

EYE of the EAGLE



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Three Ugandan women fetch water for their households. Cumulatively, more than 6 million people are no longer at risk for river blindness in Uganda. (Photo: Edward Echwalu)

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IACO 2023 Seeks Innovative Solutions for Transmission Zone

KEY TAKEAWAYS

- Indigenous health agents assisted with 93% of treatments in the Venezuelan portion of the Yanomami Focus Area.
- An educational video was adapted to accommodate cultural differences among five subgroups in the Yanomami area.
- Brazil and Venezuela presented plans to address communities with positive serology survey results.
- Below-target treatment coverage in some areas resulted from logistical challenges, insecurity, and illegal mining.

The Carter Center's regional initiative, the Onchocerciasis Elimination Program for the Americas (OEPA), hosted the 33rd InterAmerican Conference on Onchocerciasis (IACO) Nov. 8-9, 2023, in Antigua, Guatemala.

Sessions centered on the last transmission area in the region, which spans the border of Brazil and Venezuela in the Amazon Rainforest and is called the Yanomami Focus Area for the predominant nomadic indigenous group living there. About 38,000 people are at risk, comprising 667 communities across about 200,000 square kilometers. That's an average of just 57 people per community and one community per 300 square kilometers of jungle.



Yanomami women in a focus group in Mavaca community, Venezuela, watch a health education video developed with their communities in mind; they were then asked for feedback on the health messages shown.

These remote communities frequently relocate, and conflicts exist both between communities and with illegal mining operations. These factors are the major reason the Yanomami area is the final frontier for onchocerciasis elimination in the Americas. OEPA supports high-coverage mass drug administration with Mectizan® (donated by Merck & Co. Inc., Rahway, New Jersey, USA), as well as novel strategies to augment mass drug administration.

Venezuela reported strong involvement of indigenous health agents—community members who are now an essential part of the health teams that serve the Venezuela side of the Yanomami area. With program support, they provide treatment to their own and nearby communities; these agents assist with 93% of treatments in Venezuela. OEPA is exploring advocacy avenues in Brazil for similar indigenous health agent empowerment; currently the agents in Brazil can assist health teams but not offer treatment themselves.

IACO attendees were captivated by an OEPA

study that equips health workers in Venezuela with smartphones or tablets containing content to assist in their work. A keystone of this effort is an educational video on onchocerciasis, developed in consultation with two anthropologists who work with the indigenous populations of the Amazon Rainforest. Community members from five subgroups in the Yanomami area evaluated the video, and five versions were created with cultural nuances reflecting each subgroup. Conference attendees recommended that characters in the video should be utilized for other health issues vital to the people of the region, such as malaria prevention and treatment; The Carter Center is exploring avenues to support this idea.

Brazil and Venezuela presented results of a recent serological survey in children ages 1-9 years and entomological assessments. Brazil shared the positive impact of increased monitoring by field supervisors, as well as an analysis of historical data that could explain surprising serology results in some communities with a history of high-coverage treatment. In Venezuela, persistent community seropositivity was likewise associated with historically irregular high-coverage treatment rounds. Both countries presented plans to further examine and address communities that have positive cases.

Venezuela reported provisional treatment coverage of 81%, 90%, and 92%, respectively, for the first three treatment rounds in 2023 in areas targeted for quarterly treatments. In communities with semiannual treatment, first-round coverage was 86%. Brazil, where all endemic areas are treated semiannually, reported 63% provisional coverage in Round 1. Coverage below the 85% target was attributed to logistical challenges, insecurity in some communities,

closure of four health posts due to illegal mining activities, and the need for increased supervision.

IACO was preceded by a one-day meeting of the OEPA Program Coordinating Committee, the advisory committee composed of country staff

and experts, which evaluates technical progress of the national programs and makes recommendations.

The coordinating committee and IACO were pleased to host representatives from the U.S. Agency for International Development and

Mectizan Donation Program. The meetings commended the U.S. Agency for International Development, Merck & Co., Inc., the Lions Clubs International Foundation, and local Lions Clubs of the endemic and formerly endemic countries for their ongoing support. **E**

15 Ugandan Foci Have Eliminated River Blindness

KEY TAKEAWAY

The seven districts of lower Madi Mid-North focus achieved the largest halt of mass treatment for river blindness in Uganda’s history.

The 16th Uganda Onchocerciasis Elimination Expert Advisory Committee (UOEEAC) met Aug. 9–10, 2023, in Kampala. The committee provides scientific and technical recommendations to the Ugandan Ministry of Health to eliminate the transmission of river blindness in the country.

The key outcome was that the seven districts of the lower Madi Mid-North focus, population 1,121,520, met World Health Organization criteria to stop mass drug administration of ivermectin (Mectizan,® donated by Merck & Co., Inc., Rahway, New Jersey, USA). This represents the single largest stop-treatment event in Uganda’s program history.

The Maracha-Terego focus, population 225,087, which was provisionally reclassified as “transmission interrupted” in 2022, was also officially reclassified after follow-up PCR testing confirmed that seven Ov16 antibody-positive children showed no signs of active parasite infection. In total, 1,346,607 people were removed from Mectizan treatment in 2023.

Additionally, the Nyagak-Bondo focus was reclassified as “transmission eliminated” after completing

post-treatment surveillance. The recommendation was made after Nyagak-Bondo documented the continued absence of infective black flies and Ov16 antiparasite antibody prevalence significantly less than 0.1% in children under 10 years of age at least three years after stopping mass drug administration. This means that 15 (88%) of the 17 original transmission foci in the country have now achieved transmission elimination status (see Figure 1). Cumulatively, 6,149,559 people are no longer at risk.

Only five districts of the upper Madi Mid-North focus and the Lhubiriha focus remain under mass drug administration. Transmission is

suspected to be interrupted in these areas, but they border the Democratic Republic of the Congo and South Sudan, respectively. The committee wants greater evidence that transmission is interrupted on both sides of the border before recommending mass drug administration be halted. Representatives from the two countries attended the meeting, marking continued strengthening of international coordination.

The Carter Center’s work in Uganda is supported by the U.S. Agency for International Development’s Act to End NTDs | East Program, led by RTI International, The ELMA Foundation, and many other generous donors. **E**

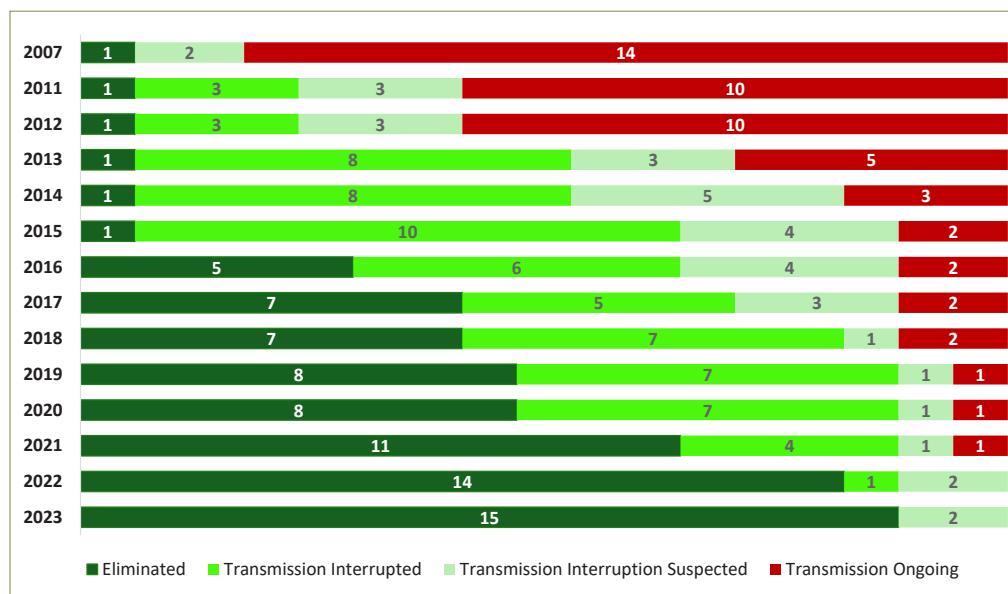


Figure 1. Progress of river blindness elimination in Uganda by number of foci, 2007–2023.

Note: Although seven districts in lower Madi Mid-North were reclassified as “transmission interrupted,” the focus will only be moved to that category when all districts have halted mass drug administration.

Nigeria Meeting Documents Progress; States Reclassified

KEY TAKEAWAY

Transmission status for three Nigerian states has been reclassified to reflect progress toward river onchocerciasis elimination.

Organized by the Federal Ministry of Health with support from The Carter Center, Nigeria’s National Onchocerciasis Elimination Committee (NOEC) convened its 17th meeting Dec. 6–8, 2023, in Abuja.

The meeting opened with a moment of silence to honor the recent passing of Christopher Ogoshi of Christoffel Blinden Mission and Rosalynn Carter, former first lady and co-founder of the Carter Center. “May the legacy she left behind continue to speak for her,” NOEC Chair B.E.B.

Nwoke said of Mrs. Carter.

The meeting recorded continued steps toward onchocerciasis elimination, with Oyo state reclassified as “transmission interrupted” pending follow-up testing from recent epidemiological surveys. If absence of infection is confirmed, then 8.5 million people in Oyo will qualify to stop treatment with Mectizan,[®] donated by Merck & Co., Inc, Rahway, New Jersey, USA. Kano and Niger states were reclassified as “transmission suspected interrupted” but will continue treatment until

they meet World Health Organization (WHO) stop-treatment criteria.

Bauchi and Kogi states met the WHO epidemiological threshold for stopping treatment, and the NOEC recommended that partners proceed to entomological assessments.

These assessments reflected output from two Nigerian laboratories that recently developed testing capacity thanks to funding from the Bill and Melinda Gates Foundation and training and support from The Carter Center. The Carter Center’s work in Nigeria is supported by the Gates Foundation and the U.S. Agency for International Development’s Act to End NTDs | East Program, led by RTI International and many other generous donors. **E**

Community-Directed Distributor Believes in Service with a Smile

Community-directed distributors (CDDs)—volunteers who distribute medicines in their communities—are the backbone of efforts to fight neglected tropical diseases. They are the ones on

the ground in the villages, conveying health education, taking measurements, administering medication to combat river blindness, and keeping meticulous records for the program.

Alem Dikaso is a member of a close-knit team of CDDs in the Abobo district of Ethiopia’s Gambella region. Because she is tall, she usually takes on the duty of measuring people with the dosing stick. She brings a subtle sense of humor to her work, helping community members feel at ease as they queue up to be measured and receive their prescribed dosage of Mectizan,[®] donated by Merck & Co. Inc.,

Rahway, New Jersey, USA. It’s not unusual to see people laughing while they are being measured, reacting to a low-volume comment Dikaso has made.

CDDs like Dikaso help the program succeed by increasing community members’ comfort with receiving health education and medications. Not all do it through humor, but all find some way to engage their audiences and gain trust and cooperation. The result is the alleviation of symptoms, the prevention of new infections, and, with time, the elimination of transmission of river blindness.

The Carter Center’s work in Ethiopia is supported by The Reaching the Last Mile Fund, housed within The END Fund, a multidonor fund, initiated and led by His Highness Sheikh Mohamed bin Zayed Al Nahyan, the Crown Prince of Abu Dhabi. **E**



Alem Dikaso shares a smile between treatment excursions in Abobo district in Ethiopia.

Center CEO, Board Member Witness South Sudan Activities

Carter Center CEO Paige Alexander and Board of Trustees member Dr. Greg Vaughn visited the South Sudan trachoma and Guinea worm programs in April 2023.

The Carter Center has been assisting the South Sudan Health Ministry's Trachoma Control Program and Guinea Worm Eradication Program for over 20 years, despite periods of war and insecurity. The country has some of the highest prevalence levels of trachoma in the world.

Beyond meeting with government officials, Carter Center staff, and strategic partners, Alexander and Vaughn traveled to Lafon County in Eastern Equatoria state to experience programmatic activities. The visit included seeing Guinea worm interventions in a village setting and two aspects of trachoma prevention: newly constructed community latrines and rehabilitated community water sources. Additionally, Alexander and Vaughn witnessed the implementation of a trachoma mass drug administration and an integrated surgical camp established in partnership with the Himalayan Cataract Project.



Carter Center CEO Paige Alexander measures a child's height to determine azithromycin dosage during her April 2023 visit to South Sudan.

"We had the opportunity to observe surgical procedures for trachoma and cataracts," Vaughn, who is an ophthalmologist, said after the visit. "I'm expecting tomorrow [these patients'] vision will be significantly improved."

The integrated surgical camp model enables remote communities to receive more comprehensive eye care services efficiently. It also serves both The Carter Center and the Ministry of Health economically with cost

savings. The Carter Center plans to expand trachoma programming and this innovative integrated surgical approach to other regions of South Sudan to ensure that those who need trachoma and cataract services receive care. **E**



Carter Center Atlanta staff pose alongside South Sudan Trachoma Control Program and Guinea Worm Eradication Program staff in Lafon County, Eastern Equatoria state, South Sudan.

Amhara Reaches Millions, Despite Challenges

The Amhara region of Ethiopia is the most trachoma endemic region in the world, with more than 15 million residents at risk of going blind from the disease. Since 2001, more than 214 million doses of antibiotics have been distributed and more than 789,000 eyelid surgeries have been

conducted to address trachomatous trichiasis (TT), the late stage of disease that can lead to blindness.

Over the past year, the Trachoma Control Program faced many challenges, including an intense rainy season, insecurity, and a drug shortage, which paused or delayed programming. Despite these challenges, from August 2022 through July 2023, the program completed 36 surveys, conducted 51,254 TT surgeries, and distributed more than 4.2 million doses of antibiotics.

In July, the regional vice president of Amhara, Seyoum Mekonnen, and the head of the Amhara Regional Health Bureau, Dr. Melkamu Abite, proudly discussed these achievements during the annual program review meeting conducted in Bahir Dar, in the Amhara region. In attendance at the meeting were individuals from the region, including integrated eye care workers, teachers and school directors, and district health officials who are working together to eliminate trachoma as a public health problem in Amhara. **E**



Seyoum Mekonnen (left) and Dr. Melkamu Abite discuss Amhara's achievements at the annual program review meeting in July 2023 in Bahir Dar, Ethiopia.

Conjunctival Photography Boosts Diagnostic Toolbox

As the work to eliminate trachoma as a public health problem forges ahead, new tools will be required to sustain progress and bolster the efforts of countries where the blinding disease persists.

The innovative practice of conjunctival photography—capturing images of the underside of eyelids of study participants—has gained prominence in trachoma research.

In July 2023, research teams in South Sudan incorporated conjunctival photography into the Enhancing the A in SAFE study, an antibiotic trial. The inclusion of this practice acts as a secondary validation of the survey teams' findings of active trachoma in study participants.

Residents from nearby communities, carefully selected and rigorously trained during a four-day pilot program facilitated by the Carter Center's South Sudan Trachoma Control Program, achieved certification as skilled conjunctival photographers.

The introduction of a newly devised Conjunctiva Photography Manual, a collaborative effort between partners in academia and nongovernmental organizations, played a pivotal role in this endeavor.

These photographers, in conjunction with the data collection teams, visited 34 communities and worked tirelessly over three weeks to amass a remarkable collection of 7,064 conjunctival photographs. These photos are being shared with the Gondar Grading Center in Amhara, Ethiopia, where certified trachoma graders assess the photos for clinical signs of trachoma. The graded photos will help in completing the research aims of the study, as well as be used to train new cohorts of field graders across the world. **E**



Survey teams capture conjunctival photographs of children in Kapoeta North County, Eastern Equatoria state, South Sudan.

Educators Bring School Trachoma Program to Life

Since 2016, The Carter Center has been working in partnership with Ethiopia's Amhara Regional Health Bureau and the Amhara Bureau of Education to support the School Trachoma Program, a robust primary school curriculum to teach students behaviors to prevent and control trachoma, the leading cause of infectious blindness worldwide.

The curriculum includes key water, sanitation, and hygiene messages and guidance on establishing anti-trachoma clubs to conduct prevention activities in the schools and communities.

In 2023, a parallel curriculum, implemented in more than 8,700 primary schools throughout the Amhara region, was incorporated into the regional curriculum, ensuring its sustained use in the primary education structure in Amhara. Additionally, a version of the School Trachoma Program curriculum adapted for use in pre-primary schools has been piloted in 60 schools.

Activities at Gult Primary School in East Gojjam zone included close collaboration with the *kebele* (village) leaders to construct 760 latrines, health education conducted at churches and mosques, and community outreach conducted during market days and other gatherings.

School administrators, principals, and teachers are trained on the content of the curriculum and its classroom implementation, schoolwide activities, and community events. Two of those educators, Habtam Aragaw, environmental science teacher and Anti-trachoma Club leader at Jarota Primary



From left to right: Melak Haileleule, project officer, School Trachoma Program, The Carter Center; Kassi Abate, curriculum director, Amhara Bureau of Education; Habtam Aragaw, environmental science teacher and Anti-trachoma Club leader, Jarota Primary School; Yayehudarun Damitie, school director, Gult Primary School; and Awoke Dagneu, project officer, School Trachoma Program, The Carter Center.

School, and Yayehudarun Damitie, school director at Gult Primary School, were honored at the Amhara Regional Annual Review Meeting in July 2023 for their exemplary work related to implementation of the School Trachoma Program. The two educators described the activities conducted in their schools, with examples of best practices.

In Jarota Primary School, in South Wollo zone, parents contributed funds to purchase radios and flash drives to support dissemination of trachoma messages in schools. In addition, the school purchased washing stations so students could practice hand- and face-washing techniques they learn through the curriculum.

Activities at Gult Primary School in East Gojjam zone included close collaboration with the *kebele* (village)

leaders to construct 760 latrines, health education conducted at churches and mosques, and community outreach conducted during market days and other gatherings.

Both schools did exemplary work to enhance the linkage between the education and health sectors by regularly inviting health extension workers to give lessons at the schools.

Implementing the curriculum in schools and educators' innovation to enhance those activities impact more than just the students in those schools; they affect the friends and families of those students as well. With educators like Habtam Aragaw and Yayehudarun Damitie making impact far beyond the classroom, elimination of trachoma as a public health problem in the most endemic region of the world becomes achievable. **E**

Conferences Showcase Carters' Leadership in Global Health

The work of The Carter Center

and its founders' legacy were front and center at two major conferences in late 2023. Carter Center staff and representatives attended the 2023 Neglected

In October, a Carter Center delegation attended the annual ASTMH meeting in Chicago. They delivered seven oral presentations, engaged in three symposiums, and presented nine

colleagues—including John Moores, Zerihun Tadesse, Sarah Carter, and Daniel Bausch—shared firsthand insight about the Carters, leaving attendees feeling inspired and connected.



A panel discussion at the ASTMH conference featured, from left, Donald Hopkins, Kane Farabaugh, Kashef Ijaz, Sarah Carter, Julie Jacobson, and Frank Richards.

posters, sharing the Center's efforts—in coordination with nearly a dozen national programs in Africa, the Caribbean, and the Americas—with public health peers.

Symposium highlights included “To Infinity and Beyond: The Tale of Eradication, Why

The ASTMH conference also honored President and Mrs. Carter for their contributions to improving global health and development in a special session. Co-hosted by Julie Jacobson, Bridges to Development managing partner and ASTMH presidential advisor, and Kashef Ijaz, the Carter Center's vice president for health programs, the event brought together more than 500 attendees who learned about the work and legacy of the Carters. The session included video tributes from Bill Foege, former CDC director and former Carter Center executive director, and Tedros Ghebreyesus, World Health Organization director-general and former Ethiopia minister of health. [E](#)

Tropical Disease NGO Network (NNN) and American Society of Tropical Medicine and Hygiene (ASTMH) conferences to present research, share accomplishments, meet with partners and stakeholders, and discuss challenges.

In September, a Carter Center delegation attended the 14th annual NNN Conference in Dar es Salaam, Tanzania. A video at the opening ceremony showcased former U.S. President Jimmy Carter and Mrs. Rosalynn Carter, and the Carter Center's leadership in fighting disease.

It Matters, and the Lessons Learned from Smallpox, Rinderpest, Polio, and Guinea Worm,” presented by Kashef Ijaz and Donald Hopkins; and “Diseases, Conflict and Health Security: Accessing Conflict-Affected Populations for Disease Eradication and Elimination Through Peace and Health Approaches,” presented by Angelia Sanders, Federic Deycard, Sara Lavinia, and Samhita Kumar.

Alongside the ASTMH conference, The Carter Center hosted an event on Oct. 20 to honor President and Mrs. Carter. Family, friends, and

Guinea Worm Disease Update

Human Cases by Year

	2022	2023*
Chad	6	9
South Sudan	5	2
Mali	0	1
Ethiopia	1	0
Central African Republic	1	1
Cameroon	0	1

*Provisional

Photo: Aidan Kranz

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