, albendazole, and praziquantel) are eagerly awaited.

During 2003, the Program distributed approximately 2,000 sets of health education materials, aired radio messages in Hausa and English, and continued to air an educational television documentary developed in 2002 as part of its efforts to educate the population about SH. The Program also mobilized 284 endemic villages and trained 458 community-directed and community-based distributors in endemic villages. Twenty-three percent (23%) of the 315 targeted communities provided a total of US $404 (equivalent) to help support their community distributors (average of US $4.40 per distributor).

Schistosomiasis Initiative in the Southeast: Delta State has recently received funding from ChevronTexaco Corporation that will allow the Program to assess SH

prevalence there, and begin treating in limited areas (Maps 6 and 7). The Program aims to assist 50,000 treatments in Delta in 2004.

RECOMMENDATIONS 2004 for GRBP NIGERIA

Onchocerciasis

Evaluate post-APOC sustainability scenario in Imo and Ebonyi States.

Explore ways to increase the number of community-directed distributors (CDDs) per village. More CDDs may imply less work and time spent per CDD, which in turn may imply reduction in demand for monetary incentives as a condition for treatment.

Consider utilizing Community Supervisors to offset the weakness of front line healthcare facilities.

Organize manageable annual surveys for monitoring coverage and factors responsible for achievement and sustainability of a desired coverage.

Continue to help the country integrate elements of LF and SH in the Southeast projects, using Plateau and Nasarawa as a model. Seek ways to map *Loa loa* and LF prevalence in the Southeast.

Determine if the large reduction in reported CDD attrition is accurate.

Continue work with other partners in the NGDO Coalition/Nigeria to develop and implement a consensus strategy to address the phasing out of APOC funding to mature project areas with long-term, sustainable importation, distribution, and reporting of Mectizan.

Report anecdotes illustrating the popularity or benefits of the Program to GRBP headquarters.

All programs should advocate as strongly as possible for support of national programs by government authorities at all levels.

Lymphatic Filariasis

Follow up on any hydrocele recurrence in patients who were part of the pilot hydrocelectomy intervention.

Distinguish between species of mosquitoes in future entomology studies.

Hone UTG for urban treatments. Seek ways to evaluate the impact of these interventions.

Consider withdrawal of MDA in Pankshin and Akwanga LGAs after 2004, as this is the fifth year of treatment.

Determine whether the distribution of bednets can be integrated into LF MDA.

Continue monitoring the impact of ivermectin and albendazole on LF transmission.

Continue efforts to mobilize more support at federal, state, and local government levels.

Seek to document other benefits of mass chemotherapy.

Urinary Schistosomiasis

Continue to treat children who are surveyed and found to be infected in areas where treatment is withdrawn.

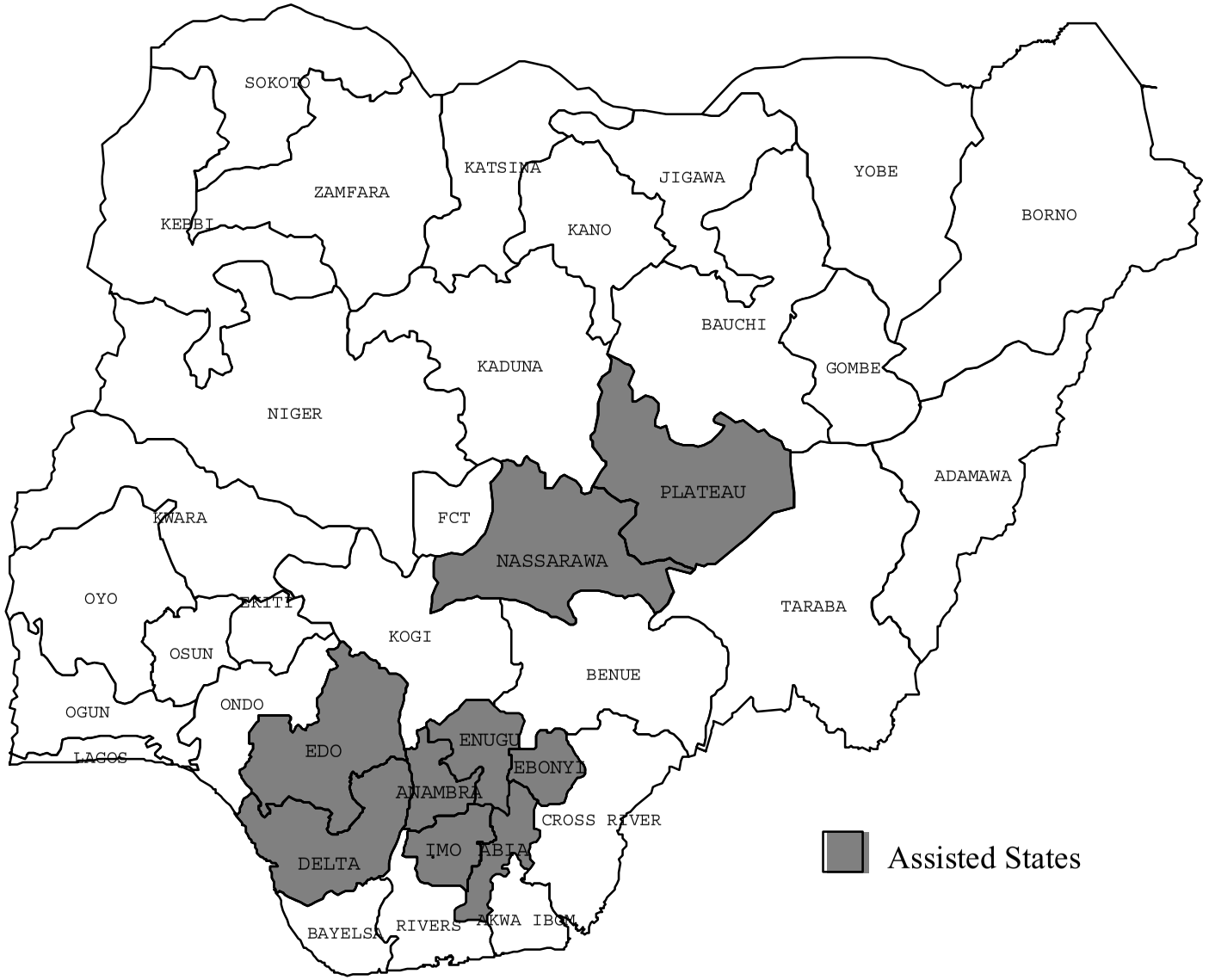
Pilot test mobilization and health education strategies in Pankshin and Akwanga LGAs by which endemic communities can successfully maintain suppression of schistosomiasis transmission after 2-4 years of mass chemotherapy, without continued mass treatments. Develop a protocol to monitor the areas where treatment is withdrawn, with the following elements of continued intervention: strengthened health education, dipstick testing, and possible parasitology.

Document the results of the ongoing study in Delta State that is assessing the impact of praziquantel on children's health status.

Continue to seek additional support, including in-kind support of praziquantel, for the Program.

Map 3

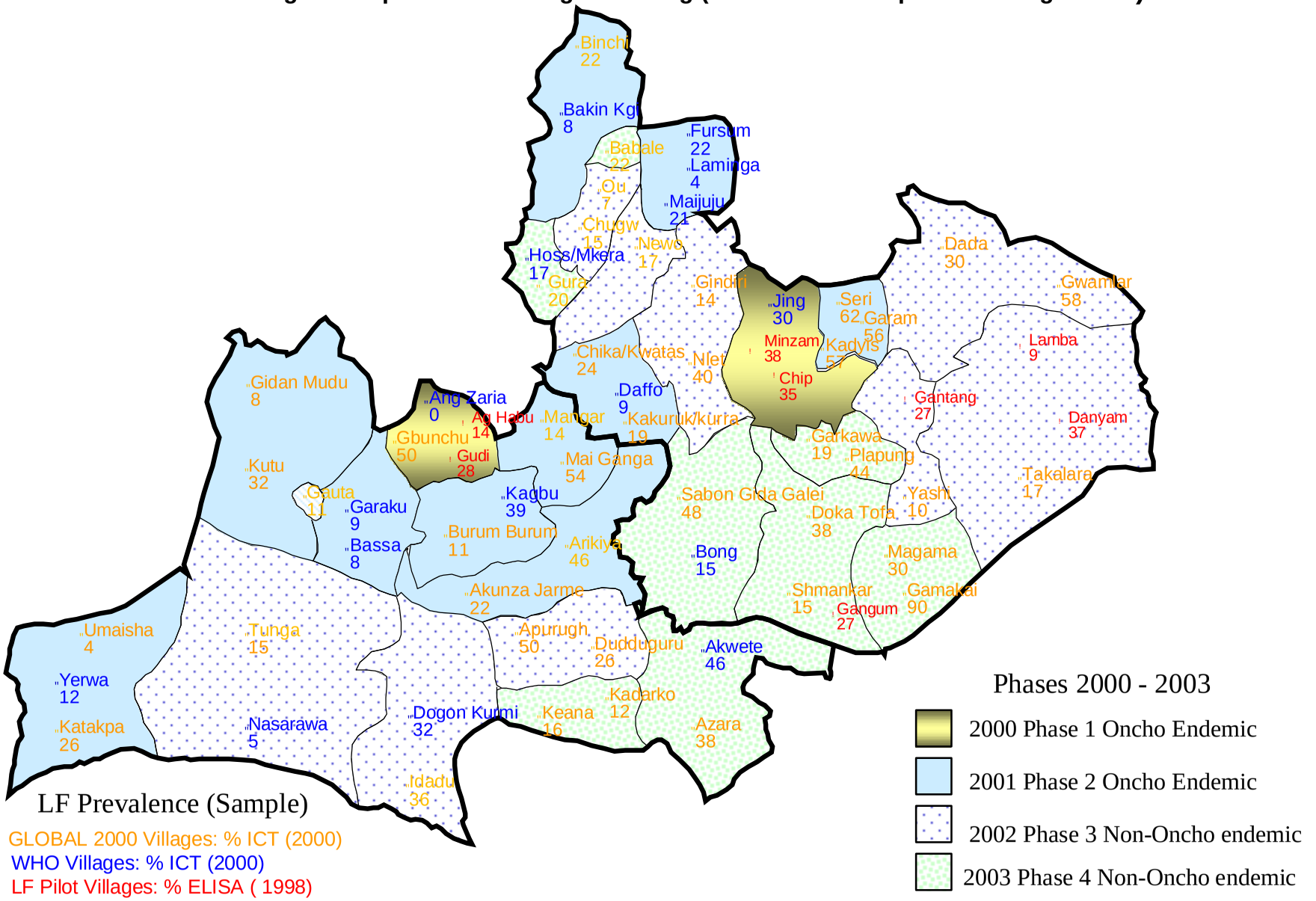
Nigeria
GRBP-assisted States



Map 4

Distribution of Lymphatic Filariasis (LF) in Plateau / Nasarawa States

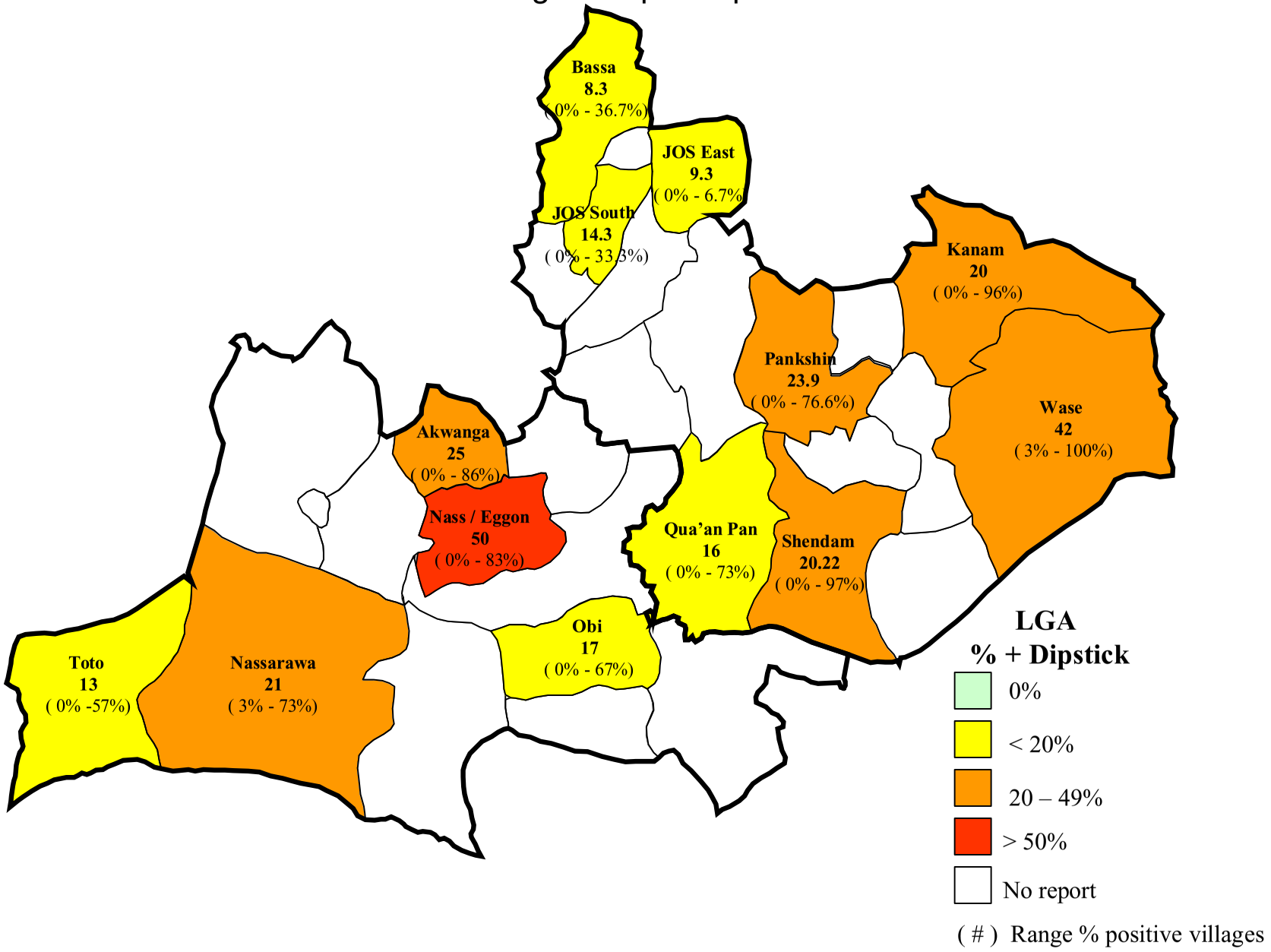
Results in Villages Sampled for LF Antigen Testing (Numbers are % positive Antigenemia)



Map 5

Rapid Assessment for Urinary Schistosomiasis in Plateau / Nasarawa States

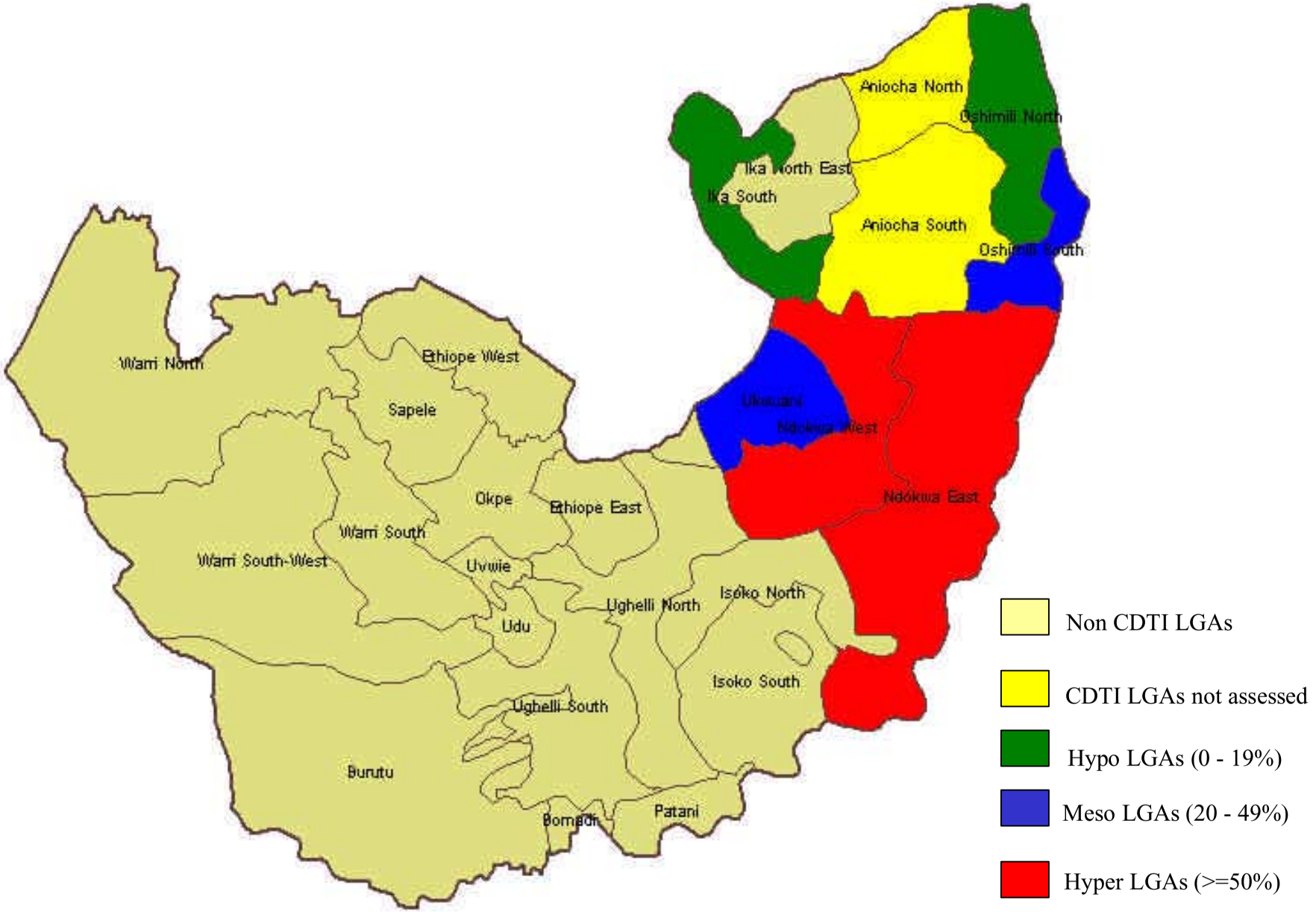
Average % dipstick positive



Map 6

Rapid Assessment for Urinary Schistosomiasis in Delta State

via questionnaire survey



Map 7

Rapid Assessment for Urinary Schistosomiasis in 2 LGAs (52 villages) in Delta State

Average % dipstick positive

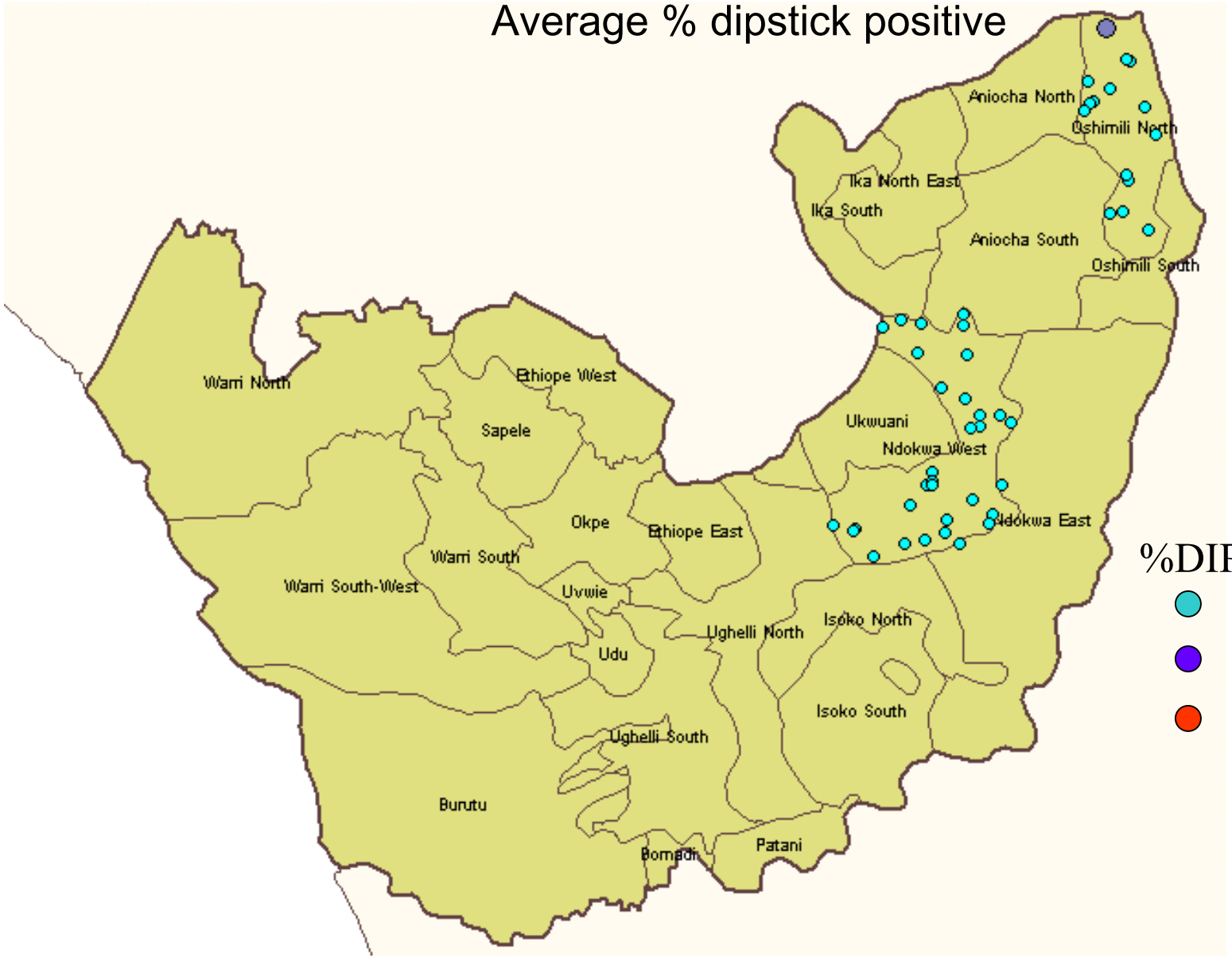
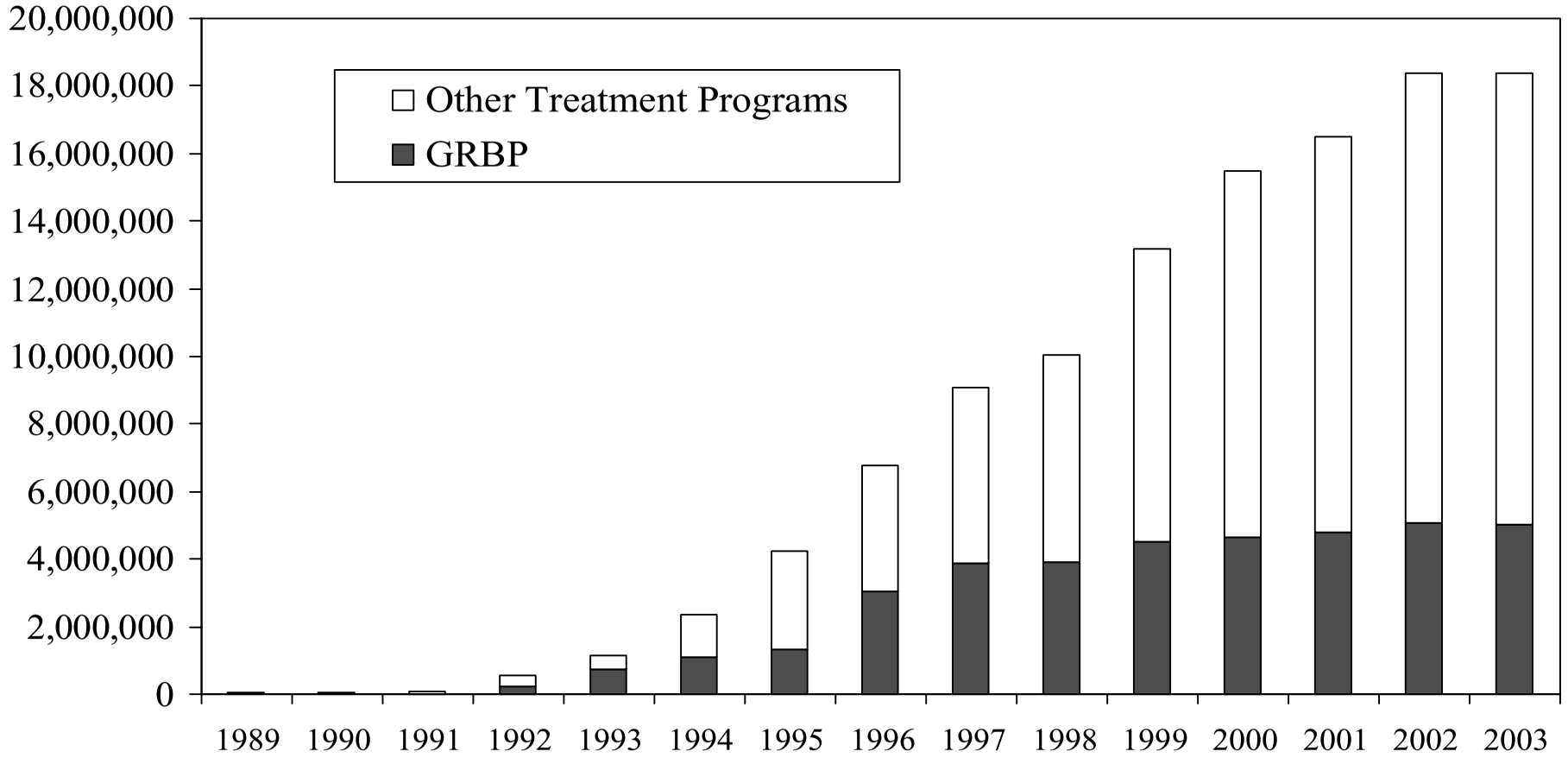


Figure 11

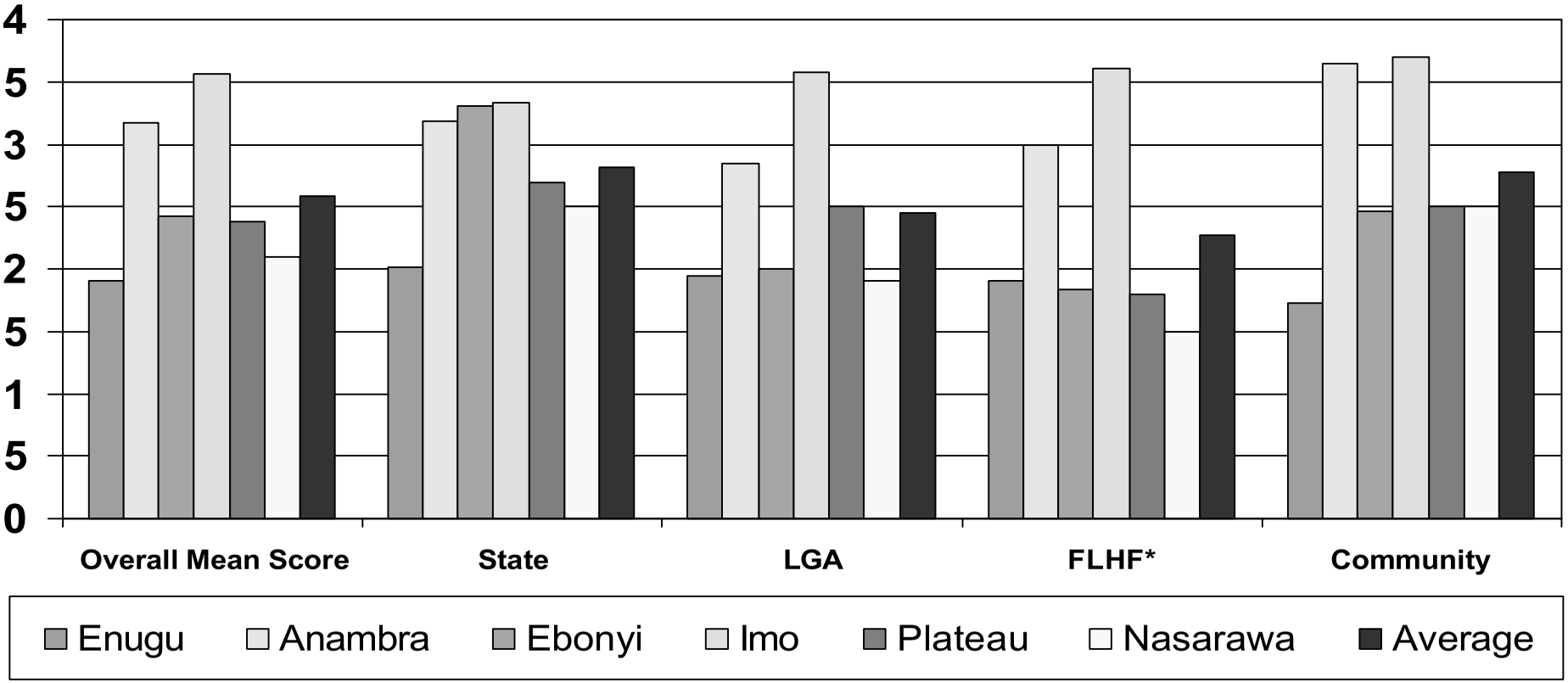
Global 2000 River Blindness Program (GRBP)-assisted treatments and total Mectizan treatments provided in Nigeria, 1989-2003



Treatments from 1992-1995 by RBF
Source of 1998 treatment figures: Nigeria NGDO meeting, April 20, 1999

Figure 12

Performance on APOC indicators of sustainability at four levels of CDTI implementation in seven GRBP-assisted states in Nigeria



*Front Line Healthcare Facilities

Figure 13

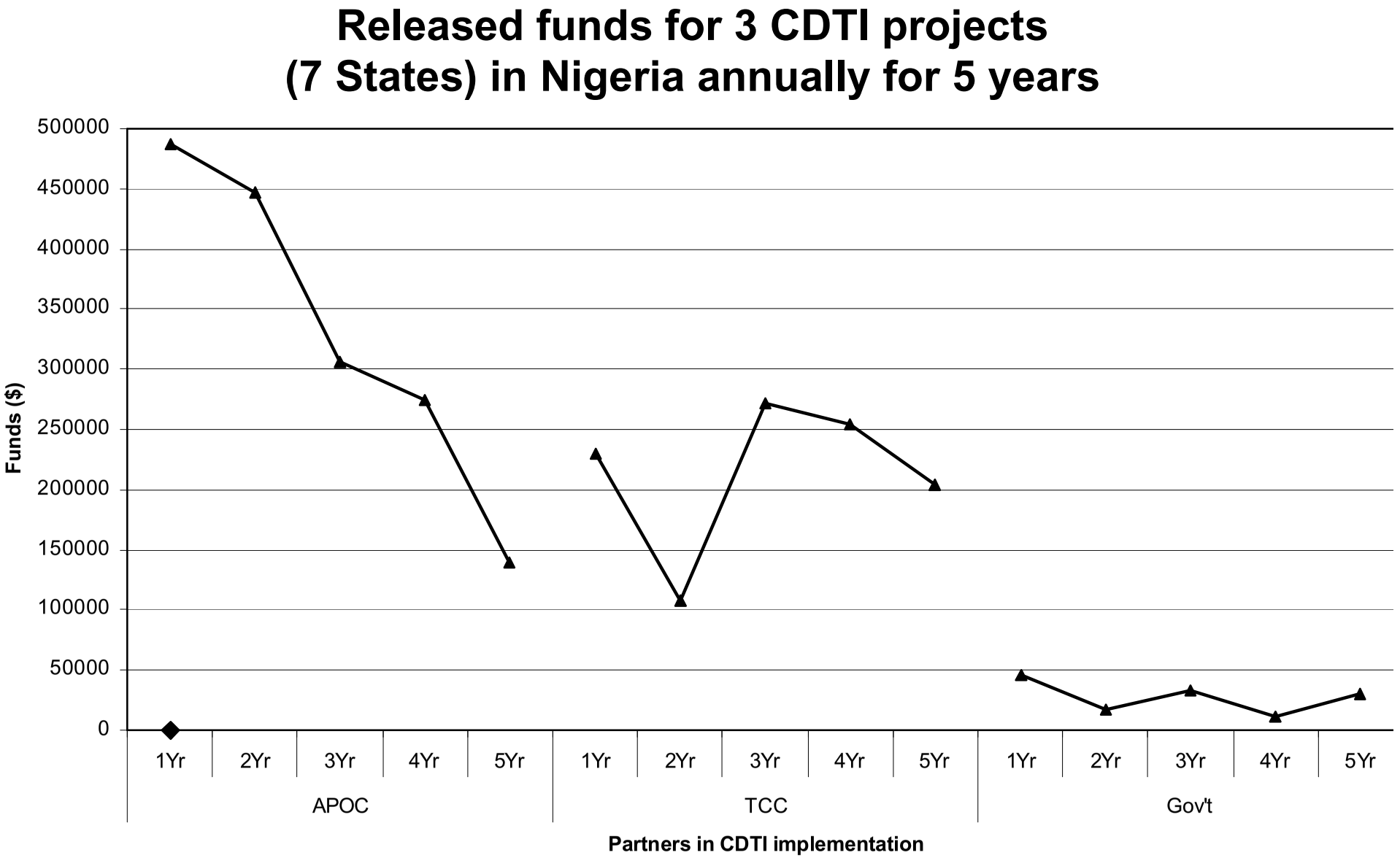

Released funds for 3 CDTI projects
(7 States) in Nigeria annually for 5 years
Funds ($)
500000
450000
400000
350000
300000
250000
200000
150000
100000
50000
0
1Yr
2Yr
3Yr
4Yr
5Yr
APOC
TCC
Gov't
Partners in CDTI implementation

Figure 14

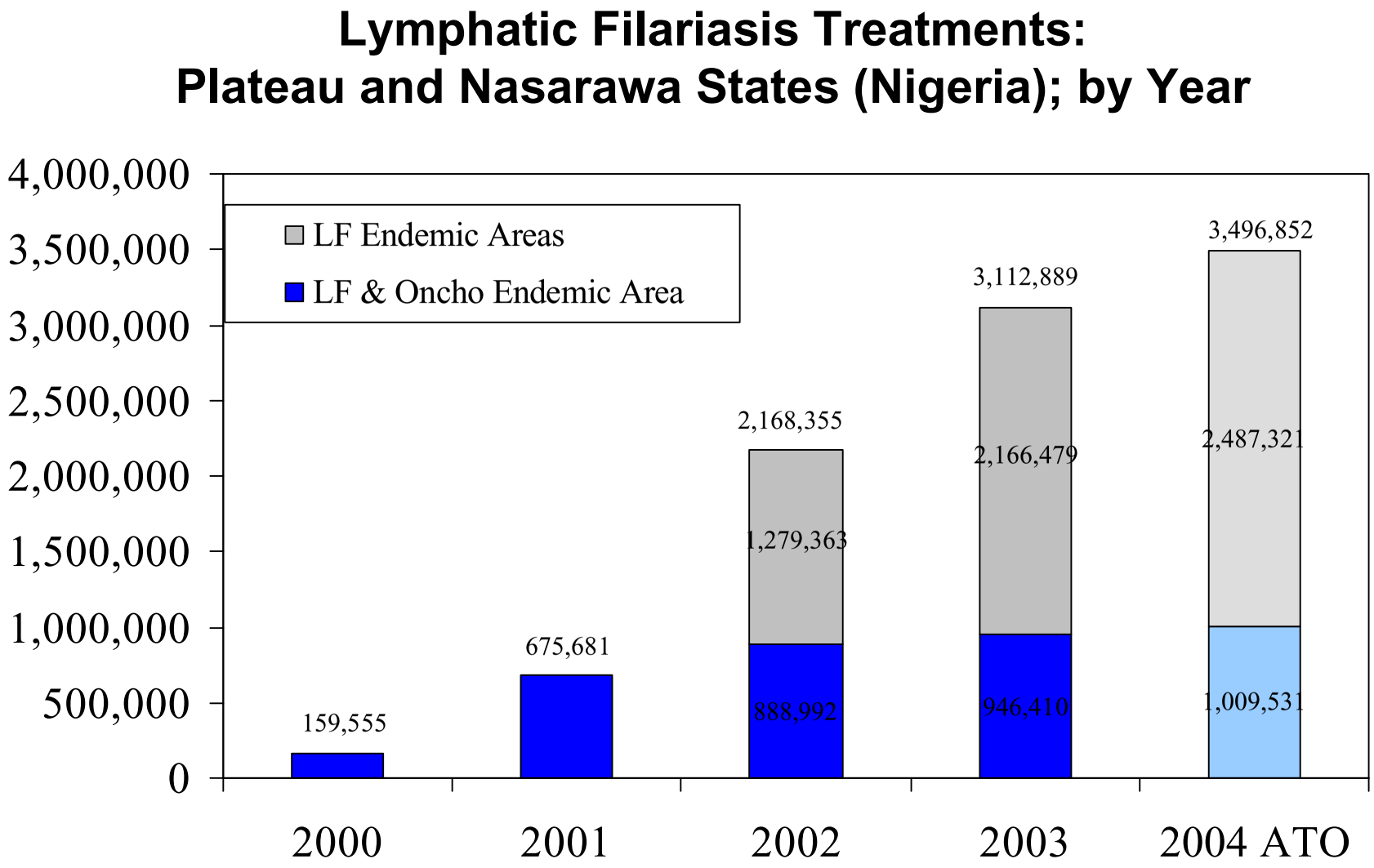
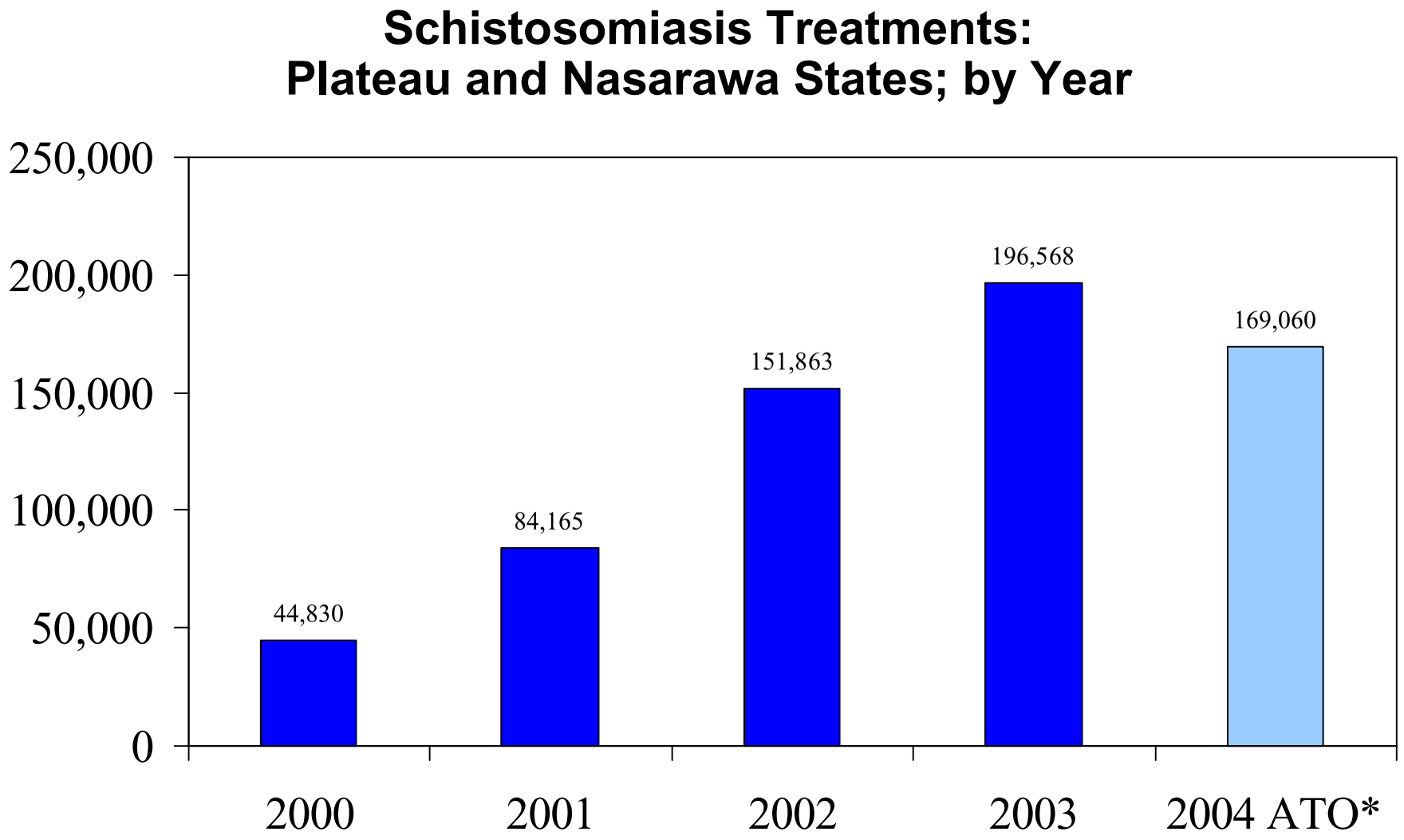

Lymphatic Filariasis Treatments:
Plateau and Nasarawa States (Nigeria); by Year
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
LF Endemic Areas
LF & Oncho Endemic Area
159,555
675,681
2,168,355
1,279,363
888,992
3,112,889
2,166,479
946,410
3,496,852
2,487,321
1,009,531
2000
2001
2002
2003
2004 ATO

Figure 15



* ATO decrease due to planned treatment withdrawal in Pankshin and Akwanga LGAs in 2004

Table 7: Nigeria: GRBP-Assisted Areas: 2003 Mass Treatments for Onchocerciasis

State	# Treatments 2003	ATO 2003	% ATO Achieved	# Villages Treated
Plateau	264,154	292,739	90.2%	282
Nasarawa	682,256	712,702	95.7%	561
Imo	743,293	639,732	116.2%	1,940
Abia	426,689	366,833	116.3%	684
Edo	636,875	497,230	128.1%	501
Delta	479,622	410,107	117.0%	470
Enugu	718,911	730,150	98.5%	1,373
Anambra	603,756	591,352	102.1%	1,062
Ebonyi	485,363	441,992	109.8%	973
Total	**5,040,919**	**4,682,837**	**107.6%**	**7,846**

Table 8: 2003 Lymphatic Filariasis, Onchocerciasis and Schistosomiasis treatments: Plateau and Nasarawa States, Nigeria

2003 Tx Category		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	% ATO
Lymph. Filariasis*	***ATO(earp)=**	**3,602,834**		**ATO(arv)=**	**3,835**										
TX(earp)		0	0	264,136	455,809	818,078	289,500	100,080	76,184	307,890	319,780	166,872	314,560	3,112,889	86.4%
Tx(arv)		0	0	409	636	858	560	93	139	201	143	55	376	3,470	90.5%
Onchocerciasis	***ATO(earp)=**	**911,513**		**ATO(arv)=**	**885**										
TX(earp)		0	0	112	88,979	511,508	60,885	63,872	33,818	89,915	47,288	30,384	19,649	946,410	103.8%
TX(villages)		0	0	0	63	474	80	50	57	33	5	35	51	848	95.8%
Schistosomiasis	***ATO(earp)=**	**203,001**		**ATO(>50%)=**	**84**	**ATO(>20<50)=**		**220**							
TX(earp)		0	0	0	3,361	0	5,169	252	187	16,525	115,005	41,958	14,111	196,568	96.8%
Villages (>50%)		0	0	0	1	0	9	0	1	10	33	21	4	79	94.0%
Villages (20-49%)		0	0	0	6	0	0	1	0	25	123	44	8	207	94.1%

*includes some LF + onchocerciasis endemic areas

UGANDA

Background: Onchocerciasis affects approximately 1.8 million persons residing in 18 (out of 39) districts in Uganda (Map 8). Currently, GRBP-assisted programs are active in 11 endemic districts: Kabale, Kanungu[3], Kasese, and Kisoro in the Southwest focus bordering the Democratic Republic of Congo (DRC); Adjumani, Moyo, and Nebbi in the West Nile focus bordering Sudan and DRC); Apac and Gulu in the Middle North focus; and Mbale (now including Sironko District) in the Mount Elgon focus in the east, bordering Kenya (Map 9, which does not show the new districts of Kanungu and Sironko). GRBP-assisted districts in Uganda operate at full coverage. Local Lions Clubs have assisted this Program since 2000.

Treatments: GRBP/Uganda helped to treat 990,194 persons in 2003, or 99.1% of its Ultimate Treatment Goal (UTG) of 999,275 persons (Figure 16 and Table 9). This was the seventh straight year of more than 85% coverage of the UTG in GRBP-assisted areas, and the sixth successive year of coverage exceeding 90% of the UTG (Figure 17). All 11 districts achieved coverage of >90% of their respective UTG, and all high-risk villages were treated during the year. In 2003, GRBP-assisted areas provided 72.3% of all treatments in Uganda, including 58,362 passive treatments by GRBP-assisted districts, mainly from Kitgum and Nebbi. The UTG for 2004 (GRBP-assisted) is 1,024,258.

Training/Health Education: Uganda trained 31,812 Community-Directed Health Workers (CDHWs) and 4,460 Community-Directed Health Supervisors (CDHSs) in 2003. Of these, 52% of the CDHWs and 49% of the CDHSs were female.

Sustainability: The "community-directed intervention approach" has been adopted as national health policy in Uganda. It already has been introduced with measurable positive results for malaria control, with significant reduction of infant mortality, and other programs. Hence, government support for onchocerciasis control activities within the primary healthcare system is strong, although financial support has not been regular or to the expected amounts. Involvement and active participation of members of the affected communities has increased over the years. Program strategies include the following: 1) training as many inhabitants of endemic villages as possible; 2) encouraging involvement of women and men; 3) grouping community health workers and those that they serve in their own kinship clans; and 4) letting community members choose their own health volunteers and the location of treatment centers. Some districts, sub-districts, and sub-counties are providing financial support for the Program. The average cost-per-person treated in 2002 was US $0.11 per person.

Kisoro District completed its fifth year of APOC support in 2001, and the results of its 2002 APOC sustainability evaluation are shown in Figure 18. For an explanation of the evaluation scale, please see Annex 5. The other districts that completed their fifth year of support in 2003 are Kabale, Kasese, Mbale, and Sironko. All but Kasese were

[3] Rukungiri district was divided into two districts: Kanungu and Rukungiri. All onchocerciasis endemic communities are located in Kanungu.

evaluated in 2003, but data were not yet available for these evaluations. Funding from APOC has been budgeted to continue for three more years in these districts. The GRBP/Uganda secretariat is encouraged to monitor the ability of Kisoro district to manage the Program and maintain good coverage of the population for 2 years without APOC support .

Financial contribution:
APOC and the Lions-Carter Center SightFirst Initiative supported the Program. The districts, health sub-districts, and sub-counties have pledged and contributed some funds for CDTI activities, but the amounts pledged and released may not sustain some CDTI activities such as training, provision of IEC materials, and provision and maintenance of transportation facilities. Phase 2 districts (Kabale, Mbale, and Sironko) completed their fifth year of APOC support, joining phase one districts of Kasese and Kisoro. The Program has provided financial figures for the Kasese and Kisoro project, shown in Figure 19. Total funds released by The Carter Center, APOC, and the local governments were approximately $85,000 over the five-year period. However, the governments only contributed about 3.5% of this figure (approximately US $3,000), while APOC contributed about 82% (approximately US $70,000). The Carter Center still supports ivermectin distribution activities, but will not fill the gap left by APOC.[4]

Integration: Approximately 67% of the CDHWs and 71.1% of CDHSs for this program are involved in other health programs, such as water sanitation and immunization campaigns. Many of them are involved in more than one other type of intervention. The level of CDHW/CDHS involvement in other health efforts continues to rise.

Gender: Uganda has a history of involvement of women in its program. This year, 52% of the CDHWs and 49% of the CDHSs were female. In 2002, these numbers were 49% and 38%, respectively.

[4] These data are provisional based on preliminary information provided by program offices.

RECOMMENDATIONS 2004 for GRBP UGANDA

The Program should monitor the implementation of health education and mass drug administration in Kisoro and Mbale districts as APOC and GRBP funding are phased out. In addition, the Program should evaluate a larger district.

The Program is urged to continue to publish accounts periodically of its experiences in establishing sustainable program operations.

The Program should continue to seek opportunities for adding integrated compatible interventions against other diseases in its operations.

The Program is urged to seize every opportunity to document the impact of current interventions against onchocerciasis (health education and annual mass administration of Mectizan) on transmission of onchocerciasis and on clinical manifestations of the disease.

The program should advocate as strongly as possible for support of national programs by government authorities at all levels.

Map 8

Uganda
REMO Map 1996

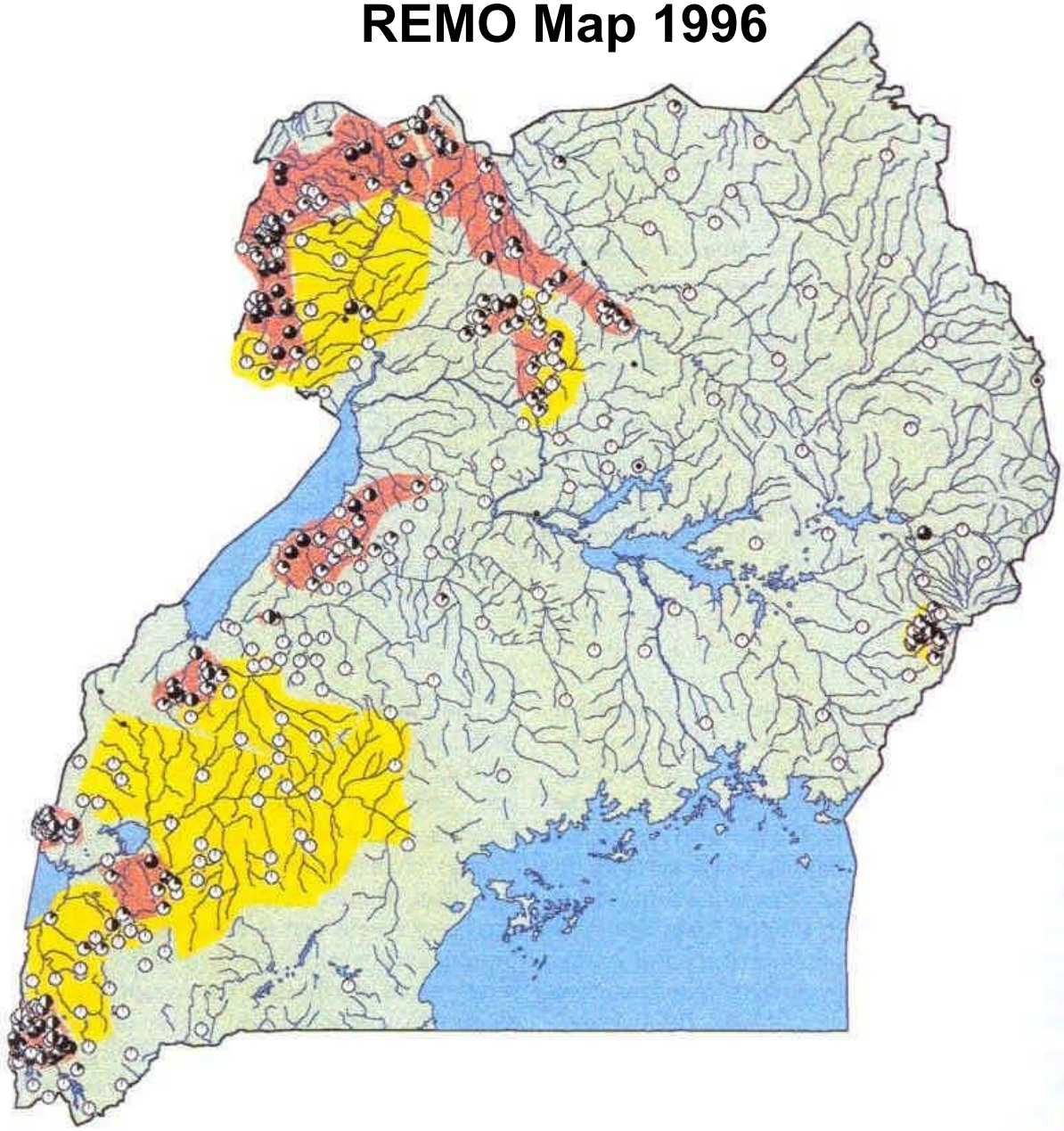
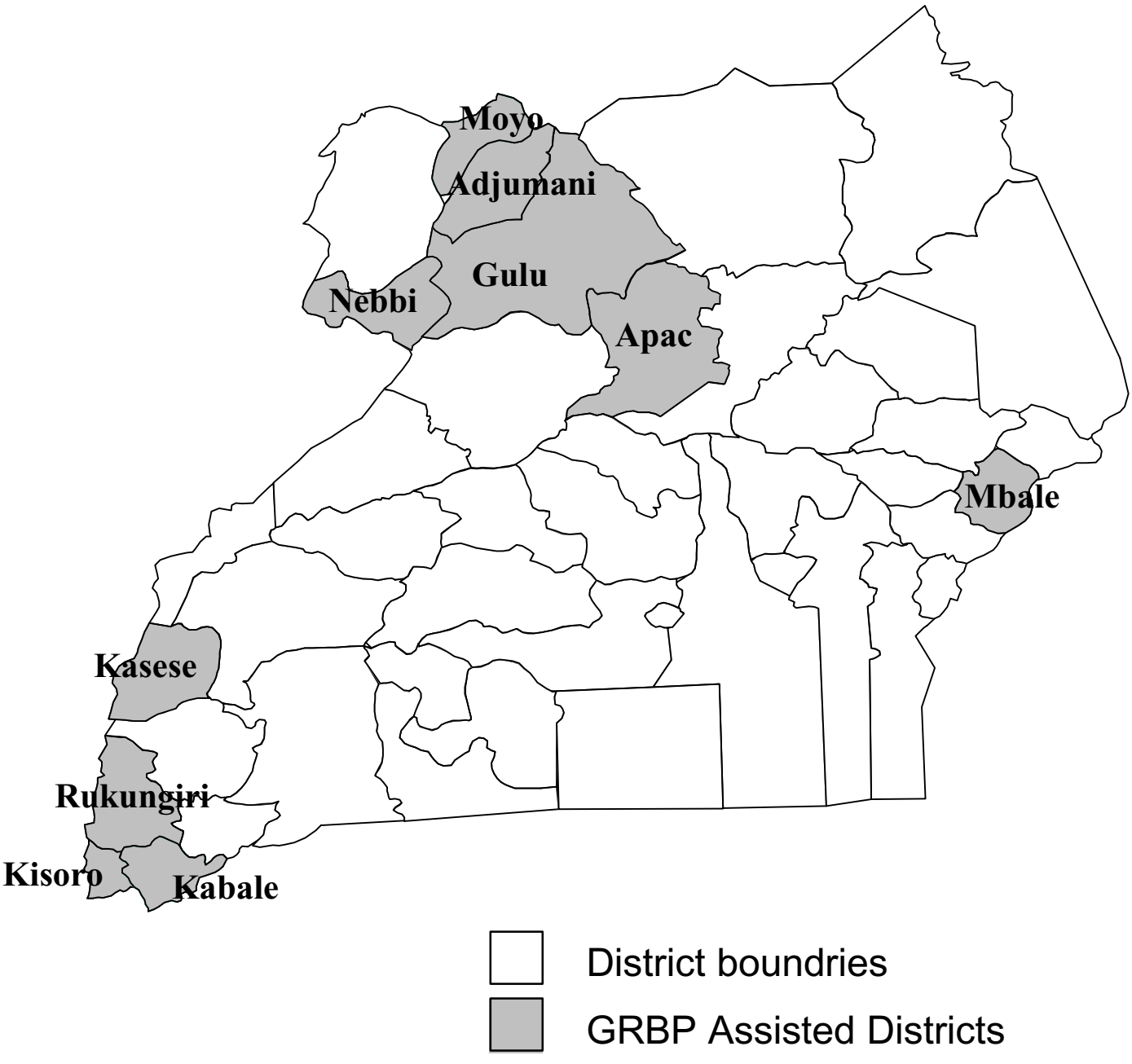


Fig. Endemicity of onchocerciasis in Uganda, as revealed by rapid epidemiological mapping. Nodule prevalences are shown as pie-charts: ○, <1%; ◔, 1%–9%; ◔, 10%–19%; ◑, 20%–39%; and ◕, >40%. Areas clearly requiring treatment (red) and areas requiring further assessment (yellow) are also indicated.

Map 9

Uganda
GRBP - Assisted Districts

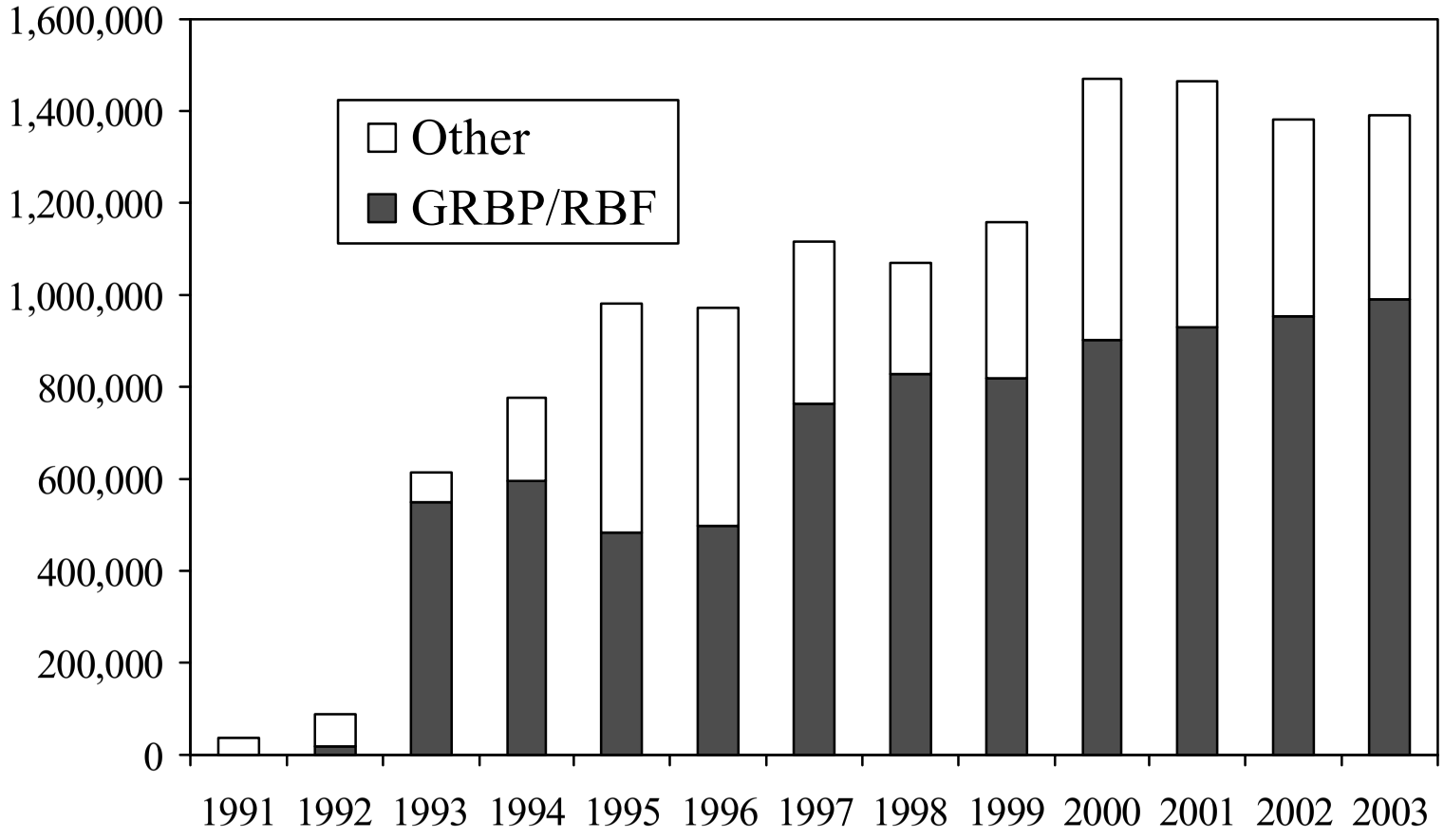
(Map does not show districts of Kanungu and Sironko*)



* see text

Figure 16

Uganda: GRBP-assisted Mectizan Treatments as Part of the Total Treatments Provided, 1991-2003



Treatments in 1992-1995 assisted by River Blindness Foundation (RBF)

Figure 17

Uganda: Percent of overall mean UTG covered annually from 1997 to 2003

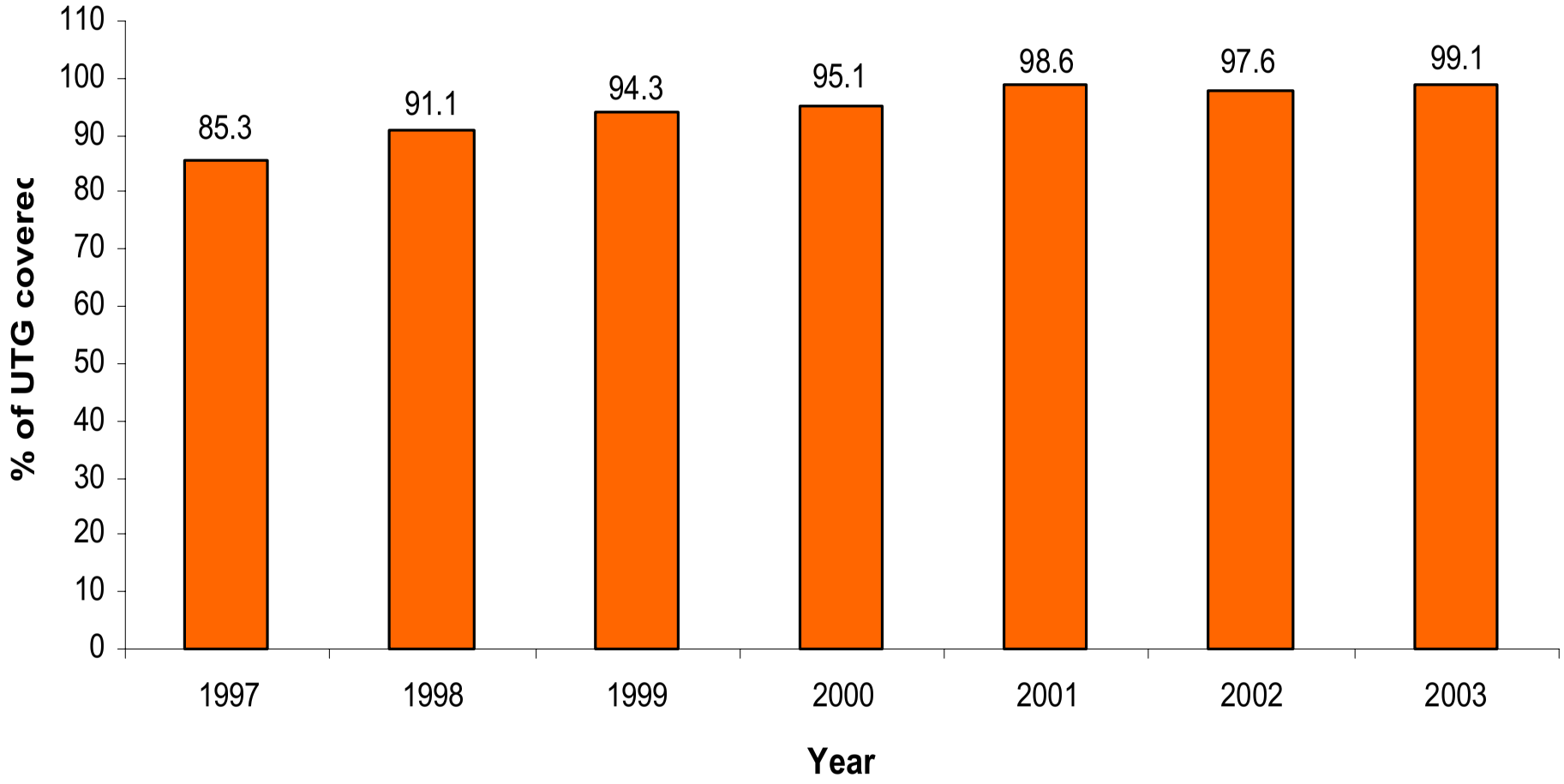


Figure 18

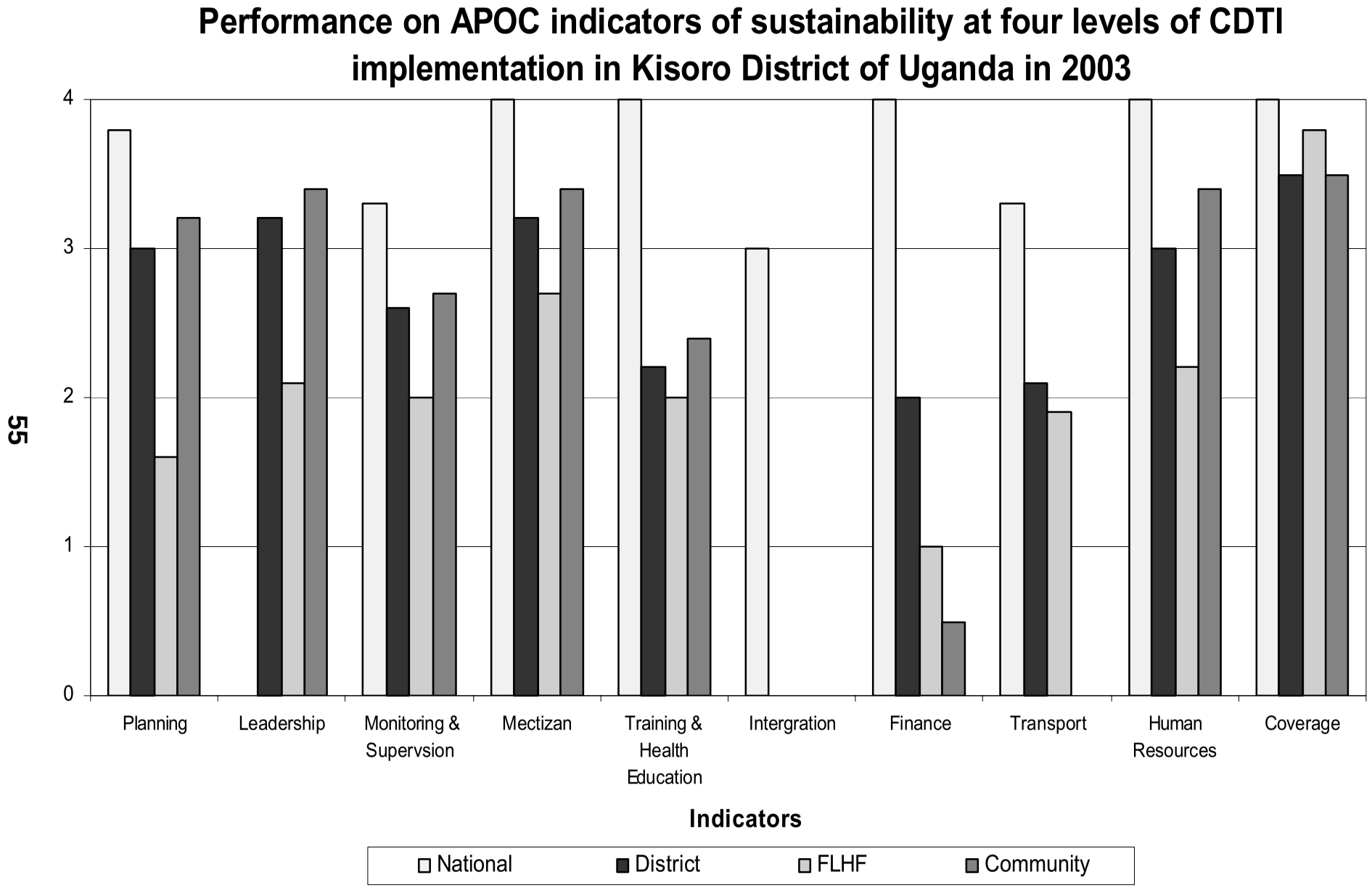

Performance on APOC indicators of sustainability at four levels of CDTI implementation in Kisoro District of Uganda in 2003
4
3
2
1
0
Planning
Leadership
Monitoring & Supervsion
Mectizan
Training & Health Education
Intergration
Finance
Transport
Human Resources
Coverage
Indicators
National
District
FLHF
Community

Figure 19

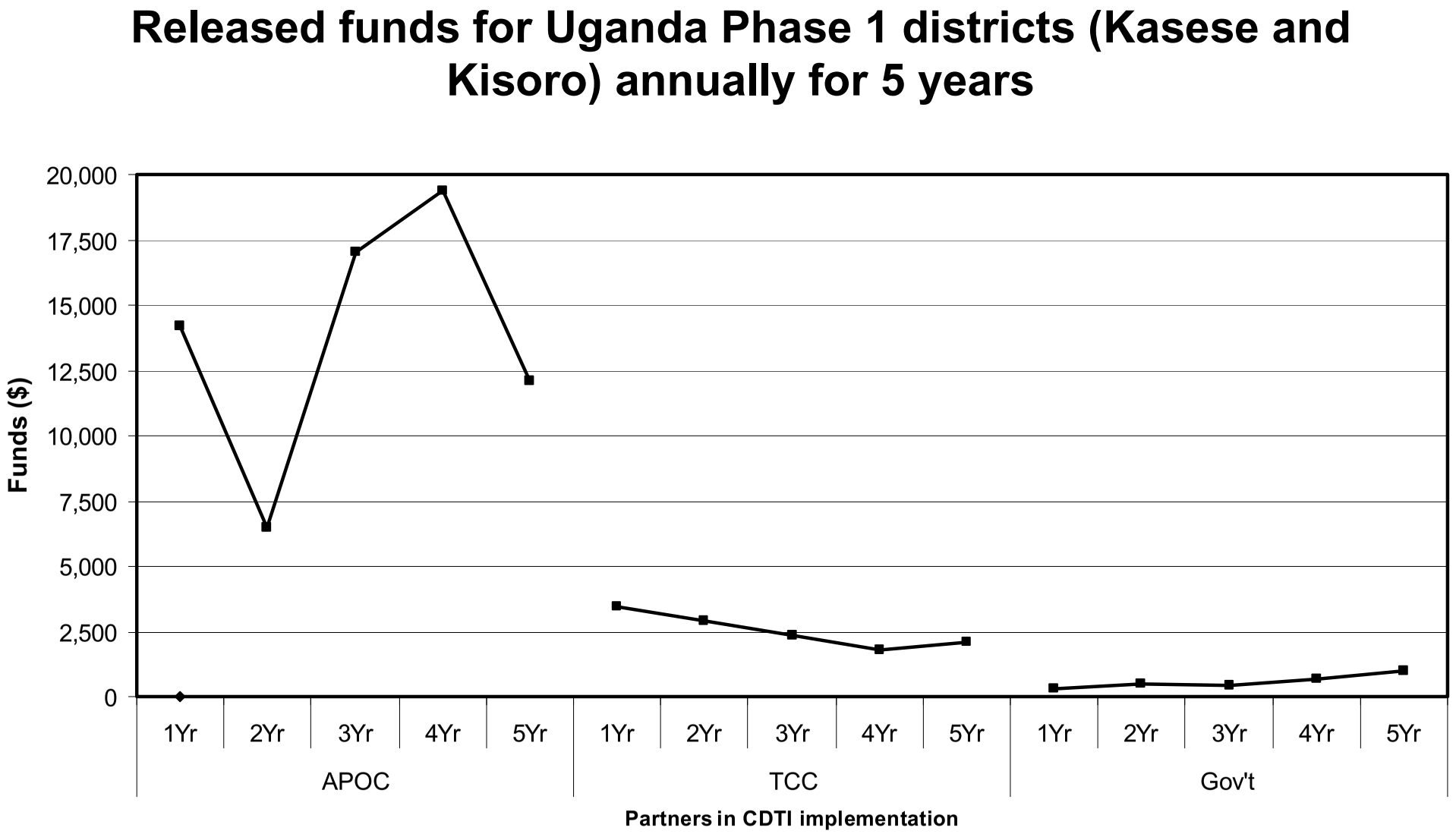

Released funds for Uganda Phase 1 districts (Kasese and Kisoro) annually for 5 years
Funds ($)
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
1Yr
2Yr
3Yr
4Yr
5Yr
APOC
TCC
Gov't
Partners in CDTI implementation

Table 9: GRBP-Assisted Uganda Treatments, 2002 and 2003, By District

2003*

UGANDA	TX (earp)	UTG(earp)	%UTG	TX (arv)	UTG(arv)	% UTG
Adjumani	142,646	142,988	99.8%	218	218	100%
Apac	12,449	12,505	99.6%	9	9	100%
Gulu	142,517	146,985	97.0%	187	187	100%
Kabale	13,738	14,863	92.4%	48	48	100%
Kanungu	37,064	37,925	97.7%	105	105	100%
Kasese	77,575	77,695	99.8%	131	131	100%
Kisoro	16,403	17,425	94.1%	31	31	100%
Mbale	136,674	136,674	100.0%	580	580	100%
Moyo	136,653	136,653	100.0%	189	189	100%
Sironko	47,688	48,688	97.9%	156	191	82%
Nebbi	226,787	226,874	100.0%	670	670	100%
Total	**990,194**	**999,275**	**99.1%**	**2,324**	**2,359**	**99%**

2002*

UGANDA	TX (earp)	UTG(earp)	%UTG	TX (arv)	UTG(arv)	% UTG
Adjumani	134,411	139,500	96.4%	218	218	100%
Apac	12,200	12,200	100.0%	9	9	100%
Gulu	137,529	143,400	95.9%	184	184	100%
Kabale	13,542	14,500	93.4%	48	48	100%
Kanungu	36,280	37,000	98.1%	102	102	100%
Kasese	75,800	75,800	100.0%	129	129	100%
Kisoro	15,906	17,000	93.6%	31	31	100%
Mbale	133,340	133,340	100.0%	580	580	100%
Moyo	131,896	133,320	98.9%	189	189	100%
Sironko	42,926	47,500	90.4%	191	191	100%
Nebbi	217,788	221,340	98.4%	670	670	100%
Total	**951,618**	**974,900**	**97.6%**	**2,351**	**2,351**	**100%**

* The ATO is equal to the UTG.

CAMEROON

Onchocerciasis is widespread in Cameroon, with an estimated 5.1 million people infected, and approximately 62% of its population of 15 million at risk of infection. Some 60,000 people are believed to suffer some degree of visual impairment from onchocerciasis, and an estimated one million persons have onchocercal skin disease.

Background: GRBP's predecessor, the River Blindness Foundation (RBF), began assisting the Ministry of Health (MOH) in North Province (the most highly endemic area for blinding onchocerciasis in the country) in 1992. North Province, which obtained APOC support in 1999, is the only GRBP project not currently assisted by LCIF. In August 1995, the Lions-Carter Center SightFirst Initiative launched a project, supervised by Lions District 403B and in partnership with the MOH and four NGDOs (RBF, Helen Keller Worldwide, International Eye Foundation, and SightSavers International), to distribute Mectizan in three additional provinces (Adamaoua, Centre, and West) over a five year period. GRBP became responsible for assisting West Province in 1996**.** The original SightFirst Cameroon project ended in early 2001, when an extension was granted to supplement new APOC projects in LCIF-assisted zones, including West Province.

Treatments: GRBP-assisted areas (Map 10) in Cameroon provided 1,360,833 treatments in 2003 (Figure 20), or 102.9% of their combined UTG (1,322,311). This included 1,089,393 treatments in West Province and 271,450 treatments in North Province (Table 10). Each of the 28 health areas in the North province achieved a UTG coverage of at least 90%, while in the West Province, only 74% of the 212 health areas achieved at least 90% UTG coverage. Performance of individual communities was not given.

Mectizan: GRBP/Cameroon received a total of 3,930, 389 Mectizan tablets in 2003, and assisted in distributing 3,923,391 tablets. 933 tablets in the West Province were wasted while 149,449 tablets were returned. Only 4,700 mild reactions were reported. The average number of tablets per treatment was 2.8.

Training/Health Education: In 2003, the Program trained a total of 6,337 community-directed distributors (CDDs), with West Province accounting for 5,225 and North Province accounting for 1,112. There was an average of one CDD per 312 persons and two CDDs per community in North Province, while in West Province, the ratio averaged one CDD per 253 persons and two CDDs per community. Health education covered all 2,926 communities in both provinces.

Loa loa: No cases of adverse reactions potentially related to *Loa loa* were reported in GRBP-assisted areas of Cameroon in 2003 (Figure 21). Surveillance structures for monitoring adverse reactions in all GRBP-assisted areas were maintained and strengthened in 2003. Provincial health delegates and provincial chiefs of community health have been informed about *Loa loa*-related reactions and the risks associated with treatment. The referral and treatment program for patients with such reactions is

integrated into the primary health care system. Patients are managed in district hospitals, so that their families remain near to help with their nursing care.

Evaluation of Sustainability: Mectizan treatment and health education using community-directed treatment with ivermectin (CDTI) has been accepted as the principal strategy for control of onchocerciasis in Cameroon since 1999. Prior to 2002, however, the Cameroonian MOH used a "cost recovery" system, under which 100 and 10 Central African Francs (CFAs) (US $0.20 and US $0.02) were charged to adults and children, respectively, for each Mectizan treatment, in order to cover distribution costs. The transitions to CDTI strategy in the two provinces were about two-thirds complete in 2002 and concluded in 2003. The Government of Cameroon pledged to provide monetary incentives to the CDDs, which so far has not been done. This is likely to present a serious challenge during 2004, unless alternative approaches for dealing with CDDs are identified.

North Province completed five years and West Province three years of APOC funding, and both provinces were evaluated for sustainability of CDTI activities. The North Province, which is more mature, performed better than the West Province, although both were rated as making progress towards sustainability (Figure 22, Annex 5). The health area level in both provinces remains weak and was judged by the evaluation to be unable to sustain its responsibilities.

Financial Contribution: APOC and the Lions-Carter Center SightFirst Initiative, especially in West Province, supported the program. APOC funding for North Province stopped after five years of support. The Carter Center still supports ivermectin distribution activities, but does not fill the gap left by APOC. The Government of Cameroon, whose contribution has been very low, did not increase its financial contribution to North Province. However, through integrated approach, North Province used some resources from other programs to ensure that distribution of ivermectin was achieved. The Government also had promised to pay the CDDs at the end of the distribution period, but was not able to do so. This presents a threat for mass distribution of ivermectin in subsequent years, as the CDDs are likely to retaliate and withhold ivermectin from affected communities.

Integration: Most programs are supported at the community level by their respective initiators, such as government, while NGOs and other donors tend to utilize CDDs. At least 90% of CDDs are involved in other community health activities, such as national immunization days, an expanded program of immunization, HIV/AIDS, malaria fever control, Vitamin A distribution, and sexually transmitted diseases. They also are utilized for non-invasive procedures in immunizations, social mobilization, impregnation of mosquito nets, registration, record keeping, and reporting.

Gender: Involvement of women has not been documented. However, it is assumed that their involvement in the North, which has a significant population of Muslims, will not be easy. West Province has a large Christian population, and involvement of women is assumed to be high.

RECOMMENDATIONS 2004 for GRBP CAMEROON

The Program should look at alternative and sustainable approaches to dealing with CDDs when the Government is not able to pay them.

The Program should establish ongoing monitoring in order to validate: coverage, involvement of community members in decision-making, health education, involvement of women, monetary incentives, attrition rate of CDDs, and any other aspects that may enhance or hinder performance.

The Program should clarify and continue to monitor support provided by the Government to the onchocerciasis program.

The Program should phase down GRBP assistance to North Province after the fifth year of APOC assistance there, and carefully monitor the sustainability of health education and mass drug administration interventions.

If funding permits, the Program should conduct a study to learn more about the impact of withdrawal of Cost Recovery.

The Program is urged to seize every opportunity to document the impact of current interventions against onchocerciasis (health education and annual mass administration of Mectizan) on transmission of onchocerciasis and on clinical manifestations of the disease.

Map 10

Cameroon
GRBP - Assisted Provinces

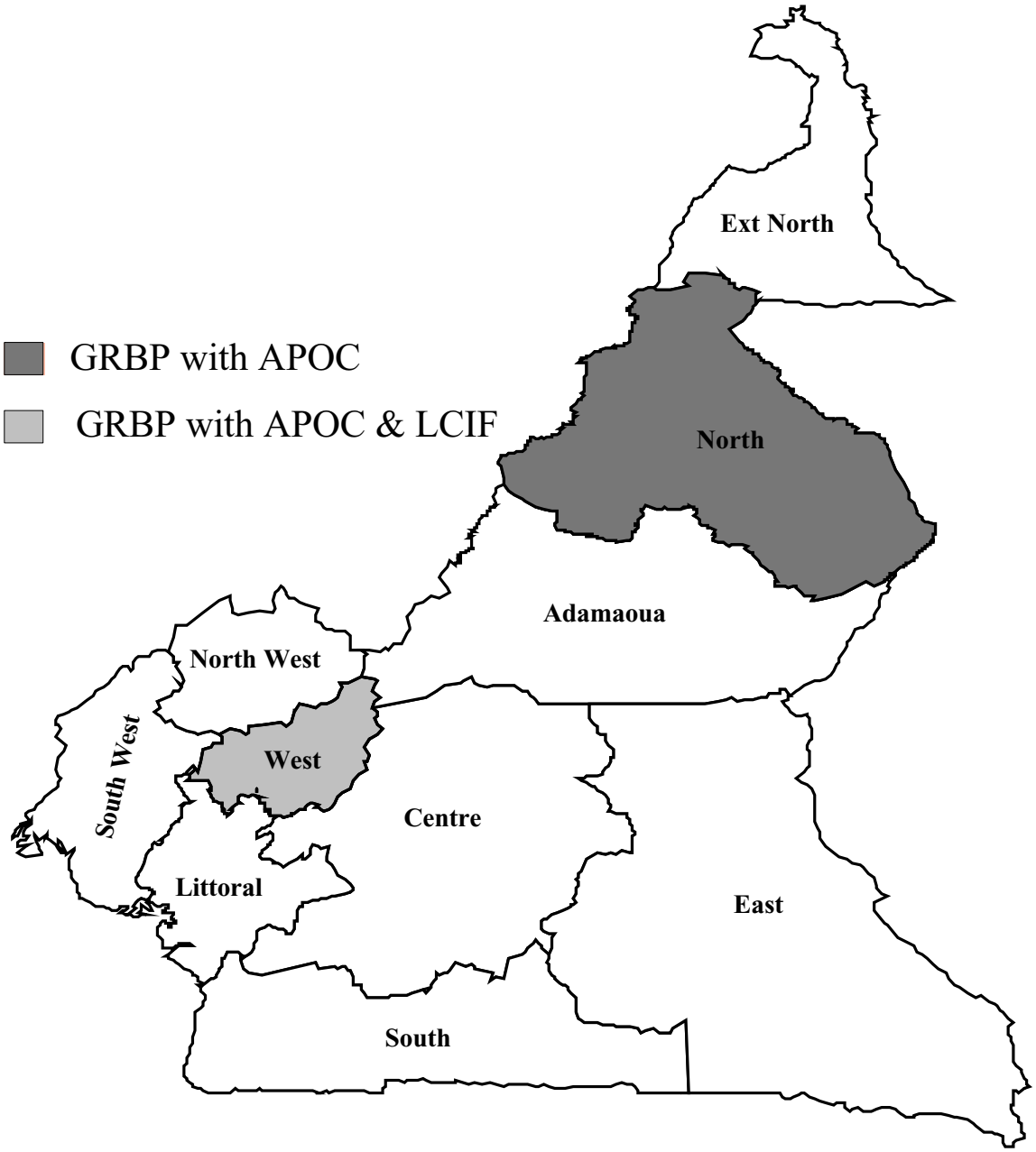
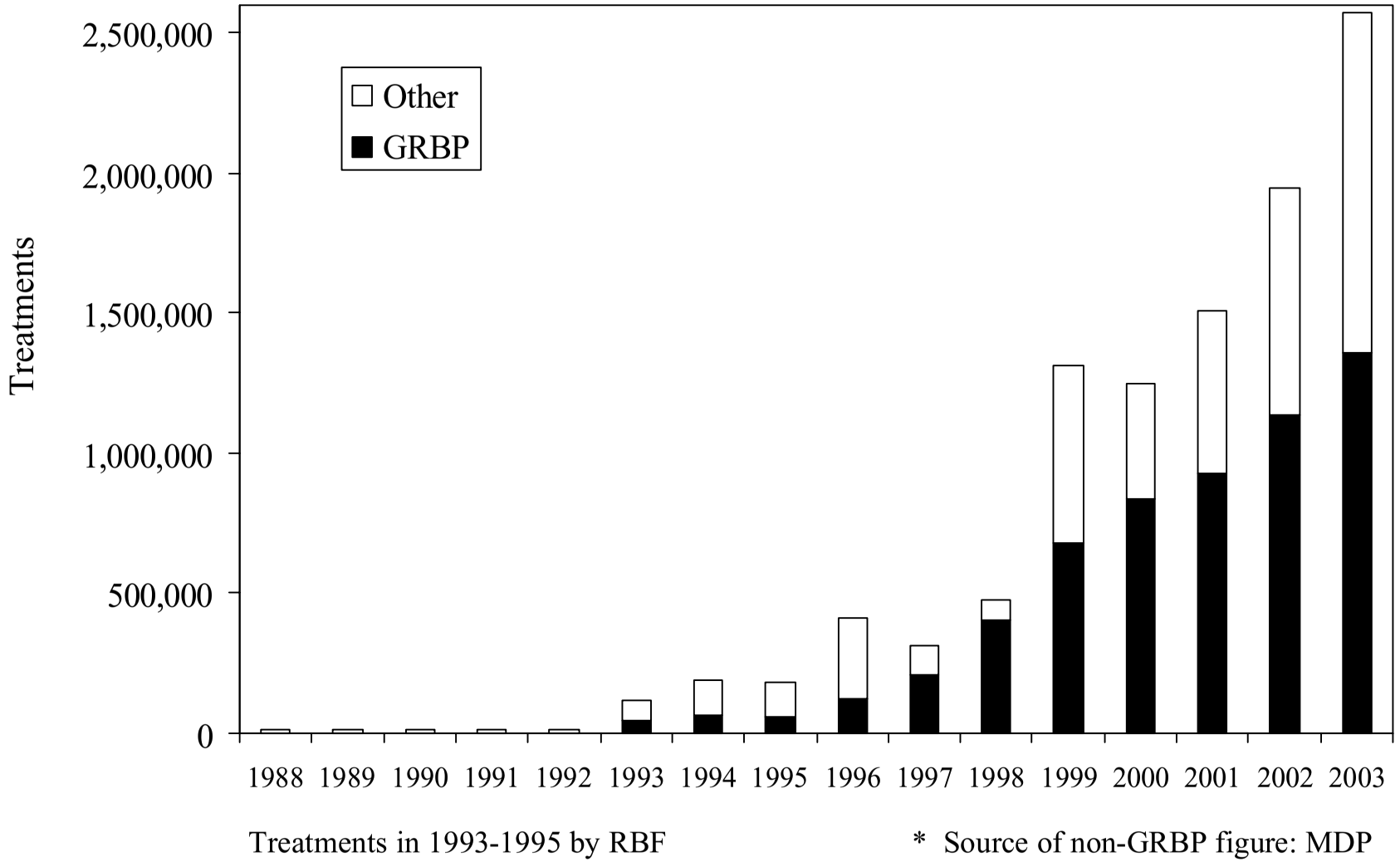


Figure 20

Cameroon: GRBP-assisted Mectizan Treatments as Part of Total Treatments Provided, 1988-2003*



Treatments in 1993-1995 by RBF

* Source of non-GRBP figure: MDP

Figure 21

Adverse Reaction Rate Potentially Related to *Loa loa*, Per Million Treatments in West Province 1996-2003

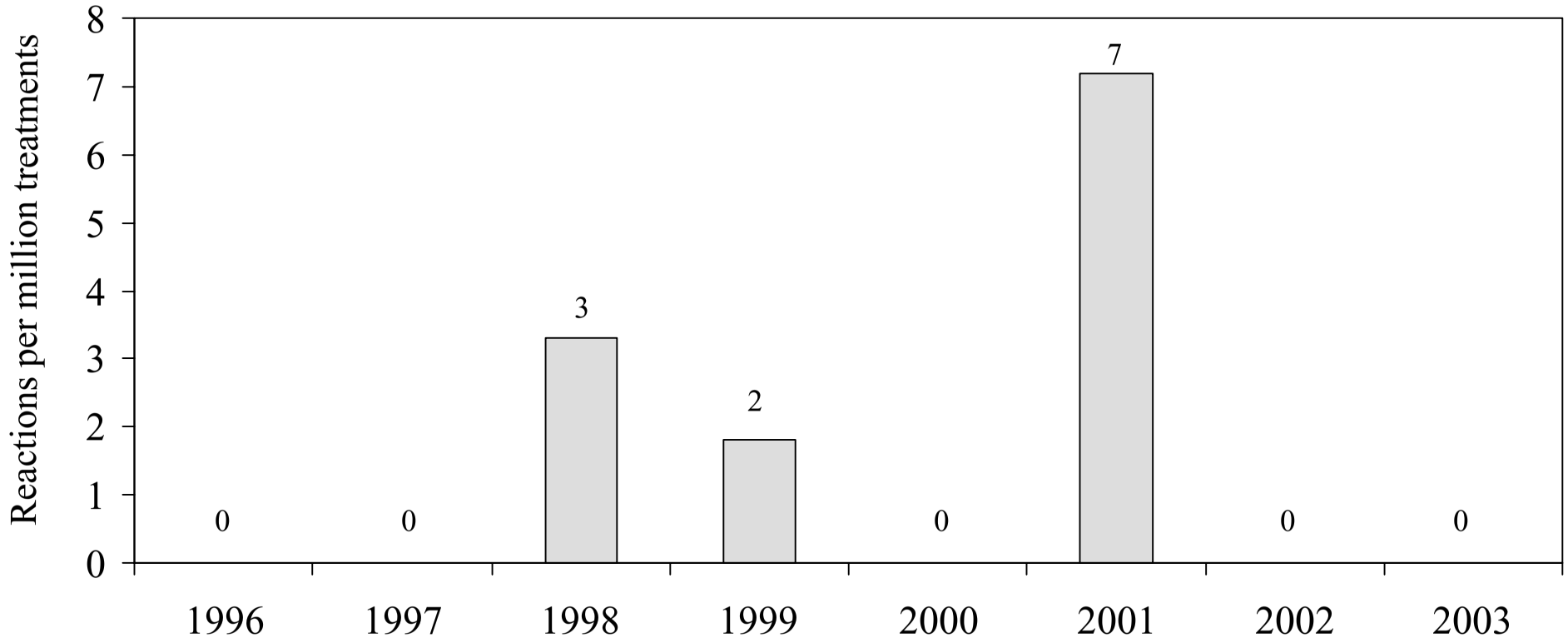


Figure 22

Performance on APOC indicators of sustainability at four levels of CDT implementation in West and North Provinces in 2003

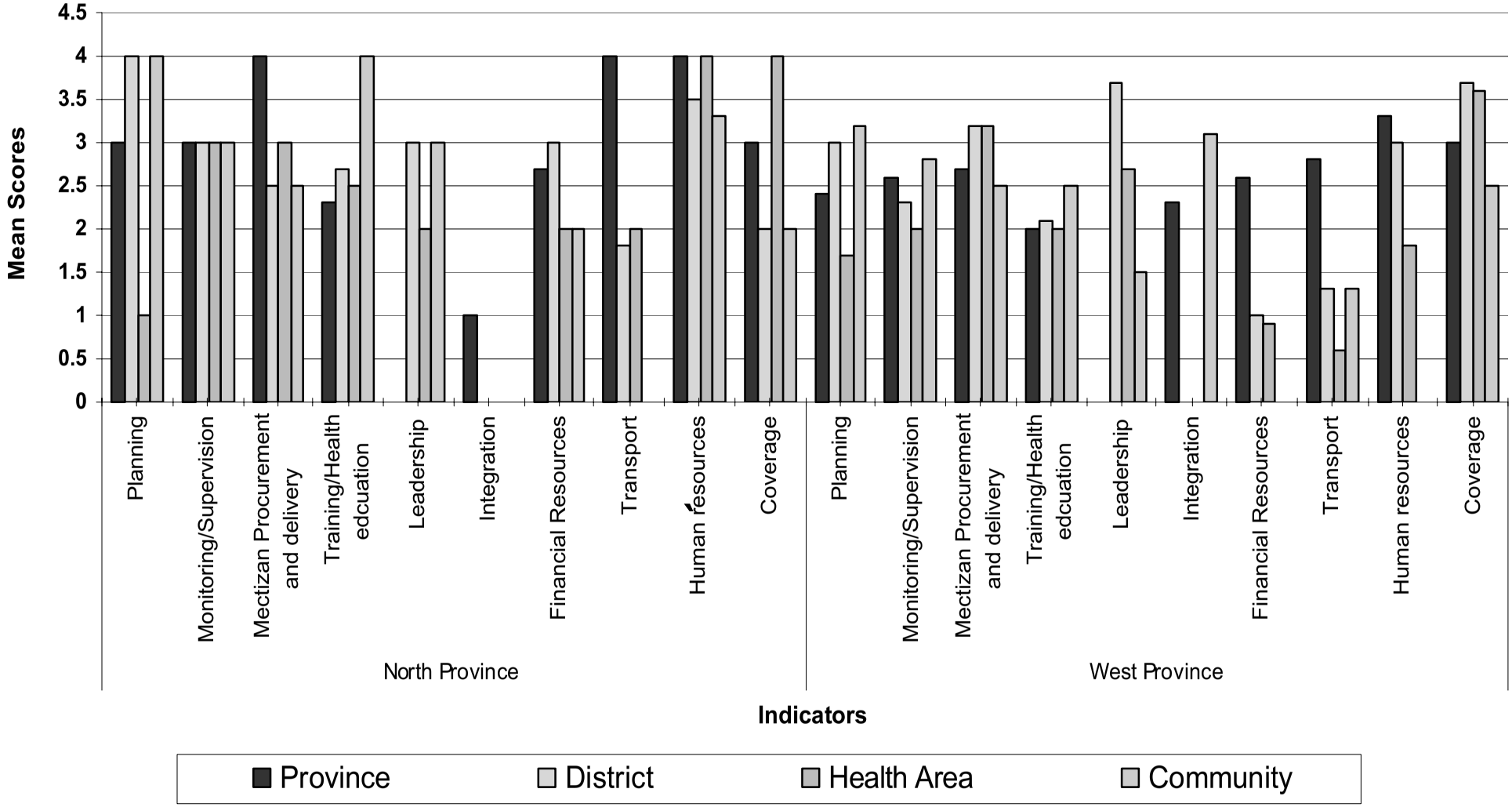


Table 10: Summary of Treatment Activities 2003: Cameroon

Name of Province	Number of Health Areas	Popn treated 2003	UTG 2003	Percent UTG treated	Total Popn for 2003	Percent total popn	Active villages 2003	Active communities UTG	Percent of active communities covered
North	28	271,450	246,682	110%	346,775	78.3	583	583	100%
West	212	1,089,383	1,075,629	101%	1,326,547	82.1	2,343	2,343	100%
TOTAL	240	1,360,833	1,322,581	103%	1,673,322	81.3	2,926	2,926	100%

SUDAN

There are at least four million persons at-risk of onchocerciasis in Sudan, and approximately 10,000 cases of onchocerciasis-related blindness. Of the several endemic areas (Map 11) in the country, the southern (principally southwestern) focus is the most significant and is characterized by high prevalence of onchocerciasis (Map 12). Some of the highest rates of blindness due to onchocerciasis in the world occur in southwest Sudan.

Background: The decades-old civil war in Sudan continues (although there is hope for a peaceful settlement in the near future), and, as a result, channels of communication between the Government of Sudan (GOS) and the non-government held areas in the south remain key to coordinating and accelerating progress in the onchocerciasis control program. Operation Lifeline Sudan/South (OLS/S) is a consortium of non-governmental organizations (NGOs) working in the contested southern part of the country, led by the United Nations Children's Emergency Fund (UNICEF). Within the structure of the OLS, Health Net International (HNI) will no longer be involved. HNI has been the NGDO coordinating the distribution of Mectizan in OLS areas in a program known as the South Sudan Onchocerciasis Control Program (SSOCP). Christoffel Blindenmission (CBM) will be taking over the responsibilities of HNI (i.e. ordering and storing Mectizan for NGOs with onchocerciasis control activities in areas served by OLS). Insecurity and funding issues have made continuous long-term assistance difficult. There are currently 26 NGOs actively involved, compared with 36 NGOs in 1996. All parties work closely with the Sudan Relief and Rehabilitation Association (SRRA), which is the humanitarian arm of the resistance group, the Sudan People's Liberation Movement (SPLM).

In 1996, Sudan established the National Onchocerciasis Task Force (NOTF), which includes both the GOS and the SSOCP. The NOTF receives support for Sudan's campaign against onchocerciasis from the Lions Clubs International Foundation (LCIF) (through The Carter Center) and the African Program for Onchocerciasis Control (APOC). In 2001, the Southern Sector Onchocerciasis Task Force (SSOTF) was established by the SRRA to respond to the technical and management issues that arise within the treatment areas under opposition control.

The Carter Center has a seat on both the NOTF and the SSOTF. In October 2002, the NOTF and SSOTF met and worked jointly on a definition of gray (unknown/unserved) areas, standardization of treatment cards and logo, definition of a community, and plans for biannual meetings.

Rapid epidemiological mapping of southern Sudan is almost complete. This has resulted in formulation and approval of five community-directed treatment with ivermectin (CDTI) projects by APOC. It is estimated that the total population affected is at least five million, with a UTG of at least 3.4 million people.

Treatments: GRBP areas treated 439,798 persons in 2003, 61% of its ATO of 716,870. This is a 16% decrease from the 525,339 treatments provided in 2002 (Figure 23). Of the total number treated in 2003, GOS treated 248,180 persons (Table 11),

while GRBP areas of OLS treated 191,618 persons (Table 12). While OLS treatments increased by 14%, GOS treatments decreased by 30%. The primary reason cited for this decrease is that APOC funding to GOS ceased in December 2002.

In 2002, LCIF funds, provided through The Carter Center, helped support GOS activities, as well as three NGDOs active in the SSOCP: Zud Ost Asia (ZOA), International Medical Corps (IMC), and Aktion Afrike Hilfe/County Health Department. This support continued in 2003.

More than 90% of the population affected by onchocerciasis in Sudan is in the south, of which the GOS and Sudan People's Liberation Army (SPLA) each have access to about 40%. The remaining 20% is inaccessible to either side. However, this situation may change as the peace talks between the GOS and SPLM seem promising. The SPLM has been setting up administrative and health delivery structures in southern Sudan. It is envisaged that when peace is realized, the number of treatments will increase dramatically. APOC trust funds may be used in establishing some health care delivery structures so that the CDTI strategy could be developed.

Training: The programs trained or re-trained 334 community-directed distributors in 2003.

Mectizan: In 2003, 1,034,000 Mectizan tablets were received, and 940,404 distributed in OLS areas. GOS did not provide information about the number of Mectizan tablets received and distributed. No Severe Adverse Events (SAEs) were reported.

Sustainability: Sustaining the gains achieved by mass treatments with Mectizan since 1995 is a particularly difficult challenge in Sudan, because of the now twenty-year-old civil war. The country's poor infrastructure and vast terrain are additional challenges. Mectizan treatments are very popular at the community level, however, and health workers on both sides have sought to actively encourage community participation in the distribution process, in keeping with the CDTI strategy. The onchocerciasis program also has been used as an entry point for several other interventions, including distribution of vitamin A and iodized salt, trachoma control, and polio eradication. The government provided no financing to the Program in 2003.

APOC conducted a fifth year evaluation in GOS areas in January 2003 (Figure 24), and the CDTI project was found to be making unsatisfactory progress towards sustainability.

RECOMMENDATIONS 2004 for GRBP SUDAN

The Carter Center/GRBP should continue facilitating joint meetings between representatives of the NOTF and the SSOTF, as well as the realization of joint NOTF/SSOTF recommendations, in order to enhance cooperation between the two programs.

GRBP should assist in close monitoring of treatment activities, particularly in GOS areas, for evidence of a continued trend in decreasing ivermectin delivery.

All programs should advocate as strongly as possible for financial support of national programs by government authorities at all levels.

The Program should define relationships between newly approved APOC-supported projects that overlap with GRBP-supported projects.

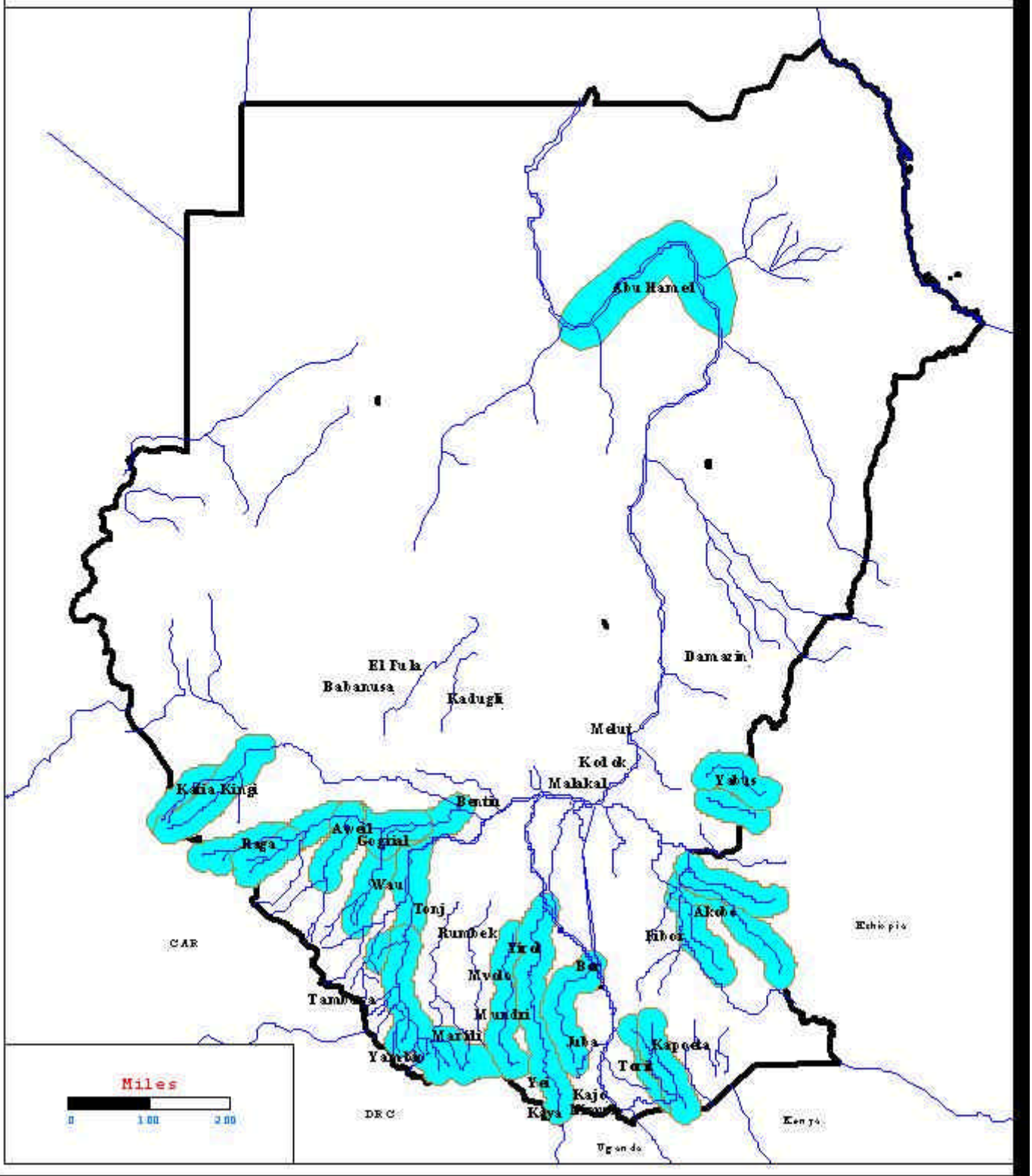
The program should establish on-going monitoring in order to validate: coverage involvement of community members is decision-making; health education, involvement of women, monetary incentives, drop out rate of CDDs and any other aspects that may enhance or hinder performance.

Headquarters staff should review ZOA Knowledge, Attitude, and Practices studies.

SAE percentages (if any) should be determined.

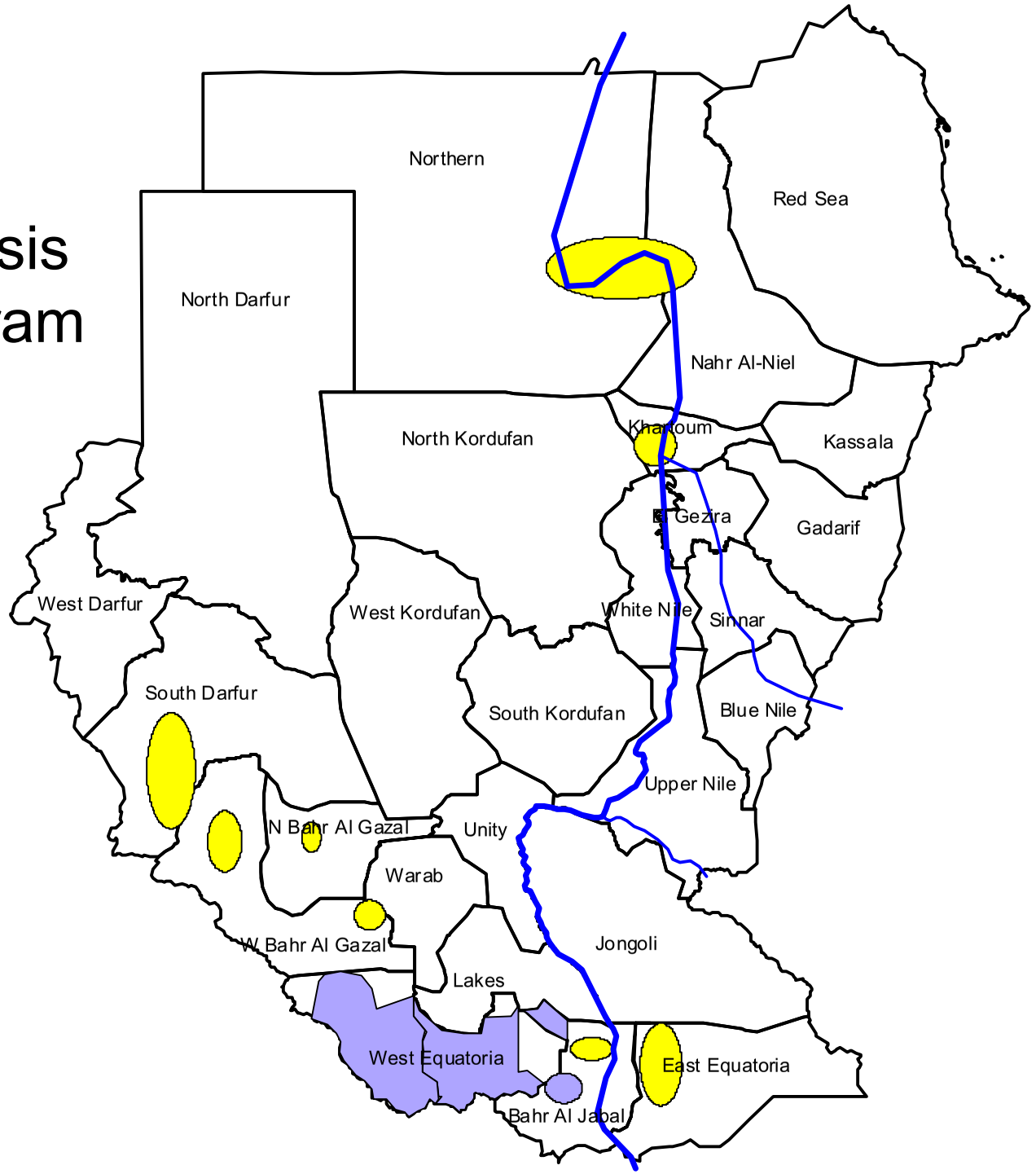
Map 11

Onchocerciasis in Sudan



Map 12

Sudan Onchocerciasis Control Program

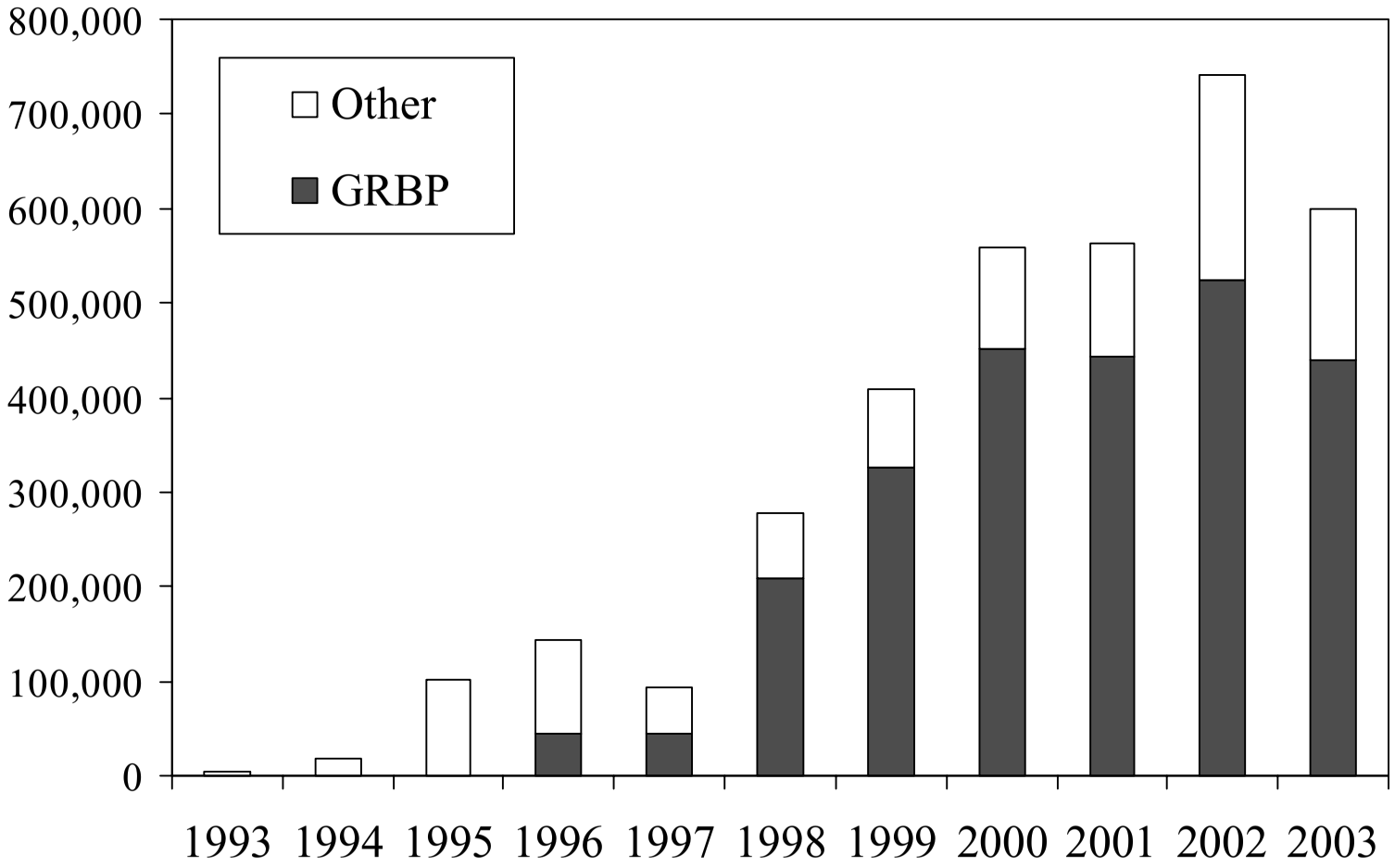


GOS

OLS/S (GRBP)

Figure 23

Sudan: GRBP-Assisted Mectizan Treatments as Part of the Total Treatments Provided, 1993-2003



Since 1997, GRBP activities in Sudan have been supported by Lions Clubs International Foundation

Figure 24

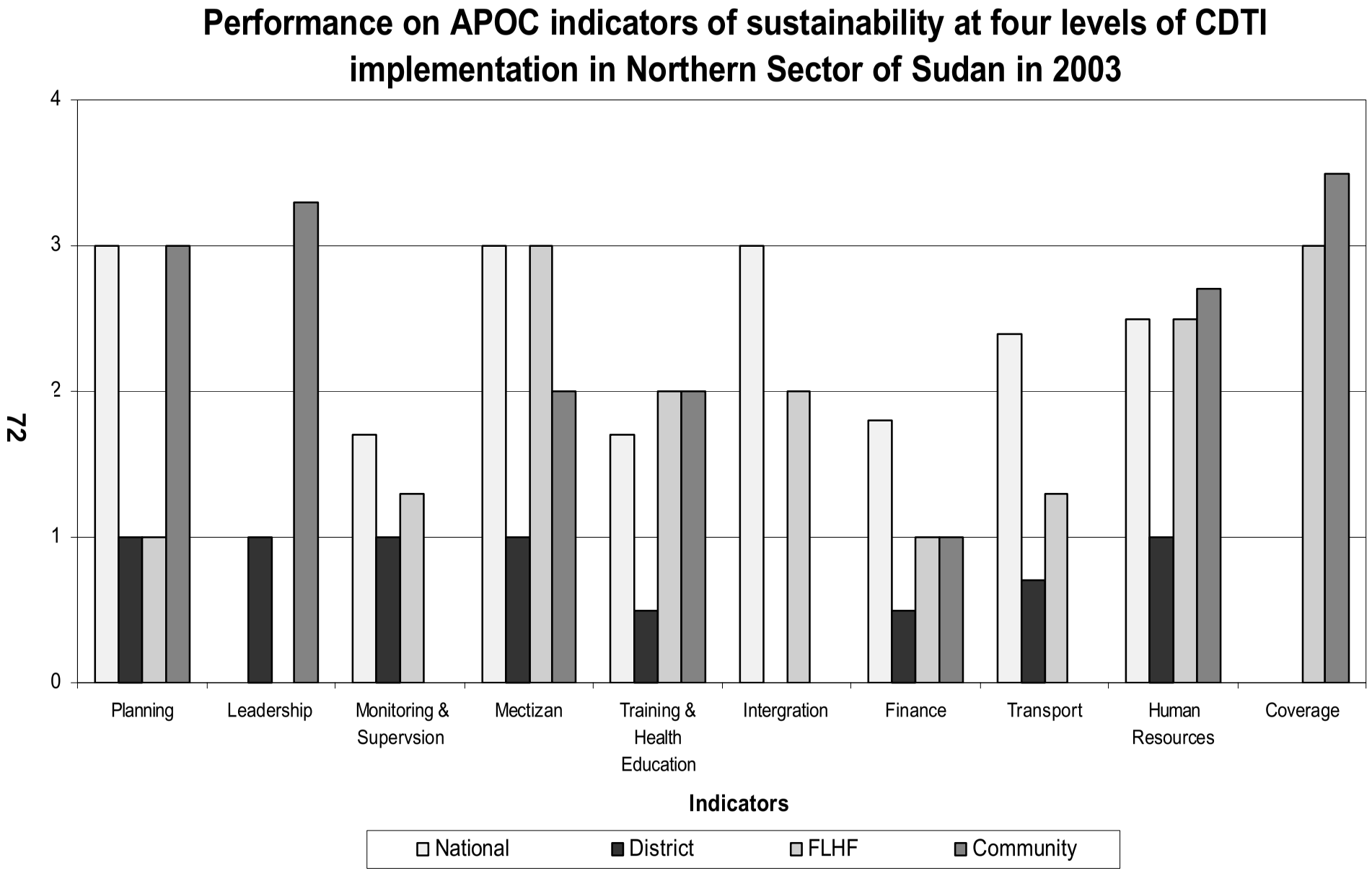

Performance on APOC indicators of sustainability at four levels of CDTI implementation in Northern Sector of Sudan in 2003
4
3
2
1
0
72
Planning
Leadership
Monitoring & Supervsion
Mectizan
Training & Health Education
Intergration
Finance
Transport
Human Resources
Coverage
Indicators
National
District
FLHF
Community

Table 11: GOS - GRBP Assisted Mectizan treatments 2003: Sudan

Area	Total Popn for 2003	Popn treated cumulative for 2003	Ultimate TX Goal ATO for 2003	Percent ATO treated	Percent total popn	No. of Villages	Active villages cumulative for 2003	Active villages UTG for 2003	Active villages % for UTG/	Percent of active villages covered
Raja *	36,237	32,272	18,500	174%	89%	34	34	34	100%	100%
Wau	120,600	77,011	100,000	77%	64%	28	55	55	51%	51%
Aweil	16,847	12,179	15,000	81%	72%	7	9	9	78%	78%
Radoum	23,528	18,652	19,700	95%	79%	20	20	20	100%	100%
Abu Hamad Kab/Sheeri +	28,489	25,930	30,000	86%	91%	30	30	30	100%	100%
Abu Hamad Locality	31,470	26,131	28,000	93%	83%	33	35	35	94%	94%
Abu Hamad Sheraik	11,999		11,000				24	24		
Torit Province & Environs	28,800		20,000				27	27		
Juba & Environs	221,200	28,737	130,000	22%	13%	76	76	76	100%	100%
ElBaraka	34,231		21,000				5	5		
Elbashir	22,077	17,188	11,700	147%	78%	7	7	7	100%	100%
Elsalam	11,957	10,080	10,000	101%	84%	3	4	4	75%	75%
TOTAL	**587,435**	**248,180**	**414,900**	**59.82%**	**42.25%**	**138**	**326**	**326**	**73%**	**73%**

Table 12: OLS/S - GRBP Assisted Mectizan treatments 2003: Sudan

2003	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL	% of ATO	% Total
SOUTH SUDAN			**ATO GRBP**		**301,970**										
State: Western Equatoria															
AAH/CHD Maridi	789	3,669	1,196	1,327	260	675	772	0	0	1,346	5,102	10,406	**25,542**		
AAH/CHD Mundri	96	57	55	26	0	0	0	0	0	428	1,140	3,933	**5,735**		
AAH/CHD Yei	814	0	0	0	0	0	0	0	0	4,284	17,865	4,781	**27,744**		
IMC Yambio	3,197	6,959	2,877	801	4,972	800	1,337	0	0	21,869	13,617	8,582	**65,011**		
IMC Tambura	1,951	1,291	2,043	1,468	229	1,129	0	0	0	23,226	9,499	2,352	**43,188**		
State: Bhar Al Jabal													**0**		
ZOA Katigiri	1,299	1,040	1,349	947	1,126	651	627	693	96	2,504	1,877	701	**12,910**		
ZOA Tali	2,118	1,329	1,141	52	105	0	0	0	0	2,823	2,353	1,567	**11,488**		
GRBP-Assisted	**10,264**	**14,345**	**8,661**	**4,621**	**6,692**	**3,255**	**2,736**	**693**	**96**	**56,480**	**51,453**	**32,322**	**191,618**	**63%**	**32%**
HNI (Other NGOs)	**21,698**	**19,368**	**8,414**	**52,694**	**4,211**	**4,875**	**0**	**204**	**5,743**	**8,091**	**19,921**	**10,290**	**155,509**		**26%**
All OLS/S	**31,962**	**33,713**	**17,075**	**57,315**	**10,903**	**8,130**	**2,736**	**897**	**5,839**	**64,571**	**71,374**	**42,612**	**347,127**		**58%**

ETHIOPIA

Background: Ethiopia is the largest, most populous country in the Horn of Africa, with a population of more than 67 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 onchocerciasis endemic in studies conducted in the 1970s. Onchocerciasis endemicity was evaluated further in Rapid Epidemiological Mapping of Onchocerciasis (REMO) exercises conducted in 1997, 1998, and 2000. REMO was completed in 2001, and the results indicated that out of six regions surveyed, all regions were endemic for onchocerciasis and four out of the five had areas that were meso- or hyper-endemic (Map 13). Currently, it is estimated that 7.4 million persons are at risk of onchocerciasis, and more than three 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, has been and still is the secretary of the NOTF. In 2001, community-directed treatment with ivermectin (CDTI) was launched with Carter Center assistance in Kaffa-Sheka zone (later officially split into two zones, Kaffa and Sheka). CDTI was expanded in 2002 and 2003 to include all 13 woredas of those two zones. During 2003, two more CDTI projects in North Gondar and Bench Maji zones were established. The total population in Carter Center-assisted areas was 1,353,600, with a UTG of 1,098,501 people**.**

During 2003, six more CDTI projects were approved to receive support from APOC trust funds. These included Jimma and Illubabor CDTI projects where The Carter Center is the NGDO partner (Map 14). The estimated population in all the areas where The Carter Center is the NGDO partner is 3,050,300 people, with a UTG of 2,429,644 people.

Local Lions Clubs continue to play an important role in advocacy for onchocerciasis control.

Treatments: During 2003, 1,007,983 people were treated with therapeutical and UTG coverage of 74% and 92%, respectively, in Kaffa, Sheka, Bench-Maji, and North Gondar (Table 13, Figure 25). Only two Severe Adverse Events (SAEs) were reported. The individuals concerned were hospitalized and discharged within three days.

Mectizan: A total of 3,021,000 tablets were received from NOTF for Kaffa, Sheka, Bench Maji, and North Gondar zones, while 3,173,001 tablets were available for distribution. 2,628,853 tablets were distributed, while 7,284 (2.3%) were wasted. The balance returned was 514,143. The average number of tablets per person treated was 2.6.

Training/ Health Education: Out of 9,024 persons targeted for training as CDDs, 5,602 (62.1%) were trained. Kaffa-Sheka zone had 238 community supervisors; other

zones did not have community supervisors. Health education covered 18 woredas and 4,250 targeted communities, representing 100% geographical coverage.

Evaluation of Sustainability: Kaffa-Sheka zone was evaluated after completing three years of implementation. It was found to be making progress towards sustainability. However, health services at the district and national levels were found to be very weak, performing below average in planning, leadership, finance, transport, and human resources. Front Line Healthcare Facilities (FLHF) performed below average on training, health education, sensitization, advocacy, and mobilization (Figure 26, Annex 5).

Financial Contribution: Although CDTI is being implemented through government health care delivery structures, most of the funding is still coming from APOC trust funds. There is need for the Government to begin allocating and releasing funds. The Program is encouraged to continue advocating for more budget allocation, specifically for CDTI core activities, as part of malaria and other vector borne diseases control.

Integration: The Program has been integrated with the existing health service delivery system since its inception. Mectizan procurement and distribution takes place through the pharmacy department of the MOH at all levels. CDTI has been integrated into the overall health plan.

Gender: The available data show that during 2003, only about five percent of CDDs (262 out of 5,347) were women. It was reported that women have limited access to health education as a result of excessive family responsibilities. No studies have been done in order to validate this hypothesis and find ways to help them access health education.

RECOMMENDATIONS 2004 for GRBP ETHIOPIA

The Program should provide a UTG for the upcoming expansion and develop a succession of ATOs that approach that UTG realistically (i.e., in an appropriate time frame).

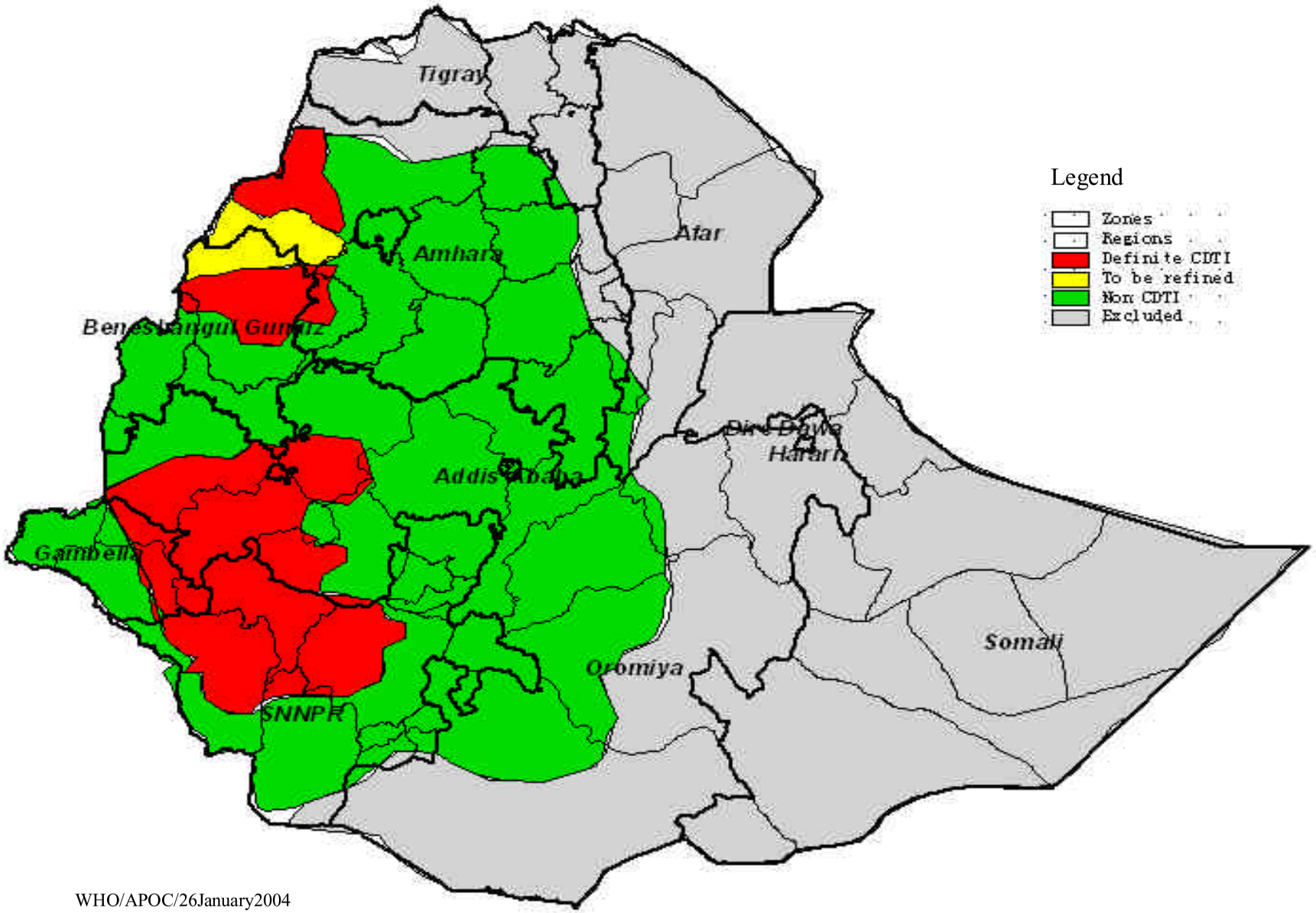
The Program should establish ongoing monitoring in order to validate coverage, involvement of community members in decision-making, health education, involvement of women, monetary incentives, attrition rate of CDDs, and any other aspects that may enhance or hinder performance.

The Program should consider a study on its low CDD attrition rates.

The Program should discuss prospects of further expansion into new APOC project areas with Headquarters.

Map 13

Current Total CDTI Areas in Ethiopia



WHO/APOC/26January2004

Map 14

GRBP-Assisted CDTI Projects in Ethiopia

Figure 25

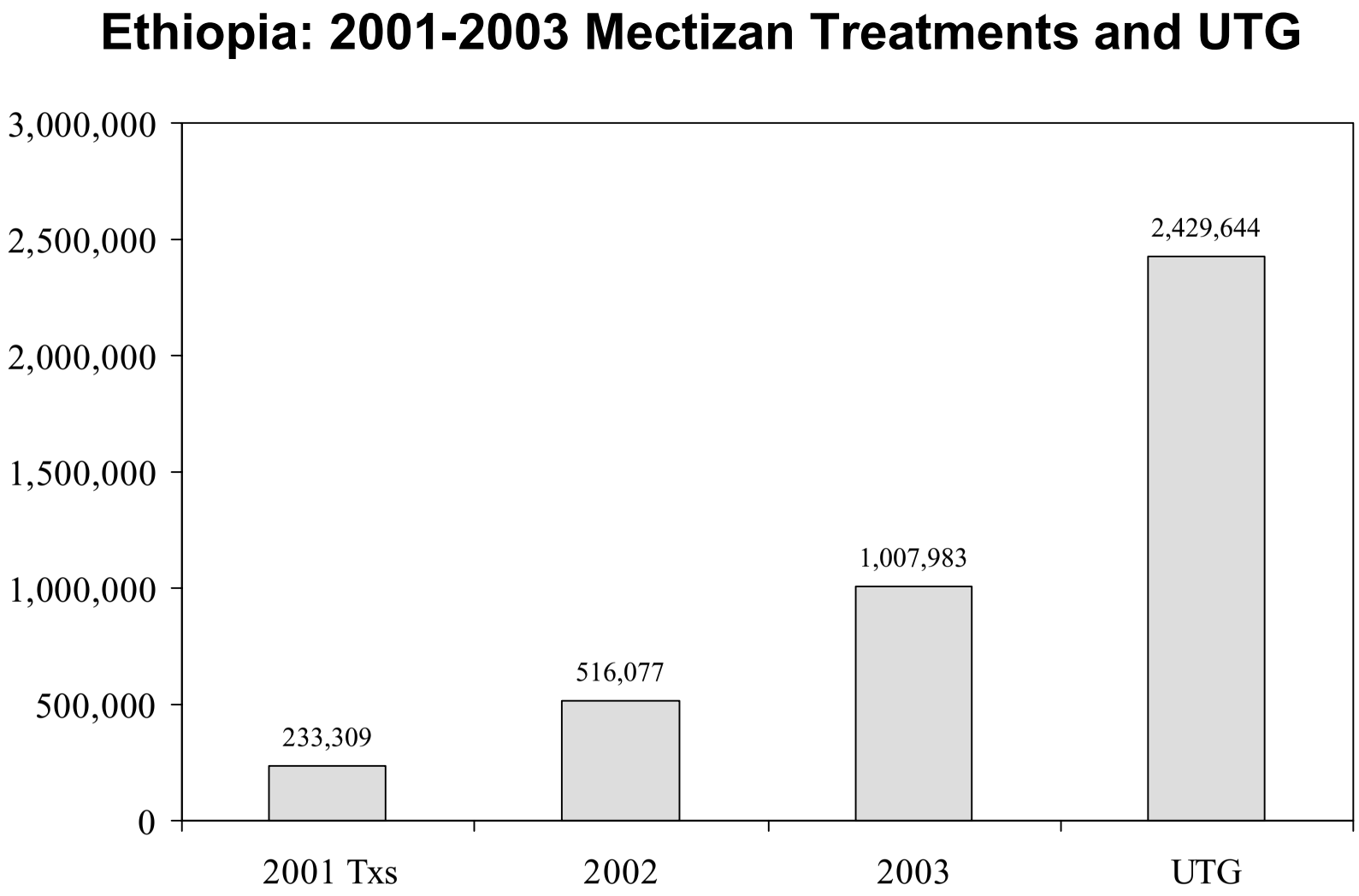

Ethiopia: 2001-2003 Mectizan Treatments and UTG
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
233,309
516,077
1,007,983
2,429,644
2001 Txs
2002
2003
UTG

Figure 26

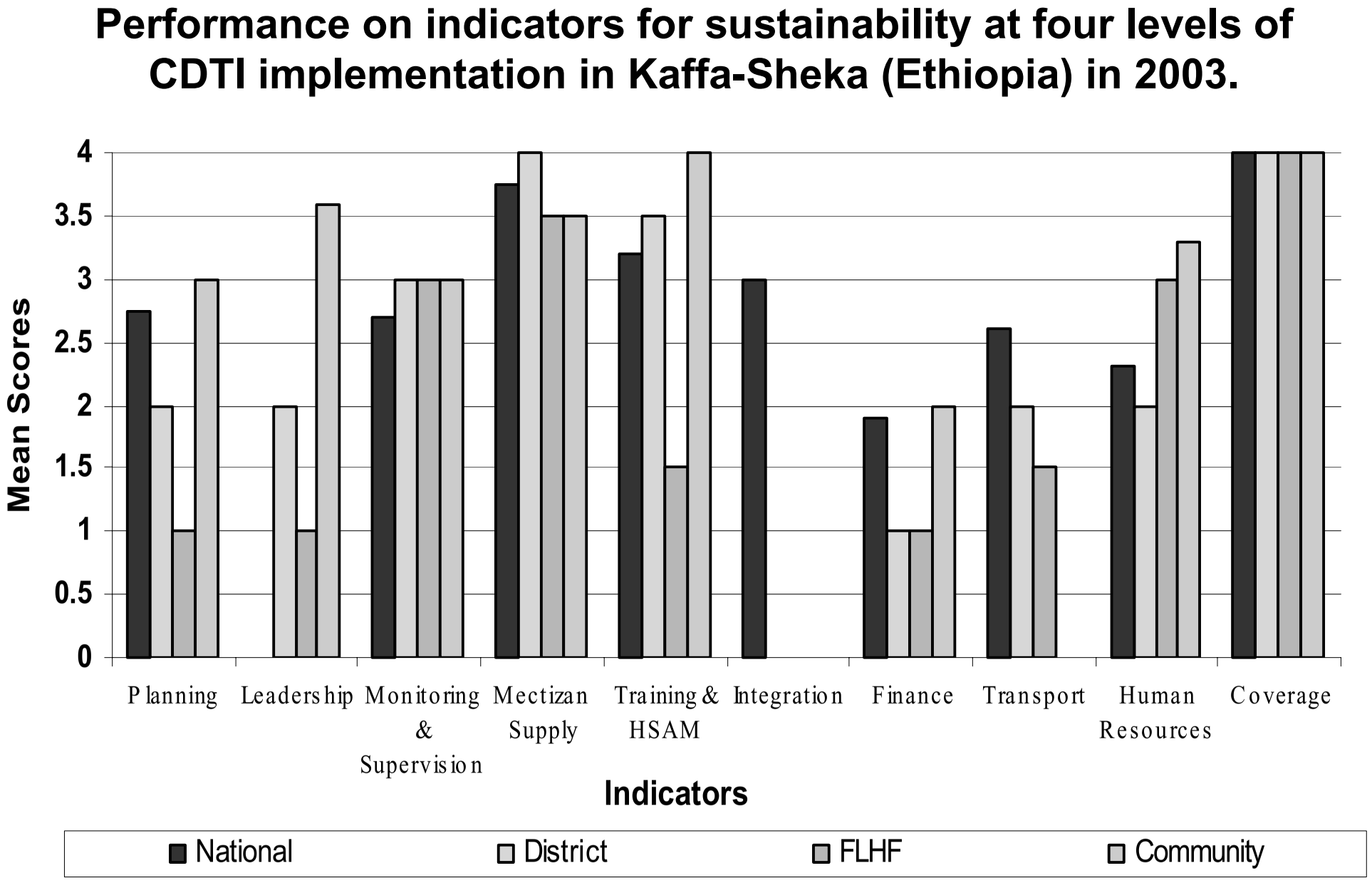

Performance on indicators for sustainability at four levels of CDTI implementation in Kaffa-Sheka (Ethiopia) in 2003.
Mean Scores
0
0.5
1
1.5
2
2.5
3
3.5
4
Planning
Leadership
Monitoring & Supervision
Mectizan Supply
Training & HSAM
Integration
Finance
Transport
Human Resources
Coverage
Indicators
National
District
FLHF
Community

Table 13: GRBP-Assisted Areas in Ethiopia, 2003 Activities and Plans for 2004

2003 Activities

Name of Zone	Number of Woredas	Popn treated cumulative for 2003	Ultimate TX Goal (UTG)/ATO 2003	Percent UTG treated	Total Popn for 2003	Percent total popn	Active villages cumulative for 2003	Active villages UTG/ATO for 2003	Percent of active villages covered
Kaffa	10	567,374	610,866	93%	763,582	74%	2,984	2,984	100%
Sheka	3	150,865	165,000	91%	191,861	79%	293	293	100%
Bench-Maji	3	203,316	221,190	92%	271,348	75%	610	610	100%
North Gondar	2	86,428	101,445	85%	126,806	68%	363	363	100%
TOTAL	18	1,007,983	1,098,501	92%	1,353,597	74%	4,250	4,250	100%

Plans for 2004

Name of Zone	No. of Woredas	Total Popn	Ultimate TX Goal (UTG) 2004	ATO (if different than UTG)	ATO (arv) 2004	Active villages(arv)	Active villages UTG/ATO for 2004
Kaffa	10	784,120	627,303	627,303	2,984	2,984	2,984
Sheka	3	210,412	178,850	178,850	293	293	293
Bench-maji	6	430,034	323,223	323,223	744	610	744
North Gondar	3	248,292	198,292	198,292	828	363	828
Illubabor	6	641,773	513,418	513,418	2,560		2,560
Jimma	3	735,698	588,558	588,558	2,940		2,940
Total	31	3,050,329	2,429,644	2,429,644	10,349	4,250	10,349

Acronyms

APOC ..... African Program for Onchocerciasis Control
arvs..... at-risk villages (villages requiring community-wide active mass therapy)
ATO ..... Annual Treatment Objective
CBD ..... Community-Based Distributors (pre-APOC strategy)
CDC ..... Centers for Disease Control and Prevention
CDD ..... Community-Directed Distributors (APOC strategy)
CDHS ..... Community-Directed Health Supervisors
CDHW ..... Community-Directed Health Workers
CDTI ..... Community-Directed Treatment with Ivermectin
CFAs..... Central African Francs
CNS ..... Central Nervous System
CSA ..... Committee of Sponsoring Agencies
earp ..... eligible at-risk population
DEC ..... diethylcarbamazine
DPD ..... Division of Parasitic Diseases
FLHF..... Front Line Healthcare Facility
FMOH ..... Federal Ministry of Health
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..... highest risk villages for morbidity, prevalence of microfilaria in skin greater than 59% (OEPA term)
IACO..... InterAmerican Conference on Onchocerciasis
ICT..... immunochromatographic card test
IDB..... Inter-American Development Bank
IDP..... Ivermectin Distribution Program
IEC..... Information, Education, and Communication
IMC ..... International Medical Corps
JAF ..... Joint Action Forum
LCIF..... Lions Clubs International Foundation
LF ..... Lymphatic Filariasis
LGA ..... Local Government Area (Nigeria)
MDA..... mass drug administration
MDP..... Mectizan® Donation Program
MEC..... Mectizan® Expert Committee
Mectizan® ..... Ivermectin (Merck & Co., Inc. product name)
MOH ..... Ministry of Health
NGDO..... Nongovernmental Development Organization
NGO ..... Nongovernmental Organization
NOCP ..... National Onchocerciasis Control Program
NOTF..... National Onchocerciasis Task Force
OCP..... Onchocerciasis Control Program

OEPA..... Onchocerciasis Elimination Program for the Americas
OLS/S..... Operation Lifeline Sudan/South
OV .....*Onchocerca volvulus*
PAHO ..... Pan American Health Organization
PCC.....Program Coordination Committee of OEPA
PCR .....Polymerase Chain Reaction
PHC..... Primary Health Care
RBF .....River Blindness Foundation
REA .....Rapid Epidemiological Assessment
REMO..... Rapid Epidemiological Mapping of Onchocerciasis
SAE ..... Severe Adverse Event
SH..... *Schistosomiasis haematobium* (urinary schistosomiasis)
SMTC ..... Sustainable Management Training Center, Jos, Nigeria
SNNPR.....Southern Nations Nationalities and Peoples Region
SPLM/A ..... Sudan People's Liberation Movement/Army
SRRA.....Sudan Relief and Rehabilitation Association
SSOCP .....South Sudan Onchocerciasis Control Program
SSOTF.....South Sudan Onchocerciasis Task Force
TCC ..... Technical Consultative Committee of APOC
TX.....treatments
UNICEF ..... United Nations Children's Fund
UTG..... Ultimate Treatment Goal
WHO..... World Health Organization
WVI.....World Vision International
ZOA .....Zud Ost Asia

ANNEXES

ANNEX 1: THE CARTER CENTER AND RIVER BLINDNESS

The Carter Center and River Blindness: In 1987, Merck & Co., Inc. approached then executive director of The Carter Center, Dr. William Foege, for assistance in organizing the global distribution of Mectizan®. The Mectizan® Executive Committee (MEC)/Mectizan® Donation Program (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 approximately 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 (MOHs) 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 in 1990 by John and Rebecca Moores. The Global 2000 River Blindness Program (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 the Onchocerciasis Elimination Program for the Americas (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 from the Lions-Carter Center SightFirst Initiative) as part of the Carter Center's peace initiative and Guinea worm disease eradication efforts there. In 1999, with expanded support from Lions Clubs International Foundation (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 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 Initiative. Another key partner is the Division of Parasitic Diseases (DPD) at the U.S. Centers for Disease Control & Prevention (CDC), where GRBP technical staff members are housed. GRBP also works closely with the MDP at the Task Force for Child Survival and Development.

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, SightSavers International, and the U.S. Committee for UNICEF. Another important partner is the African Program 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 MOH/NGDO partnerships. The Carter Center currently has 13 projects assisted by APOC in five African countries.

Partners in the Americas 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 OEPA, 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), CDC, and several U.S. and Latin American universities. In 2000, The Carter Center's partnership with Lions Clubs expanded to include OEPA, and LCIF now holds an institutional seat on the PCC. In 2003, this partnership expanded to include the Bill & Melinda Gates Foundation.

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ANNEX 4: AGENDA

AGENDA
Eighth Annual Program Review Meeting
Global 2000 River Blindness Program
The Carter Center, Cecil B. Day Chapel
March 1-3, 2004

Monday, March 1

8:00	Shuttle pickup at hotel	
8:30 - 9:00	*Continental Breakfast*	
9:00 - 9:10	Welcome, introductions and remarks	Dr. Donald Hopkins (Chair)
9:10 - 9:20	Sustainability and Integration (theme)	Dr. Moses Katabarwa
9:20 – 9:30	APOC 5th Year Evaluations	Dr. Frank Richards
Nigeria		
9:30 - 10:30	Nigeria (oncho) Presentation	Dr. Emmanuel Miri/ Dr. Abel Eigege
10:30 - 10:50	*Coffee Break*	
10:50 - 11:50	Nigeria (oncho) Presentation	Dr. Miri/Dr. Eigege
11:50 -12:50	Oncho: Discussion/Recommendations	Dr. Hopkins
12:50 - 1:50	*Lunch in Allen Foyer*	
1:50 - 2:30	Nigeria LF Presentation	Dr. Eigege
2:30 - 3:00	LF Discussion/Recommendations	Dr. Hopkins
3:00 - 3:10	LF coverage surveys	Dr. Josef Amann
3:10 - 3:15	Q & A for Dr. Amann	
3:15 - 3:25	Urban LF issues and studies	Dr. Brian Blackburn
3:25 - 3:30	Q & A for Dr. Blackburn	
3:30 - 4:00	*Coffee Break (GROUP PHOTO)*	
4:00 - 4:10	Schisto withdrawal treatment protocol	Dr. Katabarwa
4:10 - 4:50	Nigeria Schisto presentation	Dr. Eigege
4:50 - 5:20	Schisto Discussion/Recommendations	Dr. Hopkins
5:30	Shuttle departure for hotel	

Tuesday, March 2

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

<u>OEPA</u>

9:00 - 10:30	Uganda Presentation	Mrs. Habomugisha
10:30 - 10:45	*Coffee Break*	
10:45 - 11:45	Uganda: Discussions/Recommendations	Dr. Hopkins

OEPA

11:45 – 12:45	Onchocerciasis Elimination Program for the Americas (OEPA) (Part 1)	Dr. Mauricio Sauerbrey
12:45 - 1:45	*Lunch in Allen Foyer*	
1:45 - 2:15	OEPA (Part 2)	Dr. Sauerbrey
2:15 - 2:45	Research issues	Dr. Richards
2:45 - 3:45	OEPA: Discussion/recommendations	
3:45 - 4:00	*Coffee Break*	

<u>Ethiopia</u>

4:00 - 5:30	Ethiopia presentation	Mr. Teshome Gebre
5:30 - 6:30	Ethiopia: Discussion/Recommendations	Dr. Hopkins
6:45	Shuttle departure	

Wednesday, March 3

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

<u>Sudan</u>

9:00 - 10:00	Sudan presentation (Part 1, GOS)	Dr. Mamoun Homeida
10:00 - 10:15	Khartoum Office	Mr. Raymond Stewart
10:15 - 10:30	*Coffee Break*	
10:30 - 11:00	Sudan presentation (Part 2A, GRBP)	Mr. Mark Pelletier
11 :00- 11:30	Sudan presentation (Part 2B, SSOCP)	Dr. Samson Baba

11:30- 12:30	Sudan: Discussion/Recommendations	Dr. Hopkins
12:30 - 2:00	*Lunch in Allen Foyer (OPTIONAL MUSEUM TOUR)*	
2:00 - 2:15	Lions Presentation	Ms. Sonia Pelletreau
	Cameroon	
2:15- 3:15	Cameroon presentation	Dr. Albert Eyamba
3:15 - 4:15	Cameroon: Discussion/Recommendations	Dr. Hopkins
4:15 - 4:25	Cameroon cost recovery study	Dr. Adria Prosser
4:25 - 4:30	Q & A for Dr. Prosser	
4:30 - 4:45	*Coffee Break*	

Other items

4:45 - 5:15	Mectizan® Issues	MDP/Global 2000 staff
5:15 - 5:20	Reporting prize	Ms. Lindsay Rakers
5:20 - 6:00	General conclusions/reflections	Dr. Hopkins
6:00	Closure of eighth session	Dr. Hopkins
6:15	Shuttle departure	

ANNEX 5: GRBP REPORTING PROCESSES

At-Risk Villages (arvs): An epidemiological mapping exercise is a prerequisite to identifying at-risk villages (arvs) 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 illustrate 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. volvulus*. In the second stage, the survey villages are visited and a convenience sample of 30-50 adults are examined (by palpation) for onchocercal nodules. The mean nodule prevalence for each village sample, along with the latitude and longitude coordinates for that village, are entered into a geographic information system that then is used to define endemic zones (surrounding the sample villages having nodule prevalences of $\geq$ 20%). All villages falling within the treatment "zone" are considered "at-risk" and offered mass Mectizan treatment annually. In the Americas, the goal is to eliminate both morbidity and transmission from *O. volvulus*, and, as a result, all villages where transmission can occur are considered "at-risk" and offered mass Mectizan treatment activities every six months. It is recommended that every village in known or suspected endemic areas have a rapid epidemiological assessment of 50 adults, who would have both nodule examinations and superficial skin biopsies to identify *O. volvulus* microfilariae in skin. Villages in which one or more persons are positive (sample prevalence >3.3%) are considered "at-risk," and recommended for the mass treatment campaign. Thus, the cutoff prevalence for treatment also varies between Africa and the Americas.

Data Reporting: GRBP program offices are asked to submit reports monthly to Carter Center headquarters in Atlanta. These reports include: 1) numbers of villages and persons treated during the previous month (reporting of treatments are updated quarterly for the Americas); 2) the status of the Mectizan tablet supply; 3) training and health education activities; 4) epidemiological assessment, research, and program monitoring activities; and 5) administrative issues. The treatment data that are reported originate from records prepared during mass treatment activities carried out by village distributors and/or national Ministry of Health (MOH) personnel. The accuracy of these reports is routinely confirmed with random spot checks performed primarily by MOH personnel, supplemented by site visits by GRBP/OEPA staff and Lions Clubs members. Summary reports of numbers of villages and persons treated are compiled at the district level and forwarded (whenever possible through MOH surveillance and reporting channels) to both headquarters of the national onchocerciasis programs and the national GRBP offices in Jos (Nigeria), Kampala (Uganda), Yaounde (Cameroon), Khartoum (Sudan), and Nairobi (for rebel-held areas of south Sudan). In the Americas,

the MOHs in the six countries report 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 supplemented with additional information, at annual GRBP Program Reviews held the first quarter of each year. At these Reviews, all GRBP program directors and other partners convene to finalize treatment figures for the previous year, and establish new treatment objectives for the coming year. Data on Mectizan treatments provided by other programs operating in other parts of the countries GRBP assists, when available, also are discussed.

GRBP Treatment Indices: Treatments are reported as the numbers of persons or villages (communities) treated (TX) for the month by state or province. Cumulative treatment figures are compared to Annual Treatment Objectives (ATOs). GRBP uses two ATOs, both of which are established based on projections of program capacity. Communities targeted for active mass distribution (at-risk villages [arvs]) are to receive community-wide Mectizan treatment for all persons eligible to take the medicine. The ATO for mass drug administration in arvs [ATO(arvs)] is the total number of at-risk villages in which a program projects it will provide mass treatment during the year. The eligible at-risk population (earp) is all persons living in arvs who can receive Mectizan (i.e., who are over five years of age and in good health, excluding pregnant women). The ATO for the earp [ATO(earp)] is the number of persons who can receive Mectizan who are known or thought to be living in arvs. In practice, the ATO is established in projections based on age-eligible estimates, and its accuracy is expected to improve with time. The ATO(earp) is expected to be the same figure used in the annual request for tablets submitted to the Mectizan® Donation Program. Program directors are urged to define their ATOs using the latest epidemiological mapping information and village census data from the most recent treatment rounds. Given the complex emergency in Sudan (characterized by war, famine, and displacement), only a rough estimate of the ATO(earp) can be made, and reporting of ATO(arvs) has not yet been established.

Full Geographic Coverage and the Ultimate Treatment Goal: Full geographic coverage is reached when the program is able to extend mass treatment services to all arvs in the assisted area. The Ultimate Treatment Goal (UTG) is defined as the sum of the eligible populations living in all arvs in the assisted area. That is, the UTG is the number of persons estimated to ultimately require Mectizan treatment once a program has the capacity to provide full geographic coverage. At the point when the program can demonstrate that it has treated the UTG, it is said to have reached full coverage; in other words, full coverage is defined by the point TX(earp)=ATO(earp)=UTG. GRBP program progress is judged by the ability to meet ATO objectives and to increase those objectives over a reasonable time period to reach full geographic coverage and the UTG.

INDICES OF SUSTAINABILITY

GRBP programs were asked to report on performance on indices considered during evaluation using the APOC evaluation tool for sustainability. These indices tested CDTI projects for evidence of community-ownership, simplicity, effectiveness, integration into existing health services, availability of local resources, and attitude of personnel involved. Evaluation was done at every level of each CDTI project such as National, state, LGA, frontline health facility and community levels. Three groups of indices were considered.

- Indices of activities and processes which support CDTI, which include the following: planning; providing leadership; supervision and monitoring; training and HSAM; and integrating support activities.

- Indices of resources provided which include: financing and funding; transport and other material resources; human resources; and integration of support activities;

- Indices of results, which include: coverage, both geographical and therapeutical.

There were 76 indicators in the APOC evaluation tool.

Grading of the Indicators of sustainability:

Grading of the indicator	What does the grading mean?	Numerical value
Fully	The findings around this indicator point to a situation that fully supports project sustainability.	**4**
Highly	The findings around this indicator point to a situation that largely supports project sustainability, but there is some small room for improvement.	**3**
Moderately	The findings around this indicator point to a situation that only supports project sustainability about half as much as it could.	**2**
Slightly	The findings around this indicator point to a situation that only supports project sustainability slightly.	**1**
Not at all	The findings around this indicator point to a situation that does not support project sustainability at all.	**0**
Not applicable	This indicator is not relevant to this particular situation.	

Using the scores and other considerations, the evaluators determine if CDTI projects are:

Fully sustainable: All ***aspects*** are fulfilled, and all ***critical elements*** are satisfied (with perhaps one or two minor imperfections). This project therefore fulfills all the conditions for becoming sustainable.

Making satisfactory progress towards sustainability: One or two ***aspects*** are not fulfilled, and one or two ***critical elements*** are not satisfied. This project is on the way to being sustainable. With feedback from the evaluation team, national and project staff should be able to undertake the required remedial action.

Not making satisfactory progress towards sustainability: Half or less of the ***aspects*** are fulfilled, and half or less of the ***critical elements*** satisfied. This project has serious barriers to sustainability. It will require rethinking and mobilization of high-level support to get it back on track.

ANNEX 6: THE GRBP-NIGERIA LYMPHATIC FILARIASIS (LF) ELIMINATION AND URINARY SCHISTOSOMIASIS CONTROL INITIATIVE

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., Inc. for LF in Africa) and albendazole (donated by GlaxoSmithKline), or diethylcarbamazine (DEC) and albendazole. Annual mass treatment with the combination of Mectizan and albendazole prevents mosquitoes from being infected, and, when given for four to six years can interrupt transmission of *W. bancrofti* (which has no animal reservoir).

Schistosomiasis is acquired from contact with fresh water. Cercariae, released from infected snails, penetrate the skin and develop into adult worms that reside in venules of the intestines (*Schistosoma mansoni*) or bladder (*S. hematobium*). Female worms lay thousands of eggs that exit the body in feces or urine to hatch in fresh water and infect snails, continuing the lifecycle. The presence and passage of these eggs in tissues leads to inflammation and organ damage. School-aged children (ages 5-14) are the most heavily infected and also tend to be the main disseminators of this infection through their urination and defecation in or near fresh water. Mass drug distribution of praziquantel (40 mg/kg) every one to three years can significantly reduce schistosomiasis morbidity. Praziquantel (which is not being donated by pharmaceutical companies to control programs in large amounts, as are Mectizan and albendazole) costs approximately US $0.08 per 600 mg tablet.

Nigerians suffer a disproportionate share of the disease burden from these two parasitic diseases. The country is thought to have the greatest numbers of persons at risk for LF in Africa, and globally is ranked third behind India and Indonesia in human suffering from this parasite. One recent review estimated that 22% of Nigerians (over 25 million) are infected with LF, although mass drug administration for LF in Nigeria will need to reach many times this number. The geographic distribution of the disease appears to show a gradient increasing from north to south in the country, coincident with increasing tropical climate. For schistosomiasis, an estimated 20 million Nigerians (the greatest of any country in the world) need to be treated every one to three years with praziquantel. The distribution of urinary schistosomiasis (*schistosomiasis hematobium* [SH]) in Nigeria was explored in a Federal Ministry of Health survey, conducted in 1990-91, which showed that infection was most prevalent in the north-central and southeast areas of the country. The main goal of the 1997-2001 Nigeria National Plan of Action on Schistosomiasis Control was to reduce the prevalence of the disease by 50% within five years, but few treatments had been given because of the expense of praziquantel.

The Carter Center is working with the Ministry of Health (MOH) in Nigeria to establish LF elimination and SH control programs in Plateau and Nasarawa States (Maps 3 and 4). For LF, the effort is based on a strategy of health education (HE) and annual drug combination therapy with albendazole and Mectizan. The manufacturers of these drugs have global donation programs for LF: GlaxoSmithKline donates albendazole, and Merck & Co., Inc. donates 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 MOHs, the GRBP LF and SH efforts assist 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.

ANNEX 7: GRBP-ASSISTED OR CO-AUTHORED PUBLICATIONS IN 2003-4

Addiss D, Rheingans R, Twum-Danso NAY, Richards F. "A Framework for Decision-Making for Mass Distribution of Mectizan® in Areas Endemic for *Loa loa*." *Filaria Journal* 2003 2(Suppl 1):S9-18.

The Carter Center. Summary: 2002 Program Review for The Carter Center/Lions SightFirst River Blindness Programs. Atlanta, Georgia. 26-28 February 2003.

Dadzie Y, Neira M and Hopkins DR. 2003. Final Report on the Conference on the Eradicability of Onchocerciasis. *Filaria Journal* 2: 2.

Eigege A, Richards FO Jr, Blaney DD, Miri ES, Gontor I, Ogah G, Umaru J, Jinadu MY, Mathai W, Amadiegwu S, Hopkins DR. "Rapid assessment for lymphatic filariasis in central Nigeria: a comparison of the immunochromatographic card test and hydrocele rates in an area of high endemicity." *Am J Trop Med Hyg.* 68(6):643-6, 2003 Jun.

Emukah EC, Osuoha E, Miri ES, Onyenama J, Amazigo U, Obijuru C, Osuji N, Ekeanyanwu J, Amadiegwu S, Korve K, Richards FO. "A longitudinal study of impact of repeated mass ivermectin treatment on clinical manifestations of onchocerciasis in Imo State, Nigeria." *Am J Trop Med Hyg,* 70(5):556-61, 2004 May.

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"Fighting blinding diseases has profound significance, not for me as an interested observer, but for the child who will never go blind and for his parents and grandparents, who will have hope that things can improve in their lives, which quite often is the only time they've ever seen this proven."

Former U.S. President Jimmy Carter, 9/5/2000