

Summary
1997 Global 2000 River Blindness Program
Program Review for Nigeria, Cameroon, Uganda, Sudan, and OEPA
25-27 February 1998
The Carter Center
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TABLE OF CONTENTS

Acronyms	3
Abstract	5
Executive summary	6
Maps, Figures, Tables	10
Nigeria	16
Recommendations:	19
Maps, Figures, Tables	20
Uganda	24
Recommendations	27
Maps, Figures, Tables	28
Cameroon	35
Recommendations	38
Maps, Figures, Tables	39
Sudan	45
Recommendations	47
Maps, Figures	48
Onchocerciasis Elimination Program for the Americas	50
Recommendations	52
Maps, Figures, Tables	53
Mectizan® Donation Program issues	59
Annexes	60
List of Participants	60
Agenda	61
Sustainability Indices	63
<i>Loa loa</i>	64

Acronyms

AAH	Aktion Afrika Hilfa
AFO	Assistant Field Officer
arv	at-risk villages
ATO	Annual Treatment Objective
APOC	African Program for Onchocerciasis Control
CAPP	Centre d'Approvisionnement Pharmaceutique Provincial
CBD	Community-based Distributors
CBM	Christoffel Blindenmission
CDC	Centers for Disease Control and Prevention
CDTI	Community-directed Treatment with Ivermectin
DFO	District Finance Officer
DMO	District Medical Officer
earp	eligible at-risk population
GIS	Geographic Information System
GOS	Government of Sudan
GRBP	Global 2000 River Blindness Program of The Carter Center
GTZ	Gemeinschaft für Technische Zusammenarbeit
HKI	Helen Keller International
HNI	HealthNet International
hrv	high-risk (hyperendemic) villages
HQ	Headquarters
IDP	Ivermectin Distribution Program
IEF	International Eye Foundation
IMC	International Medical Corps
IACO	InterAmerican Conference on Onchocerciasis
LCIF	Lions Clubs International Foundation
MDP	Mectizan® Donation Program
MOH	Ministry of Health
MPH	Masters in Public Health
NGDO	Nongovernmental Development Organization
NOCP	National Onchocerciasis Control Program
NOTF	National Onchocerciasis Task Force
OEPA	Onchocerciasis Elimination Program of the Americas
OLS	Operation Lifeline Sudan
PAHO	Pan American Health Organization
PCC	Program Coordination Committee of OEPA
PHC	Primary Health Care
RBF	River Blindness Foundation
REA	Rapid Epidemiological Assessment
REMO	Rapid Epidemiological Mapping of Onchocerciasis
SRRA	Sudan Relief and Rehabilitation Association

SSOCP South Sudan Onchocerciasis Control Program
SVE Sentinel Village Evaluation
TCC Technical Consultative Committee of APOC
TX treatment
UNICEF United Nations Children's Emergency Fund
UTG Ultimate Treatment Goal
WHO World Health Organization
WVI World Vision International

ABSTRACT

The Carter Center in Atlanta hosted its second annual Program Review for 1997 of its Global 2000 River Blindness Program (GRBP) on February 25-27, 1998. The objectives of the Program Review were to: 1) assess the status of each program, 2) assess impediments and problems in program implementation and potential solutions, and 3) promote sharing and standardization of information. Each GRBP-assisted program (Nigeria, Sudan, Uganda, Cameroon, and OEPA) reported on treatment activities, sustainability issues, status of Mectizan® stores, assessment, training and research, and administrative issues. Key aspects of the discussions are summarized in this report.

In 1997, 5,106,133 eligible at-risk persons were treated with Mectizan® in GRBP-assisted programs (93% of the 1997 annual treatment objective); this represented a 33% increase in treatments over 1996. Most (75%) treatments were in Nigeria. Of the treatments in 1997, 3,327,975 (65%) were accomplished in partnership with the Lions Clubs International Foundation's SightFirst program (LCIF) in Nigeria, Cameroon, and Sudan. The GRBP annual treatment objective for 1998 is 5.8 million treatments, a 7% increase over 1997. Priorities for GRBP actions are: 1) completing thorough epidemiological assessments of areas of GRBP-assisted activity, 2) attaining complete coverage of treatment and health education in all at-risk villages in areas of GRBP-assisted activity, 3) submitting monthly reports of Mectizan® treatments, 4) sustaining community-based distribution programs, 5) adapting Mectizan® distribution methods to other diseases, and 6) documenting interruption of transmission, especially in Latin America.

EXECUTIVE SUMMARY

Background: Infection with the vector-borne parasite *Onchocerca volvulus* (human onchocerciasis) is characterized by chronic skin and eye lesions. The World Health Organization (WHO) estimates that at least 17.7 million people are infected, 500,000 are visually impaired and another 270,000 are blind from onchocerciasis in the endemic 37 countries. Approximately 123 million people live in endemic areas worldwide, and are therefore at risk of infection. Onchocerciasis is transmitted by small blackflies that breed in rapidly flowing rivers and streams, thus leading to the common name for the disease, "river blindness." The adult parasites are long-lived (between 8-15 years), but it is the embryos (*microfilariae*), released by female worms, that cause most of the disease. Ten years ago, ivermectin (Mectizan®), a microfilaricidal drug that can be given as a single oral dose annually in "mass" community-based treatment programs, was introduced to prevent morbidity associated with onchocerciasis. In 1987, Merck decided to donate Mectizan® free of charge to all people affected by onchocerciasis, for as long as necessary. This donation stimulated a global initiative to control onchocerciasis in severely affected areas using community-based ("mass") treatment with Mectizan®.

The Carter Center and River Blindness: In 1987, Merck approached William Foege, M.D., then-executive director of The Carter Center, for assistance with the global distribution of Mectizan®. Together, they created the Mectizan® Donation Program (MDP) and housed it at the Task Force for Child Survival and Development, an independent partner of The Carter Center. The global initiative has grown to one that enabled over 30 million treatments in 1997, and approximately 100 million treatments over the past decade. The effort represents a model of how international organizations, national ministries of health, nongovernmental development organizations (NGDOs), and industry can work successfully together toward a common goal.

In April 1996, The Carter Center expanded its role in the coalition fighting river blindness by launching the Global 2000 River Blindness Program (GRBP) as a result of acquiring most of the operations of the River Blindness Foundation (RBF), founded by John and Rebecca Moores in 1990. With field offices in Guatemala, Cameroon, Nigeria, Sudan, and Uganda, the GRBP helps local residents and health workers establish Mectizan® distribution programs in communities at greatest risk for skin and eye disease from onchocerciasis.

The Global 2000 River Blindness Program of The Carter Center collaborates with numerous partners. GRBP works closely with the Mectizan® Donation Program at the Task Force for Child Survival and Development. GRBP technical staff are housed at the Centers for Disease Control and Prevention (CDC). In Africa, partners include Lions Clubs International's SightFirst program, the World Health Organization (WHO), the World Bank, other NGDOs, and the partner countries: Cameroon, Nigeria, Sudan, and Uganda. The Carter Center has played a leading role in assisting the World Bank to secure resources for the new African Programme for Onchocerciasis Control (APOC), which over the next 10 years will establish

community-based, sustainable river blindness programs in an estimated 19 African countries. In Latin America, a regional coalition known as the Onchocerciasis Elimination Program for the Americas (OEPA) works together to control the disease. Administered by GRBP, this initiative involves the six affected countries in the Americas (Brazil, Colombia, Ecuador, Guatemala, Mexico, and Venezuela), the InterAmerican Development Bank, the Pan American Health Organization (PAHO), and CDC.

The Program Review: GRBP hosted its second annual Program Review on February 25-27, 1998 at The Carter Center in Atlanta. The review is modeled after similar reviews developed for national Guinea Worm Eradication Programs by The Carter Center's Global 2000 program and CDC, beginning with Pakistan in 1988. The main purposes of the review were to assess the status of each program and to determine impediments and problems in program implementation. In attendance were Dr. Donald Hopkins (Associate Executive Director, The Carter Center) and the GRBP country representatives from Nigeria (Dr. Emmanuel Miri), Cameroon (Dr. Albert Eyamba), Uganda (Mr. Moses Katarwa), and OEPA (Dr. Mauricio Sauerbrey and Dr. Guillermo Zea Flores). Also present was the Chair of Sudan's National Onchocerciasis Task Force (Dr. Mahmoun Homeida), and representatives from HealthNet International (Ms. Irene Goepp), the Mectizan® Donation Program (Dr. Stefanie Meredith and Dr. Bruce Dull), and Carter Center staff. Dr. Charles McKenzie (Michigan State University) was a special guest for the Sudan presentations. The review was chaired by Dr. Frank Richards Jr., Technical Director, Global 2000 River Blindness Program.

Each country representative had three hours to discuss treatment and training activities, sustainability issues, status of Mectizan® stores, epidemiological assessment activities, operations research, and administrative issues. Key aspects of the Program Review, supplemented by updated treatment data provided since the meeting, are summarized in this report, as are recommendations for GRBP actions in 1998.

Treatments: In 1997, 5,106,133 eligible at-risk persons (earp) were treated with Mectizan® in GRBP-assisted programs (93% of the 1997 treatment objective); this represented a 33% increase in treatments over 1996. Most (75%) treatments were in Nigeria. Of the treatments in 1997, 3,327,975 (65%) were accomplished in partnership with the Lions Clubs International Foundation's SightFirst program (LCIF) in Nigeria, Cameroon, and Sudan. The GRBP Annual Treatment Objective (ATO) for eligible at-risk population projection for 1998 is 5.8 million treatments with Mectizan®. Summary tables of monthly treatments of eligible persons at-risk, at-risk villages (nodule prevalence greater than 20%) and high-risk villages (nodule prevalence > 40%) are provided for the years 1997 and 1996 (Tables 1 and 2).

Figure 1 shows the annual treatment objectives (ATO) for the years 1996, 1997, and 1998, and Table 3 shows the details of the ATO calculations. GRBP projected a 33% growth in treatments between years 1996-97, but only a 7% increase for 1997-98. This trend also is reflected in Figure 2, where treatments provided in 1996 and 1997, and projected treatments for 1998 (except for Sudan), are shown. The decrease in GRBP expansion reflects the fact that

most GRBP programs have or are reaching full treatment coverage, especially in GRBP-assisted areas in Nigeria and Uganda. The graph shows little growth in treatments projected for 1998 in the Americas (reported by OEPA), but this is misleading since a major increase in treatment activity is required in Venezuela. Significant increases are projected in Cameroon for 1998, and are needed in Sudan (not shown).

Sustainability: Mectizan® delivery must be sustained for at least 10-12 years, ultimately with little to no outside funding. GRBP is developing a quarterly reporting system for monitoring sustainability indices (Annex). The most consistent reporting so far from GRBP programs is for cost per treatment (Figure 3), which ranges from US\$0.06 in Nigeria to US\$0.84 in Uganda. No cost per treatment data are currently available for the Americas or Sudan.

Funding: GRBP receives major support from the Lions Clubs International's SightFirst (LCIF) project, with which it works in partnership in three countries (Nigeria, Cameroon, and Sudan). GRBP is actively engaged in transitioning, as much as possible, its directly-funded project areas to the new African Programme for Onchocerciasis Control (APOC). Launched in 1995 by the World Bank, the \$124 million dollar, twelve-year APOC program will help support national Mectizan® distribution programs in 19 countries in Africa. GRBP staff provide some technical assistance to the new program via an institutional seat on the Technical Consultative Committee (TCC) of APOC, and former US President Jimmy Carter has been actively engaged in fund-raising assistance and advocacy for APOC. The InterAmerican Development Bank provides support to the OEPA initiative, which is based in Guatemala City. The Merck donation is valued at many millions of dollars.

GRBP PRIORITIES

The priority activities of GRBP programs are as follows:

Epidemiology-directed programs: GRBP will seek to obtain the most thorough endemicity information possible on all villages under treatment in areas of GRBP-assisted activity. The ability to determine high-risk villages (communities where morbidity from onchocerciasis is greatest, defined as having nodule rates $\geq 40\%$ or microfilaria rates $\geq 60\%$) is lacking in Uganda, Cameroon, Sudan, and Venezuela.

Coverage: GRBP will seek to attain complete coverage of treatment and health education in all at-risk villages in areas of GRBP-assisted activity. GRBP-assisted programs are nearing the state of maximum coverage (the "ultimate treatment goal") in Nigeria, Uganda, Mexico, Ecuador, and Colombia.

Sustainability: GRBP will strive to establish community-based distribution programs that can be sustained without the need for outside funding, and stress quarterly reporting of sustainability indices.

Reporting: GRBP will continue to emphasize monthly reporting of Mectizan® treatments. Annual Program Reviews will eventually be held in one of the GRBP-assisted countries.

Other diseases: GRBP will build on current successes by adapting Mectizan® distribution methods to other disease initiatives in lymphatic filariasis, schistosomiasis, and trachoma.

Elimination: GRBP will move toward the goal of elimination of onchocerciasis in the Americas, and establish a process to certify elimination. GRBP will attempt to document the impact of Mectizan® distribution on the transmission of O. volvulus in Africa.

APOC: GRBP will seek to ensure a smooth transition from LCIF support to APOC support in Nigeria, Sudan, and Cameroon. The transition of GRBP programs to "community-owned and operated" Mectizan® distribution (APOC's so-called Community-directed Treatment with Ivermectin - CDTI) is the current challenge.

Mectizan® : GRBP will help programs ensure that Mectizan® applications are submitted to MDP in a timely manner to minimize shipment difficulties and delays in receipt. GRBP will monitor new distribution procedures or needs, particularly issues related to the treatment of pregnant women, shelf life of the drug in opened bottles, security and storage of Mectizan®, and inventory control.

Table 1

Onchocerciasis: 1997 Mectizan treatment figures for GRBP-assisted areas in Nigeria, Cameroon, Uganda, and collaborative programs in Latin America and Sudan

Country/Tx Category	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL	% of ATO	% of GRBP Treatments
NIGERIA															
ATO(earp)=	3,720,000		ATO(arv)=	8,207		ATO(hrv)=	7,062								
TX(earp)	20,292	168,887	656,088	249,748	269,646	877,124	319,960	311,095	527,359	187,284	137,266	127,783	3,852,532	104%	75%
TX(arv)	41	305	1,293	506	565	1,909	620	807	1,276	460	628	520	8,930	109%	68%
TX(hrv)	41	305	1,290	498	550	1,803	522	457	825	304	414	220	7,229	102%	68%
UGANDA															
ATO(earp)=	808,514		ATO(arv)=	1,933		ATO(hrv)=	1,933								
TX(earp)	0	0	0	85,177	155,629	118,254	18,346	0	49,460	106,500	175,023	54,621	763,010	94%	15%
TX(arv)	0	0	0	354	327	100	46	0	26	122	479	479	1,933	100%	15%
TX(hrv)	0	0	0	354	327	100	46	0	26	122	479	479	1,933	100%	18%
CAMEROON															
ATO(earp)=	585,085		ATO(arv)=	706		ATO(hrv)=	706								
TX(earp)	3,403	19,712	23,311	28,869	16,531	9,517	6,189	9,133	10,575	2,704	12,800	69,120	211,864	36%	4%
TX(arv)	17	43	120	172	147	77	52	47	256	34			965	137%	7%
TX(hrv)	15	43	120	172	147	77	52	47	256	256			1,185	168%	11%
OEPA*															
ATO(earp)=	361,851		ATO(arv)=	1,928		ATO(hrv)=	251								
TX(earp)			71,851			80,635			22,284			56,818	231,588	64%	5%
TX(arv)												1,388	1,388	72%	11%
TX(hrv)												240	240	96%	2%
SUDAN															
TX(earp)								4343	8322	9952	18413	6109	47,139		1%
TX(arv)															
TX(hrv)															
Cumulative totals	ATO(earp)=	5,475,450		ATO(arv)=	12,774		ATO(hrv)=	9,952							
TX(earp)	23,695	186,599	751,250	363,794	441,806	1,085,530	344,495	324,571	618,000	306,440	343,502	314,451	5,106,133	93%	100%
TX(arv)	58	348	1,413	1,032	1,039	2,086	718	854	1,558	616	1,107	2,387	13,216	103%	100%
TX(hrv)	56	348	1,410	1,024	1,024	1,980	620	504	1,107	682	893	939	10,587	106%	100%

ATO: Annual Treatment Objective

arv: At-Risk Villages

TX: Number Treated

hrv: High-Risk Villages (module prevalence >39% or mf prevalence >59%)

earp: Eligible At-Risk Population

*OEPA figures reported quarterly; hrv villages reflect prevalence at time of initiation of Mectizan therapy;

Mexico uses >49% mf prevalence as hrv definition

Uganda and Cameroon hrv numbers not well established

Table 2

Onchocerciasis: 1996 Mectizan treatment figures for GRBP-assisted areas in Nigeria, Cameroon, Uganda, and collaborative programs in Latin America

Country/Tx Category	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL	% of ATO	% of GRBP Treatments
NIGERIA															
TX(earp)	2,947,000		ATO(earv)=	7,014		ATO(hrv)=	5,756								
TX(arv)	16,237	130,052	307,216	375,304	541,215	48,007	50,068	326,764	334,601	19,024	21,803	860,388	3,030,679	103%	79%
TX(hrv)		107	1,024	790	1,218	66	80	450	620	83	51	1,636	6,125	87%	67%
		107	1,024	789	1,203	66	80	448	615	77	46	1,561	6,016	105%	75%
UGANDA															
TX(earp)	648,514		ATO(arv)=	1,418		ATO(hrv)=	1,418								
TX(arv)	0	31,723	78,018	90,645	149,308	87,139	18,494	0	0	31,443	10,795	936	498,501	77%	13%
TX(hrv)	0	81	291	219	298	138	71	0	0	50	51	31	1,230	87%	13%
	0	81	291	219	298	138	71	0	0	50	51	31	1,230	87%	15%
CAMEROON															
TX(earp)	207,021		ATO(arv)=	620		ATO(hrv)=	620								
TX(arv)				23,836	12,115	8,846	19,372	1,930	1,897	7,866	22,676	2,891	101,429	49%	3%
TX(hrv)				132	121	63	34	3			31	17	401	65%	4%
				132	121	63	34	3			31	15	399	64%	5%
OEPA															
TX(earp)	328,576		ATO(arv)=	1,659		ATO(hrv)=	353								
TX(arv)													197,571	60%	5%
TX(hrv)													1,443	87%	16%
													345	98%	4%
Cumulative totals	4,131,111		ATO(arv)=	10,711		ATO(hrv)=	8,147								
TX(earp)	0	16,237	161,775	489,785	702,638	143,992	87,934	328,694	336,498	56,333	55,274	864,215	3,828,180	93%	100%
TX(arv)	0	0	188	1,141	1,637	267	185	453	620	133	133	1,684	9,199	86%	100%
TX(hrv)	0	0	188	1,140	1,622	267	185	451	615	127	128	1,607	7,990	98%	100%

ATO: Annual Treatment Objective
 TX: Number Treated
 earp: Eligible At-Risk Population

arv: At-Risk Villages
 hrv: High-Risk Villages (module prevalence >39%)

Table 3

GRBP Annual Treatment Objectives, 1996-1998

1996		1997		1998		% change	% change
Nigeria		Nigeria		Nigeria			
1996 ATO(earp)	2947000	1997 ATO(earp)	3720000	1998 ATO(earp)	4030000	26%	8%
1996 ATO(arv)	7014	1997 ATO(arv)	8207	1998 ATO(arv)	10524	17%	28%
1996 ATO(hrv)	5756	1997 ATO(hrv)	7062	1998 ATO(hrv)	6979	23%	-1%
Uganda		Uganda		Uganda			
1996 ATO(earp)	648514	1997 ATO(earp)	900414	1998 ATO(earp)	845000	39%	-6%
1996 ATO(arv)	1418	1997 ATO(arv)	1933	1998 ATO(arv)	1804	36%	-7%
1996 ATO(hrv)	1418	1997 ATO(hrv)	1933	1998 ATO(hrv)	1804	36%	-7%
Cameroon		Cameroon		Cameroon			
1996 ATO(earp)	207021	1997 ATO(earp)	585085	1998 ATO(earp)	599395	183%	2%
1996 ATO(arv)	620	1997 ATO(arv)	706	1998 ATO(arv)	2190	14%	210%
1996 ATO(hrv)	620	1997 ATO(hrv)	706	1998 ATO(hrv)	1707	14%	142%
OEPA		OEPA		OEPA			
1996 ATO(earp)	328576	1997 ATO(earp)	361851	1998 ATO(earp)	358875	10%	-1%
1996 ATO(arv)	1659	1997 ATO(arv)	1928	1998 ATO(arv)	1799	16%	-7%
1996 ATO(hrv)	353	1997 ATO(hrv)	251	1998 ATO(hrv)	251	-29%	0%
GRBP TOTAL 96		GRBP TOTAL 97		GRBP TOTAL 98			
1996 ATO(earp)	4131111	1997 ATO(earp)	5475450	1998 ATO(earp)	5833270	33%	7%
1996 ATO(arv)	10711	1997 ATO(arv)	12774	1998 ATO(arv)	16317	19%	28%
1996 ATO(hrv)	8147	1997 ATO(hrv)	9952	1998 ATO(hrv)	10741	22%	8%

ATO: Annual Treatment Objective

TX: Number Treated

earp: Eligible At-Risk Population

Uganda and Cameroon hrv numbers not well established

Sudan ATO values not established.

arv: At-Risk Villages

hrv: High-Risk Villages (nodule prevalence >39% or mf prevalence >59%)

Figure 1

GRBP-assisted Programs: Comparison of Annual Treatment Objectives: 1996, 1997, and 1998

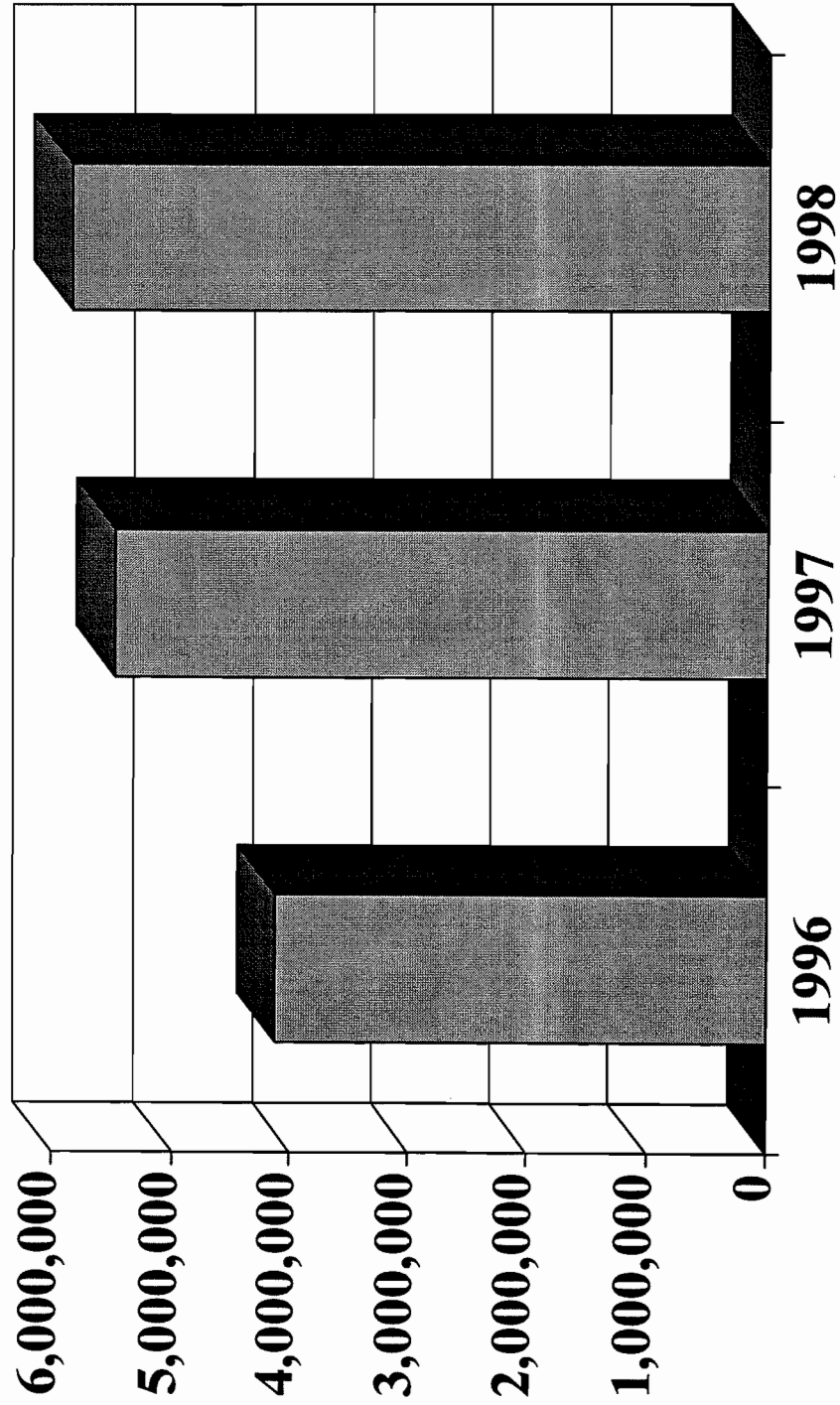


Figure 2

GRBP-assisted Programs: Comparison of 1996 and 1997 Treatment Figures, and 1998 ATOs

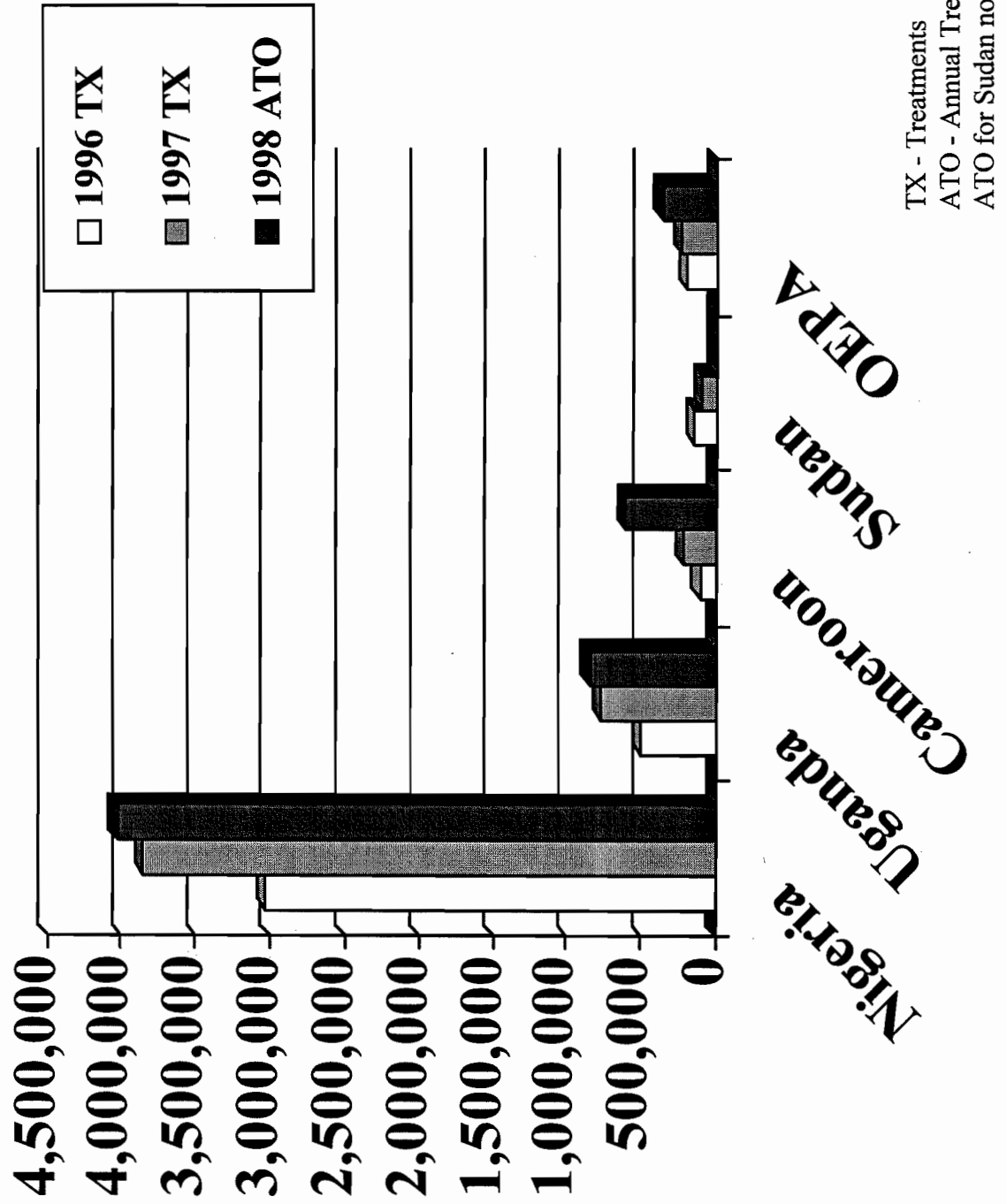
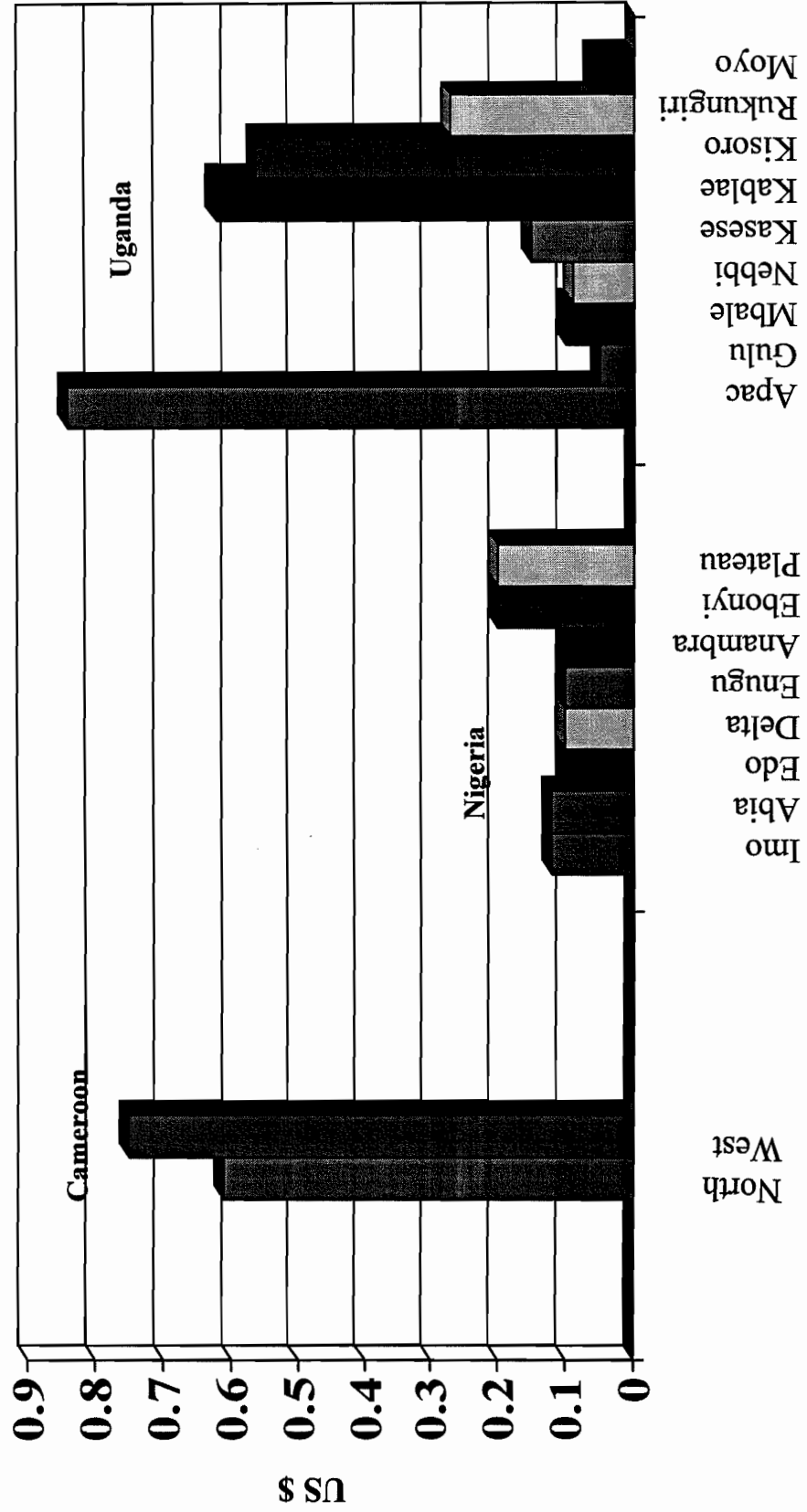


Figure 3

Cost Per Person Treated (US\$) during 1997 for GRBP-assisted Programs in Cameroon, Nigeria and Uganda



NIGERIA

Nigeria is considered to be the most highly endemic country in the world for river blindness, having as much as 30-40% of the global burden of onchocerciasis. There are approximately 15-24 million Nigerians at risk of the disease. The Nigerian Onchocerciasis Control Program, which reported Mectizan® treatments of only 71,000 persons in 1991, has progressed to more than nine million treatments in 1997 (Figure 4); more than 23 million cumulative treatments have been given.

The growth of GRBP treatments by year, compared to all Nigerian treatments, is also shown in Figure 4. RBF/GRBP assistance began in Plateau state in January 1992, in Abia and Imo States in September 1992, and in Edo, Delta, Anambra, Ebonyi, and Enugu States in January 1994.

GRBP Nigeria activities consist of: 1) direct assistance to treatment activities in nine states (GRBP has offices in Jos, Lagos, Owerri, Benin City, and Enugu), 2) helping to implement nationwide onchocerciasis control through partnership with the Nigerian government and a coalition of NGDOs (Africare, Christoffel Blindenmission, International Eye Foundation, SightSavers, UNICEF and others) through a national Nigerian Onchocerciasis Task Force (NOTF), and 3) maintaining a management training center to support country-wide instruction in Mectizan® distribution.

A major GRBP-partner in southeastern Nigeria (in Abia, Imo, Edo, Delta, Anambra, Ebonyi, and Enugu States) is the Lions Clubs International Foundation's (LCIF) SightFirst Program. The Lions Clubs District 404, with LCIF support, is actively involved in the mobilization, health education, and treatment activities in those seven states.

Treatment Activities: In 1997, GRBP Nigeria helped provide Mectizan® to 3,852,532 persons (Table 4), which represents about 40% of all treatments provided in Nigeria that year (Figure 4). Health education has been conducted in conjunction with treatments in all GRBP-assisted areas. The program treated in 8,404 villages (7,209 considered high-risk villages). In those states where GRBP and Lions are partners, 3,163,278 persons were treated (82% of all GRBP Nigeria treatments). Compared to activities elsewhere in Nigeria, treatments in the GRBP-assisted states in 1998 are not projected to increase over 1997 figures as GRBP Nigeria has nearly achieved complete coverage (Figure 5).

Assessments: Epidemiological assessments have been completed and cross validated in all nine GRBP-assisted states in Nigeria.

Mectizan®: 1997 was marked by the timely receipt of Mectizan® and presence of adequate stores for GRBP-assisted programs (a great improvement compared to 1996). Nonetheless, problems continue with shipping and receipt of the drug into Nigeria. Logistically, it would be better if Mectizan® could be shipped into Nigeria only once or twice per year rather than four

times annually. It was also noted that Mectizan® storage had passed from the Africare compound to UNICEF's as a temporary measure (Africare will cease operations in onchocerciasis in Nigeria in 1998). The final site for Mectizan® storage in Nigeria has not yet been resolved.

APOC: APOC approved proposals for Plateau and Nasarawa States, and funding will begin in 1998. Proposals for five southeast states have been completed and were submitted for TCC review in January 1998. On an administrative note, Dr. Miri noted that APOC had approved the payment of professional travel *per diem* of \$75, which in no way would be sustainable, and which ultimately would be disruptive after APOC's withdrawal, when workers might be unwilling to travel if less *per diem* were offered.

Jos Training Center: The objective of the Training Center, supported primarily by a grant provided by the Shell Foundation, is to more effectively deliver Mectizan® through the development of better management skills. Experts in international health management at Rollins School of Public Health of Emory University and CDC assist in the "training of trainers" who will teach project planning, problem solving, financial management, the use of data in decision making, logistics, and total quality management "TQM" techniques. Two full-time Nigerian management trainers, Dr. Abel Eigege and Ms. Ifeoma Umolu, teach the in-country management training course, and visit the trainees on their job sites to follow up on their activities. The program has held four in-country workshops and trained 91 managers (69 in 1997) since the program began in 1996. Tuition pays for 41% of the costs of the training. Fifty-five percent of trainees work at the state level (in 30 Nigerian states) and 18% at the zonal (regional) level. Each trainee typically trains 5-7 other members of the local work teams so there is an important "snowball" effect from this program. An additional 80 managers are scheduled to attend 1998 workshops.

Progress toward sustainability: Dr. Miri discussed the transition to "community-owned and operated" Mectizan® distribution (APOC's Community-directed Treatment with Ivermectin strategy - CDTI), particularly issues that he recently explored in a paper on management and sustainability (Problems and Perspectives of Programme Management: A Case Study of the Plateau State Programme, Nigeria). This paper was presented at the 10-year anniversary celebration of the Mectizan® Donation Program in Liverpool, England, in December 1997. Dr. Miri divided the components of the program into two groups: those that can easily be integrated into the primary health care system and the community (these include personnel, supervision, training, drug collection, and financial support) and those that cannot (such as logistic and equipment support, sentinel village evaluations, procurement and distribution of the drug to the local level, and data management).

Sustainability indices:

1. In 100% of at-risk villages in Nigeria treated in 1997, the community members themselves had selected the community-based distributors (CBDs), each of whom met

standard requirements set by GRBP and the Ministry of Health. However, communities were not otherwise involved in the *design* of the treatment program in the GRBP-assisted states, as required by CDTI.

2. In 100% of the at-risk villages the CBDs were supervised by ministry of health primary health care workers.
3. There were 6,020 village health committees (67%) functioning in the 8,930 at-risk villages in GRBP areas of assistance.
4. In 100% of the at-risk villages, the local and state governments have a line item in their budget for onchocerciasis control. However, political instability and constant shifting of local and state authorities resulted in the need for 164 LGA advocacy visits by GRBP in 1997.
5. The cost per treatment in GRBP-assisted states ranged from US\$ 0.10 - 0.20 per treatment. (Figure 3)

Challenges to the program:

Fuel scarcity was a major impediment to transport, and is expected to worsen in 1998.

A decrease in willingness to take the drug was noted in areas where the program is most mature. This may be due to the fact that the people felt better, had less itching, and wondered why there was a need to continue to take the medicine.

No severe adverse reactions were reported in GRBP-assisted programs in Nigeria, including in Edo and Delta States, where *Loa loa* occurs (Persons infected with *Loa loa* parasites in their blood are a special concern for more serious adverse reactions when treated for the first time with Mectizan - see Annex). Close monitoring for secondary reactions according to MDP recommendations will continue in these states, although most areas are now entering into second and third round therapy, when risk of reaction is less.

NIGERIA RECOMMENDATIONS 1998:

Mectizan®: Seek resolution of Mectizan® shipment and storage issues with the MDP, UNICEF, and the Government of Nigeria. Monitor impact of the transition to the CDTI strategy of APOC and its impact on data flow needed to monitor Mectizan® inventories.

Government support: The federal government has contributed only minimally to the national campaign. Seek more financial and material support for the program from all levels of Nigerian government.

APOC: Seek smooth transfer from LCIF funding to APOC funding throughout the seven GRBP-assisted southeastern states. Try to help correct the \$75.00 per diem offered by APOC.

Epidemiology: Stress treatment coverage as well as sustainability. Encourage careful review of the Nigerian REMO data with WHO. Encourage the Federal MOH to summarize the Nigerian treatments by all programs in that country in 1997 for WHO's Weekly Epidemiological Record (1996 results were published in the Weekly Epidemiological Record in July, 1997, 72 (30)).

Transmission impact: Seek to analyze data from the sentinel village evaluations in Plateau and Nasarawa States, with particular focus on the impact of treatment on transmission of onchocerciasis.

Nigeria GRBP-Assisted States

Map 1

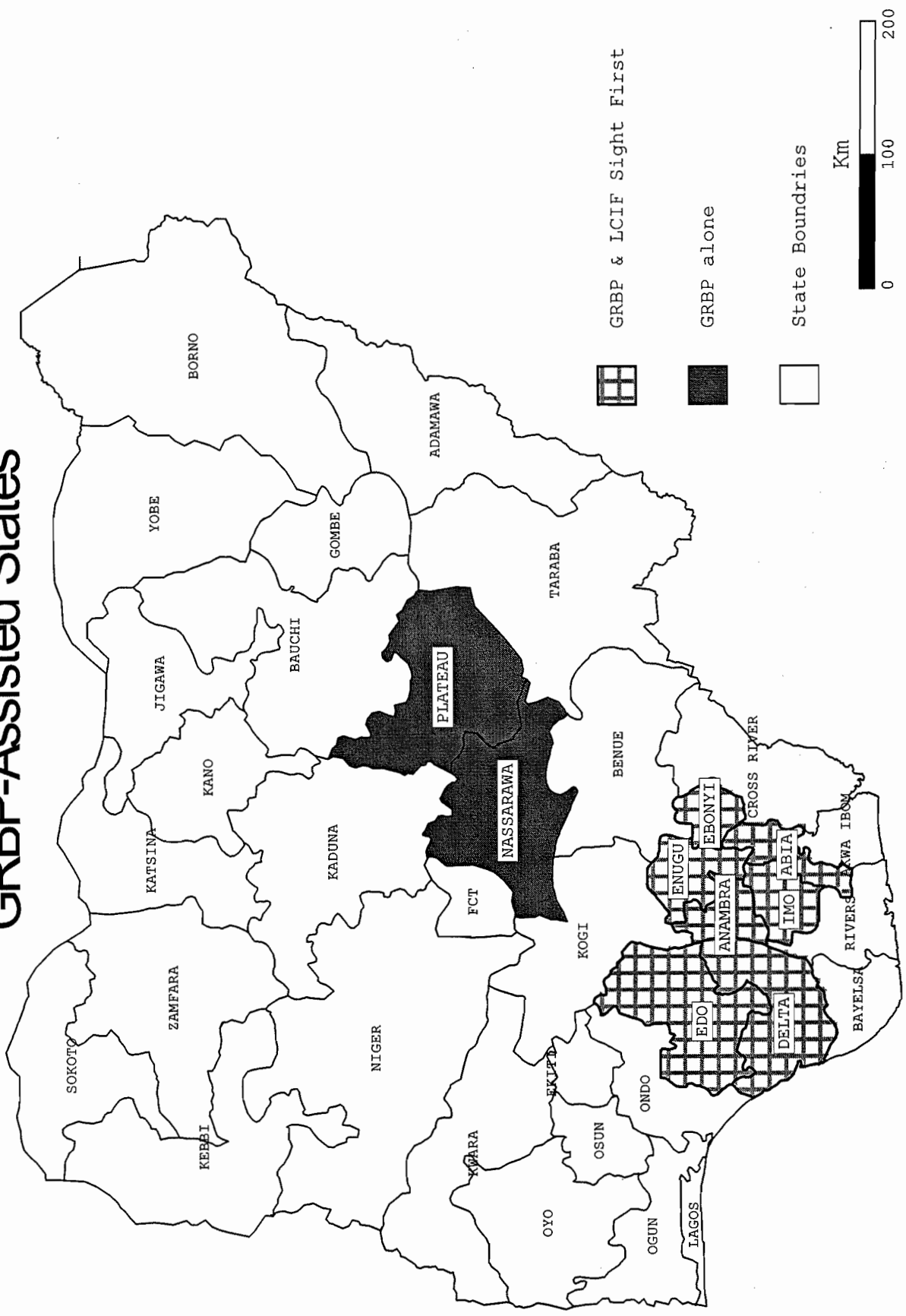


Table 4

1997 GRBP-assisted treatments in Nigeria, by state

1997	ATO(earp)	TX 1997	% ATO	ATO(arv)	TX 1997	% ATO	ATO(hrv)	TX 1997	% ATO
Abia*	270,000	319,272	118%	934	922	99%	727	715	98%
Anambra*	400,000	426,591	107%	964	964	100%	834	834	100%
Delta*	460,000	488,064	106%	664	656	99%	659	851	129%
Ebonyi*	300,000	253,819	85%	885	885	100%	873	873	
Edo*	550,000	518,851	94%	671	671	100%	645	645	100%
Enugu*	480,000	540,779	113%	1130	1072	95%	1084	1026	95%
Imo*	610,000	615,902	101%	2228	1888	85%	1415	1273	90%
Nasarawa**	402,400	431,551	107%	847	847	100%	690	690	
Plateau**	247,600	257,703	104%	607	503	83%	319	302	95%
Total	3,720,000	3,852,532	104%	8930	8408	94%	7246	7209	99%

*LCIF-assisted

**APOC-assisted

ATO: Annual Treatment Objective TX: Number Treated earp: Eligible At-Risk Population
arv: At-Risk Villages hrv: High-Risk Villages (nodule prevalence >39% or mf prevalence>59%)

Figure 4

Nigeria: GRBP-assisted Mectizan Treatments as Part of the Total Treatments Provided, 1989-97

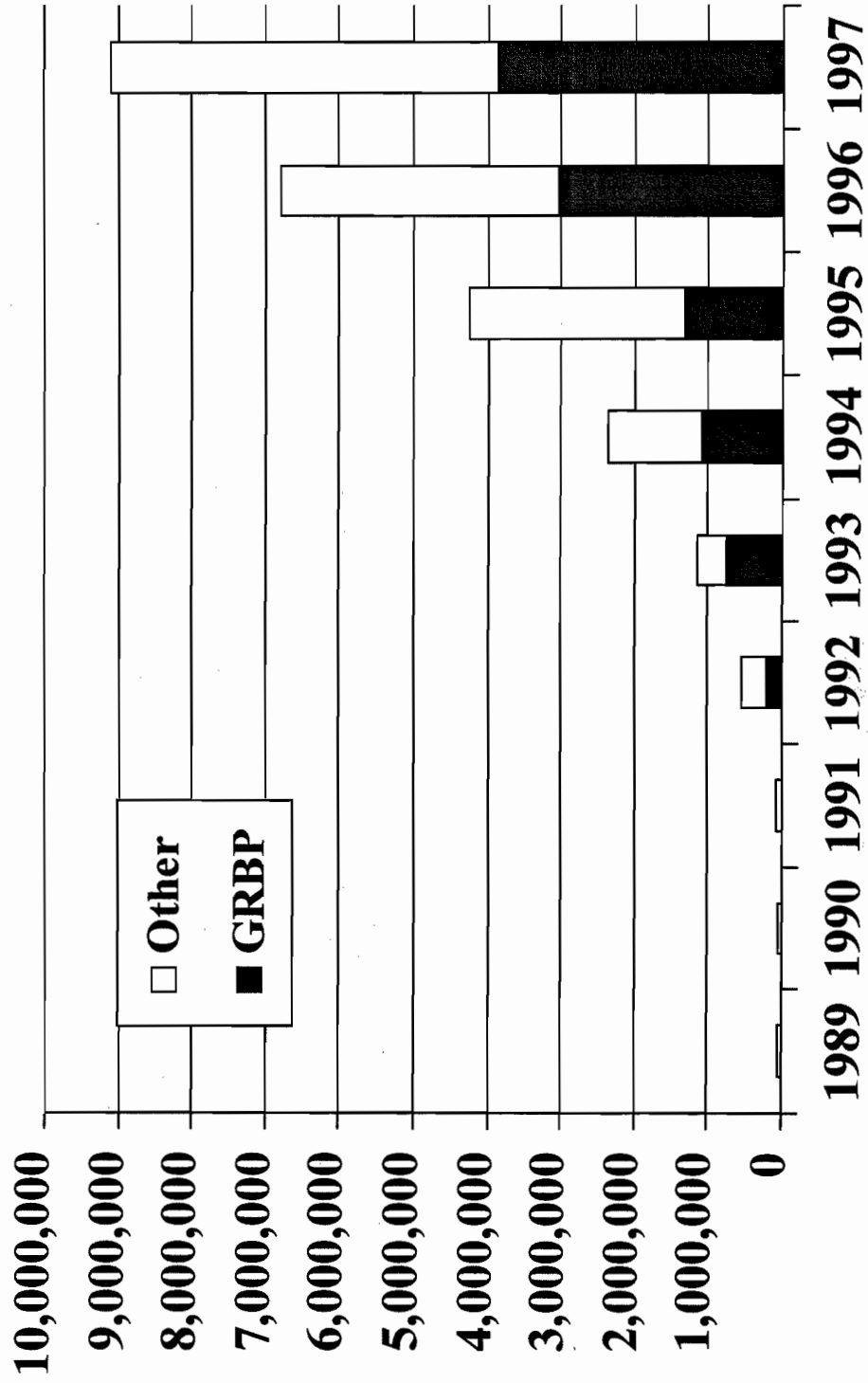
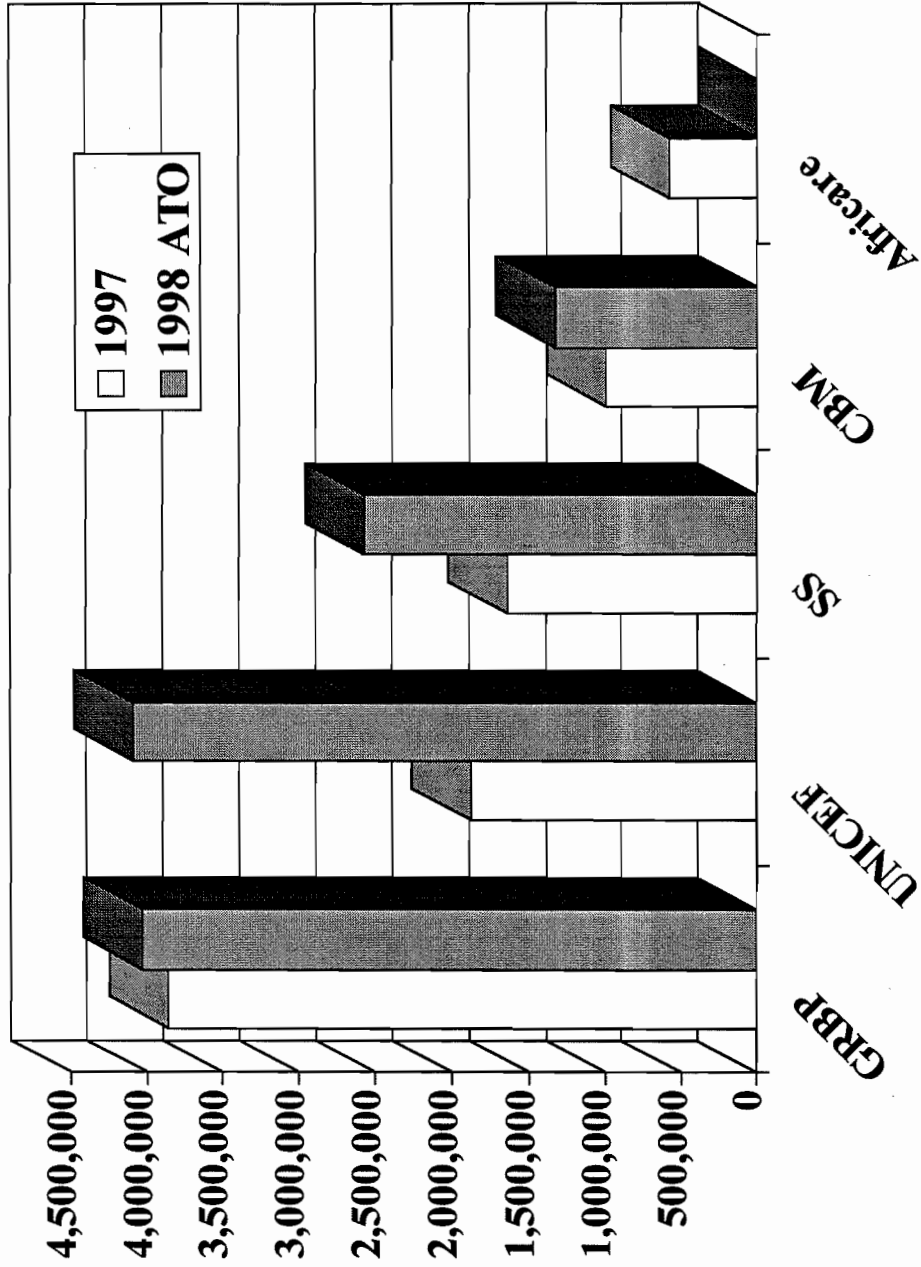


Figure 5

Nigeria: 1997 Treatments and 1998 ATOs, by Assisting NGDO*



*Only NGDOs providing over 500,000 treatments are shown

UGANDA

Onchocerciasis affects about 1.8 million persons residing in 18 (of 39) districts in Uganda. The eligible at-risk population for treatment, by district, is shown in Figure 6. RBF first began treatment activities in Uganda in 1993, with GRBP assuming that program in 1996. Currently, GRBP-assisted programs are active in all four foci (e.g., Southwest, West Nile, Middle North, and Mount Elgon) of onchocerciasis in the country and in 11 of the 18 endemic districts: Kisoro, Kabale, Rukungiri, and Kasese (in the Southwest focus bordering the former Zaire); Nebbi, Moyo and Adjumani (the West Nile focus bordering Sudan and the former Zaire), Gulu, Kitgum, and Apac (the Middle North focus); and Mbale (the Mount Elgon focus in the east, bordering Kenya). Other NGDO partners in Uganda include Sight Savers International (in Masindi, Hoima, and Kibale districts), Christoffelblinden Mission (in Bushenyi and Mbarara districts), the Church of Uganda (in Arua District), and the German bilateral agency Gemeinschaft fur Technische Zusammenarbeit (GTZ) (in Kabarole District).

1997 Treatment Activities: Treatment activities in Uganda since 1991, and projected treatments through 2001, are shown in Figure 7; a plateau in treatments shows that complete coverage of at-risk populations in Uganda is being reached. The contribution of RBF/GRBP to national treatments since 1993 is shown in Figure 8.

In 1997, GRBP Uganda treated 763,010 persons, which was 94% of its 1997 ATO (Table 5), and 68% of all Ugandan treatments provided (1,116,563). The treatment figures include treatments of 18,407 refugees and other "visitors" from across the borders with Sudan and the former Zaire. Many of these persons come specifically for Mectizan® treatment. Health education has been conducted in conjunction with treatments in all GRBP-assisted areas. All of the 1933 at-risk villages targeted for treatment in GRBP-assisted districts were reached. Coverage in Nebbi appeared low (77%) due to the fact that the 1997 ATO for that district was set too high; coverage of at-risk populations there was actually adequate. The decision was made that GRBP would support activities in Mbale in 1997, after the withdrawal of World Vision from that district. GRBP-assisted activities in Mbale provided treatment to 147,854 persons (19% of GRBP Uganda 1997 treatments). Adjumani State was recently formed from Moyo, a district of current GRBP activities.

Assessments: No rapid assessment activities were reported for 1997. In Uganda numbers of high-risk villages are given as the same figure as at-risk villages. GRBP Uganda does not have sufficient data to distinguish between at-risk and high-risk villages.

Mectizan®: There were no problems with Mectizan® importation and/or tracking in Uganda during 1997.

APOC: Kisoro and Kasese Districts were approved for APOC funding in December, 1996. Kabale and Mbale Districts were approved in December of 1997, and Rukungiri and Nebbi districts submitted proposals in January 1998. Moyo, Apac, Gulu, and Adjumani will submit

proposals in June, 1998.

Mr. Katarwa described several difficulties in the 1997 APOC experience in Kisoro and Kasese, where 67,941 treatments were given in 1997. Treatment activities are carried out under the supervision of the assistant field officers (AFOs), who report to the district medical officers (DMOs). The AFOs liaise with the villages through supervisors in the PHC system in subcounty posts. Financial aspects in the districts are managed through the District Finance Officers (DFOs):

1. Late funding: Although APOC support for Kisoro and Kasese Districts was anticipated for the entire calendar year, the project did not receive any APOC funds until June 1997. Funding was expected in January 1997 and the late receipt delayed treatment in the districts, which was planned for February and March (Figure 9).
2. Release of funds: The DFO must make two trips to MOH Secretariat to obtain funds: The first trip to submit the requisition and the second trip to obtain a bank draft. Although it was agreed early on that funding would be released for quarterly activities, in practice funding is only advanced for one month's work. This coupled with the procedures described below have made it difficult to obtain funds needed to implement the program. The procedure is as follows:
 - a. Request for funds by DFO to the Secretariat in Kampala.
 - b. Vouchers prepared at the Secretariat and taken to Entebbe for approval by the Permanent Secretary. The speed here depends on his availability.
 - c. The bank draft is brought from the bank, and collected by the DFO.
 - d. The money is deposited in the district account.
 - e. There can be an additional waiting period for the money to clear. Before withdrawal is possible within the district, another set of internal procedures for obtaining cash must be followed: requisition by DFO, approval by DMO, voucher raised and approved, check signed by all three signatories, and finally, cash withdrawal.

Thus, it can take two to four weeks to get the monthly operating budget. It is very important that the process be simplified in the future.

3. Per diem issues: The *per diem* approved by WHO is low, and collaboration with WHO is complicated:
 - a. DFOs: DFOs must travel to Kampala to check on the drafts (see above), and sometimes must use their own money to support this travel. APOC has not refunded some of these expenditures.
 - b. Supervisors: Since one AFO might coordinate as many as 125 villages, he must rely on the supervisors based at the subcounty level to interact with the communities. The supervisors must have support such as transport (bicycles) and overnight allowances. Some of these supervisors are expected to travel 20

kilometers by foot, or surmount lesser distances that are quite mountainous. It is unreasonable to assume that they will either walk or use their own means to reach the communities, and then return that same day.

- c. AFOs: The AFOs interact with the supervisors, often at the community level, to facilitate their work. The distances between the district, the subcounty level, and communities are considerable, and cannot be traveled daily. For example, the distance from Bwera to Kasese is 70 kilometers, and Bwera is where the Kasese AFO establishes his base for several days, from which he travels to more remote communities in the mountains. APOC allowances will not support the cost of the AFO residing in Bwera.

Progress toward sustainability: Mr. Katarwa completed his MPH thesis ("Selection and Validation of Indicators for Sustainability of Community-based Ivermectin Distribution for Onchocerciasis Control - a Retrospective Study") at the Rollins School of Public Health of Emory University in December 1997. He reported on certain findings, including a questionnaire survey in which high coverage was related to the community's involvement in the selection of the method of distribution, health education sessions, and participation in the selection of the community distributor. Interestingly, in his analysis, incentives were negatively related (correlated) to coverage.

The cost per person treated in Uganda by district ranges from US\$0.05 to US\$0.84, with the average cost per person is \$0.37. There are clear economies of scale (Figure 10), with the highest costs being in the districts with the fewest persons treated (Apac, Kabale, Kisoro, Rukungiri).

Constraints:

The aging motorcycle fleet and the cost of repairs remains a major issue, with the program spending between US\$300-\$3000 on each machine in 1997. This may double in 1998.

Insecurity in Gulu, Kasese, Moyo, and Kitgum continues to adversely affect work, and AFOs from Moyo and Nebbi must fly to and from the districts due to rebel activity that prevents road travel. GRBP activities in Kitgum are completely stalled, and no treatment activities are planned there in 1998.

Heavy rains also were a constraining factor in many of the districts, especially Kabale and Mbale.

Demands for incentives at the village level is a constant challenge in most districts.

A new national policy of decentralization has resulted in an entire new power structure emerging in the districts, which now must be reckoned with for local political and financial support of the program.

UGANDA RECOMMENDATIONS 1998:

APOC: GRBP will follow closely the financial and administrative experience in APOC-supported districts, and address the insufficient per diem rates in the APOC budgets via the NOTF.

Assessments: Further analyze available data to distinguish (if possible) between at-risk and high-risk villages.

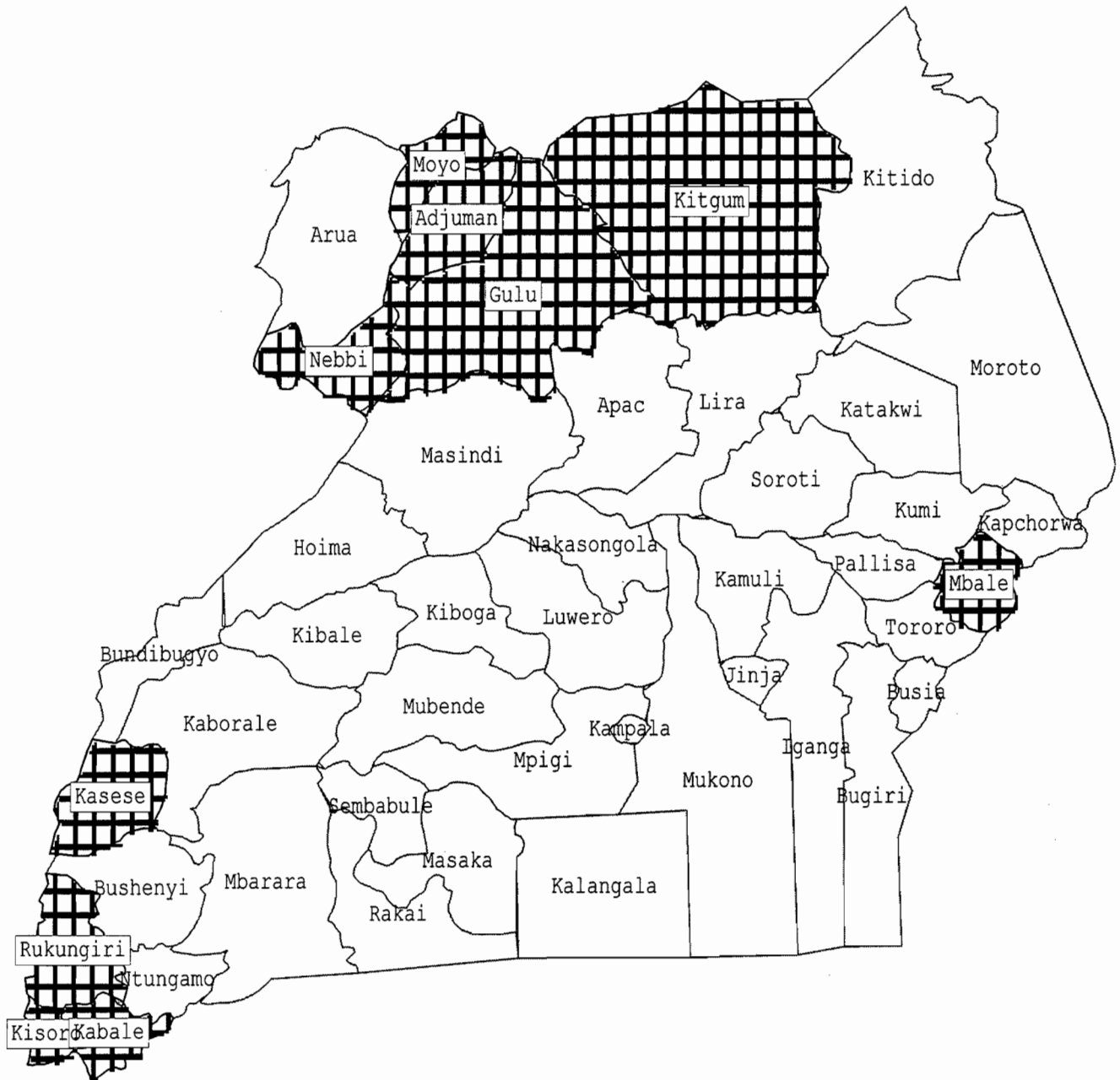
Transmission: Review and consider using sentinel village evaluation data to study the impact of Mectizan® on transmission in villages that have maintained high coverage over 4-5 treatment rounds.

Sustainability: Continue to develop and analyze Mr. Katarwa's data sets, but using less complicated statistical approaches. Management training might be considered for members of the Uganda team at the training center in Nigeria.

Map 2

Uganda

GRBP - Assisted Districts



□ District Boundaries

▣ GRBP - assisted districts

Table 5

1997 GRBP-assisted treatments in Uganda, by district

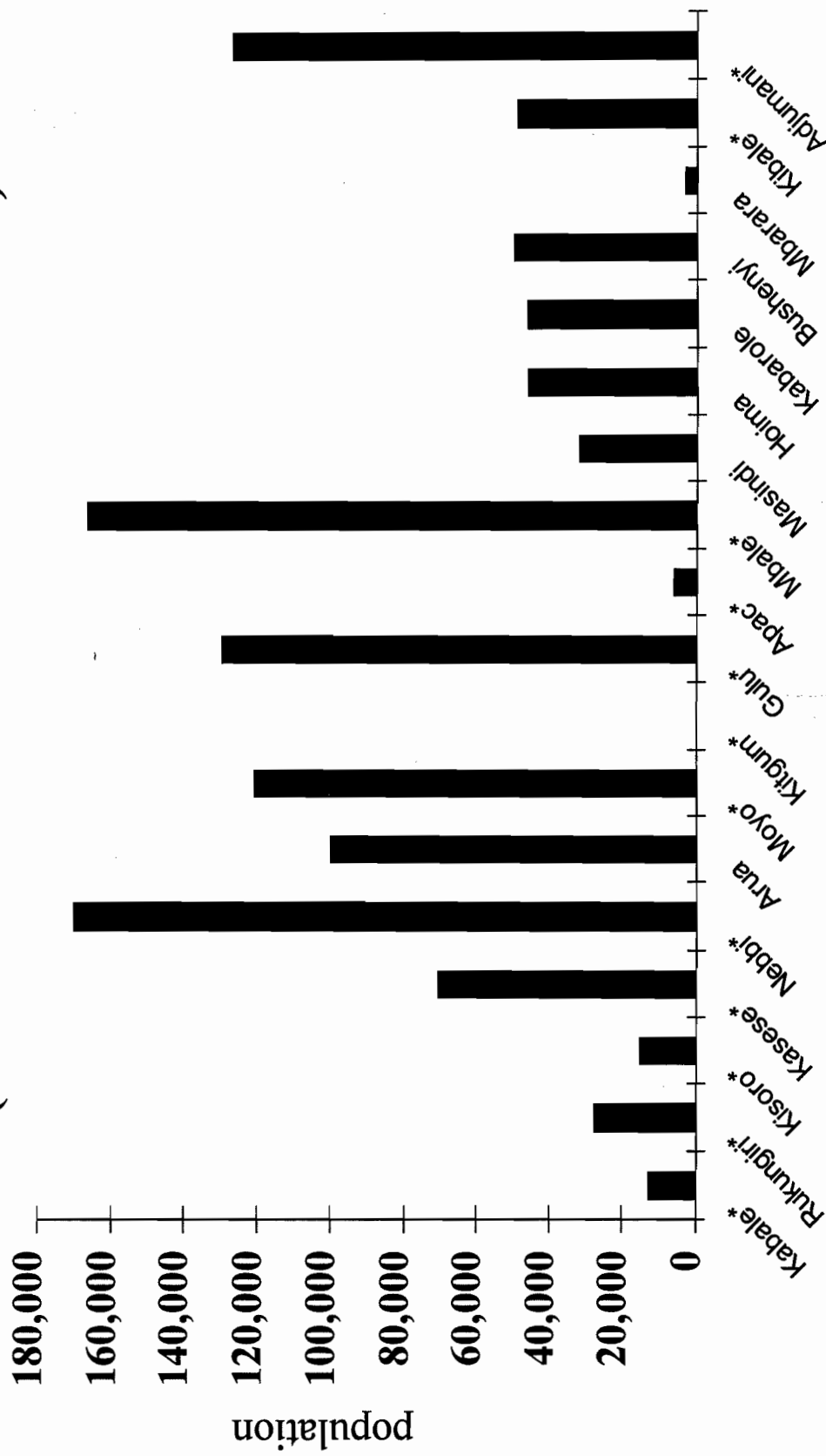
UGANDA	ATO(earp)	TX 1997	% ATO	ATO(arv)	TX 1997	% ATO	ATO(hrv)	TX 1997	% ATO
Moyo	249,544	193,349	77%	258	257	100%	258	257	100%
Kabale	11,618	12,822	110%	27	27	100%	27	27	100%
Rukungiri	26,500	26,273	99%	22	22	100%	22	22	100%
Kasese**	49,780	54,304	109%	125	123	98%	125	123	98%
Kisoro**	11,450	13,637	119%	31	31	100%	31	31	100%
Apac	4,622	5,552	120%	9	9	100%	9	9	100%
Nebbi	160,000	165,619	104%	678	678	100%	678	678	100%
Gulu	135,000	143,600	106%	268	207	77%	268	207	77%
Mbale	160,000	147,854	92%	515	431	84%	515	431	84%
Total	808,514	763,010	94%	1933	1785	92%	1933	1785	92%

**APOC-assisted

ATO: Annual Treatment Objective TX: Number Treated earp: Eligible At-Risk Population
 arv: At-Risk Villages hrv: High-Risk Villages (nodule prevalence >39% or mf prevalence>59%)
 Uganda hrv numbers not well established

Figure 6

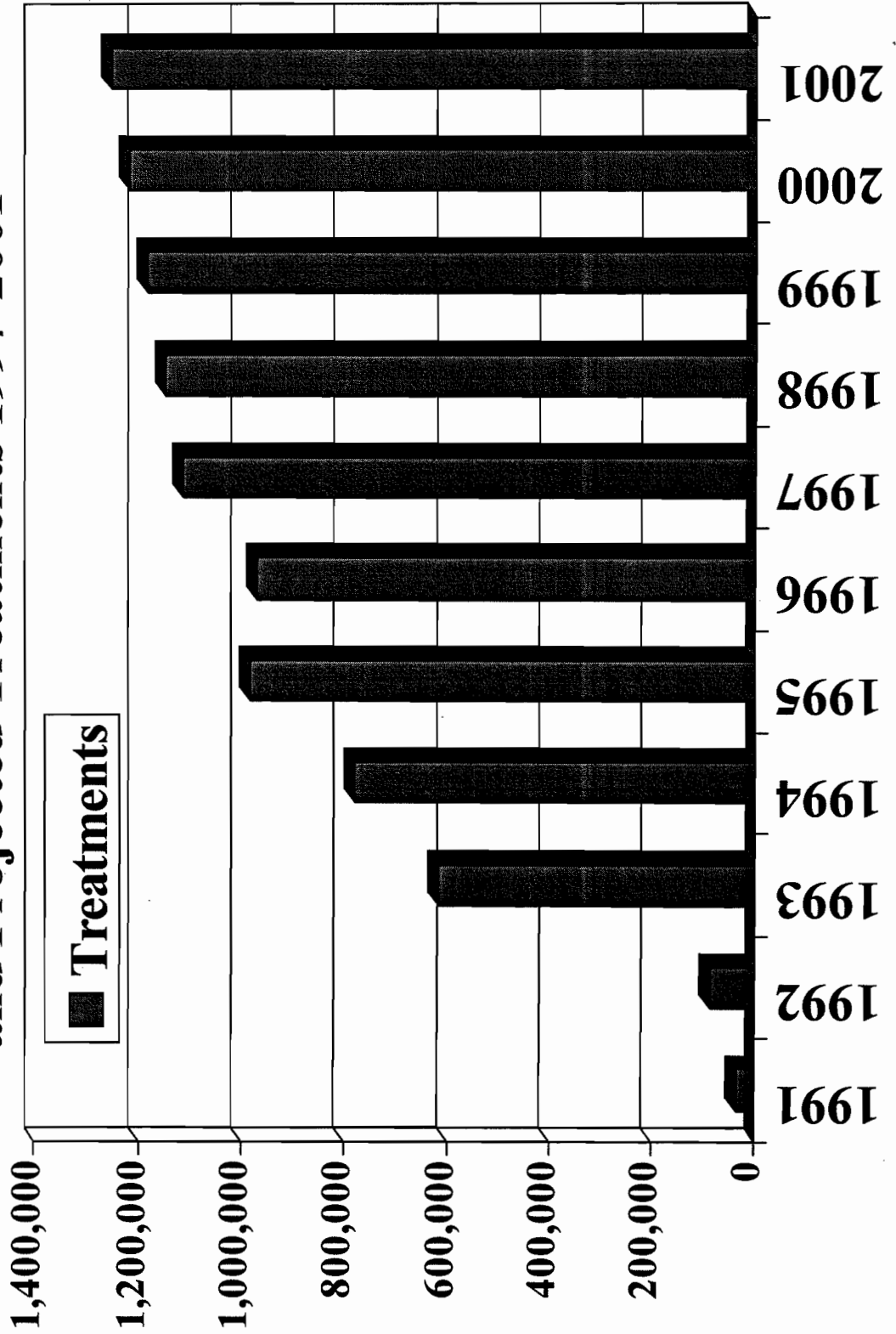
Onchocerciasis in Uganda: Eligible At-Risk Populations for Treatment, by District (Asterisks are GRBP-assisted Districts)



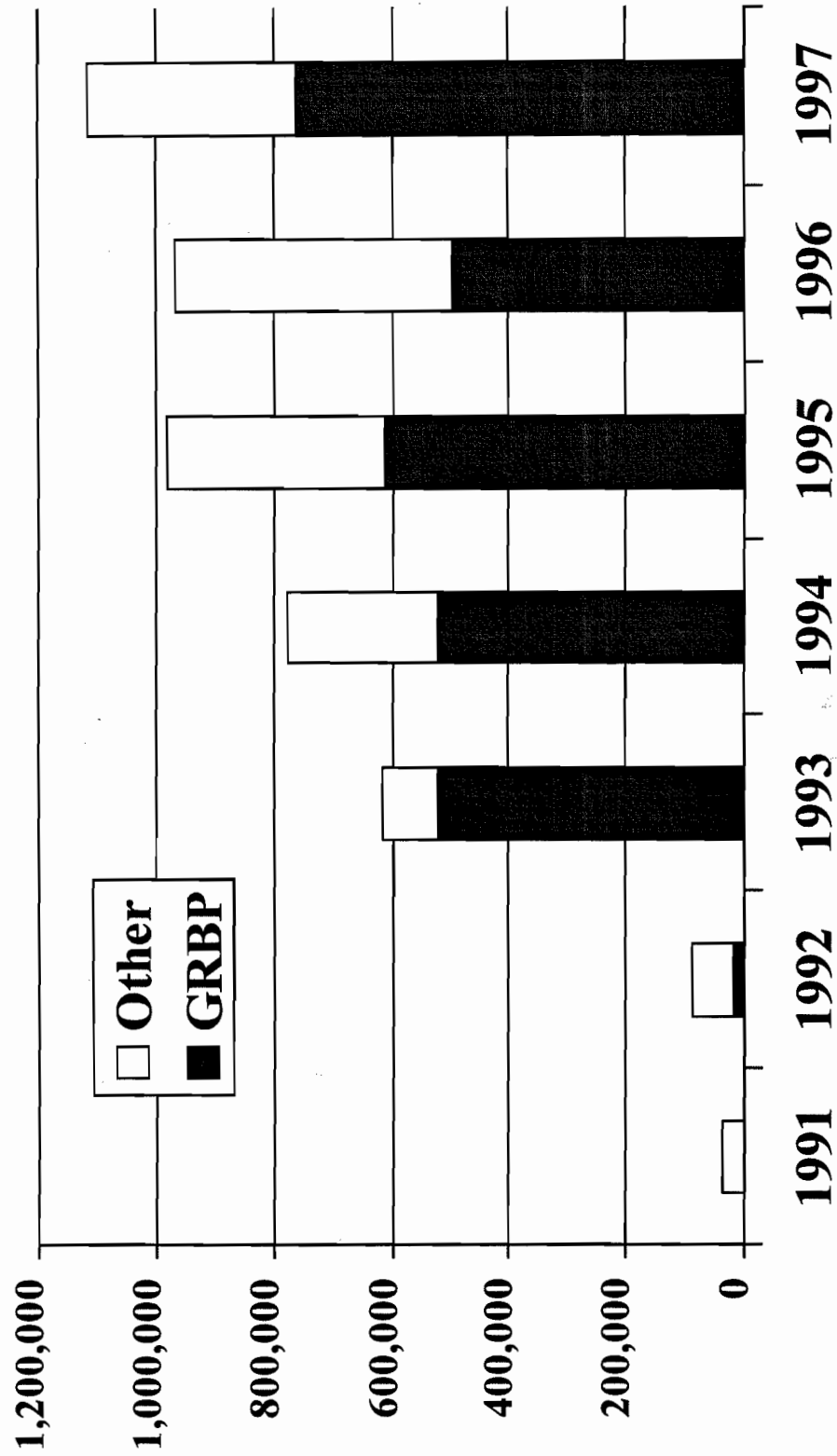
Source: 1995 National Plan, GRBP data

Figure 7

Mectizan Treatments in Uganda, 1991-1996, and Projected Treatments 1997-2001



GRBP-assisted Mectizan Treatments as Part of the Total Treatments Provided in Uganda, 1991-97



Source: GRBP Uganda treatment surveillance reports,
NOTF first progress report, Jan-Jun 1997

Figure 8

Figure 9

Impact of Funding Delays on 1997 Treatment Activities: 1997 Monthly Treatments and Monthly Treatment Objectives (MTO) for APOC-Funded Districts of Kisoro and Kasese

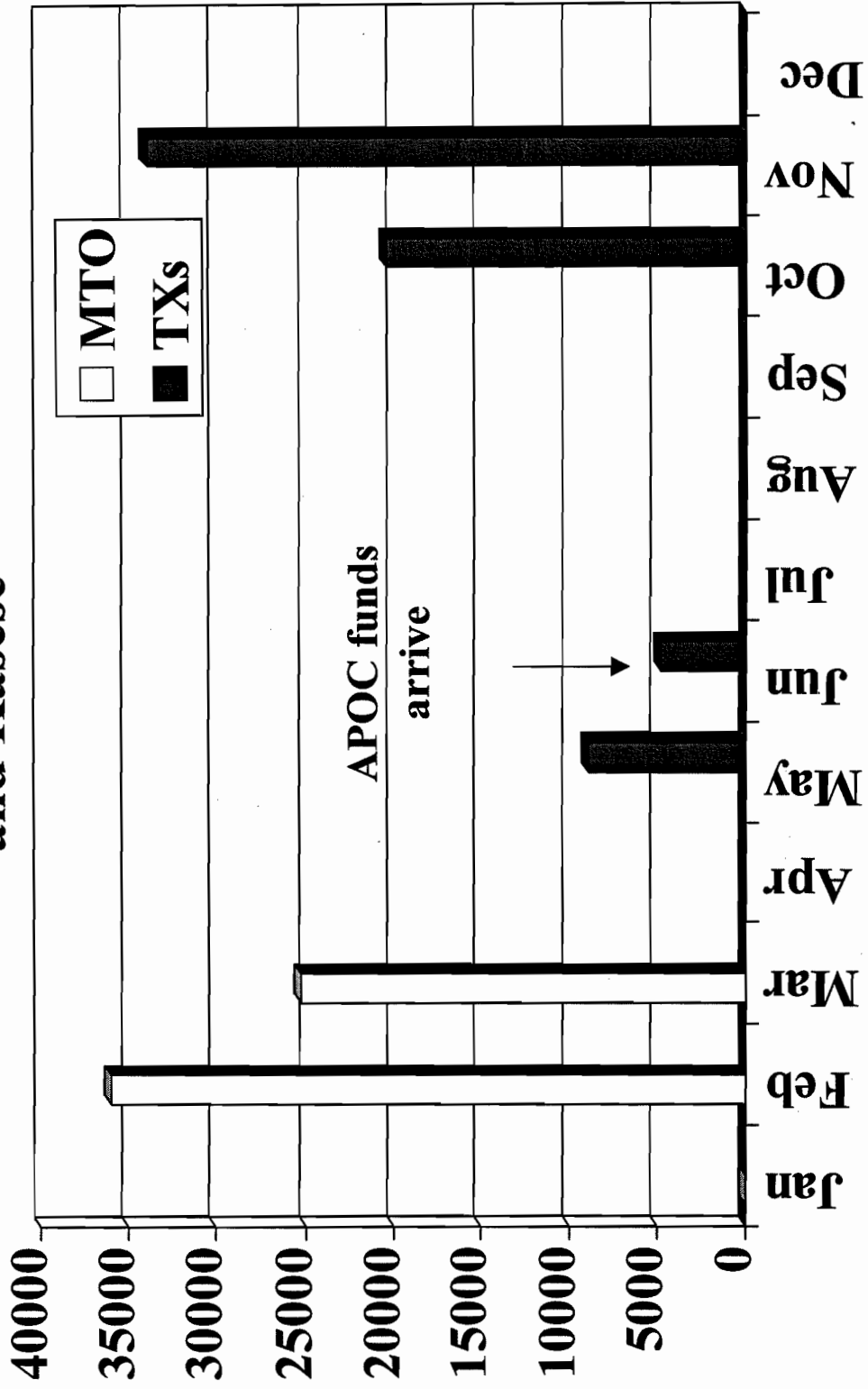
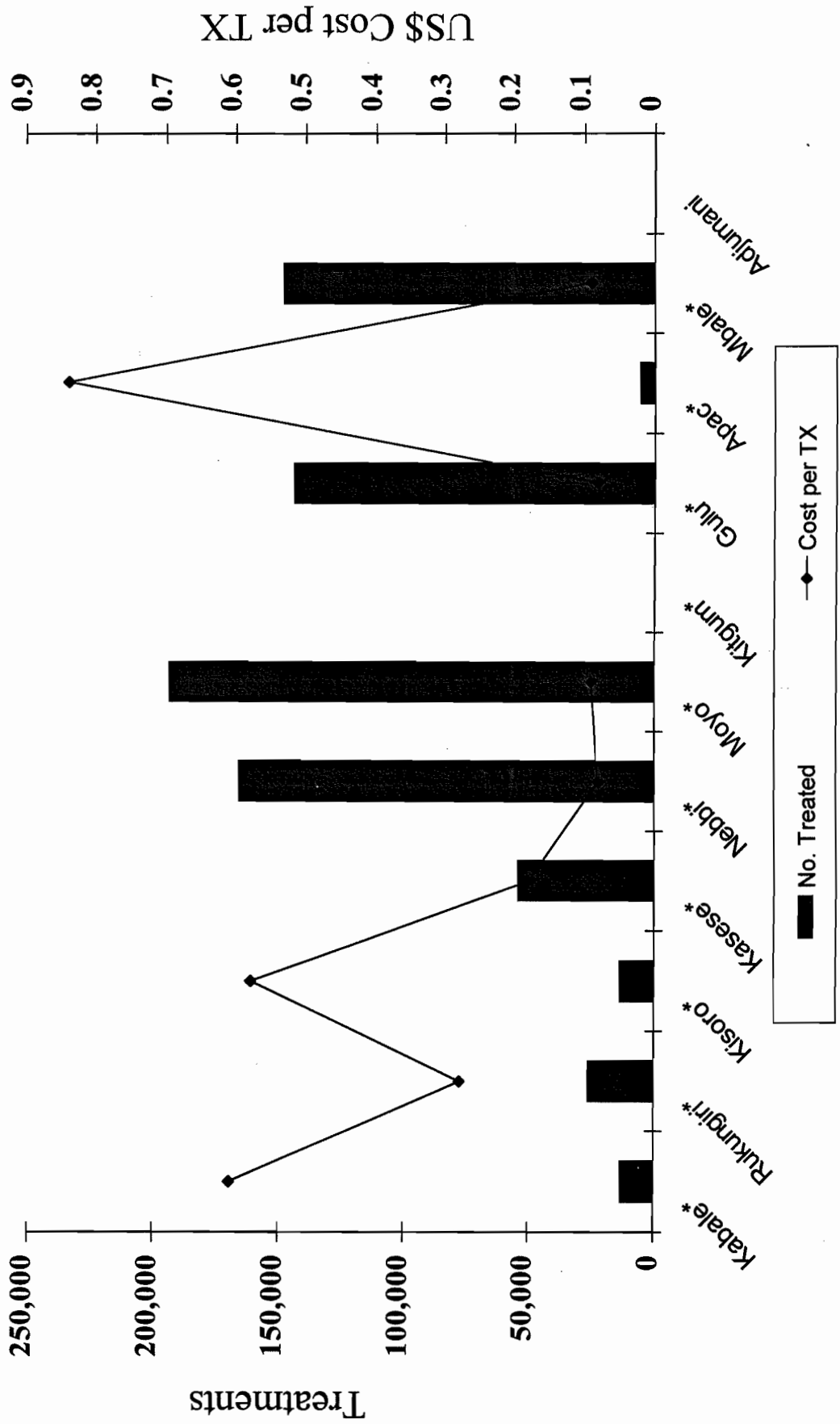


Figure 10

Economies of Scale in the Treatment of Onchocerciasis in Uganda: 1997 Treatments, and Cost per Treatment (US \$), in GRBP-assisted Districts



CAMEROON

Onchocerciasis is widespread in Cameroon, with some 1.5 million infected, and about 60% of its population of 13 million is at risk of infection. About 60,000 people are estimated to suffer some degree of visual impairment, and perhaps 1 million persons have onchocercal skin disease. Although onchocerciasis has been recognized as an important public health problem in Cameroon, large scale vector control has not been considered feasible due to cost and logistical barriers. Mectizan®, treatment has been accepted as the principal strategy in the national onchocerciasis control policy. However, in 1992, with the aid of the European Union, UNICEF, and the World Bank, the MOH implemented a change in the design of its PHC system. This process, called 're-orientation,' is based on two principles: 1) the health center is the basic unit of care that will serve a health area ("*aire de sante*"), with a population ranging from 5-10,000, and 2) a mechanism for cost recovery will be put in place for all services offered through the health center. Each health area has a pharmacy attached to it, which is supplied every two months by the provincial drug distribution center (Centre d'Approvisionnement Pharmaceutique Provincial -CAPP). Villages send a representative to a health area committee that governs certain aspects of the health center's program. In addition, community-based health workers are appointed by local village health committees to work on priority local projects.

Mectizan® distribution is integrated into this system, which differs in at least two ways from the CDTI strategy espoused by APOC: 1) the health center personnel distribute the drug through an outreach program (rather than the primary distributors being villagers), and 2) 100 CFA (about US\$ 0.20) is charged for each Mectizan® treatment to cover the costs of distributing the drug. The money is used to pay for supervision (*per diem*), the maintenance and fueling of motorcycles, and other costs, some unrelated to Mectizan® distribution. The money is managed by the MOH and the health committees (there is no accountability to participating NGDOs).

A number of NGDOs have provided assistance in Mectizan® distribution activities in Cameroon, including the International Eye Foundation (IEF), Helen Keller International (HKI), GTZ, and RBF. RBF began assisting the MOH in North Province (the most highly endemic for blinding onchocerciasis in the country) in 1992, and also pioneered the development of a nationwide epidemiological survey (the methodology of which became known as REMO). IEF worked in South Province, HKI in Monaté division of Central Province, and GTZ in Littoral Province. In August, 1995, the LCIF launched a new project, supervised by Lions District 403B, in partnership with the MOH and four NGDOs (RBF, HKI, IEF, and SSI), with the purpose of setting up Mectizan® distribution programs in 3 provinces (Centre, Adamaua, and West) over a 5-year period. The project has had a major impact on the number of treatments provided in Cameroon, increasing annual treatments by more than 200% in 1996 (Figure 11A). In 1997, the MOH developed a comprehensive plan for a nationwide control effort aimed at eliminating onchocerciasis as a disease of public health and socio-economic importance by the year 2015, and made its first applications to APOC for support.

The national plan calls for the development of a nationwide Mectizan® distribution system that is integrated into the existing PHC network.

Treatment Activities: RBF/GRBP-assisted programs in Cameroon have provided over 500,000 Mectizan® treatments since 1993 (Figure 11B). The programs work closely with the MOH, and within the policy of distributing Mectizan® as part of an outreach effort from local health centers, whose nursing personnel take the drug to the villages and distribute it at a cost of 100 CFA per person treated. In both GRBP-assisted provinces (North and West) the re-orientation process is well advanced, particularly in North Province, where (with financial support by the Cooperation Française) there is 100% health center function.

The total number of GRBP-assisted treatments in Cameroon for 1997 was 211,864, which comprised only 36% of the GRBP annual treatment objective (Table 6), but was 60% of the estimated 340,000 Mectizan treatments delivered in Cameroon in 1997 (Figure 11B). Health education has been conducted in conjunction with treatments in all GRBP-assisted areas.

North Province: The North Province of Cameroon has a total population of about 1,070,000, or about 8% of the national population. The disease-endemic area forms part of the severe blinding (savannah-type) onchocerciasis belt that extends from Nigeria into Chad and the Central African Republic, then on into the Sudan. RBF initiated a Mectizan® distribution program in North Province in 1992, which delivered its first treatments in 1993, and has provided a cumulative total of 237,756 treatments (Figure 12). In 1997, there were 91,395 treatments delivered (an increase of 34% over 1996). 129,356 treatments are proposed for 1998 (a 42% increase). The North Province operates at full coverage of endemic areas and villages, yet attained only 76% coverage of the eligible at risk population. Possible reasons for the low coverage include the outreach strategy, and/or the detrimental impact of cost recovery.

West Province: A total of about 1.5 million persons reside in West Province, or about 12% of the Cameroonian population. It is estimated that about 70% of the rural population is at risk of onchocerciasis. The tripartite coalition of GRBP, LCIF, and the MOH launched Mectizan® distribution in September 1996, providing a total of 59,043 treatments that year in five of the fourteen health districts (Figure 12). In 1997, 120,469 treatments were provided, with expansion into another 5 health districts; treatments were well short (only 25%) of the treatment objective. The final phase of the distribution plan begins in September 1998, after which all health districts should be under Mectizan® treatment. The 1998 ATO in 1998 is 470,039, which is the most ambitious expansion of any GRBP-assisted program.

Assessments: Rapid assessment for onchocerciasis in West Province in 1995 estimated that about 70% of the rural population is at risk for onchocerciasis. Data from all West Province REA activities, which have been mapped (Map 4), shows that most of the province is highly

endemic for onchocerciasis. Additional assessments in expansion areas are planned.

Dr. Eyamba pointed out that the program in West Province struggles with inaccurate census data and incomplete counts of at-risk villages. In 1997, the eligible at-risk treatment objective was 465,000, living in only 275 villages. 1997 reports showed that just 120,000 people had been treated, but these living in 660 villages. During 1998, additional villages in West Province will be inventoried and mapped with the help of an Emory MPH student, and more accurate population data will be obtained to help in planning and targeting of treatments. Data are relatively reliable for North Province, although, as in Uganda, villages at high risk for blindness cannot be distinguished within the listing of endemic villages there.

Mectizan®: In West Province, extra Mectizan® is on hand given the large 1997 order, although a new order will need to be placed in mid-1998. Theft resulted in the losses of 7,000 tablets from the North Province and 5,000 from the West Province in 1997. In addition, there is discussion of importing Mectizan® into the country directly through the Centre d'Approvisionnement Pharmaceutique Provincial (a mechanism that is being used for the first time in the North Province program).

APOC: GRBP consultant Dr. Basile Kollo played a major role in helping to write the new National Plan for Cameroon, completed in July 1997. This plan was needed to apply for support from APOC, and several projects (including North Province) have since been approved for APOC financing in 1998.

Progress Toward Sustainability: Cost per treatment averages around US\$0.68, which does not include the 100 CFA that must be paid for the service by participants.

Adverse reactions: Close monitoring for secondary reactions needs to be maintained in West Province given the existence of *Loa loa* there (see Annex); however, all available data show that the parasite occurs in low intensity infections. Five severe adverse reactions have been reported since Mectizan® distribution began in West Province in September 1996, but none had the character of *Loa loa*-related central nervous system reactions (encephalopathy/encephalitis).

Constraints:

There will likely continue to be important discussions between APOC and the MOH related specifically to the issue of the MOH's policy of Mectizan® distribution by nurses vs. APOC's preferred method of CDTI.

Other important issues to be resolved include cost recovery and its impact on coverage, and MOH incentives.

West Province is not scheduled in the National Plan to apply for APOC funding until after the LCIF project terminates in the Year 2000.

CAMEROON RECOMMENDATIONS 1998:

APOC: Implement the new APOC project in North Province. The Government of Cameroon and GRBP must determine how to best adapt the APOC strategy of community-directed distribution to the Cameroonian MOH health center outreach treatment policy.

Cost recovery: Develop a strategy for improving coverage in the North Province by trying to have the MOH accept reducing the cost recovery to 100 CFA *per family* rather than *per individual*. This is an operational research element in the APOC proposal.

Expansion: Expand treatments in West Province to all health districts, according to the LCIF action plan.

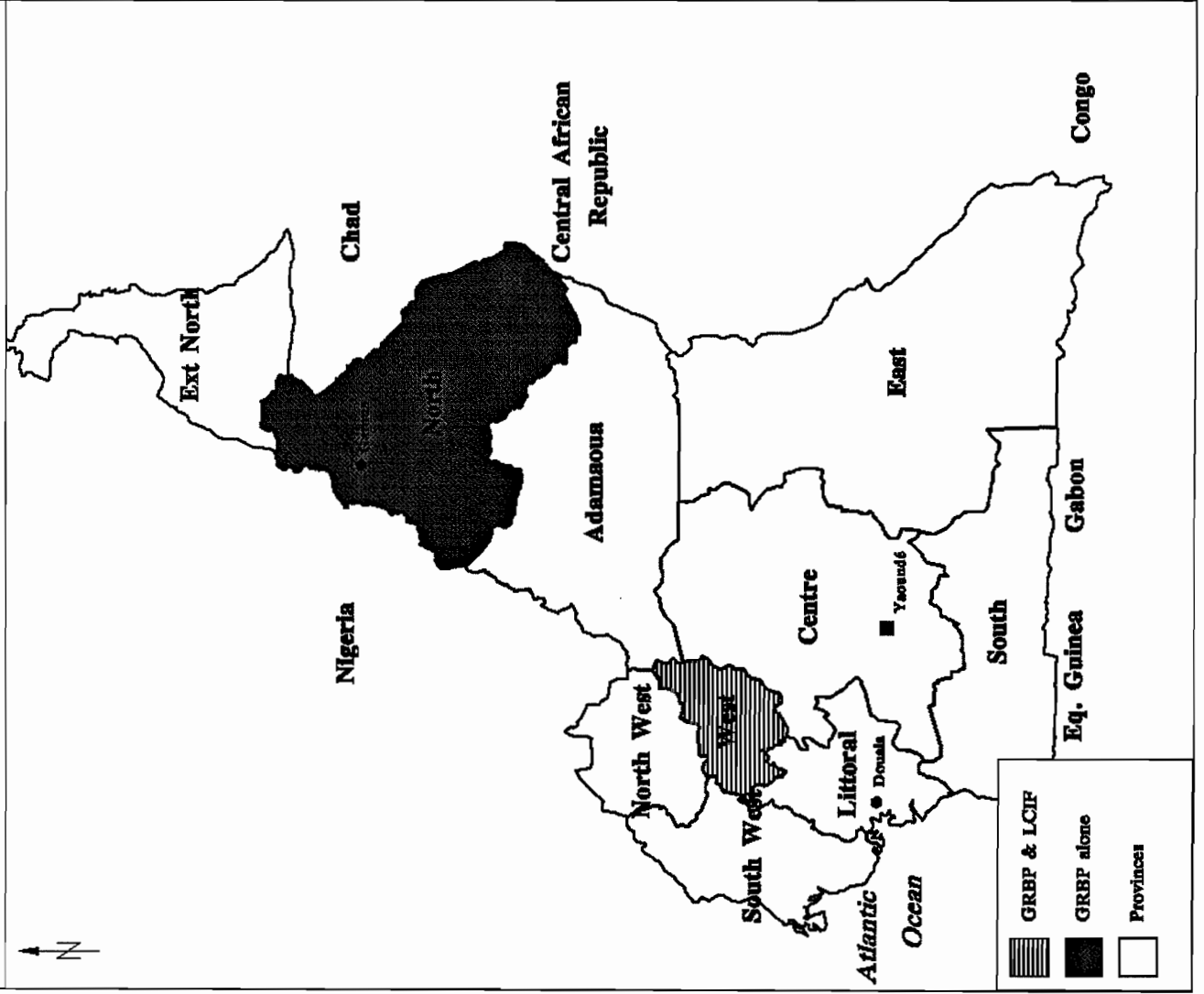
Assessments: Conduct additional REA in West Province in 1998, and establish better geographic and population data. Further analyze available data to distinguish (if possible) between at-risk and high-risk villages.

LCIF: Improve communications and build better relationships with the Lions and the other NGDOs in the Cameroonian coalition. Push for monthly treatment reporting by all NGDOs, and seek to resolve budgetary issues.

Mectizan® : Improve available population data to better calculate Mectizan® needs for West Province. Monitor and improve the security of Mectizan®, and the delivery/release of tablets from the CAPP in the North Province projects.

Cameroon

GRBP-Assisted Provinces



Map 4

Onchocerciasis in West Province, Cameroon: Hyper, Hypo, and Mesoendemic villages identified in Rapid Epidemiological Assessments

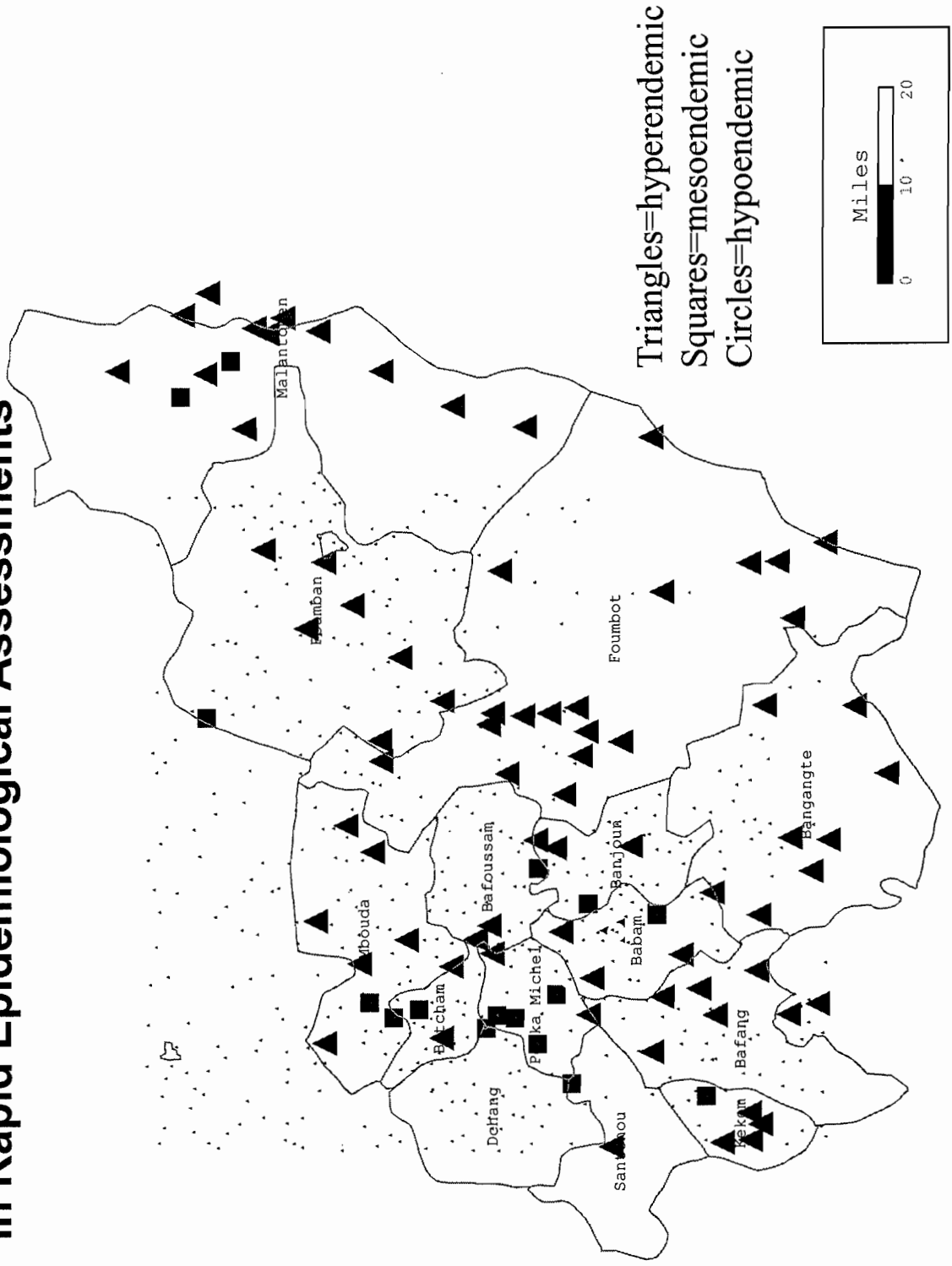


Table 6

1997 GRBP-assisted treatments in Cameroon, by province

	ATO(earp)	TX1997	% ATO	ATO(arv)	TX1997	% ATO	ATO(hrv)	TX1997	% ATO
North	120,178	91,395	76%	431	525	122%	431	525	122%
West*	464,907	120,469	26%	275	440	160%	275	660	240%
Total	585,085	211,864	36%	706	965	137%	706	1185	168%

*LCIF-assisted

ATO: Annual Treatment Objective TX: Number Treated earp: Eligible At-Risk Population
 arv: At-Risk Villages hrv: High-Risk Villages (nodule prevalence >39% or mf prevalence>59%)
 Cameroon hrv numbers not well established

Figure 11A

Cameroon: Lions Clubs-assisted Mectizan Treatments as Part of Total Treatments Provided, 1988-1997

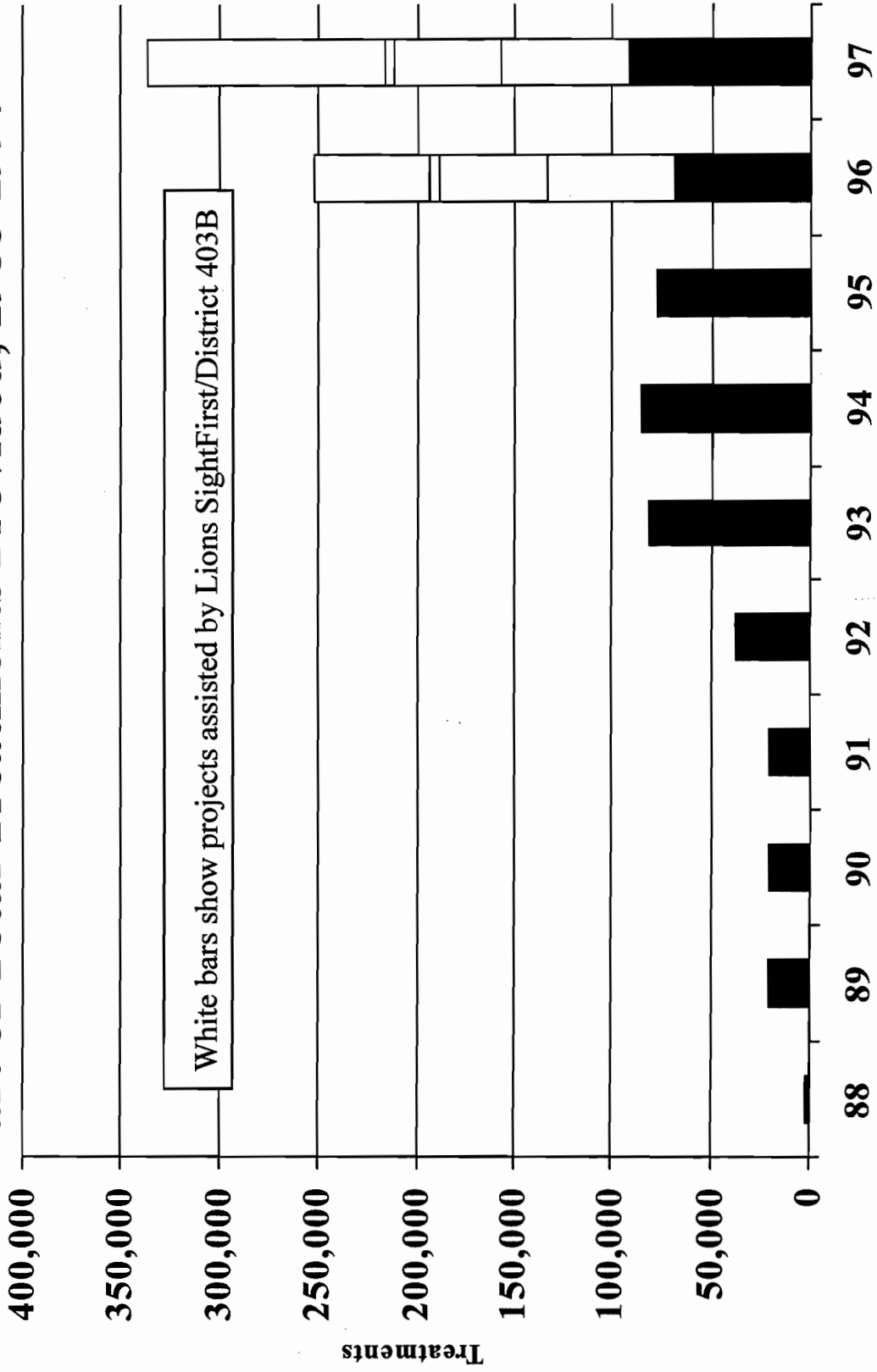


Figure 11B

Cameroon: GRBP-assisted Mectizan Treatments as Part of Total Treatments Provided, 1988-1997

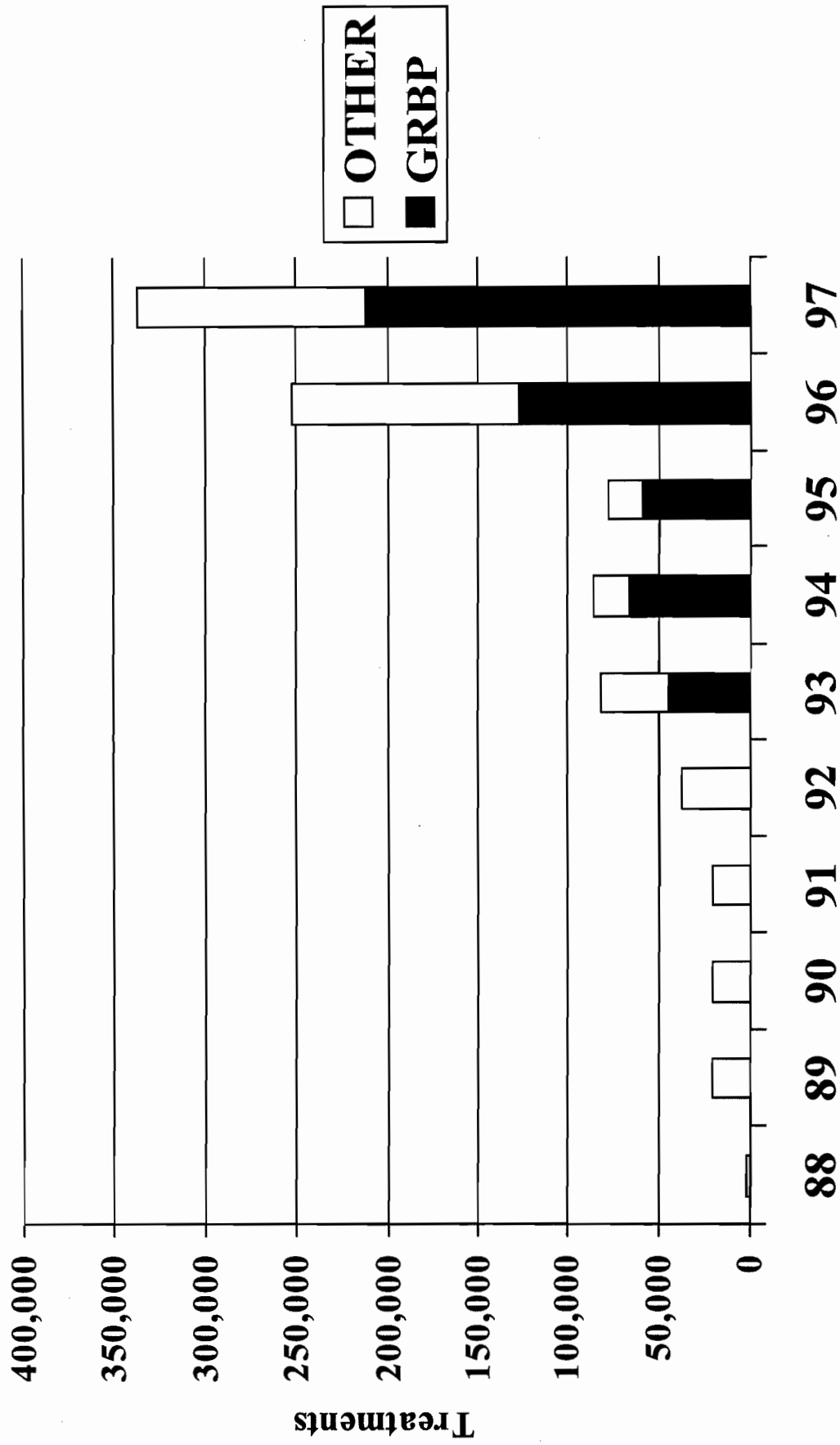
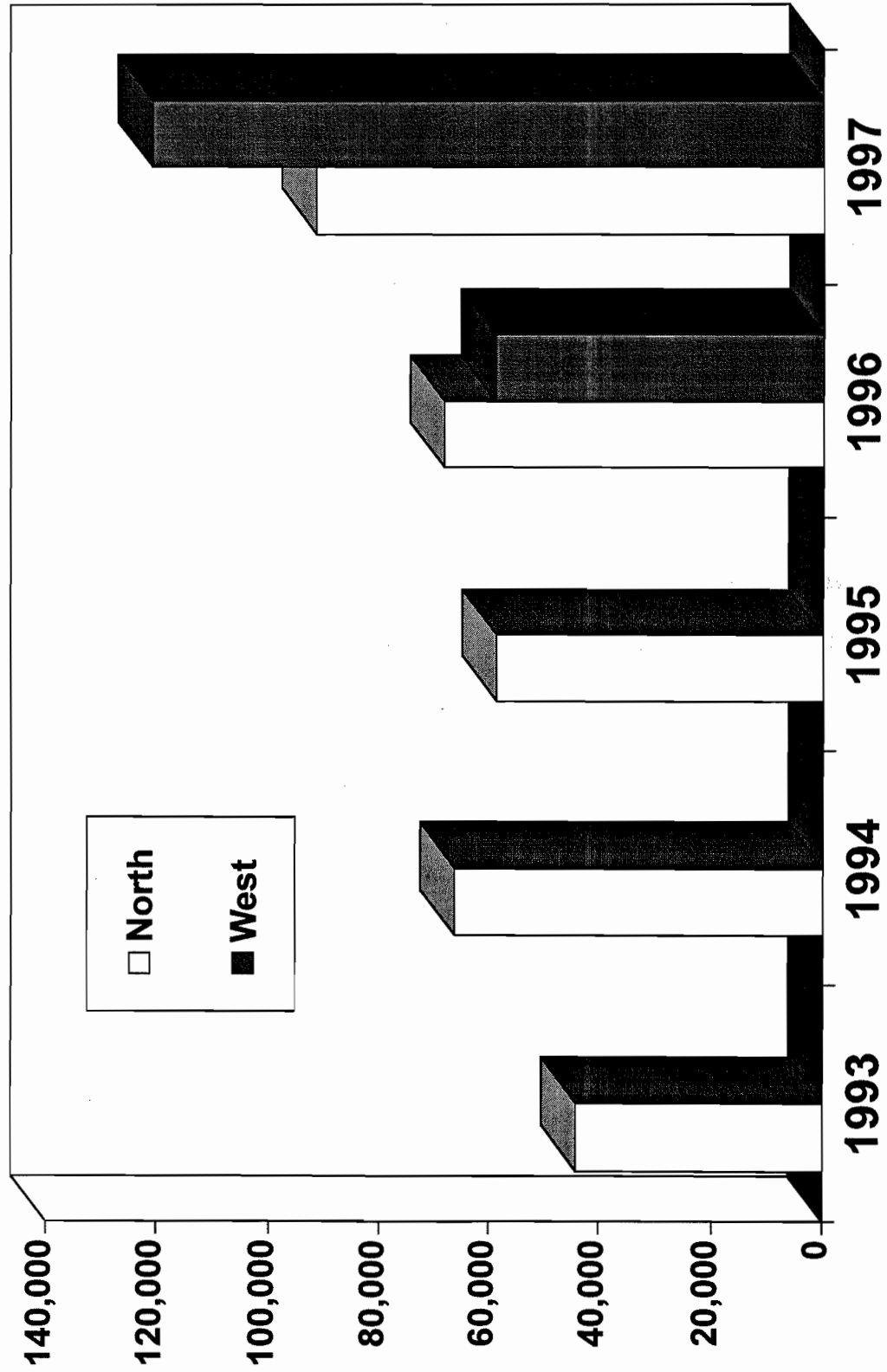


Figure 12

Cameroon: GRBP-assisted Mectizan Treatments in North and West Provinces, 1993-1997



Treatments in 1993-1995 by RBF

SUDAN

There are an estimated 2 million persons at-risk of onchocerciasis in Sudan, and 10,000 cases of onchocerciasis-related blindness, although these estimates may be significant underestimates. Although there are several endemic areas in the country, the southern (principally southwestern) focus is the most significant, and is characterized by high prevalence of blinding onchocerciasis. Indeed, some of the highest rates of blindness due to onchocerciasis in the world occur in the southwestern focus of Sudan.

In March 1995, the Government of Sudan (GOS) announced a cease-fire of the then 12-year old civil war to permit acceleration of efforts to eradicate dracunculiasis, control onchocerciasis, and deal with certain other health problems. The cease-fire was brokered by The Carter Center. As a result, new channels of communication between the GOS and Operation Lifeline Sudan (OLS) were opened to coordinate and accelerate program implementation on both sides of the conflict. OLS is a consortium of NGDOs and United Nations agencies (UNICEF is the lead agency) working in the contested southern part of the country. The cease-fire stimulated Mectizan® treatment activities, and resulted in a 5-fold increase in treatments in 1995 over 1994 (Figure 13). In March 1996, HealthNet International (HNI) assumed the lead role (formerly held by Medecins sans Frontieres) in assisting and implementing the distribution of Mectizan® in a program known as the South Sudan Onchocerciasis Control Program (SSOCP). SSOCP is composed of NGDOs with onchocerciasis control activities in areas served by OLS. HNI works closely with the Sudan Relief and Rehabilitation Association (SRRRA) and these NGDOs to coordinate the activities and standardize training and reporting formats. In early 1997, Sudan established a National Onchocerciasis Task Force (NOTF) that included both the GOS and SSOCP. The NOTF has been successful in obtaining support for Sudan's campaign against onchocerciasis from LCIF (through The Carter Center), and APOC. Unfortunately, the fighting intensified in 1997, and as a result, Mectizan® delivery activities decreased in 1997.

Treatment Activities: A total of 93,138 people were treated in Sudan in 1997, a 33% decrease from the 1996 total of 143,414. In addition to the acceleration of hostilities, treatment activities in Sudan were constrained by numerous other problems such as the large size of the country and difficult transportation, poor health system infrastructure, language barriers, nomadic populations, displaced populations, and cross-border issues. 19,401 (21%) persons were treated by the GOS, and 77,337 (79%) by the NGDOs in the SSOCP.

LCIF funds provided through The Carter Center helped support the activities of the GOS and three NGDOs active in southern Sudan: Aktion Afrika Hilfe (AAH), International Medical Corps (IMC), and World Vision International (WVI). Although the project only began on July 1, it supported 51% (47,139 persons) of total treatments in Sudan for all of 1997 (Table 1). Of the persons treated with LCIF support, 19,401 (41%) were by the Government of Sudan, and 27,738 (59%) by the three NGDOs in the SSOCP. Other NGDOs operating in SSOCP treated an additional 45,999 persons.

Assessment: REMO had been conducted in 9 areas in Bahr Al Ghazal, but concern was expressed with the REMO technique in Sudan. There are few "stable" endemic communities to select for sampling, and displacement of persons from highly endemic communities also displaces the disease from the original environmental conditions that favor onchocerciasis transmission (community stability and environmental factors are important requirements to be sampled in the REMO exercise). In addition, it was noted that in some endemic areas of Sudan, onchocercal skin disease (papular dermatitis) is a better rapid assessment indicator than is the nodule rate.

Mectizan®: The most important issues related to Mectizan® in Sudan are the prevailing myths associated with the tablets, which include a perception that after taking the medicine one cannot work, drink or have sexual relations for many months. Health programs are having difficulty changing this prevailing belief and in conveying the benefits of the medicine in some areas. Health education activities that accompany treatment are being specifically adjusted to allay these fears.

Progress Toward Sustainability: Sustainability indices are not currently being examined in Sudan. However, it was noted that APOC's special interest in Sudan was to develop approaches and models for Mectizan® distribution in areas of conflict and extensive internal population displacement. Standard treatment cards, provided and accepted by Mectizan® treatment providers on both sides, is one primary strategy that is hoped will help in providing continuity of treatments.

Constraints: OLS has prioritized its activities and flights into southern Sudan based on other more urgent demands, generated by the famine in Bahr Al Gazal, and the National Immunization Days for polio eradication. The emergency in Bahr Al Gazal works against the SSOCP activities in Western Equatoria (which is relatively stable), in that OLS devotes fewer resources to this part of their southern Sudan operations. Nevertheless, the combination of river blindness control and Guinea worm disease eradication efforts has engendered a critical mass of activities within the OLS, and increased support efforts being assisted by The Carter Center/GRBP.

SUDAN RECOMMENDATIONS 1998:

Consolidate treatment activities already in place, and extend treatment to new areas as they become accessible.

Extend epidemiological assessment.

Continue to be flexible and creative in developing Mectizan® delivery strategies that meet the needs of the difficult security situation in Sudan. This might include undertaking "assess then treat" activities where treatment can be given immediately to communities at-risk by the assessment teams (to avoid missed opportunities for treatment), and monitoring displaced persons by providing them with universally accepted (and nonthreatening) treatment cards.

Develop specialized health education efforts that focus on countermeasures for the myths associated with Mectizan®.

Onchocerciasis in southern Sudan

Map 5

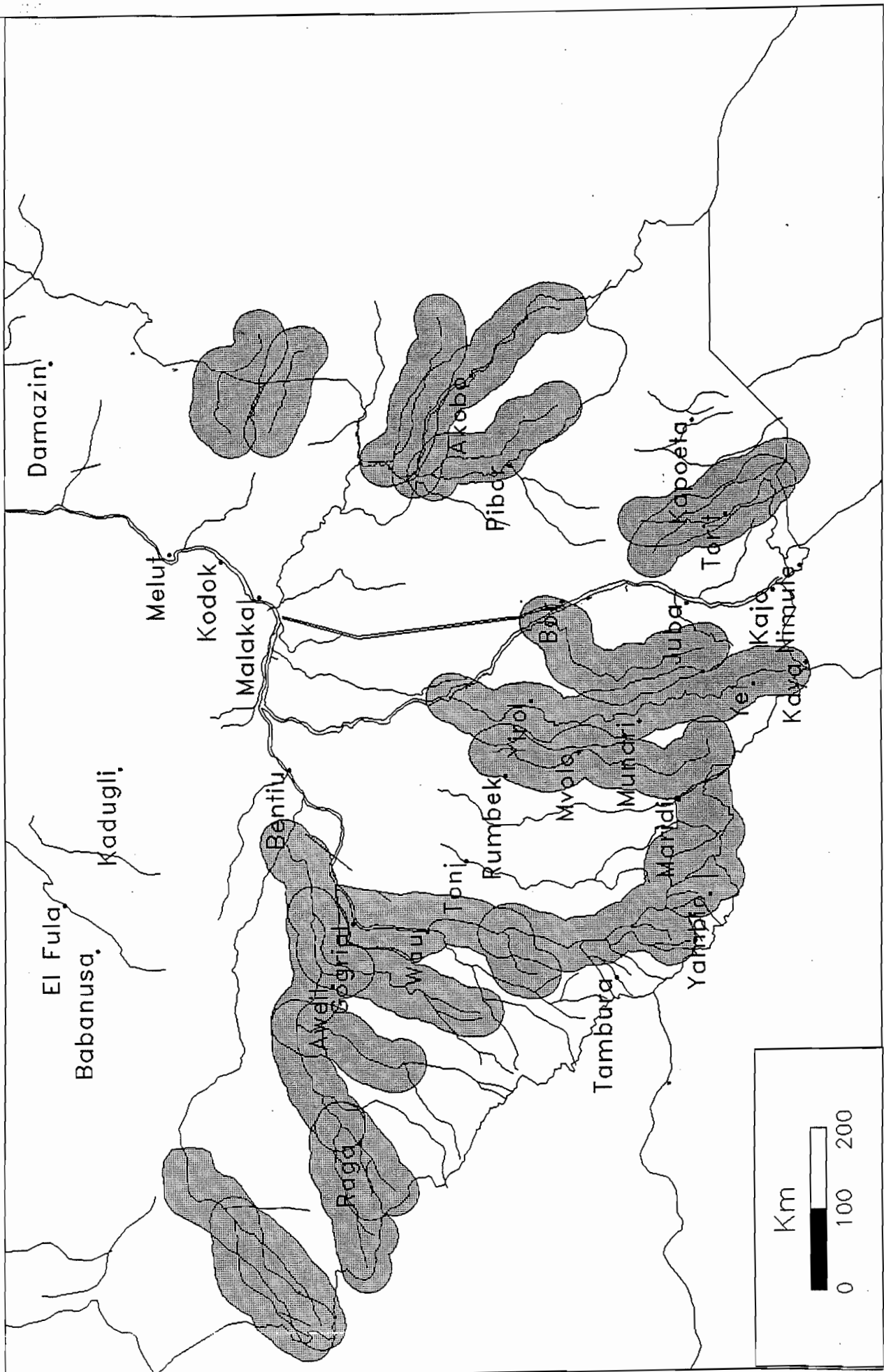
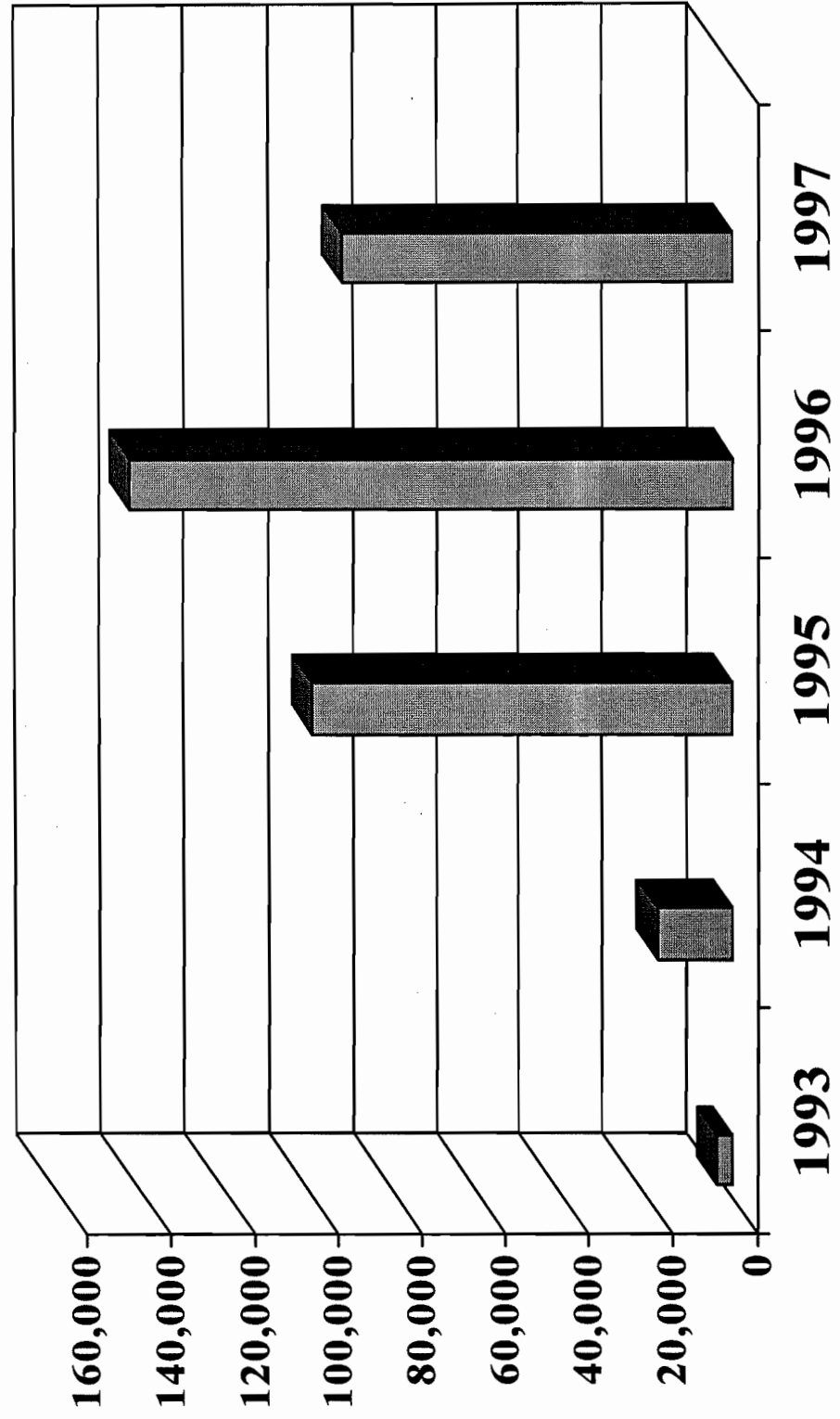


Figure 13

Persons Treated with Mectizan in Sudan, 1993-1997



ONCHOCERCIASIS ELIMINATION PROGRAM FOR THE AMERICAS (OEPA)

The Onchocerciasis Elimination Program for the Americas is a regional coalition working to eliminate morbidity, and where possible, transmission of onchocerciasis in the Americas through sustained distribution of Mectizan®. Semiannual treatment (e.g., every six months) is advocated wherever possible. The OEPA initiative began shortly after passage of the 1991 Resolution XIV of the XXXVth Directing Council of the Pan American Health Organization (PAHO). The Resolution called for the elimination of onchocerciasis as a public health problem by the year 2007. The Carter Center, InterAmerican Development Bank, MDP, PAHO, CDC, and other partners are involved. GRBP coordinates the technical and financial assistance to the initiative.

Treatment activities: For the American Region as a whole, 215,966 persons were treated with Mectizan® in 1997, an increase of 18,395 (9.3%) over 1996. Figure 14 shows the increasing trend in treatments since 1988. Individual country program treatments in 1996 and 1997 are shown in Figure 15, and treatment figures for 1997 in Table 7. Of a total of 251 known hyperendemic communities in the Americas, 240 (96%) received at least one Mectizan® treatment round in 1997, compared to 98% in 1996 (Figure 16).

Brazil provided single dose Mectizan® treatments to 852 persons in 37 communities (28 were high-risk villages). This represented a 5% decrease from 1996 treatments, and just 30% of its annual treatment objective (ATO) of 2,800.

Colombia has a single known endemic community (Nacioná, in the municipality of López de Micay, Department of Cauca). The endemic area has a population of just 886 persons living in an area of 15 square kilometers. In 1997 (the second year of the program), two rounds (semiannual) of treatment were provided to 347 of the 432 (80%) persons eligible to receive the medicine. In another part of the country bordering Ecuador (the municipality of Barbacoas, department of Nariño), WHO reported the presence of onchocerciasis in 1995, but recent evaluations in the southern part of Barbacoas have not shown onchocerciasis there. Colombia has requested the criteria needed to certify the absence of onchocerciasis from this area rumored to be endemic, as well as from Nacioná.

Ecuador treated 15,989 persons (92%) semiannually of a 17,347 ATO target for 1997. This represented an 8% decrease from treatments in 1996. All 119 endemic communities were reached, including the 43 hyperendemic ones. All high-risk villages in Ecuador have been treated for at least five years.

In **Guatemala**, treatment activities resumed in July 1996 after the decentralization of public health activities caused the interruption of Mectizan® treatment from October 1994 to June 1996. In 1997, the national program authorities provided one round of treatment in 252 villages (and all 45 high-risk villages) to 62,634 individuals (37%) of the 1997 ATO of 167,499. This represented a 22% increase over treatments provided in 1996. Two small

foci in Guatemala, Santa Rosa and San Vicente Pacaya, are ready to be evaluated for certification of elimination.

Mexico treated 132,221 persons (87% of its ATO) semiannually in 947 villages, 97 of which were high-risk villages. This represents a 4.5% increase over 1996. The Mexican program is not likely to expand treatment numbers further since, like Colombia and Ecuador, it is providing treatment in all known endemic villages.

Venezuela represents the greatest challenge to the regional initiative in that it has by far the greatest number of suspected endemic villages (Figure 17). These villages are in the two northern foci of the country, both of which remain to be completely assessed. Assessments in 1997 in parts of the north (states of Sucre, Monagas, and Aragua) showed 31 of 335 (9.3%) villages had a prevalence for onchocerciasis of $\geq 60\%$, and a total of 217 (65%) were endemic. With an estimated 2,500 additional communities left to be assessed, Venezuelan authorities believe that as many as 150 high-risk villages could yet be found that would urgently require treatment with Mectizan®. In terms of treatment activities, the national program reported having treated only 3,923 (18%) out of a 1997 ATO of 22,000. However, this represented a 192% increase over treatments in 1996.

Mectizan®: Considerable progress has been made in reporting of persons treated in the Americas and linking declared ATOs with Mectizan® Donation Program application figures. There are still important challenges with importation of Mectizan® into countries.

IACO: Representatives of the six endemic American countries have met annually since 1991 at the InterAmerican Conference on Onchocerciasis (IACOs). The seventh conference (IACO '97) was held in Cali, Colombia, on 19-21 November 1997. The theme of IACO'97 was "certification of elimination of onchocerciasis from the Americas." Participants adopted a draft resolution (to be sent for consideration by the PAHO Directing Council) calling for continued advocacy for the initiative in order to eliminate onchocerciasis by the year 2007, and for a commission to develop criteria for certification of elimination.

Progress toward sustainability: In each of the six endemic countries, delivery of Mectizan® is considered to be primarily the responsibility of the government concerned. All of the country programs work within a primary health care approach, and in all countries, the onchocerciasis activities are implemented by the ministry of health as an integrated program in conjunction with other health activities. In Ecuador, there is 100% community involvement in the design and implementation of interventions. However, Ecuador is the only endemic country in the Americas where a budgetary line item for onchocerciasis does not exist. No data on cost per treatment were presented.

Constraints: The great administrative burden of the InterAmerican Development Bank grant.

OEPA RECOMMENDATIONS 1998:

Assessments: Provide maximum support to the Venezuelan program for epidemiological assessment of the northern foci. Try to ensure that substantial progress is made during 1998 (IACO 1998 will be held in Caracas). Venezuela has proposed 3 teams to assess large numbers of communities, and OEPA needs to provide short term consultants to help in this process. Focus data analysis on documenting that all high-risk villages in the region are under treatment by developing a comprehensive database containing key information about those villages.

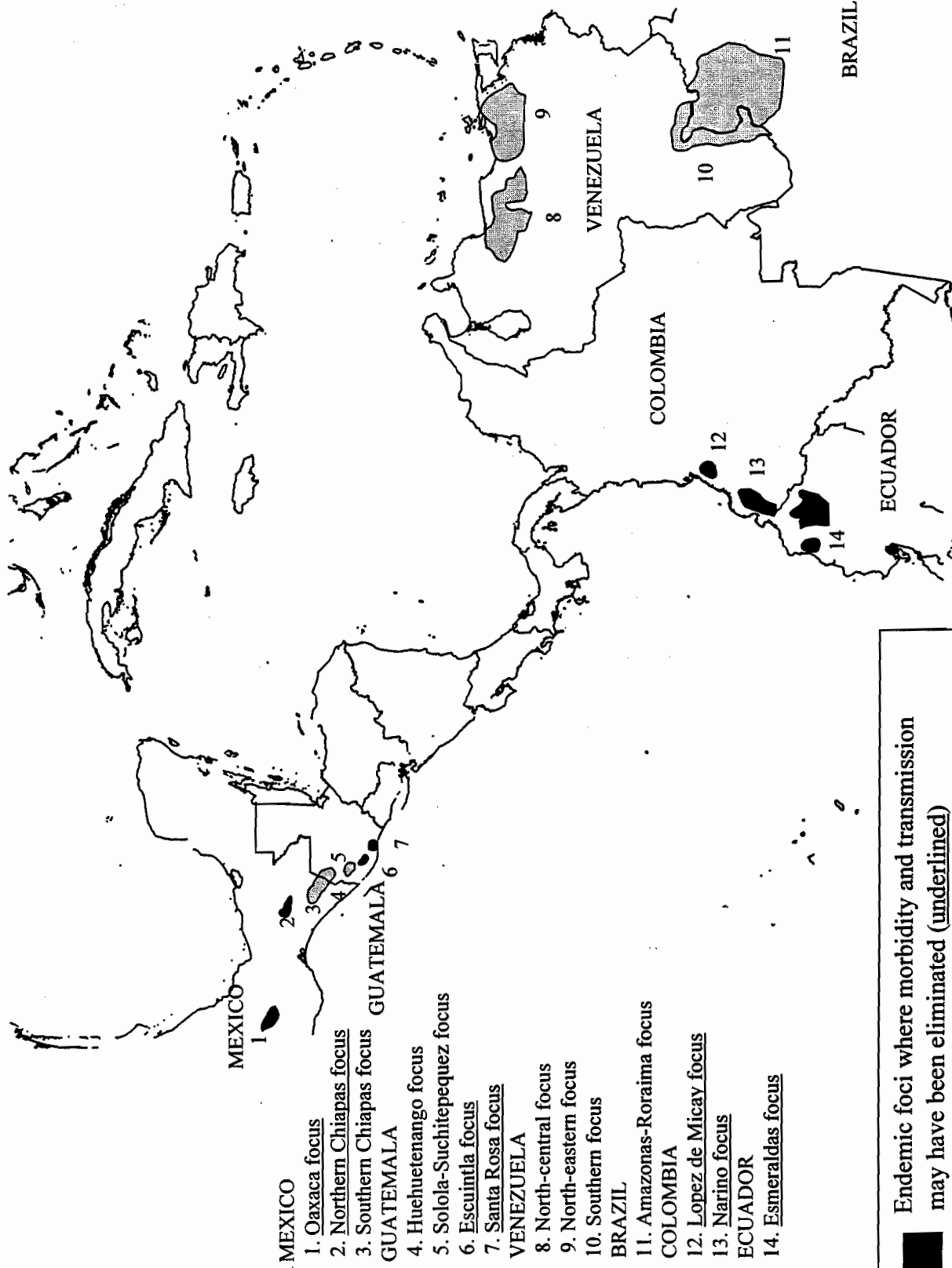
Transmission: Document the interruption of transmission in the Americas. Help standardize polymerase chain reaction (PCR) techniques (to measure infection rates in all major American blackfly vectors) through an OEPA-organized working group. Help PAHO establish criteria for certification of onchocerciasis elimination by pushing for approval of the new resolution on onchocerciasis elimination, and by developing a regional process for certification of elimination.

Treatments: Advocate continued semiannual treatments in areas where transmission is or can be interrupted. Complete a Weekly Epidemiological Record summary highlighting progress in 1997 (1996 results were summarized in a Weekly Epidemiological Record article published in July 1997, volume 72(29)).

Sustainability: Work on improving the monitoring of sustainability in Latin America, in particular by beginning to evaluate how well Mectizan® distribution is being integrated into the primary health care system, and beginning to report sustainability indices for all countries (government involvement, community involvement, and cost). Analyze the strengths and weaknesses of the six different health systems' ability to sustain Mectizan® delivery.

Mectizan® : Seek assistance from PAHO in importing Mectizan® into the countries.

Map 6 Geographic distribution of endemic onchocerciasis in the Americas



Endemic foci where morbidity and transmission may have been eliminated (underlined)

Other endemic foci

Based on:
 Weekly Epidemiological Record 1996;71:278
 WHO Technical Report 852, 1995

Table 7

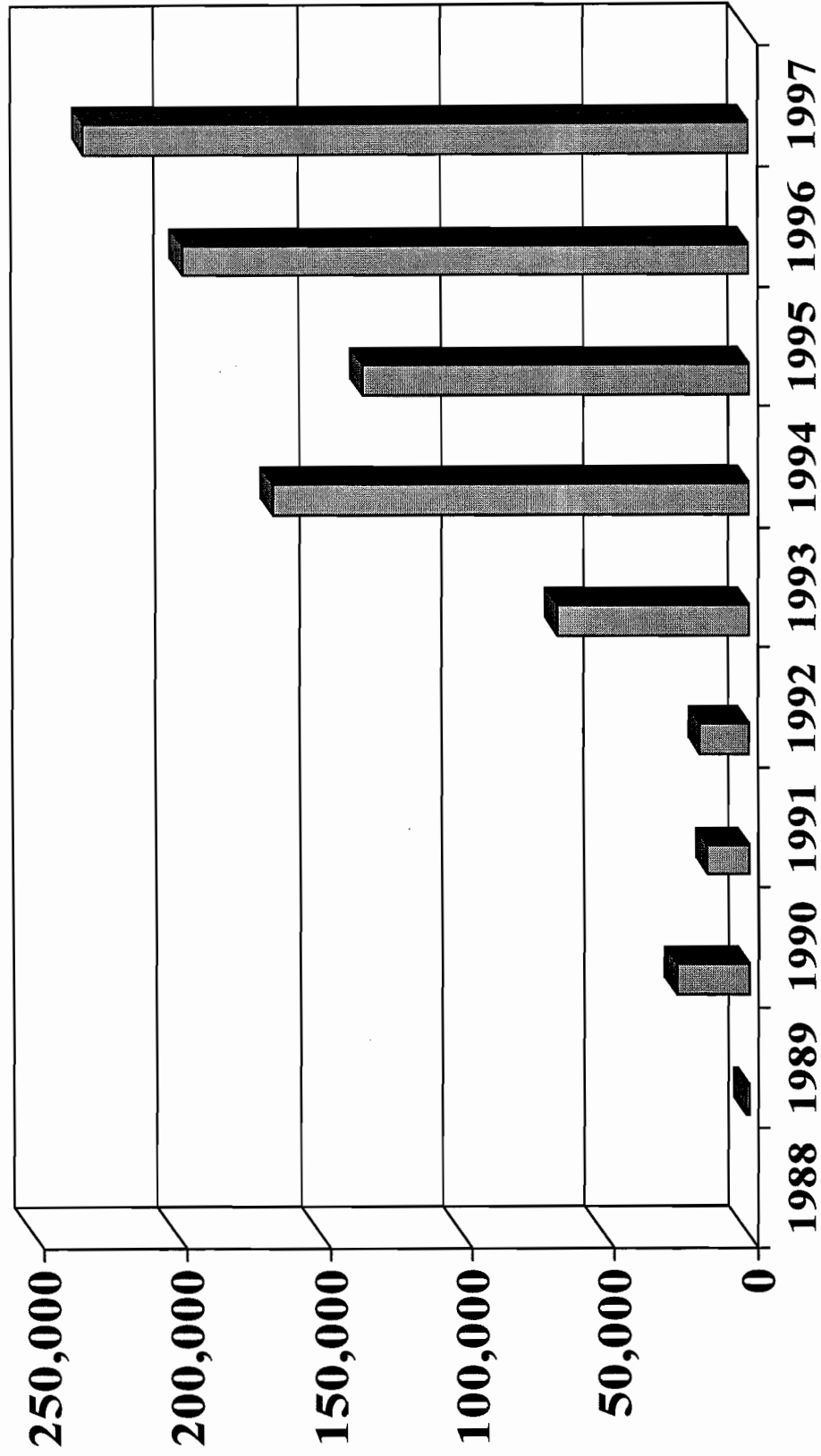
1997 GRBP-assisted treatments through the Onchocerciasis Elimination Program in the Americas, by country

Country	ATO(earp)	TX 1997	% ATO	ATO(arv)	TX 1997	% ATO	ATO(hrv)	TX 1997	% ATO
Brazil	2,800	852	30%	64	37	58%	36	28	78%
Colombia	432	347	80%	1	1	100%	0	0	0%
Ecuador	17,347	15,989	92%	119	119	100%	43	43	100%
Guatemala	167,499	62,634	37%	517	252	49%	45	45	100%
Mexico	151,773	132,221	87%	947	916	97%	97	97	100%
Venezuela	22,000	3,923	18%	280	63	23%	30	27	90%
Total	361,851	215,966	60%	1928	1388	72%	251	240	96%

ATO: Annual Treatment Objective TX: Number Treated earp: Eligible At-Risk Population
 arv: At-Risk Villages hrv: High-Risk Villages (nodule prevalence >39% or mf prevalence>59%)
 *OEPA figures reported quarterly: hrv villages reflect prevalence at time of initiation of Mectizan therapy; Mexico uses >49% mf prevalence as hrv definition

Figure 14

Persons treated with Mectizan in the Americas, 1988-1997



1996 and 1997 Mectizan Treatments in the Americas, by country

Figure 15

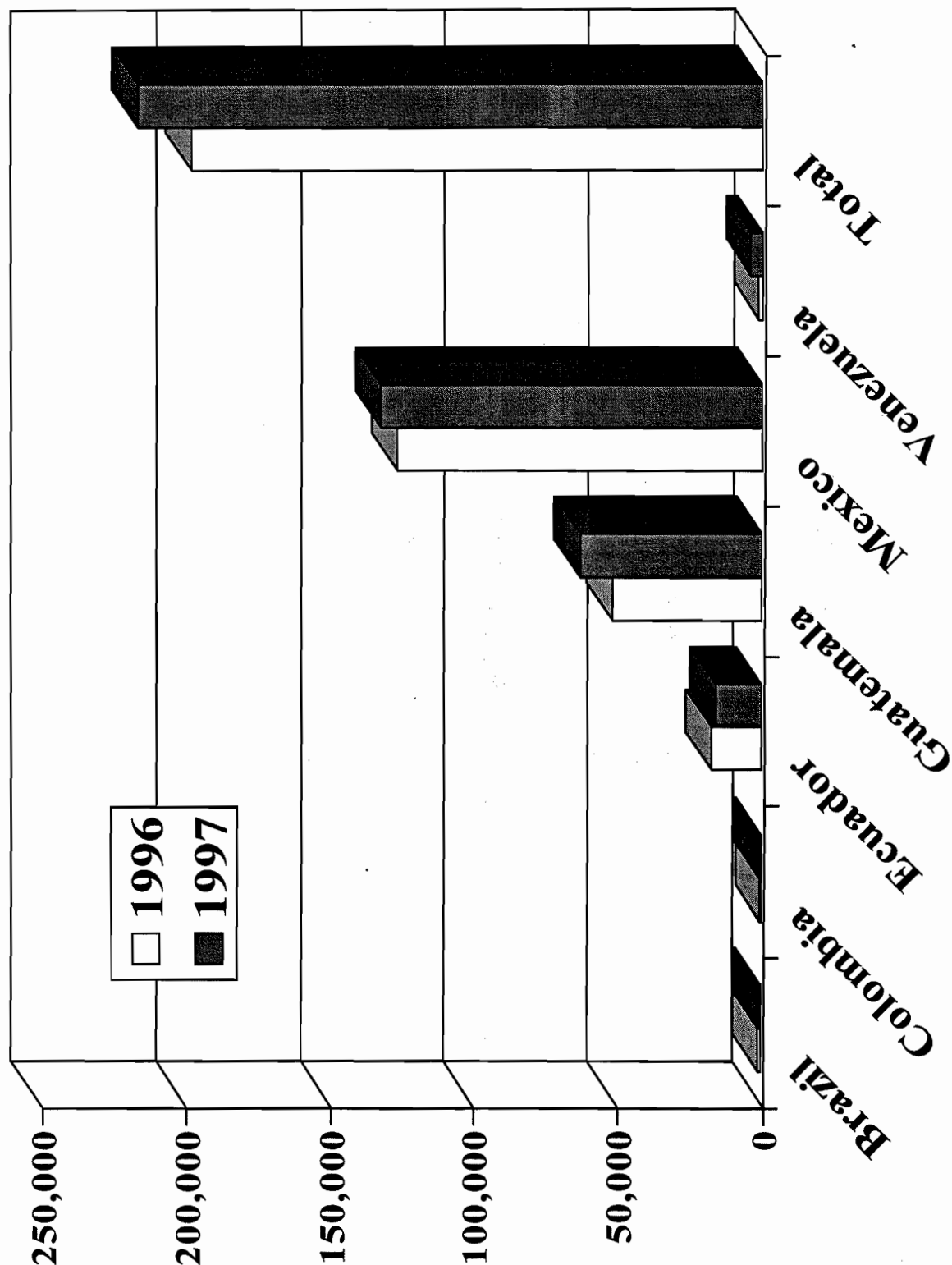
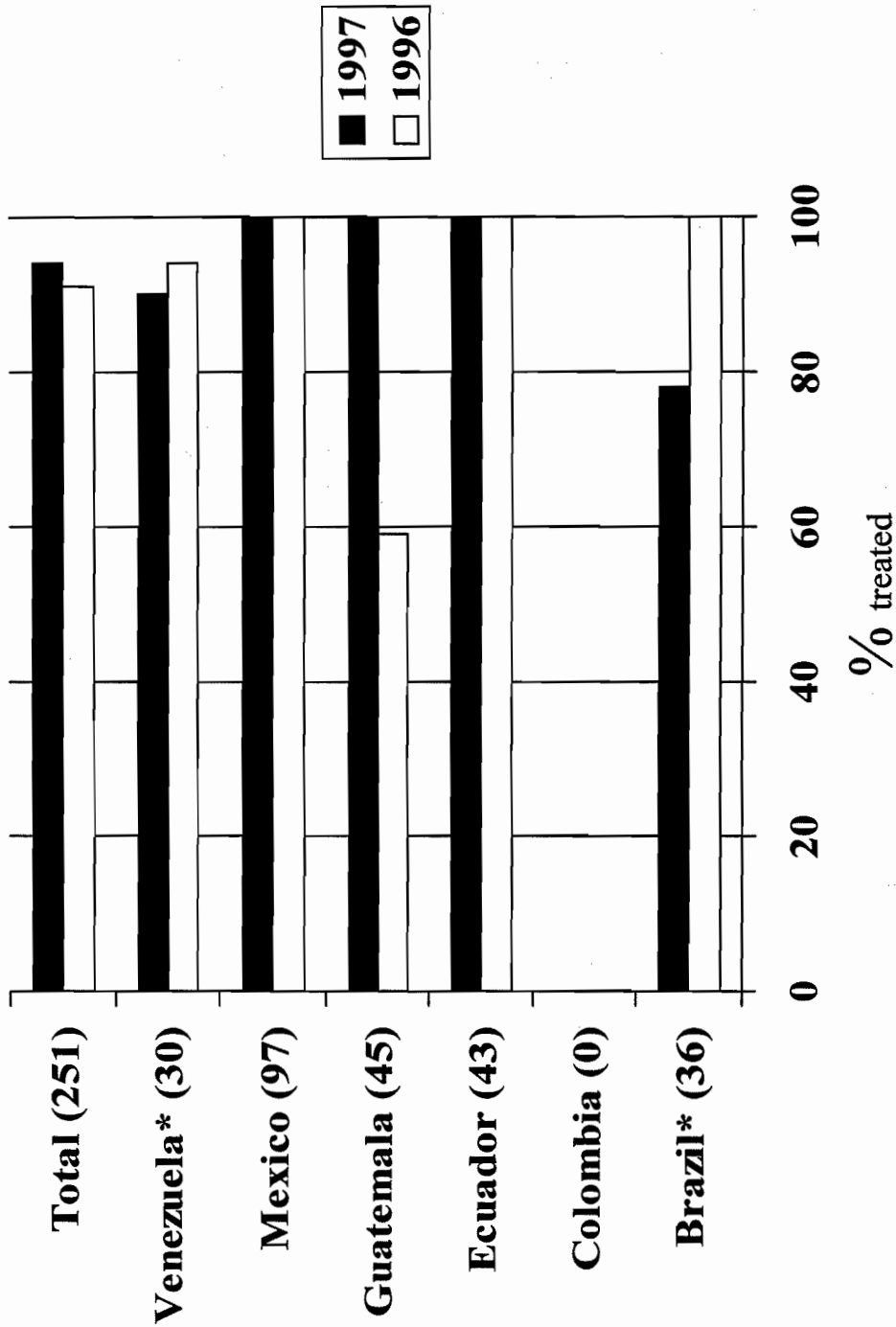


Figure 16

High risk villages and their treatment in the Americas, by year



* = incomplete assessments

Onchocerciasis in the Americas - Endemic Communities

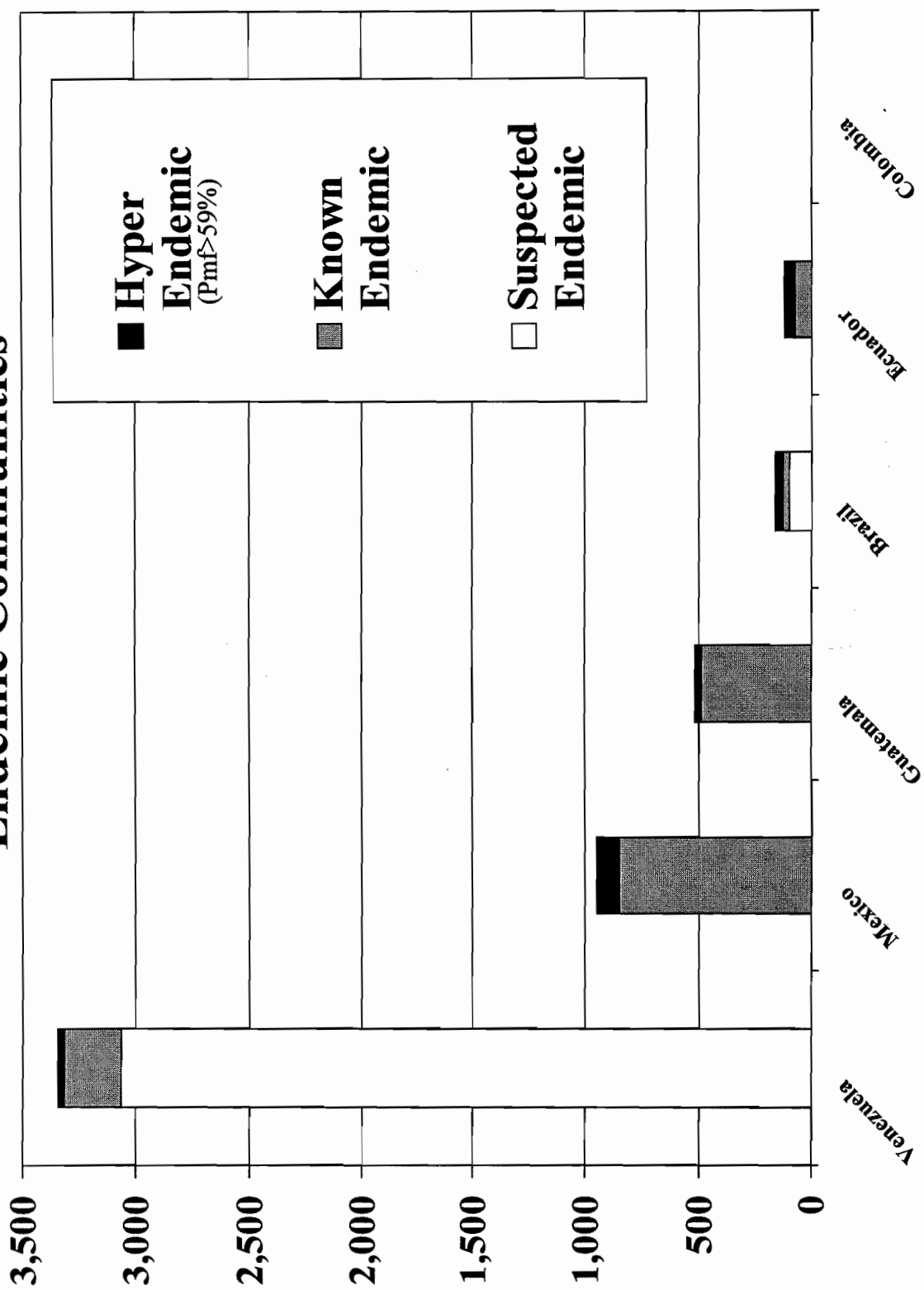


Figure 17

MECTIZAN® DONATION PROGRAM ISSUES

New formulation: The new 3-mg formulation of Mectizan® tablets (to be dispensed in 500-pill bottles) already have been distributed to several OCP countries, Uganda, and Malawi. New health education materials are being distributed to program managers to help train village health workers on the dosage for the new formulation. New Mectizan® pamphlets also have been produced to help answer frequently asked questions about the medicine and its new packaging. It was noted that these materials were designed for higher-level personnel in the national program; they were not designed for training community-based health workers. An evaluation is planned for Mali, Malawi, and possibly Uganda, to determine if the change in formulation and packaging will be readily accepted or will cause new logistical concerns.

Certain issues discussed regarding potential problems included:

- a) The potential for a concern in communities accustomed to the 6-mg tablet confronted with an unfamiliar Mectizan® tablet.
- b) The potential for increased waste due to the 500-tablet bottle (sufficient to treat about 217 persons). How would programs provide medicine to a community where census data would suggest that it did not need a "whole bottle number" of tablets (i.e., 500, 1000, 1500, etc)? Would programs need to place tablets into smaller containers to economize? If so, what other containers should be used?
- c. The shortened expiration date on opened bottles (eight-week shelf life versus 2 years). This would be a particular problem in passive treatment programs, where pharmacies might have open bottles on the shelf for months. It was noted that the tablets might have a longer shelf life after opening than 8 weeks; Merck is planning other tests for stability.

Pregnancy: All participants in the Program Review agreed that the responsibility for deciding whether or not Mectizan® should be given during pregnancy lies with the NOTF or national drug regulatory authorities of each country. All national programs should (upon request) be empowered with scientific information to aid them in making this decision. Until this NOTF policy is decided in each country, GRBP-assisted programs will not change current field procedures or educational messages to actively promote treatment during pregnancy.

Pilferage: There was considerable discussion about how to prevent Mectizan® from being sold in the parallel market. The MDP is considering requiring more stringent reconciliation of treatments with tablets used in the annual reports submitted by the programs. GRBP will tighten its internal reporting requirements for Mectizan® inventories.

LIST OF PARTICIPANTS

GRBP Headquarters

Mr. Andy Agle
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Dr. Donald Hopkins
Ms. Joni Lawrence
Ms. Dana Lee
Ms. Wanjira Mathai
Dr. Frank Richards (Chair)
Ms. Shandal Sullivan
Mr. Craig Withers
Dr. Jim Zingeser

Country Representatives

Dr. Albert Eyamba - Cameroon
Mr. Moses Katarwa - Uganda
Dr. Emmanuel Miri - Nigeria
Dr. Mauricio Sauerbrey - Latin America/OEPA

Mectizan® Donation Program

Dr. Bruce Dull
Dr. Stefanie Meredith

Other participants

Dr. Guillermo Zea Flores - OEPA/Guatemala
Ms. Irene Goepf - HealthNet, SSOCP, Nairobi, Kenya (Sudan)
Dr. Mahmoun Homeida - Chair, NOTF, Sudan
Dr. Charles MacKenzie - Michigan State University (Sudan)



AGENDA

**Second Meeting of the Country Representatives of the
Global 2000 River Blindness Program
The Carter Center
February 25-27, 1998**

Wednesday, February 25 (Cypress Room)

Opening

- | | | |
|-----------|----------------------------------|--------------------|
| 1:30-2:00 | Welcome and introductory remarks | Dr. Donald Hopkins |
| 2:00-2:30 | Objectives of the Program Review | Dr. Frank Richards |

Nigeria

- | | | |
|-----------|------------------------------------|--------------------|
| 2:30-4:30 | Nigeria GRBP Presentation | Dr. Emmanuel Miri |
| 4:30-5:30 | Nigeria Discussion/recommendations | Dr. Donald Hopkins |

Thursday, February 26 (Executive Dining Room)

Uganda

- | | | |
|-------------|-----------------------------|--------------------|
| 8:30-10:30 | Uganda Presentation | Mr. Moses Katarwa |
| 11:30-12:30 | Discussion/recommendations | Dr. Donald Hopkins |
| 12:30-1:30 | Lunch in the Copenhill Café | |

Mectizan® Presentation

- | | | |
|-----------|----------------|-----------------------|
| 1:30-2:30 | Current Issues | Dr. Stefanie Meredith |
|-----------|----------------|-----------------------|

OEPA

- | | | |
|-----------|------------------------------|--|
| 2:30-4:30 | OEPA Presentation | Dr. Mauricio Sauerbrey and
Dr. Guillermo Zea Flores |
| 4:30-5:30 | Discussion/recommendations | Dr. Donald Hopkins |
| 7:30 - | Dinner at Agnes and Muriel's | |

Friday, February 27 (Executive Dining Room)

Cameroon

8:30-10:30	Cameroon Presentation	Dr. Albert Eyamba
10:30-11:30	Discussion/recommendations	Dr. Donald Hopkins
12:00-2:00	Lunch (location to be determined)	

Sudan

2:00-4:00	Sudan Presentation	Dr. Mamoun Homeida Dr. Irene Goepp
4:00-5:00	Discussion /recommendations	Dr. Donald Hopkins
5:00-5:30	Closing Comments	Dr. Donald Hopkins and Dr. Frank Richards

Quarterly reporting of indices of sustainability

GRBP programs are now being asked to report quarterly on three sets of indices for sustainability. These were discussed at the 1996 program review and include: Community involvement (absolute and expressed as a percentage of total communities treated), National and Local Government involvement (absolute and expressed as a percentage of total communities treated), and Costs (absolute and expressed as cost per treatment). The last index is to be calculated as well in terms of government and APOC contributions.

Community involvement: Indicate the number and percent of treated villages in which the community is involved in the design and implementation of the treatment program and in the selection of their community-based distributor (CBD). If data are available on monetary or in kind community support for CBDs, formation of village health committees, and community support for CBDs to collect ivermectin from a central point, these should also be mentioned.

Government involvement: Indicate the number and percent of treated villages in which the CBD is a part of, or is supervised by, the primary health care system. Does the local and central government have a line item for onchocerciasis control in its budget? If yes, how much of this budget has been released to the program?

Cost per treatment: Estimate the cost per person treated with Mectizan as three different indices:

Actual costs of treatment: This calculation includes all costs, including: a) a proportion of HQ costs, overhead and salaries, b) your local GRBP HQ costs, overhead and salaries, c) delivery of Mectizan from the port of entry to community, including collecting the drug from a central point by CBD, d) training, e) MOH/PHC supervision and monitoring of the program, and f) remuneration/incentives paid to CBDs by the community, which could include cost recovery mechanisms.

Cost provided by national government: Provide also the government provided cost per treatment, and the percentage the government is paying of actual costs. Do not include village support.

Cost allowed and/or provided by APOC/OEPA: Provide also the amount that APOC (OEPA in the Americas) provide per capita treatment, and the percentage APOC (OEPA) is paying of actual costs.

Loa loa and Mectizan® (ivermectin)

1. Loiasis is endemic in the forested areas of west central Africa (parts of Benin, Nigeria, Cameroon, Gabon, Equatorial Guinea, Congo, CAR, Sudan, Uganda, and the former Zaire). Unlike onchocerciasis where the microfilariae (mf) are found in the skin and eyes, those of *L. loa* are found in deep organs and the blood, and can occur in spectacular concentrations.
2. Compared with the other major filariases (*Onchocerca volvulus*, *Wuchereria bancrofti*, and *Brugia* species), *L. loa* is not highly pathogenic. Classically associated illnesses include a self-limited, localized dermal angioedematous reactions on wrists and ankles ("Calabar swellings") and occasional subconjunctival migration of a worm across the eye. A variety of associated signs and symptoms have been reported, including pruritus, arthralgia, fatigue, hypereosinophilia, endomyocardial fibrosis, nephrosis, retinopathy, lymphoedema/adenitis, and endocrinopathy, but the vast majority of infected persons have no recognizable illness.
3. The effectiveness of Mectizan® against *Loa loa* remains a subject of research. At doses used for onchocerciasis (150-200 ug/kg), Mectizan® reduces *L. loa* microfilaremia to about 14% of its pretreatment level for up to one year after treatment. It is unlikely that Mectizan® kills adult *L. loa* parasites in humans at this dose range, and higher doses similar to those used to treat lymphatic filariasis (400 ug/kg) may be more efficacious for this purpose.
4. CNS reactions ("encephalitis/encephalopathy") may rarely occur in persons with very high numbers of *L. loa* mf (> 10,000 mf per milliliter of blood) shortly after treatment with the microfilaricidal drug diethylcarbamazine (DEC). Although current information suggests these reactions are even less common after ivermectin therapy, The Mectizan® Donation Program request that programs distributing ivermectin for onchocerciasis control programs have heightened surveillance for adverse reactions in areas where *L. loa* is known to be endemic.