SUMMARY PROCEEDINGS

EIGHTH ANNUAL TRACHOMA CONTROL PROGRAM REVIEW

Ten Years after the Launch of GET 2020: "Where are we now?"

THE
CARTER CENTER

Waging Peace. Fighting Disease. Building Hope.

Atlanta, Georgia
April 16 – 18, 2007

Funded by:
Conrad N. Hilton Foundation
Lions Clubs International Foundation

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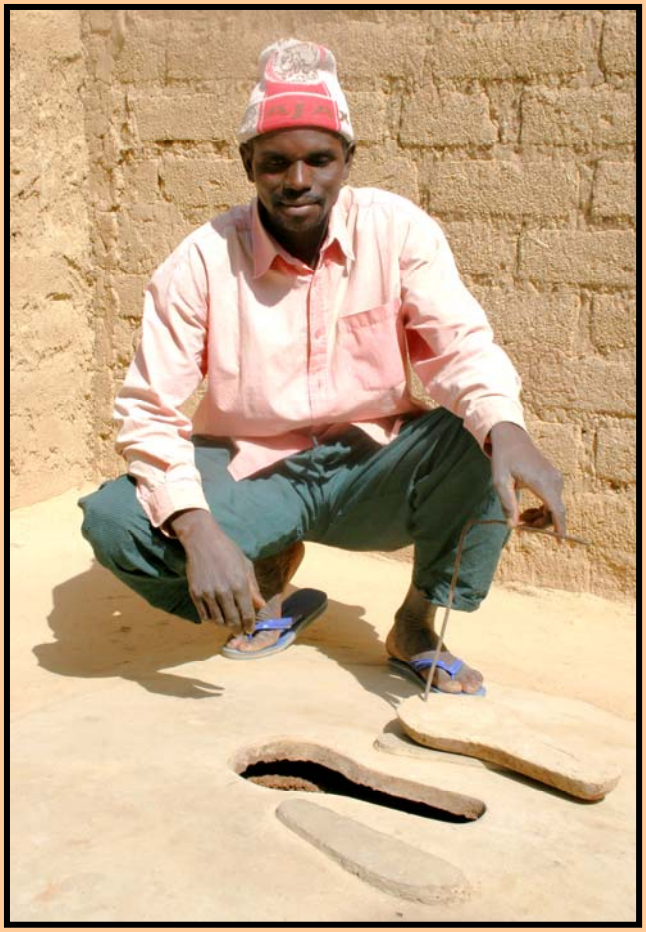
The Lions-Carter Center supported Trachoma Control Programs in Ethiopia and Sudan distributed a total of 3,064,936 doses of Pfizer-donated azithromycin in 2006.



The Conrad N. Hilton Foundation-supported programs in Niger and Mali constructed a total of 17,539 latrines in 2006 and trained 563 women in manufacture of traditional soap for face washing.



The Eighth Annual Trachoma Control Program Review:
"Ten years after the launch of GET 2020: Where are we now?"

April 16—18, 2007
Atlanta, Georgia



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ACKNOWLEDGEMENTS

The Carter Center's Trachoma Control Program is funded through generous grants from the Conrad N. Hilton Foundation and the Lions Clubs International Foundation (LCIF). The eighth annual Program Review for Carter Center-assisted trachoma control programs was made possible through the generosity of the Hilton Foundation and LCIF.

The Carter Center Trachoma Control Program also would like to acknowledge the support of the following individual donors and foundations:

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Bill & Melinda Gates Foundation

Note:
Inclusion of information in the Trachoma Program Review Proceedings does not constitute "publication" of that information.

EXECUTIVE SUMMARY

Ten years after the launch of GET 2020: Where are we now?

The eighth annual Program Review of trachoma control programs was held at The Carter Center, April 16 – 18, 2007. In addition to the seven Carter Center-assisted programs, we were joined by our partners from the International Trachoma Initiative, Helen Keller International, the Kilimanjaro Centre for Community Ophthalmology, the Francis I. Proctor Foundation, Sight Savers International, Emory University, Water Advocates and World Vision. In keeping with the theme of ***10 Years after the Launch of GET 2020: Where are we now?*** presentations focused on program progress towards ultimate intervention goals, evidence-based planning, survey methodology, and target setting.

As in previous years, the primary objectives of the program review were to assess the status of the national trachoma control programs, identify challenges encountered in planning and implementing those programs, discuss solutions and shared experience, as well as to promote sharing and standardization of information. Discussions during the program review meetings are country-specific, but the impact is global. The achievements, challenges, solutions and lessons learned continue to guide the evolution of the GET 2020 Alliance, particularly with respect to the F & E components of SAFE.

These proceedings reflect the thoughts, discussions and proposals made during the eighth annual Program Review of trachoma control programs. Program review meetings offer a unique forum for trachoma control program managers, Carter Center staff, and partners to work face-to-face to review accomplishments and plan for the future. This group, representing seven country programs, is the first and only assembly of national and regional TCP coordinators and experts to meet regularly to discuss practical application of the SAFE strategy with an emphasis on the F & E components.

Special session highlights from this year's review included latrine promotion evaluations conducted in Niger, Mali, and Ghana and a comparative presentation on latrine construction methods and costs in order to encourage the importance of local needs in designing sanitation interventions. The electronic health education materials library was demonstrated, in addition to methods for measuring inter-observer reliability and monitoring azithromycin drug stock and distribution. This year's special session presentations also included a presentation on the equitable application of the SAFE strategy among both men and women.

The review highlighted the partnership between the Lions Clubs International Foundation and The Carter Center, with particular focus on Lions Clubs of Ethiopia leadership in reducing the burden of blinding trachoma in the Amhara Regional State. In addition, a session describing plans for the USAID Neglected Tropical Diseases Initiative was presented.

National and regional trachoma control program coordinators representing the ministries of health of Ethiopia, Ghana, Niger, Nigeria and the Government of Sudan attended. In addition, The Carter Center's trachoma control program staff from Ethiopia, Ghana, Mali, Niger, Nigeria, Sudan and southern Sudan participated in the meeting. Representatives of the Lions Clubs International Foundation, the Conrad N. Hilton Foundation, and Pfizer, Inc. were also in attendance.

ACRONYMS

ATO	Annual Treatment Objective
BLTR	Bilamellar Tarsal Rotation
CBM	Christoffel Blindenmission
CDC	U.S. Centers for Disease Control and Prevention
CDTI	Community Directed Treatment with Ivermectin
CMA	Christian Mission Aid
CWSA	Community Water and Sanitation Agency (Ghana)
FAR	Fellowship for African Relief
FGD	Focus group discussions
FMOH	Federal Ministry of Health
GOS	Government of Sudan
GOSS	Government of South Sudan
GRBP	Global 2000 River Blindness Program
HKI	Helen Keller International
IDP	Internally Displaced Persons
ITI	International Trachoma Initiative
KAP	Knowledge, Attitudes, and Practice
LCIF	Lions Clubs International Foundation
LGA	Local Government Area (specific to Nigeria. An LGA is analogous to a district.)
MDG	Millennium Development Goal
MOH	Ministry of Health
NGO	Non-Governmental Organization
NPPB	National Program for the Prevention of Blindness
NR	Northern Region (Ghana)
OLS	Operation Lifeline Sudan
PHAST	Participatory Hygiene & Sanitation Transformation
PHC	Public Health Centers
SAFE	Surgery, Antibiotics, Facial Cleanliness & Environmental Improvement
SF	SightFirst
TCP	Trachoma Control Program
TRA	Trachoma Rapid Assessment
TF	Trachomatous inflammation-Follicular
TI	Trachomatous inflammation-Intense
TT	Trachomatous Trichiasis
UIG/UTG	Ultimate Intervention/Treatment Goal
UWR	Upper West Region (Ghana)
VDC	Village Development Committee
WAWI	West African Water Initiative
WHO	World Health Organization
WVI	World Vision International

Nigeria Trachoma Control Program

Presented by Dr. Bole Olowu, National Coordinator,
National Program for Prevention of Blindness

Carter Center assistance to Nigeria is funded by the Conrad N. Hilton Foundation and the Bill & Melinda Gates Foundation.

Background

Trachoma control in Nigeria is done under the auspices of the National Program for the Prevention of Blindness (NPPB); the NPPB national coordinator directs trachoma control activities through the coalition of the Ministry of Health, NGOs, and United Nations agencies. Past review of existing data and anecdotal reports suggested that trachoma is a significant cause of blindness in the northern states of Nigeria. Since October 2000, blindness prevention partners have conducted trachoma prevalence surveys in four states and trachoma rapid assessments in five others. A national survey for blindness and low vision supported by Sight Savers International began in February 2005; results are not yet available.

Nigeria's 19 northern states are assumed to be endemic with trachoma, with 10 of these believed to be highly endemic. The estimated mean prevalence of active trachoma in endemic states is around 24.7%, with an estimated TT prevalence of around 4.7%. The national trichiasis backlog has not yet been determined, although it will likely be in the region of 800,000 in the northern 'trachoma belt' alone. There are presently trachoma interventions in 82 local government areas nationally.

The national trachoma control program commenced in 2001, including the formation of the trachoma task force. Partners joined at various times, including Helen Keller International and The Carter Center in 2001, and Sight Savers and Christoffel Blindenmission (CBM) in 2003. The federal government has established 2015 as its target date for elimination of blinding trachoma.

In 2000, The Carter Center Nigeria began working with state and local health authorities to help establish trachoma control programs in Plateau and Nasarawa States. The Ministries of Health for these states did their first population-based trachoma prevalence surveys in April 2002. Survey results suggested that there were moderate levels of trachoma in both states (<10%), with pockets of higher prevalence in some local government areas (LGAs). The survey also showed that access to household latrines varied from 21% in parts of Plateau to 69% in parts of Nasarawa. The Carter Center also supported surveys in 10 LGAs in Katsina state and found TF in children aged 1-9 years ranged from 5-24% and TT in the adult population ranged from 2.3-8.0%.

Program Achievements in 2006

Facial Cleanliness and Health Education (F)

In Carter Center intervention areas, health education sessions are conducted in the community using posters and flipcharts that are distributed for use by trained community health workers. T-shirts and baseball caps with health education messages are produced and distributed to help promote trachoma prevention.

In 2006, 160 trachoma health educators were trained in trachoma health education. These health educators conduct ongoing health education campaigns in the intervention areas supported by the national program's partners. A total of 446 villages have on-going education activities, reaching 934,504 people. More than 6,000 school children are educated on how to control trachoma in their communities.

Environmental Improvement (E)
A latrine promotion project was launched with Carter Center support in Plateau and Nasarawa States in 2003. The Carter Center promotes household Sanplat latrines through the training of masons and the provision of construction materials. Two masons are typically trained per village. Materials provided include cement, blocks, spades, diggers, rakes and head pans, while the communities provide the labor and support the masons. There is no standard type of superstructure prescribed for the community, although they are encouraged to build a roof. The estimated total cost per latrine is the equivalent of $45.70, $28 of which is contributed by the household, and $17.70 comes from The Carter Center.

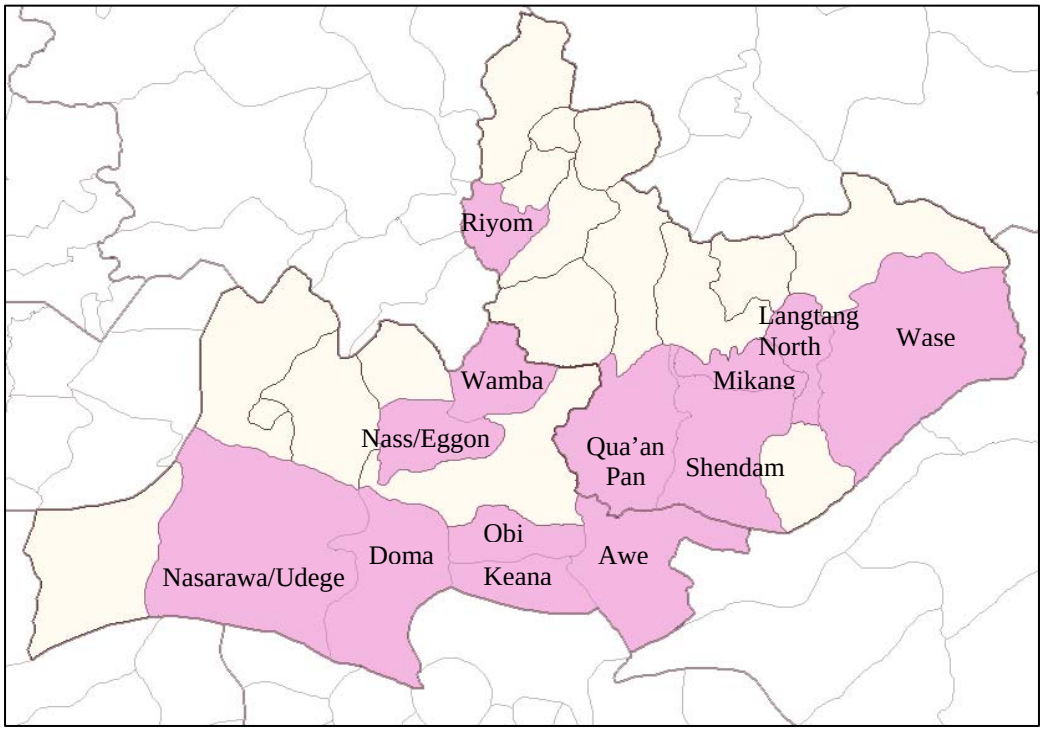
The National Blindness Prevention Program encourages state prevention of blindness committees to advocate to state and local governments to construct wells and provide potable water for trachoma-endemic communities. In 2006, two communities (Panwasa Gwandara and Konvah) benefited from one hand-dug well and one rehabilitated borehole. Other partners supporting water provision include: RUWATSAN, Water Aid, Unicef, state and local governments, and the Tulsi Chanrai Foundation.

Surgery (S)
The national program undertakes routine cataract camps during the year and has incorporated trichiasis surgeries into these camps. CBM, Sight Savers International, and Helen Keller International also use eye camps as opportunities to carry out trichiasis surgeries. Trichiasis surgery also takes place in health facilities and during village-based outreach. In 2006, 5,572 trichiasis surgeries were conducted nationally and 4 trichiasis surgeons were trained.

Antibiotics (A)
The Nigeria program does not yet receive Pfizer-donated azithromycin. Sight Savers International continues to purchase azithromycin for distribution, and reached 1,737 people in 2 communities of Sabon Birni LGA of Sokoto State in 2006. In addition, 25,102 tubes of ocular tetracycline were distributed in 56 communities with support from Sight Savers International, Helen Keller International and CBM.

Consistent with the aims of the support provided by the Conrad N. Hilton Foundation,
The Carter Center does not currently support surgery or antibiotic distribution in Nigeria.

Trachoma Prevalence Surveys to be Conducted in 2007,
Nasarawa and Plateau States, by LGA



Targets for 2007

Health Education and Facial Cleanliness (F)

- Continue trachoma health education in Borno, Sokoto, Kebbi, Zamfara, Katsina, Plateau, Nasarawa, and Yobe states
- Continue on-going health education activities in 313 villages (Carter Center)
- Train 280 trachoma control volunteers (2 each per village; Carter Center).

Environmental Improvement (E – all Carter Center targets)

- Construct 10,000 latrines
- Making of 140 sets of slab equipment
- Train 280 masons (2 per village in 240 villages)
- On-going village clean-up activities in intervention villages.

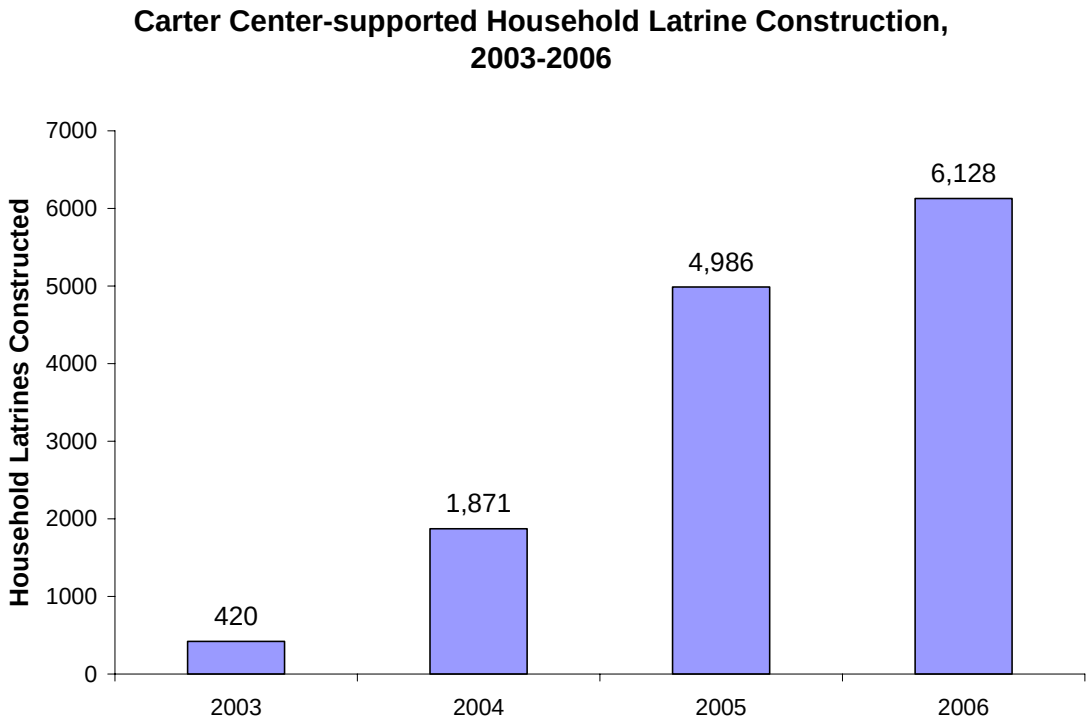
Antibiotics (A)

- Intensify the possibility of receiving azithromycin through the International Trachoma Initiative so as to reduce the cost of treatment and to increase the number of persons benefiting from azithromycin distribution
- Institute coverage registers in all intervention areas

Surgery (S)

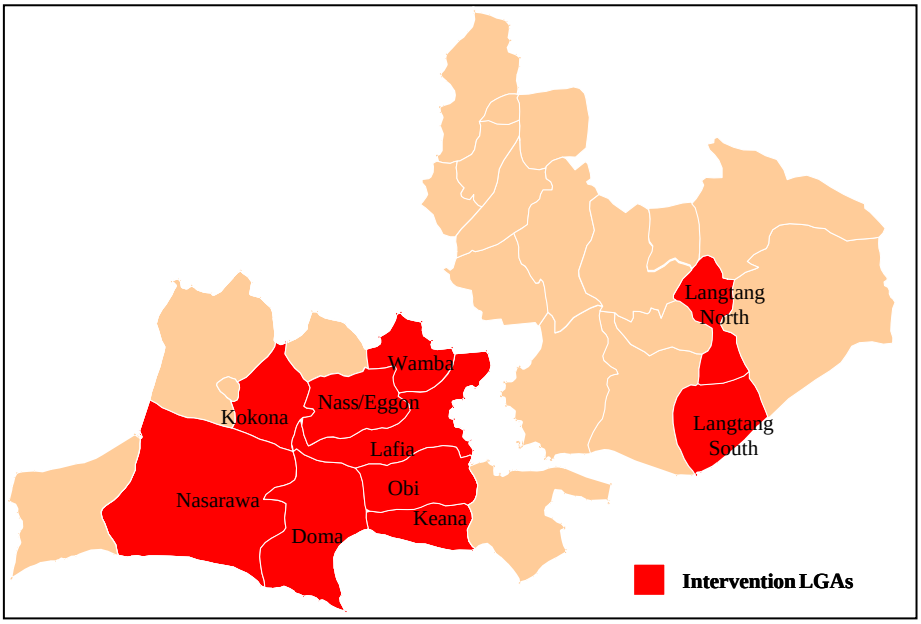
- Conduct a TT surgery camp in Gamari to train at least 4 lid surgeons and operate on 500 patients in first quarter 2007
- Provide a regular supply of consumables to the states involved in surgery
- Operate on 2,000 patients per state
- Train more lid surgeons

A village health worker conducts trachoma control education in Plateau State, Nigeria.



Carter Center-Assisted States, 2006
Nigeria Trachoma Control Program

Nasarawa and Plateau States, with Carter Center intervention LGAs



Niger Trachoma Control Program

Presented by Dr. Kadri Boubacar, Deputy Director, National Prevention of Blindness Program, Ministry of Health of Niger

The Carter Center assistance to Niger is funded by the Conrad N. Hilton Foundation.

Background

Niger's National Prevention of Blindness Program (NPBP) was established in 1987. The Ministries of Health, Education, and Water & Social Development formed a National Trachoma Task Force in 1999. Representatives of partner health organizations including The Carter Center, local Lions Clubs, Helen Keller International, CBM, The Niger Association for the Blind, the African Muslim Agency, and the World Health Organization are also Task Force members.

The most recent national trachoma prevalence survey was conducted in 1997-1999, with financial assistance from the European Union and The Carter Center. It found that an average of 44% of children under 10 years old had active trachoma (TF/TI), and 1.7% of women over 15 years old had trichiasis. Nationwide, an estimated 68,300 men and women needed trichiasis surgery. The highest prevalence of trachoma was identified in the regions of Zinder, Diffa and Maradi. The baseline assessment showed that about 50% of households had access to clean water within 1 km, and about 4% of households had access to a latrine. The national baseline (2001) prevalence of clean faces in children aged 1-10 years was 52%.

Program achievements in 2006

Facial Cleanliness and Health Education (F)

A total of 4,512 villages in three target regions (Zinder, Maradi and Diffa) received regular health education sessions for trachoma prevention in 2006. To carry out community health education, 455 volunteers, including community health workers and teachers were trained in trachoma prevention. From 1999 through 2006, there has been a steady increase in the number of villages reached by the program with health education (see graph).

To broaden the reach of the program's educational campaign throughout Niger, health education messages are produced and broadcast in local languages on local radio stations. Radio listening groups gathered to hear some of the 4,755 broadcasts that took place during the year. To reach persons without access to radio, artists and health educators performed theatrical dramas in large villages and weekly markets. The average proportion of children aged 1-9 years with clean face was 86%.

Environmental Improvement (E)

The Niger latrine promotion project began in 2002 to reduce populations of *Musca sorbens* in trachoma-endemic villages and to improve general hygiene. Latrine promotion is supported by the national program, The Carter Center, local Lions Clubs, West African Water Initiative (WAWI), and UNICEF. In 2006, the ensemble of partners

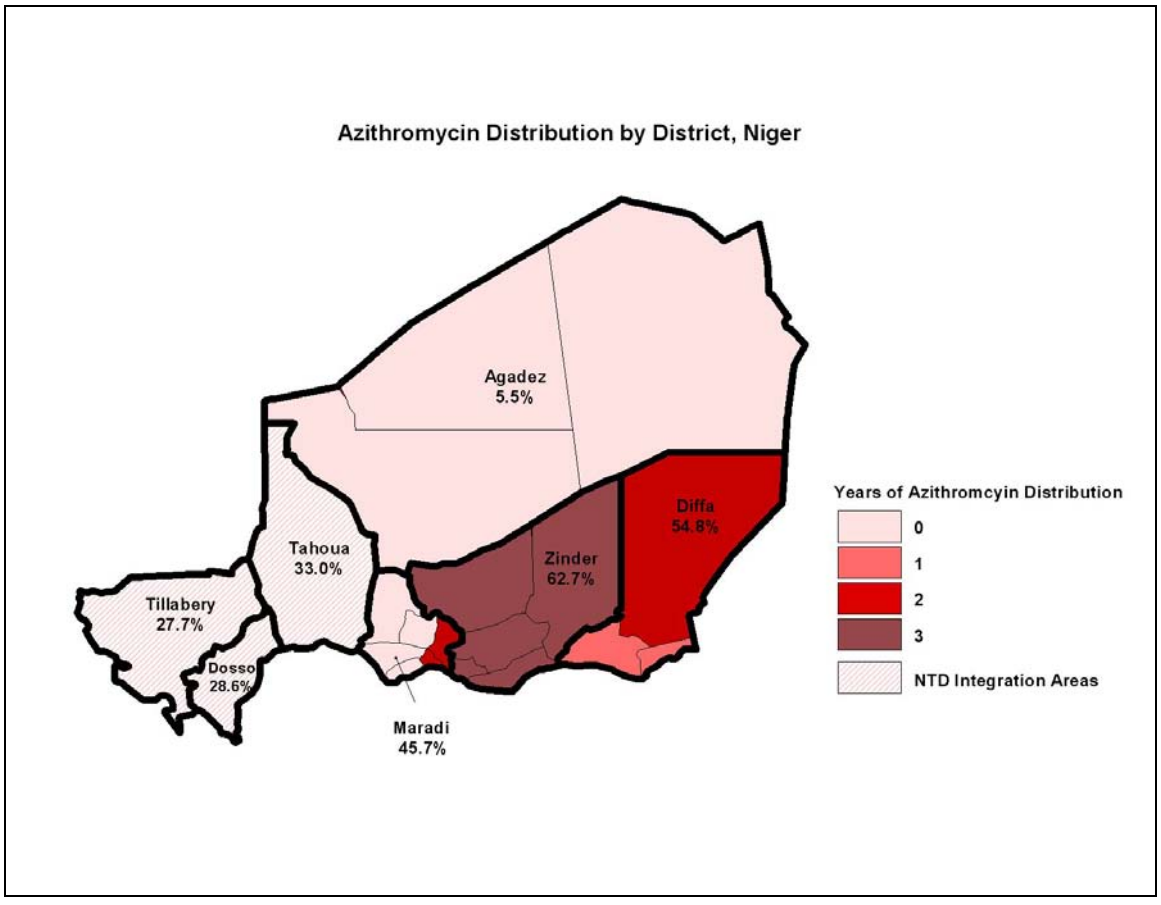
assisted the program to build 6,777 household latrines at an average cost of the equivalent of $15.00 (6,247 of which were built with Carter Center support). In addition, 411 women were trained in traditional soap manufacture, and 232 masons were trained in latrine construction. The Niger program also benefited from the construction of 91 new water points, while 15 village water committees were formed in 2006. Decision-makers were sensitized in water provision in trachoma-endemic districts.

Surgery (S)

In 2006, the program trained 44 trichiasis surgeons and distributed new trichiasis surgical kits and consumables to rural clinics. Overall, 4,500 individuals received corrective surgery for trichiasis in 2006. From 1999 through 2006, a total of 31,766 people have received corrective surgery for trichiasis (see graph). Challenges to the delivery of surgical activities included the demands of cost-recovery for health clinic activities; competing, non-trachoma related activities such as national polio immunization days; as well as the irregular supervision of the trichiasis surgeons.

Antibiotics (A)

A total of 2,532,047 persons in the three intervention regions received azithromycin during mass distribution campaigns in 2006. In addition, 61,504 persons were treated with ophthalmic tetracycline ointment. Two districts in the Maradi region (1,016,004 persons) were not reached with azithromycin due to a lack of resources.



Targets for 2007

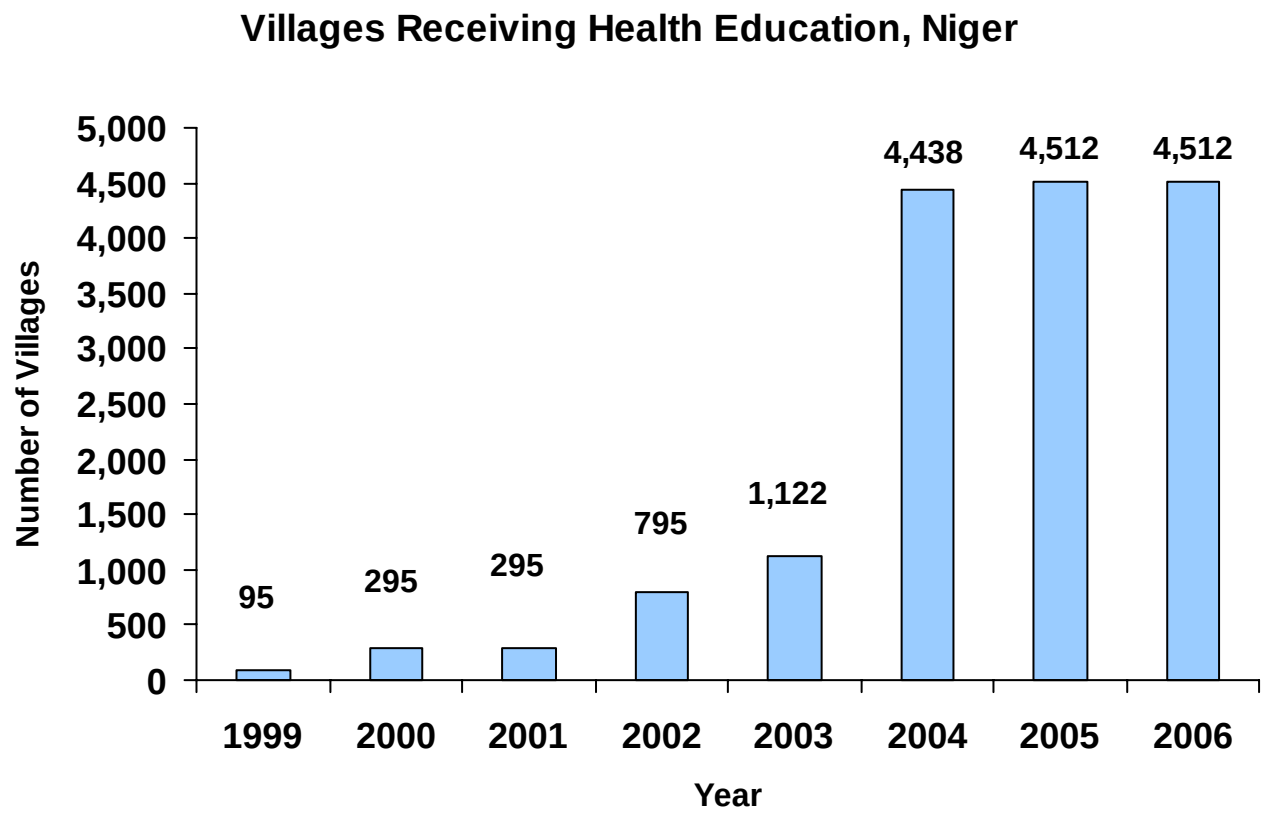
Facial Cleanliness and Health Education (F)
- Achieve 80% of children with clean face in Carter Center-supported areas
- Train 252 women in traditional soap-making
- Train 30 village hygiene committees

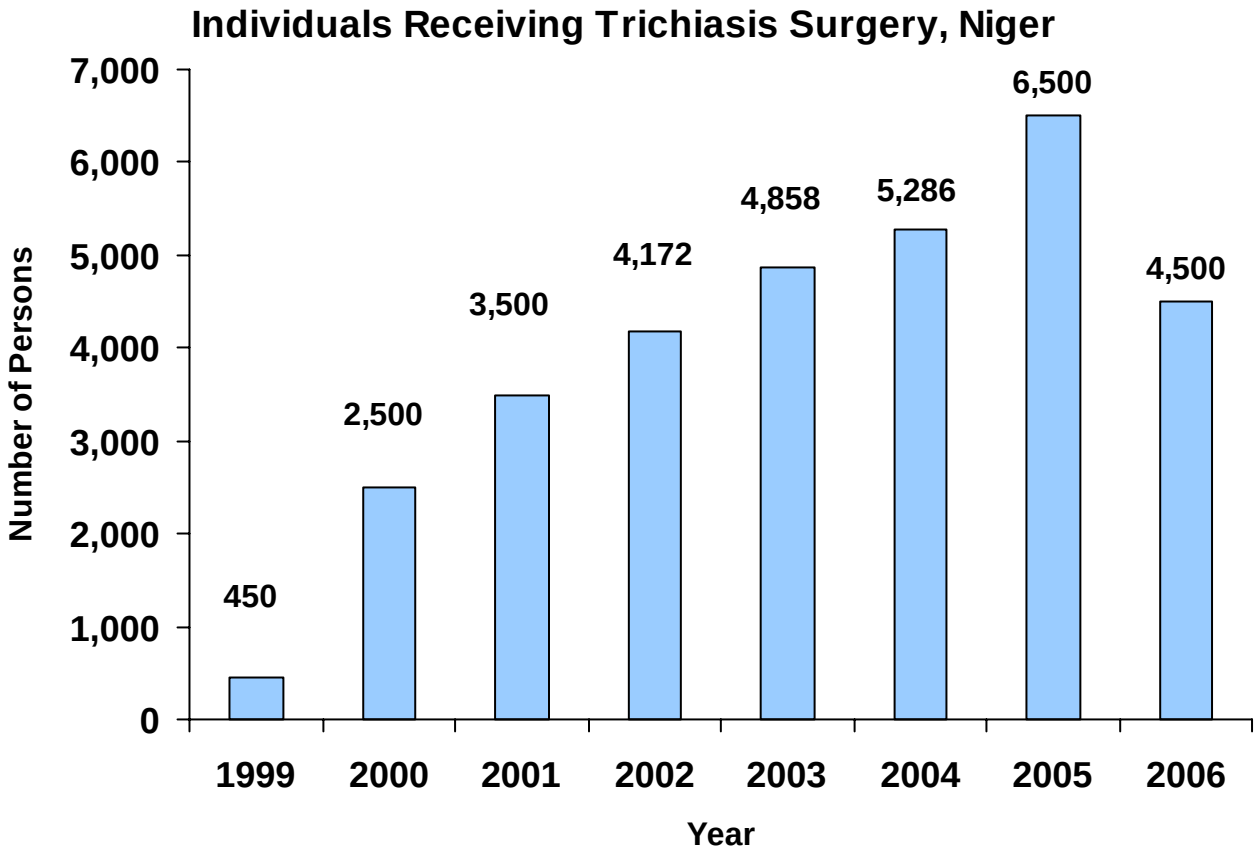
Environmental Improvement (E)
- Train 266 village masons and 30 water point repairmen
- Build 8,400 household latrines and 60 blocks of school latrines
- Build 43 new water points and repair 44 hand pumps

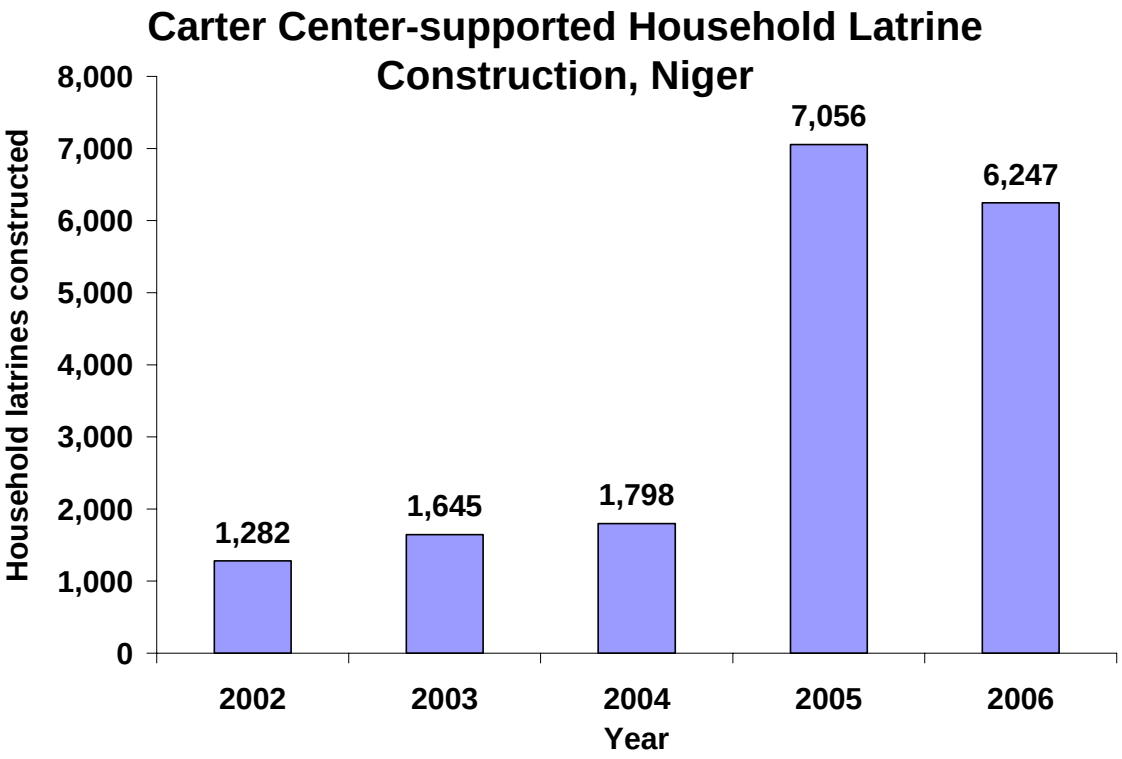
*Antibiotic*s *(A)*
- Treat 6,000,000 persons with azithromycin in mass treatment campaigns
- Continue distribution in 2 districts in Maradi region and 3 districts in Diffa region

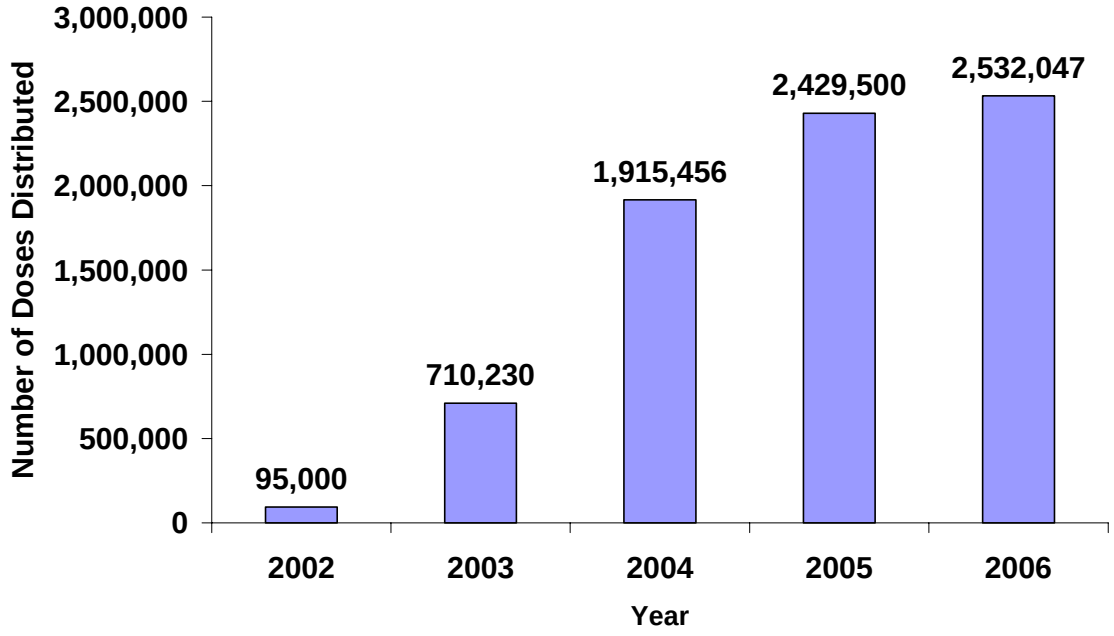
Surgery (S)
- Train 66 additional trichiasis surgeons
- Do corrective eyelid surgery on 10,580 individuals (3,399 in health facilities and 7,181 in outreach camps)

Other
- Expand trachoma control activities to 3 new regions: Tillaberi, Dosso and Tahoua

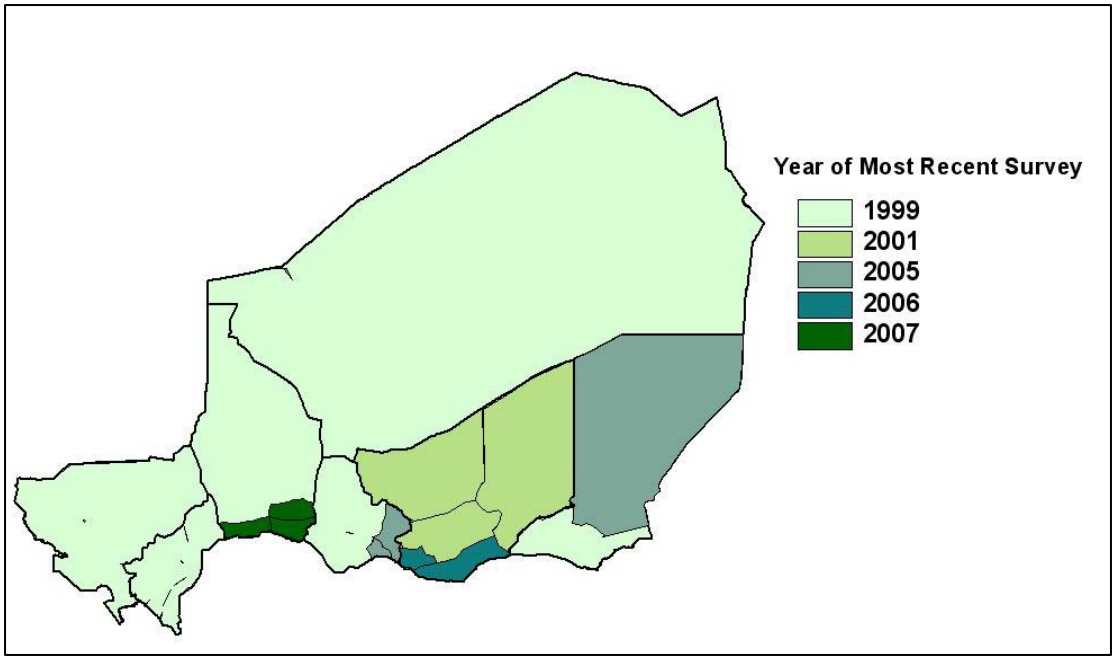

Villages Receiving Health Education, Niger
Number of Villages
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
95
295
295
795
1,122
4,438
4,512
4,512
1999
2000
2001
2002
2003
2004
2005
2006
Year

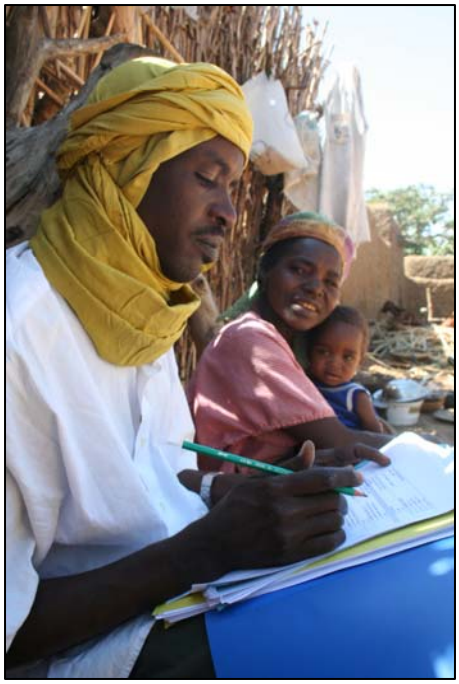

Individuals Receiving Trichiasis Surgery, Niger
Number of Persons
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
450
2,500
3,500
4,172
4,858
5,286
6,500
4,500
1999
2000
2001
2002
2003
2004
2005
2006
Year


Carter Center-supported Household Latrine Construction, Niger
Household latrines constructed
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1,282
1,645
1,798
7,056
6,247
2002
2003
2004
2005
2006
Year


National Azithromycin Distribution, Niger
Number of Doses Distributed
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
95,000
710,230
1,915,456
2,429,500
2,532,047
2002
2003
2004
2005
2006
Year

Trachoma Prevalence Surveys Conducted in Niger
1999-2007





A woman (*at left*) demonstrates how to make soap from locally available materials. The trachoma control program conducted a latrine evaluation in November 2006 (*at right*).

Mali Trachoma Control Program

Presented by Mr. Yaya Kamissoko, Carter Center Mali Trachoma Program Officer

Carter Center assistance to Mali is funded by the Conrad N. Hilton Foundation.

Background

The first national trachoma prevalence survey, conducted in 1996-1997, found that trachoma is endemic in every region of Mali. The overall prevalence of active trachoma (TF and/or TI) in children under 10 years of age was 35% and the prevalence of trichiasis among women over 15 years of age was 2.5%. With these results, a national Prevention of Blindness Program was established in 1994. In October 1999, the Mali Trachoma Control Program was launched in Koulikoro in an official ceremony with the former U.S. President Jimmy Carter, former head of state General Amadou Toumani Touré (now president of Mali) and then Lions Clubs International President, Jim Ervin.

Trachoma knowledge, attitudes, and practice surveys conducted in Koulikoro Region in 1996 and 2000 provided baseline sociological data for the development of health education strategies and materials. A national 5-year plan finalized in 2005 is still awaiting official government approval.

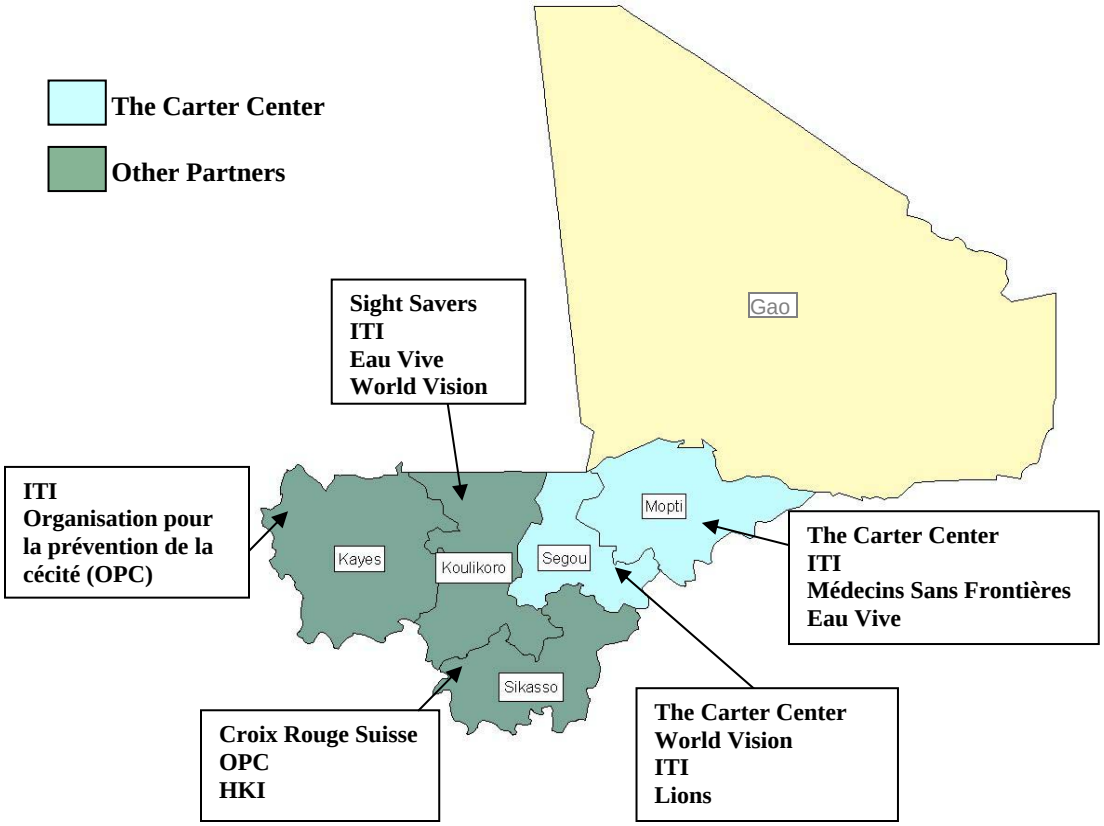
In Mali, health education activities are carried out through multiple channels: by rural radios, primary school teachers, environmental health agents, village educators, NGO supervisors and field officers, and during village gatherings such as naming ceremonies and weddings. In 2003, new trachoma health education strategies and materials (documentary film, video, radio tapes and a comic book) were developed with support from Johns Hopkins University, including a logo and slogan for the educational campaign and a training manual. In order to reach large numbers of persons at risk for trachoma, the program also developed radio and television campaigns to broadcast information about trachoma and its prevention. Trachoma education has also been included in primary school curricula in Mali.

A national survey found that in 2001, 23% of households did not have a latrine in Mali (30% in rural areas). In 2003, the Mali National Division of Hygiene and the Trachoma Control Program began household latrine promotion in Kayes and Ségou regions with assistance from the International Trachoma Initiative (ITI) and The Carter Center.

A 1997 estimate showed the backlog for trichiasis surgery to be 85,700 persons. Between 1999 and 2006, 29,052 persons have been operated (34% of the estimated backlog). Trichiasis surgery is conducted in 5 fixed locations throughout Mali, as well as during routine rural outreach and rural trichiasis surgery campaigns. The main partners who have supported surgery in Mali include: Helen Keller International, ITI, Médecins Sans Frontières Luxembourg, Organisation pour la Prévention de la Cécité, Sight Savers International, and Swiss Red Cross.

Since 2001, the Malian program has distributed Pfizer-donated azithromycin in mass treatment campaigns. Distribution currently takes place in Kayes, Koulikoro, Mopti and Ségou regions.

Map 1. Mali and partners supporting trachoma control activities



Program achievements in 2006

Facial Cleanliness and Health Education (F)

The Carter Center supported ongoing health education in 809 villages in 2006. Rural radios in all health districts broadcast trachoma health education messages—an additional 20 radio announcers were trained in trachoma education. To strengthen routine hygiene education, the program trained 1,572 community health workers and 423 school teachers in targeted endemic villages (of whom 20-30% are women). A trachoma week was held in Tominian district of Ségou region which included health education, trichiasis surgery and antibiotic distribution.

Environmental Improvement (E)

The national program has estimated its Ultimate Intervention Goal for household latrines to be 212,187. (This would be the minimum necessary to achieve 50% household Sanplat latrine coverage.) In 2006, 14,557 household latrines with Sanplat slabs were built at an average unit cost of the equivalent of $14.60 (11,849 with Carter Center support). An additional 33 ventilated improved pit latrines were built by the national program. To increase local capacity, 681 village-based masons were trained in latrine construction and equipped with tools.

Water provision in endemic communities is supported by the Ministry of Water and NGO partners such as Helen Keller International, local Lions Clubs, World Vision, and USAID. One hundred six water point repair persons were trained in 2006.

Surgery (S)
In 2006, 5,272 persons were operated, achieving 65.9% of their annual goal. The program cited difficulties with a lack of human resources to carry out surgery outreach and a lack of support from partners for surgery.

Antibiotics (A)
In 2006, antibiotic distribution took place in Ségou, Kayes, Koulikoro, and Mopti regions. A total of 5,783 village-based distributors were trained and community-based distribution of azithromycin reached a total of 3,935,247 persons, 58% of the targeted 6,778,630 people. The national program was not able to purchase tetracycline eye ointment for distribution this year.

A mason (*at left*) finishes a latrine slab. At right, a traditional latrine is inspected during a latrine evaluation.

Targets for 2007

Facial Cleanliness and Health Education (F)

- Train 750 community health workers (600 with Carter Center support)
- Train 500 teachers and 315 students
- Train 131 nurses in rural medical posts
- Organize a radio campaign in Ségou, Mopti, Sikasso, Koulikoro and Kayes regions
- Revise the educational flipchart

Environmental Improvement (E)

- Assist 20,000 households to build Sanplat latrines

*Antibiotic*s (A)

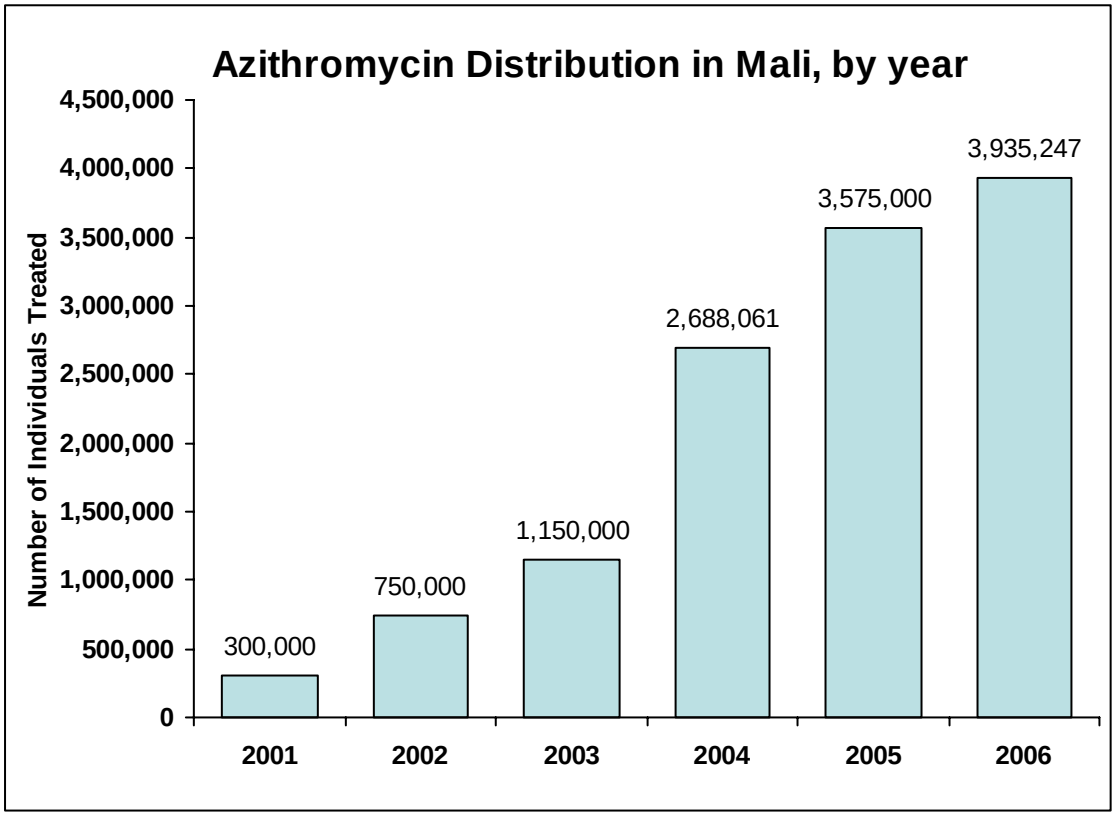
- Distribute azithromycin to 6,777,000 persons in Sikasso, Ségou, Mopti et Kidal regions

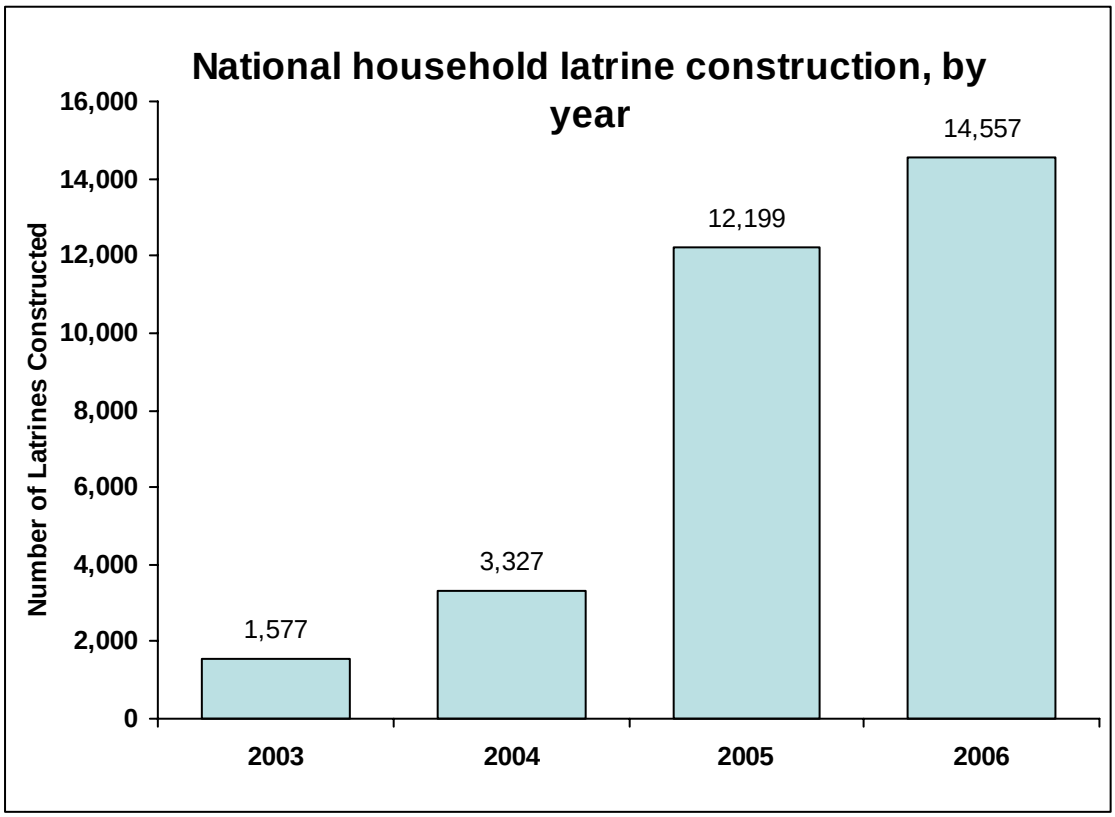
Surgery (S)

- Operate on 14,000 persons with trichiasis

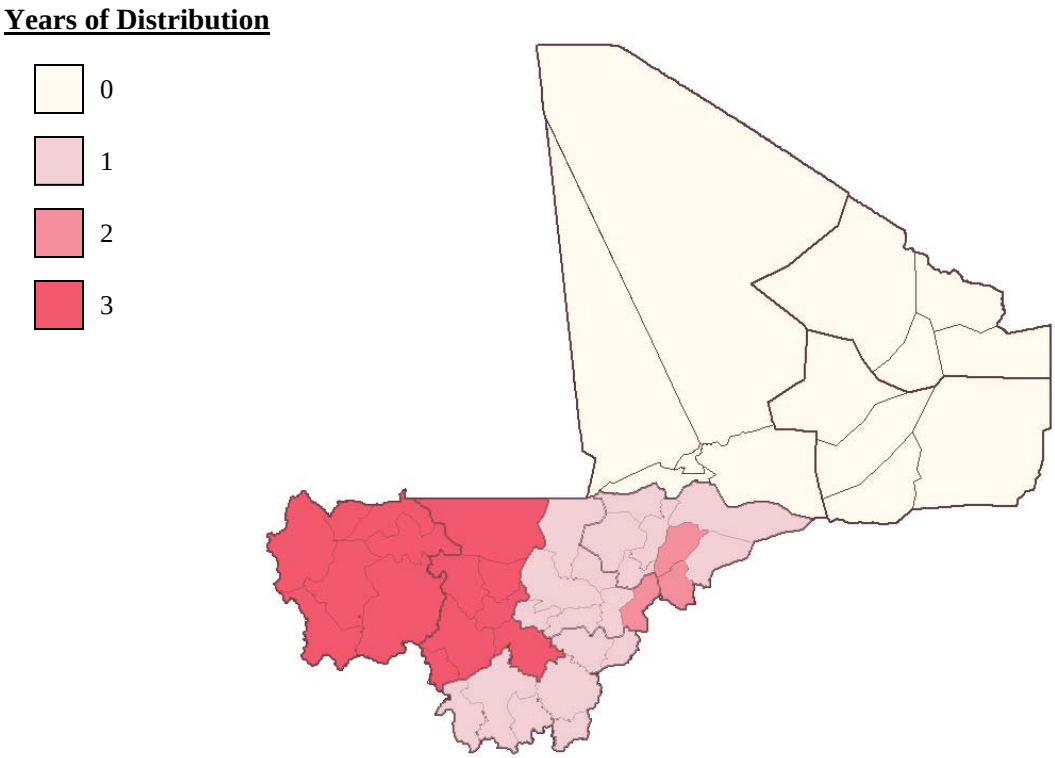
Summary of SAFE intervention achievements, 1999-2006

	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Number of persons receiving TT surgery	1,500	2,500	2,500	4,150	4,500	2,758	5,872	5,272
Number of persons receiving azithromycin	0	0	300,000	750,000	1,150,000	2,688,061	3,575,000	3,935,247
Number of persons receiving tetracycline	0	0	0	0	0	0	75,000	0
Number of household latrines built	0	0	0	0	1,577	3,327	12,199	14,557
Number of household latrines built with Carter Center support	0	0	0	0	477	2,646	8,354	11,849

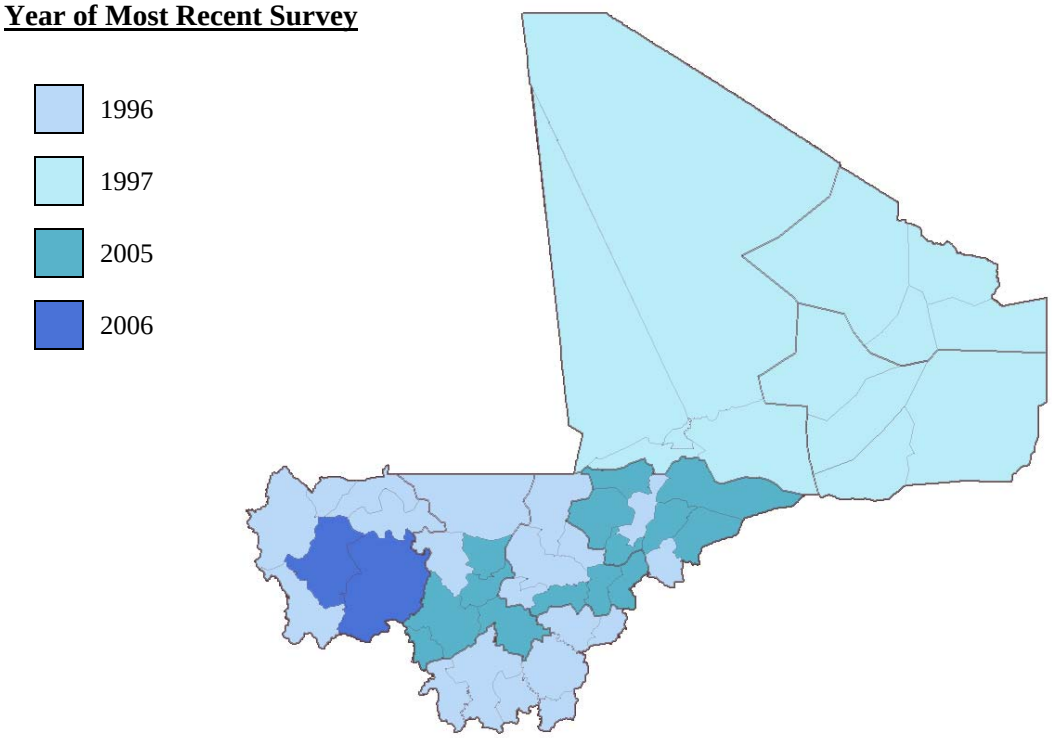

Azithromycin Distribution in Mali, by year
Number of Individuals Treated
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
300,000
750,000
1,150,000
2,688,061
3,575,000
3,935,247
2001
2002
2003
2004
2005
2006


National household latrine construction, by year
Number of Latrines Constructed
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1,577
3,327
12,199
14,557
2003
2004
2005
2006

Map 2. Azithromycin Distribution, by District



Map 3. Prevalence Survey Coverage, by Year



Ghana Trachoma Control Program

Presented by Dr. Oscar Debrah, Head of Eye Care, Ghana Health Service

Carter Center assistance to Ghana is funded by the Conrad N. Hilton Foundation.

Background

Trachoma is the third leading cause of blindness in Ghana, after cataract and glaucoma. In March 2000, The Carter Center helped the National Trachoma Control Program to conduct the first population-based trachoma prevalence survey in the Upper West (UWR) and Northern (NR) Regions. The Carter Center also supported Ghana's first knowledge, attitudes and practices (KAP) studies in the UWR (December 1999) and NR (July 2000), utilizing household surveys, focus group discussions, and direct community observations. The results of these studies were used during workshops in October 2000 and January 2001 during which district and regional plans for trachoma control were established. The estimated current backlog of trichiasis surgeries is 9,963 (down from 13,200 at the program's inception, 25% of backlog operated). The population at-risk of trachoma in the two regions totals 2,717,689.

The Ghana program began implementing the SAFE strategy in 5 districts from 2000-2002 and expanded to a sixth district in 2003. To facilitate expansion to include all trachoma-endemic sub-districts in 2004, the program conducted a trachoma prevalence survey of 551 communities in the two regions. Based on these findings, the program expanded to 681 communities, covering all known endemic districts in the country.

The National Trachoma Control Task Force, which includes both governmental and non-governmental organizations, oversees trachoma control activities at the national level. In each trachoma-endemic region, a regional task force plans and monitors trachoma control activities. It reports to the National Task Force and provides feedback to the districts and other partners. A similar structure exists at the district level, which works closely with frontline workers to implement the SAFE strategy in target communities. The Ghana Trachoma Control Program has set the goal of eliminating blinding trachoma by 2010.

Program Achievements in 2006

Facial Cleanliness and Health Education (F)

In 2006, 2,215 villages benefited from ongoing trachoma health education. Approximately 45,000 household education sessions and 8,000 community education sessions were conducted by frontline trachoma workers. Over 2 hours of radio programming were broadcast each week on 5 stations in 2 districts (targeting approximately 2 million people). Local musicians and celebrities are included as an active part of the health education campaign. New trachoma messages and songs were created and aired. A total of 600 health educators were trained in 26 districts. A total of 45 schools received health education on trachoma—more than 1,000 hand and face washing stations were produced and distributed, and several new flipcharts were developed.

Environmental Improvement (E)

The Carter Center now supports latrine construction in 65 communities in Upper West and Northern Regions, and completed 889 latrines in 2006 at a unit cost of the equivalent of $33.01. Provision of water is supported by WaterAid, World Vision Ghana, UNICEF, WAWI, USAID, and the Church of Christ. In 2006, 834 boreholes or hand dug wells were provided to trachoma-endemic communities.

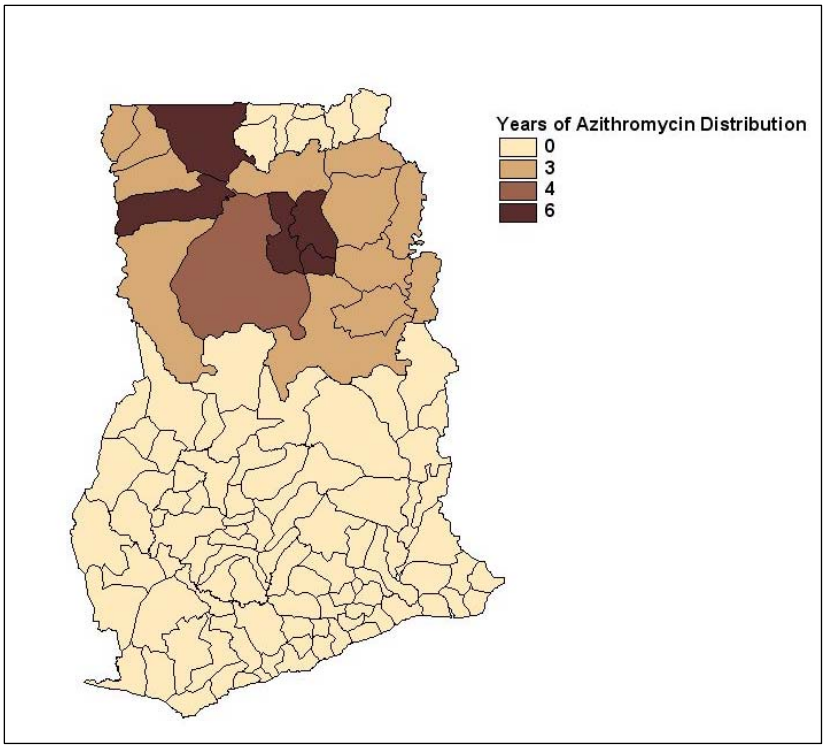
Surgery (S)

The key activities for trichiasis surgery in Ghana include: creating awareness, case identification and registration during systematic active case searching, passive case identification, community- and facility-based surgery, and follow-up on operated persons. In 2006, 626 persons received trichiasis surgery. The Ghana program has found that systematic house-to-house case searching improves case detection and registration. Surgery acceptance is high when performed in the individual's own community and positive testimony from satisfied patients increases acceptance by nearby communities.

Antibiotics (A)

In 2006, 825,217 individuals were reached with mass azithromycin distribution. The national program also distributed tetracycline eye ointment to 20,134 persons. The Ghana trachoma control program has found that community recognition of azithromycin as a safe and effective drug increases its acceptance. The program has also found that the active involvement of chiefs and volunteers in activities coupled with the donation of bicycles provided by the Red Cross has improved the process of organizing activities in communities.

Azithromycin Distribution in Ghana, by district



Summary of program achievements in SAFE, 2001-2006

	2001	2002	2003	2004	2005	2006
Number of TT patients operated	336	421	383	951	1,146	626
Number of persons receiving azithromycin	71,438	101,174	163,931	292,715	740,884	825,217
Number of persons receiving tetracycline	6,292	6,668	9,785	15,101	12,697	20,134
Number of household latrines constructed	14	206	791	1,141	3,828	889

Targets for 2007

Facial Cleanliness and Health Education (F)

- Train 931 health workers on trachoma control, retrain 3,900
- Produce and broadcast 30 radio messages with potential to reach all trachoma-endemic communities in Ghana
- Print 5,000 educational materials
- Produce video documentaries in 2 languages

Environmental Improvement (E)

- Construct 200 potable water sources
- Construct 5,000 household latrines

Surgery (S)

- Detect and operate 3,000 people with trichiasis
- Train and retrain 650 teachers and 130 environmental health workers on identification of trichiasis
- Train 3,900 volunteers in case detection

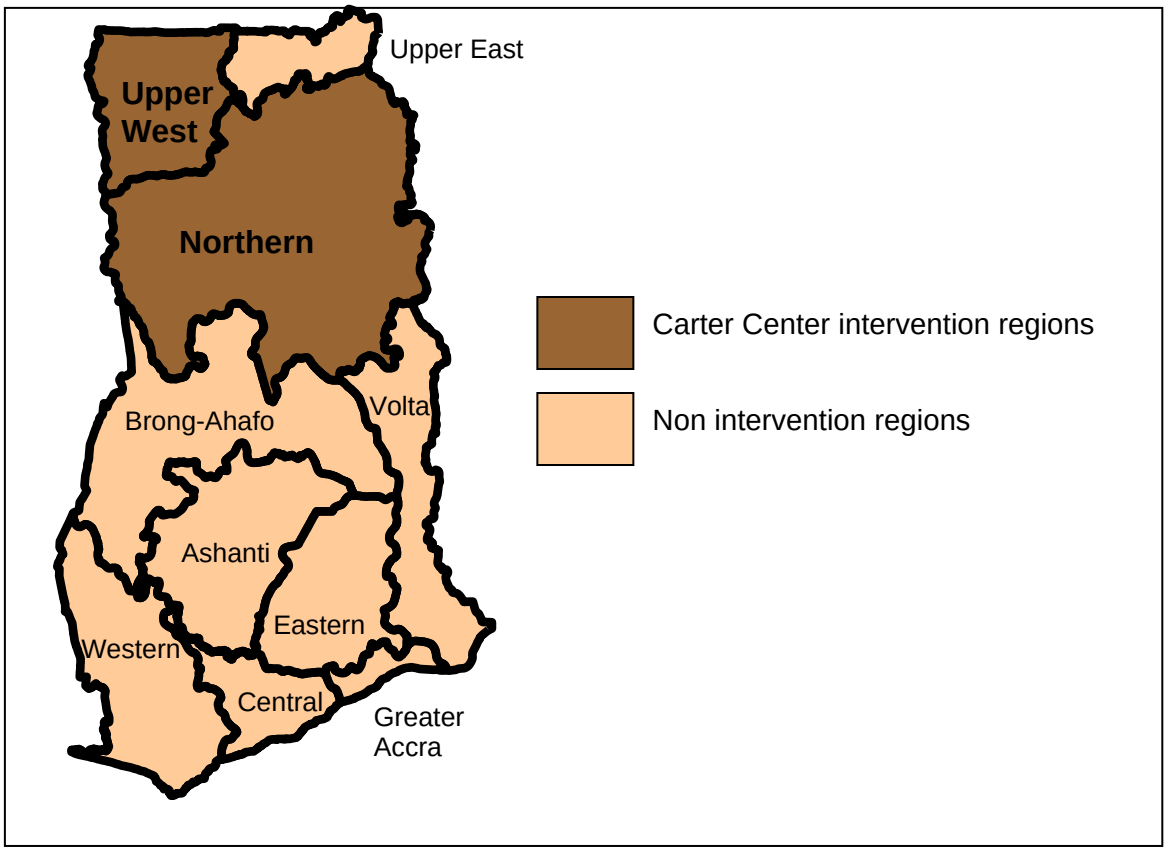
*Antibiotic*s *(A)*

- Distribute antibiotic to 957,000 people

Other

- Present results from trachoma baseline prevalence survey in Upper East Region

Carter Center Intervention Regions in Ghana



Students learn about trachoma prevention through school-based health education.

Sudan Trachoma Control Program: Government of Sudan

Presented by Dr. Awad Hassan, National Trachoma Control Program Coordinator, Federal Ministry of Health, Government of Sudan

Carter Center assistance to Sudan is funded by the Lions-Carter Center SightFirst Initiative.

Background

Sudan is the largest country in Africa, with an area of about 2.5 million km^2. Sudan has been affected by civil war for 37 of the 51 years since independence in 1956. On January 9th, 2005, a peace agreement ended the 21-year civil war with the Sudan Peoples' Liberation Army in the south which had been the longest lasting war in Africa. Under the terms of the Comprehensive Peace Agreement, the country is now unique in that it has two systems: the Government of Sudan (GOS) governs the 15 northern states; the Government of South Sudan the 10 southern states. GOS areas have a population of about 26 million, including 4 million internally displaced persons (IDP).

Trachoma has long been known to be a public health problem in Sudan, but little data were available until May 1999. At that time, the Sudanese Federal Ministry of Health (FMOH) completed the first population-based trachoma prevalence surveys with financial assistance from the Conrad N. Hilton Foundation and technical support from The Carter Center. One survey was done in Wadi Halfa, in the north, and the other in Malakal, in the south. Trachoma was previously believed to be a significant problem only in the north, but the surveys confirmed that trachoma is a cause of severe disability and significant blindness in southern as well as northern Sudan.

These survey results, in part, led to the signing later that year of an agreement for the Lions-Carter Center SightFirst Initiative. Pfizer Inc began to donate azithromycin (Zithromax®) to Sudan through the International Trachoma Initiative in August 2000.

In March 2005, the Federal Minister of Health signed a resolution stating that the Trachoma Control Program has officially joined the National Program for Prevention of Blindness (NPPB), and is under the responsibility of its coordinator, Dr. Kamal Hashim. Carter Center-supported activities in GOS areas continue to be coordinated and monitored from Khartoum. In 2005, the program started the process of decentralizing implementation of program activities to the state ministries of health and localities.

In GOS program areas, routine trichiasis surgery is performed by ophthalmologists and trained ophthalmic medical assistants at central and state hospitals. During eye camps in rural areas, ophthalmologists conduct trichiasis surgery in addition to routine cataract surgeries. Payment is levied on a sliding scale for TT surgery in the hospitals, but is provided free in eye camps. Antibiotic distribution in GOS areas is decentralized and implemented by the state ministries of health, assisted by the national program. Local supervisors and village-based health workers organize and conduct drug distribution, which is preceded by community mobilization and health education. Endemic communities establish distribution dates, select the volunteers and supervisors, and are

involved in raising awareness of the campaign. A new national policy has established that cash incentives will not be paid to drug distributors.

Program Achievements in 2006

During 2006, the program focused on surveying various states and localities to evaluate program interventions and to obtain baseline data for new locations. Surveys were conducted in Jabal Awlia internally displaced persons (IDP) camp in Khartoum State (April), Dongola locality of Northern State (May), Haj Yusif IDP camp (June) and Kassala locality of Kassala State (December). A community participation protocol was also drafted in 2006. The program identified and recruited three public health officers to join the national trachoma control program.

Provisional Prevalence Survey Results, Government of Sudan

Prevalence indicators		**Dongola**	**Kassala (rural)**	**Jabal Awlia**	**Haj Yusif**
TF and/or TI in children aged 1-9	% (95% CI)	8.57% (3.37-13.78)	0.26% (-0.22-0.74)	5.05% (2.55-7.55)	3.06% (0.32-5.80)
TF and/or TI in people aged 10 +	% (95% CI)	27.78% (20.53-35.03)	3.69% (1.24-6.14)	7.76% (4.19-11.33)	9.63% (7.68-11.58)
TT in people aged 15+	% (95% CI)	1.41% (0.18-2.64)	1.08% (0.44-1.73)	2.96% (-0.24-6.17)	1.13% (0.29-1.96)

Facial Cleanliness and Health Education (F)

The GOS trachoma control program has produced an educational booklet for children based on a cartoon rabbit book originally designed by Helen Keller International. Shoulder bags with the "Jamal" strategy (Arabic for SAFE) were also designed and 1,000 copies distributed to health educators. Trachoma messages have also been incorporated into the school curriculum—the school-based program was provided with materials and training for teachers.

In Northern State, health education is being conducted via mass media (radio). There are 15 active trachoma clubs, each with more than 25 participants. A total of 156 health educators were trained in the 27 villages with ongoing health education activities. The national program estimates it reaches an approximate population of 15,000 people with health education in Northern State.

Environmental Improvement (E)
The GOS Trachoma Control Program does not yet promote household latrines in its intervention areas. The program has been represented in the UNICEF Water and Environmental Sanitation task force since 2005. Trachoma-endemic communities themselves play a strong role in water provision.

Surgery (S)
A decentralized surgical program is now in place through the state-level trachoma coordinators. The national program has developed and printed a trichiasis training module and implemented the criteria for certification of trichiasis surgeons. Surgery partners include the various eye hospitals, departments and units; The Carter Center; Al Baser International Foundation; FIMA; and HelpAge International. In 2006, 1,183 surgeries were performed, achieving 47.3% of the yearly target. Twelve new trichiasis surgeons were trained and 6 medical assistants were trained in trachoma grading and prevention. The estimated minimum existing backlog is 18,817 persons, although not all states have been surveyed and the backlog will change as new information becomes available.

Antibiotics (A)
In 2006, antibiotic distribution focused on mass distribution in Dongola locality of Northern State and IDP camps in Khartoum State. Antibiotic distribution takes place house-to-house and is directly observed by a trained medical assistant or community health worker. Recent prevalence surveys confirmed that levels of trachoma in Kassala state do not warrant intervention with antibiotic. Excess stock of azithromycin ear-marked for Kassala were shipped to southern Sudan.

Targets for 2007
Facial Cleanliness and Health Education (F)
- The program will refine existing plans and develop stronger indicators and monitoring with the Northern State Ministry of Health for implementation in 2007.
- Face-washing will be emphasized using a range of techniques during a Trachoma Week in Dongola town, Northern State. This event will form the basis of Trachoma Weeks to take place in other localities during the year.
- The program plans to complete the design and production of the SAFE/JAMAL posters.

Environmental Improvement (E)
- Stronger environmental interventions will be considered after results of upcoming prevalence surveys. They are not main interventions in Northern state due to the already high sanitation rate and availability of water.

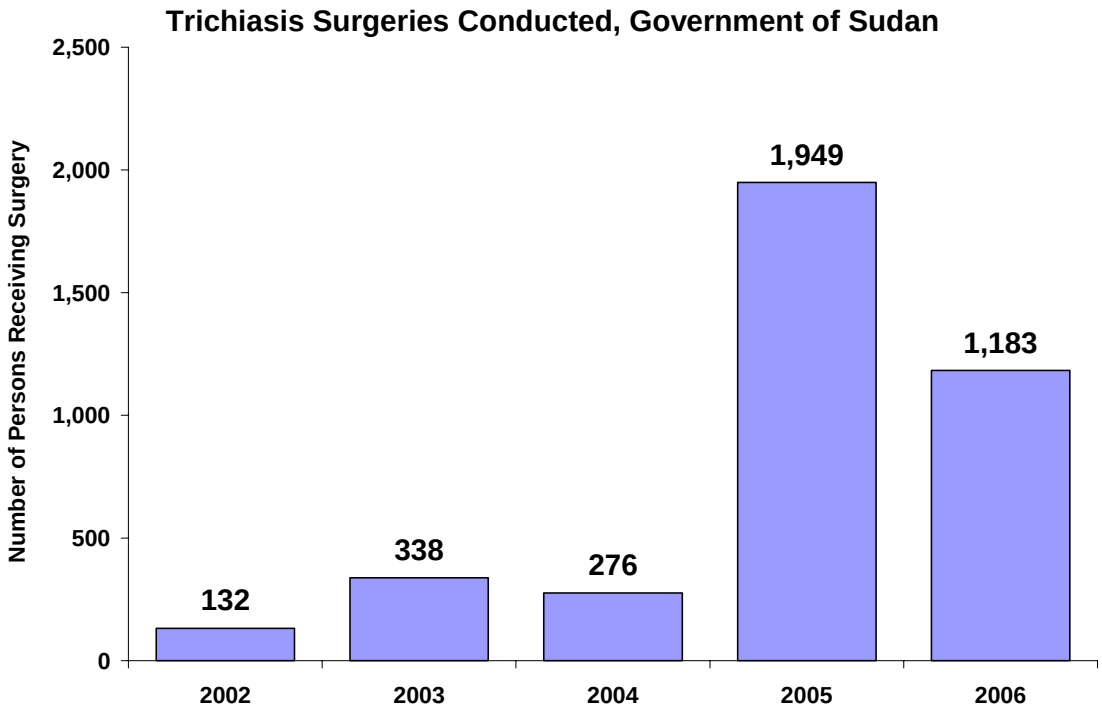
Surgery (S)
- Conduct 2,500 trichiasis surgeries
- Train 24-30 ophthalmic medical assistants (4-5 per state) on trichiasis surgery and equip them with surgical kits.
- Conduct a refresher course on primary eye care for 30 medical assistants per state.

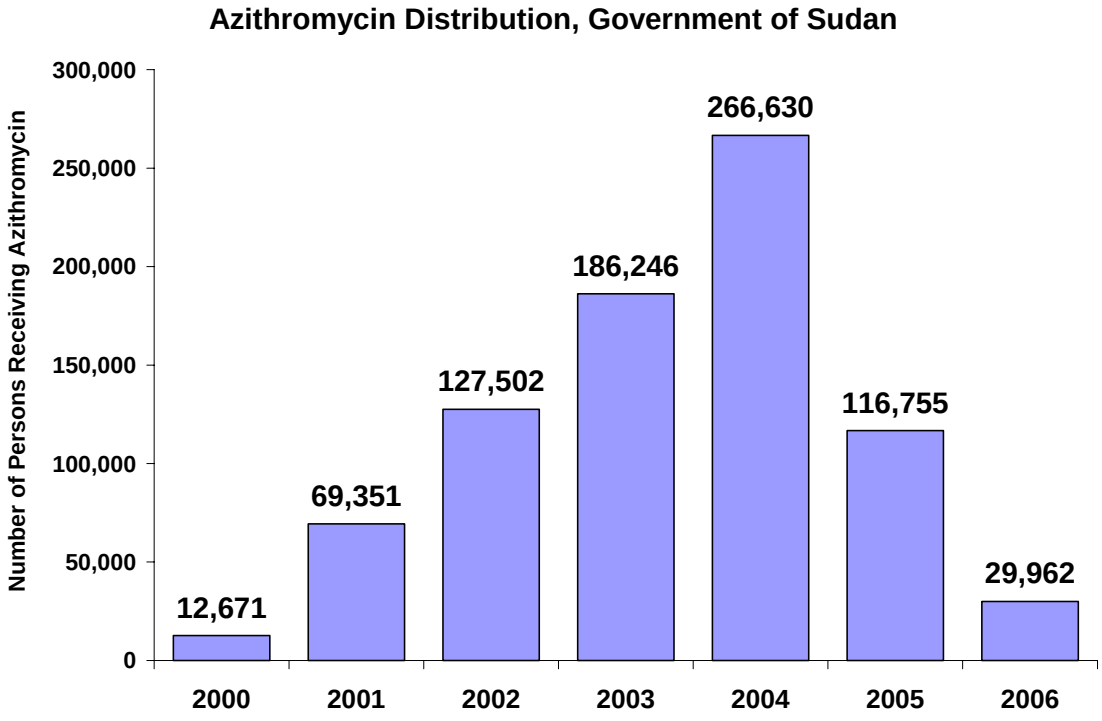
Antibiotics (A)

- Distribute 104,000 doses of azithromycin in Dongola locality (second round)
- Consider distribution in Khartoum state IDP camps
- Depending on the results of the prevalence surveys, distribute azithromycin and train volunteers in each locality

Other

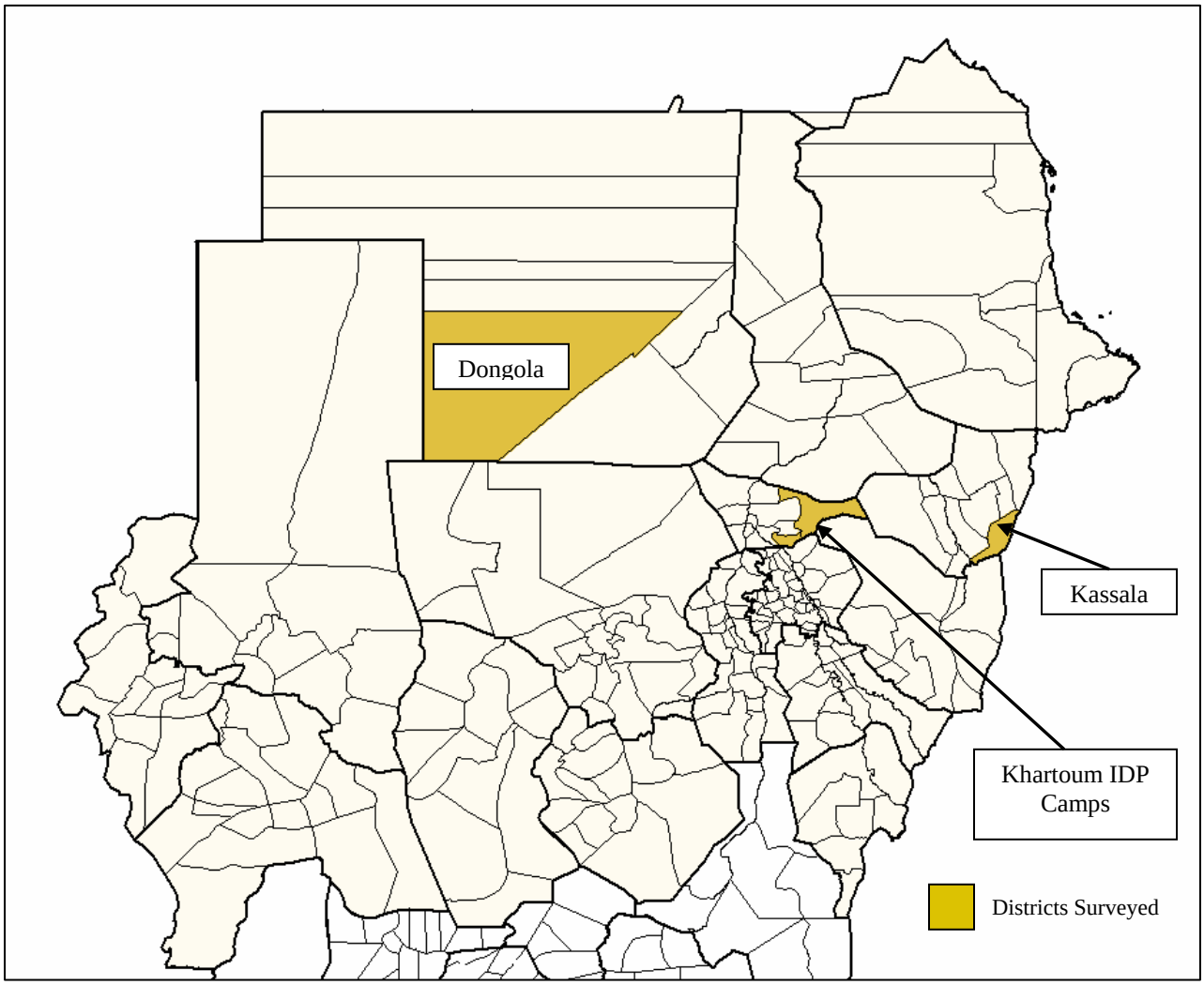
- Trachoma prevalence surveys will be conducted in Blue Nile, Sinnar and White Nile states in 2007.
- The National Trachoma Control Program intends to identify potential partners in Darfur and to explore the possibility of intervention in trachoma-endemic areas.





N.B. After the signing of the Comprehensive Peace Agreement in January 2005, the Government of Sudan was no longer responsible for program implementation in the south.

Map 1. Prevalence Survey Coverage, 2006



At left, a group of women recover from trichiasis surgery. A health worker (*at right*) explains the progression from trachoma infection to blindness.

Sudan Trachoma Control Program: Government of South Sudan

Presented by Mr. Ben Lopidia, Carter Center Trachoma Program Officer, South Sudan

Carter Center assistance to Sudan is funded by the Lions-Carter Center SightFirst Initiative.

Background

Sudan is the largest country in Africa, with an area of about 2.5 million km^2. Sudan has been affected by civil war for 37 of the 51 years since independence in 1956. On January 9th, 2005, a peace agreement ended the 21-year civil war with the Sudan Peoples' Liberation Army in the south which had been the longest lasting war in Africa. Under the terms of the Comprehensive Peace Agreement, the country is now unique in that it has two systems: the Government of Sudan governs the 15 northern states; the Government of South Sudan (GOSS) the 10 southern states.

Between 1989 and 2005, humanitarian aid to southern Sudan was carried out under the auspices of Operation Lifeline Sudan (OLS), a consortium of United Nations agencies and over 40 non-governmental organizations. The initial partners for trachoma control in southern Sudan began working with non-governmental organizations in the OLS consortium to plan a broad trachoma control effort based on the SAFE strategy. Pfizer, Inc. began to donate azithromycin (Zithromax®) to Sudan through the International Trachoma Initiative in August 2000.

In 2000, The Carter Center began collaboration with NGOs to implement the SAFE strategy in OLS-supported areas. Activities in these areas were coordinated by The Carter Center from Nairobi with assistance from partner NGOs and humanitarian units in south Sudan. Trachoma prevalence surveys were done in four locations in 2001 and an additional three in 2002. The Carter Center office that supports activities in GOSS areas began its relocation from Nairobi, Kenya, to Juba, Sudan, in 2005.

The GOSS Trachoma Control Program operates in areas with extremely high prevalence of blinding trachoma, where trichiasis is found in children as young as 5 years old. The Carter Center supports work in 13 locations (payams) that have an estimated total population of 1 million persons. It is difficult for the program to gain access to those most at risk because of the insecurity in many areas. This situation is complicated by a poor health infrastructure, minimal physical infrastructure, and strong cultural beliefs and practices that inhibit behavior change. There are many mobile nomadic populations and a large number of internally displaced persons who are hard to reach and at-risk for infection and eventual blindness.

NGO partners supporting trachoma control interventions in GOSS areas include: Adventist Development Relief Agency (ADRA), Christian Mission Aid (CMA), Sudan Medical Care (SMC), Tear Fund, ZOA Refugees Care, and Christoffel Blindenmission.

Program Achievements in 2006

Facial Cleanliness and Health Education (F)

In Government of South Sudan intervention areas, health education is conducted by trained community based health workers, including:

- Trachoma, Guinea worm and primary health care supervisors
- Community health workers at NGO primary health care units
- Maternal and child health care workers (Traditional birth attendants and vaccinators)
- Primary school teachers
- Community hygiene promoters from NGO partners involved in water and sanitation
- Community animal health workers under NGOs providing veterinary services

In order to educate the community and create awareness health education sessions are conducted at different levels:

- By community hygiene promoters and traditional birth attendants during women's group meetings and household visits
- Community health workers at the primary health care units and centers
- School teachers at schools during classes and assemblies.
- Field officers and supervisors during social gatherings including churches and youth initiation festivals in cattle camps, and local courts targeting community leaders and chiefs

Health education posters are being utilised at the health units, schools social gatherings and cattle camps. As far as mass media, the only available radio stations used to be found in the main towns of Malakal and Juba. The use of media is now gradually picking up, as the Ministry of Information is encouraging establishment of FM radio stations at the state capitals (the Eastern Equatoria capital in Torit now has a radio station).

Environmental Improvement (E)

Latrine construction progresses slowly in southern Sudan due to unstable soil conditions and high costs of materials that cannot be purchased in the local market and have to be imported overland from Uganda or Kenya. In 2006, 175 latrines were constructed nationally. Ventilated improved pit latrines are typically promoted, with NGO partners providing all supplies and digging tools, and household owners providing labor. After cholera outbreaks in 2006, the state and GOSS Ministries of Health are currently developing national latrine promotion guidelines. Central Equatoria State has recently formed a task force to plan and give recommendations on latrine construction that can be adapted for other states.

In southern Sudan, water provision falls under the Ministry of Cooperative and Rural Development. This same ministry is responsible for the development of water provision guidelines and for rehabilitation and protection and rehabilitation of shallow hand dug wells and bore holes constructed by NGO partners. Partners currently supporting water

provision in trachoma-endemic villages include: UNICEF (Kapoeta North; Eastern Equatoria), Association for Aid and Relief-Japan (Kapoeta North and South), Accord (Central Tali; Eastern Equatoria), World Vision International (Upper Nile; Fashoda), and Adventist Development Relief Agency (Latjor Kiech Kuon). A total of 53 villages benefited from new water sources in 2006, reaching approximately 63,600 households.

Surgery (S)
In 2006, a total of 563 persons received trichiasis surgery and 46 trichiasis surgeons were trained. Partners supporting surgery include: The Carter Center, Christian Mission Aid, Christoffel Blinden Mission (CBM), and Merlin.

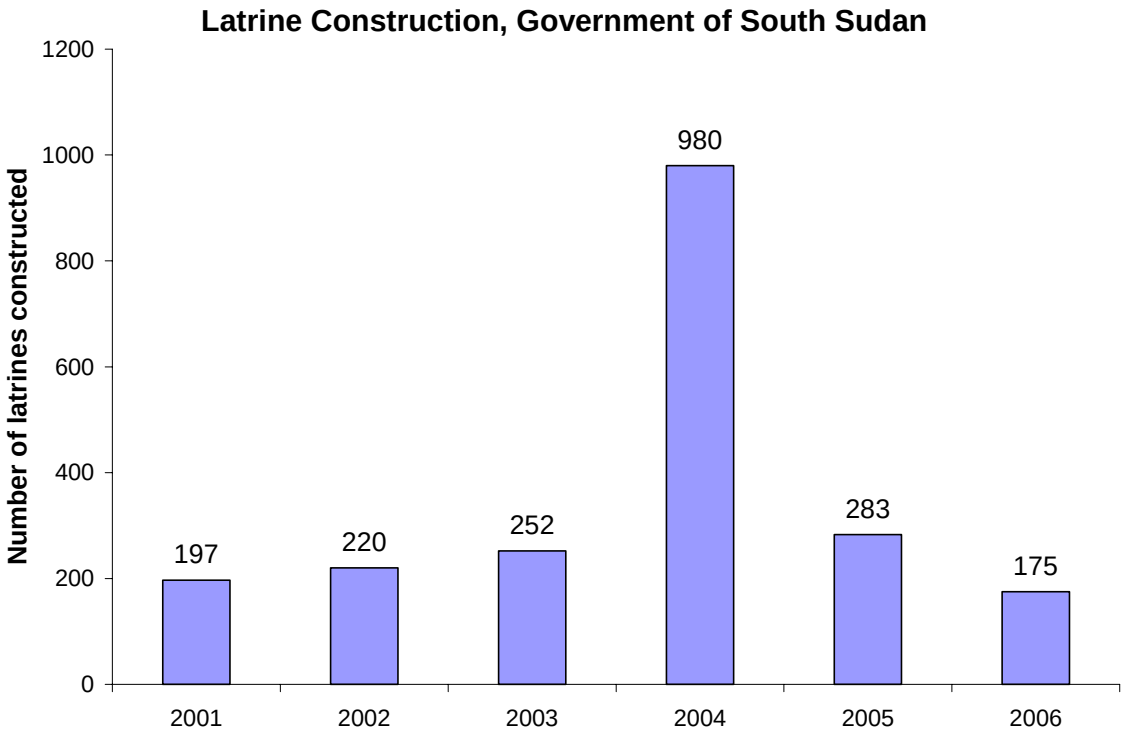
Antibiotics (A)
Mass antibiotic distribution is conducted annually by trained community health workers. Before these distribution campaigns, community mobilization is carried out to target civil authorities and community leaders. Distribution centers are identified in consultation with community leaders, taking into account population movements towards animal grazing grounds and water points. Seven of the thirteen payams were covered through mass distribution in 2006. A total of 109,405 persons received azithromycin, and 115,324 received tetracycline.

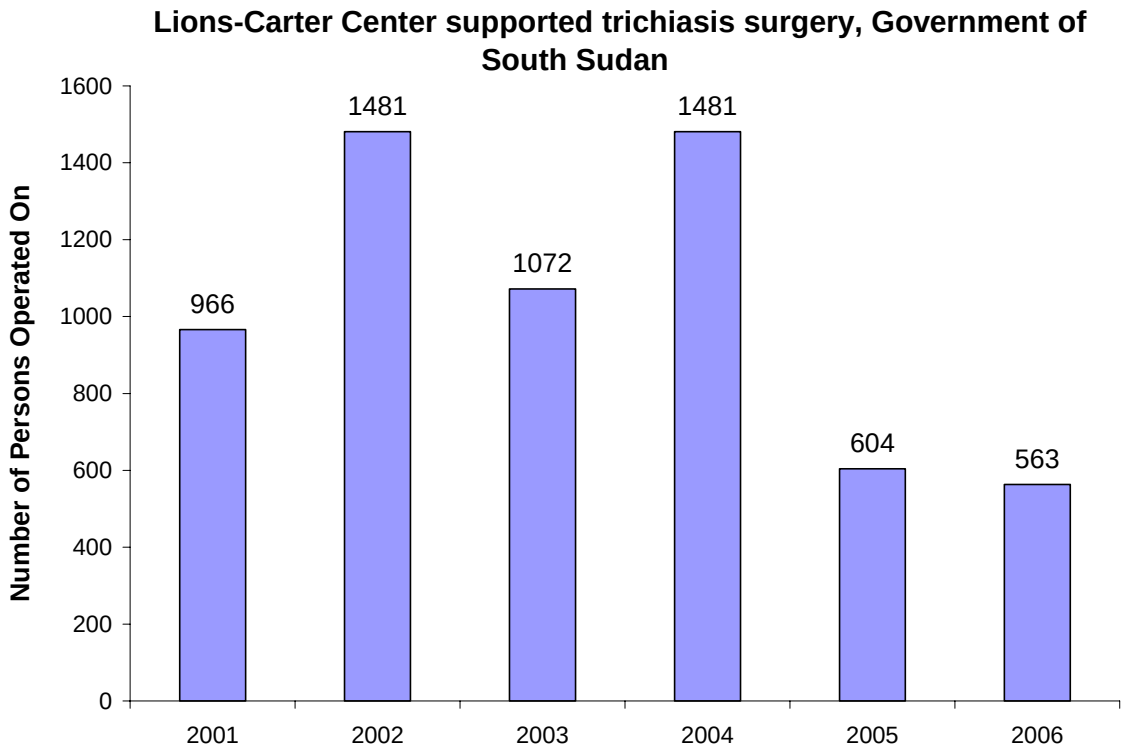
Targets for 2007
Facial Cleanliness and Health Education (F)
- In collaboration with partner NGOs, target 200 accessible villages of 24 subdistricts or payams for health education on personal hygiene and latrine construction
- Train 150 health educators (75 men and 75 women) to conduct health education activities in schools, churches and other social gathering places.

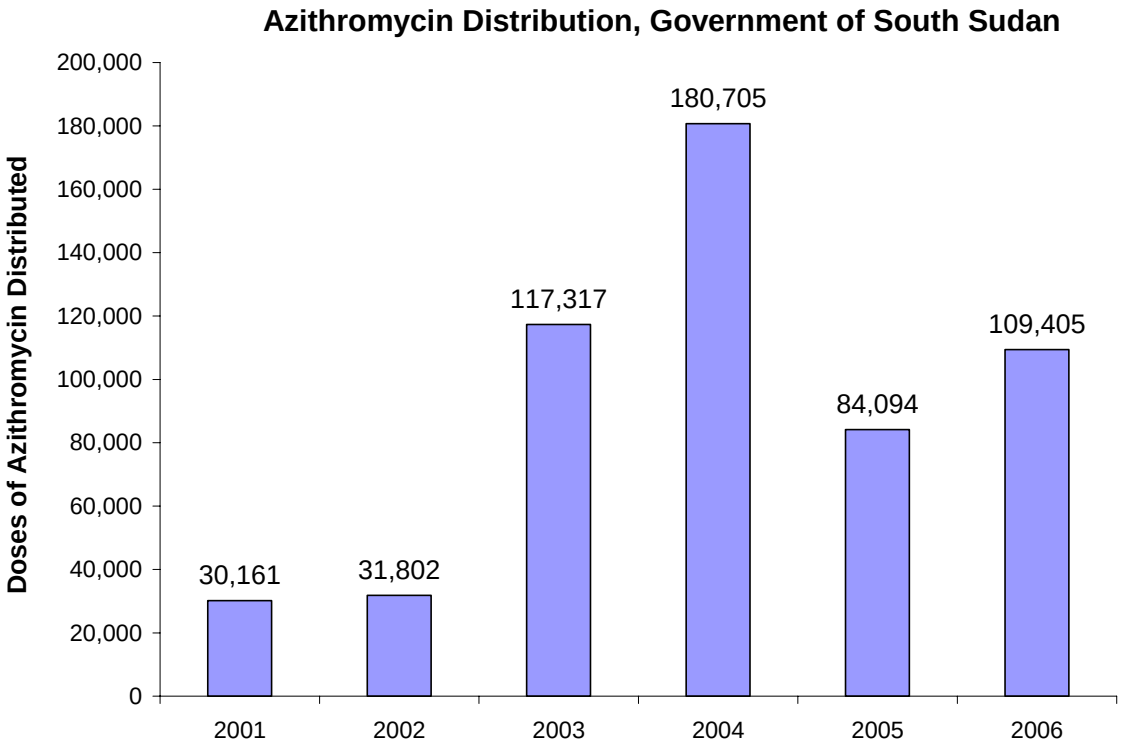
Environmental Improvement (E)
- Promote construction of 100 households and public latrines in accessible endemic villages
- Coordinate with other water and sanitation NGOs in trachoma-endemic villages to improve and protect community hand dug wells to improve access to safe water

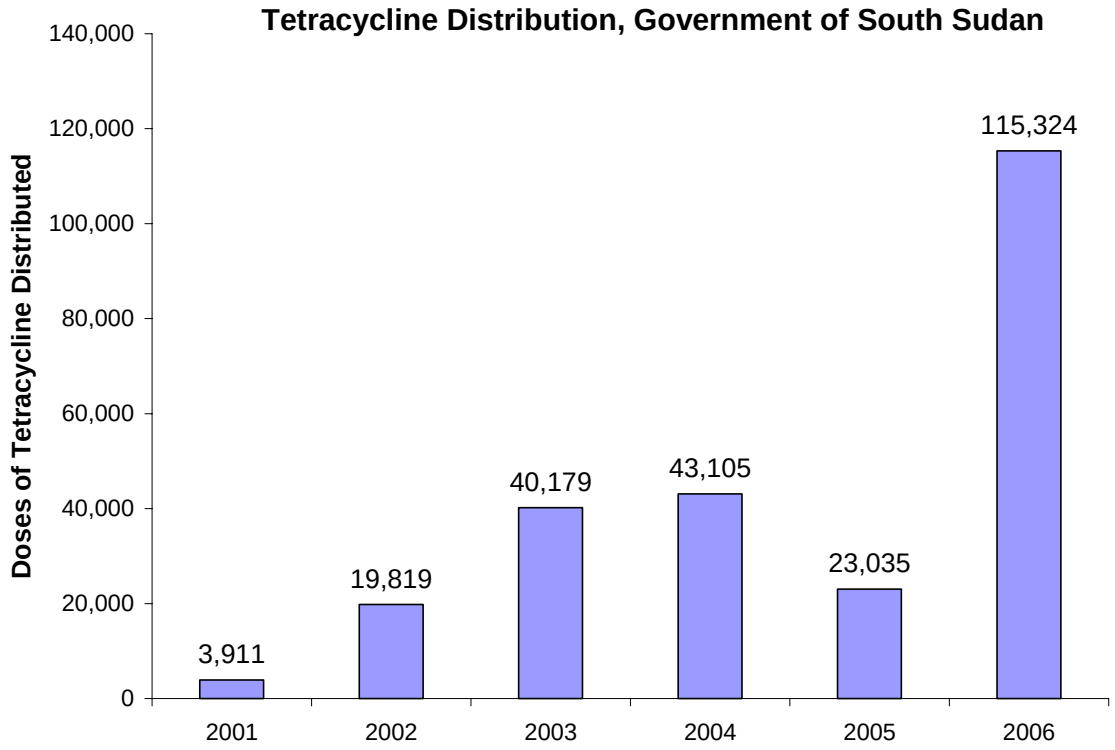
Surgery (S)
- Train 50 new trichiasis surgeons
- Operate 2,000 people with trichiasis

Antibiotic (A)
- Distribute azithromycin to 525,198 people (in Carter Center intervention zones in Eastern Equatoria and Jonglei States)
- Distribute tetracycline eye ointment to 105,239 people

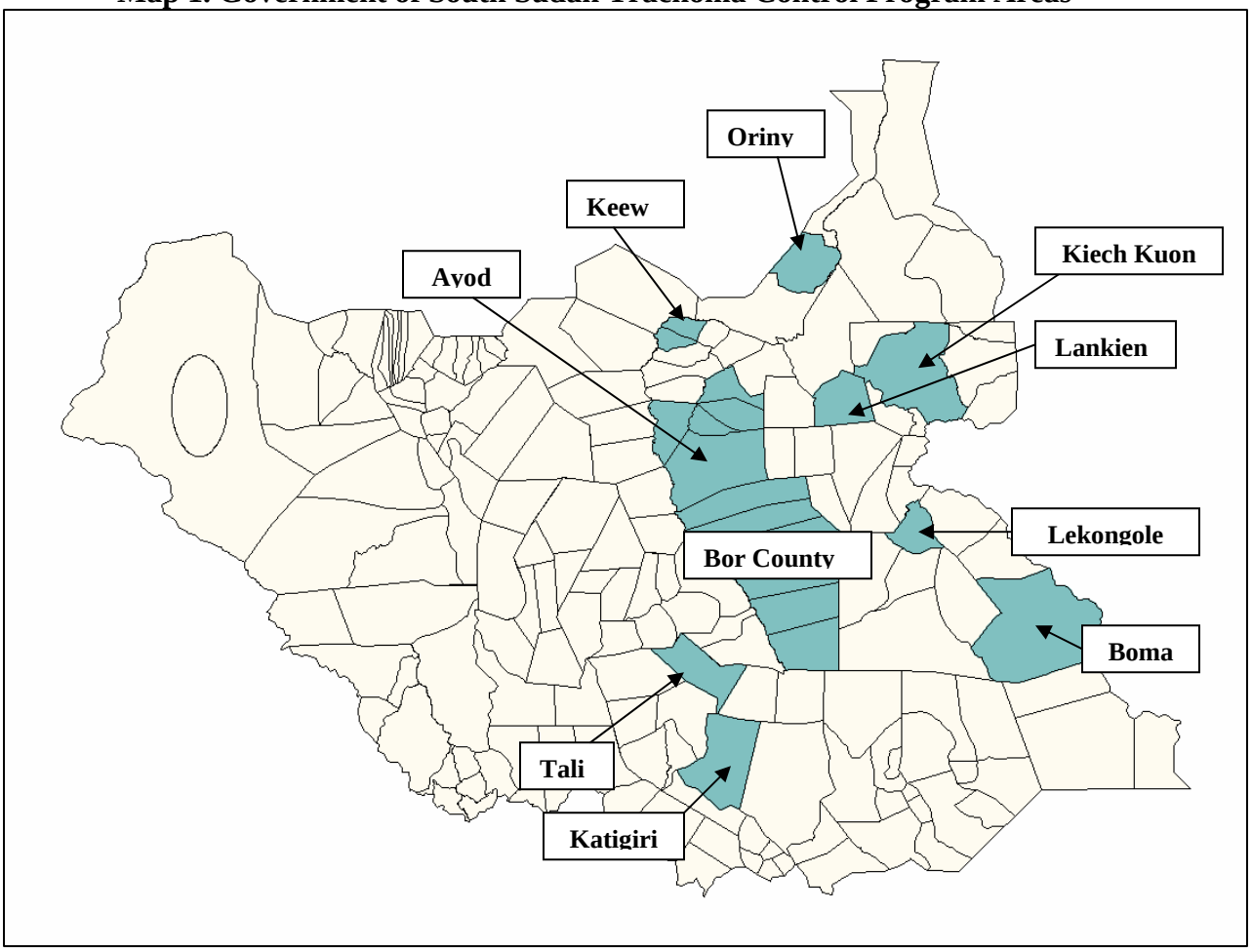

Latrine Construction, Government of South Sudan
Number of latrines constructed
1200
1000
800
600
400
200
0
197
220
252
980
283
175
2001
2002
2003
2004
2005
2006


Lions-Carter Center supported trichiasis surgery, Government of South Sudan
Number of Persons Operated On
1600
1400
1200
1000
800
600
400
200
0
966
1481
1072
1481
604
563
2001
2002
2003
2004
2005
2006

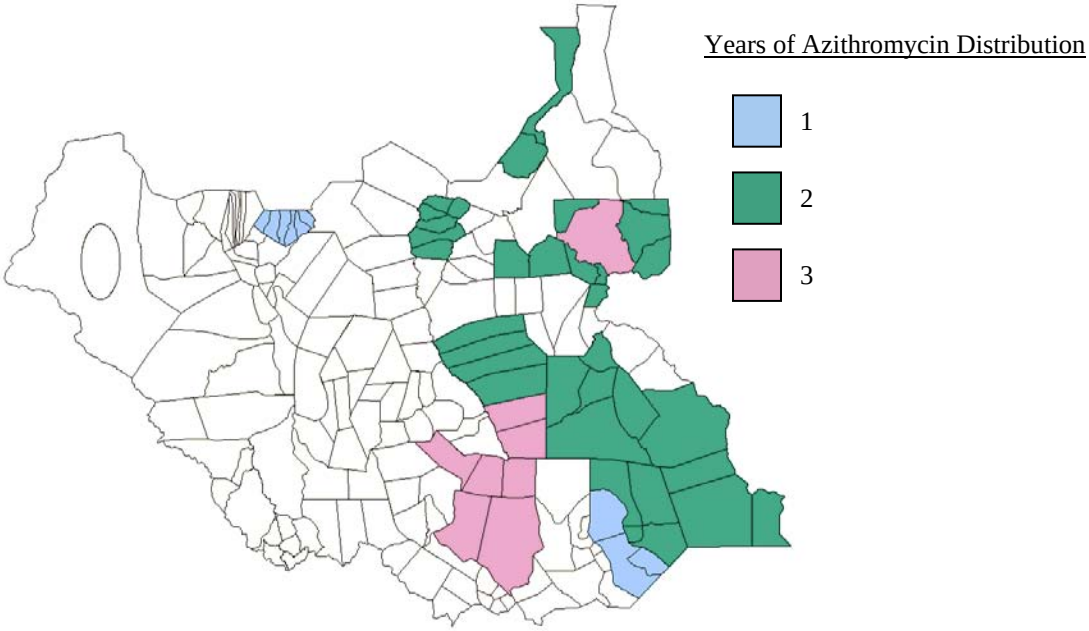

Azithromycin Distribution, Government of South Sudan
Doses of Azithromycin Distributed
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
30,161
31,802
117,317
180,705
84,094
109,405
2001
2002
2003
2004
2005
2006


Tetracycline Distribution, Government of South Sudan
Doses of Tetracycline Distributed
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
3,911
19,819
40,179
43,105
23,035
115,324
2001
2002
2003
2004
2005
2006

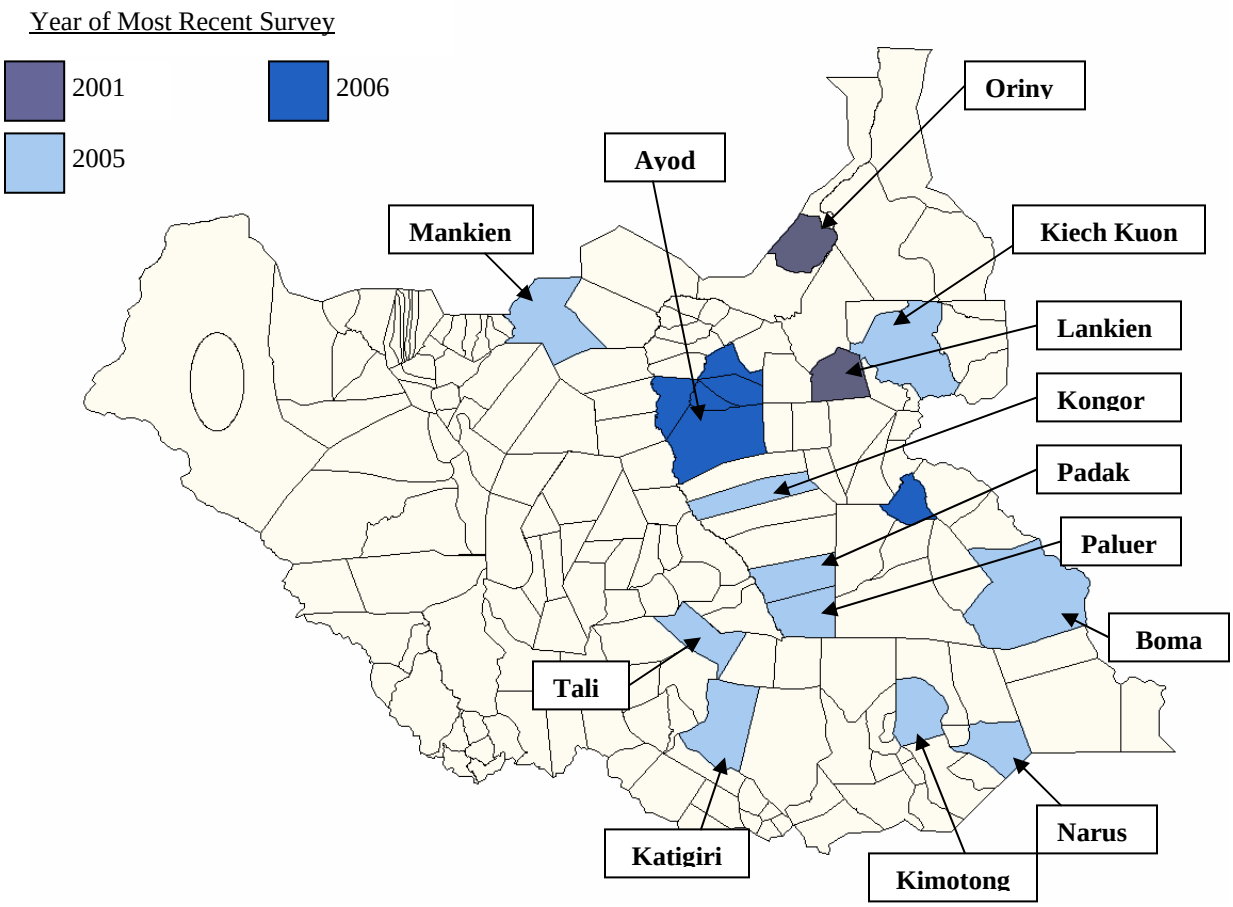
Map 1. Government of South Sudan Trachoma Control Program Areas

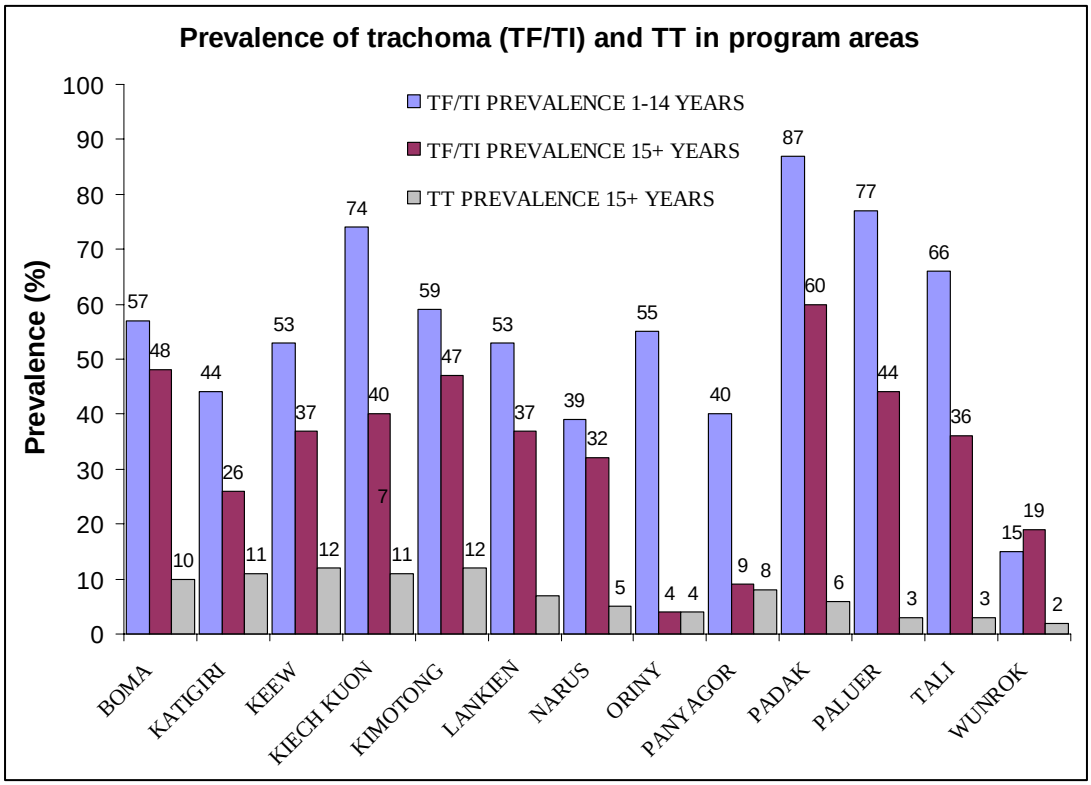


Map 2. Azithromycin Distribution, by County



Map 3. Prevalence Survey Coverage, by Year





Ethiopia Trachoma Control Program

Presented by Mr. Mulat Zerihun, Carter Center Ethiopia, and Dr. Asrat Genet Amnie, Amhara National Region Health Bureau

Carter Center assistance to Ethiopia is funded by the Lions-Carter Center SightFirst Initiative.

Background

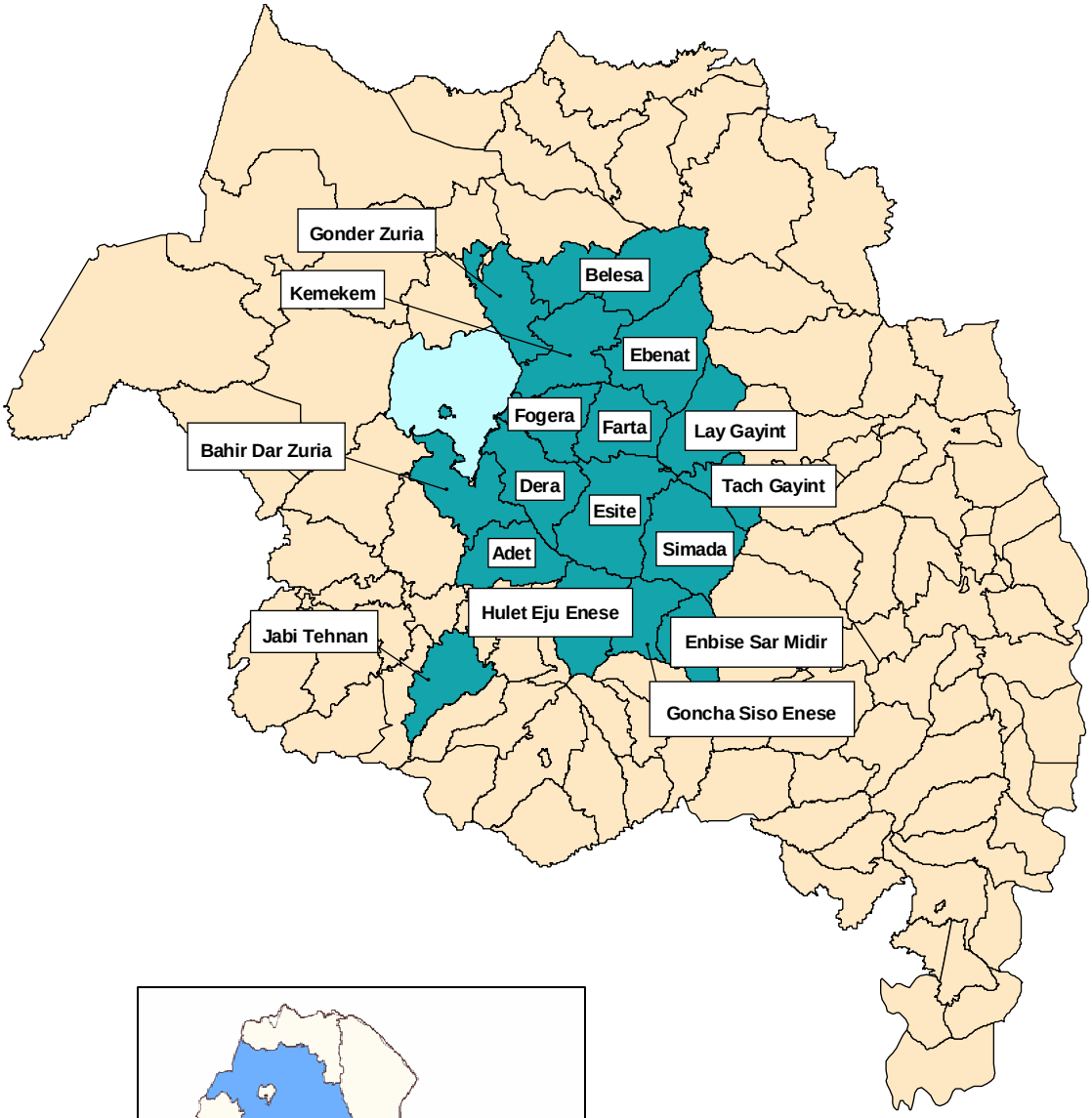
The prevalence of blindness in Ethiopia, estimated at 1.6%, is thought to be among the highest in the world. The two major causes of blindness are cataract (50%) and trachoma (12%). A nationwide blindness and low vision survey was completed in 2006, shedding light on the national trachoma situation. The national prevalence of active trachoma (either TF or TI) in children 1-9 years old is 40.1%. Considerable variations are observed in the active trachoma prevalence across regional states, with the highest prevalence in Amhara (62.6%). The rural prevalence of active trachoma is almost fourfold compared to urban prevalence (42.5% vs. 10.7%). The national average prevalence of trachomatous trichiasis (TT) is 3.1%, with the highest prevalence found in Amhara regional state (5.2%). TT is almost three fold greater in women compared to men (4.1% vs. 1.6%).

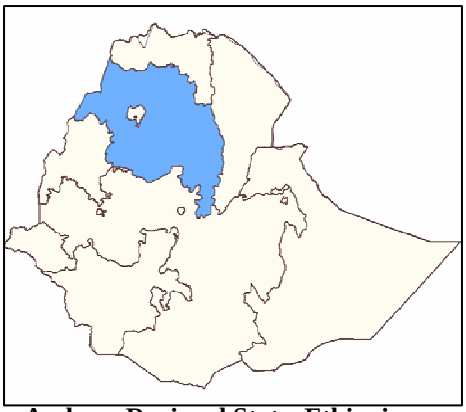
Based on the current estimated population of Ethiopia (75 million), there are an estimated 1.2 million blind people, 2.8 million people with low vision, 9 million children 1-9 years of age with active trachoma, and 1.3 million adults with trachomatous trichiasis. A national strategic plan for trachoma was prepared and completed for the period 2006-2010. In the plan, the Federal Ministry of Health has set 2015 as the target for elimination of blinding trachoma.

In October 2000, The Carter Center began assisting the Amhara National Region Health Bureau in trachoma control with funding from the Lions-Carter Center SightFirst Initiative. Four districts in the South Gondar Zone (Dera, Ebinat, Estie and Simada) were selected to launch activities (see Map 1). The initial program area comprised 155 kebeles (groups of villages), with a total population of over one million persons.

In December 2000, the Amhara Regional Health Bureau, the Prevention of Blindness Team of the Federal Ministry of Health, and The Carter Center conducted a community-based trachoma prevalence survey in the four woredas. Survey results were consistent with reports that Ethiopia has an extremely high prevalence of both active and blinding trachoma. A knowledge, attitudes and practices (KAP) survey including focus group discussions, informal interviews and a household survey was conducted in the same four districts one month later. The findings were used to develop a school health curriculum and health education materials such as posters, flipcharts, pamphlets, and a community worker training manual. A five-year (2001-2005) action plan for the South Gondar trachoma control program was drafted in 2000.

Map 1. Lions-Carter Center Assisted Trachoma Control Program Woredas, Amhara Region





Amhara Regional State, Ethiopia

Baseline Data in Lions-Carter Center Program Zones (2001/2003)

	South Gondar	North Gondar	East Gojam	West Gojam	Total
TF (1-9 yrs old)	62.4-66.6%	71.6%	80.8%	67.3%	
TT (15 yrs & above)	4.3-7.0%	7.5%	4.5%	5.5%	
UIG Antibiotic (Entire population)	2,095,374	510,771	554,433	887,372	4,047,950
UIG TT surgery	58,262	18,500	12,475	24,402	113,639

Based on the successful initial years of the South Gondar program, the Carter Center expanded support to an additional 15 trachoma-endemic districts in 2004, for a total Lions-Carter Center assisted program of 19 districts in 4 zones of the Amhara Region, reaching a total population of about 4 million persons (22% of Amhara National Regional State).

Program Achievements in 2006

Facial Cleanliness and Health Education (F)

All 654 Carter Center-supported program kebeles in Amhara Region receive ongoing health education. Approximately 20,000 health education sessions were conducted in 2006, attended by about 1,200,000 people. A total of 3,366 health educators were trained, including trachoma volunteers, health workers, community leaders, teachers and women leaders. These health educators assess clean faces in children 1-9 years old and the status of latrine construction while visiting households. They found an average prevalence of 62% clean faces among children 1-9 years old. There are 1,135 schools with on-going health education activities.

Environmental Improvement (E)

In Ethiopia, latrine construction is a priority of the federal government and is promoted in pursuit of the Millennium Development Goal 7 ("to halve the proportion of households without access to sanitation by 2015"). National latrine coverage was estimated to be 32% in 2006. According to the 2005 Demographic and Health survey, access to sanitation in Amhara is even lower, at 29.7%. The Amhara trachoma control program has estimated its regional ultimate intervention goal for latrine construction to be 616,105 (total of 3,035,000 households in Amhara with 50% targeted coverage and 29.7% that already have a latrine).

The national latrine promotion program is based on behavior change and empowering community members to build their own latrines using only local materials. Community input in latrine building includes labor and all the materials. The program promotes individual household pit latrines in all project areas, with no specific training of masons

or artisans. A key component of the National Health Service Extension program is latrine promotion. There is no direct program cost for these locally-made latrines.

Current access to potable water is estimated to be about 47%. The program's ultimate intervention goal for water is to have 100% of households in endemic communities with access to potable water within 1 kilometer or a 40 minute round-trip walk. The Federal Minister of Water Resources is responsible for planning and execution of safe water provision. In 2006, Lions Clubs of Ethiopia, with CBM, ORDA, and the Carter Center built 119 small-scale water schemes in Lions-Carter Center supported trachoma-endemic areas. Approximately 10,613 households, around 59,000 people, benefited from this project.

Summary Achievements of F & E Activities from 2002 – 2006, Lions-Carter Center SightFirst Assisted Areas

	2002	**2003**	**2004**	**2005**	**2006**	**Total**
Persons trained for trachoma control mobilization	1,080	138	6,021	8,624	3,366	19,229
Villages implementing health education strategies regularly	138	155	654	654	654	N/A
Latrines constructed	1,333	2,151	89,096	144,750	75,621	312,951
% of children aged 1-9 years with clean face			60.5%	62.9%	62%	N/A

Surgery and Antibiotics (S&A)

In 2006, 27 individuals were trained in trichiasis surgery in the Lions-Carter Center intervention zones. A total of 52,000 people received trichiasis surgery nationally, 7,283 of these were in the Amhara region. These were operated in camps in health facilities and through routine trichiasis surgery in fixed sites.

Nationally in 2006, 4,374,796 individuals received azithromycin, 2,925,569 of these with Lions-Carter Center support. National data on tetracycline eye ointment distribution were unavailable, though the program treated 261,733 persons for active trachoma with ophthalmic tetracycline ointment.

Summary Achievements of S & A Activities from 2001 – 2006
Lions-Carter Center Sight First Assisted Areas

	2001	2002	2003	2004	2005	2006	Total
TT surgeons trained	8	11	19	67	75	27	207
Persons operated for trichiasis	815	4,019	6,840	23,676	22,097	7,283	64,730
Treatment with azithromycin	0	0	100,256	625,422	1,680,394	2,925,569	5,331,641
Persons treated with tetracycline	1,042	7,964	35,106	125,208	256,048	261,733	687,101

Targets for 2007 *(some regional and some Amhara specific targets were presented)*
During the annual Amhara Region trachoma program review meeting, each woreda set its own targets for 2007. The Lions-Carter Center program will expand its assistance to 36 new program woredas in Amhara in 2007.

Health Education, Facial Cleanliness (F)

- Reach at least 50% of primary school in Amhara region with health education
- Reach at least 50% of kebeles in Amhara region with health education
- Train at least 80% of health extension workers in trachoma prevention and control

Environmental Improvement (E)

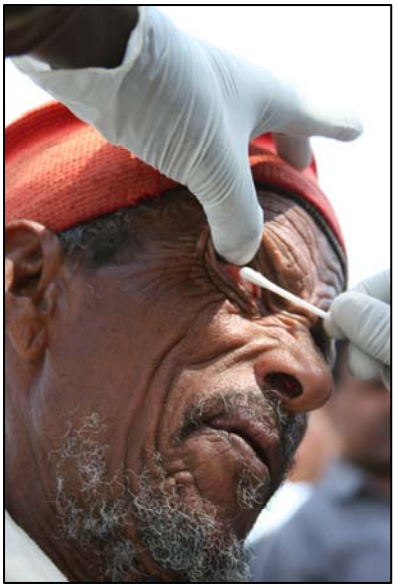
- Achieve 54% latrine coverage in Amhara Region
- Support construction of 450,000 household latrines in the Amhara Region

Surgery (S)

- Train 156 new trichiasis surgeons in Amhara (306 nationally)
- Conduct 95,751 trichiasis surgeries in Amhara (129,357 surgeries nationally)

Antibiotics (A)

- Mass treatment of 9.7 million individuals with azithromycin in the 36 new and 16 existing program woredas in Amhara (10.4 million doses nationally)



A swab is taken from an Ethiopian man (at left) for the TANA study, a collaboration between the Francis I. Proctor Foundation and The Carter Center (see special session summary). At right, a man demonstrates how to use a hand-washing station.

Map 2. Azithromycin Distribution in Ethiopia, by Year

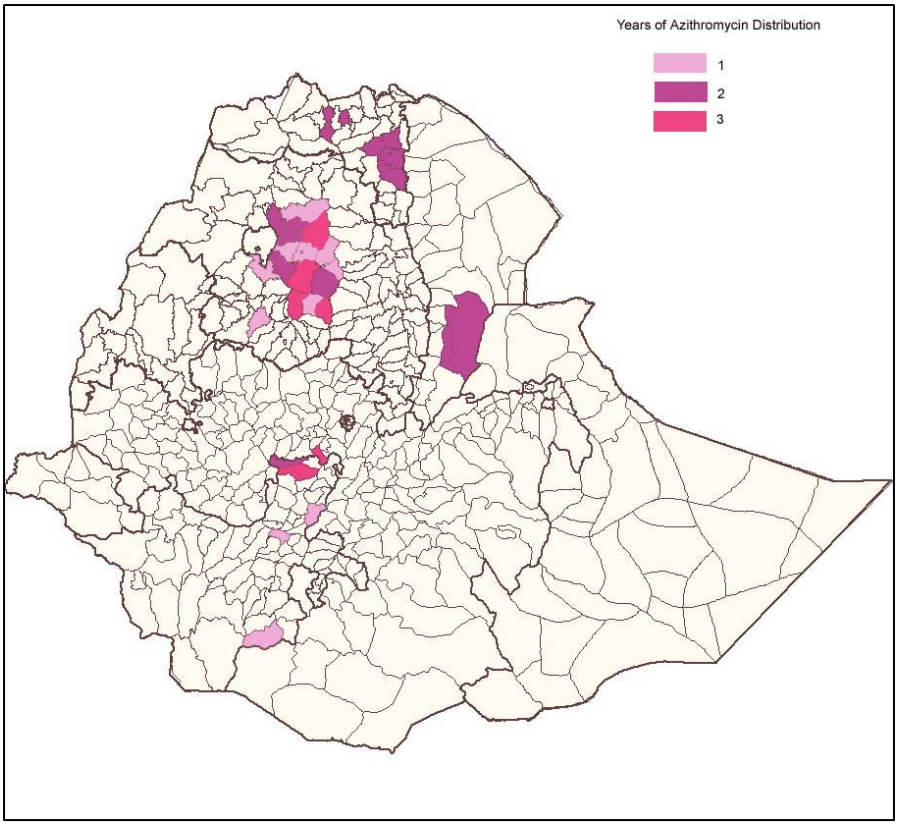


Table 1. Summary of Trachoma Control Interventions (Carter Center-assisted countries)

National data as reported for 2006 at the Eighth Annual Program Review, Atlanta, April 16 – 18, 2007

	Ghana	Mali	Niger	Sudan		Ethiopia	Nigeria	Totals
				GOS†	GOSS‡			
F & E								
Number of villages with hygiene education	2,215	809	4,512	27	901	654	446	**9,563**
Villages targeted	2,608	4,500	4,438	*	2,004	654	*	**14,203**
Percent coverage	85.2%	17.9%	101.6%	-	44.9%	100.0%	-	**67.3%**
Number of household latrines constructed	889	14, 557	6,777	*	175	75,621	6,128	**104,128**
Target for household latrines	5,622	15,000	8,400	*	1,000	257,483	*	**287,505**
Percent coverage	15.7%	97.0%	80.6%	-	15.6%	29.3%	-	**36.2%**
Antibiotics								
Azithromycin								
Treatments	825,217	3,935,247	2,532,047	29,962	109,405	4,374,796	1,737	**11,808,411**
2006 Target	800,000	3,877,261	4,089,763	250,000	992,000	9,950,000	*	**19,959,024**
Percent coverage	95.9%	101.5%	61.9%	11.9%	11.0%	43.9%	-	**59.2%**
Tetracycline								
Treatments	20,134	0	61,504	*	115,324	261,733	25,102	**483,797**
2006 Target	16,935	79,577	76,751	*	660,000	*	*	**-**
Percent coverage	118.9%	0.0%	80.1%	-	17.4%	-	-	**-**
Surgery								
Surgeries	626	5,272	4,500	1,183	563	52,000	5,572	**69,716**
2006 Target	1,500	8,000	10,580	2,500	26,450	99,315	5,000	**153,345**
Percent coverage	41.7%	65.9%	42.5%	47.3%	2.1%	52.3%	111.4%	**45.9%**

† Government of Sudan (GOS)

‡ Government of South Sudan (GOSS)

[1] Carter Center-supported only, national data not available.

* Data not presented

Table 2. National Trachoma Control Program Annual Targets 2007 (Carter Center-assisted countries)

As presented at the Eighth Annual Program Review, Atlanta, April 16 – 18, 2007

	Ghana	Mali	Niger	Sudan		Ethiopia	Nigeria	Total
				GOS	GOSS			
Facial cleanliness & Environmental change								
Health education (villages)	**	**	**	**	200	1,617	**	**-**
Household latrines to construct	5,000	20,000	8,400	**	100	450,000	**	**483,400**
Water sources to construct or repair								
Antibiotic								
Azithromycin mass distribution (persons)	957,000	6,778,630	6,000,000*	300,000	525,198	10,400,000	**	**24,960,828**
Tetracycline ointment distribution (persons)	**	**	-	**	105,239	**	**	**105,239**
Surgery								
Persons for trichiasis surgery	3,000	**	10,580	2,500	2,000	129,357	**	**144,440**

* Reflects targets for total antibiotic distribution
** Targets not presented/available

Table 3. Summary of Carter Center-Supported Interventions, by country 1999-2006

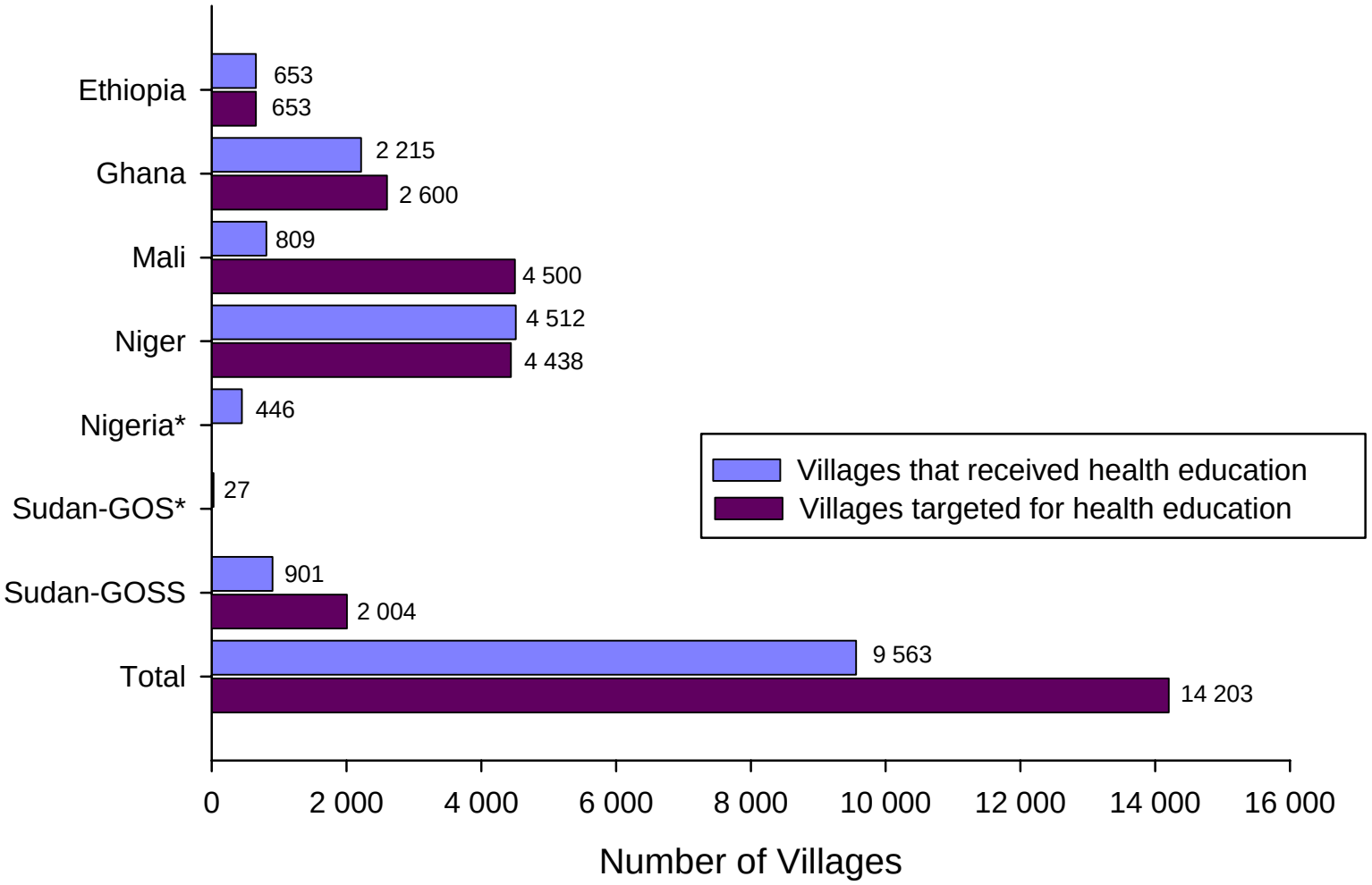
	Indicators	Ghana	Mali	Niger	Sudan		Ethiopia	Nigeria	Total
					GOS***	GOSS***			
S	Number of people operated for trichiasis	N/A**	N/A**	N/A**	2,098	1,401	64,730	N/A**	**68,229**
	Number of new trichiasis surgeons trained	N/A**	N/A**	N/A**	55	55	207	N/A**	**317**
A	Number people treated with azithromycin	N/A**	N/A**	N/A**	82,426	193,501	4,925,481	N/A**	**5,201,408**
	Number of people treated with tetracycline ointment	N/A**	N/A**	N/A**	N/A	138,359	687,101	N/A**	**825,460**
F	Number of villages with ongoing health education*	45	809	495	-	177	653	175	**2,354**
	Number of new persons trained for health education	7,703	13,873	4,034	329	1,390	13,493	1,603	**42,425**
E	Number of household latrines built	2,200	23,869	18,028	N/A	417	312,951	14,377	**371,842**
	Number of public latrines built	N/A	44	5	N/A	54	N/A	7	**110**
	Number of new masons trained	N/A	1,910	554	N/A	N/A	N/A	270	**2,734**

*2006 Data only.

**Carter Center support in Niger, Nigeria, Mali, and Ghana is focused exclusively on F & E intervention activities. However, indirect support to S & A activities in terms of logistics and technical advice are offered to the national programs when requested.

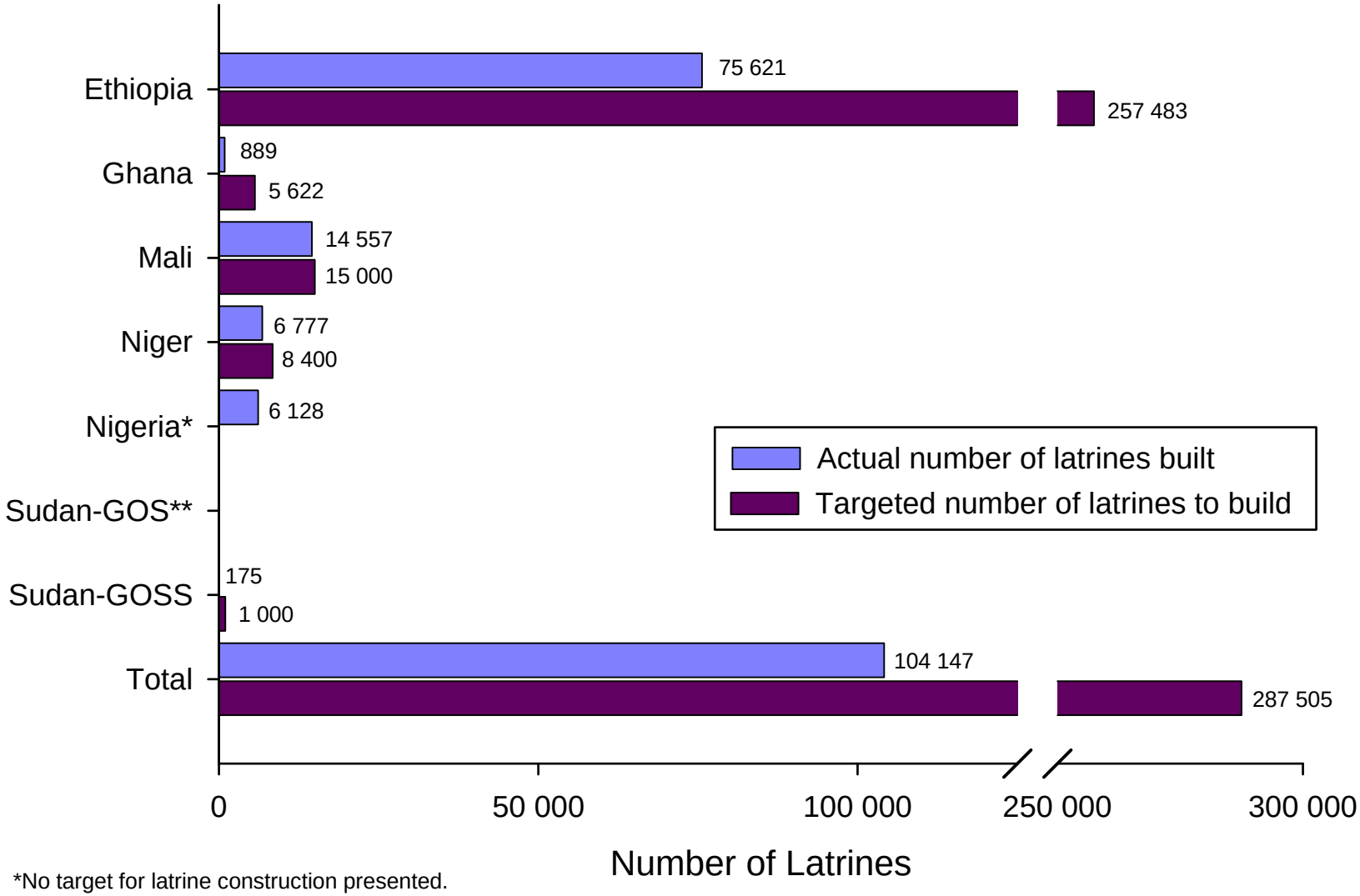
***GOS/GOSS: Government of Sudan/Government of South Sudan

Figure 1. Villages Receiving Health Education, Carter Center-Assisted Countries
National program data as presented for January - December 2006



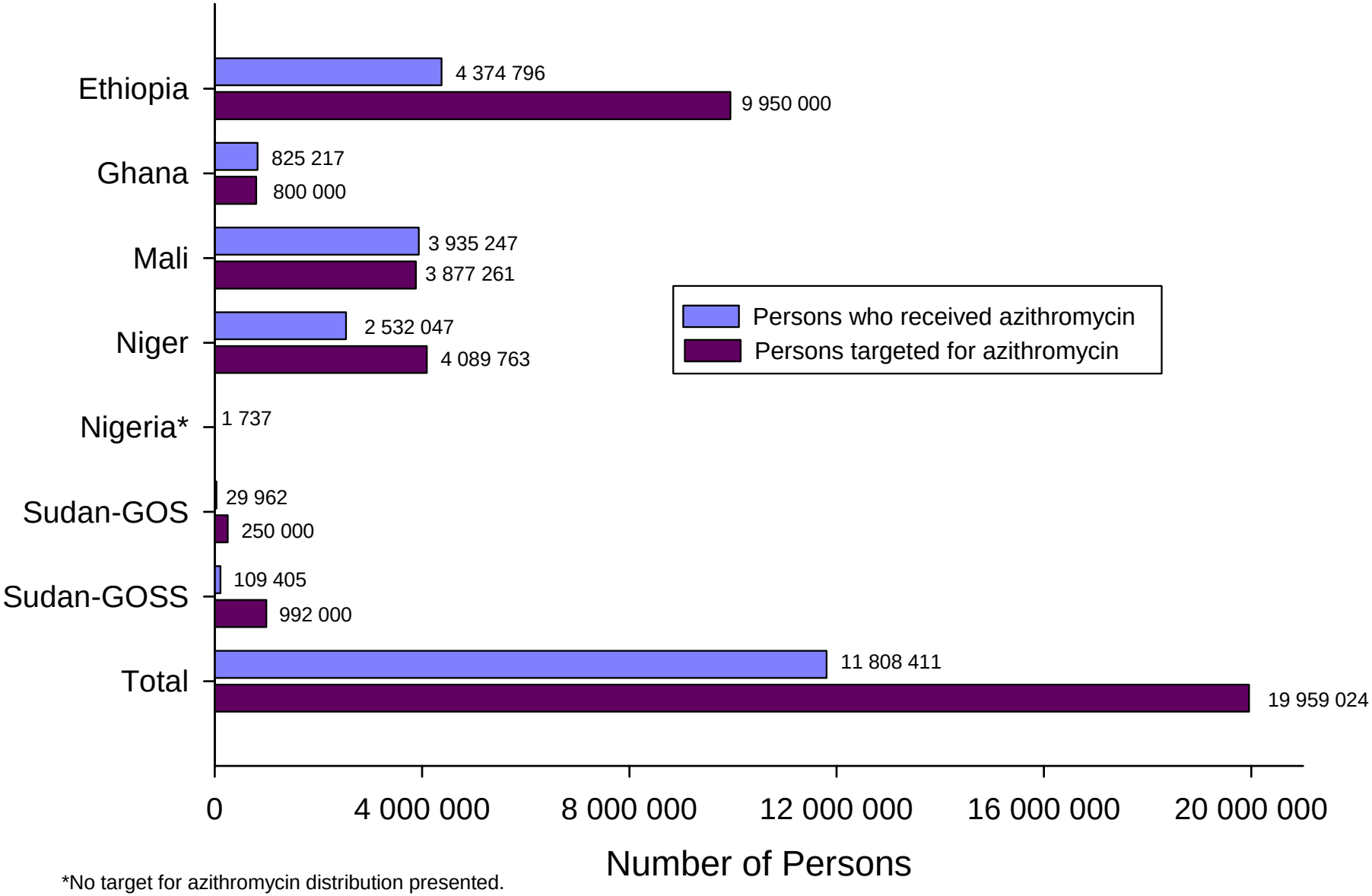
*No target for health education presented.

Figure 2. Household Latrines Built, Carter Center-Assisted Countries
National program data as presented for January - December 2006



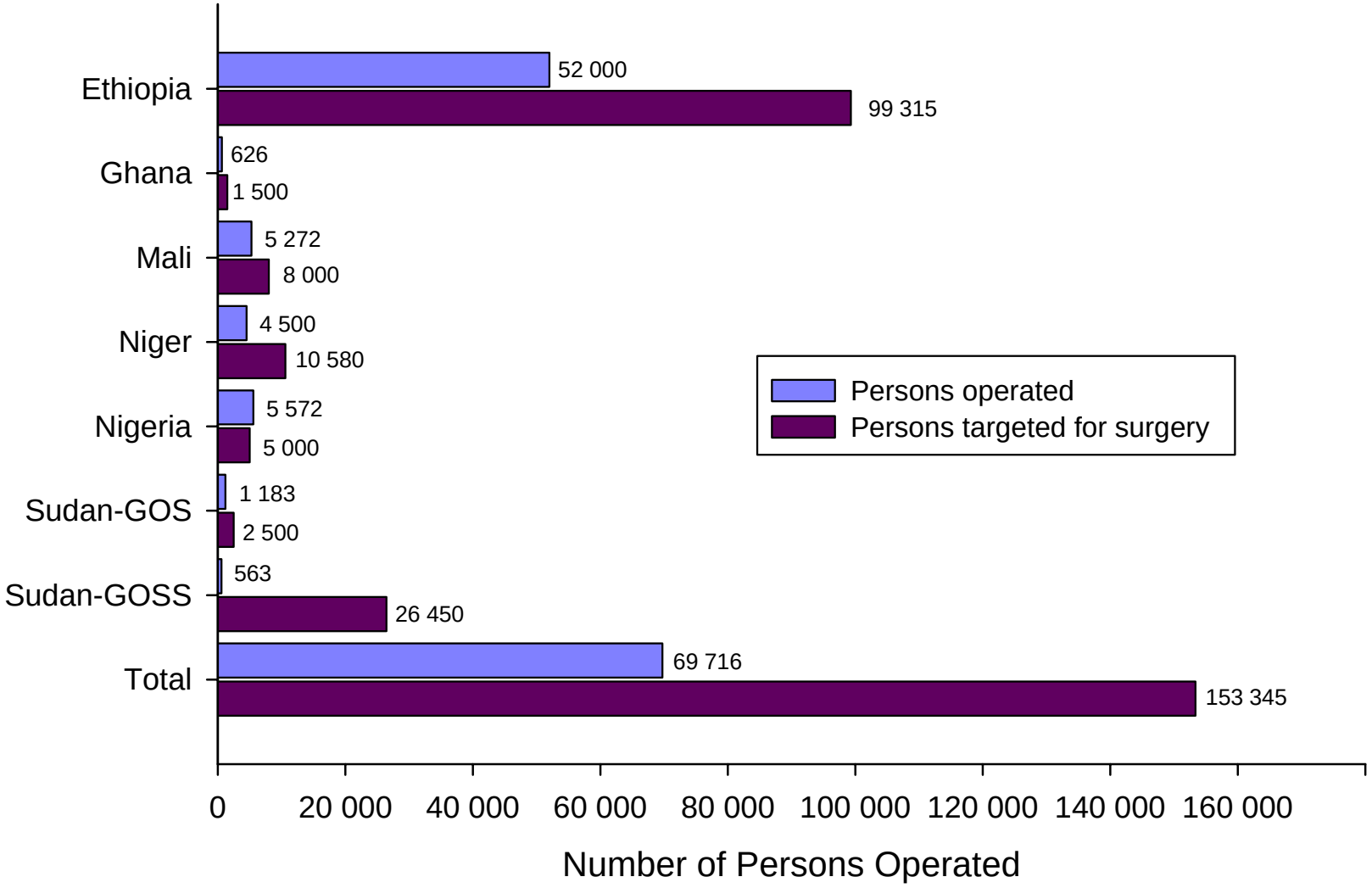
*No target for latrine construction presented.
**No data for latrine construction presented.

Figure 3. Azithromycin Distribution, Carter Center-Assisted Countries
National program data as presented for January - December, 2006



*No target for azithromycin distribution presented.

Figure 4. Persons Having Received Trichiasis Surgery, by country
National program data as presented for January - December 2006



*No target for trichiasis surgeries presented.

Figure 5. Villages that Received Ongoing Health Education

National data in Carter Center-assisted countries as presented for 2001-2006

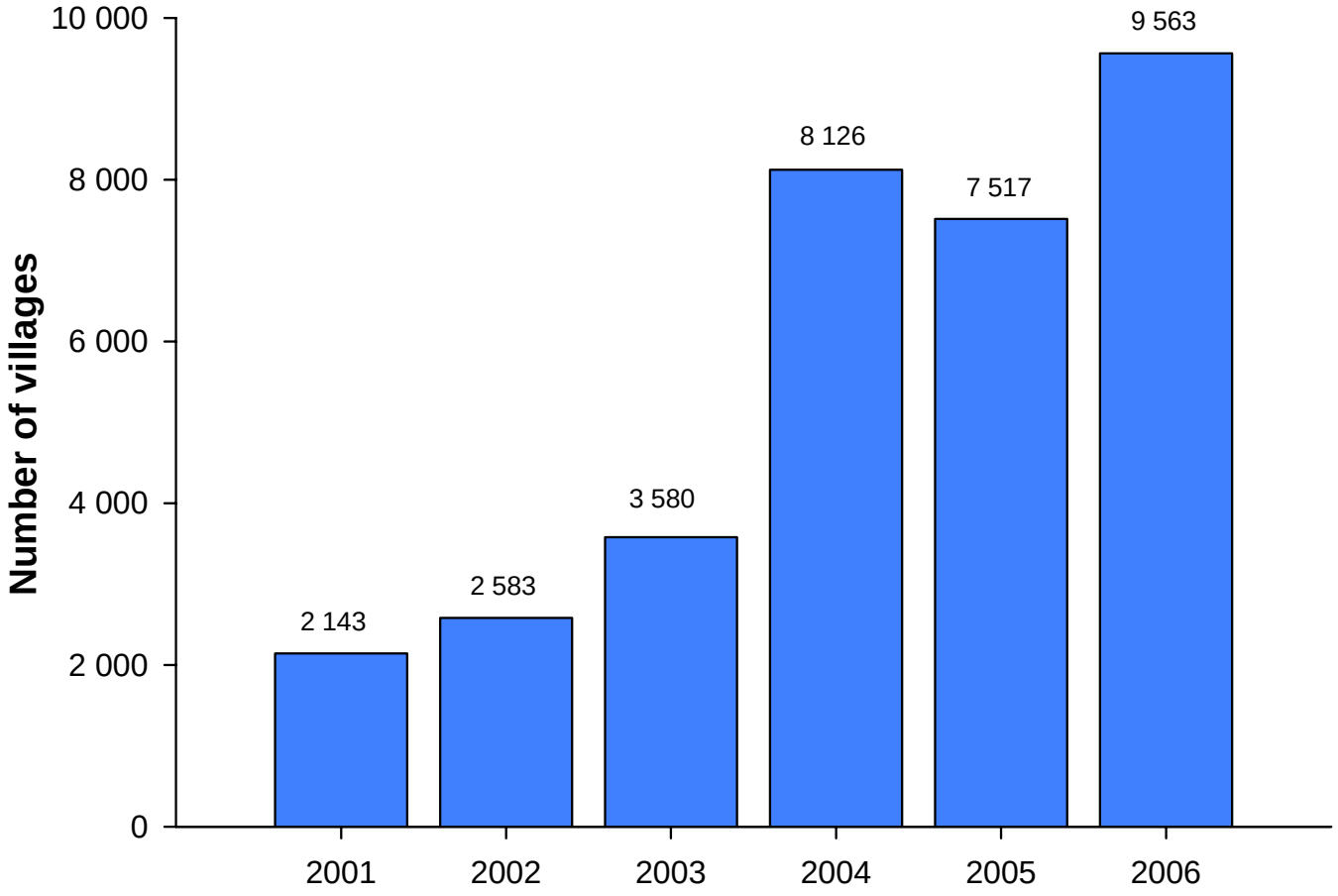


Figure 6. Household Latrines Built

National data in Carter Center-assisted countries as presented for 2002-2006

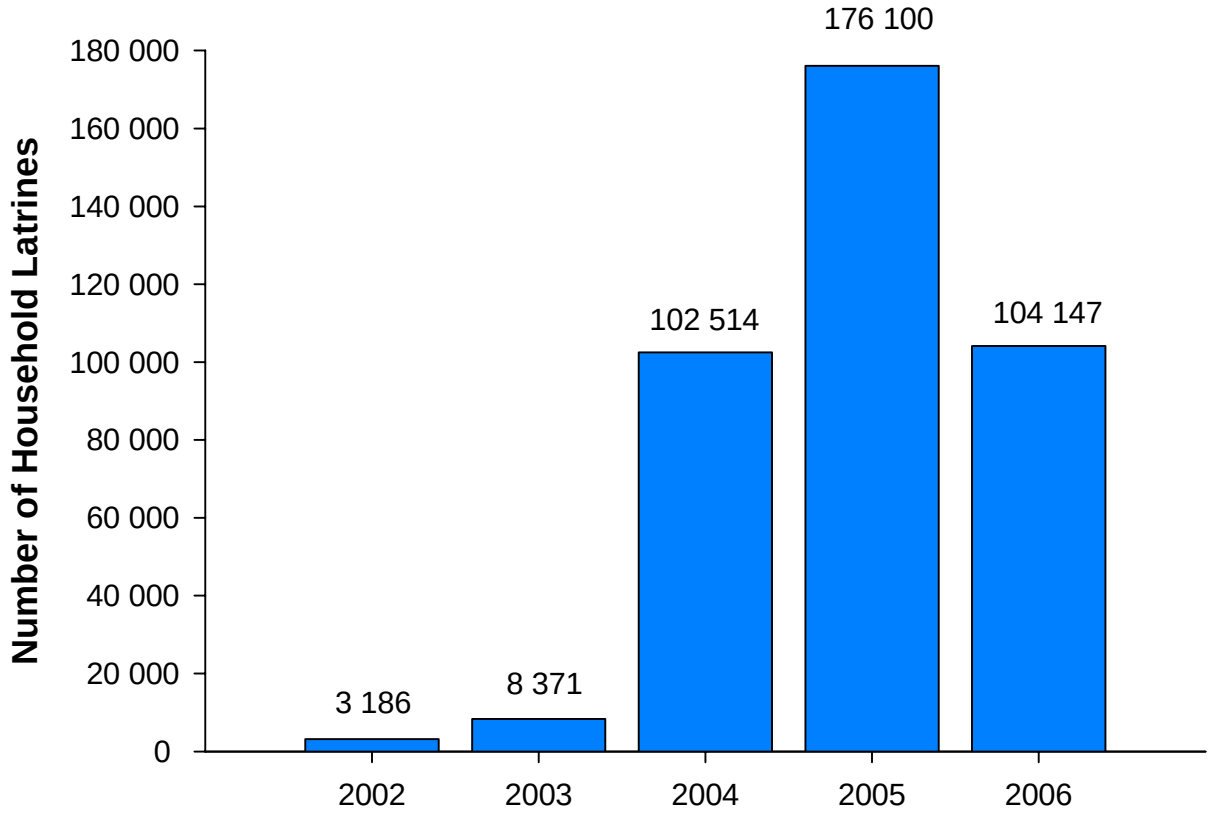
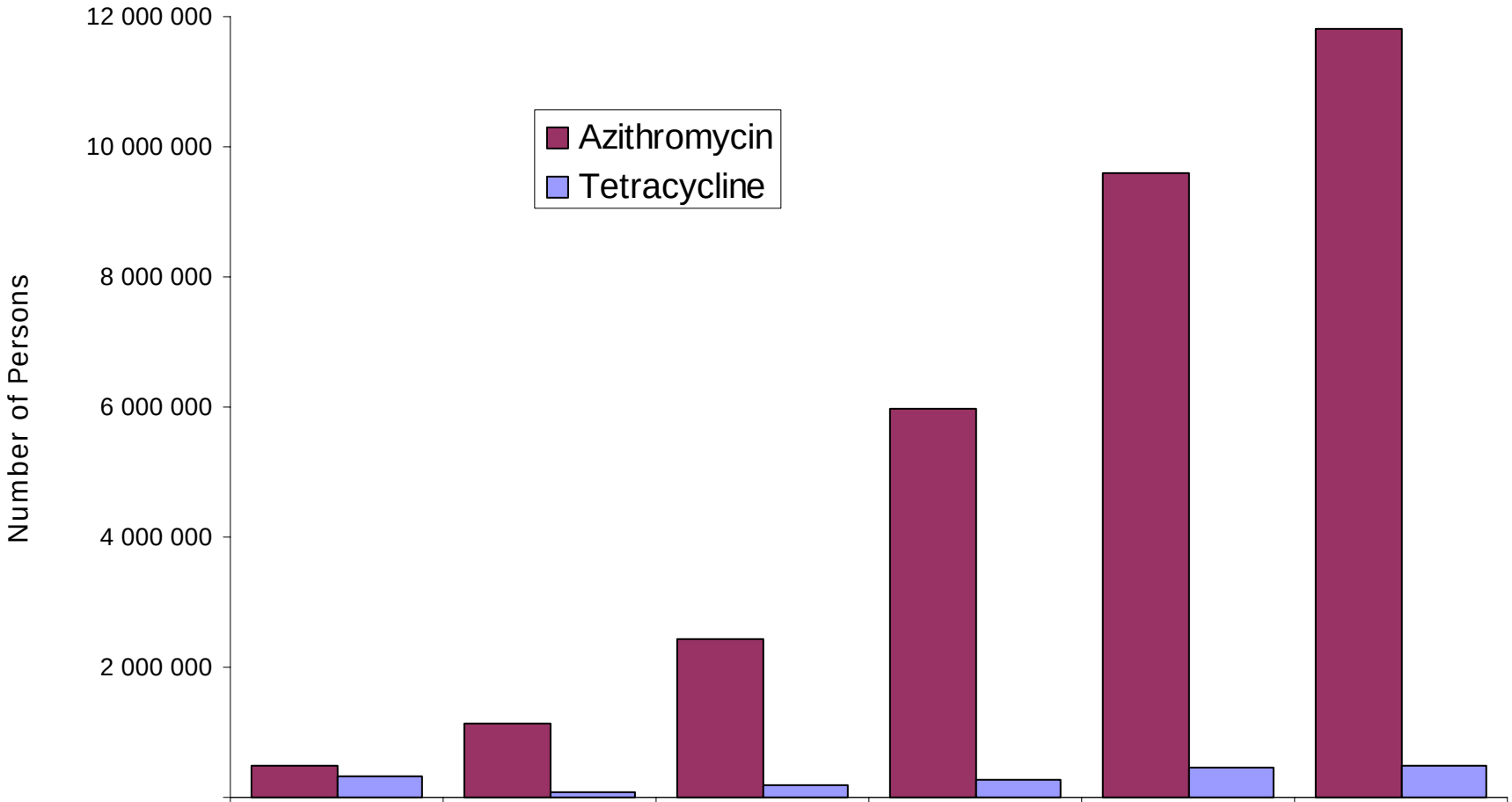


Figure 7. Persons Having Received Antibiotics

National data in Carter Center-assisted countries as presented for 2001-2006



	2001	2002	2003	2004	2005	2006
Azithromycin	487,273	1,138,603	2,427,980	5,971,265	9,582,860	11,808,411
Tetracycline	328,809	69,158	193,004	281,633	452,063	483,797

Trachoma Health Education Materials Library

Presented by Elizabeth Cromwell, The Carter Center, Atlanta

Over the past few years, trachoma control program managers and international partners have requested assistance from The Carter Center to develop new health education and behavior change and communication materials. For most trachoma control program staff, the development of health education materials is often limited by what they can find in country. With this limitation in mind, we wanted to share the wealth of our collection, although limited by the few print copies of these materials stored in Atlanta. In response to this demand, an online library of trachoma health education materials has been created to share this resource worldwide. The Carter Center has compiled an extensive collection of these materials, developed by both The Carter Center and numerous partner organizations working in trachoma control.

The electronic collection contains over 100 different items, including flip charts, posters, t-shirts and hats, manuals, leaflets, storybooks and school-based materials. In addition, the website offers a tutorial page with guidance on the steps to developing health education materials, from formative research to pre-testing to production. Each page is categorized by type of material; each section contains thumbnail images of each item available.

This collection features materials available from trachoma control programs worldwide in many languages. It encompasses the range of materials produced—from black and white to color images, and from expensively-produced materials to basic documents. The purpose of the online health education materials library is to inspire programs to develop their own materials after having seen what others have done. Each country program should develop unique materials appropriate for their specific local context and the financial resources available to them.

These resources are now available online at:

http://www.cartercenter.org/health/trachoma_education/index.html

Evaluation of Carter Center-supported Latrine Promotion in Ghana

Presented by Ann Rodgers, The Carter Center

Overview

A 2005 study demonstrated that sanitation coverage in northern Ghana was very low (<10%). National sanitation standards require costly materials that are unavailable in the north. As a result, no latrines found were built without the support of an outside organization, and most individuals stated that these programs were limited to 5-10 households in each community. Additionally, an evaluation of past latrine promotion programs showed that all had failed to provide an adequate number of completed and usable latrines.

In a response to the 2005 study's findings, the Carter Center began to support health districts in northern Ghana in a unique latrine promotion program in June 2005. The approach focused on providing 100% household latrine coverage in each selected village, regardless of a household's wealth, status, or ability to provide labor. The latrines constructed are the ventilated pit latrines, the most cost-effective, safe, and replicable latrine available under the national sanitation standards.

The present study evaluated the Carter Center-supported latrine promotion program through a household survey in a random sample of supported villages in the Northern Region.

Methodology

Twelve communities that had participated in The Carter Center-supported latrine promotion program for at least 12 months were randomly selected from two districts. Every household in these communities was sampled, and it was determined that no latrines had been present in the communities at the commencement of the program. A total of 327 households were interviewed to determine demographics, access to a household latrine, perceptions of latrines, and construction costs to the household. A visual inspection of all latrines was also conducted to determine latrine use and construction status.

Results

The visual inspection of the latrines showed that 94% of the households had a latrine at the time of the interview, and 88% were usable. Of these, 88% had walls, 84% had a roof, and 69% had adequate privacy. Feces were observed in 71% of all the latrines. The average cost to the households with a latrine was approximately $5 US when all reimbursements are taken into consideration. Additionally, 96% of households contributed non-monetary resources: general labor (74%), water (64%), and grass (54%). Few households had a plan of what to do when the latrine was full. Thirty percent stated that they will build another, 12% will close it, and 37% did not know or hadn't considered the issue.

The results showed that 93% of the household heads were male, with an average age of 53 years. The average household size was 13 persons. When asked about access to

latrines, 50% stated that someone in the household was *not allowed* to use the latrine. Of these households, 94% restricted use to young children and 14% to adults. In addition, 61% stated that someone in the household *chose* not to use the latrine. This was approximately equal for children (77%), men and women (73%), and old people (63%). The primary reasons for not using a latrine were the belief that it is unsafe (45%), lack of privacy (21%), and a preference to defecate in the bush (13%).

The perceptions of latrines were consistent for both households that owned a usable latrine and those that did not. Both were informed about the advantages and disadvantages of owning a latrine; however a higher proportion of households without a latrine (100%) stated an advantage than households with a latrine (85%). The most commonly stated advantages of owning a latrine were convenience, health benefits, lack of feces around the compound, and privacy. The disadvantages stated were latrine maintenance, a bad odor, the high cost, and a risk of collapse.

Twenty of the 327 households interviewed did not have a household latrine, and only 3 (15%) of them had been advised to build one. The major reasons for not building a latrine were cost (33%), lack of time (13%), and inability to provide labor (13%). Despite this, 100% of these households stated an intention to build a latrine in the future.

Conclusions

In Carter Center-supported communities, household latrine coverage has increased from 0% to 94%, and 88% of households have a usable latrine. In addition, feces were found in 71% of the latrines. There is still a need for heightened health education and behavior change activities. The major reasons for lack of use by adults were the belief that the latrine was unsafe, lack of privacy, and desire to defecate in the bush. It is critical that communities are educated about the strength of the latrine, the need to have doors and walls that provide adequate privacy during the day, and the importance of disposing of all feces in the latrine. Households must also be made aware of how to reuse the cement slab, ring beam, and vent pipe once the latrine is full. Overall, the latrine promotion program increased access and use in all selected communities and should be encouraged as a model for other latrine programs in northern Ghana.

Recommendations

1. Ensure there is a community demand for improved sanitation by making it a measure for community selection. Additionally, sanitation education should be increased in communities prior to starting latrine construction. Everyone should be aware of the benefits of improved sanitation and determine if they want to participate.
2. Ensure communities are aware of responsibilities, expectations, and deadlines associated with the latrine promotion program.
3. Enlist more support from district and regional officials for health education, material transportation, and supervision.
4. Continue to support the adjusting of national sanitation standards that include a more attainable model for the average villager.

Effect of Latrine Promotion on Local Latrine Production in Niger and Mali

Presented by Lisa Rotondo, The Carter Center

Overview

According to national surveys in Mali (2001) and Niger (1998), these countries have 70% and 5.9% rural household latrine coverage, respectively. The national trachoma control programs have incorporated latrine promotion in their five-year strategic plans—Mali has the goal of increasing coverage from 70 to 90% by 2009, while Niger has the goal of constructing 50,000 household latrines by 2009.

Since 2003 in Mali and 2002 in Niger, The Carter Center has been supporting the national programs' objectives in construction of household latrines. The Carter Center supports latrine promotion through technical training, provision of equipment, and donation of materials for latrine construction (cement, iron bars, etc.). Masons are given latrine molds and other necessary equipment to begin construction. At the same time, the Carter Center also supports health education to promote latrine construction and use via radio programming. In Mali, a reported 1,229 masons have been trained and 12,577 latrines built since 2003, all with direct support from the Carter Center. In Niger, 382 masons have been trained and 11,781 latrines are reported built since 2002.

The present study evaluated the Carter Center-supported latrine promotion program in districts in Niger and Mali, with the following objectives:

1) examine actual household latrine coverage
2) visually assess the condition of latrines constructed, and examine for signs of use
3) evaluate demand for household latrines
4) determine attitudes toward latrines by owners and non-owners
5) examine differences in socioeconomic status, education, and travel history of heads of household who have latrines compared to those who do not

Methodology

In order to achieve these objectives, structured interviews were conducted with household heads (including latrine owners and non-owners) from 24 randomly-selected villages in 4 districts (12 Carter Center-supported villages and 12 non Carter Center-supported villages) in Niger and Mali. Interview teams also visually inspected latrines to assess use and durability. Fifty households were randomly selected per village, for a total of 1,200 respondents. Separate questionnaires were used for households with and without a latrine.

Results

The results showed that 70.0-74.1% of the household heads were male. The average household size was 7 persons. In Mali there was an equal number of latrines in intervention (270) and non-intervention villages (271), giving 90.3% household latrine coverage. Household latrine coverage in intervention villages in Niger was significantly higher than non-intervention, though coverage was still low (30.3% in intervention

villages and 5.3% in non-intervention villages). There was a significant difference in the type of latrine slab; in both countries intervention villages were more likely to have a cement, Sanplat slab type ($p<0.0001$) (Table 1).

Table 1: Type of latrine built in intervention and non-intervention villages

	Mali			Niger		
Latrine construction material	Mud, wood	Sanplat, cement	Other	Mud, wood	Sanplat, cement	Other
Intervention village	60.0%	38.9%	1.1%	11.0%	87.9%	1.1%
Non-intervention village	99.7%	0.3%	0%	62.5%	37.5%	0%

Nearly all of the latrines found had a completed superstructure: 99.3% in intervention villages in Mali, 99.3% in non-intervention villages; 93.8% in intervention villages in Niger, 100% of non-intervention villages. A very high proportion of latrines showed signs of use, though there were no significant differences between intervention and non-intervention villages. Heads of household in intervention villages in Niger were more likely to report having been advised to build a latrine ($p<0.0001$).

Heads of household who own a latrine were more likely to have certain indicators of wealth, including having a larger than average household size, having a house with a metal roof, and having a child who attends school (Table 2).

Table 2: Indicators of wealth among latrine owners and non-owners

	Mali		Niger	
	Owners	Non-Owners	Owners	Non-Owners
Larger than average household size	31.5%	20.7%	43.8%	25.9% p<.0001
House with a metal roof	25.1%	3.5% p<.0002	5.6%	6.1%
Child at school	67.9%	46.6% p<.0012	72.0%	41.6% p<.0001

There were no significant differences in education level between owners and non-owners. More than 80% of all heads of household reported having visited a city, and owners were slightly more likely to report having used a latrine in the city, though latrine use was universally high. The three most commonly cited advantages in Mali were: convenience, privacy, and improved status/good for visitors. In Niger, the reported advantages were similar: convenience, privacy, and cleanliness.

Conclusions

The present study found that where latrines have been built in Niger and Mali, there is very high use. Both owners and non-owners demonstrated strong knowledge of advantages to owning and using a latrine, while there was little mention of disadvantages. In Mali, the program's effect has been to improve quality of latrines. At the same time, the Mali program has achieved its objective of 90% household latrine coverage. In

Niger, latrine coverage is still very low (most people still practice open defecation), but the program has significantly increased coverage. An upcoming challenge to the Niger program will be to accelerate output in order to increase access to latrines. Both programs have made progress in increasing access to sanitation and have contributed greatly to the national programs' strategic goals.

Randomized trial of face washing to develop a standardized definition of a clean face

Presented by Jonathan King, The Carter Center

Background

The F component of the SAFE strategy aims to promote face washing to interrupt fly-to-eye and person-to-person transmission of ocular *Chlamydia trachomatis* infection. To monitor the impact of activities to promote face washing, the World Health Organization recommends trachoma control programs assess clean faces in children. However, no standard definition of a clean face exists. We conducted a randomized controlled trial of face washing in trachoma-endemic villages of Tanzania and Mali to develop a valid and repeatable definition of a clean face derived from the following components: ocular and nasal discharge, dust, food, and flies on the face.

Methodology

A total of 424 children aged 1-5 years were randomized to washed and not washed groups after an initial observation in the morning. One observer (blinded to randomization status) made the initial observation followed by three additional observations spread throughout the day. Photographs were taken at each observation to assess agreement among multiple, remote observers. After the fourth observation at the end of the day, all children were washed and examined for clinical signs of trachoma. Any child with active trachoma was treated according to that country's guidelines.

Results

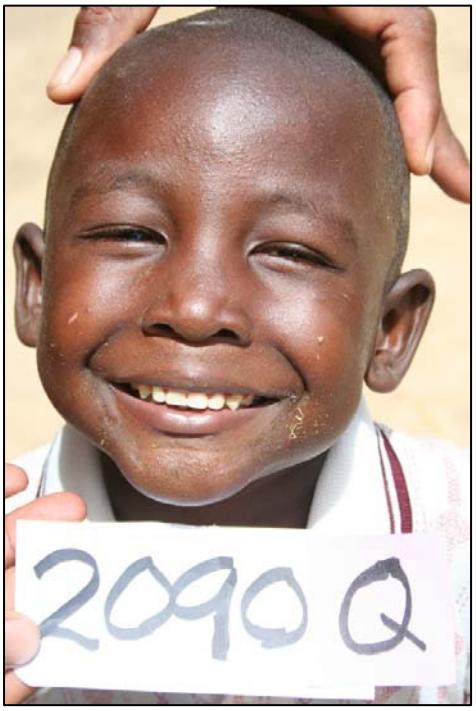
There were no systematic differences in the basic demographics of the two groups. Overall, children with active trachoma were more likely to have ocular discharge at the initial observation (OR 3.23 95%CI 1.81-5.76) and the presence of clinical signs of active trachoma did not differ between age groups 1-2 years and 3-5 years.

Time of day appeared to affect the presence of ocular discharge and whether a fly was observed on the face, but not the other components. Ocular discharge was observed less at the end of the day than at the start in both washed and unwashed groups. Flies were observed less frequently at observation three coinciding with the hottest part of the day, when flies are known to be less active.

Both ocular discharge and dry nasal discharge were significantly lower in the face-washed group in the morning (after washing), at lunchtime, and in the afternoon ($p<0.01$ at each time point). However, the effect of face-washing disappeared by the last observation in the afternoon. The other components of the definition of clean face were not affected by face-washing.

To determine whether a definition is repeatable, we assessed the agreement among multiple observers on the presence of facial components using photographs. Agreement of whether a fly

was present was near perfect among observers (Kappa=0.891). Observer agreement on the presence of nasal discharge was substantial (Kappa=0.638). Observers had moderate agreement on the presence of ocular discharge (Kappa=0.481) and food (Kappa=0.422). There was little agreement on the presence of dust on the face.



Conclusion

Evidence from this study demonstrates that it is possible to have a valid and repeatable definition of a clean face that indicates whether a face has been washed. We recommend that a working definition of a clean face be "absence of ocular and dry nasal discharge." In addition, since the impact of face washing in the morning was not evident by the afternoon, we recommend trachoma control programs promote twice daily face washing for children.

Latrine Construction: Costs, Progress to Goals, and Sustainability

Presented by Paul Emerson, The Carter Center

Rationale for latrines in trachoma control

There are multiple transmission routes for trachoma, which are usually summarized as the three Fs: fingers; fomites (infective discharge on towels, bed sheets etc); and flies. The vector of trachoma is a species of fly called *Musca sorbens*. Fly-to-eye contacts by *Musca sorbens* on the eyes of children in trachoma endemic villages can number over 3,000 a day and transmission of trachoma is reduced when *Musca sorbens* is controlled. *Chlamydia trachomatis* has been recovered from the legs and mouth parts of the flies. *Musca sorbens* breeds in human faeces that is lying on the ground, but does not breed in pit latrines. Provision of latrines reduces the population of *Musca sorbens* and reduces the frequency of fly-to-eye contacts.

Promotion of latrines will reduce one of the transmission routes of trachoma. Even with 100% coverage of latrines in a community there will still be transmission of trachoma by the flies that remain, and also on fingers and fomites.

All trachoma-endemic countries supported by The Carter Center have signed-up to the Millennium Development Goals (MDGs), which include MDG 7 – halve by 2015 the proportion of people without access to safe faeces disposal.

In addition to the effect on controlling trachoma, and the obligation of governments to work towards the MDGs, latrines provide other health benefits such as controlling diarhorreal disease, cholera and intestinal worms, are convenient for users, improve the cosmetic appearance of villages and are popular among users.

Choosing the right technology

In their simplest form pit latrines are a 2-3 metre hole in the ground with a platform of wooden posts over it so that a user can defaecate into the pit without falling in, and with a screen to provide privacy whilst doing so. At the other end of the spectrum are elaborate cement structures with lined pits that can be emptied, ventilation pipes, and concrete block outhouses built over the pit. Both ends of the spectrum are equally effective in the safe disposal of faeces and control of *Musca sorbens*. The technology to choose must be based on a combination of cost, cultural expectation, availability of materials, soil structure, and weather conditions. Most household pit latrines should be built with the expectation of using it for a good 3-8 years. If that is not possible then a movable slab and shallow holes should be used, with the slab being moved every few months and the holes back-filled with soil.

There is a latrine technology available for every culture, every locality and every environmental condition.

What do latrines cost?

There are two elements to the cost of latrine construction; non-cash costs such as labour, local materials that can be gathered for free, and water; and cash costs such as building

materials that must be bought, and payment for skilled workers. It is the cash costs that are of greater programmatic concern, these vary by country and are presented for selected Carter Center supported programs below.

Table: Cost estimates for programmatic cash costs for latrine construction in selected countries (costs are per latrine and converted to US$)

	Mali	Niger	Nigeria	Ghana	Ethiopia
Cement	12.50	15.00	12.50	12.22	0
Vent pipe and screen	0	0	0	9.41	0
Reinforcing iron	2.10	2.60	0	0	0
Skilled mason	0	0	0	6.50	0
Aggregate	0	0	2.00	0	0
Labour contribution to owner	0	0	0	4.88	0
Total	$14.60	$17.60	$14.50	$33.01	$0

Note: only *cash costs* to the program are represented here. Non-cash costs, cash costs carried by the owner and program costs are not included

Progress and sustainability

In order to consider progress to a goal, the goal must be agreed upon, a baseline established and appropriate record-keeping and monitoring should be in place. The goal for latrine promotion varies by country and locality, but is usually either: minimum of 50% household coverage in a community; MDG 7 (halve the number of households that do not have a latrine by 2015); or total sanitation coverage with 100% of households having latrine access.

In Amhara, Ethiopia, the program goal is a minimum of 50% coverage in all endemic villages in the next five years. The estimated population size is 17 million people living in 3.03 million households. Current reported latrine coverage is 29.7%, meaning that to achieve 50% coverage an additional 20.3% of 3.03 million households (615,000) will need a latrine in the next five years. The annual target should be at least 121,000 latrines.

The average annual program output over the past three years has been 103,000 latrines, which is 15% short of the target. Slight program modification should enable this gap to be covered.

It is regretted that Amhara is a rare example of sustainable progress towards the goal. A similar calculation for the Northern Region of Ghana shows average annual output over

the past three years to be just 0.9% of the required annual intervention target to achieve the goal of 50% household coverage in the next five years.

Conclusions

There is a myth that the 'E' component of the SAFE strategy is too difficult to plan and too costly to implement. This is false.

1) Safe disposal of human faeces can be used to control trachoma throughout Africa
2) There are latrines available for all environments, and at all budgets
3) The Amhara example demonstrates that it is possible to calculate targets, plan programs to reach specific goals and implement the plans in a sustainable fashion
4) Latrine promotion can be a sustainable and realistic part of a national trachoma control program that fits-in with other national objectives

Comparison of Trachoma Survey Methods

Presented by Jeremiah Ngondi, Carter Center Technical Advisor

Trachoma surveys are essential for quantifying disease burden in order to facilitate program planning, implementation, monitoring and evaluation. Cluster random sample (CRS) survey design is currently the recommended method for trachoma prevalence surveys. In addition, two rapid assessment techniques have recently been advocated: trachoma rapid assessment (TRA); and acceptance sampling trachoma rapid assessment (ASTRA). The characteristic of these survey methods are summarised in the table below.

Cluster random sampling (CRS)

Population-based prevalence surveys are the gold standard for estimating the prevalence of trachoma within a target population. The most commonly used survey design for trachoma prevalence surveys is cluster random sampling (CRS). The sample size for CRS is calculated by defining parameters which include: expected prevalence estimates (P); error margin or precision (d); confidence level; level of significance (α); and design effect (DEFF). Design effect describes the relative change in the variance caused by cluster sampling.

In CRS, non-overlapping subpopulations (clusters) usually based on geographical or political boundaries are selected and within each cluster eligible participants are selected. Commonly, a two-stage design comprising selection of villages (clusters) and individuals within households is used. The design can be extended to incorporate multiple stages. Modifications of CRS include use of probability proportional to size (PPS) sampling based on the cluster population. Use of sampling weights should be considered where complex CRS designs are conducted. This method is efficient in that only enumeration of the population in the selected cluster is required rather than a need to conduct a complete population census. CRS samples can be used for multiple indicators at the same time (for instance, assessment of active trachoma, trichiasis and community risk factors). The main drawbacks are that CRS is not intended for calculation of estimates from individual clusters; and are usually applied at the level of administrative units districts, provinces, states, etc.) which do not take into account different ecological units, e.g. highlands, lowlands, savannah, forest. The resulting population-based estimates for the administrative unit may miss pockets of disease associated with specific environment.

Trachoma rapid assessment (TRA)

TRA was developed in 1999 to be a simple and efficient method to allow for rapid assessment of active trachoma in children, trichiasis in women and environmental risk factors. This method employs a convenience sample and a two-phase sampling plan to identify high-risk communities. The method is based on community participation and has been advocated to provide a practical way of determining whether blinding trachoma is endemic in a given community. TRA has been advocated as an operational tool allowing for ranking of communities thus facilitating prioritisation of interventions in worst affected areas. However, TRA is not based on probability sampling, does not estimate prevalence, and should never replace proper surveys. In addition, this method has been found to have low consistency and doubtful accuracy and is of limited use since it does not allow for estimation of prevalence.

Table 1. Summary of characteristics of trachoma survey methods

Characteristic	Cluster random sampling (CRS)	Acceptance sampling trachoma rapid assessment (ASTRA)	Trachoma rapid assessment (TRA)
Sampling design	One or multistage -stage cluster sample. Random selection.	Stratified random sample – Modified LQAS*.	Convenience sample. Non-random selection.
Sub-populations	Called clusters. Based on geographic or political boundaries. Supposed to be heterogeneous.	Called lots. Based on geographic or political boundaries. Supposed to be homogenous.	Villages or communities.
Sample size	Estimate based on a population proportion.	Estimated based on hypothesis test (desired proportion and level of Type I and Type II errors).	Fixed sample of 50 children aged 1-9 years.
Lists of units	List of primary sampling units needed; complete census not needed.	Population census is essential.	No census needed.
Basis for inference	Confidence interval for estimate.	Hypothesis test.	Ranking of communities.
Outcome	Overall population estimate (e.g. prevalence). Estimate from individual clusters should not be calculated.	Individual lots judged as acceptable or not acceptable. Overall estimates if stopping rule is not used.	Proportions in each village or community.
Weighting of sample	Self weighting if PPS.	Weights calculated for each lot if overall estimate is required.	Weighting not required.
Cost	Decreased travel time and preparation. Reduced cost since census not required.	Low cost due to small sample sizes claimed. However, the need to sample each lot may yield higher cost for population census.	Cheap since sample is convenient.
Reasons for potential bias	Geographical clustering of sample.	Small samples in each lot.	Selection bias.
Advantages	Simple and efficient to conduct. Population census not required. Multiple indicators may be assessed in one survey.	Small sample sizes for deciding acceptability of a lot Suitable for small study units. Suitable for monitoring program coverage.	Simple and cheap to conduct.
Disadvantages	Does not derive estimate for individual clusters. Population estimate likely to miss pockets of disease.	Population census list essential. Expertise required deciding acceptable proportions and risks. Small samples in each lot may result in imprecise estimates. Large sample sizes if overall estimate is required. Cannot be used for multiple indicators.	Inaccurate and Inconsistent estimates. Does not produce prevalence estimates. Not based on accurate epidemiological methods. Not suitable for monitoring or surveillance.
When to use	Interest in overall population estimate. Prevalence surveys are the “gold standard”.	Interest in information for each lot. Suitable for monitoring or surveillance.	May identify where prevalence surveys are required. Limited use due to inadequate statistical rigour.

*Lot Quality Assurance Sampling

Acceptance sampling trachoma rapid assessment (ASTRA)

ASTRA is based on lot quality-assurance sampling (LQAS) and has been advocated for identifying and classifying communities that have low or high prevalence of trachoma. LQAS originated from the manufacturing industry for quality control purposes and has been used by public health services to evaluate immunization coverage. This survey design does not have a fixed sample size and sampling may stop once the number of defects allowed has been exceeded. The main outcome of this methodology is to determine if a batch or lot of goods is "acceptable" or "not acceptable" by taking a sample of items and defining the level of reasonable risks to be taken for not inspecting every item. The decision value is the number of "defective" items that need to be found before a lot is deemed unacceptable. In a trial of ASTRA in Malawi in 2003, children aged 2-5 years were examined until a predetermined number of cases of active trachoma were identified (high prevalence) or a total of 50 children sampled without the cut-off point being reached (low prevalence). Although not generally used for overall population estimates, ASTRA can be modified to estimate prevalence whereby sampling in a lot continues until the maximum sample size is met rather than stopping when the expected "defective" units are identified. ASTRA's key advantage is asserted to be saving time and cost due to relatively small sample sizes; however, the total sample size may be larger than that required for a PBPS if the overall population estimated is required in addition to time spent surveying every lot. In addition, small samples in each lot may result in imprecise estimates.

Survey costs

Population based surveys are considered the 'gold standard' in estimation of prevalence; however, they have been criticized for being expensive, time consuming, and may use-up scarce resources that could be better used on interventions. Anecdotal data from Trachoma Control Programs currently supported by the Carter Center in Sudan, Nigeria and Ethiopia suggests that direct survey costs (material, transportation, accommodation, food, data entry and data analysis) using the CRS design are on average US $ 2,500 per district surveyed. However, there is need to systematically collect and collate data on survey costs, including costs by key cost items, from different countries. These data will be important in informing survey planning in country programs.

The argument that rapid assessment techniques are cost saving is fallacious. Furthermore, rapid assessment provides samples that may result in imprecise estimates. In addition, population census data is not available in trachoma endemic settings, therefore use of sampling designs that require complete population census data (for instance ASTRA) are probably not practical. Whereas a census can be done to construct a sampling frame for the survey purposes, such an exercise substantially increases the total survey period and costs. Therefore the cluster random sample (CRS) design provides the best population-based method of surveying communities for trachoma prevalence.

Conclusions and recommendations

At present, 22 out of 55 trachoma endemic countries do not have reliable survey data. Surveys are essential for planning interventions in endemic countries currently not implementing the SAFE strategy and expansion of activities in countries partially implementing trachoma control

programs. In order to monitor reduction of disease, prevalence data collection needs to be consistent with uniform age and gender groups. Consistency of survey methods is essential to enable between survey comparability, allow rational program planning and equitable prioritisation at the global level and within national programs. To enable good program planning, there is a need to determine trachoma prevalence at least at the district-level with reasonable precision. Standardisation of survey methods will enhance the conduct of trachoma surveys and therefore accelerate mapping of endemic districts, planning of interventions, and realization of the GET 2020 objectives.

Cluster random sampling design has many advantages over rapids assessment designs (TRA and ASTRA). In addition, CRS can be designed to survey multiple indicators in a single survey. With the current global trend towards integration of disease control programs, survey designs need to cater for the assessment of multiple diseases that may be endemic within specific communities. Survey methods that accommodate multiple indicators are likely to enhance integration of disease control programs. Overall, disease specific survey designs will be a drawback since they will result in competition of the already scarce program resources. Therefore, further research is suggested to design sampling protocols that cater for multiple endemic diseases which may afflict a population concurrently.

USAID Grant for Integrated Control of Neglected Tropical Diseases

Presented by Amos Sam-Abbenyi, International Trachoma Initiative

On March 14, 2006 USAID issued a Request for Application for what they expect will be a total of $100 million over a five-year period for integrated control of neglected tropical diseases. The goal of the project is to develop and implement an effective and transferable health package model for the integration of delivery of chemotherapy against five neglected tropical diseases (NTD)—trachoma, schistosomiasis, soil-transmitted helminths, lymphatic filariasis and onchocerciasis. In doing this, an additional goal is to demonstrate that the integration of implementation into one recommended health package will enhance program effectiveness, reduce costs, enhance coverage and promote sustainability, thereby reducing the overall burden of disease.

After much negotiation and preparation of plans and documents, the International Trachoma Initiative (ITI) joined with other partners in a coordinated proposal. The members of the consortium are as follows:

- **Lead Agency:**
  - *Research Triangle Institute (RTI) International* - will provide grant management systems and oversight for the NTD project, and will establish and maintain the project's monitoring and evaluation and management information systems.
- **Partners:** These will provide technical expertise and support.
  - *Sabin Vaccine Institute*
  - *Liverpool Associates in Tropical Health*
- **Implementing Grantees:**
  - *The Schistosomiasis Control Initiative*
  - *International Trachoma Initiative*

Award

On July 10, 2006 the group received official notification from USAID that it had been awarded the grant, conditional upon successful contract negotiation. However, as of April 2007 only the first year of funding for this grant has been approved. Funding for subsequent years will be subject to the success of the implementation of the integrated neglected tropical disease control and approval of USAID fiscal year budgets.

Dual Strategy Project Implementation

- ***Direct, Fast-track Implementation***

Once core project staff are recruited and project financing and management systems are established, direct, fast-track implementation will start in five African countries: Burkina Faso, Ghana, Mali, Niger, and Uganda - pre-selected in consultation with WHO Geneva and AFRO because of the known high prevalence and co-endemicity of the target diseases and hence the extent of poly parasitism in these poor populations. We have the written

commitment of their governments at the highest levels to control NTDs and to integrate their control with malaria.

ITI will take the lead role for the project in Ghana and Mali, while the Schistosomiasis Control Initiative (SCI) will lead in Burkina Faso, Niger (with ITI support) and Uganda. In each country, ITI and SCI will engage other partners as appropriate, with the objective of bringing everyone together, utilising all available resources, consolidating all energies and avoiding duplication of effort.

- ***Second Phase Implementation*.**

Concurrently, ITI will establish a competitive grants program to allow for up to 12 additional countries to receive project support for subsequent years depending on available funding from USAID and other donors. Proposals will be solicited and reviewed by the Technical Advisory Board.

Management & Organization

- **Program Coordination:** This will be provided by prime contractor, RTI International supported by Liverpool Associates in Tropical Health (LATH) and Sabin Institute.
- **Project Director:** To be filled.
- **Technical Oversight Board (TOB):** This body will be responsible for the professional and financial oversight of the project and the allocation of all funds. Peter Hotez, MD PhD from Sabin Institute will serve as Executive Director of the Board and as Alternate Point of Contact for USAID.
- **Senior Advisors:** These include Professor David Molyneux; Dr. Jacob Kumaresan; Dr. Uche Amazigo Oncho; Dr. Lorenzo Savioli; and Dr. Paul Sikosana.
- **Project Management Staff:** Regional Operations Managers for Africa**,** Latin America and Asia. Additional financial, monitoring and grant management staff will be housed at RTI.

Updates

- ITI and SCI have hired staff at headquarters and in-country
- Stakeholder meetings took place in all the countries
- A detailed work plan and budget for 2007 was developed

Next Steps

- Program implementation scheduled for April/May, and June 2007
- RTI and partners will solicit membership for the TOB and hold the first meeting
- Request for Applications from RTI seeking for additional countries

Monitoring Drug Distribution: ***What are we doing?***

Presented by Jonathan King, The Carter Center

Monitoring the distribution of antibiotics in trachoma control programs is essential to ensure that all eligible populations are treated. Program managers need to determine whether antibiotics reach the intended populations and if the intended populations accept treatment. In addition, monitoring enables appropriate management of antibiotics to minimize waste and reduce the potential for drug resistance.

Trachoma control programs are recommended to provide mass antibiotic treatment annually for at least three years to all areas where prevalence of trachomatous inflammation follicular (TF) in children aged 1-9 years is greater than or equal to 10%.[1] Coverage is a common indicator of mass distribution. Programs should aim to achieve 100% geographical coverage and at least 80% drug coverage. These indicators can be defined as the following:

- *Geographical coverage* – proportion of the total areas eligible for mass antibiotic treatment that actually receive treatment. Example: 28 districts in 3 regions are eligible for "A" (≥10% TF) but antibiotics are being distributed only in 19 districts. Geographical coverage =(19/28)=67.9%

- *Drug coverage* – proportion of the total population that are treated with antibiotics. Example: The total population registered during the census of one district was 112,220. During the antibiotic distribution, 97,540 people were treated based on all reports received from supervisors. Drug coverage for this district =(97,540 / 112,220)=86.9%

Treatment registers and reports are tools that can be used to help us monitor coverage. Treatment registers are essentially a community census taken prior to the first distribution that must include all residents in the community, including nomadic ethnic groups that may not be considered a part of villages. A sheet for each household is included in the register that records information such as the head of household name plus the name, birth date, and gender of each individual household resident. Registers should include the number of tablets, ml suspension, or number of tetracycline tubes given to each individual. The reason for not being treated may be recorded in registers. Other programs such as lymphatic filariasis (LF) may have existing community registers that could be used to create, update or even integrate registers for trachoma antibiotic distribution.

Reports or tally sheets are used to count the total number of people treated, amount of antibiotics used and amount remaining. The distribution teams should submit the registers to supervisors along with any remaining antibiotics. Supervisors can then fill out reports using the information in the treatment registers and then submit the reports to district program coordinators. Trachoma control program coordinators gather all reports and submit a district report that includes geographic coverage and drug coverage; the total population registered in the community census; the number of persons treated with

azithromycin and tetracycline; the quantity of antibiotic used, discarded and returned; plus any reports of severe adverse events.

Severe adverse events (SAE) surveillance is crucial to any mass drug distribution campaign. A severe adverse event can be defined as any event perceived to be due to mass drug treatment that results in death or hospitalization or requires significant medical attention. Adverse events associated with azithromycin or tetracycline eye ointment are very rare. However, communities should be sensitized to potential adverse events that may occur with ingestion of antibiotics and instructed what to do if a severe adverse event is experienced. Likewise primary care facilities should be informed to notify district program coordinators of any suspect SAE. Trachoma control programs may consider creating SAE reporting forms for district coordinators. Any SAE report should be sent immediately to the national program. Both district and national programs should investigate rapidly and manage all SAE reports. This is extremely important for trachoma programs integrating with other drug distribution campaigns.

In addition to providing overall coverage estimates, the data in treatment registers and reports may be analyzed to determine drug coverage by groups. A simple analysis of frequencies can determine differences in coverage or SAEs between gender, age group, districts and urban or rural localities. Program managers should investigate any differences found in the analysis to identify and manage problems with drug logistics, distribution, community sensitization and non-compliance.

Table 1 provides an overview of what some other programs do to monitor drug distribution. Each program has coverage indicators and different coverage goals. The schistosomiasis (Schisto) and soil transmitted helminths (STH) programs have different target populations based on the prevalence and intensity of infections in the community. All programs use reports and the LF and Onchocerciasis (Oncho) programs use community treatment registers to calculate coverage indicators. In addition, the LF and Oncho programs conduct additional independent assessments to monitor drug coverage.

Two examples of independent assessments are treatment register cross checks and coverage surveys. Cross checks may be done by reviewing, in detail, a random sample of treatment registers. The exercise allows an estimate of drug coverage to be compared to the reported drug coverage. Also, cross checks provide an opportunity to analyze treatment by age and gender and to identify potential non-compliant groups. Cross checks should take minimal time away from implementation activities and can be done once per district preferably after the first year of antibiotic distribution. The LF program places high priority on coverage surveys. The recommended methodology is to conduct a randomized, population-based cluster survey. Treatment history is taken in a census of residents in selected households to provide an independent estimate of drug coverage. In addition, the survey provides an opportunity to identify detailed information about compliance through structured interviews with at least one randomly selected resident per household.

National trachoma programs should be able to answer the following question: Are we monitoring "A" as best as we can? The answer is yes if programs are using registers, reporting coverage, assessing coverage independently, managing antibiotic stock, and conducting SAE surveillance.

Table 1: What other programs do to monitor drug distribution

	LF	Oncho	Schisto/STH
Distribute Drugs	Yearly for at least 5 years	Yearly, indefinitely	Based on prevalence and intensity
Coverage Indicators	Geographic coverage % treated / total pop % treated / eligible pop	Geographic coverage % treated / total pop Annual Treatment Objectives	% treated / target p
Goal	80% total pop 100% eligible pop	65%	>75% school aged
Coverage Source	Registers & Reports Household surveys	Registers & Reports Independent Monitoring	Program reports
Other indicators	# Adverse Events Drug logistics	# Adverse Events Drug logistics	# Adverse Events Drug logistics

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Trachoma Amelioration in Northern Amhara (TANA) Study Update

Presented by Jenafir House and Kevin Hong, The Francis I. Proctor Foundation, University of California, San Francisco

The purpose of the TANA study is to investigate the role of antibiotics and latrine construction in trachoma control for hyper-endemic areas such as the Amhara region of Ethiopia. This study is made possible through a partnership between The Carter Center, the Proctor Foundation at UCSF, and the Amhara Regional State Health Bureau. The study is being conducted in Goncha Sesso Enesie District in the northern Amhara Region of Ethiopia.

Study Team

The study activities are conducted by the TANA team, consisting of 10-15 local health extension workers, nurses and health professionals recruited from the Goncha area through the help of the Health Bureau. The team is offered extensive training and support from the Proctor Foundation and Carter Center staff in grading, swab collection and treatment.

Study Design

The TANA study has three main research aims and one ancillary aim:

1. To study the optimal frequency of mass antibiotic distribution:
The WHO recommends annual treatments of communities. However, the previous study conducted by the Proctor Foundation has shown that biannual distribution of azithromycin might be more effective in eliminating ocular infection at the local level. We will compare communities receiving annual treatments (Arm A) and those with biannual treatments (Arm B).

2. To investigate the possible protective effect of treating children only:
Most ocular infections are found in children between 1 to 5 years of age and most adults do not harbor infection even though they have signs of disease. The current WHO recommendation is treatment of all ages in the entire community. We are attempting to see if treating only children has a protective effect on the entire population. In Arm C, only children are treated, and to prove the concept they are to be treated every three months for one year. Arm C will be compared to Arm D which will receive treatment at one year.

3. To study the effect of latrines on vector control:
We will study how intensive promotion of latrine construction and use will affect the rate at which ocular infection returns to a community after mass antibiotic distribution. Communities in Arm F will receive baseline treatment with no further interventions. Communities in Arm G will receive baseline treatment with intensive latrine construction and promotion on latrine use.

The ancillary aim is to study the impact of community-wide distribution of antibiotics on 1) infant mortality and 2) antimicrobial resistance.

Study Definitions:
Active trachoma: either TF or TI
Adults: individuals 10 years of age or older
Children: individuals younger than 10 years old

Study Progress and Baseline Results

The TANA study team has successfully completed the baseline, 3-month, 6-month and 9-month study visits. During the baseline visit in June 2006, the team examined and collected PCR swabs from 3,000 children and 2,869 adults and offered treatment for 31,082 children and 48,169 adults. Clinical exam results showed a high level of active trachoma in children, ranging from 61.5% to 83.9% average prevalence in all the study communities evaluated in each arm. PCR exam results also revealed a high level of infection in children, ranging from 36.7% to 48.5% average prevalence in all the communities in each arm. Average treatment coverage for the baseline ranged from 92.1% to 96.6% in children and from 88.9% to 96.6% in adults.

Further results for the first year of the study will be available in the coming months.

Is Access to SAFE Equal for Men and Women?

Paul Courtright, Kilimanjaro Centre for Community Ophthalmology

Survey data consistently show that trachoma-related blindness is two to four times higher in women compared to men. Tracing the excess of the burden of trachoma borne by women back through the life-course of trachoma is less convincing. Understanding the reasons for the excess burden of trachoma in girls and women requires examination of a number of issues related to biologic and gender-roles that explain the excess risk of trachoma and its consequences. There has been minimal evidence generated to assess gender equity in access to various aspects of the SAFE strategy.

Women bear the greatest burden of trichiasis and therefore should account for between two-thirds to three-quarters of all surgical cases. Evidence from cross-sectional surveys of trichiasis surgical coverage has generally suggested that women are more likely to remain with uncorrected trichiasis. The barriers that prevent women from using eye care services are generally different than the barriers that prevent men. Follow up studies, few in number, suggest that utilization rates can be equal provided that there are community-based strategies linking communities to health providers. Although information on gender of surgical cases is routinely recorded, this information is generally not compiled, rendering assessment of sex-specific coverage of routine surgical services impossible.

Understanding access to antibiotics is less straightforward, as it depends upon a number of factors, including distribution modality and culture and religion constructed gender roles. The absence of coverage data reporting by sex limits our ability to assess access. The widely held supposition that poor antibiotic coverage is due to providers rather than the recipients should be questioned. It is likely that the most marginalized in the community will be those least likely to have access to antibiotics, even when provided free of charge. Evidence from willingness to pay studies supports this hypothesis.

Understanding access to facial cleanliness and environmental improvements requires an in-depth appreciation of societal gender roles which includes understanding decision making at community and household levels, how behavioral changes happen at the community level, and gender roles that either enable or disable behavioral change. In Africa, mothers are responsible for ensuring facial cleanliness but, in settings where water is scarce, often do not have the authority to decide how water is used in the household. Health education messages and strategies addressed at facial cleanliness and environmental improvements sometimes fail because the messages are not addressed to the right audience or that the media used are inappropriate for the audience or message. As men and women acquire information differently, single health education strategies are insufficient for health education needs.

In summary, while there is a need to generate additional information, all indications are that there are gender differences in access to the SAFE strategy. Improved data collection, disaggregating data by sex, and further operational research would assist to improve access to the SAFE strategy in trachoma-endemic communities.

Integration of Malaria and Trachoma Control Efforts: the MALTRA Experience from Ethiopia

Presented by Estifanos Biru, The Carter Center Ethiopia

Background

The Carter Center has played a pioneering role in the prevention and control of trachoma in Ethiopia. From 2001 through 2006, the trachoma control program, assisted by the Lions-Carter Center SightFirst Initiative, was implemented in 19 districts in the Amhara region of Ethiopia. As of September 2006, The Carter Center scaled up its interventions and initiated an integrated malaria and trachoma control program (MALTRA) in the entire Amhara region—in 10 zones and 146 woredas (districts).

The Rationale for an Integrated Approach

The launch of MALTRA was based on the following merits:

i. Malaria is a leading cause of outpatient consultations, hospital admissions and hospital deaths in Ethiopia. From 2001-2005, malaria accounted for 22-44% of all outpatient consultations, 10-23% of total admissions and 15-30% of inpatient deaths.
ii. Trachoma is among the major health problems in the region and causes serious devastation and huge socio-economic burden on affected communities.
iii. There is significant geographic overlap between malaria and trachoma in the region.
iv. Lessons could be drawn from the implementation of the trachoma control program to better plan community-centered interventions against malaria.
v. Integration with malaria would increase attention and resources to effectively tackle trachoma and scale up its interventions.
vi. As such, an integrated approach will result in a rapid impact package that will be of significant benefit to those who suffer from both infections.

Cognizant of these facts, the Ethiopian Minister of Health made an explicit request in February 2006 for The Carter Center's involvement in malaria control. Four months later, The Carter Center's Board of Trustees approved the request to scale-up the trachoma control program region-wide and to integrate it with malaria control efforts. As of September 2006, the integrated malaria and trachoma control program (MALTRA) was launched in Amhara region. Meanwhile, an integrated malaria and onchocerciasis control program (MALONCHO) was launched in Southern Nations, Nationalities and Peoples' region and Oromiya region.

The overall goal of the MALTRA project is to achieve 50% reduction of malaria burden (morbidity and mortality) through achieving 100% long lasting insecticidal net (LLIN) coverage by means of distributing at least two LLINs per household, and reduce the prevalence and severity of active trachoma by 80% with consequent elimination of blindness attributable to trachoma.

Strategies

The main strategies of the MALTRA project include:

i. Implementing the full package of SAFE strategy- Surgery to correct advanced stages of the disease**;** Antibiotics (azithromycin, tetracycline eye ointment) to treat active infection; Face washing to prevent disease transmission; and Environmental change to increase access to clean water and improved sanitation

ii. Selective vector control for malaria prevention-provision of three million LLINs, of which 1.26 million go to the MALTRA project areas. Health service extension workers and community volunteers play a key role in the distribution of LLINs and health education.

iii. Supporting monitoring and evaluation activities through epidemiological surveys and assessments, operational studies, and technical assistance for developing monitoring and evaluation tools in line with the national guidelines.

iv. Advocacy, communication and social mobilization through sensitization and advocacy meetings to ensure active involvement of both government and non-governmental partners and to introduce the concept and goals of MALTRA; technical assistance for production and distribution of training and health education materials; training of trainers on effective communication; and community-based health education on both malaria and trachoma.

Activities Underway

In addition to the regional MALTRA coordination office located in Bahir Dar, eight zonal project coordinators were assigned to provide technical and logistic support to the respective zonal health departments. A sub-regional office opened in Dessie town will coordinate activities in the five eastern zones of the region.

Three million LLINs, 1.26 million of which in MALTRA project areas, have already been procured and delivered to the respective zonal health departments. Of these, 1.11 million nets have now reached the households. As a result, The Carter Center's contribution was the largest share of LLINs provided in 2007 from five different sources.

Another major task accomplished is the malaria and trachoma baseline survey. In Amhara region, the survey was conducted in 160 clusters involving 4,122 households. During this survey, all household members were examined for signs of trachoma and 8,110 individuals were tested for the malaria parasite in their blood through rapid diagnostic test and slide microscopy. Information was gathered at the household level regarding malaria and trachoma risk indicators and availability and utilization of LLINs. GPS coordinates (altitude, latitude, longitude) were recorded for each household.

Preliminary results of the survey indicate that 22.4% of the households had at least one LLIN, and 4.2% of blood slides examined under microscopy were positive for malaria parasites. It was found that 33.4% of children 1-9 years had trachomatous inflammation follicular (TF) and 5.4% of adults ≥15 years had trachomatous trichiasis (TT).

The Way Forward

- Finalizing baseline trachoma and malaria prevalence survey: analysis and dissemination of results
- Supporting the distribution of LLINs to the household level
- IEC material development
- Training of health workers and community leaders
- Assessing barriers to utilization of malaria intervention services and acting jointly to solve the barriers
- Follow-up LLIN coverage and utilization survey

Campaign SightFirst II

Presented by Philip Albano, Lions Clubs International Foundation, and Tebebe Y. Berhan, Lions Club District 411A, Ethiopia

Campaign SightFirst II (CSF II) is a worldwide fundraising effort undertaken by Lions Clubs International Foundation (LCIF) to re-fund SightFirst, the foundation's global blindness prevention program. The goal of CSF II is to raise US $150 million, which will support LCIF's trachoma, cataract and onchocerciasis efforts, as well as enable LCIF to become active in new areas of blindness prevention like refractive error, childhood blindness and diabetic retinopathy. A "stretch" amount of US $50 million is also being sought for CSF II, making the total campaign goal US $200 million. Funds raised over US $150 million will support programs that serve the blind and promote operational research. As of April 2007, a total of US $81 million in cash or pledges had been raised. The campaign is scheduled to end at the Lions international convention in July 2008, though funds will be received well after that date.

SightFirst is a Lions blindness prevention effort, one that raises its funds from the 1.3 million Lions members around the world. SightFirst is currently undergoing a long range planning process. One of the two issues being discussed at present includes a SightFirst spending plan which could establish a target amount available each year for SightFirst projects. The second is a draft plan of action where SightFirst would focus future trachoma program resources on the surgical aspects of the SAFE strategy. Proposals for the other components may be eligible for consideration, but only on a case-by-case basis.

Reliability Studies for Trachoma Graders and Questionnaires

Presented by Jeremiah Ngondi, Carter Center Technical Advisor

Standardization of trachoma graders

Before undertaking any trachoma surveys, it is important to know that all examiners are using the WHO simplified grading system in a consistent manner. Evaluation of grader reliability is an essential step and must be taken before any epidemiological survey on trachoma. The reliability study ensures that the examiners are always grading trachoma in a proper way and that their observations are consistent.

Setting up a reliability study

In the initial training of potential examiners, reliability can be tested using the WHO set of photographs of trachoma signs. In this case, potential examiners are allowed to grade trachoma signs presented on photographs and record their diagnoses on a pre-printed form. At the end of the exercise, grading of photographs by examiners is compared with the standard diagnoses that have already been determined by WHO for each photograph. However, testing reliability using photographs should not replace reliability testing using a sample of people.

The easiest way to check for reliability of all examiners is to make everyone grade trachoma on the same subjects. At the end of a series of examinations, a tally can be made of these grades and the extent to which the results agree. No individual trachoma grade alters between examinations on the same day, so discrepancies must be due to differences in the way the examiners are grading.

The senior examiner should select a total of 50 people, including both children and adults. Some of these would have the various signs of trachoma, while others would have no signs of the disease. It is usually easy to find cases of TF and/ or TS to organize this kind of evaluation, although other signs (TI, TT, and CO) may not be sufficiently numerous in a group for inclusion in a reliability study. TT and CO are easy to diagnose and may be excluded from formal reliability studies. The sample should include at least 15 to 20 people presenting with the sign in question, so that analysis of agreement can have some value. Everyone in the sample of people should be given an identification number written on a card to be shown to the examiner.

The senior examiner and each potential examiner should examine independently all people in the sample and record findings for each person in a pre-printed form. At the end of the exercise, each trachoma examiner will have a completed form with all persons in the sample individually and independently graded. Ideally each examiner should be in agreement with the senior examiner and, therefore, with the others in the grading.

Calculating interobserver reliability

Percentage interobserver agreement is a quick and simple way of testing observer variability. If there is a need for more detailed analysis, such as a Kappa statistic, a statistician should be consulted.

The table below presents the basis for calculating percentage of interobserver agreement. In this matrix, '1' represents sign present and '0' represents sign absent. The observation by the potential examiner and the senior examiner (gold standard) can be summarised into a 2x2 contingency table with cells A and B representing agreement and cells B and C representing disagreement. N is the total number of people included in the sample which should equal A+B+C+D.

Interobserver agreement is calculated as: (A+B)/N x 100; and is reported as a percentage. For a reliable grading system, the minimum acceptable interobserver agreement is 80% or greater, while interobserver agreement of 90% or greater is ideal. If, however, the percentage is lower, it is necessary to see where the problems lie by looking at disagreements which may arise as a result of failure of the potential examiner to recognize signs (underscoring - cell C) or mistaken recognition of the sign by the potential examiner (over-scoring – cell B).

Sign (e.g. TF)		'Gold standard' (senior examiner or photograph)	
		1	**0**
Potential Examiner	**1**	A (1,1)	B (0,1)
	0	C (1,0)	D (0,0)
			N

A simple spreadsheet has been developed in MS Excel for calculating interobserver agreement. The observations by the senior examiner "gold standard" are entered in the specified worksheet. Worksheets can then be created to enter the grading for each potential examiner. The worksheet automatically calculates the interobserver agreement for each trachoma sign. This tool is available from the Trachoma Control Program at The Carter Center (trachoma@emory.edu).

Back translation of questionnaires

In conducting trachoma surveys, often questionnaires have to be translated from one language to another. Back translation is a simple method that can be used to improve questionnaire reliability and validity. It involves three steps, two independent translators and a third person to compare the translations. The independent translators must be familiar with both the original language and the target language and must not have seen the original questionnaire prior to the translation exercise.

In the first step, one translator translates the questionnaire from the original language to the target language. In step two, the second translator translates the questionnaire from the target language back to the original language. Finally, the back-translated version is compared with the original questionnaire for consistency by a third person.

The back-translated questionnaire should be revised if there are any inconsistencies and used for training interviewers. Pilot testing of questionnaires also helps in standardising interviews before the actual survey. Whenever possible, questionnaires should be printed in the target language after back-translation.

APPENDIX I: The Disease

Trachoma is the world's leading cause of preventable blindness. The World Health Organization estimates that 6 million people are blind due to trachoma, most of whom are women, and another 540 million – almost 10 percent of the world's population – are at risk of blindness or severe visual impairment. Trachoma is caused by repeated infections of the conjunctiva (the lining of the eye and eyelid) by the bacterium *Chlamydia trachomatis*, and can be prevented through simple hygiene practices. Most cases occur in rural, arid areas of developing countries, such as the Sahelian region of Africa, where access to clean water is limited.

The early stage of the disease is called *inflammatory trachoma*, and is most common among children. Inflammatory trachoma can present as either the formation of whitish follicles on the conjunctiva under the upper lid or around the cornea, or as an intense uncomfortable inflammation with thickening of the conjunctiva and pain. Repeated cycles of infection and resolution lead to the formation of scar tissue on the conjunctiva. Women are repeatedly exposed to inflammatory trachoma in their role as primary caretakers of children. It is therefore not surprising to find that women develop chronic trachoma two to three times more often than men. Trachoma is transmitted through discharge from the eyes and nose of infected individuals, which may be passed to others on hands, towels and clothing, or by flies, which are attracted to ocular and nasal discharges. As a trachoma patient's eyelids are repeatedly infected with chlamydia, subsequent scarring of the conjunctiva deforms the eyelid margin, resulting in eyelashes turning inward and rubbing against the cornea. This condition, called *trichiasis*, causes disabling pain and physically abrades the cornea, scratching it and introducing other infections. Trichiasis is horrific in itself, but also rapidly leads to blindness.

Recent developments have brought new hope that we can effectively control this disease. In 1987, eye care experts and the World Health Organization (WHO) developed a simplified trachoma grading scale, which facilitated and standardized the diagnosis and identification of all stages of trachoma. In 1996, WHO established the GET2020 Alliance, which brings international non-governmental development organizations, donors and researchers together to work collectively in controlling trachoma. In addition, with support from the Edna McConnell Clark Foundation (EMCF) and WHO, the *SAFE strategy* was created to control trachoma through community-based interventions.

Another important development was the finding that the oral antibiotic *azithromycin*, taken once or twice annually, is as effective in preventing chronic trachoma as six weeks of daily treatment with tetracycline eye ointment, the previously recommended therapy. To assist ministries of health in implementing the "A" component of the SAFE strategy, the International Trachoma Initiative (ITI), formed through the collaboration of EMCF and Pfizer Inc, is managing a significant donation of Zithromax® (azithromycin) for treatment of trachoma in selected endemic countries. Pfizer's donation of azithromycin is the largest donation of patented pharmaceutical in history, and the existence of the donation program has served to invigorate trachoma programs.

Appendix II: Program Agenda
Ten years after the launch of GET 2020: Where are we now?
8th Annual Trachoma Control Program Review
April 16-18, 2007

Monday, April 16

7:30	***Shuttle Pick-up at Hotel***	
8:00 – 8:30	Breakfast	
8:30 – 9:00	Welcome and Introductory Remarks Participant Introductions	Dr. Donald Hopkins Dr. Paul Emerson

F & E Components of the SAFE Strategy

9:00 – 9:40	Sudan (GoS) presentation and discussion	Dr. Awad Hassan
9:40 – 10:20	South Sudan (GoSS) presentation and discussion	Mr. Ben Lopidia
10:20 – 10:50	Group Photo and Coffee Break	
10:50 – 11:30	Ethiopia presentation and discussion	Mr. Mulat Zerihun
11:30 – 12:10	Niger presentation and discussion	Dr. Kadri Boubacar
12:10 – 12:50	Mali presentation and discussion	Mr. Yaya Kamissoko
12:50 – 2:00	Lunch	

Special Sessions

2:00 – 2:30	Evaluation of Latrine Promotion in Ghana	Ms. Ann Rodgers
2:30 – 3:00	Effect of latrine promotion on local production of latrines in Niger and Mali	Ms. Lisa Rotondo
3:00 – 3:30	Coffee Break	
3:30 – 4:00	Clean Face Study	Mr. Jonathan King
4:00 – 4:30	Cost, progress towards goals and sustainability of latrine promotion for trachoma control	Dr. Paul Emerson
4:30 – 5:00	Trachoma Health Education Materials Library	Ms. Elizabeth Cromwell
5:30	***Shuttle Departure for Hotel***	

Appendix II: Program Agenda
Ten years after the launch of GET 2020: Where are we now?
8th Annual Trachoma Control Program Review
April 16-18, 2007

Tuesday, April 17

7:30	***Shuttle Pick-up at Hotel***	
8:00 – 8:30	Breakfast	
	F & E Country Presentations (Continued)	
8:30 – 9:10	Nigeria presentation and discussion	Dr. Omobolanle Olowu
9:10 – 9:50	Ghana presentation and discussion	Dr. Oscar Debrah
	S & A Components of the SAFE Strategy	
9:50 – 10:30	Sudan (GoS) presentation and discussion	Dr. Awad Hassan
10:30 – 10:50	Coffee Break	
10:50 – 11:30	South Sudan (GoSS) presentation and discussion	Mr. Ben Lopidia
11:30 – 12:10	Ethiopia presentation and discussion	Dr. Asrat Genet
	Special Sessions	
12:10 – 12:40	Comparison of Trachoma Prevalence Survey Methods	Dr. Jeremiah Ngondi
12:40 – 2:00	Neglected Tropical Diseases Coalition Update	Dr. Amos Sam-Abbenyi
2:00 – 2:30	Lunch	
2:30 – 3:00	Monitoring and Evaluation of Drug Distribution	Mr. Jonathan King
3:00 – 3:30	TANA Study Update from Ethiopia	Ms. Jenafir House/ Mr. Kevin Hong
3:30 – 4:00	Coffee Break	
4:00 – 5:00	Is Access to SAFE Equal for Women and Men?	Dr. Paul Courtright
5:30	***Shuttle Departure for Hotel***	

Appendix II: Program Agenda
Ten years after the launch of GET 2020: Where are we now?
8th Annual Trachoma Control Program Review
April 16-18, 2007

Wednesday, April 18

7:30	***Shuttle Pick-up at Hotel***	
8:00 – 8:30	Breakfast	

S & A Country Presentations (Continued)

8:30 – 9:10	Niger presentation and discussion	Dr. Kadri Boubacar
9:10 – 9:50	Mali presentation and discussion	Mr. Yaya Kamissoko
9:50 – 10:30	Nigeria presentation and discussion	Dr. Omobolanle Olowu
10:30 – 11:00	Coffee	
11:00 – 11:40	Ghana presentation and discussion	Dr. Oscar Debrah

Special Sessions

11:40 – 12:10	Integration of Malaria & Trachoma: The MALTRA Experience from Ethiopia	Dr. Estifanos Biru
12:10 – 12:40	Sight First II and Lions in Ethiopia	Mr. Philip Albano
12:40 – 2:00	Lunch and Self-Guided Tours of Carter Center Museum	
2:00 – 2:30	Survey Updates	
2:30 – 3:00	Training and Standards for Trachoma Graders	Dr. Jeremiah Ngondi
3:00 – 3:30	Conclusions and Reflections	Dr. Paul Emerson Dr. Donald Hopkins
4:00	***Shuttle Departure for Hotel***	
6:30	***Shuttle Departure for Eclipse di Luna***	
7:00	**Dinner at Eclipse di Luna**	

Appendix III: List of Participants

Ethiopia
Dr. Estifanos Biru (The Carter Center)
Dr. Asrat Genet
Mr. Mulat Zerihun (The Carter Center)

Ghana
Dr. Oscar Debrah
Mr. Jim Niquette (The Carter Center)
Mr. Ibrahim Yussif (The Carter Center)

Government of Sudan
Mr. Miles Kemplay (The Carter Center)
Dr. Kamal Hashim
Dr. Awad Hassan

Government of South Sudan
Mr. Steven Becknell (The Carter Center)
Mr. Ben Lopidia (The Carter Center)

Mali
Mr. Yaya Kamissoko (The Carter Center)
Mr. Jim Ting (The Carter Center)

Niger
Mr. Ali Amadou (The Carter Center)
Dr. Kadri Boubacar
Mr. Mohamed Salissou Kane (The Carter Center)

Nigeria
Dr. Nimzing Jip (The Carter Center)
Dr. Emmanuel Miri (The Carter Center)
Dr. Omobolanle Olowu

Cambridge University
Dr. Jeremiah Ngondi

Conrad N. Hilton Foundation
Ms. Jennifer Lieberstein

Emory University
Dr. Dieudonné Sankara

Francis I. Proctor Foundation
Mr. Kevin Hong
Ms. Jenafir House

Helen Keller International
Ms. Maki Suzuki
Dr. Danny Haddad

International Trachoma Initiative
Dr. Amos Sam-Abbenyi
Ms. Susanna Joy Smith

Kilimanjaro Centre for Community Ophthalmology
Dr. Paul Courtright

Lions Clubs International Foundation
Mr. Philip Albano
Mr. Jim Ervin

Lions Clubs-Ethiopia
Dr. Tebebe Yemane Berhan

Pfizer Inc
Ms. Heather Lauver

Sight Savers International
Mrs. Catherine Cross

Water Advocates
John Oldfield

World Vision
Dr. Joseph Riverson de Graft

The Carter Center
Ms. Rebecca Brookshire
Ms. Kelly Callahan
Ms. Elizabeth Cromwell
Dr. Paul Emerson
Ms. Maureen Goodman
Dr. Patricia Graves
Dr. John Hardman
Ms. Madelle Hatch
Dr. Donald Hopkins
Ms. Nicole Kruse
Mr. Jonathan King
Mr. Aryc Mosher
Dr. Frank Richards
Ms. Ann Rodgers
Ms. Lisa Rotondo
Dr. Ernesto Ruiz-Tiben
Mr. Craig Withers