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CARTER CENTER

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Summary
2005 Program Review for The Lions-Carter Center SightFirst River Blindness Programs
Cameroon, Ethiopia, Nigeria, OEPA, Sudan, and Uganda
20-22 February 2006
The Carter Center
Atlanta, GA

LIONS CLUBS INTERNATIONAL FOUNDATION

THE CARTER CENTER
RIVER BLINDNESS PROGRAM

June 2006

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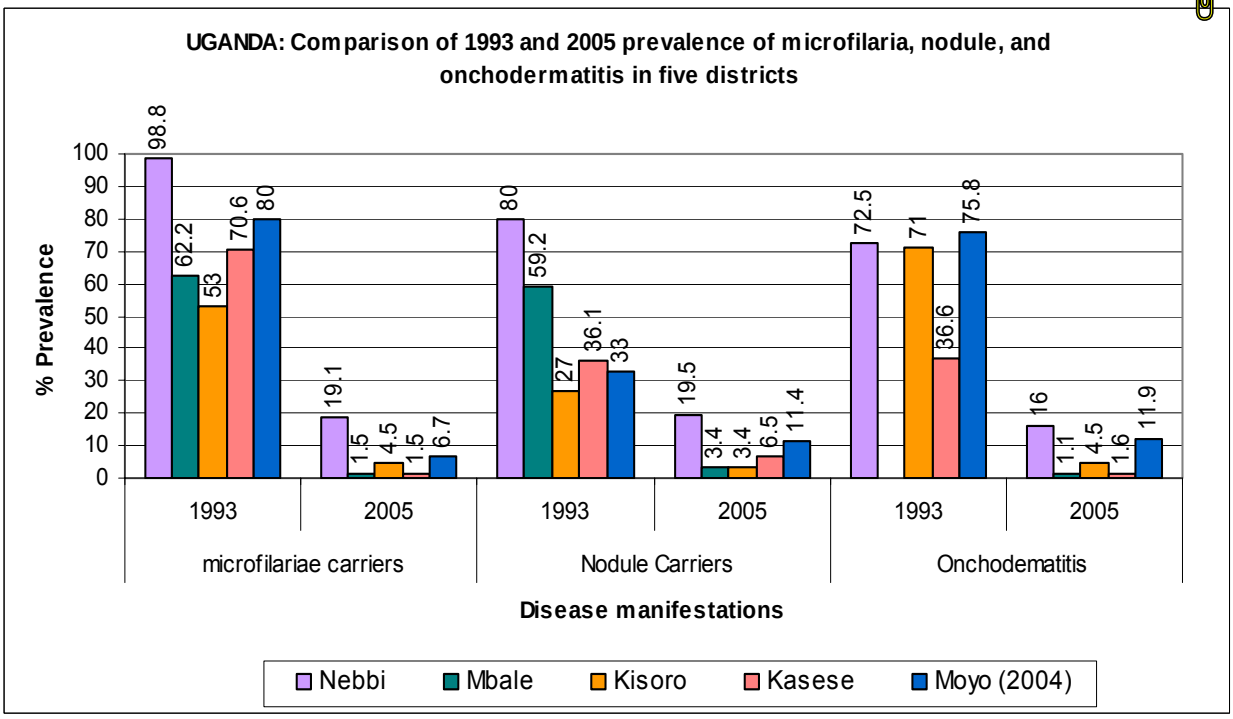
And to many others, our sincere gratitude

Figure A: Impact in Africa



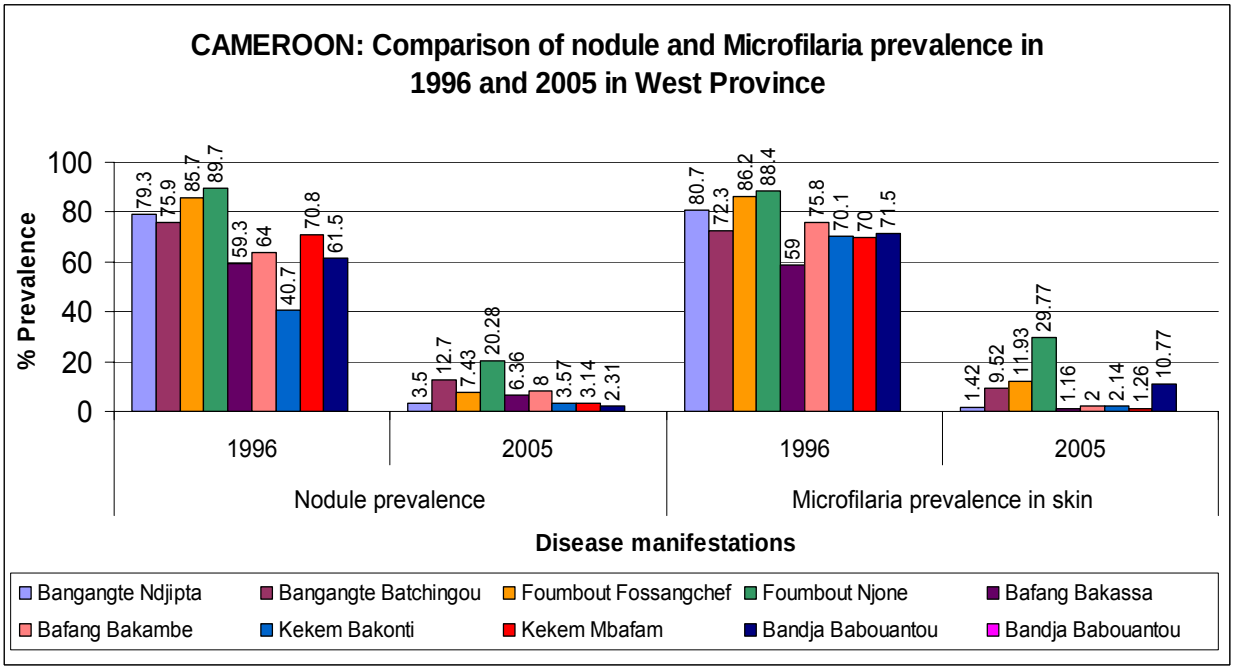
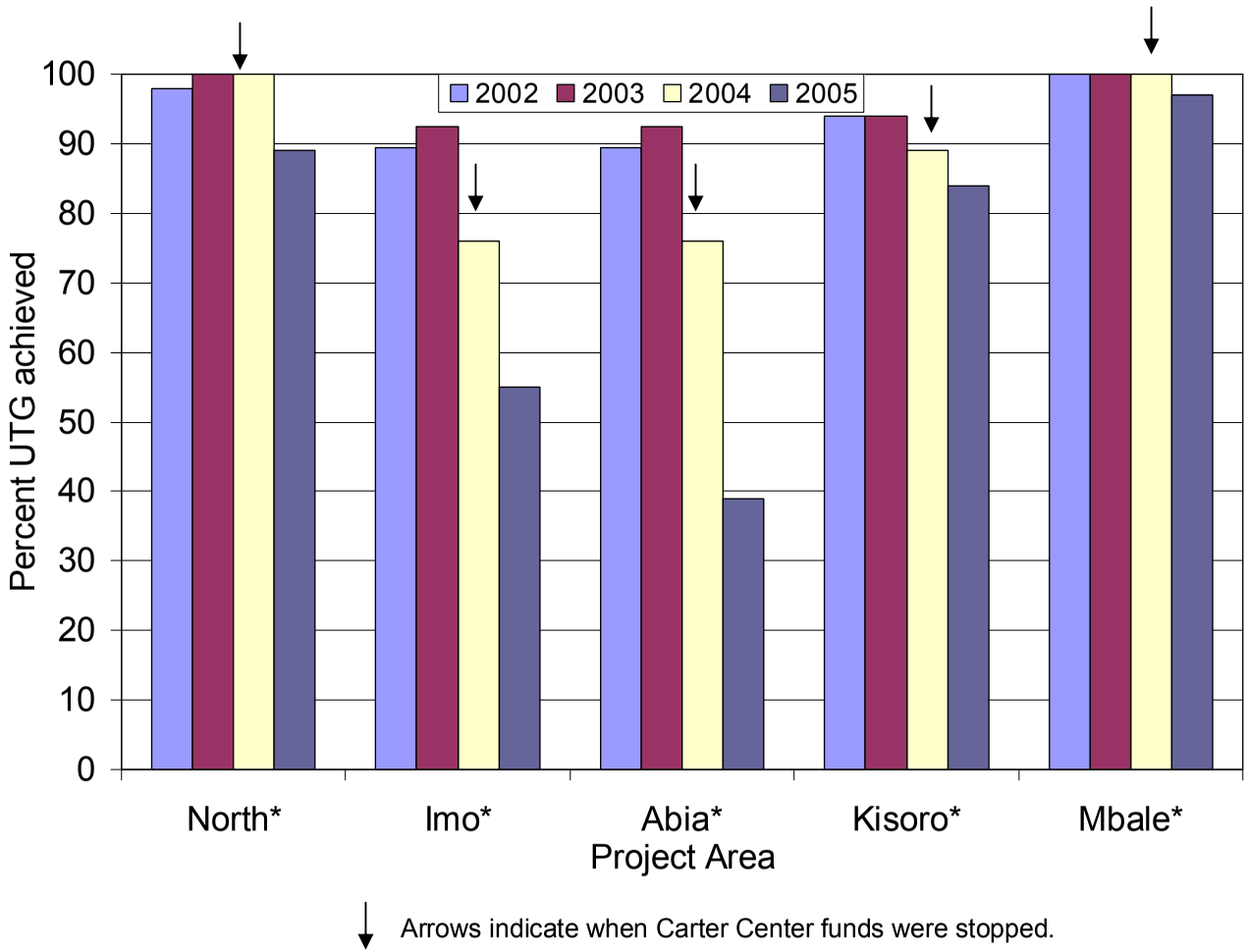


Figure B: UTG coverage of projects which participated in the Post-APOC, Post-NGDO trial in 2004 and 2005, in which Carter Center did not fund activities



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INTRODUCTION AND OVERVIEW

The River Blindness Program of The Carter Center assists the ministries of health of 11 countries (Figure 1) to distribute Mectizan® (ivermectin, donated by Merck & Co., Inc.) through programs that aim to control or eliminate onchocerciasis. Human onchocerciasis, caused by the parasite *Onchocerca volvulus,* is an infection is characterized by chronic skin and eye lesions. 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." The World Health Organization (WHO) estimates that approximately 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 99% of those at risk reside in Africa. Periodic mass treatment with Mectizan® prevents eye and skin disease caused by *O. volvulus* and may also be used to reduce or even interrupt transmission of the disease.

Local Lions Clubs and the Lions Clubs International Foundation (LCIF) are special partners of The Carter Center in the battle against river blindness (RB). When The Carter Center assumed the functions of the River Blindness Foundation (RBF) in 1996, we also entered into RBF's former collaboration with local Lions Clubs in Cameroon and Nigeria for community mobilization, health education, and supervision of Mectizan® distribution activities. Since 1997, LCIF has generously provided grants through their SightFirst Initiative to The Carter Center for the control of river blindness and trachoma, including a five year grant of $16 million in 1999. Through the SightFirst Initiative, LCIF and The Carter Center expanded their partnership to encompass controlling river blindness in five countries in Africa (Cameroon, Ethiopia, Nigeria, Sudan, and Uganda) and eliminating river blindness altogether in the six endemic countries of the Americas (Brazil, Colombia, Ecuador, Guatemala, Mexico, and Venezuela).

In 2003, the Bill & Melinda Gates Foundation made a $10 million challenge grant to The Carter Center in support of our elimination efforts in the Americas. The grant provided $5 million as an outright contribution and challenged the Center to raise an additional $5 million, which would be matched dollar-for-dollar by the Gates Foundation. LCIF, with a pledge of $2 million, and many other donors helped the Center meet the challenge by the end of 2005.

Other partners in Africa and the Americas include Merck & Co., Inc., the U.S. Centers for Disease Control and Prevention (CDC), WHO, the African Program for Onchocerciasis Control, and The World Bank, as well as other foundations, industries, international bilateral donors, and other nongovernmental development organizations (NGDOs).

The River Blindness Program hosted its tenth annual Program Review on February 20-22, 2006, at Hilton, Addis Ababa in Ethiopia. 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 (see Annex 1 for background

information on Carter Center activities). The main purposes of the review were to assess the status of each program, celebrate successes, and determine impediments and problems in program implementation.

Program review attendants included the following: Carter Center country representatives Dr. Albert Eyamba (Cameroon), Mr. Teshome Gebre (Ethiopia), Ms. Peace Habomugisha (Uganda), Dr. Emmanuel Miri (Nigeria), and the resident technical advisors of Sudan (Mr. Steven Becknell in Juba (GoSS) and Mr. Raymond Stewart in Khartoum). Dr. Mauricio Sauerbrey, director of the Onchocerciasis Elimination Program for the Americas (OEPA), presented progress made in the six endemic countries in the Americas. Other technical staff members included Drs. Abel Eigege and Emmanuel Emukah (Nigeria), and Mr. Abate Tilahun (Ethiopia). Ministry of Health representatives included Dr. Daddi Jima (Ethiopia), Dr. Richard Ndyomugyenyi (Uganda), Dr. Marceline Ntep (Cameroon), Dr. Ambrose Onapa (Uganda), and Dr. Y.A. Saka (Nigeria). Special guests included Dr. Uche Amazigo (Director of APOC); Dr. Samson Baba (Southern Sudan Onchocerciasis Task Force); Dr. Tebebe Berhan, Mr. Getachew Desta, Mr. Mayur Kotari, Mr. Ramendra Shah, Mr. George Stavrou, Mr. Getachew Temeche, and Dr. Kebede Worku (Lions, Ethiopia); Mr. Fasil Chane (CBM Sudan); Dr. Tony Ukety (NGDO Coordinator), and Ms. Sonia Pelletreau (Lions Clubs International Foundation). Dr. Frank Richards (Technical Director of The Carter Center's River Blindness Program, Lymphatic Filariasis Elimination Program and Schistosomiasis Control Program) chaired the meeting. See Annexes 2, 3 and 4 for a complete participant list, contact list, and the agenda of this meeting.

A major focus of The Carter Center is routine reporting by assisted programs. The reader is referred to Annex 5 for a discussion of The Carter Center 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]), as used by the OEPA program where semiannual treatments are delivered; Annual Treatment Objectives (ATOs); eligible at-risk population (earp); at-risk villages requiring mass treatment (arvs) provided in the communities themselves; and full coverage, which is defined as 85% achievement of the UTG, or for OEPA, the UTG[2]. Passive treatments are Mectizan® treatments for onchocerciasis provided at health care units.

Summary of the Meeting

In 2005, ministries of health (MOHs) in Carter Center assisted areas provided a total of 10,320,904 mass Mectizan® treatments for onchocerciasis (Table 1 and Figure 2), 477,530 passive treatments. This represented a 4% decrease from the 11,109,611 treatments in 2004. This number constituted 88% 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 76,577,813. About 41% of treatments were provided in Nigeria, but both Nigeria and Sudan registered decreased treatments in 2005 (Figure 4). Nearly all treatments (97%) were supported by LCIF (Figure 5).

In the Americas, Mectizan® treatments are given twice per year with the goals being to both eliminate clinical manifestations of onchocerciasis by 2007 and to interrupt transmission of the disease so that ocular treatment programs can ultimately be stopped. The InterAmerican Conference on Onchocerciasis (IACO'05) held in Caracas, Venezuela, in November 2005 concluded that available data suggest no cases of blindness attributable to onchocerciasis in the region since 1995. However, microfilaria in the anterior segment of the eye are still detected in at least five of the 13 foci. In anticipation of 2007, the OEPA program continues to increase its assistance to countries to monitor clinical and epidemiological indicators in each focus.

Cameroon and Uganda reported dramatic data from sentinel areas showing the impact of 10 years (Cameroon) and 13 years (Uganda) of annual Mectizan® treatment on microfilaria in skin, nodules, and (in Uganda) dermatitis (Frontispiece A). It is clear from these data that onchocerciasis has been controlled but not been completely eliminated by prolonged annual Mectizan® therapy.

Ethiopia: At the request of the Ethiopian government, The Carter Center Ethiopia agreed to extend its support to two new CDTI projects (Gambella and Metekel) at the end of 2005. This implies that the current UTG of 2,680,868 will increase to 2,761,066 in 2006 for Carter Center supported zones.

Sudan: After the signing of the peace agreement in Sudan in January 2005, the office supporting the south (formerly in Nairobi, Kenya) relocated to Juba, where it will work in collaboration with the Government of South Sudan (GOSS). The Carter Center, based on a request by the GOSS, withdrew its support from NGDOs operating in Western Equatoria in mid-2005, a policy which resulted in a decreased number of Carter Center assisted treatments in 2005 compared to 2004. The Khartoum office, with the Government of Sudan (GOS), began to work exclusively in the northern sector, and together with the GOS considered beginning in 2006 to work on elimination of onchocerciasis in two foci (Abu Hamed and Sundus).

Uganda: Ministry of Health officials from Uganda expressed strong interest in working with The Carter Center beginning in 2006 on focal elimination of onchocerciasis in all foci where such a strategy would be technically feasible.

Nigeria: The Nigerian program has emphasized integration of lymphatic filariasis elimination, schistosomiasis control, and malaria control programs into the mature onchocerciasis control activities in Delta, Plateau and Nasarawa States. Integration of interventions appears to be an excellent way to bundle programs to reduce costs, strengthen healthcare systems and infrastructure, and make the best use of scarce human and material resources. Evidence of the impact of combined interventions against these diseases has been observed. Further details can be found in the Nigeria section of this document.

Experiences of the Post-APOC, Post-NGDO sustainability trial

The African Program for Onchocerciasis Control (APOC)/WHO and The World Bank have scaled down their support in recent years to all Carter Center assisted projects in Africa. These projects have received or will receive funds for capital equipment replacement and funds for advocacy, but will no longer get funds for delivery of Mectizan® from APOC Trust fund

Twenty-four Carter Center assisted areas are no longer receiving APOC support. Five of these were selected for a Post-APOC, Post-NGDO (PAPN) trial in 2004 and 2005: North Province (Cameroon), Imo and Abia States (Nigeria), and Kisoro and Mbale Districts (Uganda). All of these were the highest scoring Carter Center assisted areas on their APOC sustainability evaluation in their respective countries. The Carter Center withdrew funding for activities in 2004 and 2005 in order to test what could happen when activities are turned over to the full responsibility of the national, state, and local governments. Figure 6 shows the treatment performance in these areas from 2003 (when they were fully funded) to 2005. Table 2 shows the coverage in each of the Carter Center projects with respect to APOC year.

Each area showed varying levels of program dysfunction by the end of 2005; coverage was highest in Cameroon's North Province, where government funding is considered strong. Treatment coverage in Mbale, Uganda, was also high. The greatest program decline occurred in Imo and Abia States, Nigeria, where treatments decreased by 31% during the PAPN period. However, we observed reporting delays and dysfunction from all areas where Carter Center funding was withdrawn, which could influence reported coverage levels through reporting errors. In all PAPN areas, training and health education numbers diminished. Further discussion of each trial can be found in the country sections under the heading ***Post-APOC, Post-NGDO sustainability trial***.

Because the PAPN areas universally demonstrated decreased program functionality, all Carter Center Country Directors strongly argued at the Program Review for an end to the PAPN sustainability trials in 2006, but with insistence on increased government co-funding as The Carter Center resumes its funding in those areas. It was agreed that the trials would cease in Nigeria and Uganda. Government support by national and local governments for Mectizan® distribution programs will be the major determinant of program sustainability. Because Cameroon's government has been willing to step in and contribute to its program, The Carter Center will continue with its decreased level of funding there.

Other Observations

The Lions are interested in the demonstration of program impact on disease manifestations, particularly blindness.

The Carter Center remains very interested in determining whether onchocerciasis could be eradicated from Africa so that programs would not have to be sustained indefinitely.

The improved version of the presentation format developed for the 2004 Program Review, which attempts to focus discussion and standardize presentation of data, was used successfully. The new format was considered by the audience to be an improvement over previous years and is a work in progress.

The Ethiopian Program was recognized at the meeting and congratulated for holding this meeting, the first River Blindness Program Review held outside of Atlanta. The meeting was a success, and we thank the Ethiopia field office for a job well done!

GENERAL RECOMMENDATIONS 2006 FOR THE CARTER CENTER'S RIVER BLINDNESS PROGRAM

Stop post-APOC post-NGDO scenario trials in 2006 in Nigeria (Imo and Abia) and Uganda (Kisoro and Mbale), but insist on government co-funding. Monitor changes in treatment processes (including treatment numbers, % of UTG attained, tablet supply, logistical chain issues, duration of village treatment exercises, community-directed distributor [CDD] and health worker training, and number of communities promptly reporting), as well as new financial inputs required to rejuvenate programs. In Nigeria's Imo and Abia States, headquarters will send financial staff or a consultant in the first half of the year to establish a system for monitoring the new financial inputs required to rejuvenate programs. Close monitoring for new investments from APOC is also needed.

The Carter Center will be looking closely at how it is funding the 'post APOC gap' in all its assisted projects, and it will consider withdrawing such funding in the next two to three years if government does not begin to contribute.

All Carter Center-assisted projects should continue to refine their APOC, government and Carter Center funding figures in 2006.

All efforts must be made to ensure that any decrease in treatments reported is not a result of withholding data or reports of treatments that were actually delivered.

All external partners (APOC and NGOs) are encouraged to undertake their own post-APOC post-NGDO scenario trials.

Consider twice-per-year treatment in isolated foci where government is willing to fund the additional efforts in order to focally eliminate onchocerciasis.

Make progress toward a field trial of delivering the three-drug combination (Mectizan®, albendazole, and praziquantel) in Nigeria and/or Uganda.

The importance of demonstrating the impact of Carter Center-assisted programs on ocular disease was stressed by Lions as being very important for the second phase of SightFirst fundraising. Carter Center programs need to review all available data from past sentinel areas that may have baseline data pertaining to visual impairment or ocular disease due to onchocerciasis.

Conduct The Carter Center monitoring protocol.

Seek to increase training, supervision, involvement of kinship groups, and improve gender balance among CDDs.

Better information is needed on CDD attrition, CDD training, and CDD retraining. Indices for CDDs should include CDDs/village, CDDs/population targeted, CDDs/persons treated, and CDDs/kinship group.

Carter Center program staff are encouraged to complete the Emory IRB ethics test, and are required to do so where research on human subjects is or will be taking place.

The presentation format should continue to be modified to simplify data presented on each slide, using more graphs and fewer tables.

All projects should send CDD training proposals to APOC, with a focus on kindred approach.

Enhance CDC collaboration in Nigeria, OEPA and other countries (particularly those interested in elimination).

Encourage APOC to deal with cross border issues.

To invest in integration with other diseases, we would first need formal Carter Center Board approval; however, if the government wants to support integration in areas where we work, we cannot refuse to participate.

Figure 1: Carter Center-Assisted Onchocerciasis Control Programs

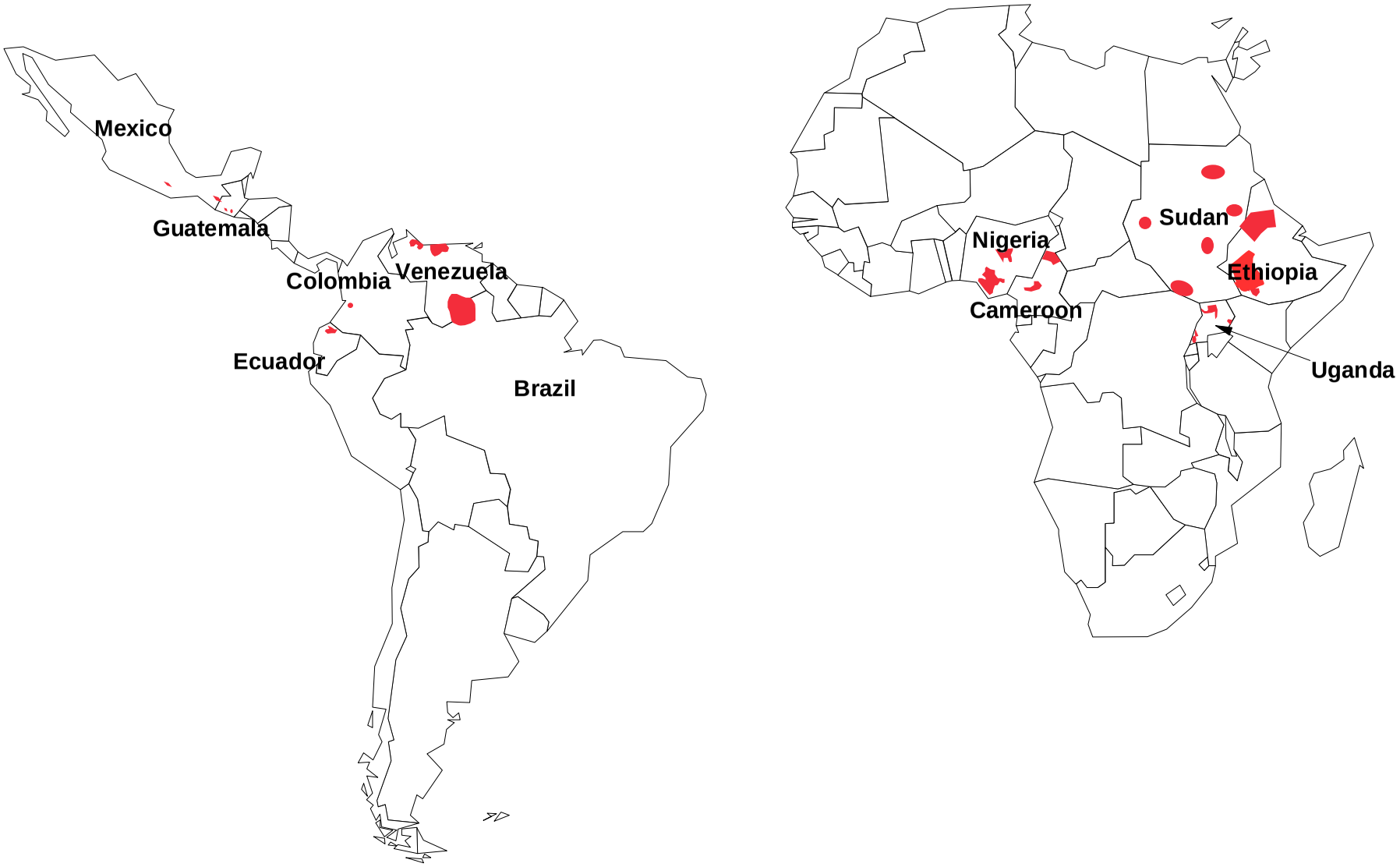


Figure 2: Carter Center-Assisted Programs: Annual Mectizan Treatments, 1996 - 2005

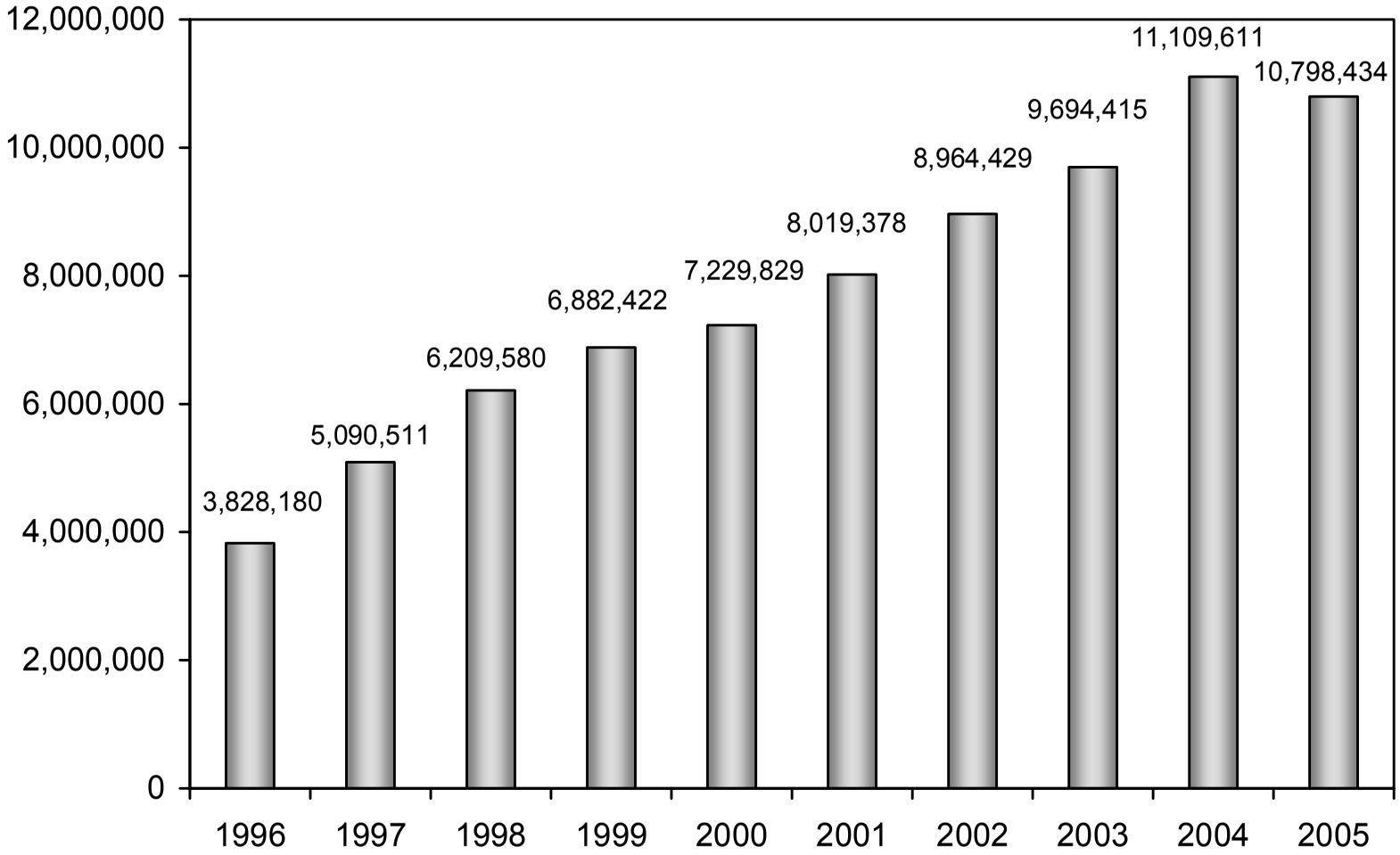


Figure 3: Carter Center-Assisted Programs: Percent of Ultimate Treatment Goals reached in 2004 and 2005

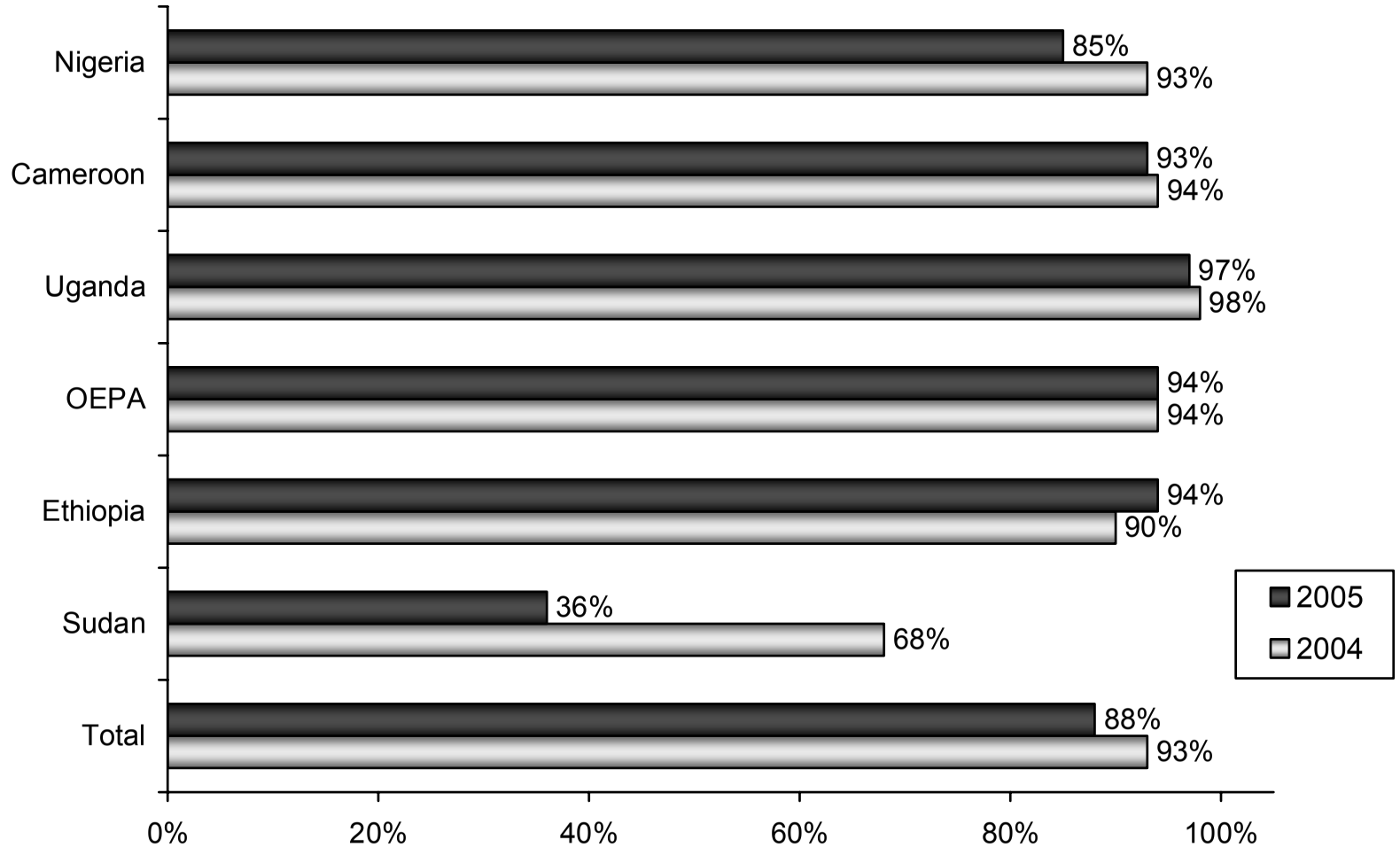


Figure 4: Carter Center-Assisted Programs: 1996 - 2005 Mectizan Treatments, by program

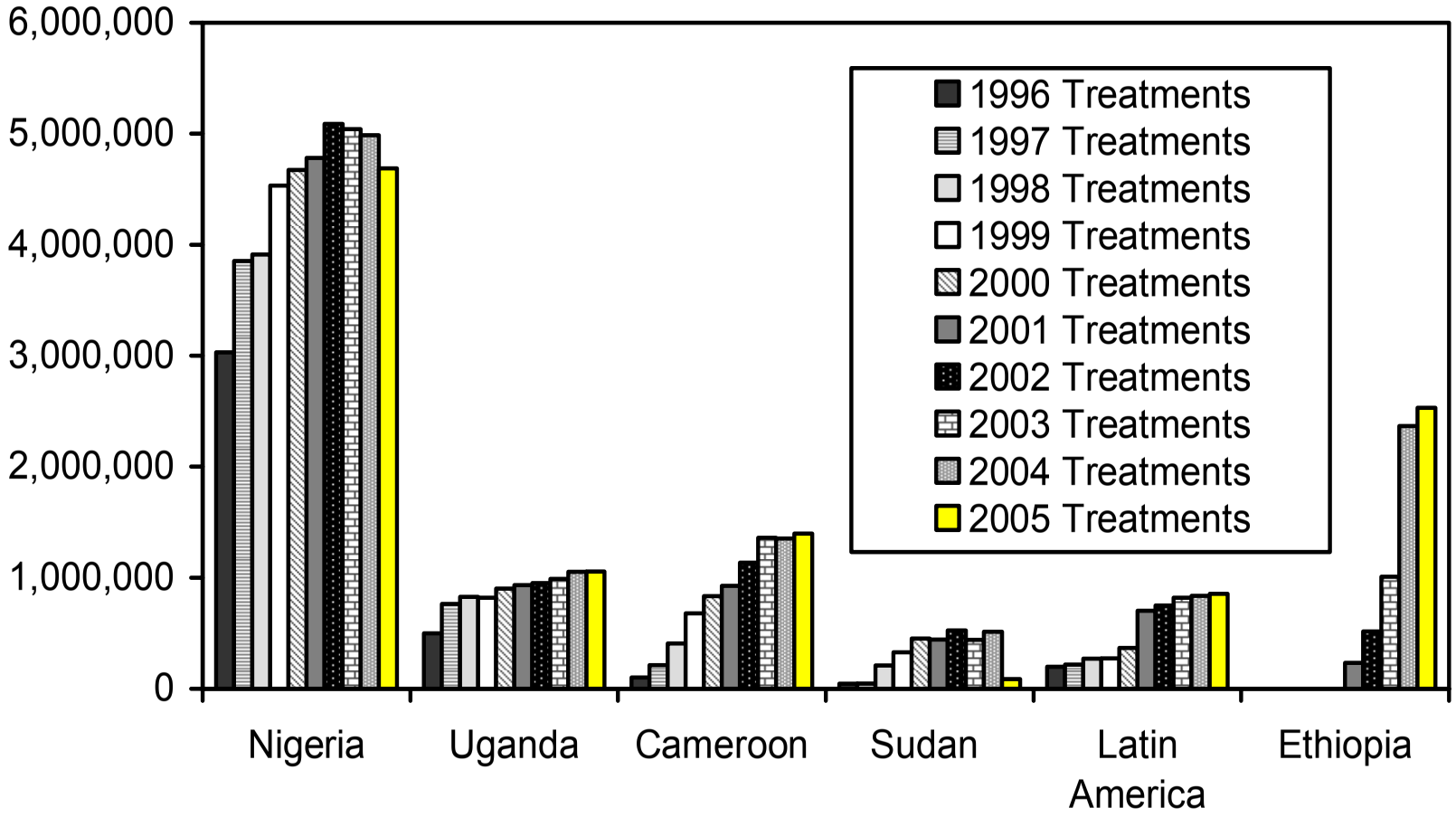


Figure 5: Annual Mectizan Treatments, Carter Center-Assisted and Carter Center / Lions-Assisted Programs

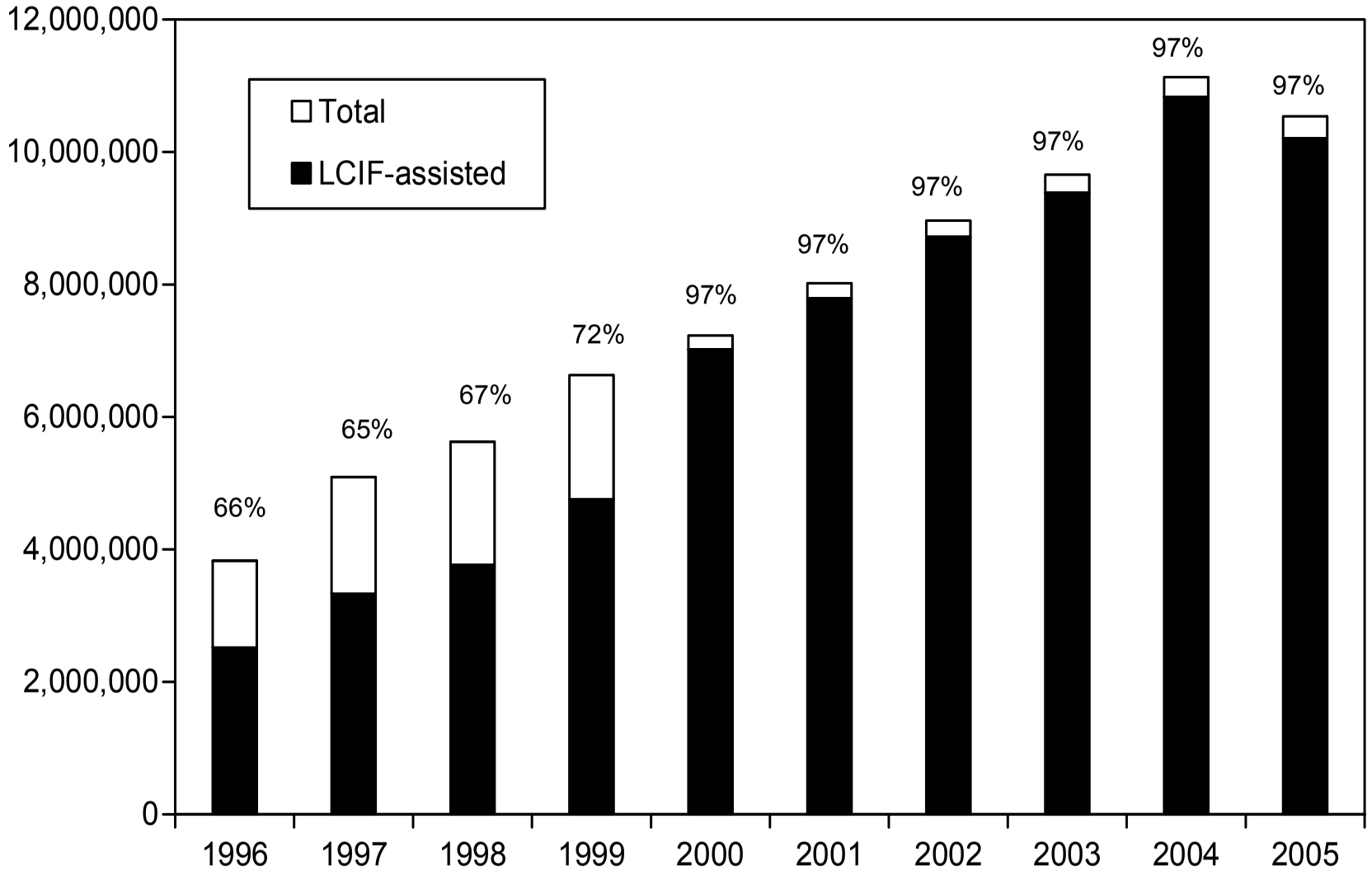
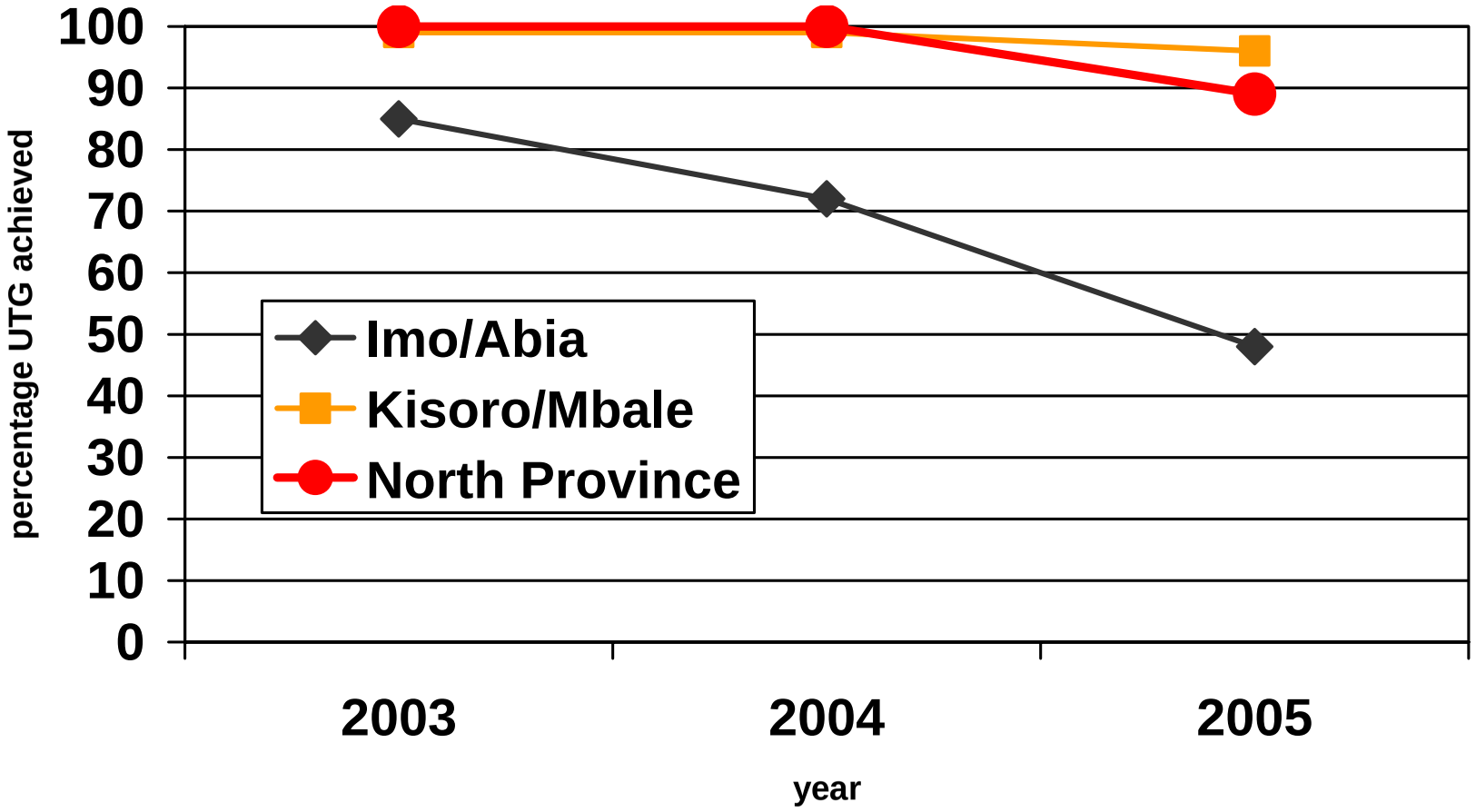


Figure 6: Post-APOC, Post-NGDO Projects
Mass Treatment Coverage, 2003 – 2005*



* In 2003, APOC funding ceased and Carter Center withdrew activity funding to test post-APOC, post-NGDO scenario.

Table 1: Onchocerciasis: 2005 Mectizan mass treatment figures for The Carter Center River Blindness Program-assisted areas in Nigeria, Uganda, Cameroon, Ethiopia, and collaborative programs in Latin America (OEPA) and Sudan

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	% ATO	% ALL RBP TX
NIGERIA	***UTG=**	**4,847,289**		**ATO(arv)=**	**7,917**										
Treatments	0	17,117	171,617	147,745	92,227	495,134	1,524,148	674,094	159,396	464,871	290,368	215,292	**4,252,009**	88%	41%
Villages treated	0	15	141	72	128	754	2,215	1,095	418	750	624	121	**6,333**	80%	24%
UGANDA	***UTG=**	**1,049,867**		**ATO(arv)=**	**2,360**										
Treatments	0	13,263	154,086	154,711	62,587	100,744	110,731	155,435	165,238	79,822	24,804	0	**1,021,421**	97%	10%
Villages treated	0	31	227	502	273	367	371	485	516	213	189	0	**2,360**	100%	9%
CAMEROON	***UTG=**	**1,502,412**		**ATO(arv)=**	**3,392**										
Treatments	0	0	0	0	0	193,995	0	65,296	167,887	269,792	280,813	413,590	**1,391,373**	93%	13%
Villages treated	0	0	0	0	0	531	0	173	268	849	1,299	453	**3,573**	105%	14%
OEPA	****UTG(2)=**	**908,852**		**ATO(arv)=**	**1,950**										
Treatments	0	0	0	0	0	426,204	0	0	0	0	0	428,998	**855,202**	94%	8%
Villages treated	0	0	0	0	0	1,833	0	0	0	0	0	1,859	**1,846**	95%	7%
ETHIOPIA	***UTG=**	**2,680,868**		**ATO(arv)=**	**13,842**										
Treatments	0	0	0	0	0	307,059	94,536	1,376,283	26,465	632,582	95,042	0	**2,531,967**	94%	25%
Villages treated	0	0	0	0	0	1,207	722	7,573	0	2,585	0	0	**12,087**	87%	46%
SUDAN	***ATO=**	**759,742**													
Treatments	17,893	19,591	18,319	2,731	16,064	0	0	0	0	0	0	194,334	**268,932**	35%	3%
TOTALS	***ATO=**	**11,749,030**		**ATO(arv)=**	**29,461**										
Treatments	**17,893**	**49,971**	**344,022**	**305,187**	**170,878**	**1,523,136**	**1,729,415**	**2,271,108**	**518,986**	**1,641,401**	**885,361**	**1,252,214**	**10,320,904**	**88%**	**100%**
Villages treated	**0**	**46**	**368**	**574**	**401**	**1,652**	**2,586**	**1,753**	**1,202**	**1,812**	**2,112**	**2,433**	**26,199**	**89%**	**100%**

RBP-assisted cumulative treatments (1996 - 2005) = 76,577,813
2005 total passive treatments = 10,789,434

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

Table 2: Carter Center/Lions-Assisted project coverage as it relates to year of APOC funding

				Coverage (UTG)					
COUNTRY	**PROJECT**	**Overall APOC Sustainability Score**	**First year with APOC**	**5th year funding ends**	**1 Year before APOC stopped funding**	**Year when APOC funding stopped**	**Year after APOC funding stopped**	**Second year after APOC funding stopped**	**Third year after APOC funding stopped**
Cameroon	North*	2.9	1998	2003	98	110	100	89	n/a
	West	2.5	2001	2006	92	94	-	-	-
Ethiopia	Illubabor	n/a	2004	2008	-	-	-	-	-
	Jimma	n/a	2004	2008	-	-	-	-	-
	Kaffa	3.0	2000	2005	91	-	-	-	-
	Sheka	3.0	2000	2005	95	-	-	-	-
	Bench Maji	n/a	2002	2007	-	-	-	-	-
	North Gondar	n/a	2002	2008	-	-	-	-	-
	Metekel	n/a	2004	2008	-	-	-	-	-
	Gambella	n/a	2004	2008	-	-	-	-	-
Nigeria	Enugu	1.9	1998	2003	86	93	99	100	-
	Anambra	3.2	1998	2003	86	88	100	93	-
	Ebonyi	2.4	1998	2003	86	88	100	87	-
	Edo	3.1	1999	2004	92	93	100	100	-
	Delta	2.5	1999	2004	85	91	99	97	-
	Imo*	3.6	1998	2003	90	92	76	55	-
	Abia*	2.6	1998	2003	90	92	76	39	-
	Plateau	2.4	1998	2003	94	90	97	95	-
	Nasarawa	2.4	1998	2003	100	96	108	109	-
South Sudan	Juba	n/a	n/a	2003	63	63	38	not known	-
Sudan	Khartoum	2.4	1997	2003	78	60	96	37	-
Uganda	Kasese	2.9	1997	2002	99	100	100	99	97
	Kisoro*	2.5	1997	2002	93	94	94	89	84
	Mbale*	3.1	1998	2003	100	100	100	97	-
	Kabale	2.4	1998	2003	93	92	90	88	-
	Kanungu	2.6	1998	2004	98	97	97	-	-
	Nebbi	3.0	1998	2004	100	100	98	-	-
	Moyo	n/a	1999	2005	99	99	-	-	-
	Gulu	n/a	1999	2005	93	96	-	-	-
	Apac	n/a	1999	2005	100	97	-	-	-
	Adjumani	n/a	1999	2005	98	97	-	-	-
Average performance with respect to APOC year					**92**	**92**	**93**	**85**	**91**

* projects which performed the post-APOC, post-NGDO sustainability trial
A "-" indicates information that the program has not yet reached this year

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® in the endemic areas of the region. There are 13 onchocerciasis foci within the six endemic countries (Brazil, Colombia, Ecuador, Guatemala, Mexico, and Venezuela) in the region (Figure 7). 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, The Carter Center, Lions Clubs and the 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 these partners and serves as a steering committee for OEPA office, which is based in Guatemala City, and is staffed and financed through The Carter Center. The Center also coordinates technical and financial assistance to the six countries, through the OEPA office.

OEPA has three main goals:

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

- To interrupt transmission of onchocerciasis as soon as possible through high coverage, semiannual mass treatment of at-risk populations with Mectizan®. Treatment programs aim to reach at least 85% of persons eligible for treatment who reside in communities known to be endemic for onchocerciasis (Figure 8), and sustain treatment coverage for approximately ten years.

- To 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 2005:

Mectizan® 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 required treatments in the region (the UTG multiplied by two, since each individual should be treated twice during a calendar year). Treatment coverage is defined the number of treatments provided divided by the UTG(2).

The total number eligible for treatment in 2005 was 454,426, giving a UTG(2) of 908,852 (Figure 8, Table 3). During 2005, 855,202 treatments were provided, reaching 94% coverage, and continuing the trend for increasing numbers of treatments in the region (Figure 9). For the third consecutive year, all countries reported an overall ivermectin coverage rate that exceeded the goal of 85% (Figure 10). Figure 11 shows the 2005 coverage rates among eligible populations in the 13 endemic foci. The South focus of Venezuela has never reached this treatment coverage goal; all twelve other foci have reported exceeding 85% coverage for at least the past 3 years. The individual country reports below provide greater detail. Of the 1,950 endemic communities within the 13 endemic foci, 1,648 (85%) reached or surpassed the coverage goal in their individual community (Figure 12).

2005 Country data:

Brazil has 1.8% of the population needing treatment for onchocerciasis in the Americas, all of whom reside in a vast single focus (the Amazonas focus) bordering Venezuela. The Brazilian program has demonstrated the feasibility of delivering treatment to the migratory Yanomami communities in the extensive Amazon forest. Brazil provided 13,483 treatments in 2005, 90% of its UTG(2) of 15,044, reaching the treatment coverage goal for the fifth consecutive year. 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 base camps in both rounds of treatment.

Colombia has <1% of the population needing treatment in the Americas, all of whom reside in a single focus (López de Micay, Cauca). Its program provided 2,209 treatments in 2005, 94% of its UTG(2) of 2358. Colombia exceeded the treatment coverage goal for the seventh consecutive year, despite civil unrest that continues in the area.

Ecuador has a single endemic focus in Esmeraldas Province (the focus is further divided into 6 operational areas, in some of which transmission has been interrupted), and accounts for 4.5% of the regional population that needs treatment. The program achieved greater than 85% coverage for the fifth consecutive year, providing 39,385 treatments, which is 98% of the UTG(2) of 40,042. The Ecuadorian program established an agreement with Lions Clubs of Ecuador to share information on patients with cataracts detected in onchocerciasis endemic areas so that they may be treated through the Lions' SightFirst Program for cataracts.

Guatemala has four endemic foci (Central, Huehuetenango, Escuintla, and Santa Rosa) in which 39% of the population needing treatment in the Americas resides. The Guatemalan program provided 326,646 ivermectin treatments in 2005, 93% of its UTG(2) of 349 624. The country surpassed the coverage goal for the fourth consecutive year.

Mexico has three endemic foci (Oaxaca, North Chiapas and South Chiapas), comprising 33% of the regional treatment population. Mexico achieved greater than 85% coverage for the fifth consecutive year (287,856 treatments, 95% of the UTG(2) of 304 606). Mexico has also been providing ivermectin four times a year in 50 of the most highly endemic communities in the South Chiapas focus since 2003, as part of a trial aimed at hastening interruption of onchocerciasis transmission. A three-year impact evaluation of the communities involved is scheduled for 2007. A joint visit with local and international Lions and Carter Center staff to villages in Tapachula, Chiapas, Mexico, to assist in Mectizan® distribution activities was undertaken in 2006. A video taken during that visit will be part of the upcoming new Lions SightFirst 2 campaign.

Venezuela also has three endemic foci (North-Central, North-Eastern and South – the latter bordering the Brazilian focus). The eligible population in the Venezuelan foci comprises 22% of the regional treatment population. Venezuela reached the 85% treatment coverage goal for the third consecutive year (185,623 treatments, 94% of the UTG(2) of 197,178), despite failing to attain this goal in the South focus. The poorly accessible South focus (where only 1.3% of the regional total population lives), provided 5,481 treatments (46.81% of their UTG(2) of 11,710) in 2005 compared to 5,683 treatments (51% of 11,120) in 2004.

The Regional UTG(2) for 2006 is 917,688. The country and foci specific UTG(2) targets are provided in Figures 13 and 14 respectively.

Special PCC meeting in southern Venezuela:

A meeting of OEPA partners involved in providing health care to the Yanomami Indians who inhabit the South onchocerciasis focus of Venezuela took place in Puerto Ayacucho (Amazonas State, Venezuela) on July 19-22, 2005. A map of that focus is shown in Figure 15, which also shows the large area of unexplored territory in the focus. Since the South focus of Venezuela is continuous with the Brazilian focus, interruption of transmission in both countries is threatened by the failure to reach good coverage in southern Venezuela. The meeting was attended by OEPA staff and several Program Coordinating Committee (PCC) members. The focus of the meeting was on working with PAHO and Venezuelan partners to find ways to improve geographic and treatment coverage. Important recommendations included:

1) Implementing the Venezuelan Government's "Yanomami Health Plan" which would provide the funding, air transport and critical on ground infrastructure needed to deliver Mectizan® treatments as part of an integrated essential health care package to this remote population;
2) The South Venezuelan Focus and Brazilian Amazonas Focus, being considered one transmission zone, should be called the 'Yanomami Area'. Cross-border agreements in the Yanomami Area are needed to better coordinate activities there;
3) Formal agreements between the health sector and the Venezuelan Army are needed to guarantee reliable air (especially helicopter) transport and logistics to reach all endemic communities.

In August 2005, President Carter wrote to President Chavez of Venezuela to communicate these recommendations to the highest levels of government.

IACO 2005:

The fifteenth annual InterAmerican Conference on Onchocerciasis (IACO 2005) was held in Caracas, Venezuela in November 2005. The meeting was organized by OEPA and PAHO, with financial support from the Bill & Melinda Gates Foundation, Lions Clubs International Foundation 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 involved in Mectizan® distribution in endemic areas, CDC and academic institutions. A large contingent of Lions attended the meeting, representing local Lions Clubs in five of the six endemic countries (Brazil absent), and the LCIF headquarters in Oakbrook, IL.

From left to right: Lions attendees Dr. Manuel Bautista Plaza, Dr. Florencio Cabrera Coello, Mr. Carlos Samuel Arévalo, Mr. Ramiro Peña Constante, Mrs. Blanca García de Ortiz, Mrs. Xiomara Elena Mata de Sánchez, Mrs. Margarita Garrido de Peña, Dr. Libardo Bastidas Passos, and Ms. Holly Becker are joined by Dr. Mauricio Sauerbrey on the far right.

The IACO 2005 theme was "OEPA's contribution to reducing blindness and improving visual health in the Americas." Each country reviewed the current status of visual health related to onchocerciasis in the 13 foci, and each concluded that the evidence indicates that no new cases of blindness attributable to onchocerciasis had occurred since 1995. IACO 2005 concluded that the widespread use of ivermectin has resulted in improved visual health in all endemic foci. However, the conference also noted the need to conduct additional ophthalmological surveys in at least four of the 13 foci during 2006 in preparation for a 2007 progress report to PAHO on how close the region has come to ending reversible onchocerciasis ocular morbidity (Figure 16) (defined by OEPA as <1% prevalence microfilaria in the anterior segment of the eye in sentinel villages in endemic foci).

In terms of the goal of interrupting transmission of the parasite in the region, a presentation was made at IACO 2005 about studies conducted in 2004–2005 in the Guatemalan focus of Santa Rosa by CDC and OEPA. The conference concluded that these data showed absence of transmission in Santa Rosa.

Other recommendations from IACO 2004 included the need for:

- A meeting of entomologists prior to the next IACO to review available data and move toward the use of 'annual transmission potentials' (ATPs);
- An adult worm antigen detection test to determine when all adult worms have been eliminated from an area (now being developed by The Scripps Research Institute in California with support from Mr. John Moores);
- Independent coverage surveys to verify reported treatment levels at the community level;
- Implemention of the Venezuelan Government's "Yanomami Health Plan;"
- Work in 2006 in anticipation of a 2007 report to PAHO on the progress toward the goal of the 1991 PAHO resolution (elimination of new ocular morbidity in the region).

Transmission interruption in the 13 foci:

It is believed that transmission has been interrupted in Santa Rosa (Guatemala), and suppressed in five of the other 12 foci: Oaxaca and North Chiapas (Mexico), Huehuetenango and Escuintla (Guatemala), and Lopez de Micay (Colombia).

Editor's Note on the Program Coordinating Committee (PCC) meeting in May 2006:

The 26th meeting of the OEPA steering committee (the PCC) took place from May 9-10, 2006 at the OEPA headquarters in Guatemala City. Some key conclusions and recommendations from that meeting are included in this document as a supplement the 2005 Program Review Proceedings.

1. Santa Rosa: The PCC revisited the 2004-2005 data collected for the Santa Rosa focus, together with the IACO 2005 conclusion related to absence of transmission, in a meeting with high level Guatemalan Ministry of Health officials and CDC OEPA technical personnel. The PCC conclusion was as follows:

In the Guatemalan focus of Santa Rosa, the PCC reviewed the epidemiological and treatment history of that focus, along with recent entomological, ophthalmologic, and serological field studies completed by the MOH, CDC and OEPA. The PCC noted, with reference to WHO Certification guidelines, that the data indicate no recent transmission in the area, and no eye disease attributable to onchocerciasis. Accordingly, the PCC unanimously recommended to the Ministry of Health of Guatemala that it suspend Mectizan® treatment in that focus (the MOH is currently considering the recommendation). The PCC recommended to OEPA that support be provided to the MOH and CDC to help Santa Rosa maintain epidemiological surveillance for recrudescence of the disease for the time period recommended by the WHO guidelines. The PCC noted with satisfaction that this is the first of the 13 foci in the Americas where such a recommendation has been made.

2. PCC noted that the perceived requirement to achieve (as indicated by the upper 95% confidence limit) <1 infective fly in 10,000 flies in order to declare suppression of transmission, is a misinterpretation of the WHO Certification guidelines. It expressed concern that this was being established as 'fact' in publications in medical literature. In fact, the WHO guidelines recommend a minimum sample size of 10,000 flies, and 'absence or near absence' of infective flies in those samples. The PCC noted that even 0 infective flies in a 10,000 fly sample would not provide the necessary power to determine (as indicated by the upper 95% confidence limit) <1 infective fly in 10,000. The PCC also noted that obtaining more than the 10,000 flies per site is frequently impossible or too costly to do programmatically. Lastly, the PCC noted that the criterion currently used by Special Programme for Research and Training in Tropical Diseases (TDR) in West Africa of <1 infective fly (as indicated by the upper 95% confidence limit) per 1,000 parous flies would in most instances be adequately powered by a 10,000 fly sample, and that <1 infective fly per 1,000 parous flies could also be interpreted (per the WHO Certification guidelines) as 'absence or near absence' of infective flies.

3. Given the above, PCC urgently called on OEPA to organize a meeting of entomologists before the November IACO'06. Pending that meeting, entomological data are to be reorganized using the estimated transmission threshold of 2/1000 flies (assuming 50% parity).

The current 13-foci table that includes the clarified interim entomology threshold is shown in Table 4.

RECOMMENDATIONS 2006 for OEPA

Focus on improving treatment coverage in southern Venezuela.

As much as possible of the 13-foci table should be completed in 2006.

Switch to ATO and R_o analysis of PCR data by the end of 2006.

Improve data management in sentinel villages, consider monitoring individuals or cohorts, and establish serological (OV-16) monitoring.

Stop treatments in Santa Rosa, if the Government of Guatemala and the PCC agree.

Assist the Mexican program in the important four times-per-year treatment protocol being conducted in Chiapas.

Work with CDC/MERTU to determine next steps with *Wolbachia* antibiotic or other macrofil trials.

Continue to develop antigen detection tests.

Consider adding other interventions (nodulectomy, focal vector control), when appropriate, that could be applied in specific foci.

Maintain CDC lab involvement, particularly in serology, nodule histology, entomology, and drug studies.

Seek more Lions involvement, to help maintain program visibility and support.

Work on improving the coverage surveys being performed.

Promote community surveys for validating the level of community involvement, health education, training and coverage. Implement the scoring system to monitor community participation.

Complete PCR in all collected flies banked in the region prior to IACO 2007.

Establish mathematical transmission models for all foci, with particular urgency to do so in *S. ochraceum* areas.

Conduct certification exercises in Escuintla (Guatemala) in collaboration with CDC.

Figure 7: Distribution of Onchocerciasis in the Americas

Figure 8: Population at risk in the Americas 2005

Country	Population at risk	%	Eligible Population	%	Endemic Communities	%
Brazil	9,483	2%	7,522	2%	17	1%
Colombia	1,410	0%	1,179	0%	1	0%
Ecuador	23,386	5%	20,021	4%	119	6%
Guatemala	199,558	39%	174,812	38%	518	27%
Mexico	168,819	33%	152,303	34%	670	34%
Venezuela	113,019	22%	98,589	22%	625	32%
Total	515,675	100%	454,426	100%	1,950	100%

UTG(2)= 908,852

Figure 9: Treatments with Mectizan® in the Americas 1989-2005

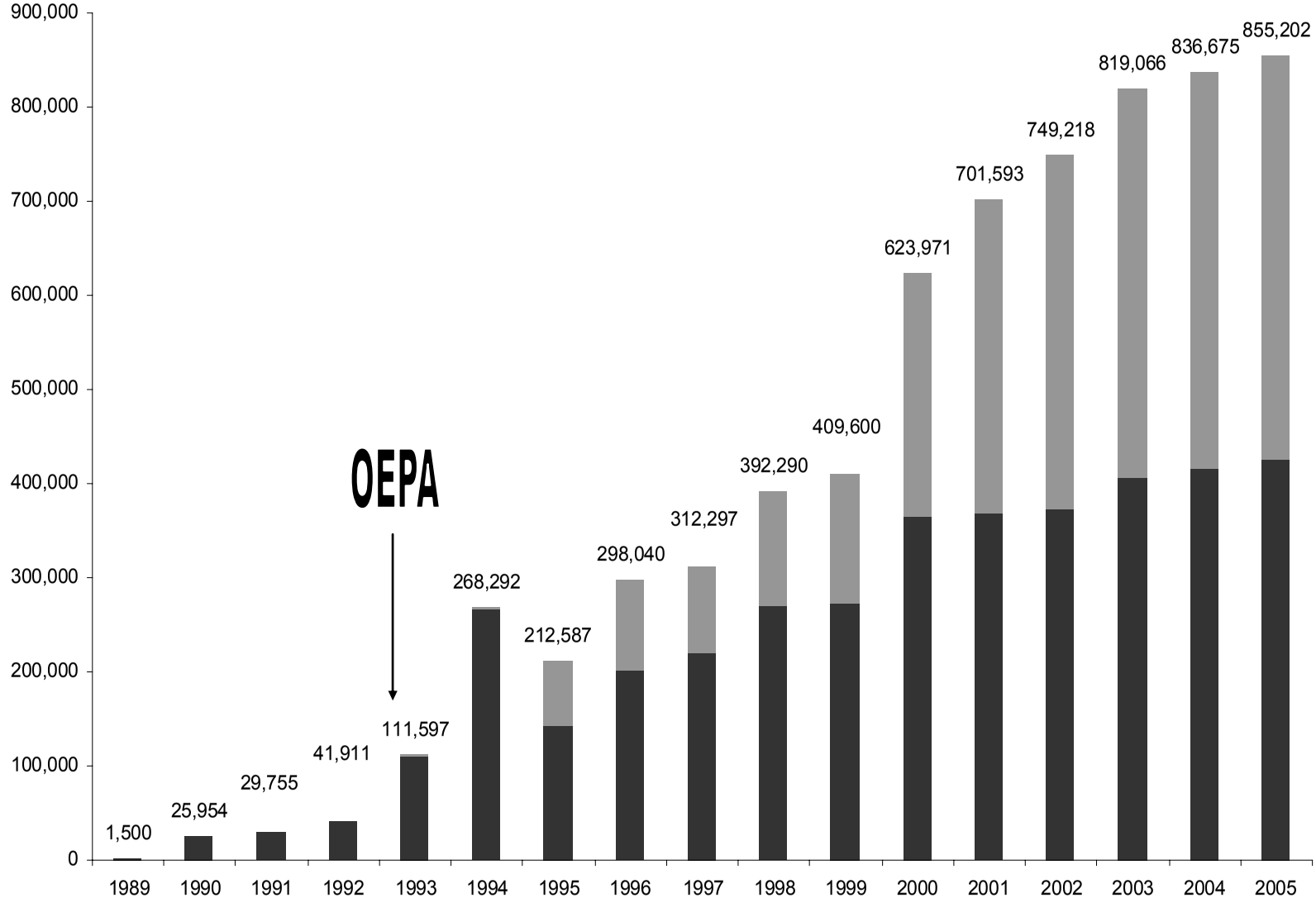


Figure 10: Evolution of treatment coverage UTG(2) in the Americas, by country, 2002 - 2005

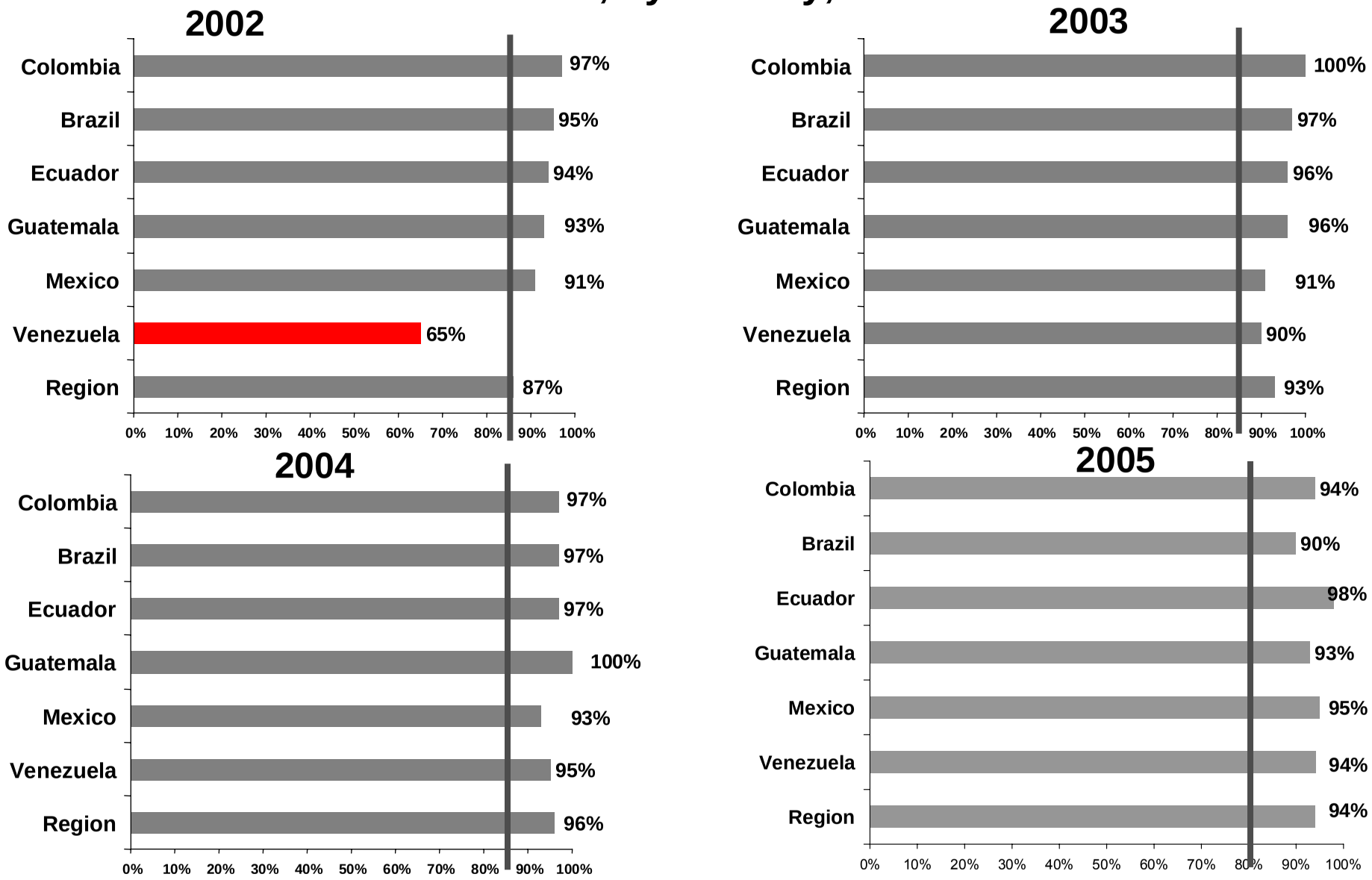


Figure 11: Treatment Coverage of UTG(2) reached in 2005, by focus

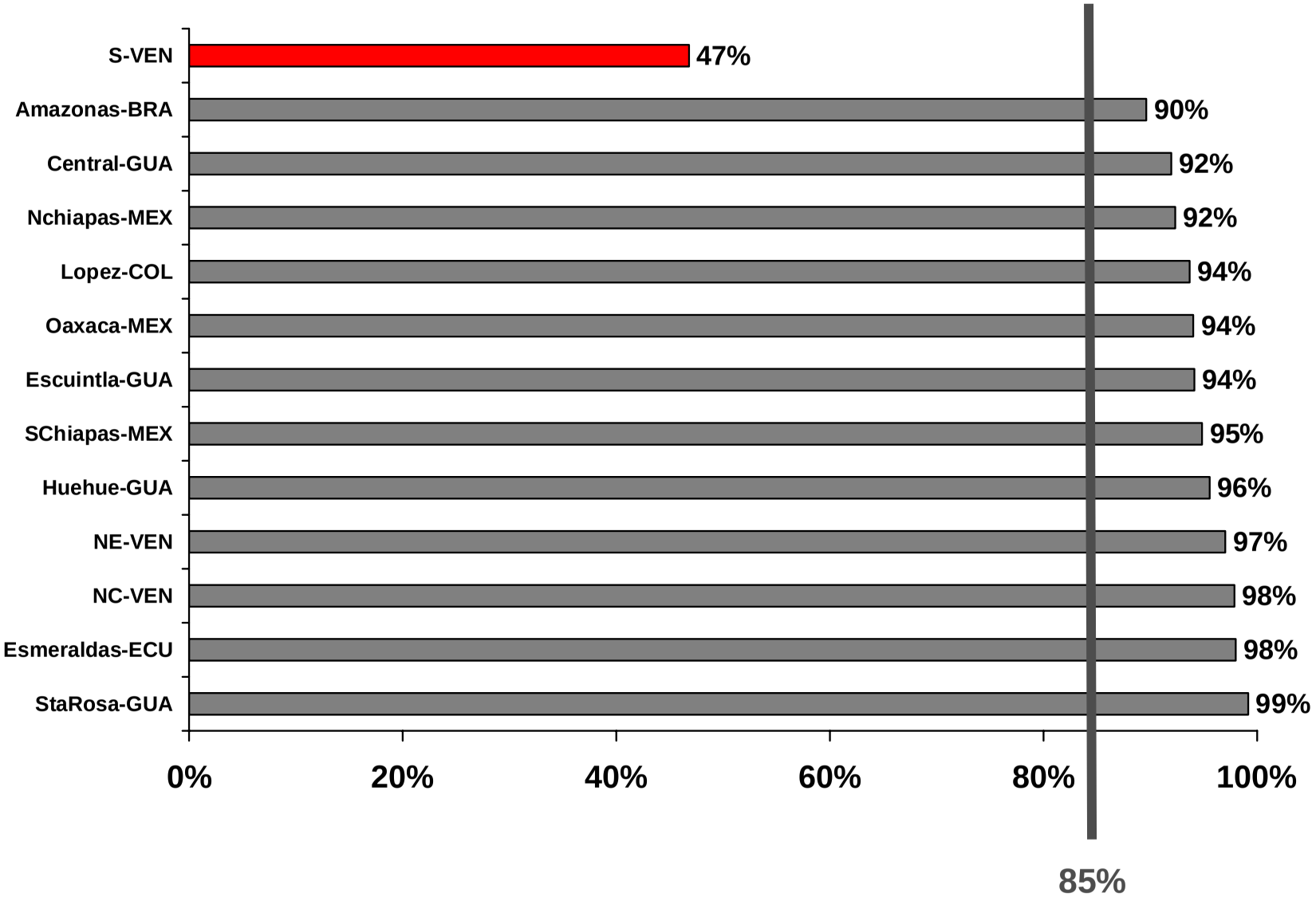


Figure 12: Percentage of communities (n = 1950) in which >85% of eligible population was treated with ivermectin in 2005, by focus

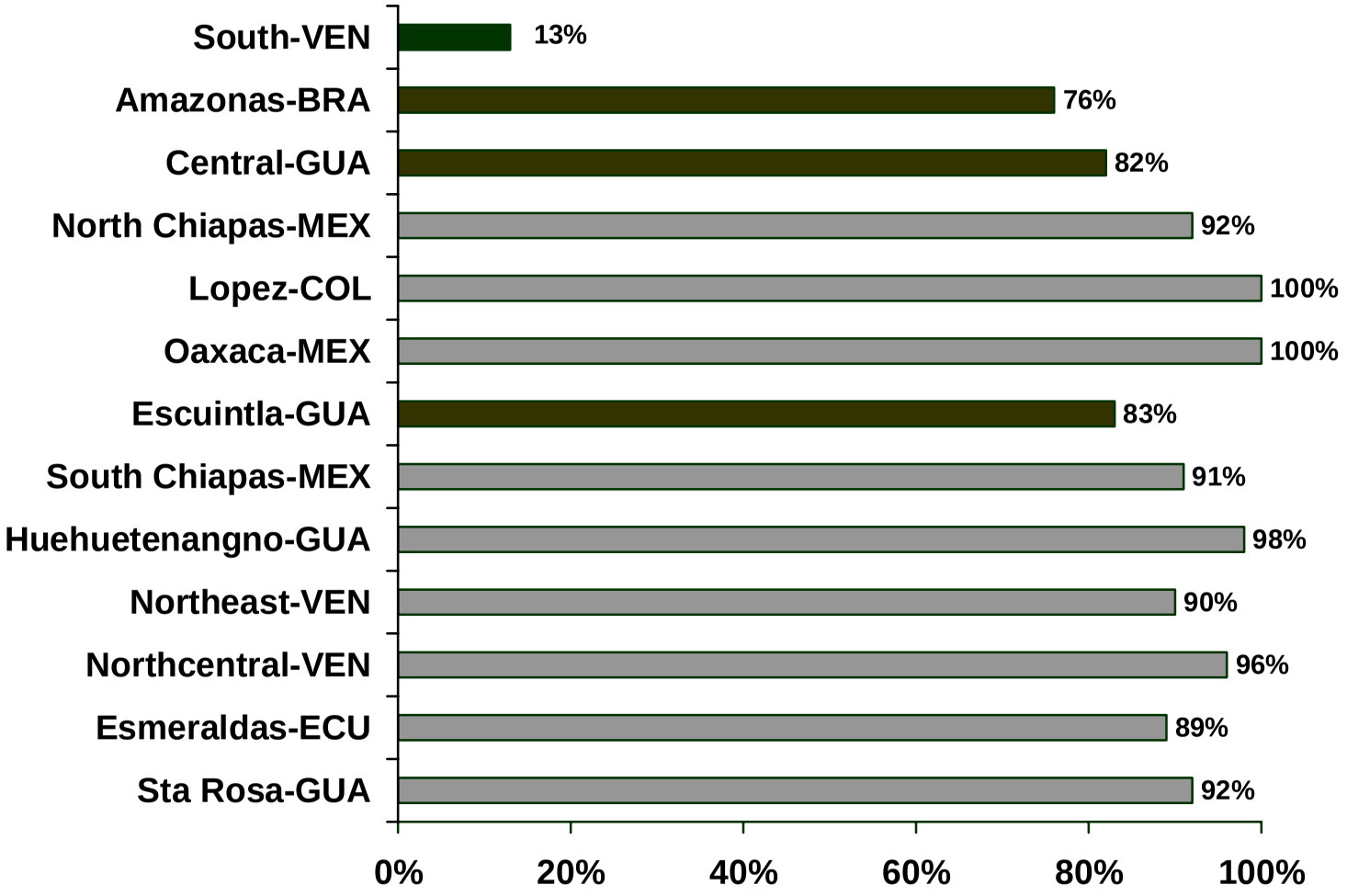


Figure 13: Population at risk in the Americas, 2006

Country Program	Population at risk	%	Eligible population (UTG)	%	# Communities	%
Brazil	9,905	2%	7,946	2%	18	1%
Colombia	1,227	0%	1,196	0%	1	0%
Ecuador	24,378	5%	20,947	5%	119	6%
Guatemala	198,559	39%	177,710	39%	520	27%
Mexico	163,400	32%	151,561	33%	670	34%
Venezuela	111,192	22%	99,484	22%	625	32%
Total	**508,661**	**100%**	**458,844**	**100%**	**1,953**	**100%**

UTG(2)= 917,688

Figure 14: Population at risk in the Americas in each focus, 2006

Country	Focus	# Communities	Population at risk	%	Eligible Population	%
Brazil	Amazonas Roraima	18	9,905	2%	7,946	2%
Colombia	Lopez de Micay	1	1,227	0%	1,196	0%
Ecuador	Esmeraldas-Pichincha	119	24,378	5%	20,947	5%
Guatemala	Huehuetenango	43	30,051	6%	27,259	6%
	Escuintla	117	49,616	10%	45,224	10%
	Santa Rosa	37	10,923	2%	9,818	2%
	Foco Central	323	107,969	22%	95,409	22%
Mexico	Foco Norte o Chamula	13	7,092	1%	6,528	1%
	Foco Sur o Soconusco	559	109,716	23%	102,698	23%
	Oaxaca	98	46,592	10%	42,335	10%
Venezuela	Nor Central	45	13,033	3%	11,842	3%
	Nor Oriental	465	91,839	19%	82,573	19%
	Sur	115	6,320	1%	5,069	1%
Total		**1,953**	**508,661**	**100%**	**458,844**	**100%**

UTG(2)= 917,688

Figure 15: Brazil: Relationship Between Rivers and Onchocerciasis Endemicity

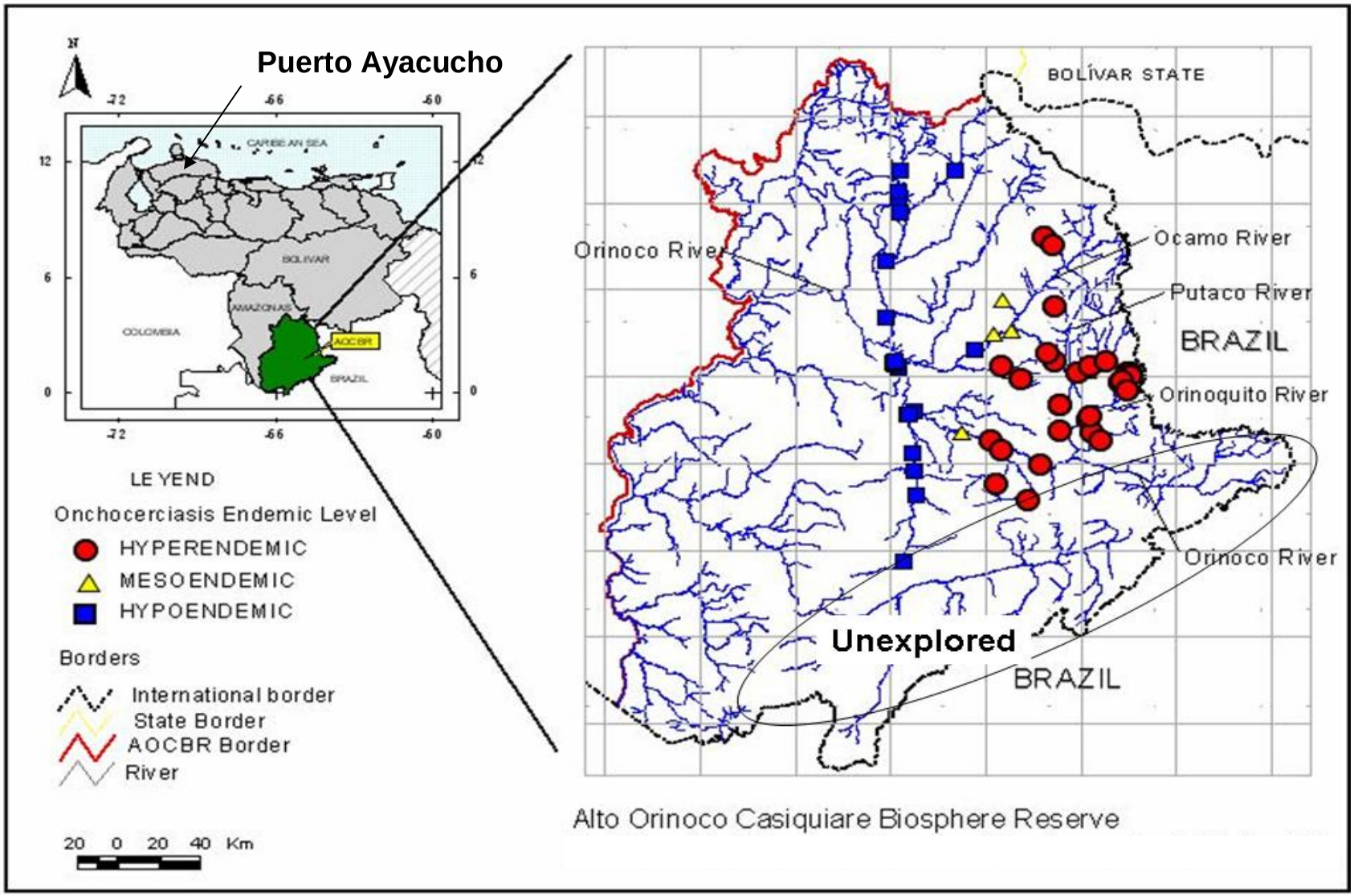
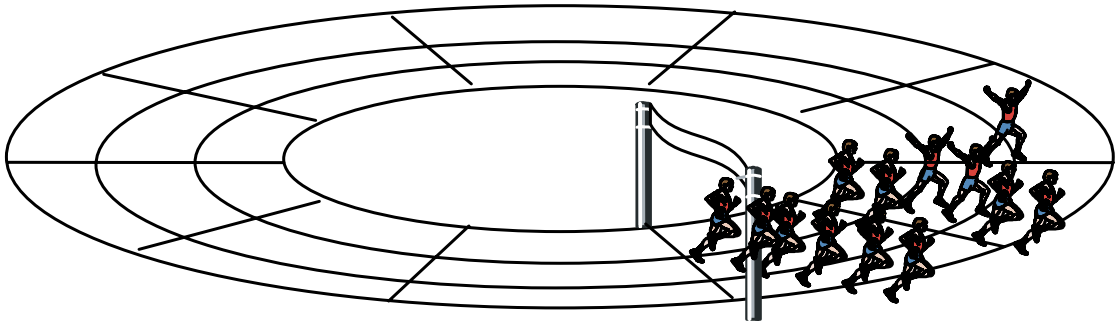


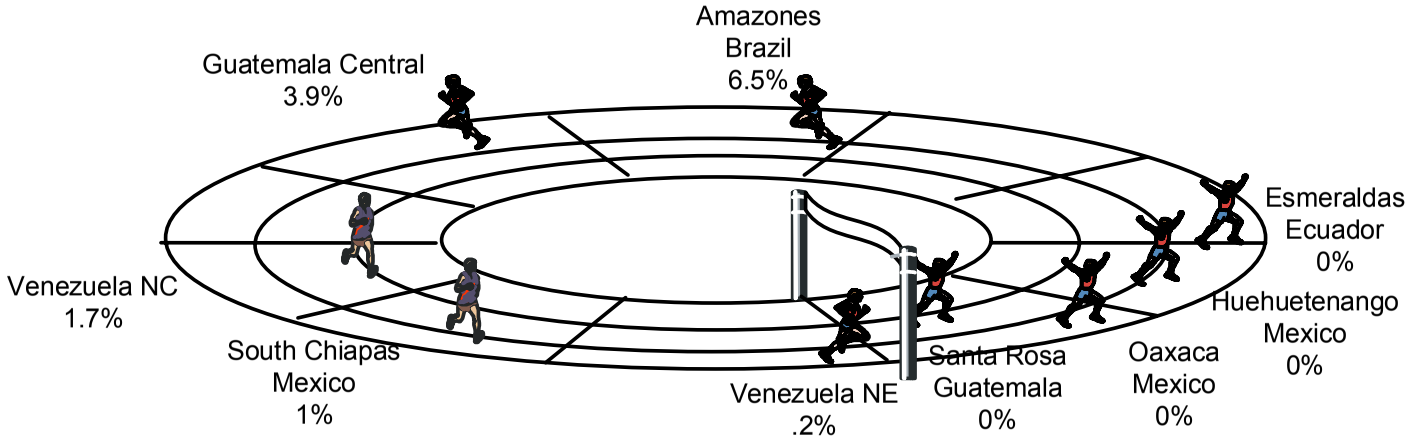
Figure 16: Impact in the Americas: RB Elimination Race in the 13 Foci

Blindness



The InterAmerican Conference on Onchocerciasis (IACO'05) concluded that there have been no cases of blindness attributable to onchocerciasis in the region since 1995!

Anterior Segment Eye Disease



Data show presence of microfilaria in the anterior segment of the eye in formerly hyper or mesoendemic communities in ocular examinations performed in the last three years

No current data available for North Chiapas (Mexico), Lopez de Micay (Colombia), Venezuela South and Escuintla (Guatemala).

Table 3: Treatments in the Americas by country, 2002 – 2005

OEPA 2005

			first round		second round		Total Treatments	
Countries	**UTG**	**UTG(2)**	**treated**	**% UTG**	**treated**	**% UTG**	**Cum**	**% UTG(2)**
Brazil	7,522	15,044	6,834	91%	6,649	88%	13,483	90%
Colombia	1,179	2,358	1,048	89%	1,161	98%	2,209	94%
Ecuador	20,021	40,042	19,452	97%	19,933	100%	39,385	98%
Guatemala	174,812	349,624	161,956	93%	164,690	94%	326,646	93%
Mexico	152,303	304,606	144,685	95%	143,171	94%	287,856	95%
Venezuela	98,589	197,178	92,229	94%	93,394	95%	185,623	94%
Total	**454,426**	**908,852**	**426,204**	94%	**428,998**	94%	**855,202**	**94%**

OEPA 2004

			first round		second round		Total Treatments	
Countries	**UTG**	**UTG(2)**	**treated**	**% UTG**	**treated**	**% UTG**	**Cum**	**% UTG(2)**
Brazil	6,787	13,574	6,180	91%	6,933	102%	13,113	97%
Colombia	1,182	2,364	1,155	98%	1,131	96%	2,286	97%
Ecuador	20,044	40,088	19,393	97%	19,461	97%	38,854	97%
Guatemala	163,924	327,848	154,126	94%	154,198	94%	308,324	94%
Mexico	154,817	309,634	143,374	93%	145,061	94%	288,435	93%
Venezuela	97,804	195,608	92,405	94%	93,434	96%	185,839	95%
Total	**444,558**	**889,116**	**416,633**	**94%**	**420,218**	**95%**	**836,851**	**94%**

OEPA 2003

			first round		second round		Total Treatments	
Countries	**UTG**	**UTG(2)**	**treated**	**% UTG**	**treated**	**% 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	
Countries	**UTG**	**UTG(2)**	**treated**	**% UTG**	**treated**	**% 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%**

Table 4: Epidemiological Indicators of the 13 Foci endemic for Onchocerciasis in the Americas (June 13, 2006)

#	Focus	Nodule and Mf in Skin Prevalences					MfAC and PK Prevalences					
		Mf in skin			Nodules		Mf in AC			Punctate Keratitis		
		Baseline	Second to last	Last	Baseline	Last	Baseline	Second to last	Last	Baseline	Second to last	Last
1	Mexico - Oaxaca	7.3% (1993)	0% (1999)	0% (2004)	5.1% (1993)	0% (2004)	0% (1995)	0.2% (2000)	0 (2004)	1.7% (1995)	4.0% (2000)	0 (2004)
2	Mexico - North Chiapas	1.5% (1995)		Scheduled for 2006	0.1% (1995)	0% (2004) Scheduled for 2006	0.6% (1995)		Scheduled for 2006	7.7% (1995)		Scheduled for 2006
3	Mexico - South Chiapas	14.5% (1995)	3.2% (2000)	2.0% (2004)	8.7% (1996)	2.7% (2004)	1.5% (1995)	0.8% (2000)	0.2% (2004)	13.7% (1995)	3.2% (2000)	1% (2004)
4	Guatemala - Huehuetenango	2.9% (1987)		0.0% (2006)	5.8% (1987)	0%	7.2% (La Providencia)[3] (1981)		0% (2006)	10.0% (La Providencia)[3] (1981)		0% (2006)
5	Guatemala- Central (Suchitepequez, Solola and Chimaltenango)	52.2% (1994)	20.0% (1998)	16% (2003)	29.8%[3] (1981)	33.0 % (2003)	20.7%[3] (1981)		2.9% (2003)	50.1%[3] (1981)		3.9% (2003)
6	Guatemala - Escuintla	37.4% 29.5% (1979)[4]		Scheduled for 2006	17.3% 10.3% (1979)[4]	Scheduled for 2006	6.2% (1979)[5]		Scheduled for 2006	N/A		Scheduled for 2006
7	Guatemala - Santa Rosa	3% (1982, 1983 1987)		N/A	4.6% (1982, 1983 1987)	N/A	N/A		0% (2005)	N/A		0% (2005)
8	Venezuela - Nor Central	44.3% (1999)	2% (2001)	0% (2005)	21.5% (1999)	1.35% (2005)	31.0% (1999)	0% (2001)	0% (2005)	39.7% (1999)	0% (2001)	1.7% (2005)
9	Venezuela - North-Eastern	28.0% (1999)	5.23% (2001)	3.1% (2005)	8.5% (1999)	3.1% (2005)	21.7% (1999)	4.23% (2001)	0% (2005)	23.9% (1999)	5.41% (2001)	0.22% (2005)
10	Venezuela- South	75.0% (1998) 5 comunidades		45.5% (2001) 4 com, Scheduled for 2006	33.0% (1998)	7.6% (2001) Scheduled for 2006	10.5% (1998)		5.8% (2001) 3 com. Scheduled for 2006	27% (1998)		18.6%(2001) 3 com, Scheduled for 2006
11	Brazil - Amazonas / Roraima	63.3% (1995)	19.2% (1998)	20.2% (2003)	N/A	3.2% (2003)	31.2% (1995)	0.1% (1998)	2.7% (2003)	71.6% (1995)	52% (1998)	6.6% (2003)
12	Colombia - Lopez de Micay (Cauca)	39.6% (1995)	6.6% (1998)	0.9% (2004)	17.0% (1995)	0% (2004)	2.2% (1996)	0% (1998)	0% (2001) Scheduled for 2006	32.6% (1996)	32.0% (1998)	25.7% (2001) Scheduled for 2006
13	Ecuador- Esmeraldas / Pichincha	78.7% (promedio de %) (1991)	2.8% (2000)	0.039% (2004)	15.5% 2 com (1997)	4.6% (2004)	24.7% (avg %) (1991)	0% (2000)	0% (2004)	35.3 (1991)	2.4% (2000)	0% (2004)

TI= The last prevalence evaluation calculated on 1/10,000 flies

[1] Results in this table correspond to the first time SIMON-a run preliminary data from Naiciona-Colombia. Some of this information, particularly vector parameters, need to be reviewed and verified. More replicates should be run to guarantee the integrity of the results.

[2] Information on all foci available at OEPA from 2001 on. However, some focus could have reached treatment coverages above 85% before that year.

[3] Brandling-Bennett 1981

[4] J.O. Ochoa 1979, San Vicente Pacaya

[5] I. Tada, et al 1979

[6] "Datos de Distribución de Comunidadades Oncocercosas en Guatemala (Enfermedad de Robles), 1980-1991:Un Compendio de Datos del Ministerio de Salud de Guatemala". Draft 18-05-2005

[7] Information obtained by ELISA using the tricoctel igG Total.

[8] It corresponds to Maximum Likehoood Estimate

Key to transmission status: Suspected suppressed Ongoing

Table 4: Epidemiological Indicators of the 13 Foci endemic for Onchocerciasis in the Americas (June 13, 2006)

Entomological Evaluations					Serology and Nodules in children <5 years		UTG 2005 (in thousands)	Rounds with coverage >85% From 2001-2005	Transmission status	**Model Prediction to end transmission (confidence)**	**Predicted year for end transmission**
Vector	TIP	TI	TI>2/1000	TI mean (95% CI)	Serology	Nodules					
	Baseline	Baseline	Last	Last							
S. ochraceum	0.42% (1999)	0.21% (1999)	Y (2001) [2004 in process]	1.68 (3.7) [2001]	0% (2004) [7]	N/A (1993) 0% (2004)	43.6	9	Suspected suppressed		2008
S. ochraceum	N/A	N/A	N (2001) [2004 in process]	In sufficient sample size	0% (2001) Scheduled for 2006	0% (2004) Scheduled for 2006	6.5	8	Suspected suppressed		2008
S. ochraceum	1.24% (2000)	0.16% (2000)	Y (2001) [2004 in process]	4.56 (11.7)	13% (2001)	20.7% (1998) 0.4% (2004)	102.3	10	Ongoing		?
S. ochraceum	N/A	N/A	N/A	N/A	0% (2001) In process 2006	0.0% (2006)	26.5	10	Suspected suppressed		2007
S. ochraceum	1.95% (1996)	0.19% (1996)	Y (2002)	5 (9.2) [2002]	10.7% (2003)	8.6% (2003)	94.1	9	Ongoing		?
S. ochraceum	N/A	N/A	2006 in process	2006 in process	Scheduled for 2006	Scheduled for 2006	45.5	9	Suspected suppressed		2008
S. ochraceum	N/A	N/A	N	0 (1.72) [2005]	0% (2005)	N/A	8.8	9	Interrupted		2006
S. metallicum	0% (2001)	0% (2001)	Scheduled for 2006	Scheduled for 2006	2005' in process	0% (2005)	11.6	7	Ongoing		?
S. metallicum	1.38% (2001)	0.55% (2001)	Scheduled for 2006	Scheduled for 2006	2005' in process	0% (2005)	81.1	6	Ongoing		?
S. guianense and S. oyapockense	4.17% (1997) 4 comun	0.44 (1997) 4 comun	Scheduled for 2006	Scheduled for 2006	Scheduled for 2006	Scheduled for 2006	5.9	0	Ongoing		?
S.guianense, S.oyapockense and S. incrustatum	7.02% (1995)	0.52% (1995)	Y (2002/2003)	0.76% (2002/2003)	2003' in process	0% (2003)	7.5	10	Ongoing		?
S. exiguum	4.27% (1996)	1.07% (1996)	N (2004)	0.96 (4.9) 2004	0% (2004)	0% (2004)	1.2	10	Suspected suppressed	2007	2007
S. exiguum, S. quadrivittatum	2.33% (1996)	0.94% (1996)	Y (2000) 2004 in process	1.9 (3.2) (2000)	0% (2001) 2004 in process	2% (2004)	20.0	10	Ongoing, except for the Rio Santiago Sub-focus	2007 (100%) Corriente Grande[1]	?

UGANDA

Background: Onchocerciasis affects approximately 1.8 million persons residing in 18 (out of 70) districts in Uganda (Figure 17). Currently, Carter Center-assisted programs are active in 11 of these endemic districts: Kabale, Kanungu, 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 divided into three districts: Manafua, Mbale and Bubulo) and Sironko in the Mount Elgon focus in the east, bordering Kenya.

Local Lions Clubs have been active participants since 2000in the Carter Center-assisted and LCIF-funded river blindness control activities in Uganda. Lions have engaged and mobilized relevant government officials and members of parliament. They have provided education about onchocerciasis, and have advocated for regular and sustained government support of community-directed treatment with ivermectin (CDTI) activities. Lions also have established new Lions Clubs in some onchocerciasis endemic districts. The Carter Center's Country Representative in Uganda, Ms. Peace Habomugisha, is a Lions Club member. LCIF SightFirst financial support for this program concluded in 2005.

Treatments: The Carter Center Uganda assisted in the treatment of 1,056,921 persons in 2005. Excluding passive and visitor treatments totaling 35,500, Uganda reached 97% of its Ultimate Treatment Goal (UTG) of 1,049,867 persons (Table 5). This was the ninth straight year of more than 85% coverage of the UTG in Carter Center-assisted areas, and the eighth successive year of coverage exceeding 90% of the UTG. All of the 2,360 high-risk villages were treated during the year. In 2005, Carter Center-assisted areas provided 80% of the country's total of 1,322,497 treatments (see Figure 18). The UTG for 2006 in Carter Center-assisted areas is 1,072,134.

Training and Health Education: Uganda trained or retrained 10,266 community-directed distributors (CDDs) and 4,350 Community-Directed Health Supervisors (CDHSs) in 2005. Of these, 43% of the CDDs and 47% of the CDHSs were female. The ratio of CDDs to population served is 1:39, and 14 CDDs per community, which is the best ratio of all Carter Center river blindness programs.

Financial Contribution: In 2005, support to the Program was provided by: APOC, the Lions-Carter Center SightFirst Initiative, and the NGDO Coordination Group for Onchocerciasis Control, with funds from Merck & Co. 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 be sufficient to sustain CDTI training, provision of Information, Education and Communication (IEC) materials, and maintenance of vehicles.

All districts have now completed their fifth year of APOC funding. Total funds released to all programs by The Carter Center, APOC, and the local governments were approximately $152,978 in 2005. The governments contributed about US $6,552 (9% of all contributions). The Carter Center contributed about 44% of total funding in 2005 (but did not contribute in Kisoro and Mbale, see ***PAPN*** section below).

Sustainability and Integration: The "community-directed intervention approach" was adopted as national health policy in Uganda in 2001. It has been introduced with measurable positive results for malaria control 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 in 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 to serve as distributors; 2) encouraging the involvement of women; 3) grouping community health workers and those that they serve in their own kinship clans (so as to reduce the demand for 'incentives'); and 4) letting community members choose their own health workers and the location of treatment centers. The CDDs and CDHSs continue to demonstrate high levels of involvement in other types of interventions, most commonly water and sanitation and immunization. Some districts, sub-districts, and sub-counties are providing financial support for the Program. However, it is a concern that 2005 contributions (US $6,552) were about US $2,448 less than 2004 contributions.

Post-APOC, Post-NGDO sustainability trial (PAPN): In Kisoro and Mbale Districts, The Carter Center did not provide funds towards treatment implementation activities, to test what happens when activities are turned over to the full responsibility of the federal, district, and local governments. In 2005, there was evidence from these two districts that increased time was required for MDA and reporting compared to 2003 and 2004; data collection and reporting took five months in Kisoro and Mbale compared to an average of 3.5 months in other assisted districts. In Kisoro, 47% of CDDs did not distribute Mectizan®. In both districts, involvement of health workers and community leaders was minimal, at less than 5%. Figure 19 suggests that involvement of community members in program activities had been generally reduced in post-APOC, post-NGDO scenario districts. Treatment coverage levels dropped by 10% in Kisoro (from 94% to 84%) between 2003 and 2005, and had a slight 3% reduction in Mbale to 97% during the same period (Figure 20). The Carter Center will stop the PAPN sustainability trial in 2006, but will insist that local governments in Kisoro and Mbale provide direct financial assistance for drug distribution activities in those districts to ensure better performance and sustained delivery of Mectizan®.

Monitoring, Evaluation and Research: Annual monitoring of CDTI activities was done in five randomly selected districts (Kanungu, Kasese, Kisoro, Mbale and Moyo). There was a general reduction in the percentage of persons who received health education in 2005 compared with 2004 (Figure 21). For the last three years, health education and selection of CDDs by community members have been predictors of achievement of

treatment coverage of 90% and above, and ensuring that individuals turn up the following year for treatment (Table 6).

A thirteen-year impact assessment of Mectizan® treatment on onchocerciasis was conducted by the Ministry of Health in Kasese, Kisoro, Mbale, and Nebbi districts in sentinel communities for which baseline (1993) data were available (with assistance from the River Blindness Foundation) and where mean annual treatment coverage has been consistently above 80%. Skin snips, nodule palpation, skin examination for onchocerciasis related dermatitis were performed.

Considerable impact was noted on microfilaria and nodule carriers as well as on onchocercal dermatitis (Frontispiece A). However, despite 13 years of annual Mectizan® treatment, infection rates persisted in all categories. Among the districts, prevalence of microfilaria in skin ranged between 2% -19% in 2005, down from 80% - 99% in 1993. Nodule prevalence ranged 3% -20% in 2005, down from 33% - 80% in 1993. Dermatitis prevalence ranged 1% -16% in 2005, down from 37% - 76% in 1993. Skin snips from a small number of children (10) under 5 years of age in these districts were negative for microfilaria in the skin. These data suggest that onchocerciasis has been largely controlled but not eliminated by prolonged and high coverage annual Mectizan® therapy. We believe that these data also imply that annual distribution of ivermectin may not be safely stopped (as is so often stated) 'after 15 years of good coverage.'

Wadelai Onchocerciasis Elimination Project: The new Uganda government policy on elimination (rather than indefinite control) of onchocerciasis, wherever technically and epidemiologically feasible, was presented in detail by Dr. Richard Ndyomugyenyi and Dr. Abrose Onapa at the Program Review. Dr. Ndyomugyenyi noted that at least 70% of Ugandan onchocerciasis foci are isolated and potentially amenable to elimination through twice per year Mectizan® treatment, in some cases supplemented with vector control. The policy has been established in the post-African Program for Onchocerciasis Control (APOC) era (APOC only supported annual treatment). A Carter Center decision was made in 2005 to assist Uganda's elimination effort in the isolated Wadelai focus (found in Nebbi District, see Figure 22), after securing support from the NGDO Coordination Group (which received a generous donation from Merck. & Co).

During the session on elimination in Uganda, it was noted that the Conference on the Eradicability of Onchocerciasis, held at The Carter Center (with support of the Bill & Melinda Gates Foundation and WHO) in January 2002, recommended that where interruption of transmission is feasible and cost-effective, programs should aim for that goal using all appropriate and available interventions (Dadzie, Y., Neira, M., and Hopkins, D. Final Report of the Conference on the Eradicability of Onchocerciasis. *Filarial Journal* 2003:2). The Review noted the many similarities of some isolated Ugandan foci to those in the Americas where the Onchocerciasis Elimination Program in the Americas (OEPA) has been successful in halting transmission in some areas using semiannual treatments. In addition, many foci in Uganda have a vector which transmits onchocerciasis (*S. neavei*) that has a limited flight range of four to five km.

Twice-per-year treatment with Mectizan® in Wadelai, including hypo-endemic villages, will begin in 2006, along with increased monitoring to establish current baseline information and measure impact of intensified treatment activities.

RECOMMENDATIONS 2006 FOR CARTER CENTER UGANDA

Stop post-APOC post-NGDO scenario trials in Kisoro and Mbale in 2006, but insist on government co-funding, which The Carter Center will match when provided. Monitor changes in treatment processes (including treatment numbers, % of UTG attained, tablet supply, logistical chain issues, duration of village treatment exercises, community-directed distributor (CDD) and health worker training, and number of communities reporting promptly), as well as new financial inputs required to rejuvenate programs. Close monitoring for new investments from APOC is also needed.

Obtain and share with Atlanta office the publication of the impact assessment results.

Wadelai focus semiannual treatments (*S. neavei* areas where elimination of onchocerciasis transmission is feasible) should begin in 2006. If additional resources can be identified to assist the government in its effort to eliminate onchocerciasis in other Ugandan foci, The Carter Center should assist there as well, in partnership.

Assess Moyo and Adjumani Districts for onchocercal eye disease.

Consider assisting three drug treatment (praziquantel, Mectizan®, albendazole) trials in TCC-assisted districts.

All Carter Center-assisted projects should continue to refine their APOC, government and Carter Center funding figures in 2006.

All efforts must be made to ensure that any decrease in treatments reported is not a result of withholding data or reports of treatments that were actually delivered.

Figure 17: Uganda
Carter Center - Assisted Districts

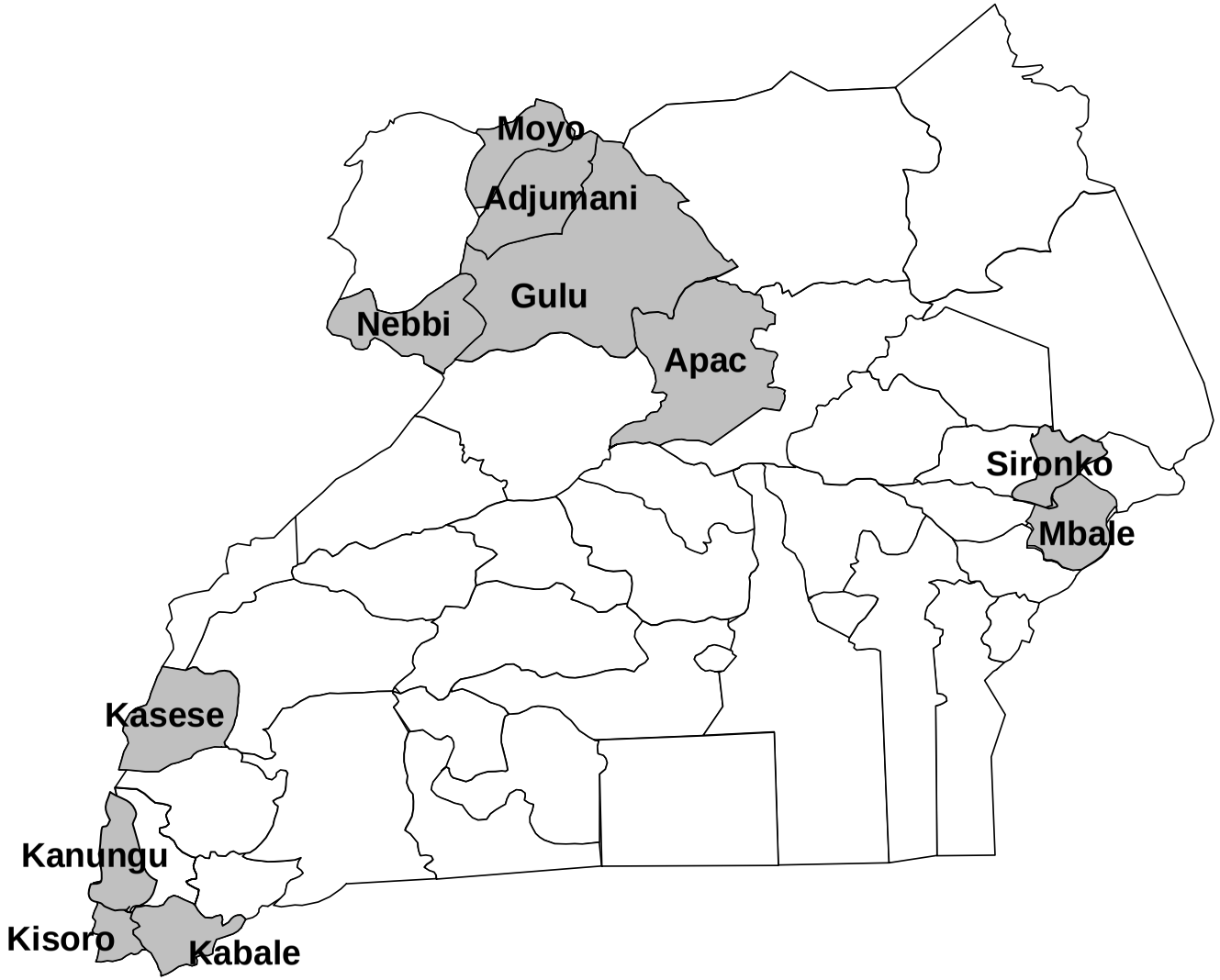
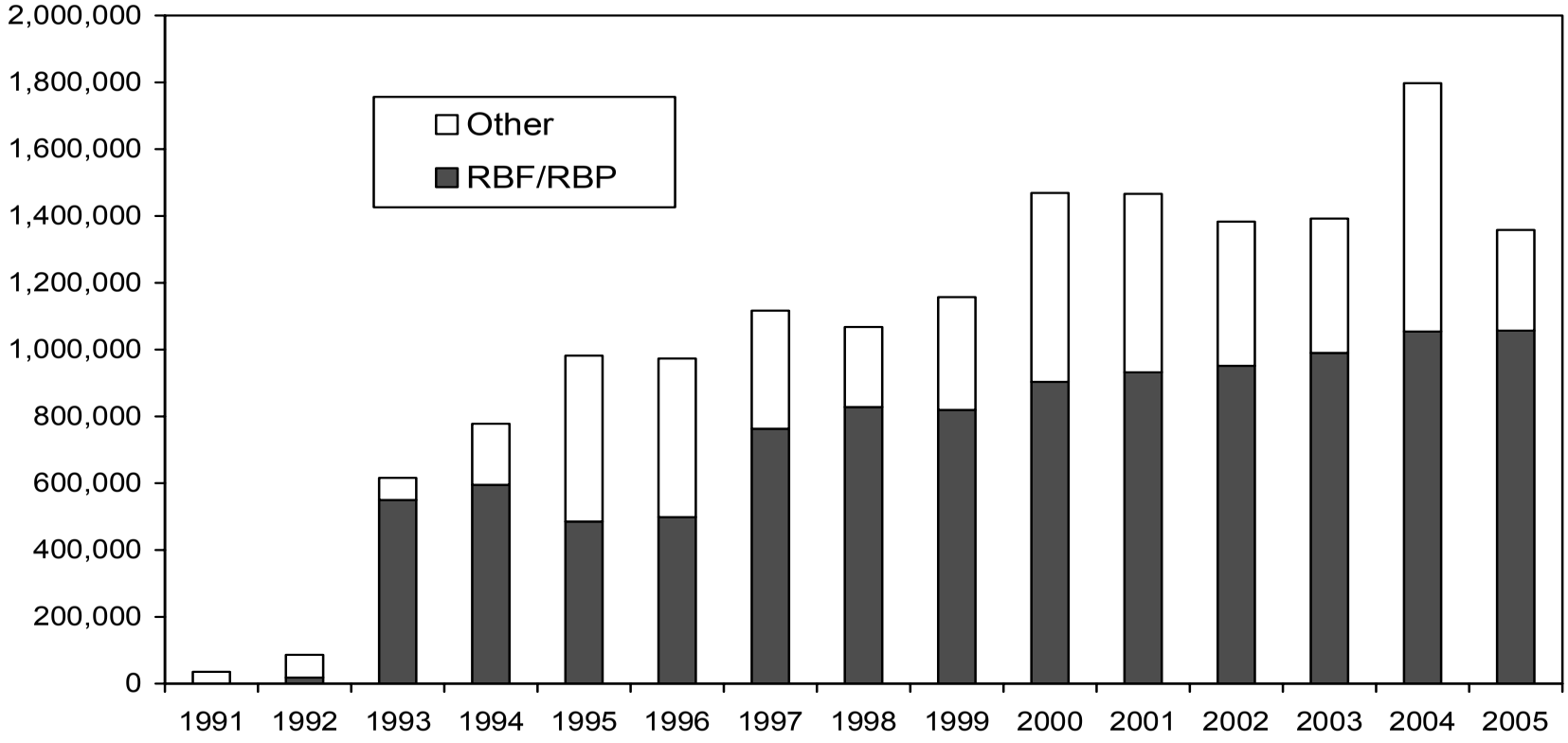
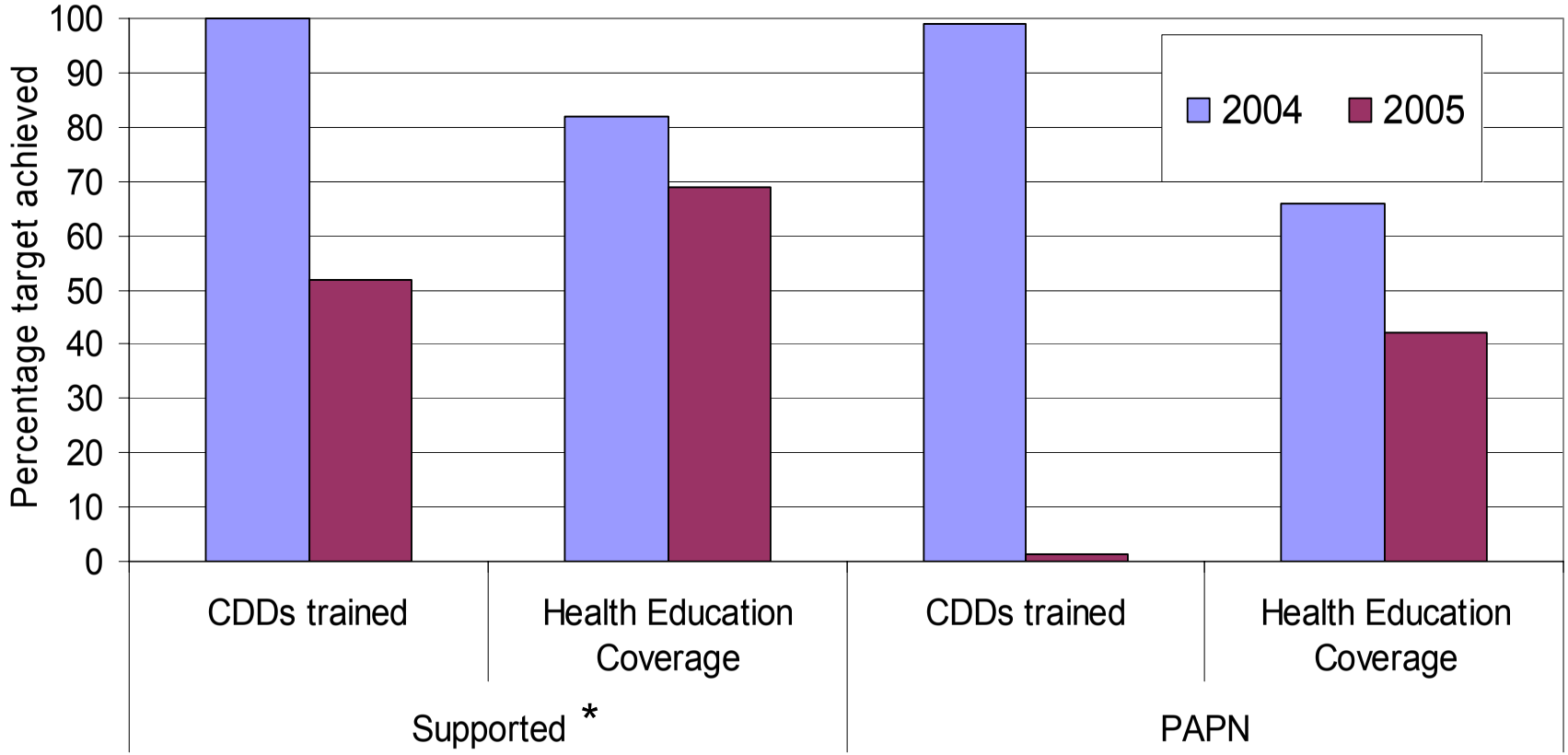


Figure 18: Uganda: Carter Center-Assisted treatments and total Mectizan treatments provided, 1991-2005*



* Treatments in 1992-1995 assisted by River Blindness Foundation.
Source of provisional 2005 national figure: Uganda NOCP. Some 2005 data not available.

Figure 19: Uganda: Comparing CDTI projects with Carter Center support to those testing Post-APOC, Post-NGDO (PAPN) scenario: training of CDDs and health education during 2004 and 2005



* Four districts in this category received APOC funding through February 2005

Figure 20: Uganda: Mean coverage by district, 1997-2005 (post-APOC, post-NGDO scenario districts circled)

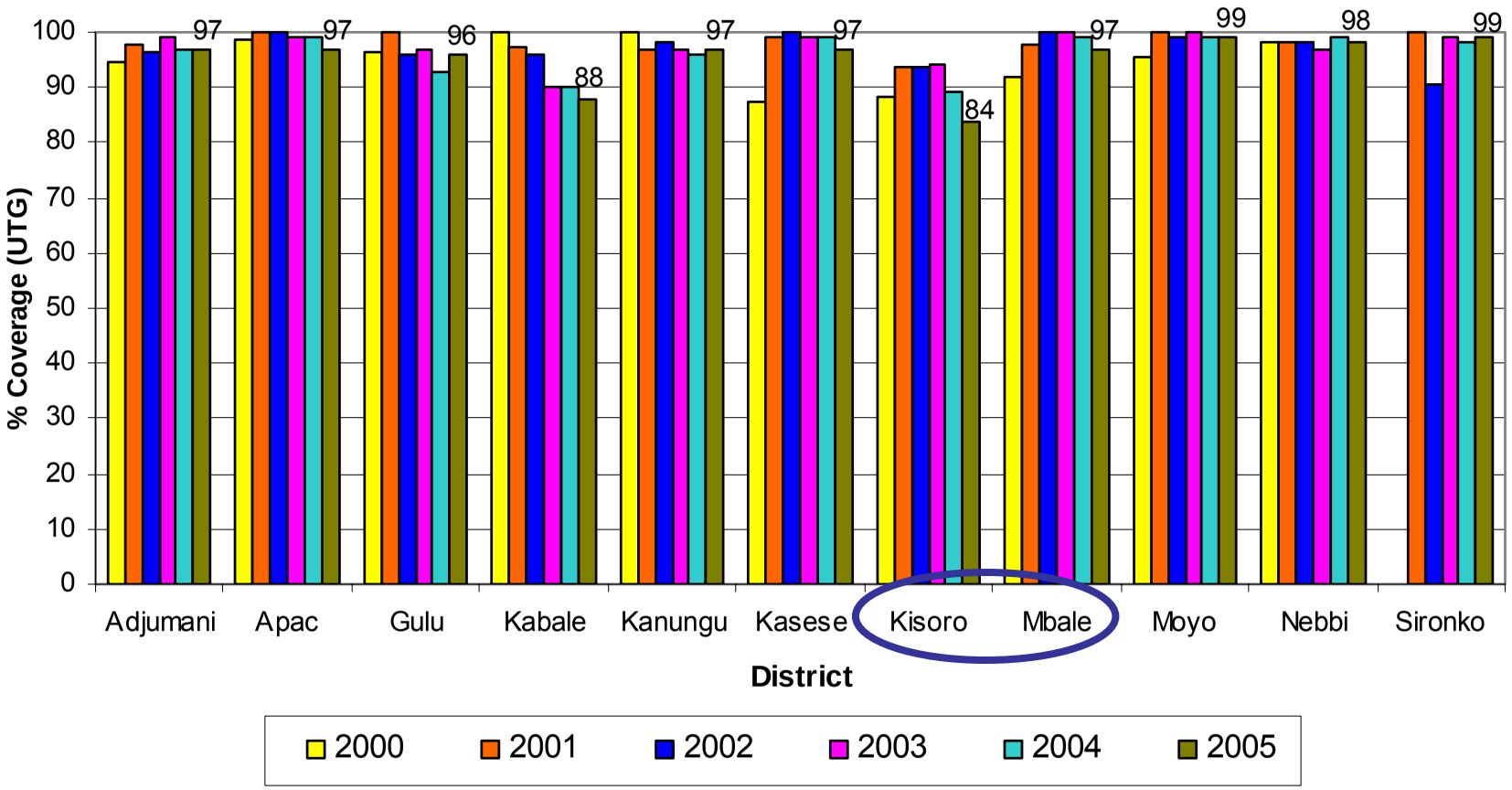
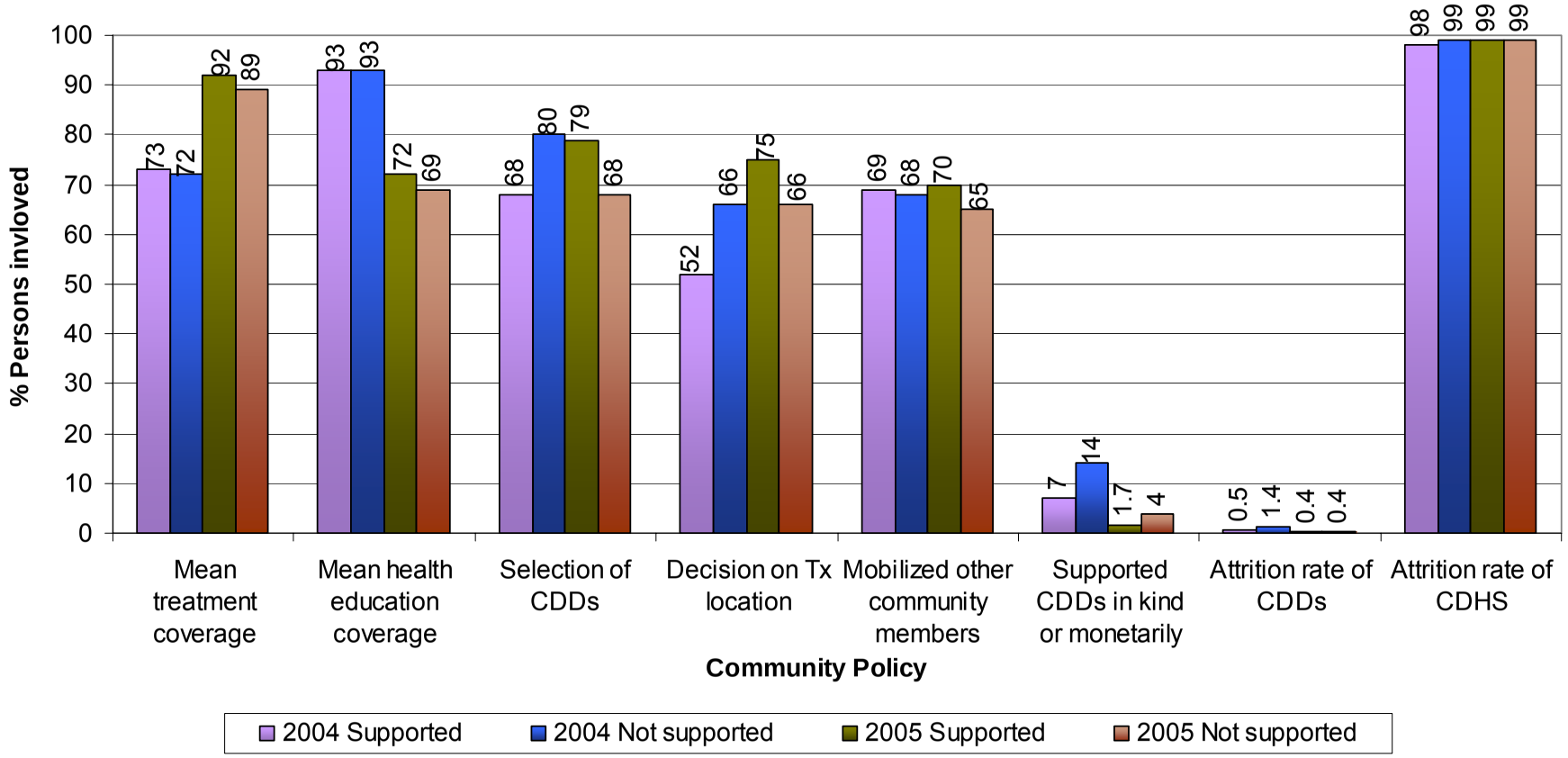


Figure 21: Uganda: Comparison between districts with or without external support (2004-2005)



* Kisoro and Mbale ceased to receive funding from APOC in 2003, and Carter Center did not fund activities there in 2004 and 2005

Figure 22: Wadelai focus in Nebbi District, Uganda

Table 5: Uganda: Carter Center-Assisted Areas: 2005 Mass and Passive Treatments for Onchocerciasis

District	Total Popn for 2005	Ultimate TX Goal (UTG) for 2005	Popn treated cumulative for 2005	Total Popn TX % for 2005	Popn TX % of UTG 2005	Active villages treated 2005	Active villages of UTG for 2005	% of active villages covered
Adjumani****	175,406	150,227	146,267	83%	97%	218	218	100
Apac****	16,064	13,139	12,771	80%	97%	9	9	100
Gulu****	210,000	154,427	148,154	71%	96%	187	187	100
Kabale**	17,912	15,616	13,631	76%	87%	48	48	100
Kanungu***	47,609	39,845	38,712	81%	97%	105	105	100
Kasese*	98,110	81,628	78,971	80%	97%	131	131	100
Kisoro*	21,848	18,308	15,446	71%	84%	32	32	100
Mbale**	184,243	143,593	139,590	76%	97%	580	580	100
Moyo****	182,233	143,571	142,858	78%	100%	189	189	100
Nebbi***	290,607	238,360	234,506	81%	98%	670	670	100
Sironko**	61,284	51,153	50,515	82%	99%	191	191	100
TOTAL	1,305,316	1,049,867	1,021,421	78%	97%	2,360	2,360	100

* phase 1
** phase 2
*** phase 3
**** phase 4

Passive and visitor treatments 2005: 35,500

Table 6: Uganda: health education and selection of CDDs by community members have been predictors of achievement

Output/Dependent Variable	Input/Independent Variable	2003 P-value	2004 P-value	2005 P-value
1. Will come back for Tx	1. Health education	P = 0.00043	P ≈0.0014	≈ 0.0133
	2. Decided on location of treatment	P = 0.00227	NS	NS
	3. Selected own distributors	P = 0.00237	P ≈0.016	≈ 0.0034
	5. Involvement in mobilization	NS	P = 0.001	NS
2. Was treated	1. Health Education	P < 0.001	P < 0.001	P < 0.001
	2. Involved in mobilizing community members	P < 0.001	P < 0.001	P < 0.001
	3. Selected own distributor	P < 0.001	P < 0.001	P < 0.001
	4. Distance from home to treatment centre	P < 0.001	NS	NS
	5. Decision Making	NS	P < 0.001	P < 0.001

SUDAN

Background: There are approximately five million persons at risk of onchocerciasis in Sudan, with an estimated ultimate treatment goal (UTG) of 3.4 million people. There are several endemic areas in the country in both the north and south. The Carter Center's River Blindness Program helps support activities in both northern and southern areas of the country. Current financial support for river blindness activities in Sudan comes from a five-year grant from LCIF (Figure 23).

The Carter Center began supporting Mectizan® distribution in the southwest (West Equatoria) in 1995 with the 'Guinea Worm Ceasefire' negotiated by President Carter. Initial financial support for river blindness program activities in Sudan was provided by The River Blindness Foundation, and later by the Lions Clubs International Foundation (LCIF). In recent years, The Carter Center has channeled support for onchocerciasis control through two NGOs in West Equatoria: Aktion Afrike Hilfe/County Health Department (AAH/CDH) for Maridi, Mundri, and Yei payams, and International Medical Corps (IMC) for Ezo, Yambio, and Tambura payams. Activities have been carried out through a coalition of NGDOs working through Operation Lifeline Sudan (OLS) in Kenya (Lokichokio), in collaboration with the Sudan People's Liberation Movement (SPLM). During the war, The Carter Center also worked in southern garrisoned areas controlled by the civil Government of Sudan (GOS).

In January 2005, a Comprehensive Peace Agreement was signed, hopefully putting an end to the decades-old civil war. The peace agreement created a Government of South Sudan (GOSS), which took over health-related operations from the SPLM and OLS in Southern Sudan. At the March, 2005 Carter Center River Blindness Program Review in Atlanta, Dr. Ahoy Ngong Bellario, Director General of the Secretariat of Health, GOSS, announced the GOSS plan to transfer all health care delivery provided by GOS or NGDOs to the new Southern Sudan Ministry of Health. He noted that all GOS garrisoned areas would pass their Mectizan® distribution activities to the new GOSS Ministry of Health. In addition, he requested that The Carter Center end its funding for AAH/CDH and IMC. Accordingly, The Carter Center/Lions-assisted NGO-based Mectizan® treatment program came to a successful close in West Equatoria in mid-2005, after ten years of support, having delivered a cumulative total of 801,742 treatments. The process of altering the strategy of supporting NGOs in onchocerciasis control was accomplished during 2005.

Transfer of Carter Center-assisted garrison area treatment areas in West Bahr Al Ghazal to the GOSS is anticipated in 2006. Given the history of Carter Center work in the area, and the coendemicity with trachoma and Guinea worm disease there, The Carter Center expressed its interest in working as lead NGDO in West Bahr el Gazal, if formally requested by GOSS. Support for the GOSS Mectizan® distribution program is provided by APOC, the NGDO, and Christoffel Blindenmission (for five new CDTI projects supporting Mectizan® distribution throughout southern Sudan).

Carter Center activities in the north also were subject to a governmental policy change that temporarily disrupted Mectizan® treatment activities. GOS called for the national program to shift its headquarters from a private medical school (the Academy of Medical Sciences and Technology) to the Federal Ministry of Health (FMOH) in GOS during 2005. This transfer resulted in diminished Mectizan® treatments in Sudan compared to previous years.

The Carter Center learned during the 2006 Review that the GOS was considering altering its approach to onchocerciasis from control to elimination (e.g. twice per year treatments) in those foci where it would be technically feasible, such as Abu Hamad, Sundus, and Koryubus (Figure 23).

Treatments: The Carter Center-assisted areas in North and South Sudan treated 238,932 persons with Mectizan® in 2005, reaching 50% of its annual treatment objective (ATO) of 534,217. The 55% reduction in treatments compared to 2004 (when 514,323 treatments were assisted) is attributed to three factors: 1) the GOSS change in policy of channeling treatments through NGOs, 2) the transfer of treatment activities in the south from GOS to GOSS, and 3) the disruption resulting from the transfer of the program from the Academy of Medical Sciences and Technology to the MOH. While Carter Center-treatments decreased, treatments overall throughout Sudan were essentially unchanged (Figure 24). Of the total number treated in 2005, GOS treated 151,311 persons (Table 7), while Carter Center-assisted areas in South Sudan treated 87,298 persons (Table 8). GOS treatments decreased by about 57% from 2004 to 2005. Carter Center-assisted treatments in GOSS areas decreased by about 20%. It is expected that GOS treatments will decrease further in 2006 as internally displaced camps near Khartoum are abandoned as people return to their homes in the south.

Training and Health Education: IMC and Zud Ost Asia (ZOA) in South Sudan reported training 67 community-directed distributors (CDDs) and community-directed health workers (CDHWs), one community supervisor and 47 health workers in early 2005, prior to termination of support for these activities by The Center. In the same communities, 100 villages of a targeted 114 received health education (88%). No reports on training and health education were received from AAH.

The GOS reported training 520 CDDs and CDHWs in 2005, as well as retraining 886 of the same. This represented 57% of their training ATO of 915, and 40% of the retraining ATO of 2,190. A total of 73 Community Supervisors were also trained, 83% of the objective of 88.

Mectizan®: In 2005, 1,335,000 Mectizan® tablets were received, and 684,462 were distributed in GOS areas. IMC and ZOA reported receipt of 575,000 tablets, but final numbers distributed were not received. No Severe Adverse Events (SAEs) were reported by either side.

Sustainability and Integration: Sustaining the gains achieved by mass treatments with Mectizan® since 1995 has been a particularly difficult challenge in Sudan, due to the twenty-year-old civil war, but hopefully the development of the GOSS MOH

infrastructure will lead to dramatic improvements. This next year will be important for GOSS, as it establishes non-NGDO directed CDTI activities in West Equatoria project areas.

RECOMMENDATIONS 2006 FOR CARTER CENTER NORTH SUDAN (Khartoum office)

Consider twice-per-year treatment in Abu Hamed focus if the GOS is interested and willing to provide funding for the program.

Conduct impact assessments and delimitation of transmission zones in Abu Hamed. Conduct impact assessments in Radong. Obtain baseline data in Sundus and Koryubus.

Integrate vitamin A supplementation.

Make all efforts to obtain more info about the Raja blindness study.

All Carter Center-assisted projects should continue to refine their APOC, government and Carter Center funding figures in 2006.

All efforts must be made to ensure that any decrease in treatments reported is not a result of withholding data or reports of treatments that were actually delivered.

RECOMMENDATIONS 2006 FOR CARTER CENTER SOUTH SUDAN
(Juba office)

The Carter Center has complied with GOSS requests to cease funding for NGDO delivery in West Equatoria.

The Carter Center is prepared to work as the lead NGO in West Bahr el Gazal if formally requested by GOSS.

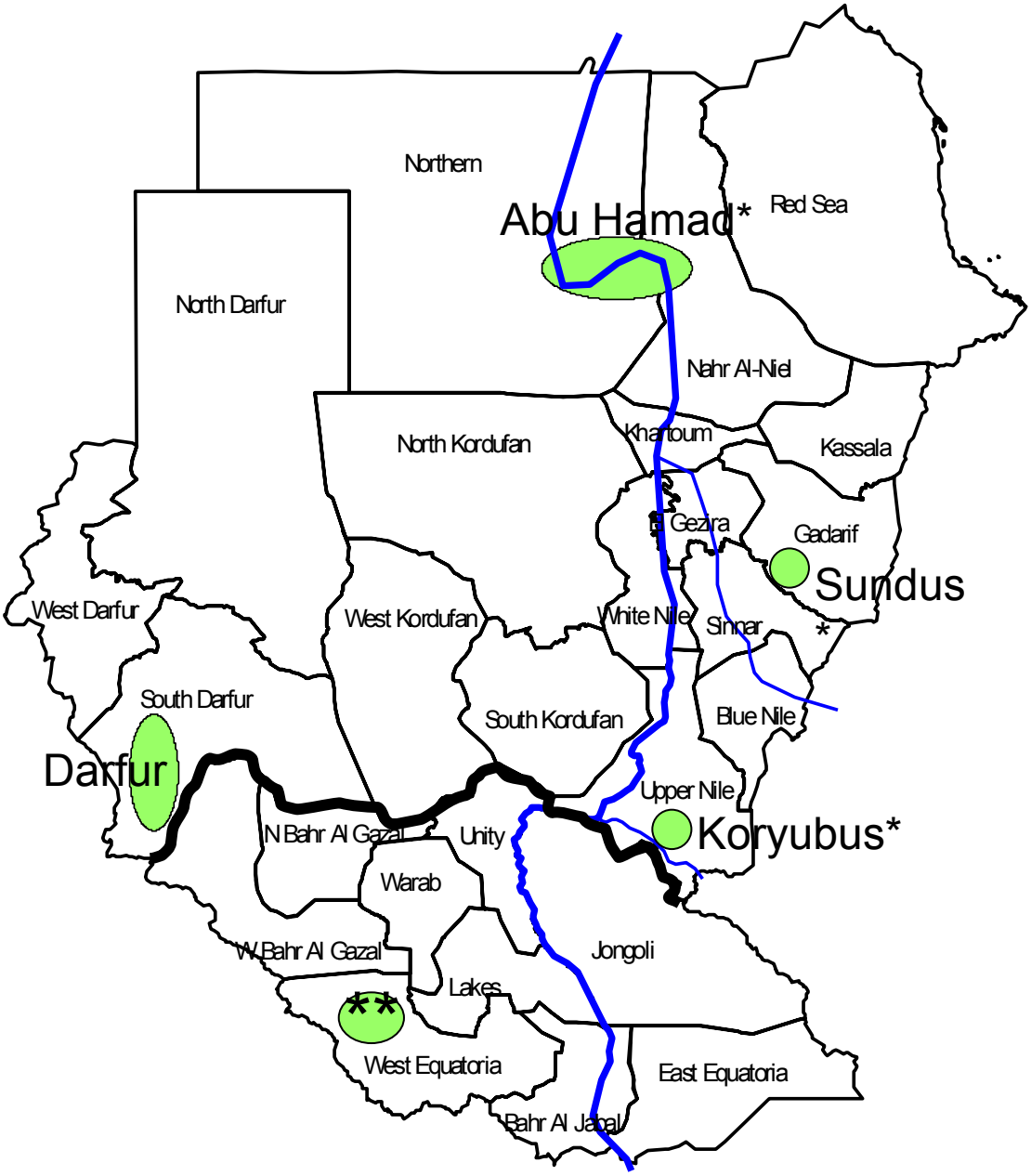
Create sentinel sites for baseline blindness studies.

Refine REMO and RAPLOA in West Bahr el Gazal.

All Carter Center-assisted projects should continue to refine their APOC, government and Carter Center funding figures in 2006.

All efforts must be made to ensure that any decrease in treatments reported is not a result of withholding data or reports of treatments that were actually delivered.

Figure 23: Sudan:
Carter Center-LCIF-Assisted Areas

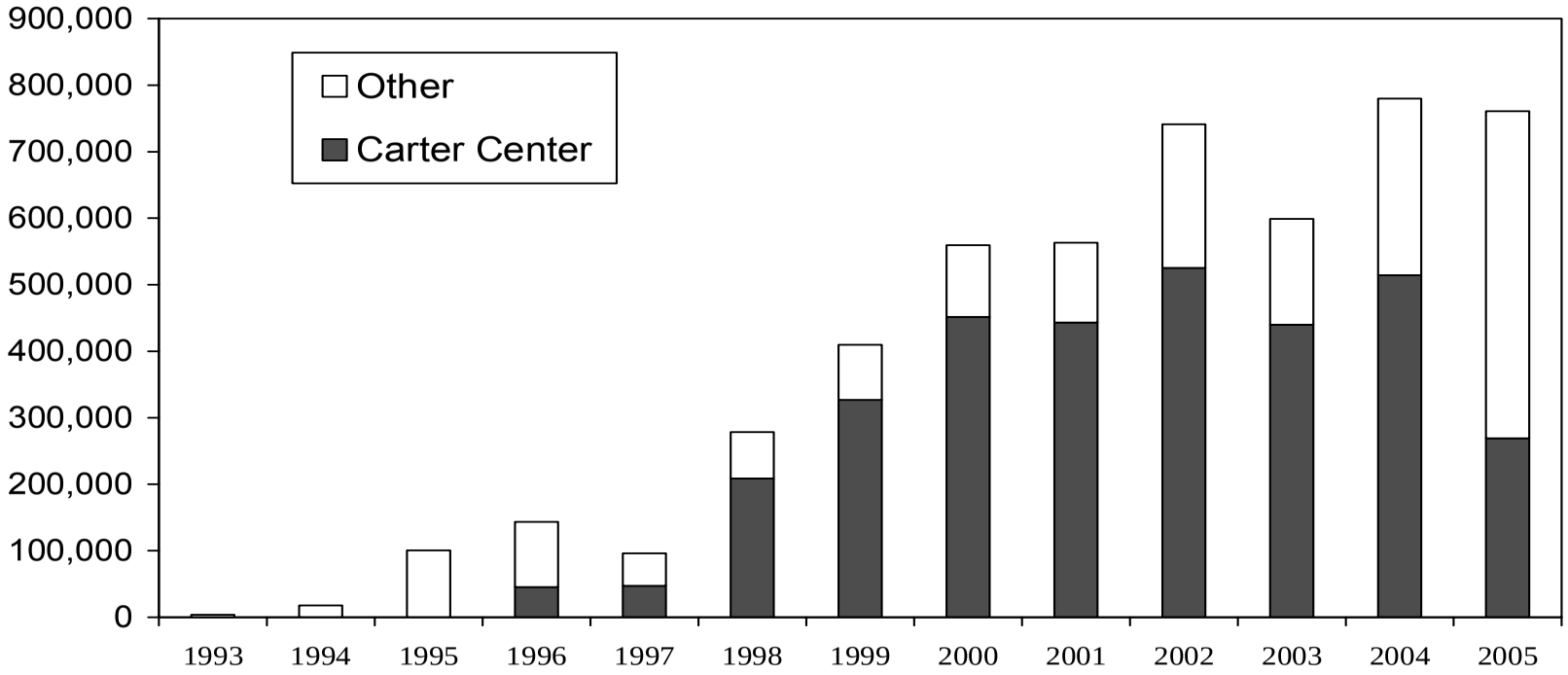


Carter Center areas of river blindness activities

*Areas where elimination might be pursued

**Carter Center assistance terminated in early 2005

Figure 24: Sudan: Carter Center-Assisted Mectizan Treatments as Part of the Total Treatments Provided, 1993-2005*



* Since 1997, Carter Center activities in Sudan have been supported by Lions Clubs International Foundation. Source of non-Carter Center figure: NGDO coordinating office.

Table 7: Sudan: GOS - Carter Center-Assisted Mectizan treatments 2005

State	Locality	Total Popn for 2005	Popn treated cumulative for 2005	Ultimate TX Goal (UTG)/ ATO for 2005	% UTG treated in 2005	% of total popn treated in 2005	Active villageUTG/ ATO for 2005	Active villages cumulative for 2005	Active village % for UTG/ ATO for 2005	% active villages treated in 2005
Western Bahr ElGhaza	2	138,037	61,418	114,821	53%	44%	86	79	92%	92%
Northern Bahr ElGhazal	1	37,870	-	15,000	0%	0%	9	-	0%	0%
South Darfour	1	25,915	21,511	22,027	98%	83%	20	20	100%	100%
River Nile	3	88,115	68,382	74,897	91%	78%	89	89	100%	100%
Bahr El Jabal	2	179,732	-	112,000	0%	0%	330	-	0%	0%
Lakes	1	8,000	-	6,000	0%	0%	19	-	0%	0%
Eastern Equatoria	1	28,800	-	22,000	0%	0%	49	-	0%	0%
Khartoum	2	56,742	-	36,800	0%	0%	16	-	0%	0%
TOTAL	**13**	**563,211**	**151,311**	**403,545**	**37%**	**27%**	**618**	**188**	**30%**	**30%**

Table 8: Sudan OLS/S - Carter Center-Assisted Mectizan treatments 2005

NGO	PAYAM	Population treated cumulative from Jan-Dec 2005
IMC	TAMBURA	**25,566**
IMC	EZO	**12,928**
IMC	YAMBIO	**30,952**
ZOA	TALI	**5,152**
ZOA	KATIGIRI	-
AAH/CHD	MARIDI	-
AAH/CHD	MUNDRI	-
AAH/CHD	YEI	-
Other reported treatments		12,700
Total		**87,298**

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. Approximately 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: The Carter Center'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, began receiving Lions Clubs International Foundation (LCIF) funds towards the end of 2005. The Carter Center began assisting West Province in 1996**.** In 1999, the Lions-Carter Center SightFirst Initiative (LCCSFI) launched a project, supervised by Lions District 403B and in partnership with the MOH and three other NGDOs (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. The original Sight First Cameroon project ended in early 2001, when an extension was granted to supplement new APOC projects in LCIF-assisted zones, including West Province.

In Cameroon, the Lions-Carter Center Sight First Initiative operates and is funded as part of a consortium of four international NGDOs (The Carter Center, HKI, IEF, and SSI), which is coordinated by Lions District 403B, in partnership with the Cameroonian MOH. The Lions in West Province are strong advocates for support of onchocerciasis control.

Treatments: Carter Center-assisted areas (Figure 25) in Cameroon provided 1,391,373 treatments in 2005 (Figure 26), or 92.6% of the ultimate treatment goal (UTG) of 1,502,412, and 44% of the national treatment coverage. This included 1,058,284 treatments in West Province and 333,089 treatments in North Province (Table 9). Both provinces provided 6,595 passive treatments. All six health districts in the North Province achieved UTG coverage of at least 89%, while in the West Province, 16 of 17 health districts achieved at least 94% UTG coverage.

Mectizan®: The Carter Center/Cameroon received a total of 4,507,500 Mectizan® tablets in 2005, and assisted in distributing 3,948,870 tablets; only about 15,611 (0.3%) tablets were unaccounted for in the two provinces. The balance of tablets remained at the district level. No severe adverse reactions were reported during 2005. The average number of tablets per treatment was 2.82.

Training and Health Education: In 2005, the Program trained a total of 8,023 community-directed distributors (CDDs) in West and North Provinces. In North Province, there was an average of one CDD per 165 persons (considerably improved compared to one CDC per 476 persons in 2004), and 2 CDDs per community during

2005 in North Province (compared to 1 in 2004). In West Province, the ratio averaged one CDD per 124 persons (down from 325 persons in 2004) and 4 CDDs per community (from 2 during 2004). Health education was provided to all 3,574 communities in both provinces. Involvement of women as CDDs in the North (3% of all CDDs), which has a significant Muslim population, was lower than in the predominantly Christian West (27% of all CDDs).

Loa loa: No cases of serious adverse reactions potentially related to *Loa loa* were reported in Carter Center-assisted areas of Cameroon in 2005, making this the fourth year free of serious reactions (Figure 27). Surveillance structures for monitoring adverse reactions in all Carter Center-assisted areas, which were strengthened in 2003 and in 2004, were maintained during 2005. 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 program for patients with such reactions is integrated into the primary health care system.

Financial Contribution: APOC and the Lions-Carter Center SightFirst Initiative, especially in West Province, supported the program in 2005. APOC funding for North Province stopped in 2003, after five years of support. The Carter Center did not provide support in the North in 2004 and 2005 as part of the Post-APOC, Post-NGDO sustainability trial (see below).

There was evidence of less government investment in the CDTI program in the West Province (US $7,750) compared to the North Province (US $37,951). The difference in investment is even more dramatic when one considers the per capita treatment expenditure by the government (West 0.7 cents of government investment per treatment compared with North 11 cents/treatment)!

Sustainability and Integration: Prior to 2002, the Cameroonian MOH used a “cost recovery” system, under which 100 and 10 Central African Francs (CFAs) (U.S. $0.20 and U.S. $0.02) were charged to adults and children, respectively, for each Mectizan® treatment, in order to cover distribution costs. The transition to the CDTI strategy, with elimination of cost recovery, became policy after 2002, with transition in the two provinces about two-thirds complete in 2002 and concluded in 2003.

To address the concern that CDDs would be less motivated to do their jobs without funds generated for them through cost recovery, The Carter Center-supported Cameroon program began to implement the kinship strategy to engage new CDDs with the expectation that they would not demand payment. Health workers were trained in the kinship strategy and the need for selection and training of community supervisors, who in turn are expected to train and supervise CDDs. The number of trained CDDs increased from 5,037 in 2004 to 8,023 in 2005. Also, 1,964 community supervisors (trainers of trainees) were trained. Selection and training of community supervisors should increase the numbers of CDDs substantially, maximize the level of community involvement, and improve the potential for sustainability. The program would like to

increase the number of CDDs from its average of 2 to 4 per community to 10 per community during 2006.

A sample of 257 CDDs showed that 74% were involved in other community health activities, such as national immunization days, an expanded program of immunization, family planning, HIV/AIDS, malaria fever control, TB and water and sanitation. They also are utilized for non-invasive procedures in immunizations, social mobilization, distribution and impregnation of mosquito nets, registration, record keeping, and reporting.

It is believed that the potential integration of Vitamin A distribution, malaria control, and lymphatic filariasis interventions into the CDTI framework in North Province would help strengthen the programs, particularly in the absence of APOC support.

Post-APOC, Post-NGDO Sustainability Trial: North Province provided important evidence as to the critical importance of government funding in sustaining Mectizan® distribution after APOC and NGDO funding ceases. The Carter Center did not provide funding towards treatment activities during 2004 and 2005 to North, turning over the full responsibility to the federal, provincial, and local governments. Little change in treatment coverage or programmatic activity was observed (Figure 28). The Carter Center will continue to engage the government of Cameroon to contribute funding toward CDTI activities during 2006. The funding in 2005 was not as significant as in 2004, and it is hoped that with continued advocacy, this will change.

Monitoring, Evaluation and Research: Cameroon engaged in routine monitoring of coverage, involvement of community members in decision-making, health education, involvement of women, monetary incentives, and attrition rate of CDDs. Among 3,773 persons interviewed, 94.5% reported that they received treatment in 2004, but only 36.9% reported receiving health education. Health education did seem to have an effect on the respondents' participation in CDTI activities.

In a linear regression analysis of the monitoring questionnaire, achievement of a 90% UTG coverage was independently predicted by both health education ($p= 0.002$) and individual community members' involvement in mobilizing other community members ($p= 0.034$). In addition, we found that more community members said they were willing to take next year's treatment if such treatment were offered by the distributors they had participated in selecting. Since we found community members tended to select their relatives as distributors, this points to the importance of involving kinship groups in the distribution process.

Performance on factors such as community members selecting their own CDDs, and deciding on the method of treatment and location of the treatment center was very low, although decisions made by leaders and health workers were reduced dramatically from the levels in 2004 (Figure 29), an encouraging finding.

Among 357 CDDs interviewed (of which the majority [75.6%] were male), 89.6% voiced intent to continue distributing in 2006.

Impact Assessments:

West Province: Skin snips and nodule palpation were conducted in sentinel areas to assess impact of the Mectizan® program. Frontispiece A shows the comparison of nodule and microfilaria prevalence in10 health districts in West Province in 1996 and 2005. Out of 1,298 persons examined in 2005, 5.9% were positive for microfilaria and 6.2% were positive for nodules. This compares to rates of 62.7% and 67.4%, respectively, in a sample of 605 people in the same districts in 1996. In 2005, six out of 148 children (4%) under 5 years were positive for microfilaria, indicating that transmission is still ongoing.

North Province:

In the North Province in 2005, ocular examinations were performed in sentinel villages in CDTI areas. Seven hundred and thirty-eight adults were examined for eye disease. Sclerosing keratitis was found in 3.9% and punctate keratitis was at 6.0%. Visible microfilaria in the cornea were seen in 3.0%. Trichiasis (trachoma) was found in 14.6%. The evaluation team concluded that both onchocerciasis and trachoma were important ocular health problems in North Province.

RECOMMENDATIONS 2005 FOR CARTER CENTER CAMEROON

Given the success of the post-APOC post-NGDO scenario trial in North Province, The Carter Center is reluctant to take any action that will discourage continued government investment. New funds from Lions Sight First should be restricted to monitoring and evaluation activities or enhanced training to increase numbers of CDDs in kinship groups. The program should continue to monitor changes in treatment processes (including treatment numbers, percent of UTG attained, tablet supply, logistical chain issues, duration of village treatment exercises, community-directed distributor [CDD] and health worker training, and number of communities reporting promptly). Close monitoring for new investments from APOC or additional government funding is critical.

Seek to increase training, supervision, involvement of kinship groups, and improve gender balance.

Vitamin A supplementation should be linked to CDTI.

Report to headquarters in monthly reports on the interaction of Carter Center-assisted programs with the Roll Back Malaria Program/Global Fund, the LF program, and Vitamin A distribution.

Report the analysis of data which seems to suggest that increased integration has led to a decrease in onchocerciasis treatment coverage. Factors affecting integration should be monitored closely.

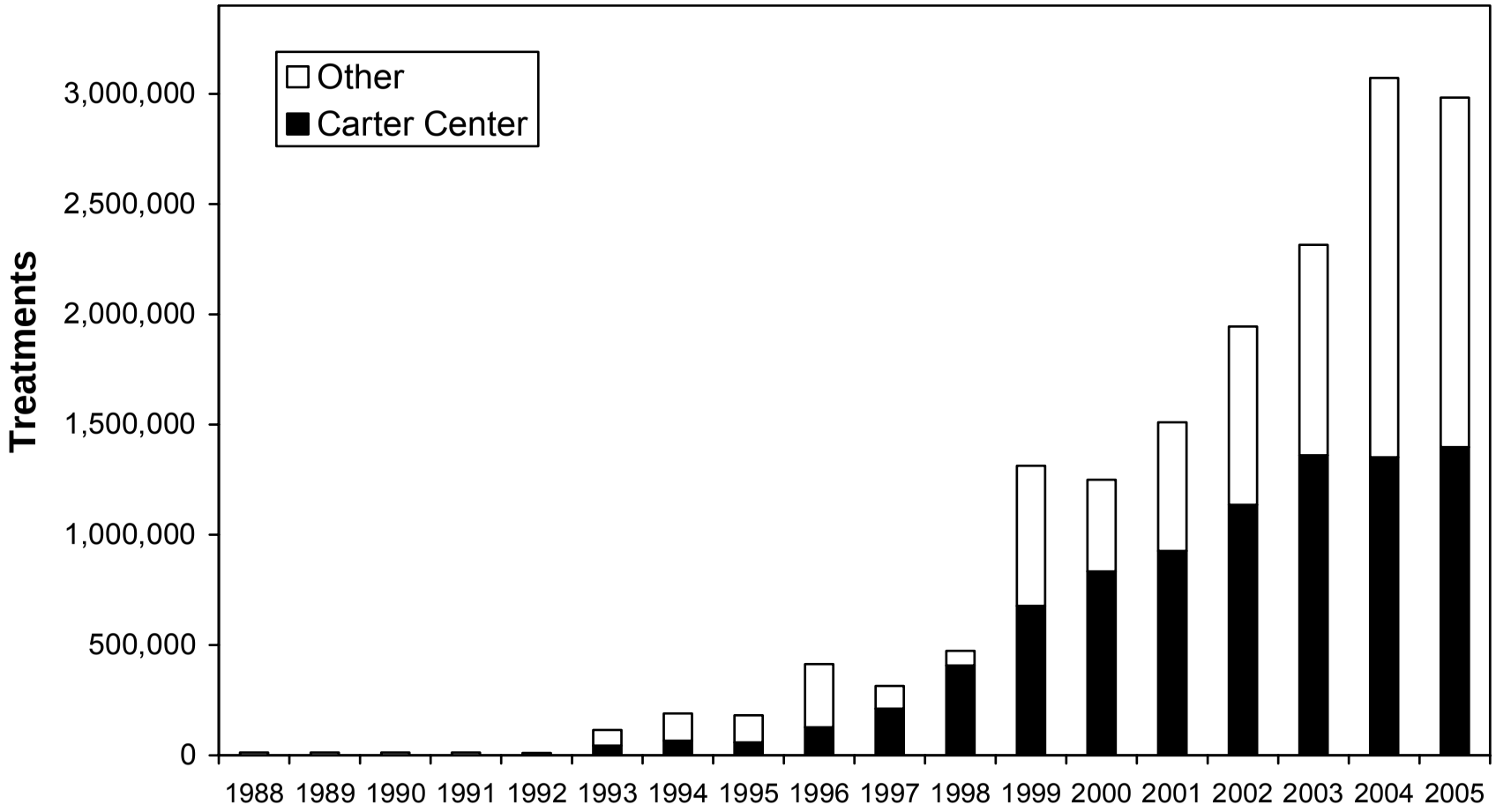
Try to resolve conflicting data for eye exams and skin snips in the North. Obtain nodule data.

All Carter Center-assisted projects should continue to refine their APOC, government and Carter Center funding figures in 2006.

All efforts must be made to ensure that any decrease in treatments reported is not a result of withholding data or reports of treatments that were actually delivered.

Figure 25: Cameroon
Carter Center - Assisted Provinces

Figure 26: Cameroon: Carter Center-Assisted Mectizan Treatments as Part of Total Treatments Provided, 1988-2005*



*Treatments in 1993-1995 by RBF. Source of provisional national figure: NGDO coordinating office.

Figure 27: Adverse Reaction Rate Potentially Related to *Loa loa*, Per Million Treatments in West Province, Cameroon 1996-2004

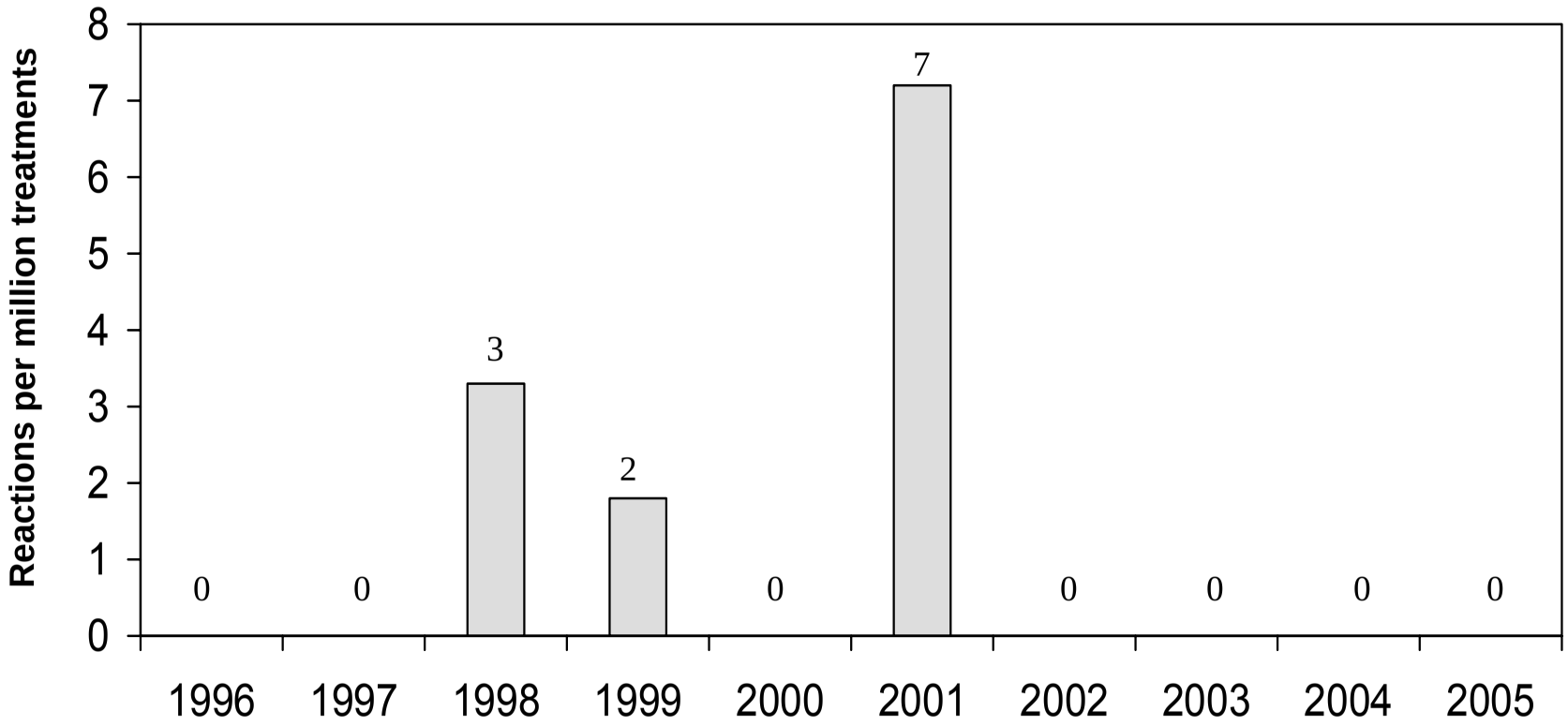
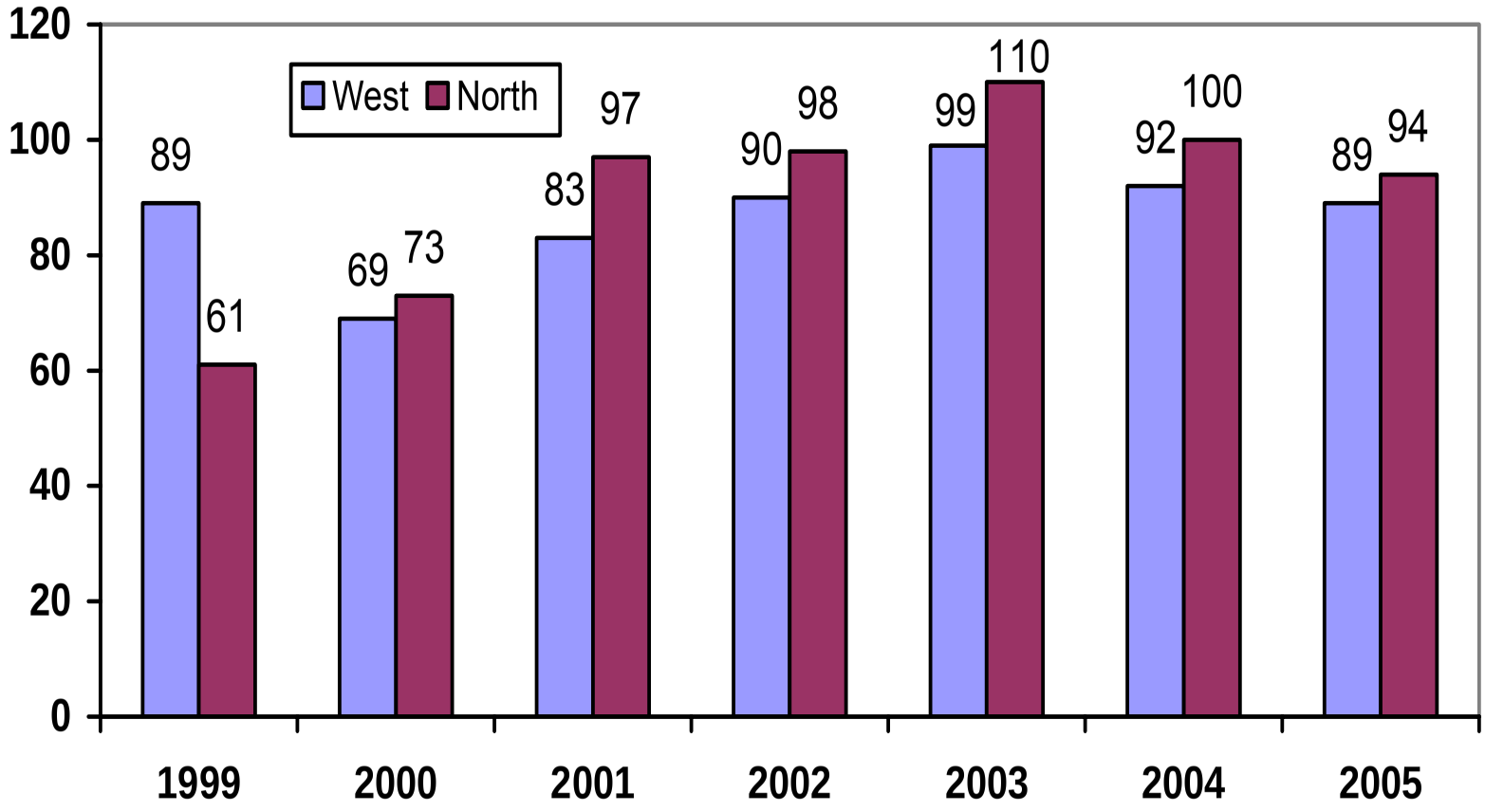


Figure 28: Cameroon: Performance of West Province vs. post-APOC scenario in North Province*



* North Province ceased to receive funding from APOC in 2003, and Carter Center did not fund activities there in 2004 and 2005.

Figure 29: Comparison of performance on community policy factors in the Carter Center in Cameroon (2004-2005)

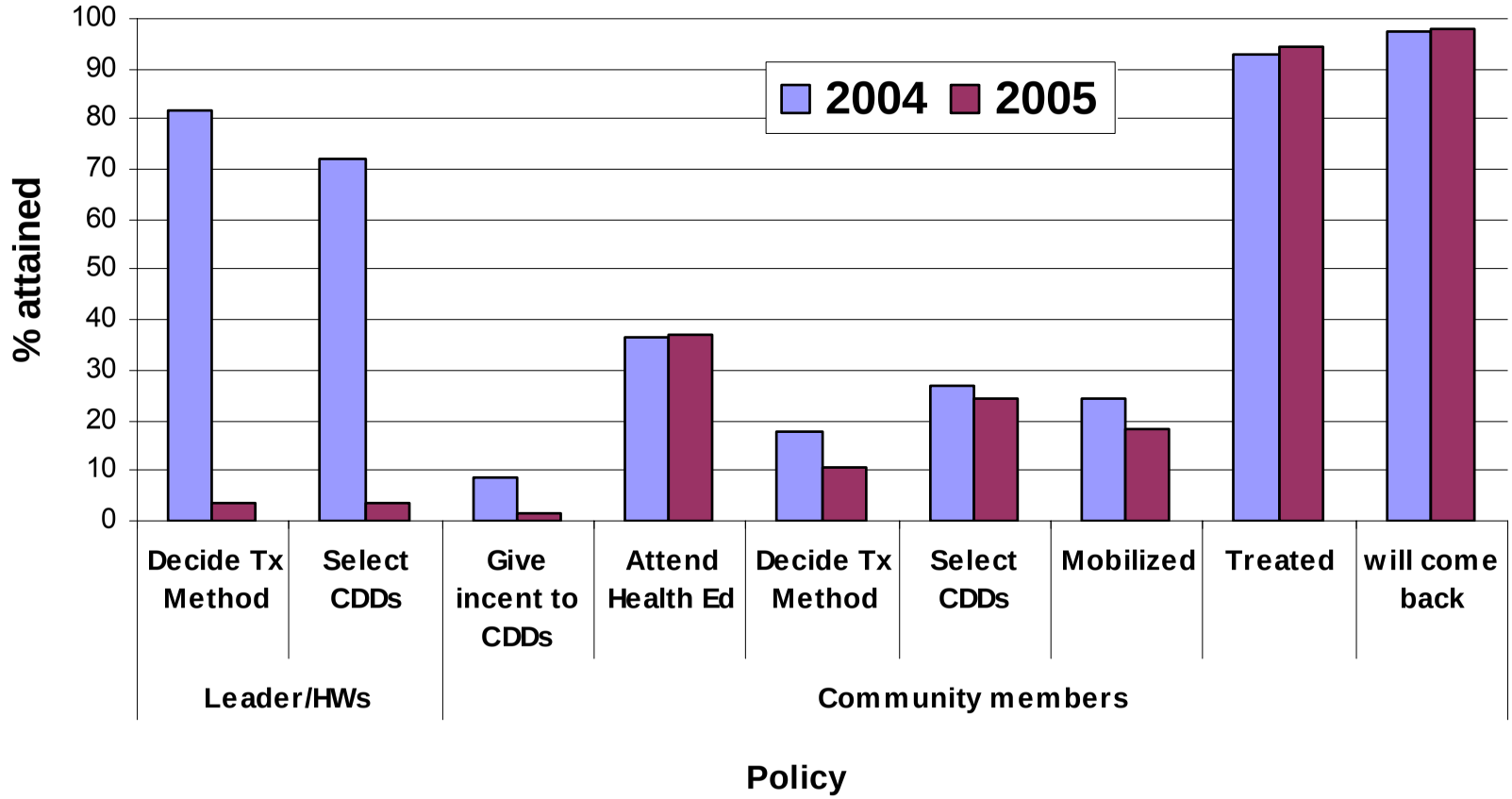


Table 9: Cameroon: Summary of Treatment Activities 2005

Name of Province	Number of Districts	Popn treated cumulative for 2005	UTG/ATO for 2005	% UTG/ATO treated	Total Popn for 2005	% Total Pop treated	Active Com cumulative for 2005	Active Com UTG/ATO For 2005
West	17	1,058,284	1,128,208	94%	1,327,303	80%	2,416	2,416
North	6	333,089	374,204	89%	439,708	76%	1,157	1,157
Total	**23**	**1,391,373**	**1,502,412**	**93%**	**1,767,011**	**79%**	**3,573**	**3,573**

Passive treatments: 6,470

NIGERIA

Nigeria is 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 (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 over 18 million treatments in 2005 (provisional number from Nigerian Federal Ministry of Health). Annual Mectizan treatments, after reaching 20 million in 2003, appear to have decreased to 18.4 million in 2005 (Figure 30).

Background: The Carter Center program in Nigeria has its headquarters in Jos (Plateau State) and supporting offices in Benin City, Enugu, Lagos, and Owerri. Primary activities consist of: 1) directly assisting treatment activities in nine (Figure 31) of the 32 onchocerciasis endemic states in Nigeria (Abia, Anambra, Delta, Ebonyi, Edo, Enugu, Imo, Nasarawa, and Plateau States); 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 International Eye Foundation, MITOSATH**,** SightSavers, and UNICEF; and 3) working to implement and evaluate the African Program for Onchocerciasis Control (APOC) strategy of sustainable Community-Directed Treatment with Ivermectin (CDTI) programs. The Lions Clubs International Foundation (LCIF) SightFirst Initiative is a major Carter Center partner in Nigeria.

In addition to the funding provided by LCIF, members of Lions Clubs District 404 have been active participants in the Carter Center-assisted RB control activities in Nigeria since 1996. They participate in mobilization of communities in advance of mass drug administration, in health education, advocacy, and monitoring of coverage.

Treatments: In 2005, the Lions-Carter Center-assisted program in Nigeria provided health education and Mectizan® treatments to 4,687,444 persons in nine states (Table 10), 435,435 (9.3%) of which were passive treatments. Mass treatments totaled 88 percent of the UTG of 4,847,289, and an 8 percent decline from the 4,986,925 treatments assisted in 2004, due largely to plummeting treatments in Imo and Abia State's post-APOC/post-NGDO (PAPN) scenario test. Treatments were conducted in 8,346 villages, including the 1,539 hypo-endemic villages in the southeastern states that received passive treatment (no passive treatments are provided in Plateau and Nasarawa States). Villages treated declined 10% from 2004 due to the PAPN trial. The treatments assisted by The Carter Center represented approximately 26% of the total treatments estimated to have occurred in Nigeria.

No Serious Adverse Events (SAEs) were reported as a result of Mectizan® treatments in Nigeria in 2005, despite close monitoring for adverse reactions in the southeastern

states because of the presence of *Loa loa* in that part of the country. Because all of those states have now had six to seven years of mass treatment, the risk of SAEs is low. The impact of this long-standing program can be seen in decreased nodule prevalence between 1992/1993 and 2005 (Figure 32).

Mectizan®: The Carter Center Nigeria Program received 12.1 million Mectizan® tablets for 2005. It had about 1.2 million tablets remaining at the end of 2005. The average number of tablets per person treated was three.

Training and Health Education: The nine states conducted training or retraining of 18,689 health workers involved in Mectizan® distribution in 2005, almost 10,000 fewer than in 2004, mainly as a result of the PAPN trial in Imo and Abia States (see below). This included 11,568 community-directed distributors (CDDs), 5,246 Community Supervisors, and 1,875 frontline-health level workers. The average number of CDDs per village was 1.7. The ratio of persons treated per CDD was very high at 368:1. Forty-four percent of CDDs were female, which was 10% more than 2004. CDD attrition remains high, ranging between 20% and 40% in the different states.

Overall, Nigeria reached only 31% of its training target, which is a concern. Most but not all of this was due to the negligible training (4% of the objective) achieved in Imo and Abia States.

Financial Contribution: Overall, the funding picture for Carter Center assisted programs in Nigeria during the period 2001-2005 was one of decreasing core APOC funding and increasing Carter Center funding, with static government funding. APOC funding increased in 2005 over 2004 in payment of outstanding funds from concluded projects, and in replacement of capital items. However, overall APOC concluded its core programmatic funding for seven of the nine states in 2003, and the remaining two (Edo and Delta) in 2004. In 2005, the government (all levels) contributed approximately 9% of the total funds, APOC contributed 22%, and The Lions-Carter Center Initiative contributed the remainder (69%).

In 2005, 1,379 villages (22% of villages receiving treatment) in the southeastern states supported their CDDs. Support averaged US $4.34 per CDD (assuming 140 naira to US $ 1). In Plateau and Nasarawa States, 1,127 communities provided an average of US $1.49 to each of their CDDs in 2005. Total village-level contribution equaled about 2 million naira (US $14,789). At the LGA level, about 4 million naira (US $29,889) was contributed. Eight of the nine states (excepting Plateau State) contributed funding, totaling almost 8 million naira (US $56,285). The Federal Ministry of Health (FMOH) provided no direct financial support for the River Blindness Program in any of the nine states in 2004.

Sustainability and Integration: The Program has successfully integrated with the existing health service delivery system. 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. MOH personnel who supervised

Mectizan® distribution also were involved with other health programs and CDTI has been integrated into the overall health plan in Nigeria.

Post-APOC, Post-NGDO sustainability trial in Imo and Abia States: In 2004 and 2005 The Carter Center ceased to provide funding towards implementation activities in Imo and Abia States, in order to test what happens when activities are turned over to the full responsibility of the federal, state and local governments (Figure 33). Compared to treatments delivered in 2003 and years prior, there was a readily observable decrease in these states in 2004 and 2005; all other states reported coverage at 85% and above but Anambra and Ebonyi States showed concerning downward trends. Total treatments in Imo and Abia numbered 483,757 in 2005, a 31 percent decline from 2004 (698,292), and 52% lower than in 2003 (1,000,788). Imo and Abia reached only 71% and 73% coverage, respectively, in 2004, and then diminished further to 53% and 38% in 2005.

The low training achievements mentioned on the previous page (Imo and Abia States reached only 4% of their 2005 training goal) are another indicator of program decline in those two states. Large inventories of Mectizan remained at the local government area (LGA) level in Imo and Abia. Treatment data were reported from the field much later than usual, with final data reports for 2005 not received until April 2006 (all other states submitted final reports by February). Based on the high inventories of Mectizan®, the Review concluded that the decrease in treatment numbers was probably real, and not a result of withholding data or slow reporting of treatments that were actually delivered.

The Program Review concluded that The Carter Center should stop the PAPN sustainability test in Imo and Abia in 2006, but monitor carefully the costs required to rejuvenate the program, while insisting upon government funding for treatment activities.

Lymphatic filariasis (LF) initiative in Plateau and Nasarawa States: With financial support provided by The Bill and Melinda Gates Foundation and GlaxoSmithKline, The Carter Center program in 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 *Schistosomiasis hematobium* (SH) in those two states. An additional objective is to investigate the potential eradicability of LF in tropical Africa. Health education is an integral part of both components of this initiative, which are implemented in conjunction with established onchocerciasis control activities. (See Background in Annex 7.)

LF is widespread in Plateau and Nasarawa States, and mass treatment and health education for LF were necessary in all cities and villages in the 30 LGAs (Figure 34) of the two states (estimated current population: 4.2 million). A total of 3,266,881 persons in the two states received health education and mass treatment for LF in 2005, which was 92% of the UTG of nearly 3.6 million treatments (Figure 35 and Table 11). Of the total treatments given, 1,073,538 were in hyper- and meso-endemic onchocerciasis target areas, and the remaining 2,193,343 in LF-only areas (some of which are also

hypo-endemic for onchocerciasis). This year marked the third year in which all 30 LGAs in the two states were reached. Monitoring in sentinel areas showed a dramatic decrease in mosquito infection rates and LF antigenemia rates, but the trend suggests a leveling off of the decline between 2004 and 2005 (Figures 36 and 37). The leveling of mosquito infection rates may be an artifact resulting from the large numbers of mosquitoes that now need to be dissected to detect further decline in rates.

Hydrocelectomy surgeries continued on a limited scale. Hydrocele surgery is performed in larger village hospitals during "mass surgery days." Since these began in September 2002, a total of 270 men have undergone surgical correction of their hydroceles (using the eversion 'wrap' technique). All personnel, equipment, and supplies are assembled for 3 to 5 days of hydrocele surgeries. Patients are admitted, examined, and then undergo the 20-30 minute procedure to remove the fluid and tighten the hydrocele sac to prevent fluid reaccumulation. Consultant surgeons have monitored the hydrocelectomy effort as well as conducted follow-up to evaluate postoperative outcome. Overall, the patients have done extremely well, and the rate of hydrocele recurrence and complications has been very low.

Schistosomiasis initiative in Delta, Plateau and Nasarawa States:

A total of 93,885 persons in Plateau, Nasarawa and Delta states received health education and mass praziquantel treatment for schistosomiasis in 2005 (Figure 38 and Table 11), which was 52% of the ATO of 181,972. The reason for low coverage was a delay in the 2005 praziquantel shipment clearance; the drug was held up in customs for months and not released until January 2006. Treatments achieved in 2005 were a result of praziquantel remaining from 2004. The ATO for the three states in 2006 is 183,819. The medicine slated for 2005 is now available for 2006 treatments.

In Delta State, impact assessment of praziquantel on microhematuria (blood in urine detected by reagent dipsticks) was carried out in eight communities where distribution has occurred twice. The baseline prevalence of blood in urine prior to treatment among 240 school-age persons tested was 49%; after 2 rounds of annual praziquantel treatment, the blood prevalence in the same villages in an independent sample of 403 persons was 6%.

The progress of the highly popular schistosomiasis component of the integrated program was limited by the need for village by village assessments, and by the cost of praziquantel tablets (averaging about US$0.20 per treatment). Ministries of Health of Plateau and Nasarawa States, and The Carter Center, began rotating praziquantel mass treatment from LGAs where treatment has reduced the rates of hematuria to below the 20% mass treatment threshold, to other LGAs that have yet to be treated. However, with the rotation there is evidence in two LGAs (Pankshin and Akwanga) that hematuria prevalence is increasing after the mass treatment intervention is rotated away (Figure 39). These observations require further data analysis and field study in 2006.

An article on the difficulties of integrating the schistosomiasis components into LF and onchocerciasis programs was accepted for publication in the *Bulletin of WHO* [F. Richards, A. Eigege, E. Miri, MY Jinadu, DR Hopkins. Integration of Mass Drug Administration Programs in Nigeria: The Challenge of Schistosomiasis] and should appear in late 2006.

Collaboration between LF and malaria, Plateau and Nasarawa States:
In Africa, the same anopheline mosquitoes transmitting LF also transmit malaria. Insecticide treated bednets (ITNs) are one of the most important prevention tools for malaria and should also be useful as an adjunct to mass drug treatment in the LF elimination program. With this in mind, The Carter Center, in partnership with the Nigerian Ministry of Health, has linked ITN distribution with mass drug administration programs for LF on a pilot basis. It is hoped that sharing resources between these programs will result in cost reductions, and protection from the mosquito vectors will reduce transmission of both diseases simultaneously.

The Carter Center received a donation of 60,000 ITNs from the MOHs of Plateau and Nasarawa. The majority of the ITN distribution process (about 30,000 ITNs) occurred in 2004, in two LGAs- Kanke (in Plateau State) and Akwanga (in Nasarawa State). Logistical systems were developed, and distributors were trained, to enable distribution of ITNs during the mass drug administration (MDA) for LF. The ITN are provided free of charge to children under five and pregnant women (the 'vulnerable groups' targeted by the MOH malaria program). In 2005, CDC epidemiologists Drs. Brian Blackburn and Els Mathieu conducted a cluster survey for ITN coverage. An article reporting the results of this study is in press. The abstract follows:

> In Africa anopheline mosquitoes transmit malaria and lymphatic filariasis (LF); insecticide-treated bed nets (ITNs) significantly reduce transmission of both. ITN provision to children under-5 (U5) and pregnant women (PW) is a major goal of malaria control initiatives, but use in Africa remains low because of cost and logistics. We therefore integrated ITN distribution with the 2004 LF/onchocerciasis mass drug administration (MDA) program in Central Nigeria. Community volunteers distributed 38,600 ITNs, while simultaneously treating 150,800 persons with ivermectin/albendazole (compared to 135,600 in 2003). This was subsequently assessed with a 30-cluster survey. Among surveyed households containing U5/PW, 80% (95%CI 72-87%) owned >1 ITN, a 9-fold increase from 2003. This first linkage of ITN distribution with MDA resulted in substantial improvement in ITN ownership and usage, without adversely affecting MDA coverage. Such integration allowed two programs to share resources while realizing mutual benefit, and is one model for rapidly improving ITN coverage objectives. [B. Blackburn, A. Eigege, E. Miri, E. Mathieu, and F. Richards. Successful integration of insecticide-treated bednet distribution and mass drug administration in Central Nigeria. *Am. J Trop Med Hyg*, 2006, in press]

The challenge in 2005 was the need to reimpregnate nets already distributed (ITN need retreatment with insecticide at least once per year), while continuing the ITN distribution. A summary of bednet distribution in 2004 and 2005, as well as retreatment, can be seen

in Table 11. A total of only 15,545 nets were retreated in 2005, at a cost of US$0.50/net. In 2005 the program tried a new strategy of distributing nets when LGAs agree to purchase the insecticide treatment packets, but that approach dramatically slowed the distribution process of the remaining nets. In our experience, if ITN distribution is to be successful, the program must obtain long-lasting insecticide-treated nets to avoid the cost and logistical difficulties of ITN retreatment.

Monitoring Surveys: In 2005, onchocerciasis monitoring surveys were conducted in Imo, Edo, Plateau, and Nasarawa. Nasarawa had the lowest rates of community involvement in deciding the method of treatment and selecting CDDs (21% and 33% of persons reporting involvement, respectively). Imo State had the lowest likelihood of community members providing support to CDDs (10%), and by far the lowest levels of health education (48.6%). Edo had the highest level of health education (58%) and Plateau reported the most community involvement across the board (87% of sampled community members supported CDDs, and 66% helped decide the method of drug distribution). The coverage rates that these respective states achieved are shown in Table 11.

RECOMMENDATIONS 2006 for THE CARTER CENTER NIGERIA

Stop post-APOC post-NGDO scenario trials in Imo and Abia States in 2006, but insist on increased government co-funding. Headquarters will send a financial consultant in the first half of the year to establish a system for monitoring the new financial inputs required to rejuvenate programs. In anticipation of this visit, Imo and Abia programs must immediately log all Carter Center spending and staff activities. Monitor changes in treatment processes (including treatment numbers, % of UTG attained, tablet supply, logistical chain issues, duration of village treatment exercises, community-directed distributor (CDD) and health worker training, and number of communities promptly reporting). Close monitoring for new investments from APOC is also needed.

Advocate for Nigeria to support treatments.

Solve drug inventory issues at LGA levels.

Follow national figures closely to determine if there is a downturn in treatments now that APOC funding has been withdrawn from most projects in the country. Obtain final 2005 treatment figures from FMOH to determine if treatment levels in 2004 were maintained in 2005.

Monitor impact of the program on onchocerciasis. Seek to design a study to evaluate impact of combined albendazole, and Mectizan on onchocerciasis transmission.

Encourage the Lions Club District 404 to be more involved in advocacy at the state levels. Pursue high-powered advocacy to states and LGAs for release of counterpart funding.

Continue to refine APOC, government and Carter Center funding figures for Carter Center assisted projects in 2006.

Verify that any decrease in treatments reported is not a result of withholding data or reports of treatments that were actually delivered.

Make progress toward a field trial of delivering the three-drug combination (Mectizan®, albendazole, and praziquantel) simultaneously in Nigeria and/or Uganda.

RECOMMENDATIONS 2006 for NIGERIA INTEGRATED PROGRAMS

Plateau and Nasarawa States:

Lymphatic filariasis

Keep ITNs in sentinel villages impregnated. Monitor mosquito numbers.

Maintain the best possible coverage for LF (including urban areas) in order to interrupt transmission.

Continue LF treatments in all areas, but work to design further impact studies on transmission. Cohort studies are needed.

Evaluate the impact of MDA on LF in urban areas.

Resolve importation issues related to 2006 Mectizan and praziquantel.

Seek to combine albendazole, Mectizan and PZQ treatments in pilot areas. The Carter Center should begin to develop plans and a protocol to do so in Plateau and Nasarawa.

Continue to support "Mass Hydrocele Surgery Days" on a limited scale in areas where patients have been identified in The Carter Center-supported hydrocele prevalence surveys. Focus on pre-op screening, sterility during surgery, timely removal of stitches, and postoperative follow-up. Encourage states and LGAs to fund this intervention. Encourage Dr. Thomas to publish her results.

Schistosomiasis

Monitor schistosomiasis prevalence in areas where treatment has been withdrawn. Analyze baseline data of hematuria from the 20 sentinel villages with headquarters. Create a plan for routine rounds every 2 to 3 years, taking into account the plan for triple treatments.

Increase attention to revising, delivering, strengthening and monitoring health education activities in anticipation of PZQ withdrawal, as well as KAP studies pertaining to the community understanding surrounding the withdrawal. Set and reach definite goals for number of persons trained, number of training sessions, etc., which can be monitored in monthly reports. Conduct surveys in areas where treatment has been withdrawn to gauge community KAP regarding schistosomiasis.

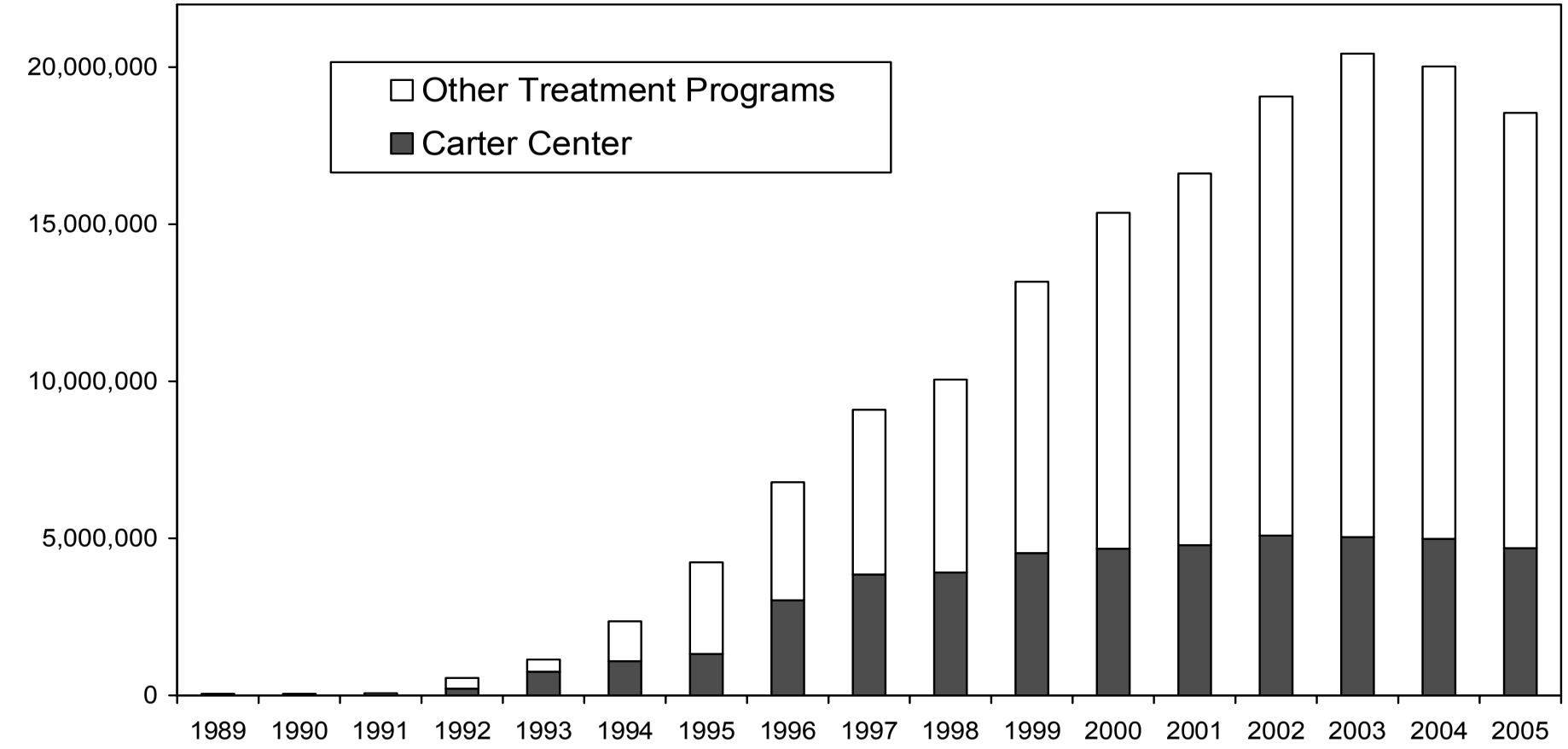
Develop the approach to evaluating the impact of trachoma latrines on the prevalence of schistosomiasis (urinary and intestinal).

Southeastern States:

Continue with LF surveys wherever possible.

Reanalyze sensitivity, specificity, and predictive value data for the urinary schistosomiasis study in Delta State, with assistance from headquarters.

Figure 30: Nigeria: Lions/Carter Center-Assisted treatments and total Mectizan treatments provided in, 1989-2005*



* Treatments from 1992-1995 by RBF. Source of provisional 2005 national figure: Nigerian Federal Ministry of Health.

Figure 31: Nigeria: Lions/Carter Center-assisted States

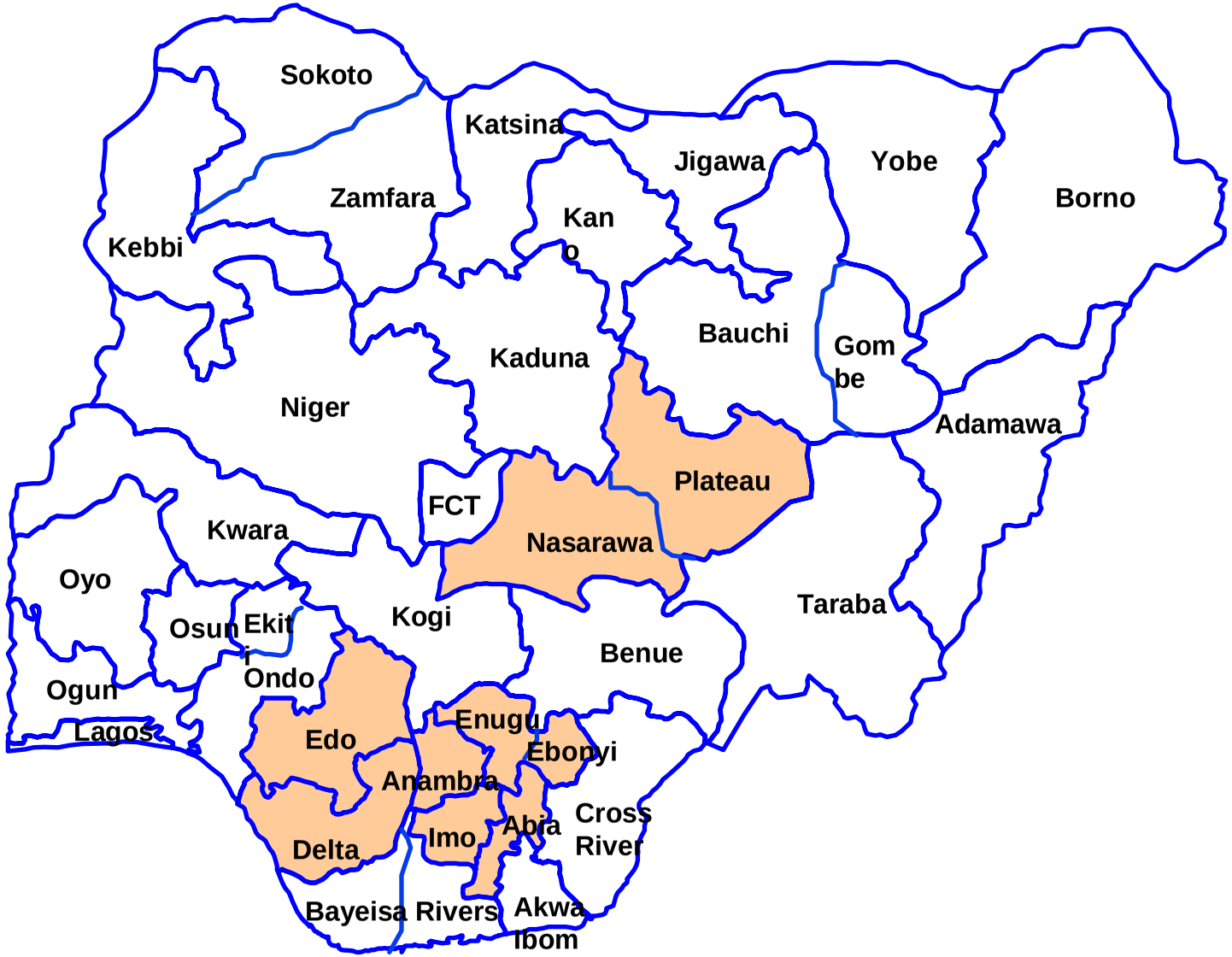


Figure 32: Onchocerciasis Nodule Prevalence in 11 Villages (n=330 in 1992-1993, n=483 in 2005)

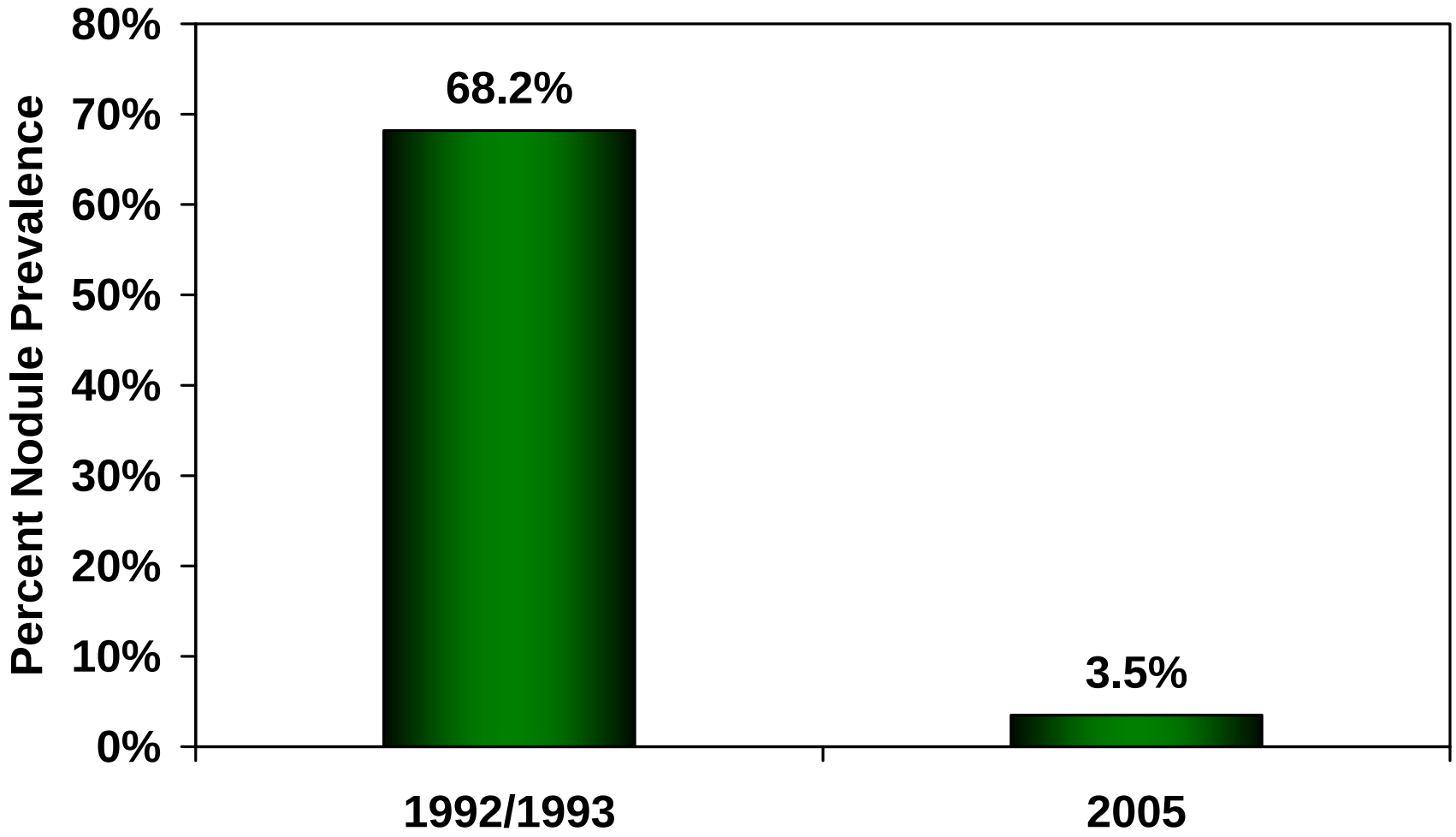
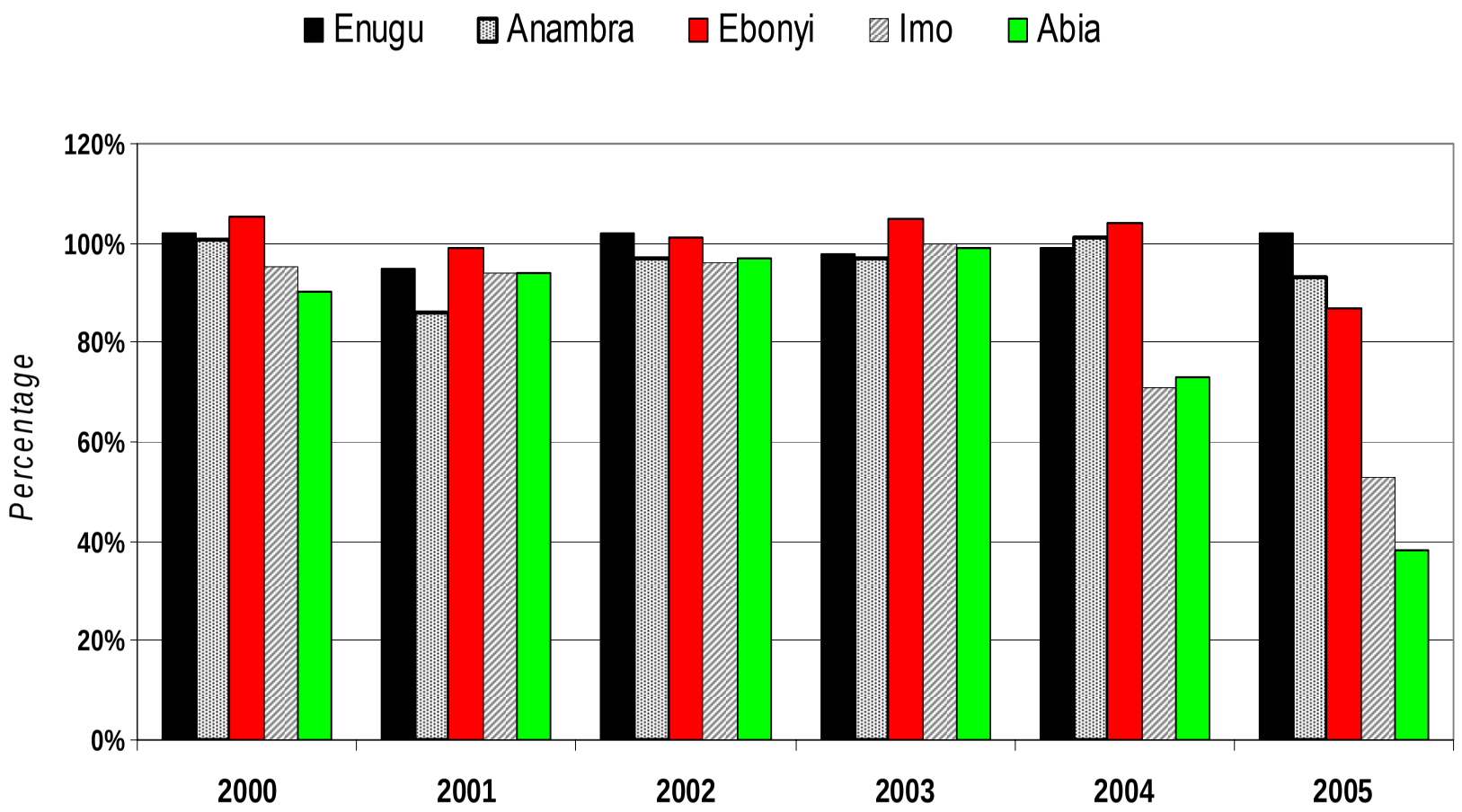
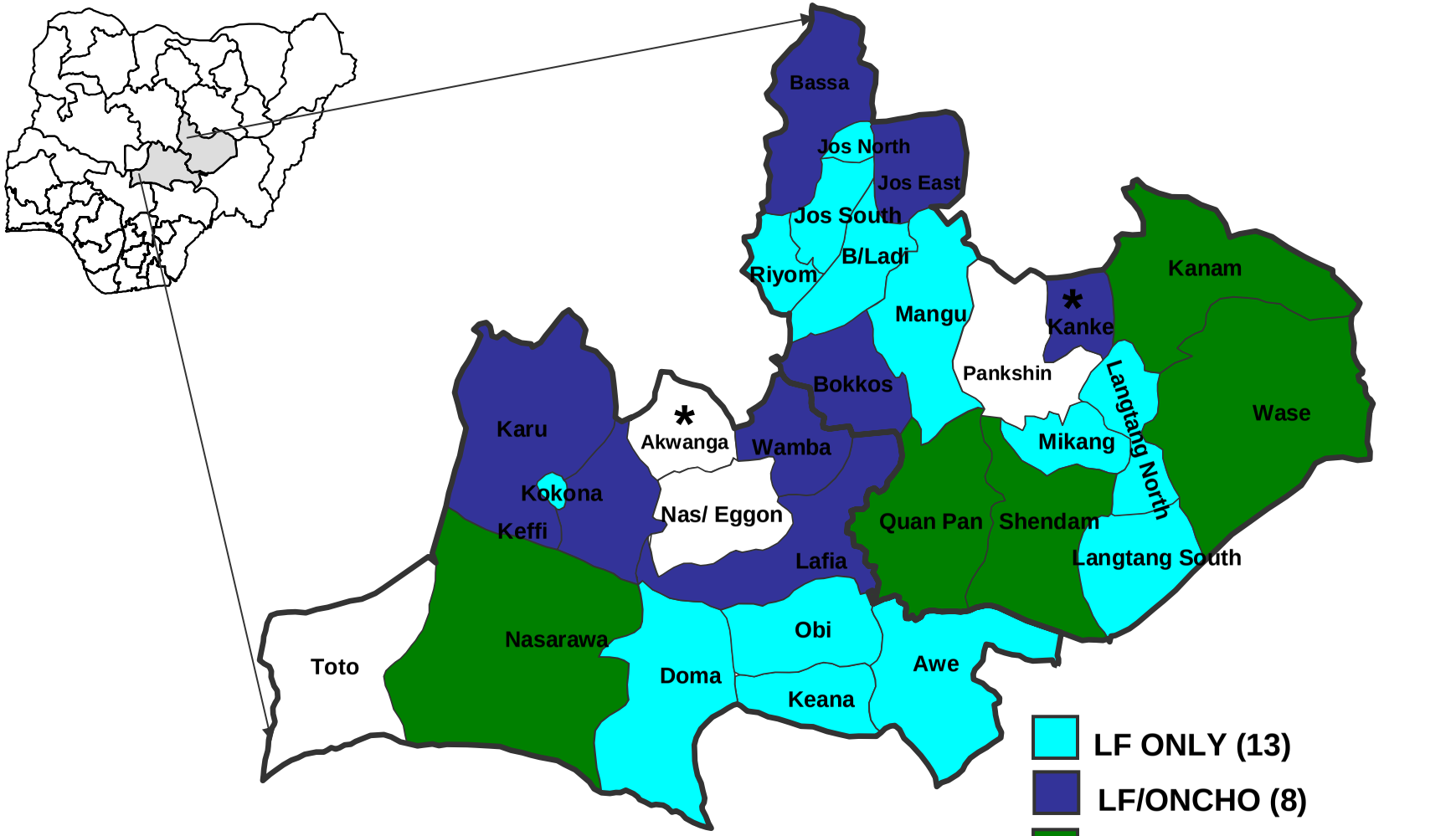


Figure 33: Nigeria: Treatment coverage contrast between 2 post-APOC scenario states and 3 other Southeastern states*



* Imo and Abia States ceased to receive funding from APOC in 2003, and Carter Center does not fund activities there.

Figure 34: Project areas in Plateau and Nasarawa, Nigeria



* In Kanke and Akwanga LGAs, collaboration with malaria program began in 2004.

Figure 35: Lymphatic Filariasis Treatments: Plateau and Nasarawa States (Nigeria); by Year

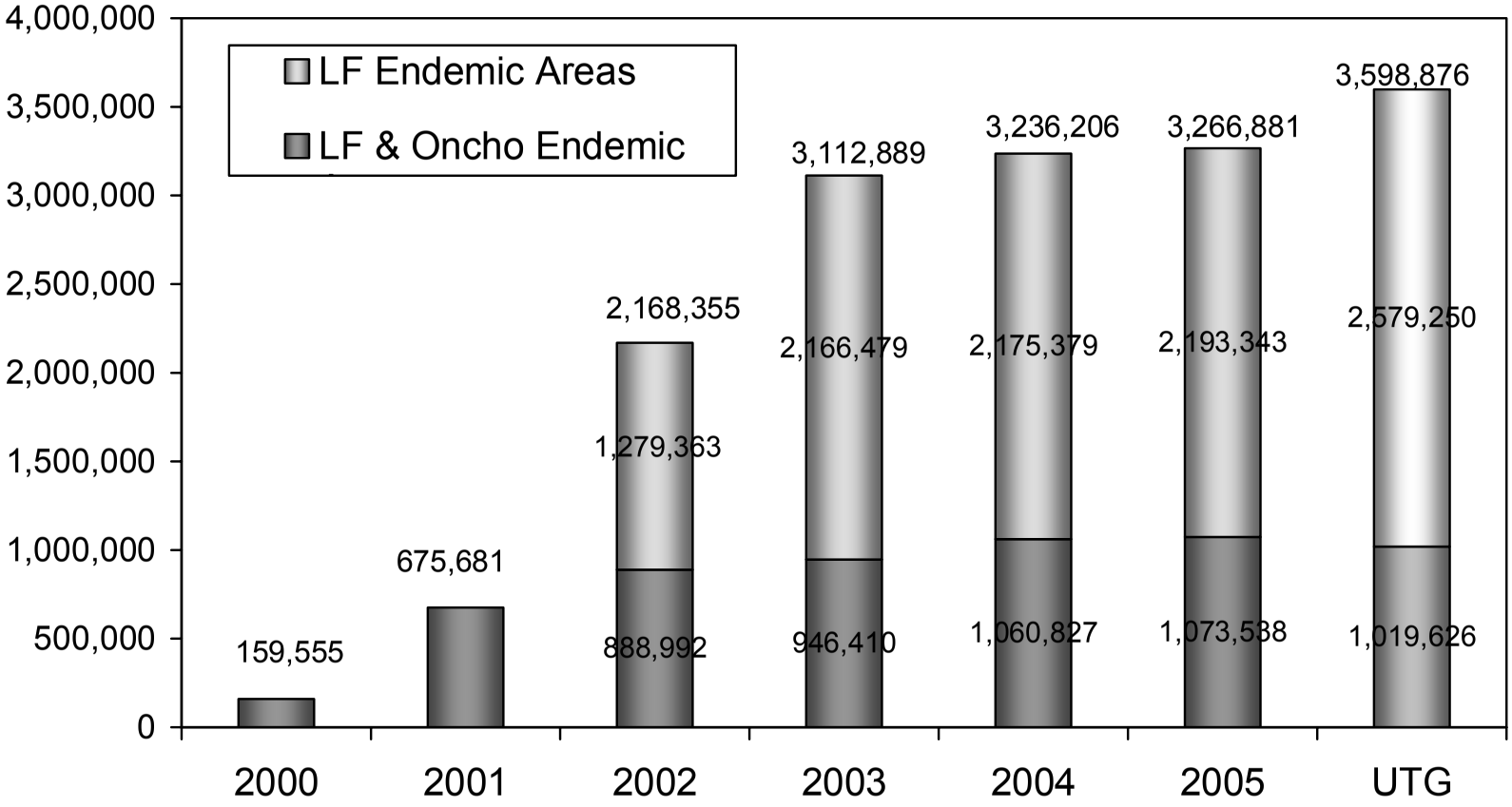


Figure 36: Average Lymphatic Filariasis ICT Results in Seven Sentinel Villages, Nigeria (n = 2,000)

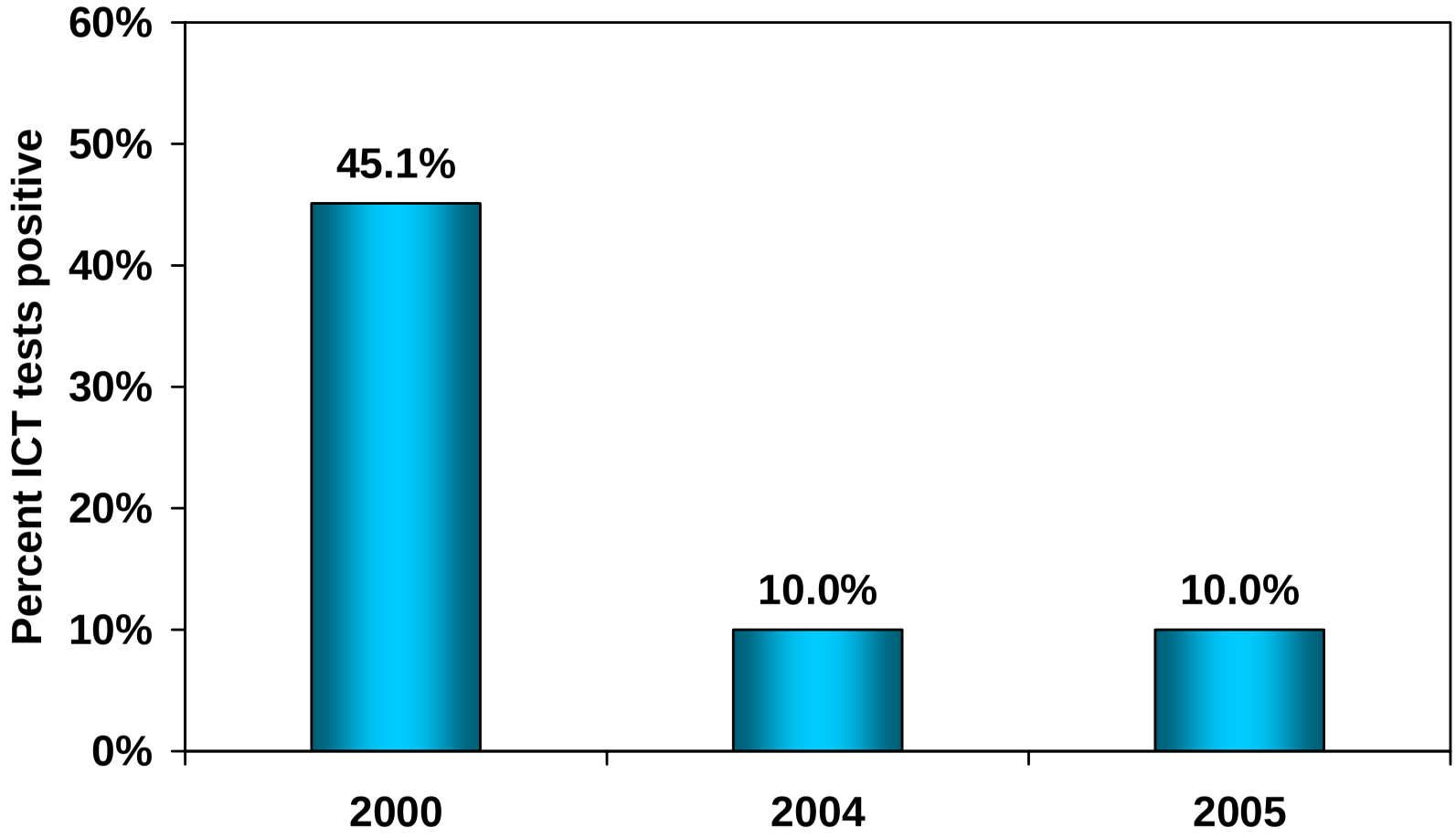


Figure 37: Average Lymphatic Filariasis Mosquito Infection Rate (*W. bancrofti*) in 9 Sentinel Villages, Nigeria (n > 1,000)

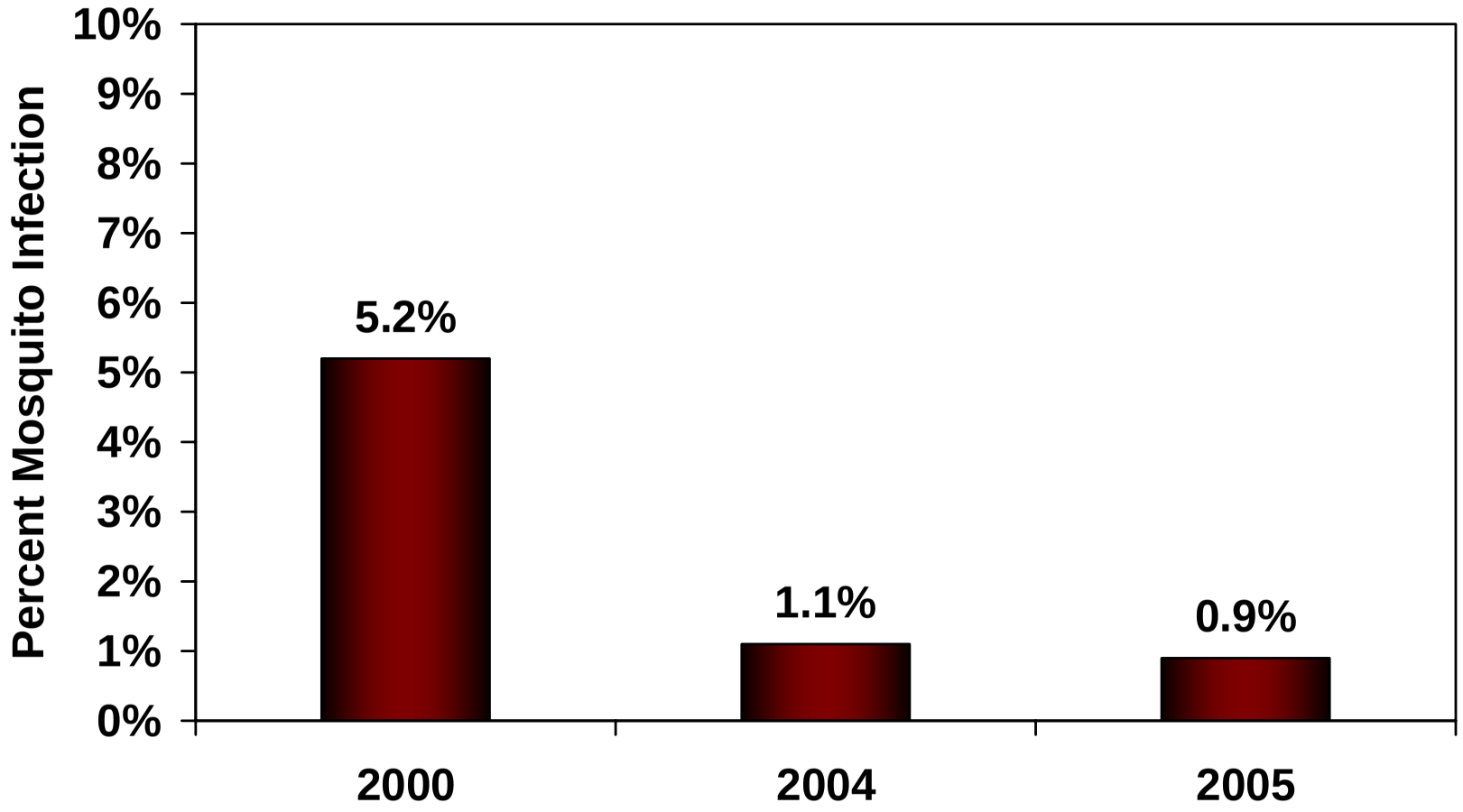


Figure 38: Schistosomiasis Treatments: Plateau, Nasarawa and Delta States, Nigeria, by Year

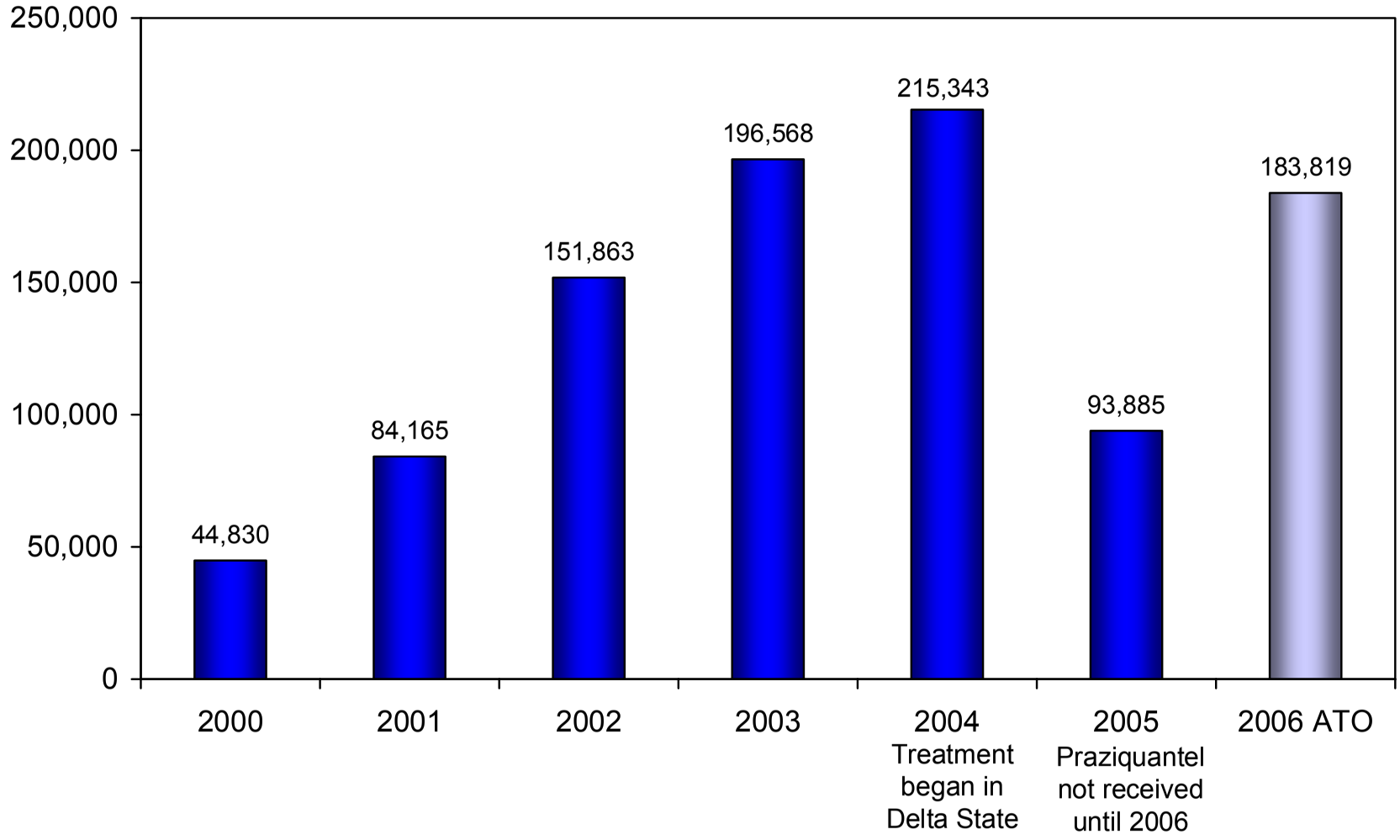


Figure 39: Average Schistosomiasis Dipstick Positivity, Pankshin and Akwanga LGAs, Nigeria (n = 300)

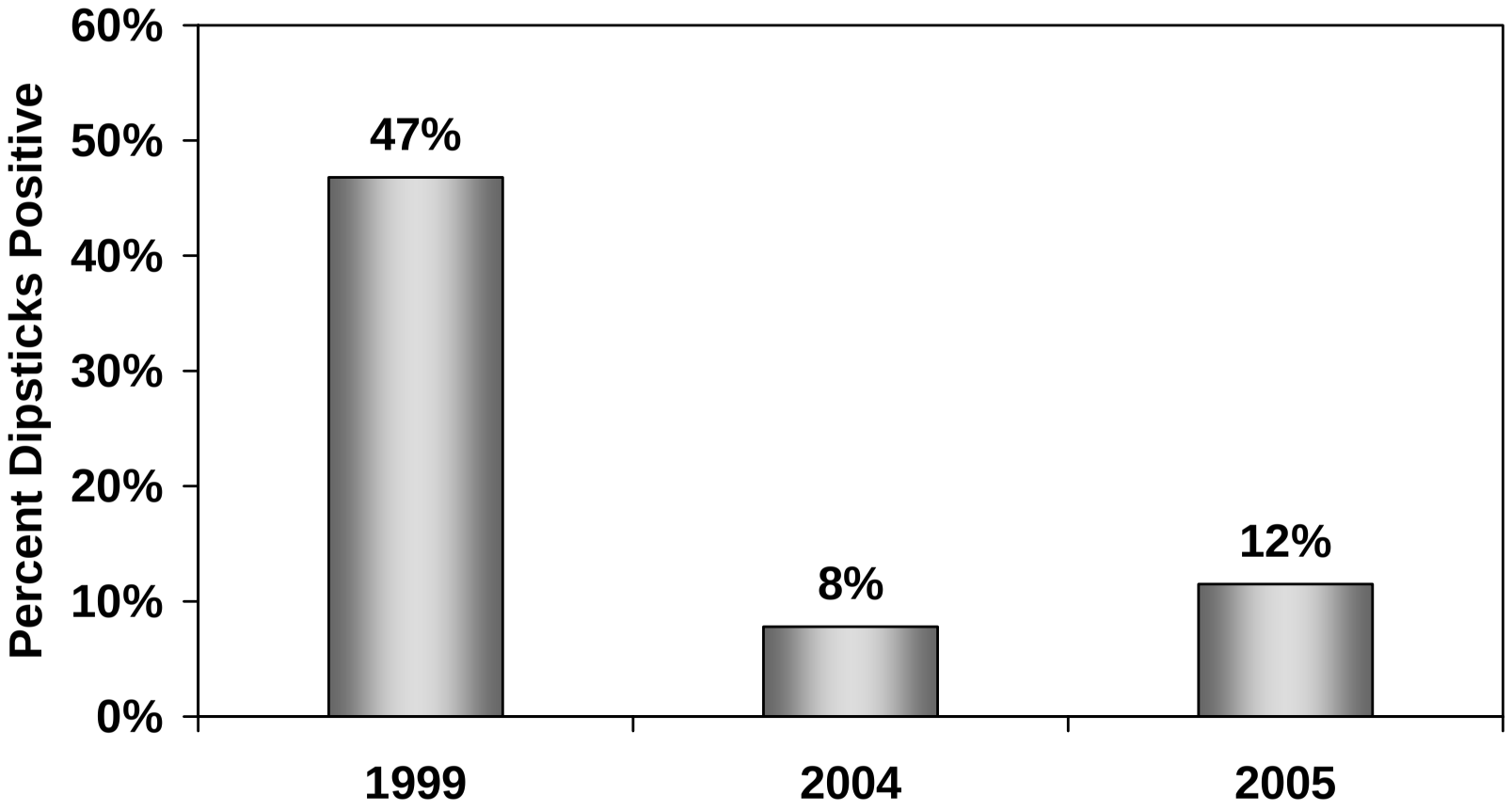


Table 10: Nigeria: Carter Center-Assisted Areas: 2005 Mass and Passive Treatments for Onchocerciasis

Mass treatments

State	Number of LGAs	Popn treated cumulative for 2005	2005 UTG	% UTG treated in 2005	Total Popn 2005	% of total popn treated in 2005	No. of Villages treated during the current month	Active villages cumulative for 2005
ENUGU	16	778,546	764,088	102%	922,475	84%	21	1,372
ANAMBRA	16	543,589	603,153	90%	735,153	74%	31	1,066
EBONYI	10	413,967	476,567	87%	594,000	70%	0	984
EDO	12	555,246	550,167	101%	687,029	81%	1	530
DELTA	9	403,366	450,812	89%	562,439	72%	0	466
IMO	20	348,817	634,855	55%	805,208	43%	32	731
ABIA	12	134,940	348,021	39%	422,920	32%	24	327
PLATEAU	5	281,376	295,666	95%	354,799	79%	12	290
NASARAWA	7	792,162	723,960	109%	868,751	91%	0	567
TOTAL	**107**	**4,252,009**	**4,847,289**	**88%**	**5,952,774**	**71%**	**121**	**6,333**

Passive treatments

STATE	Number of LGAs	Popn treated cumulative 2005	ATO for 2005	% ATO for 2005	Passive villages cumulative for 2005	Passive villages ATO for 2005	Passive villages % ATO for 2005
ENUGU	2	7,373	8,017	92%	42	37	114%
ANAMBRA	5	41,139	24,512	168%	132	132	100%
EBONYI	3	15,338	17,858	86%	136	193	70%
EDO	6	163,126	99,000	165%	155	220	70%
DELTA	16	70,992	40,000	177%	273	280	98%
IMO	9	84,536	123,264	69%	420	738	57%
ABIA	9	52,931	91,463	58%	254	618	41%
TOTAL	**50**	**435,435**	**404,114**	**108%**	**1,412**	**2,218**	**64%**

Table 11: Nigeria: 2005 Lymphatic Filariasis and Schistosomiasis treatments in Plateau, Nasarawa and Delta States and Collaboration Between LF and Malaria Programs in Kanke and Akwanga LGAs of Plateau and Nasarawa States

Lymphatic Filariasis treatments

Name of State	No. of LGAs	Popn treated cumulative 2005	Ultimate TX Goal (UTG) 2005	% UTG treated 2005	Total Popn 2005	% of total popn treated 2005	Active villages cumulative 2005	Active villages UTG 2005
Plateau	17	1,784,245	2,079,976	86%	2,495,971	72%	2,575	2,616
Nasarawa	13	1,482,636	1,483,268	100%	1,779,922	83%	1,010	1,061
TOTAL	30	3,266,881	3,563,244	92%	4,275,893	76%	3,585	3,677

Cumulative LF treatments since 2000: 12,619,567

Schistosomiasis Treatments

Name of State	No. of LGAs	Popn treated cumulative 2005	ATO for Y2005	% ATO for 2005	Total Popn 2005	Mass Villages treated 2005	School based Villages treated 2005
Plateau	4	53,498	98,725	54%	530,915	9	26
Nasarawa	3	29,808	43,448	69%	283,373	4	20
Delta	9	10,579	39,799	27%	80,008	7	18
TOTAL	16	93,885	181,972	52%	894,296	20	64

Cumulative SH treatments since 1999: 795,304

Collaboration Between LF and Malaria Programs: Bednet distribution

Name of State	LGAs	ITN Distribution cumulative	ITN Distribution objective (ADO) for Y2005	% ADO coverage	Total Popn 2005	Villages covered 2005	ATO (Villages)	% village coverage
Plateau	Jos East and Kanke	9,511	10,496	91%	137,872	63	67	94%
Nasarawa	Keana and Akwanga	8,936	15,781	57%	218,527	49	76	64%
TOTAL	4	18,447	26,277	70%	356,399	112	143	78%

Cumulative bednet distribution since 2004: 57,067

Collaboration Between LF and Malaria Programs: Bednet retreatment

Name of State	LGAs	ITN retreatment cumulative	ITN Retreatment objective 2005	% retreated	Total Popn 2005	Villages covered 2005	ATO (Villages)	% village coverage
Plateau	Jos East and Kanke	5,070	5,073	100%	137,872	69	69	100%
Nasarawa	Keana and Akwanga	10,475	6,965	150%	218,527	31	49	63%
TOTAL	4	15,545	12,038	129%	356,399	100	118	118%

ETHIOPIA

Background: Ethiopia is the largest, most populous country in the Horn of Africa, with a population of more than 77.4 million people and an area of 426,371 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 nine zones or regions were endemic for onchocerciasis and eligible for community-directed treatment with ivermectin (CDTI) (Figure 40). 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). In 2001, CDTI was launched with Carter Center assistance in Kaffa-Sheka zone (later officially split into two zones, Kaffa and Sheka). As APOC approved CDTI projects in all ten endemic zones in Ethiopia, The Carter Center has taken on additional projects and is now the NGDO partner in all but two of these zones (Map 15). Thus, the Ethiopian program has experienced some of the most rapid expansion of any of our river blindness programs. The estimated population in all the areas where The Carter Center is the NGDO partner is 3,521,045 people, with a UTG of 2,957,678 people.

Sonia Pelletreau of LCIF and District 411 SightFirst Chairman, Lion Getachew Desta, at the Program Review meeting.

Members of Lions District 411A continue to play an important role in advocacy, especially for onchocerciasis control in the Lions-Carter Center-assisted areas of Ethiopia (Annex 9). Mr. Teshome Gebre, The Carter Center country representative, and himself a Lion, is co-chair of the NOTF and chair of the NGDO coalition, and so plays a leadership role in the national effort against river blindness. Thus, he represents the Lions both on the NOTF and the National Committee for the Prevention of Blindness (NCPB), and is the incoming SightFirst Committee Vice Chairman for Ethiopia. Ethiopian Lions participated actively in the annual staff retreat and five Ethiopian Lions attended this Program Review in Addis Ababa, including the Honorable Dr. World Laureate Tebebe Y. Berhan.

Treatments: During 2005, 2,531,967 people were treated, reaching 94% of the annual treatment objective in The Carter Center-assisted zones of Kaffa, Sheka, Bench-Maji, North Gondar, Illubabor and Jimma (Table 12, Figure 41). This is a slight increase in treatments over 2004. Each year from 2001 to 2004, the Ethiopia program doubled treatments from the prior year due to the rapid scaling up of that country's efforts. In 2006, with the addition of Gambella and Metekel Zones, the program will aim to reach its UTG of nearly 3 million. For the second year, there were no Severe Adverse Events (SAEs); two were reported in 2003.

Mectizan®: In 2005, a total of 7,791,000 tablets were received from NOTF and made available for distribution to The Carter Center's (then) six assisted CDTI zones. Through the course of the year, 6,840,018 tablets were distributed, while 49,205 (0.7%) were damaged. The balance returned was 1,694,629. The average number of tablets per person treated was 2.7. Mectizan® treatment is very popular in Ethiopia, in part because of its additional and highly popular benefits from purging intestinal helminthes.

Training and Health Education: Training was provided to 32,634 community-directed distributors (CDDs), achieving 91% of the training target. This is a 27% increase over CDDs trained in 2004, and the program hopes this will ease the burden on individual CDDs and discourage the demand for cash incentives. A total of 1,655 community supervisors were trained, representing 99% of the training target of 1,670. Sheka Zone did not train any supervisors. The six zones trained a total of 910 front line health workers, 97% of the target of 934. Health education was provided in 38 woredas and 12,354 targeted communities, representing 100% geographical coverage.

Financial Contribution: Although CDTI is being implemented through government health care delivery structures, funding comes from the Lions Clubs International Foundation, and (in all but Kaffa and Sheka Zones) APOC. There is need for the government to begin allocating and releasing more funds in support of the Program. The Program is encouraged to continue aggressive advocacy for more government budget allocation and release, specifically for CDTI core activities, as part of malaria and other vector borne disease control budget lines.

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

Monitoring, Evaluation and Research: Bench-Maji, Jimma, North Gondar, and Illubabor engaged in routine monitoring activities of 143 communities in 2005, including validation of treatment coverage, CDD and supervisor numbers and gender, percentage of CDDs involved with other health activities, and CDD attrition rate. It was found that while the majority of community members (over 60%) were involved in selecting their CDDs, many (around 25%) still were not involved in that process. North Gondar had the highest level of female participation in drug delivery; 28% of the CDDs in surveyed areas in that zone are female. Most CDDs (88%) and all Community Supervisors

(100%) reported that they planned to continue their work in 2006. Treatment coverage in the 143 surveyed communities accurately approximated the data obtained from each zone's reports over the course of the year (86% therapeutic coverage in 143 surveyed villages versus 83% reported therapeutic coverage in the 5,574 total villages).

RECOMMENDATIONS 2006 FOR CARTER CENTER ETHIOPIA

Move to help projects in Gambella and Metekel. Adjust UTG accordingly.

In Bench-Maji, work with the Ministry of Health to pilot ways to solve the issue of pool funding or separate accounts.

Consider establishment of sentinel villages.

Obtain results of APOC ocular evaluations performed in Ethiopia.

Start clinic-based passive treatments in hypo-endemic areas.

Develop a relationship with Jimma University for research and data analysis purposes.

Assist in lymphatic filariasis mapping.

Continue to refine APOC, government and Carter Center funding figures in Carter Center assisted projects in 2006.

Verify that any decrease in treatments reported is not a result of withholding data or reports of treatments that were actually delivered.

Figure 40: Carter Center-Assisted CDTI Projects in Ethiopia

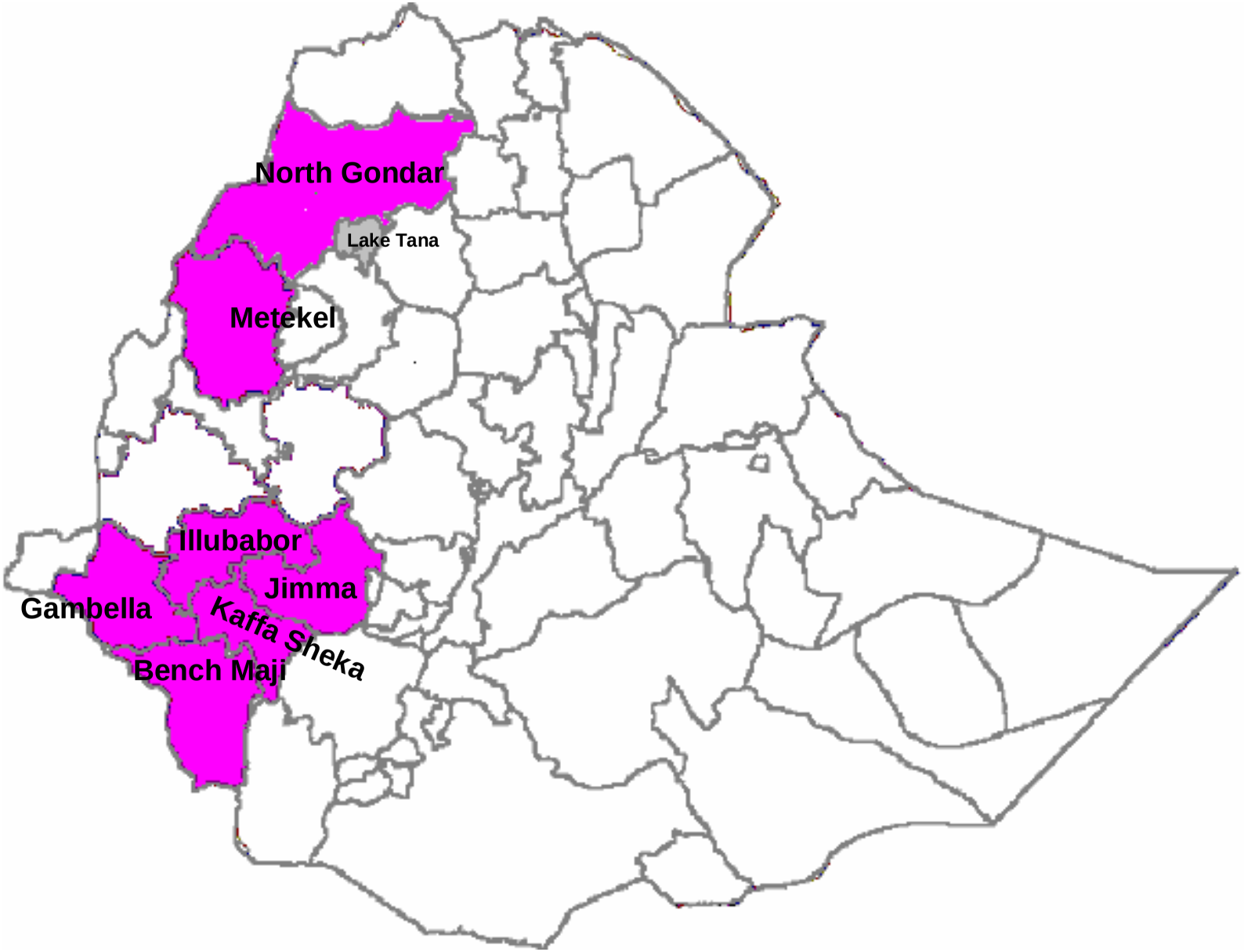


Figure 41: Ethiopia: 2001-2005 Mectizan Treatments and UTG*

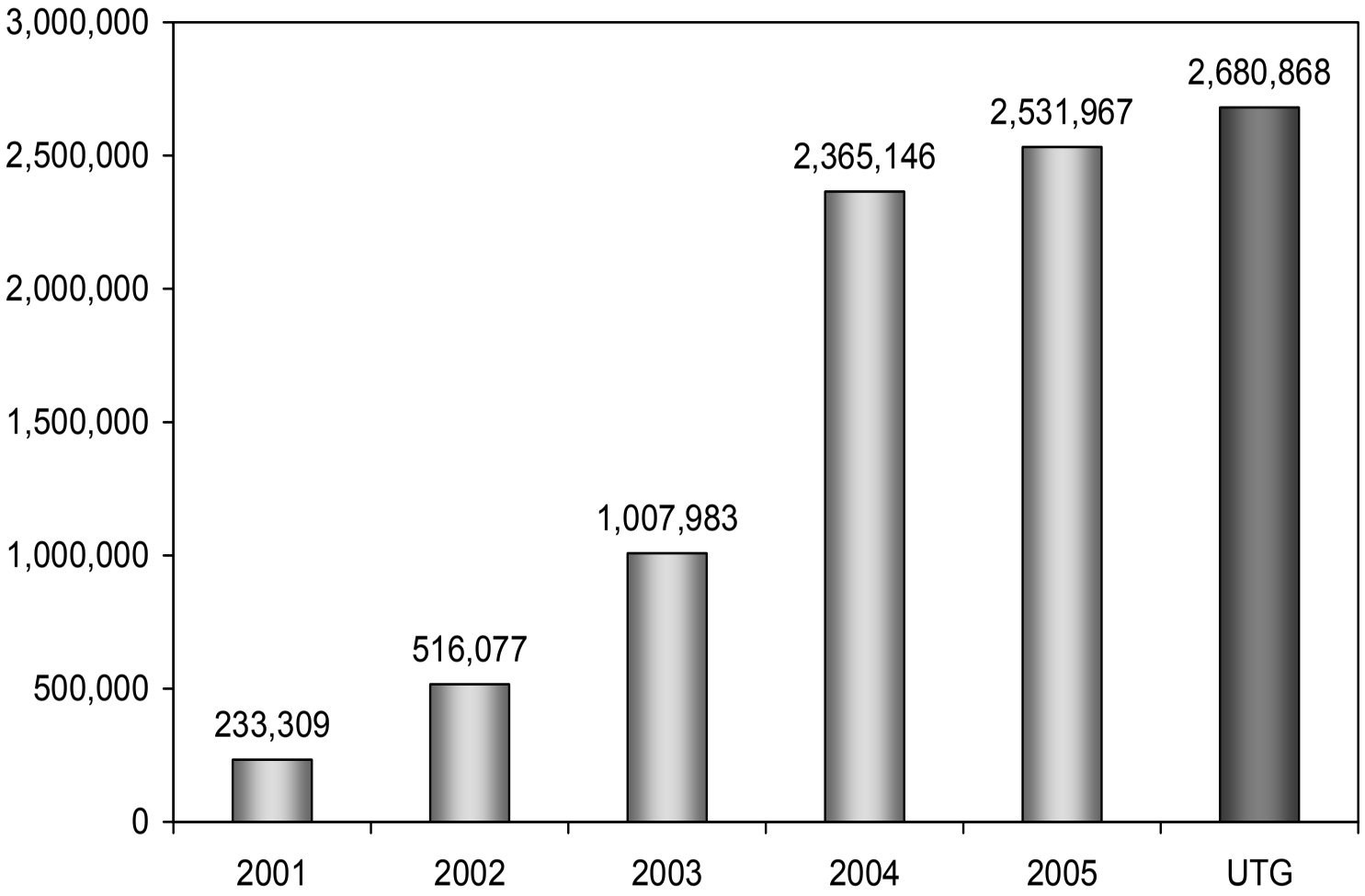


Table 12: Carter Center-Assisted Areas in Ethiopia: Activities and Plans for 2005

CDTI Zone	No. of Woredas	Popn treated cumulative 2005	Ultimate TX Goal (UTG)	% UTG treated	Total Popn 2005	% total popn treated	Active villages UTG	Active villages treated as % UTG
Kaffa	10	635,995	697,502	91%	830,360	77%	2,984	100%
Sheka	3	151,771	159,869	95%	190,319	80%	293	100%
B. Maji	8	457,828	461,732	99%	549,681	83%	1,053	100%
N. Gondar	3	183,945	196,605	94%	234,054	79%	914	100%
Illubabor	6	462,241	518,335	89%	617,065	75%	3,503	100%
Jimma	3	640,187	646,825	99%	770,030	83%	3,607	100%
TOTAL	33	2,531,967	2,680,868	94%	3,191,509	79%	12,354	100%

Acronyms

APOC ..... African Program for Onchocerciasis Control
arvs ..... at-risk villages (villages requiring community-wide active mass therapy)
ATO ..... Annual Treatment Objective
CDC ..... Centers for Disease Control and Prevention
CDD ..... Community-Directed Distributors
CDHS ..... Community-Directed Health Supervisors
CDHW ..... Community-Directed Health Workers
CDTI ..... Community-Directed Treatment with Ivermectin
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
GOSS ..... Government of South Sudan
GSK ..... GlaxoSmithKline
HE ..... Health Education
HQ ..... Headquarters
IACO ..... InterAmerican Conference on Onchocerciasis
ICT ..... immunochromatographic card test
IEC ..... Information, Education, and Communication
ITN ..... Insecticide-treated bednets
JAF ..... Joint Action Forum
LCIF ..... Lions Clubs International Foundation
LCCSFI ..... Lions-Carter Center SightFirst Initiative
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
PAHO ..... Pan American Health Organization
PAPN ..... Post-APOC, Post-NGDO
PCC ..... Program Coordination Committee of OEPA
PCR ..... Polymerase Chain Reaction

PHC.....Primary Health Care
RBF .....River Blindness Foundation
RBP..... River Blindness Program of The Carter Center
REA..... Rapid Epidemiological Assessment
REMO ..... Rapid Epidemiological Mapping of Onchocerciasis
SAE .....Severe Adverse Event
SH .....*Schistosomiasis haematobium* (urinary schistosomiasis)
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
TDR..... Special Programme for Research and Training in Tropical Diseases
TX..... treatments
UNICEF .....United Nations Children's Fund
UTG..... Ultimate Treatment Goal
WHO ..... World Health Organization
WVI .....World Vision International

ANNEXES

ANNEX 1: THE CARTER CENTER AND RIVER BLINDNESS

The Carter Center and River Blindness: In 1987, Merck & Co., Inc. approached Dr. William Foege, then executive director of The Carter Center, for assistance in organizing the global distribution of Mectizan®. Shortly thereafter, in 1988, The Mectizan® Expert Committee (MEC)/Mectizan® Donation Program (MDP) was created and housed at the Atlanta-based Task Force for Child Survival and Development, an independent partner of The Carter Center, with Dr. Foege as Chair. The global initiative has grown to one that now enables approximately 70 million treatments per year. 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 solving a major health problem.

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), which was founded in 1990 by John and Rebecca Moores. The River Blindness Program (RBP) was established at The Carter Center to assume the field activities of the RBF. The Carter Center'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 RBP also includes the Onchocerciasis Elimination Program for the Americas (OEPA), which coordinates activities to eradicate the infection in all six onchocerciasis-endemic countries in the Americas (Brazil, Colombia, Ecuador, Guatemala, Mexico, and Venezuela). In 1997, The Carter Center's RBP expanded to Sudan (with support from the Lions-Carter Center SightFirst Initiative -LCIF) as part of the Carter Center's peace initiative and Guinea worm disease eradication efforts in Sudan. In 1999, as part of the expanded Lions-Carter Center Sight First Initiative (LCCSFI), The Carter Center accepted an invitation to assist onchocerciasis control activities in Ethiopia, and treatments and HE began in 2001.

Partnerships: The Carter Center works through partnerships. Our primary partners are the ministries of health (MOHs) and their national onchocerciasis control programs, executed within and through the indigenous primary health care system. The Carter Center and MOH staff work closely with the rural communities, and through technical assistance and information, education, and communication techniques (IEC) the afflicted peoples themselves are empowered to be full partners in the program and in the drug delivery process. As mentioned above, The Carter Center has a long and evolving partnership with Lions Clubs and the Lions' SightFirst Initiative (see Introduction section for more details), which is supported by the Lions Clubs International Foundation, Merck, Inc., and The Division of Parasitic Diseases (DPD) at the U.S. Centers for Disease Control & Prevention (CDC), where Carter Center technical staff members are housed. The Carter Center also works closely with the MDP at the Task Force for Child Survival and Development, and is represented on the Mectizan® Expert Committee (MEC).

Partners in the African Programs: In Africa, the main Carter Center partners are the MOHs in host countries (Cameroon, Ethiopia, Nigeria, Sudan, and Uganda). The Carter Center also works with other NGDOs through the NGDO Coalition for Mectizan distribution that includes, among others, Christoffel Blindenmission, Helen Keller Worldwide, Interchurch Medical Assistance, Lions Clubs International Foundation, SightSavers International, and the U.S. Committee for UNICEF. The African Program for Onchocerciasis Control (APOC), which is executed by WHO and funded through a trust fund housed at The World Bank, is another important partner of The Carter Center. APOC was launched in 1995, and aims to establish, by the year 2010, "community-directed" river blindness treatment programs in an estimated 19 African countries. APOC provided funds and technical/managerial support for five-year Mectizan® distribution projects carried out by MOH/Carter Center partnerships. The Carter Center had 19 projects (comprised of 31 states, districts and zones), but seven have reached the end of their core APOC funding. Dr. Moses Katabarwa, Carter Center River Blindness Epidemiologist and Lions club member, serves on the Technical Consultative Committee of APOC.

Partners in the Americas Programs: The Carter Center provides the administrative framework for OEPA. Headquartered in Guatemala, OEPA is the technical and coordinating body of a multinational, multi-agency coalition working for the elimination of all onchocerciasis morbidity and transmission from the Americas by the year 2007. Through OEPA, The Carter Center 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), which is convened by OEPA and has representation from key members of the initiative. The Carter Center works with the Lions Clubs International Foundation (LCIF), Pan American Health Organization (PAHO), CDC, and several U.S. and Latin American universities. (Please see the third paragraph of the OEPA section for more details on the Lions partnership.) In 2003, this partnership expanded to include the Bill & Melinda Gates Foundation.

In 2005, The Carter Center and its partners reached the 75 millionth assisted treatment with Mectizan®, and the second year in which the program assisted in treating more than 10 million people.

ANNEX 2: LIST OF PARTICIPANTS

The Carter Center Atlanta

Mrs. Kelly Callahan
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Ms. Lisa Rotondo
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Prof. Ahmed Ali – Ethiopia
Mr. Tibebu Amente – Ethiopia
Dr. Daniel Argaw – Ethiopia
Dr. Samson Baba – Sudan
Mr. Steve Becknell – Sudan
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ANNEX 4: AGENDA

Tenth Annual River Blindness Program Review
Monday February 20 – Wednesday February 22, 2006
Hilton Addis Ababa

Day 1: Monday February 20, 2006

8:30 – 8:40	Welcome, introduction and remarks	Dr. Donald Hopkins Dr. Frank Richards (chair)
8:40 – 8:50	Welcome and remarks	Dr. Kebede Worku, State Minister
8:50 – 8:55	***Carter Center River Blindness Program Video***	

Part 1: 2005 Treatment Activity Summary

8:55 – 9:00	Introduction to Day 1	Dr. Moses Katabarwa
9:00 – 9:30 9:30 – 9:45	Ethiopia presentation Discussion	Mr. Teshome Gebre
9:45 – 10:15 10:15 – 10:30	Nigeria onchocerciasis presentation Discussion	Dr. Emmanuel Miri and Dr. Emmanuel Emukah
10:30 – 10:45	***Coffee Break***	
10:45 – 11:15 11:15 – 11:30	Nigeria integrated programs presentation Discussion	Dr. Abel Eigege
11:30 – 12:00 12:00 – 12:15	Uganda presentation Discussion	Ms. Peace Habomugisha
12:15 – 1:15	***Lunch***	
1:15 – 1:45 1:45 – 2:00	Cameroon presentation Discussion	Dr. Albert Eyamba
2:00 – 2:30 2:30 – 2:45	OEPA presentation Discussion	Dr. Mauricio Sauerbrey
2:45 – 3:00	***Coffee Break and Group Photo***	
3:00 – 3:30 3:30 – 3:45	Sudan presentation (Khartoum) Discussion	Mr. Raymond Stewart
3:45 – 4:15 4:15 – 4:30	Sudan presentation (Lokichokio/Juba) Discussion	Mr. Steve Becknell
4:30 – 5:00	Mectizan® Issues	MDP/Global 2000 Staff
5:00 – 5:15	Day 1 Conclusions	Dr. Frank Richards
5:15	***Session Adjourned***	

Day 2: Tuesday February 21, 2006

Part 2: Sustainability and Integration

8:30 – 8:35	Introduction to Day 2	Ms. Lindsay Rakers
8:35 – 8:50 8:50 – 9:05	Whither Onchocerciasis Control? Discussion	Dr. Donald Hopkins
9:05 – 9:45 9:45 – 10:05	Ethiopia presentation Discussion	Mr. Teshome Gebre
10:05 – 10:15	***Coffee Break***	
10:15 -- 10:55 10:55 – 11:15	Cameroon presentation Discussion	Dr. Albert Eyamba
11:15 – 11:55 11:55 – 12:15	Nigeria presentation (Southeast States) Discussion	Dr. Emmanuel Emukah
12:15 – 1:15	***Lunch***	
1:15 – 1:55 1:55 – 2:15	Uganda presentation Discussion	Ms. Peace Habomugisha
2:15 – 2:35	Oncho/LF Coendemicity in Uganda New Approaches toward Oncho Elimination	Dr. Ambrose Onapa Dr. Richard Ndyomugyenyi
2:35 – 2:50	Lions Presentation	Ms. Sonia Pelletreau
2:50 – 3:00	***Coffee Break***	
3:00 – 3:40 3:40 – 4:00	Nigeria presentation (Plateau and Nasarawa) Discussion	Dr. Abel Eigege
4:00 – 4:40 4:40 – 5:00	OEPA presentation on the 13 foci Discussion	Dr. Mauricio Sauerbrey
5:00 – 5:15	Day 2 Conclusions	Dr. Frank Richards
5:15	***Session adjourned***	

Day 3: Wednesday February 22, 2006

Part 3: Monitoring, Evaluation and Research

8:30 – 8:40	Introduction to Day 3	Dr. Moses Katabarwa
8:40 – 9:15 9:15 – 9:30	Ethiopia presentation* Discussion	Mr. Teshome Gebre
9:30 – 10:05 10:05 – 10:20	Nigeria presentation: Plateau and Nasarawa* Discussion	Dr. Abel Eigege
10:20 – 10: 30	***Coffee Break***	
10:30 – 11:05 11:05 – 11:20	Nigeria presentation: Southeast* Discussion	Dr. Emmanuel Emukah
11:20 – 11:55 11:55 – 12:10	Uganda presentation* Discussion	Ms. Peace Habomugisha
12:10 – 1:10	***Lunch***	
1:10 – 1:45 1:45 – 2:00	Cameroon presentation* Discussion	Dr. Albert Eyamba
2:00 – 2:15 2:15 – 2:30	Duration of treatment Discussion	Dr. Frank Richards
2:30 – 2:45	***Coffee Break***	
2:45 – 3:20 3:20 – 3:35	OEPA presentation* Discussion	Dr. Mauricio Sauerbrey
3:35 – 4:30	Summary and Conclusions, Days 1 – 3	Dr. Frank Richards
4:30 – 4:45	Reflections and Closure of Ninth Session	Dr. Donald Hopkins
4:45	***2005 Carter Center River Blindness Program Review Adjourned***	

ANNEX 5: THE CARTER CENTER RBP 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. An overview 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 prevalence $\geq$ 20%. In the first stage of REMO, survey villages are selected from areas that are environmentally able to support black fly breeding and therefore transmission of *O. volvulus*. In the second stage, the survey villages are visited by field teams and a convenience sample of 30-50 adults are examined (by palpation) for characteristic onchocercal nodules. The mean nodule prevalence for each village sample is mapped (often using geographic information systems) and the map is used to define endemic zones (called 'CDTI treatment zones'). Those zones typically are defined by sample villages having nodule prevalence of $\geq$ 20%. All villages within the CDTI treatment zone are offered mass Mectizan® treatment annually (this approach is modified for areas where the parasite *Loa loa* exists).

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. For the Americas, where the endemic foci are characteristically smaller and more defined than Africa, 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* microfilaria in skin. Villages in which one or more persons are positive (sample prevalence >3%) are considered "at-risk," and recommended for the mass treatment campaign. Thus, the cutoff prevalence for treatment is much lower for the Americas compared to Africa.

Data Reporting: The Carter Center program offices report monthly to The 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. Standardized tables and graphs are used across programs. 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 The Carter Center staff and/or 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 Carter Center offices in Jos (Nigeria), Kampala (Uganda), Yaounde (Cameroon), Khartoum (Sudan), and Juba (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 The Carter Center and (in meetings) to the PCC.

The data from monthly reports are supplemented with additional information at an annual Carter Center River Blindness Program Review held during the first quarter of each year. At these Reviews, all Carter Center 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/partners operating in other parts of the countries where The Carter Center assists also are discussed, as well as epidemiological data and any research that is ongoing.

RBP Treatment Indices: Treatments are reported as numbers of persons and number of villages (communities) treated for the month, by state or province. Cumulative treatment figures are compared to the Annual Treatment Objectives (ATOs) or Ultimate Treatment Goals (UTGs). The decision whether to use ATOs or UTGs is based on projections of program capacity. Mature programs that sufficiently reach their entire program area are said to be at "full geographic coverage," and use the UTG index as their coverage denominator (see below). With the exception of Sudan, all Carter Center RBP activities operate at full geographic coverage (e.g., UTG).

The eligible populations of villages targeted for active mass distribution (at-risk villages - arvs) receive community-wide Mectizan® treatment. The eligible at-risk population (earp) includes all persons living in arvs who are eligible to receive Mectizan® (i.e., who are over five years of age and in good health). Although mass treatment activities exclude pregnant women, these women should be treated one week after parturition (generally later during the treatment year) by community distributors; therefore they should be included in the ATO/UTG calculation. The ATO/UTG for the earp includes the number of persons who can receive Mectizan® and are known or thought to be living in arvs. In practice, the ATO and UTG are established in projections based on age-eligible estimates, and the accuracy of these projections is highly variable. Program directors are urged to define their ATOs/UTGs using the latest epidemiological mapping information and village census data from the most recent treatment rounds. The UTG is also expected to be the same figure used in the annual request for tablets submitted to the Mectizan® Donation Program.

ANNEX 6: THE CARTER CENTER AND THE AFRICAN PROGRAMME FOR ONCHOCERCIASIS CONTROL (APOC)

The Carter Center is a partner in 19 APOC projects (Table 15). These projects consist of 31 "states" (province, states, zones and districts) in five African countries. Of the 19 projects, only six will still receive support from APOC Trust funds after 2006. Note that APOC Trust funds are provided as core support to a CDTI project for only five years, after which the project may continue to receive limited "non programmatic support" for replacement of capital items or for advocacy and training; the project would not be eligible for implementation (field) activities such as community mobilization, health education, supervision, monitoring, data collection, reporting and feedback (which should then be the responsibility of government and communities). Note that some Carter Center programs also did not receive all their funding during the five year period and have funds provided from APOC during the sixth year.

Table 15: APOC funding for The Carter Center assisted CDTI projects

COUNTRY	PROJECT	First year with APOC (JAF, definitive)	5th year funding ends
Nigeria	Imo/Abia*	1998 Sept	2003 Oct
Nigeria	Enugu/Ebonyi/Anambra	1998 Sept	2003 Oct
Nigeria	Edo/Delta	1999 June	2004 Nov
Nigeria	Plateau/Nasarawa	1998 April	2003 May
Cameroon	North Province*	1998 Nov	2003 Oct
Cameroon	West Province	2001 Jan	2006 June
Sudan	Northern	1997 May	2003
Sudan	Southern Sector	1998	2003 June
Uganda	Kasese/Kisoro*	1997 May	2002 July
Uganda	Mbale/Kabale*	1998 Sept	2003 Oct
Uganda	Kanungu/Nebbi	1998 Dec	2004 June/July
Uganda	Moyo/Gulu/Apac/Adjumani	1999 Aug	2005 Feb
Ethiopia	Illubabor Zone	2004 June	2008 Nov
Ethiopia	Jimma Zone	2004 June	2008 Nov
Ethiopia	Kaffa/Sheka Zones	2000 Aug	2005 Oct
Ethiopia	Bench Maji Zone	2002 Oct	2007 Mar
Ethiopia	North Gondar Zone	2002 Oct	2008 Mar
Ethiopia	Metekel Zone**	2004 Aug	2008 Aug
Ethiopia	Gambella Zone**	2004 Sept	2008 Sept

* Post-APOC, Post NGDO scenario was tested in Imo, Abia, Kisoro, Mbale and North Province in 2004 and 2005.

** First year with APOC was 2004, Carter Center became NGDO partner in 2005

Potential for sustainability of CDTI projects without external support

ANNEX 7: THE 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. Microfilariae are tiny embryonic worms that are released by the female worms to then circulate nocturnally in blood. They are picked up by mosquitoes when they bite an infected person, and are later transmitted to another (potentially uninfected person) when the mosquitoes bite again. Microfilariae 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 a period of time (estimated to be five 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. The small parasitic form released from the eggs finds and infects certain types of snails. In the snails the parasites multiply, releasing cercariae, so continuing the lifecycle. Disease from schistosomiasis comes from the release of the eggs into human tissues by the female worms. The passage of these eggs through human tissue leads to inflammation and organ damage. School-aged children (ages 5-14) are the most heavily affected by schistosomiasis and act as the main disseminators of this infection through their urination and defecation in or near fresh water. Mass drug distribution of praziquantel (40 mg/kg) can significantly reduce schistosomiasis morbidity. Praziquantel kills the adult worms and so prevents the eggs from accumulating in tissues. Unfortunately, praziquantel is not routinely donated in large amounts to control programs by the pharmaceutical companies, (as are Mectizan® and albendazole) and costs approximately US $0.20 per child treated.

Nigerians suffer in disproportionate numbers from these two parasitic diseases. The country is considered to contain the largest number of persons at risk for LF in Africa, and is ranked third globally behind India and Indonesia in the human suffering from this parasite. It is estimated that more than 25 million (22%) of Nigerians are infected with LF, and the mass drug administration for LF in Nigeria will need to reach many times this population. The geographic distribution of the disease appears to show a gradient increasing from north to south in the country, coinciding with increasing tropical climate. For schistosomiasis, an estimated 20 million Nigerians (the greatest of any country) need to be treated with praziquantel every one to three years. A 1990 Federal Ministry of Health survey for urinary schistosomiasis (*schistosomiasis hematobium* [SH]) that

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 using praziquantel, but few treatments were given because of the expense of the medicine.

The Carter Center, working with the Federal Ministry of Health (FMOH) of Nigeria and with the state and local government ministries in Plateau and Nasarawa States, has assisted in establishing an LF elimination program in Plateau and Nasarawa States and SH control programs in Plateau, Nasarawa and Delta 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®, and in four LGAs, treatment plus distribution of impregnated bednets (donated by Roll Back Malaria). 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, most recently, Shin Poong Pharmaceutical Company, Ltd. The Carter Center has purchased the remainder through funds raised from other donors. Dr. M.Y. Jinadu, the national program coordinator for the LF and SH programs in Nigeria, is actively involved in The Carter Center-assisted program.

ANNEX 8: RECENT (2005-2006) PUBLICATIONS PERTAINING TO THE PROGRAM

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treatments in Nigeria. *Ann Trop Med Parasitol*. 2005 Mar; 99(2):155-64.

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ANNEX 9: 'Leading story on Lions Clubs that appeared in the Ethiopia Herald the day before the The River Blindness Program hosted its tenth annual Program Review on February 20-22, 2006 in Addis Ababa

11th All Africa Lions Conference kicks off[1]

Addis Ababa - The 11th All Africa Lions Conference was officially launched here in Addis yesterday at the United Nations Conference Centre (UNCC).

In his inaugural speech, President Girma Wolde-Giorgis said that since Africa witnessed the formation of first Clubs in Algeria and Morocco, the clubs have performed tremendous work in alleviating the suffering of the less fortunate members of the society especially in the preservation and treatment of eye disease.

In Ethiopia, many people have benefited from this programme, President Girma, said and saluted the commitment of the lions Club to eradicate blindness by the year 2020.

The President also expressed his happiness that the Lions international will be embarking on another vital project, the fight against HIV/AIDS.

International Director of Lions Club International, Manoj Shah on his part said most clubs in Africa are getting recognition and support by the African governments while membership status in African countries had shown positive sign particularly over the past five years.

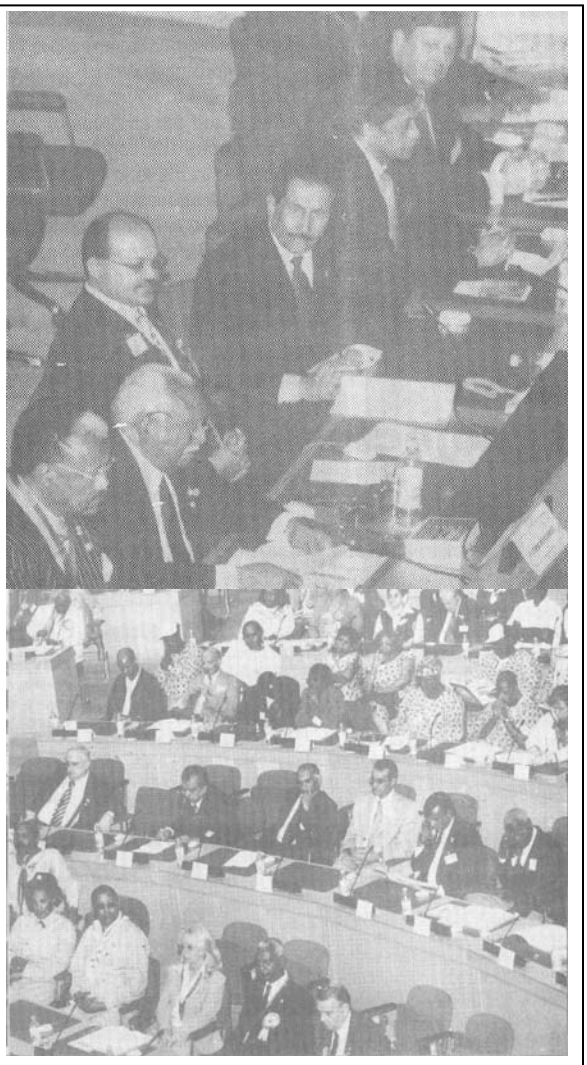
Underlining the successes witnessed through the Sight First project of the African Lions Clubs, Shah said that over 200,000 cataract surgeries as well as over 66 million treatments was given for river blindness patients in Africa.

The construction of 11 new eye hospitals as well as expansion and upgrading of other ten eye hospitals were also among the success stories achieved over the past ten years, he indicated.

Training was offered for some 250 ophthalmic nurses in various African countries, the Director said and added that special training was provided for 19,000 health workers and teachers.

Trachoma control programme is under way in five African nations, he added.

A video clip depicting the impacts made by the Lions club was officially inaugurated by President of Lions Club International, Dr. Ashok Mehta.



President Girma Wolde-Giorgis speaking at the *11th All Africa Lions Conference*

Lions Club-Ethiopia country representative and Chairman of the event organizing committee, Dr. Med World laureate Tibebe Yemane Berhan was elected Ambassador of Good Will and award medal for his outstanding service in the Lions Club.

The 11th All Africa Lions Conference, which attracted over 400 participants from African Lions Clubs, is expected to deliberate on future plans as well as serve as experience sharing forum for member clubs.

[1] *The Ethiopian Herald*, February 19, 2006.

ANNEX 10: ACKNOWLEDGEMENTS

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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