

Summary Proceedings

Twentieth Annual Trachoma Program Review

Seeing Trachoma Disappear: The Magic of Passion, Partnerships, and Possibilities

THE
CARTER CENTER



Waging Peace. Fighting Disease. Building Hope.

Atlanta, Georgia

March 18-20, 2019

THE
CARTER CENTER



Waging Peace. Fighting Disease. Building Hope.

“Seeing Trachoma Disappear: The Magic of Passion, Partnerships, and Possibilities”

The Twentieth Annual Trachoma Control Program Review



**The Carter Center
Atlanta, Georgia**

Acknowledgements

The Carter Center's Trachoma Control Program would like to acknowledge the support of numerous partners and donors who have made the 2018 activities reviewed in this document possible:

Abbott	London School of Hygiene and Tropical Medicine
Al Ansari Exchange, LLC	Manaaki Foundation
Alwaleed Philanthropies	Noor Dubai Foundation
Mr. and Mrs. Lawrence J. Brown	The OPEC Fund for International Development
Margaret A. Cargill Foundation	Pfizer Inc
Thalia & Michael C. Carlos Foundation, Inc.	The Francis I. Proctor Foundation at the University of California at San Francisco
The William H. Donner Foundation, Inc.	The Queen Elizabeth Diamond Jubilee Trust
Mr. and Mrs. Stanley F. Drezek, Jr.	Sightsavers
The END Fund	SoapBox Soaps
International Trachoma Initiative	Stanard Family Foundation
Conrad N. Hilton Foundation	Government of the Republic of Sudan
John C. & Karyl Kay Hughes Foundation	The Task Force for Global Health/ COR-NTD
Lions Clubs International Foundation	United Kingdom Department for International Development
Lions Clubs of Ethiopia and Dr. Tebebe Y. Berhan	Walton Family Foundation, Inc.
Lions Clubs of Mali	
Lions Clubs of Niger	
Lions Clubs of Uganda	

And to many others who may not be listed, our sincere gratitude.

Table of Contents

Acronyms	1
Executive Summary	3
Trachoma Control Country Program Summaries	
SAFE in Ethiopia	4
SAFE in Amhara, Ethiopia	11
SAFE in Mali	20
SAFE in Niger	27
SAFE in South Sudan	36
SAFE in Sudan	44
SAFE in Uganda	53
Summary Tables & Figures	
Table 1: Summary of National Data from Trachoma Control Programs (Carter Center-Assisted Countries)	61
Table 2: National Trachoma Control Program Annual Targets 2019 (Carter Center-Assisted Countries)	62
Table 3: Carter Center-Assisted Implementation of SAFE (Carter Center-Assisted Outputs)	63
Table 4: Carter Center-Assisted Implementation of SAFE (1999-2018)	64
Figure 1: Persons Operated for Trichiasis, Carter Center-Assisted Countries	65
Figure 2: Azithromycin Distribution, Carter Center-Assisted Countries	66
Figure 3: Health Education, Carter Center-Assisted Countries	67
Figure 4: Household Latrines Constructed, Carter Center-Assisted Countries	68
Special Sessions	
Keynote Address: Dr. Julius Schachter	69
Trichiasis With and Without Tarsal Conjunctival Scarring: a multi-centre observational study on burden, phenotype and morbidity	71
An Exploratory Study on Surgeons' Skill Awareness during HEAD START Training in Niger	73
Long term outcome of the two most commonly used surgical procedures to treat trachomatous trichiasis (TT): PLTR vs BLTR	75
A Cohort Study of Post-Epilation Lashes in un-operated and postoperative TT Cases: lash burden, phenotype, and surgical acceptance	77
3D photography as a field grader training tool for trachomatous trichiasis: an evaluation study in Ethiopia	79
ESPEN and the Status of Trachoma in the African Region	81
The Non-Target Effects of Mass Distribution of Azithromycin for Trachoma	83
Serology – Use in Surveillance	85
International Coalition for Trachoma Control Update and Toolkit for Transition Planning	87
World Health Organization Guidelines on Sanitation and Health	92
WASH and Health Working Together: A 'how-to' guide for NTD Programmes	96
Assessment of WASH Intervention Uptake in the WUHA Trial	99
Uganda WASH study results	101
Appendix Materials	
Appendix I: 2019 Program Review Recommendations	104
Appendix II: Trachoma: The Disease	107
Appendix III: Program Review Agenda	108
Appendix IV: List of Participants	111

Acronyms

2D	Two-dimensional
3D	Three-dimensional
ACT	Azithromycin in Control of Trachoma
ARHB	Amhara Regional Health Bureau
BLTR	Bilamellar tarsal rotation
CAR	Central African Republic
CI	Confidence Interval
CLTS	Community-led Total Sanitation
DBS	Dried blood spots
DFID	UK Department for International Development
DRC	Democratic Republic of the Congo
ECA	Eyelid contour abnormality
ESPEN	Expanded Special Project for the Elimination of Neglected Tropical Diseases
EU	Evaluation Unit
FMOH	Federal Ministry of Health
GET2020 Alliance	WHO Alliance for the Global Elimination of Trachoma by 2020
GTMP	Global Trachoma Mapping Project
HEW	Health Extension Worker
HKI	Helen Keller International
HPW	Hygiene Promotion Worker
ICTC	International Coalition for Trachoma Control
IDP	Internally displaced people
IEC	Information, education, and communication
IECW	Integrated Eye Care Worker
IHPS	Infantile hypertrophic pyloric stenosis
IGA	Intergrader assessment
IRR	Incidence-rate ratio
ITI	International Trachoma Initiative
KITFO	Kebele Intervention of Trachoma for Ocular Health
MDA	Mass Drug Administration
MOH	Ministry of Health
MORDOR	Mortality Reduction After Oral Azithromycin (Macrolides Oraux pour Réduire les Décès avec un Oeil sur la Résistance)
NAAT	Nucleic Acid Amplification Test
NNN	Neglected Tropical Diseases NGDO Network
NPPB	National Program for the Prevention of Blindness
NPV	Negative predictive value
NTD	Neglected Tropical Disease
NTTF	National Trachoma Task Force
PCT-NTDs	Preventive Chemotherapy NTDs
PHQ	Patient health questionnaire
PLTR	Posterior lamellar tarsal rotation
PNLC	Programme National de Lutte contre la Cecité (National Blindness Prevention Program)
PNSO	Programme National de Soins Oculaire (National Eye Health Program)
POS	Powder for Oral Suspension
PPV	Positive predictive value
PTT	Postoperative Trachomatous Trichiasis
RAFET	Reseau Africain Francophone des Experts du Trachoma

SAFE	Surgery, Antibiotics, Facial Cleanliness, and Environmental Improvement
STHP	School Trachoma Health Program
SWIFT	Sanitation, Water, and Instruction in Face-Washing for Trachoma
TAP	Trachoma Action Plan
TCS	Tarsal conjunctival scarring
TEO	Tetracycline Eye Ointment
TESFA	Trachoma Elimination by Focused Antibiotics
TF	Trachomatous Inflammation-Follicular
TG	Trachoma grader
TS	Trachomatous Scarring
TT	Trachomatous Trichiasis
UHC	Universal Health Coverage
UNICEF	United Nations Children's Fund (formerly United Nations Children's Education Fund)
UTT	Un-operated trachomatous trichiasis
VRQoL	Vision related quality of life
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization
WHO/AFRO	WHO Regional Office for Africa
WUHA	WASH Upgrades for Health in Amhara

Executive Summary

The 20th Annual Trachoma Program Review was held at The Carter Center in Atlanta from March 18-20, 2019. The theme of this year's review was "Seeing Trachoma Disappear: The Magic of Passion, Partnerships, and Possibilities". Attending this year's review were representatives from the Ministries of Health and Carter Center field offices in the 6 countries where the Center currently provides assistance: Ethiopia, Mali, Niger, South Sudan, Sudan, and Uganda. Partners and donors in attendance included representatives from Abbott, CBM International, Emory University, The END Fund, FHI360, Bill & Melinda Gates Foundation, Helen Keller International, Conrad N. Hilton Foundation, International Coalition for Trachoma Control, International Trachoma Initiative, Johns Hopkins University, Lions Clubs International Foundation and Lions Clubs of Ethiopia, Mali, Niger, and Uganda, London School of Hygiene and Tropical Medicine, LUI Che Woo Prize Limited, Manaaki Foundation, Noor Dubai Foundation, Pfizer Inc, The Francis I. Proctor Foundation at the University of California at San Francisco, Rollins School of Public Health at Emory University, RTI International, Sightsavers, Task Force for Global Health, United Nations Children's Fund, University of North Carolina-Chapel Hill, U.S. Agency for International Development, U.S. Centers for Disease Control and Prevention, The Waypoint Foundation, and World Health Organization.

As with past program reviews, the 2019 program review provided an opportunity to assess the status of each national program and discuss progress towards meeting trachoma elimination goals. In 2018, The Carter Center continued its support of SAFE strategy interventions. A total of 39,156 trichiasis surgeries were conducted, approximately 14 million doses of antibiotics were distributed, and F&E interventions continued in communities and schools throughout the Carter Center-assisted countries. In Amhara, Ethiopia, 54 districts have graduated from mass drug administration (MDA). This means 5.4 million people no longer require annual antibiotic treatment for trachoma. In South Sudan, surgical services restarted in July 2018 after several years due to insecurity. The program implemented a new way of managing patients, allowing them to overnight to ensure they receive proper post-operative care and feel cared for. In Mali, the program is in the final stages of eliminating trachoma as a public health problem and plans to submit the dossier to the World Health Organization (WHO) in December 2019. The dossier is required in order for a country to be validated as having eliminated trachoma as a public health problem.

For the first time in program review history, a keynote speaker opened the meeting. Dr. Julius Schachter, a professor emeritus at the University of California at San Francisco and a leading researcher in the trachoma field, shared the history of trachoma research and how his work led to the discovery of what is now commonly known as mass drug administration with azithromycin.

Significant attention was given to work in the area of water, sanitation, and hygiene (WASH). In Amhara, The Carter Center and The Francis I. Proctor Foundation are working together on a study, known as SWIFT, to provide more evidence on the effectiveness of WASH interventions in the fight against trachoma. Ms. Angelia Sanders and Ms. Yael Velleman presented the new WHO WASH and neglected tropical disease (NTD) toolkit, which will serve as a guide for NTD programs to integrate WASH activities into existing activities.

In her closing, trachoma program director, Ms. Kelly Callahan, quoted WB Yeats: "The world is full of magic things, patiently waiting for our senses to grow sharper." The global trachoma program is getting sharper, and we are seeing the magic. Over the past 21 years, The Carter Center and its partners have seen incredible success and learned and shared so much. The last mile will present greater challenges requiring greater focus through increased passion and partnership, and programs will make magic in improved interventions, better estimates, and sharper aims as trachoma disappears from the world.

SAFE in Ethiopia

Presented by Mr. Nebiyu Negussu, NTD Team Leader, Federal Ministry of Health, Ethiopia

Background

The National Survey on Blindness, Low Vision, and Trachoma conducted in 2006 revealed that 2.8 million people in Ethiopia had low vision and 1.2 million people were blind. It was estimated that 87% of blindness was from avoidable diseases. The survey revealed that active trachoma was endemic in virtually all regions of the country, with more than 1.3 million people in the country living with trachomatous trichiasis (TT). The results of the survey showed that Ethiopia had approximately 30% of the burden of trachoma in sub-Saharan Africa.

From 2010 through 2014, the National Program worked with partners to complete mapping of all unmapped districts in Ethiopia as part of the Global Trachoma Mapping Project (GTMP). Data collected from the project has shown that 70% of the global burden of trachoma is in Ethiopia. The results from the GTMP have assisted with the NTD effort related to trachoma elimination.

There has been growing momentum on the issue of NTDs in Ethiopia. In 2013, a national NTD master plan was launched, with regional states preparing their own NTD master plans. An NTD team was formed within the Federal Ministry of Health (FMOH) and NTD indicators became part of the national Health Management Information System. In 2016, a second NTD plan was issued by the FMOH.

The Fast Track Initiative, launched in 2015, aimed to clear the TT backlog across Ethiopia over 18 months. This initiative resulted in significant progress in eliminating the TT backlog with more than 400,000 surgeries conducted from 2016 to 2018. The National Program continues to scale up the SAFE strategy in all districts in the country requiring interventions and to work towards maintaining scale to eliminate trachoma as a public health problem by 2020.

Timeline of Events

- 2001: National guideline for Primary Eye Care developed¹
- 2003: Trachoma Control Program launched in 4 districts in Amhara
- 2006: National guideline for mass antibiotics distribution developed; national taskforce for trachoma control established
- 2006-2007: Amhara region's baseline survey at zonal level
- 2008: Trachoma Campaign, formerly MaTra, launched in Amhara region²
- 2012: National Trachoma Action Plan (TAP) was prepared
- 2010-2014: GTMP completed in 672 districts
- 2013: Trachoma becomes part of national NTD program under disease prevention and control directorate
- 2015: Fast Track Initiative launched by FMOH; Health Sector Transformation Plan finalized; SAFE scale up to 358 districts
- 2016: Further scale up of trachoma program to 521 districts; SAFE activities launched in 26 districts in SNNP region and 4 districts in Ethiopian Somali region; Fast Track Initiative scaled up
- 2017: Further scale up to cover all districts with TF greater than 10%
- 2020: Target date for elimination

¹ A 5-year document, currently in 3rd cycle.

² MaTra (Malaria and Trachoma) week was a biannual weeklong outreach campaign that involved the mass distribution of azithromycin to prevent and treat trachoma. Additionally, recipients were provided with health education and testing and treatment for malaria with Coartem®.

Table 1. Program Achievements in 2018

Indicator	Goal	National	
		Target	Achieved
# of persons operated	217,813	168,325	90,469 (53.7%)
# of women operated			64,680 (71.5%)
# of surgeons trained		207	Not reported
Doses of azithromycin distributed during MDA	71,151,492	69,717,342	57,441,977 (82.4%)
Doses of TEO distributed during MDA	1,452,071	1,422,802	1,402,908 (98.6%)
# of villages with health education		Not reported	
# of household latrines built		Not reported	

Surgery (S)

In 2018, the program was very ambitious and planned to conduct 168,325 TT surgeries in all trachoma-endemic districts in Ethiopia. Following the success of the Fast Track Initiative, during which many areas conducted more than 80% of the surgeries included in their TT backlog, the program is now seeing a decrease in surgical output as cases become more difficult to find across the country. Additionally, many integrated eye care workers (IECWs) were engaged with impact surveys in different parts of the country, which hinders their ability to provide TT surgery on a regular basis and resulted in lower outputs than expected. A total of 90,469 TT surgeries were conducted in 2018. Of the total surgeries performed, 64,680, or 71.5%, were provided to women.

The current estimated TT backlog in Ethiopia is 371,444. A total of 116 districts have reached the WHO elimination threshold for TT and no longer require TT surgical campaigns. Incident cases are now managed within the local health system. The program saw peak surgical output in 2016 and 2017, when over 400,000 TT surgeries were performed. As a result of this success, finding TT cases in those districts where TT surgery has been underway for many years is currently the greatest challenge that the program is facing. The National Program has new funders and implementing partners that have come online to ensure scale up of geographic coverage in Afar, Somali, Benishangul-Gumuz, and Gambella regions.

The program implemented a new strategy in 2018 in order to address the challenge of finding TT patients. The new strategy, door-to-door case finding, was piloted in the Tigray region. Based on the success of the pilot, the program scaled up this activity to select districts. Criteria was developed to determine which districts would implement this new strategy. Districts included had low TT surgical output despite high estimated TT backlog, had an impact survey scheduled, and had low outreach service in recent years. A total of 77 districts, with a targeted population of 6,742,658, were selected to implement the door-to-door case finding approach. These districts had a total estimated backlog of 73,173. Health workers screened 5,859,847 people for TT. Through case searching, 24,412 TT cases were confirmed, which is 33% of the estimated backlog. Of the confirmed cases, 18,389, or 75%, accepted surgery. For those who did not receive surgery, 3,211 people, refused service, 2,635 people are on a waiting list to receive surgery, and 177 people were referred a hospital for surgery due to complications.

In addition to TT surgery activities, the program did a deep dive into survey data collected using Tropical Data to learn more about TT in the districts that have been surveyed. From 2017-2018, 134 districts were surveyed using Tropical Data. A total of 228,648 people were examined for TT as part of these surveys. From

the data collected, the program learned that the majority of people with TT, 79%, are women, 16.8% suffer from postoperative TT (PTT), and 63.5% of people with TT reported that they had not been offered TT surgery. The program will be discussing this data with the Trachoma Advisory Committee and the National Trachoma Task Force (NTTF) in order to get clear guidance and recommendations to address the issues highlighted.

The program has introduced guidelines for quality surgical outcome supervision and audits, which were developed in collaboration with all implementing partners. The program wants to ensure quality TT surgery is provided across the country. A total of 61 eye health professionals from secondary eye care units and universities were trained on the guidelines and carried out TT surgery supervision and surgical audits. From 2017-2018, 223 IECWs, which is 27% of the total IECWs in the country, were visited for supervision and surgical auditing, with 109 visited in 2018. The data shows that 92% of surgeries audited were well corrected. A total of 21 IECWs had above 10% complications, and of those, 16 received refresher training and continued working, while 5 were stopped from continuing to provide TT surgery.

Antibiotic Therapy (A)

The trachomatous inflammation-follicular (TF) prevalence, especially after intensifying MDA, has shown a very significant change in terms of trachoma mapping. The MDA geographic coverage in 2018 was 83%, and the program is aiming for 100% geographical coverage in 2019. The number of doses of antibiotics distributed has increased over time since this activity began in 2003. In 2018, a total of 57,441,977 doses of azithromycin and 1,402,908 doses of tetracycline eye ointment (TEO) were distributed through MDA in Ethiopia. This represents 82.4% and 94.6% of the targets for 2018. As of March 2019, a total of 198 districts, 32%, no longer warrant MDA. A total of 113 districts and 4 refugee camps successfully stopped MDA in 2018. Of the districts with MDA activities remaining, 203 require 1 round, 156 districts require 2 rounds, 22 require 3 rounds, and 29 require 4 more rounds of MDA.

The program conducted a total of 149 surveys in 2018. Of those, 124 were impact surveys and 25 were surveillance surveys. From the 25 surveillance surveys conducted, 11 districts maintained a TF prevalence below 5%, while the other 14 districts had a TF prevalence above 5%. Of the districts that had impact surveys, 50 had a TF prevalence below 5%. The program is reviewing this data and considering a way forward, as the high rate of districts who did not pass impact and surveillance surveys has implications, both financially and programmatically, for the upcoming years.

Facial Cleanliness (F) & Environmental Improvement (E)

The National Program continues to remain focused on F&E as part of its NTD program. The program has developed a WASH and NTD toolkit for district-level implementation. The toolkit was piloted in 4 regions. Beginning in 2019, the toolkit will be rolled out to other areas for implementation. The program plans to continue to increase engagement and collaboration with WASH partners. A technical working group has been established at the national level, as well as cascaded to the 4 regions with the highest trachoma prevalence. The working groups will work to bring together WASH and NTD partners to have an even greater impact on trachoma throughout Ethiopia. Additionally, the National Program has mapped where WASH and NTD partners are operating throughout the country to assist in identifying where organizations may be able to work together on projects. Mapping will continue to look at access to water and other indicators that could impact how effective WASH activities may be on the elimination of trachoma as well as other NTDs.

At the community level, the National Program often uses MDA as an opportunity to teach communities about the importance of WASH activities. The FMOH has revised the health extension worker (HEW) manual to include NTDs, specifically trachoma. All HEWs who have completed training have received information on all NTDs. The trachoma portion of the manual heavily emphasizes the importance of F&E in

communities as a way to fight trachoma.

In schools, the National Program has focused on teacher trainings and the establishment of school health clubs to increase promotion of personal and environmental hygiene practices. The Amhara region is the only region that has intensified the full SAFE strategy, especially F&E activities, in all endemic districts. Intensifying activities in schools has been a major focus for the Amhara region. Schools are establishing school health clubs where students teach their peers and surrounding communities about the importance of good hygiene, including face and hand washing and latrine construction and use, to reduce the spread of trachoma. The National Program remains committed to using schools as a platform to integrate WASH education into school curriculums, especially at the primary school level. In addition to primary school-aged children, the National Program is supporting activities that target children ages 3 to 5 years, who have not yet entered school. These activities are currently being piloted in the Tigray region in 9 districts. The activities focus on the children as well as their caregivers, with an aim to begin educating children on the importance of good hygiene behaviors as early as possible. The program plans to expand these activities to other areas in the coming years.

Latrines remain an important part the National Program's agenda in the fight to eliminate trachoma as a public health problem. According to the 2016 Ethiopia Demographic and Health Survey, which uses the presence of fresh excreta inside the pit, the presence of a foot path to the latrine, and the presence of flies to measure latrine utilization, the latrine coverage overall is good. Overall, latrine coverage using 1 marker is 73% for Tigray, Amhara, Oromia, and SNNP regions. For 2 markers, overall latrine coverage is 44%. While this data is helpful, it is outdated at this time and should be updated annually.

Transition Planning & Dossier

Transition planning is one of the most important components of trachoma elimination. More than 160 districts have achieved elimination targets, but a system is not yet in place to monitor these districts after elimination. To help with this, the NTTF has established a small group to develop a national transition planning guide. The draft document has been completed and shared with NTTF members. The document will be reviewed and discussed before it is finalized and shared. Work on the dossier has not yet begun as the National Program feels it is too early to begin this work.

Programmatic Challenges

The program faced several challenges in 2018. Recrudescence is one of the challenges flagged due to the number of districts that did not pass impact surveys in 2018. Timeliness of reporting is also a challenge for the program in its efforts to monitor progress of the program at the district level. A lack of resources has hindered the National Program from achieving 100% geographical coverage for TT surgery and MDA activities. There are approximately 161 districts with an estimated backlog of 70,561 that are not being reached, as well as 46 districts with a population of about 3 million people that are not receiving MDA. The program is working to find additional resources to support activities. F&E activities also require additional resources to scale up to reach all districts in the country to ensure that all districts are receiving intensified F&E activities.

Status of 2018 Program Review Meeting Recommendations

Recommendation 1: The Ethiopia National Trachoma Control Program should seek to ensure 100% SAFE strategy coverage in all geographic areas.

Status: Progress has been made to address this recommendation. Currently, there is 74% geographic coverage of "S", with interventions in 534 out of 725 districts. The program has achieved 85% geographic

coverage of “A” activities, with interventions in 504 of the 608 districts that require MDA. F&E has been scaled up to 293 districts across the country, which is 41% geographic coverage.

Recommendation 2: The FMOH should consider training nurses, not only IECWs, to serve as graders during trachoma impact and surveillance surveys.

Status: The program attempted to include mid-level eye care workers and other health professionals as graders for impact and surveillance surveys in 2018. Unfortunately, most health professionals engaged for this were not successful in the training and were not certified to continue with surveys. However, some passed the training and supported these activities.

Recommendation 3: The FMOH should review the merits of WASH indicators as part of the Tropical Data platform and work closely with WHO and Tropical Data as warranted for inclusion.

Status: The NTTF formed a small working group to develop key indicators to measure WASH behavior indicators during impact surveys. Discussions on indicators underway.

Targets for 2019 and Plans to Meet Targets:

Surgery (S)

- Operate on 185,722 TT patients
- Train 205 TT surgeons

Antibiotic Therapy (A)

- Distribute 59,484,651 doses of azithromycin
- Distribute 1,213,972 doses of TEO
- Conduct 250 impact surveys and 39 surveillance surveys

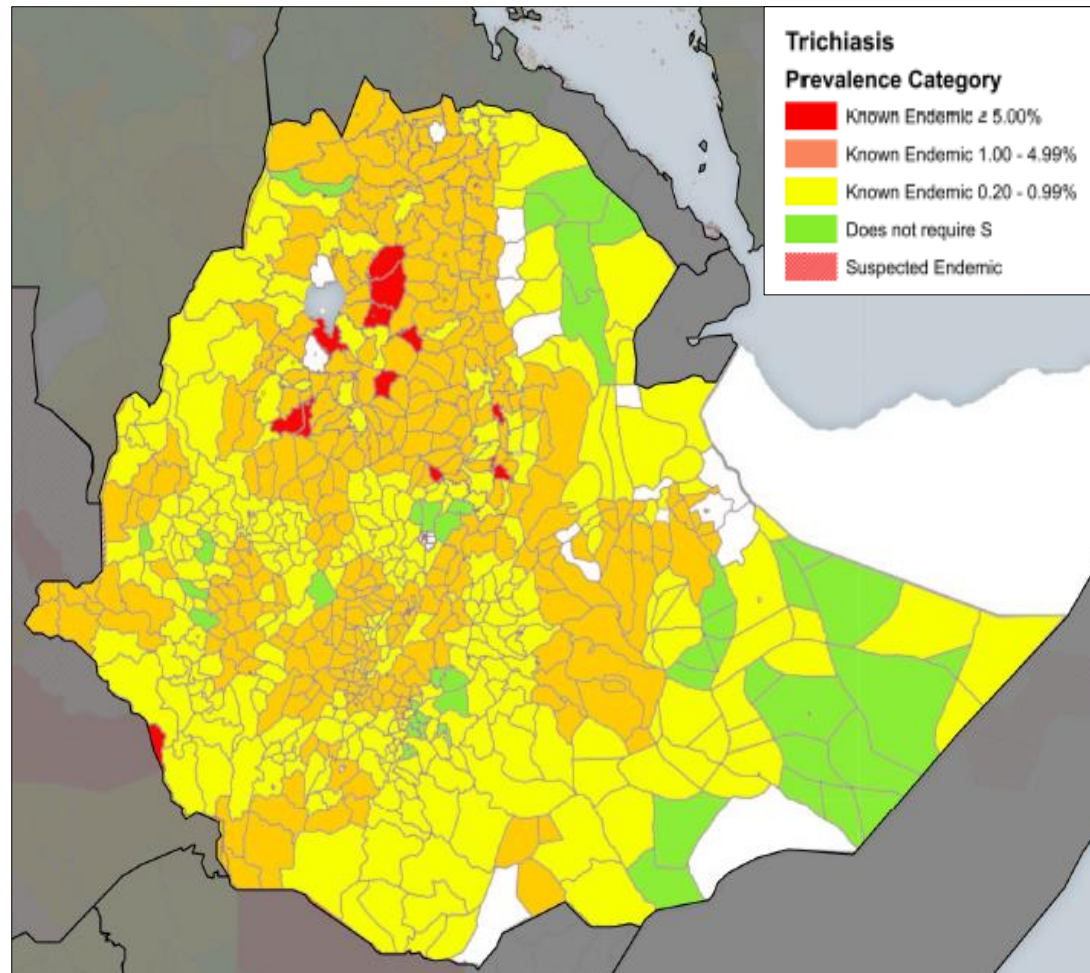
Facial Cleanliness (F) & Environmental Improvement (E)

- Finalize WASH and NTD framework rollout
- Rollout WASH and NTD toolkit at district level
- Engage WASH community on NTDs
- Increase F&E intervention coverage in communities and schools from 41% to over 60%
- Intensity early childhood focused F&E activities, which focus on children ages 3-5 years

Operational Research

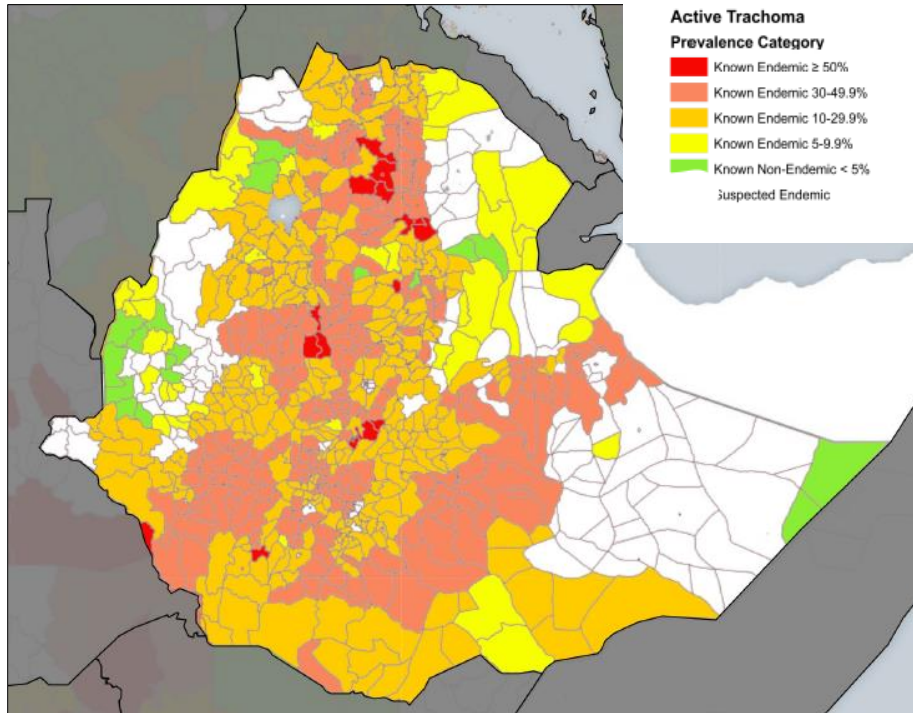
- The National Program continues to encourage operational research to inform the program
- Roll out the NTD research road map to encourage students and others to undertake additional operational research
- Current studies:
 - Sanitation, Water, and Instruction in Face-Washing for Trachoma (SWIFT) in Amhara region
 - Trachoma Elimination by Focused Antibiotics (TESFA) in Amhara region
 - Stronger SAFE in Oromia
 - PTT Management in SNNP region

Ethiopia: TT Prevalence among Adults ≥ 15 years, 2018

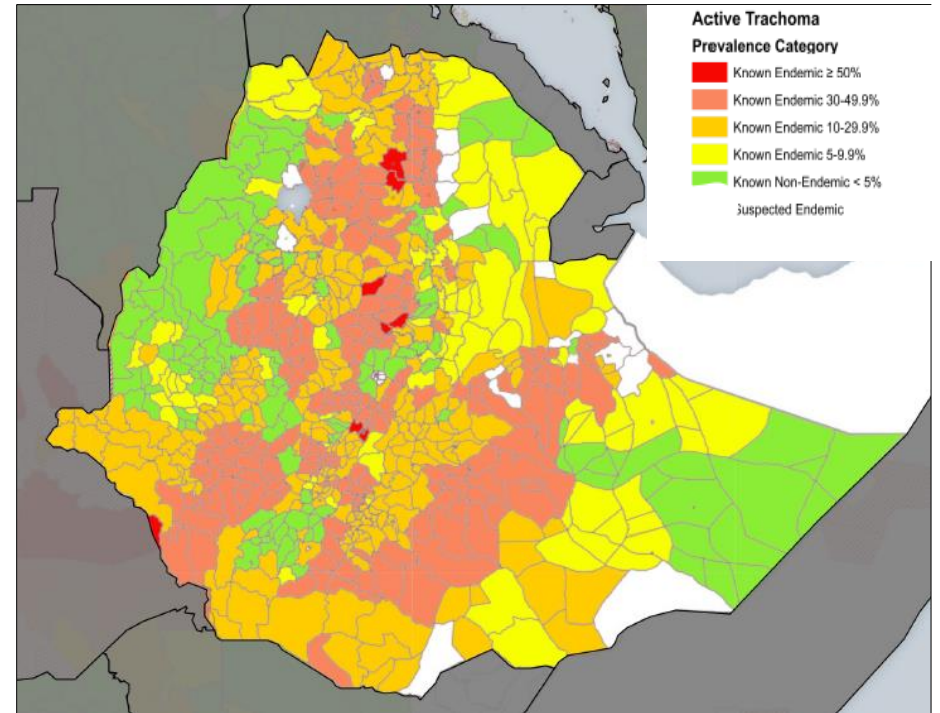


Ethiopia: TF Prevalence among Children 1-9 years

Baseline (2013)



2018



SAFE in Amhara, Ethiopia

Presented by Dr. Abebaw Gebeyhu, Head, Amhara Regional Health Bureau

Background

In the Amhara region of Ethiopia, a trachoma prevalence survey at the zonal-level was conducted in 2007 to quantify the zonal prevalence of active trachoma and TT. This survey estimated that over 17 million people were at risk of trachoma and 643,904 people required surgery to correct TT in the Amhara region alone. Critically, the survey indicated that all zones in the Amhara region were eligible for the full SAFE strategy, which was scaled up to all districts in 2008. The regional trachoma program is part of the National Committee for the Prevention of Blindness and there is a trachoma focal person assigned in the Amhara Regional Health Bureau (ARHB).

Following 5 years' implementation of the WHO-endorsed SAFE strategy, the WHO requires a trachoma impact survey be conducted to assess progress towards meeting the elimination targets. Impact surveys were conducted in all 167 districts of the Amhara region from 2011-2015 through collaboration with the ARHB and The Carter Center. These surveys showed dramatic reductions in all clinical signs of trachoma. Results indicated that 9 of the 167 districts had met the elimination criteria for TF, reducing the prevalence of TF among children ages 1 to 9 to less than 5%. The results also indicated that the remaining districts continue to warrant the full SAFE strategy. As of 2018, a total of 50 districts in the Amhara region are exempt from MDA. This represents 31% of the total districts and includes 5.4 million people. The program remains focused on intensifying TT outreach and is looking at new strategies for reaching the remaining backlog in the region. The program continues to work towards elimination of trachoma as a public health problem by 2020.

Timeline of Events

- 2001: Phase I agreement (4 districts); first 5-year TAP, updated every 5 years; S, F, & E implementation begins in 4 districts
- 2003: Full SAFE implementation begins
- 2004: SAFE expansion to 19 districts
- 2006: National baseline survey; SAFE expansion to entire region (167 districts)
- 2006-2007: Amhara zonal-level baseline survey
- 2008: Trachoma Campaign, formerly MaTra, launched
- 2015: 167 districts completed 1st impact survey after 5 years of SAFE; Fast Track TT Clearing Initiative piloted in East Gojjam zone
- 2016: Fast Track Initiative scaled up to all zones; region-wide school trachoma health program (STHP) launched
- 2017: The number of districts exempted from MDA reached 36, with 22 new districts exempted in 2017
- 2018: 15 districts exempted from MDA, for a total of 50 districts (31%) exempt from MDA
- 2020: Target date for elimination

Table 1. Program Achievements in 2018

Indicator	Goal	Amhara Region (Carter Center-Assisted)	
		Target	Achieved
# of persons operated	198,626	93,126	32,474 (35%)
# of women operated			22,304 (69%)
# of surgeons trained		34	0
Doses of azithromycin distributed during MDA	14,655,865	14,655,865	13,180,791 (90%)
Doses of TEO distributed during MDA	299,099	299,099	293,974 (98%)
# of villages with health education		3,871	3,871 (100%)
Latrine ownership		100%	62.6%

Surgery (S)

In 2018, the ARHB, with assistance from The Carter Center continued to make progress towards reducing the TT backlog in the Amhara region. A total of 32,474 TT patients received surgery, which is 35% of the annual target. Of those who received surgery, 69%, or 22,304, were women, who are twice as likely as men to suffer from TT. While no new IECWs were trained in Amhara in 2018, refresher training was provided to 132 existing IECWs regularly throughout the year. At baseline, the TT backlog was more than 600,000. As of March 2019, the remaining cases to be operated to clear the backlog is 169,418. At the current pace, it will require 5 years of activities to clear the backlog.

The program implemented a new approach in 2018 to locate the remaining TT cases, which involves teams completing house-to-house case searches. This activity was piloted in select districts in the region in 2017 and rolled out to more districts in 2018. This new approach was implemented in 31 districts, where the estimated total backlog is 52,387. Teams targeted 1,025,149 households in the 31 districts and were able to reach 871,377 households, about 85%. Among those households visited, 2,093,860 people age 15 and above were screened for TT. This represents about 82% of the number of people the teams were targeted to screen. A total of 85,303 suspected cases of TT were registered by the HEWs and other health workers who were involved in the case searches. Once a suspected case is registered, that person must be mobilized for confirmation, which requires them to see an IECW at a local health center in order to confirm they have TT. Teams were able to mobilize 82%, or 70,222 people, of registered cases for confirmation. Of those cases, 15,129 people, or 22%, were confirmed to have TT and offered surgical services. Based on these findings, the TT prevalence in those 31 districts is 0.72% with an estimated backlog of 18,381. This is 35% of the backlog that was considered prior to the start of the house-to-house case finding.

The program continues to conduct TT supervision and surgical audits. These follow-up and outcome assessments are conducted by IECWs. Training was provided to 14 technical supervisors on supportive supervision and surgical audit procedures. In 2018, 74 IECWs at 41 campaign sites were supervised by trained supervisors. An audit was also conducted, which audited 8 IECWs. This output is lower than expected for the year. During the audit, 247 people and 280 eyelids were examined.

TT surgery validation continued in 2018. This activity is conducted to confirm that surgeries that were reported were actually completed. The program selected 3,639 TT patients from TT registers. A total of 3,075 patients selected, 85%, were interviewed. Out of those interviewed, 3,009, or 98%, were confirmed to have received TT surgical services. Overall, the program validated 9% of surgeries in 2018.

Antibiotic Therapy (A)

As of March 2019, 31% of districts in Amhara have achieved TF less than 5%, as compared to none at baseline. The program expects this number to increase following surveys conducted in 2019. A total of 13,470,458 doses of antibiotics were distributed through MDA in 2018. This includes 13,180,791 doses of azithromycin and 293,974 doses of TEO. The program reached 90% and 98% of the targets for azithromycin and TEO in 2018. The majority of districts achieved over 80% coverage during MDA.

Facial Cleanliness (F) & Environmental Improvement (E)

The program remains focused on implementing F&E activities and continues to make progress in 2018. The regional WASH and NTD working group was established and quarterly meetings are being conducted. A hygiene and environmental health report database has been developed, and hygiene and environmental health-specific supportive supervision was conducted in 2018.

These F&E activities align with the *woreda*, or district, transformation policy. This is a holistic approach to achieve universal health care coverage through strengthening primary health care. One of the 4 major parts of this new policy is the creation of the model *kebele*. The criteria of the model *kebele* includes improved latrine ownership, creating model households, improving school health performance and facility delivery. Creating a model household includes maternal and child health, malaria prevention and control (in malaria-endemic settings), and good personal and environmental hygiene practices. With school health performance, criteria looked at includes latrine hand washing facility, availability of safe water, availability and use of dry and liquid waste disposal facility, availability of first aid kits, different student health clubs, and regular health screening of students.

Latrine coverage is improving. In 2018, data shows 62% average latrine coverage for the entire region. The highest coverage was reported in East Gojjam, with 76%, and the lowest coverage was seen in Central Gondar, with 36%.

The STHP has been rolled out to the entire region. Quarterly monitoring and evaluation indicator reports were collected in 3 quarters in 2018. Reports were submitted by 6,700 schools, about 78% of all primary schools in the region. Of those schools that submitted reports, 90% reported as having anti-trachoma clubs established. The anti-trachoma clubs promote F&E activities within the school environment as well as in the surrounding community.

In 2018, 2,241 school cluster supervisors and 324 education officers received training on the STHP. An evaluation was conducted at 137 schools in the region. A total of 1,142 schools were checked for facial cleanliness, health education, and general supervision of the school program. The program provided 2,300 flash disks to schools, which contain trachoma radio programs and spot messages on trachoma prevention and good hygiene practices. The program awarded a water container and 2 radios to the best performing schools in each district.

Transition Planning & Dossier

Transition planning and dossier preparation is underway. In districts where elimination thresholds for TF have been achieved, notification of survey results and discontinuation of MDA was done during MDA meetings. The ARHB has contributed to the preparation of the national-level transition planning documents. At the national level, a transition and dossier preparation meeting was conducted. Transition planning will continue in 2019.

Programmatic Challenges

In 2018, the program faced a challenge with insecurity in some parts of the region. The politics in Ethiopia

are changing regularly, and the program hopes that insecurity will decrease in the upcoming year. The program also faced a low TT surgery output when compared to the estimated backlog. The program hopes the house-to-house case searching will improve TT outputs, however further review and discussion of this issue is warranted, especially in light of overestimations based on survey results.

Status of 2018 Program Review Meeting Recommendations

Recommendation 1: The Amhara Region Trachoma Control Program should leverage the STHP data with partners responsible for provision of latrine and hand-washing facilities in schools to advocate for 100% coverage. STHP should provide monitoring data to the responsible organizations for advocacy.

Status: The data was presented at the annual review meeting in July 2018 and at the regional taskforce meeting. The data was also shared with the education bureau.

Recommendation 2: The ARHB should focus efforts to clear the TT backlog by 2019 by maintaining the momentum created by the Fast Track Initiative through enhanced community mobilization and case search teams.

Status: The 2018 performance showed that it may be difficult to clear the backlog by 2019. The program is utilizing new approaches to reach TT patients, specifically conducting house-to-house case searches. This approach has demonstrated that a lower number of patients have been identified than was estimate by survey data.

Targets for 2019 and Plans to Meet Targets:

Surgery (S)

- Operate 54,070 TT patients, all with Carter Center assistance
- Train 33 new TT surgeons

Antibiotic Therapy (A)

- Distribute 14,243,302 doses of azithromycin, all with Carter Center assistance
- Distribute 290,680 doses of TEO, all with Carter Center assistance
- Conduct 52 impact surveys and 20 surveillance surveys

Facial Cleanliness (F) & Environmental Improvement (E)

- Support health education in 3,871 villages, all with Carter Center assistance
- Train 18,000 school principals and teachers
- Conduct monthly STHP supportive supervision
- Conduct quarterly WASH and NTD Taskforce meetings at the regional and zonal levels
- Achieve 80% improved latrine coverage
- Increase latrine coverage (all types) from 62% to 100%
- Increase latrine utilization from 94% to 100%
- Increase open defecation free *kebeles* from 45% to 94%

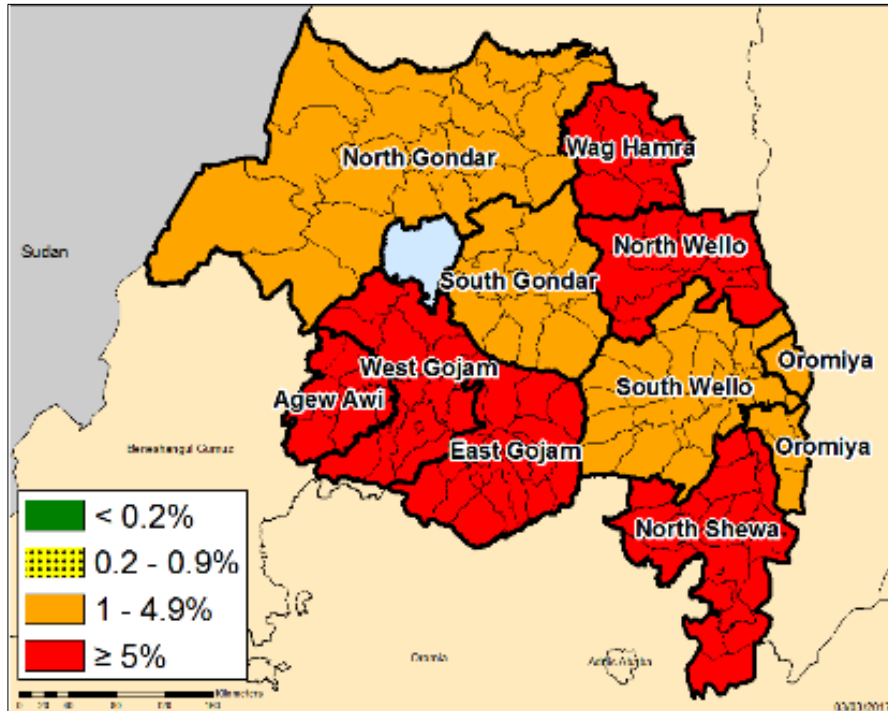
Operational Research

- Current Studies:
 - SWIFT
 - TESFA

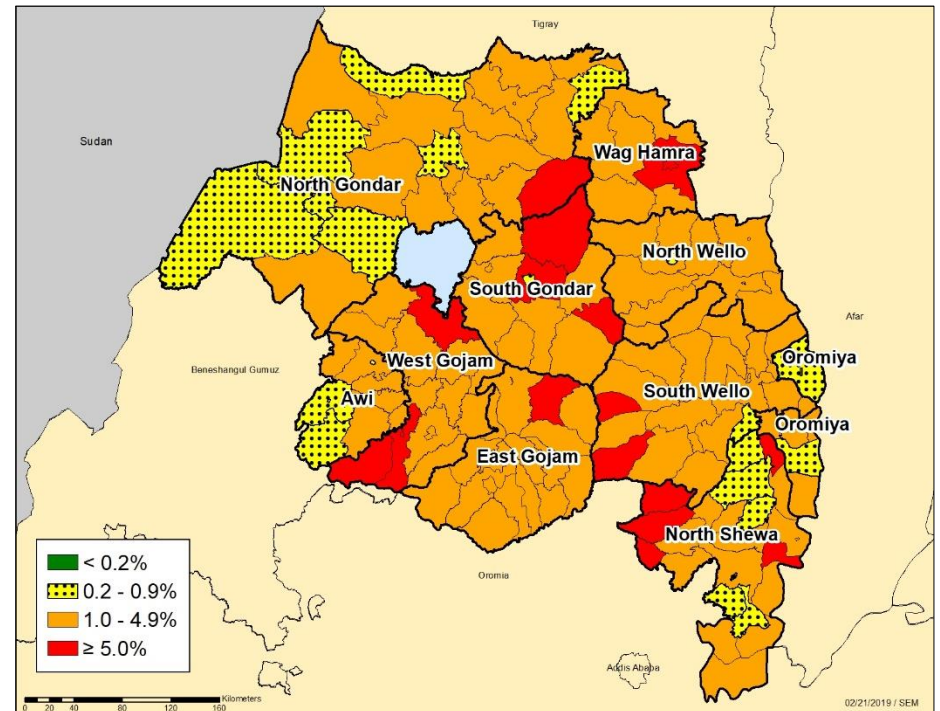
- Proposed Studies:
 - SWIFT II (continuation of SWIFT; will begin in September 2019)
 - Kebele Intervention of Trachoma for Ocular Health (KITFO): pending ethical approval

Amhara, Ethiopia: TT Prevalence among Adults ≥ 15 years

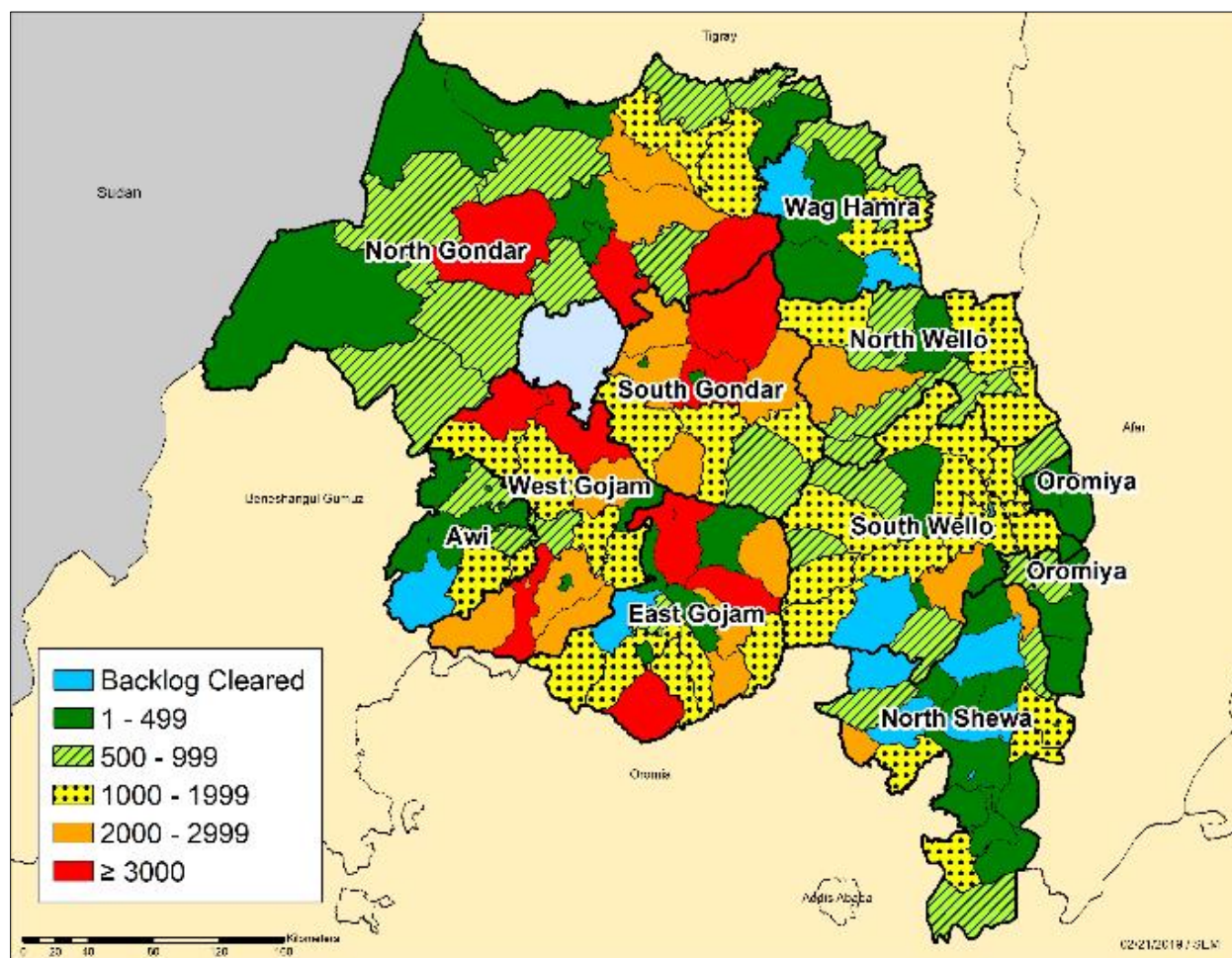
Baseline, 2007



2018

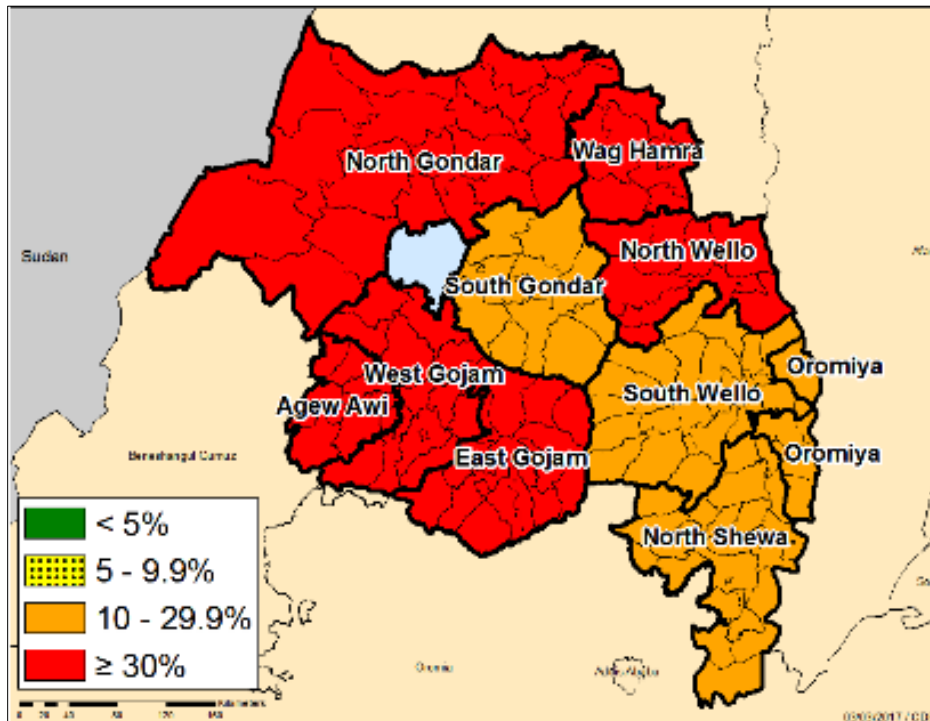


Amhara, Ethiopia: Surgical Backlog, 2018

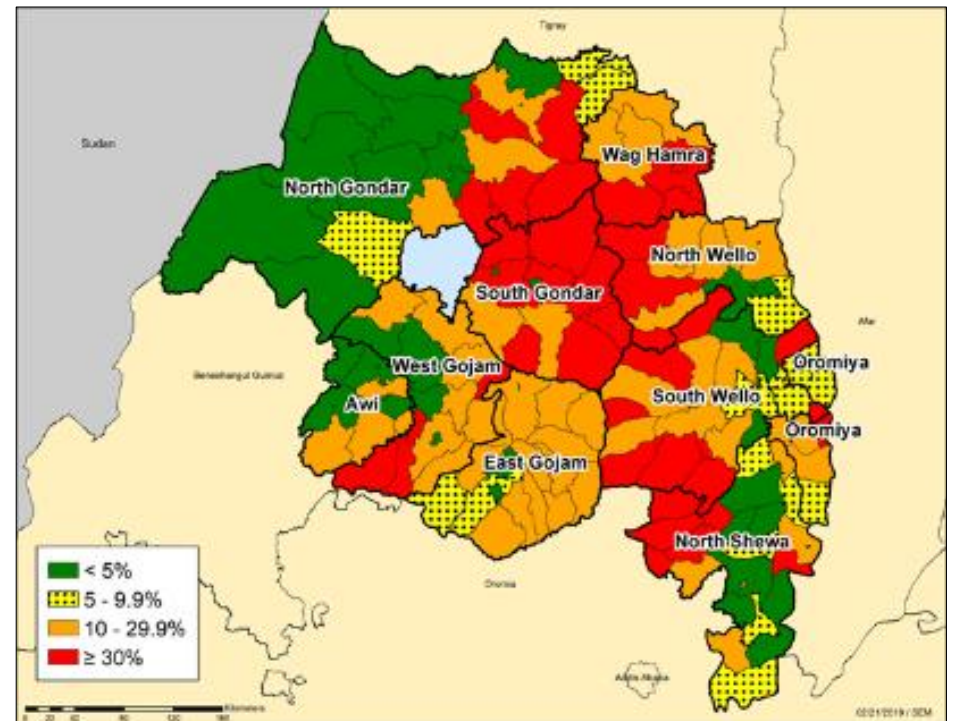


Amhara, Ethiopia: TF Prevalence among Children 1-9 years

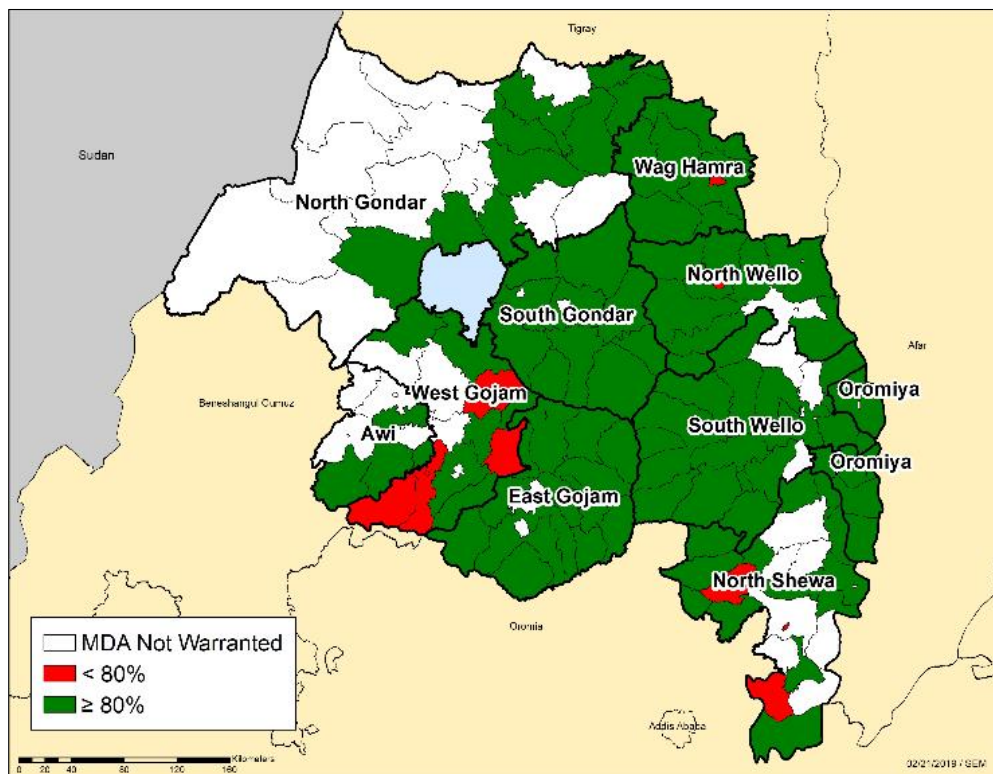
Baseline, 2007



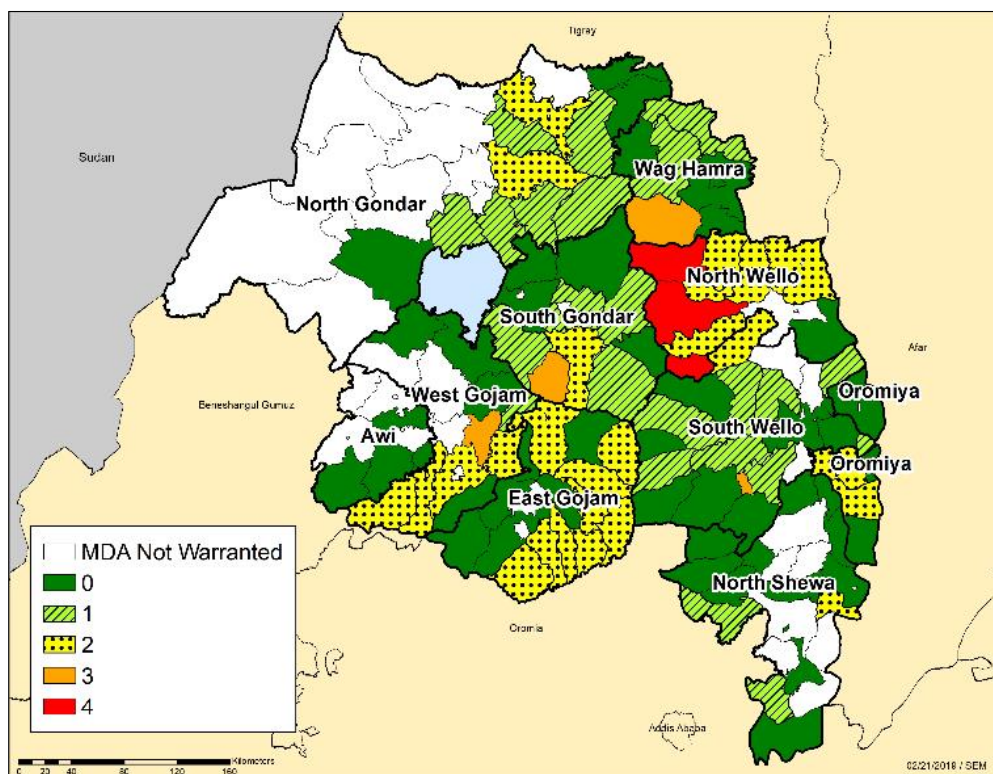
2018



Amhara, Ethiopia: MDA Coverage, 2018



Amhara, Ethiopia: MDA Rounds Remaining, 2018



SAFE in Mali

Presented by Professor Lamine Traoré, Coordinator PNSO, Ministry of Health, Mali

Background

In 1994, the Malian National Blindness Prevention Program (PNLC) was created; however, since December 2014, the PNLC has been known as the National Eye Health Program (PNSO). Following prevalence surveys conducted in 1996-1997, trachoma was identified as a major public health issue in Mali. Despite the Ministry of Health's (MOH) 3 priorities being malaria, HIV, and tuberculosis, a national trachoma control program was established in 1999. Though Mali does not have a formal TAP, at the end of each year, the PNSO develops a plan of action during its annual program review meeting. The Carter Center, along with other partners, currently supports the implementation of all SAFE components. All districts in Mali have reached the WHO threshold for TF, with all districts below 5%. Therefore, MDA is no longer warranted in the country. The National Program remains focused on the S, F & E components of the SAFE strategy and is working towards elimination of trachoma as a public health problem in 2019.

Timeline of Events

1994: PNLC launched
1996-1997: National baseline prevalence survey
1999: National Trachoma Control Program launched
1999: Surgeries initiated
2001: Distribution of Pfizer-donated Zithromax® begins
2003: Facial cleanliness and Environmental improvement activities initiated
2005-2018: Impact and surveillance surveys conducted
2014: PNLC becomes PNSO
2019: Target date for elimination of trachoma in Mali

Table 1. Program Achievements in 2018

Indicator	Goal	National		Carter Center-Assisted	
		Target	Achieved	Target	Achieved
# of persons operated	5,893	5,893	1,996 (33.8%)	1,500	600 (40%)
# of women operated			1,203 (60.3%)		408 (68%)
# of surgeons trained		0	23	0	0
Doses of azithromycin distributed during MDA	MDA no longer warranted in any districts in Mali.				
Doses of tetracycline distributed during MDA					
# of villages with health education		300	242 (80.6%)	250	142 (56.8%)
# of household latrines built		6,000	6,447 (107%)	5,000	3,355 (67.1%)

Surgery (S)

The 1996 baseline survey in Mali revealed that 75% of districts surveyed were endemic for trachoma. The National Trachoma Control Program has made tremendous progress towards elimination of trachoma as a public health problem. In 2018, the program conducted 1,996 TT surgeries in the regions with remaining backlogs. Of the surgeries conducted, 1,203, 60%, were provided to women. As of March 2019, the estimated backlog in Mali is 3,120. The highest remaining backlog is in the Mopti region. The regions of Gao and Kidal have cleared the TT backlog. The program plans to clear the remaining backlog in 2019. The program also provided training to 23 TT surgeons in 2019. Training was conducted using HEADSTART.

The National Program has implemented the *ratissage* strategy to locate and operate on the remaining TT cases in the country. The strategy is time consuming but has been successful in identifying cases. As part of this strategy in 2018, a total of 1,015,543 were screened for TT. Only 1,677 cases, 0.2%, were identified. Of those identified, 1,368, 81.6%, accepted TT surgery, while 309, 18.4%, refused surgical services.

Antibiotic Therapy (A)

All districts in Mali have reached the TF threshold for elimination and therefore no longer require MDA. This is a great achievement for the National Program. MDA started in the country in 2001 and distribution peaked in 2009. Over 30 million doses of antibiotics were distributed through MDA for trachoma in Mali. Most distribution stopped in 2012 and 2013, with only some districts treated since 2013, and all activities were completed by 2016. In 2018, the program conducted 11 surveillance surveys out of the 20 that were planned. Since MDA has not been carried out in recent years, no impact surveys are required in Mali. The program plans to finish all required surveillance surveys in 2019.

Facial Cleanliness (F) & Environmental Improvement (E)

F&E activities have been critical to the success of the program in Mali. In 2018, the program supported health education activities in 242 villages across the country. The National Program supports the training of community health workers, who then are able to conduct community meetings to share information about trachoma and raise awareness of the importance of hygiene. The program also supports community-led total sanitation (CLTS) and expanded these activities in 2018. Women's groups have been an asset to the program, as they receive training and share information within their communities. Radio broadcasts of information, education, and communication (IEC) messaging has also been important in raising awareness of the disease and activities that are being implemented.

The program also supports the training of masons in order to facilitate latrine construction. Once they received training, materials for latrine construction are distributed to each mason to carry out construction in their own community. In 2018, 6,447 latrines were constructed. Additionally, water points have been created in some communities. There are many partners involved in this activity, including other ministries within the government. The program is working to gather data from all partners involved in these activities.

Trachoma activities are also carried out in primary schools in Mali. Trachoma-specific activities and information have been added to the primary school curriculum. In 2018, training was provided to teachers and mothers of students on the revised curriculum to ensure it is carried out in both classrooms and in the students' homes and communities.

Transition Planning and Dossier

A working group has been created which brings together all partners working on trachoma in the country. Additionally, a validation committee was created by the MOH to oversee the dossier development and submission process. A database has been created to capture all program data and is being updated. In February 2019, a workshop was held to review the database and provide further updates. Development of the dossier will be ongoing while the program finishes all SAFE activities. A timeline for development has been created, and the program plans to submit the final dossier to WHO in December 2019.

The program has been preparing for post-elimination transition. A total of 69 eye care units have been established in almost all districts in the country. The eye care units are managed by individuals who have been trained to manage incident cases of TT that may present at the district level. To date, 174 ophthalmic assistants and 70 ophthalmologists have received this training. The program is considering how the eye care units will continue to receive consumables and TT kits once the National Programs moves into the post-elimination phase.

Programmatic Challenges

Insecurity continues to be an issue that affects program implementation in certain areas of the country. This is the single greatest issue facing the program. While security has improved in the northern regions, Mopti, in the central part of the country, is now heavily affected by insecurity. The highest remaining backlog is in Mopti. The program and its partners remain prepared to access areas when they can. Teams are ready to move in quickly, as soon as access is possible. Beyond insecurity, the National Program continues to be challenged by the work required to find the remaining TT cases in the country. TT surgery refusal is also a challenge. The program is working with Helen Keller International (HKI) on a study to further understand the high rate of refusals in the Kayes region.

Status of 2018 Program Review Meeting Recommendations

Recommendation 1: The Mali Trachoma Control Program should immediately start preparing the dossier for the validation of the elimination of trachoma as a public health problem.

Status: Preparations of the dossier are currently underway. A validation committee has been formed. The historical data is under review and is being organized.

Recommendation 2: The Mali Program should ensure all 20-planned surveillance surveys are conducted in 2018, while simultaneously implementing TT surgical activities to clear the TT backlog by the target date for elimination, 2018.

Status: The program conducted 9 surveillance surveys in 2018, including 2 surveys that were unplanned and conducted in Bamako. TT surgery activities were conducted concurrently. The current backlog as of January 2019 is 3,120.

Recommendation 3: The Mali Program should aggressively plan to clear the TT backlog, using detailed planning and simultaneous activities, by 2018.

Status: The program planned to clear the backlog in 2018, however not all TT surgeries were conducted.

Recommendation 4: The Mali Program should consider, when and where possible, working with the National Guinea Worm Eradication Program to promote awareness creation and knowledge of cash rewards.

Status: Not completed.

Recommendation 5: The Mali Program should consider pursuing experience exchange with the Niger Trachoma Control Program.

Status: The program has continued to exchange experiences with the Niger program, including participation in the Niger Annual Program Review in January 2019.

Targets for 2019 and Plans to Meet Targets

Surgery (S)

- Conduct 3,120 TT surgeries, 1,500 with Carter Center assistance

Antibiotics (A)

- Conduct 12 surveillance surveys

Facial Cleanliness (F) & Environmental Improvement (E)

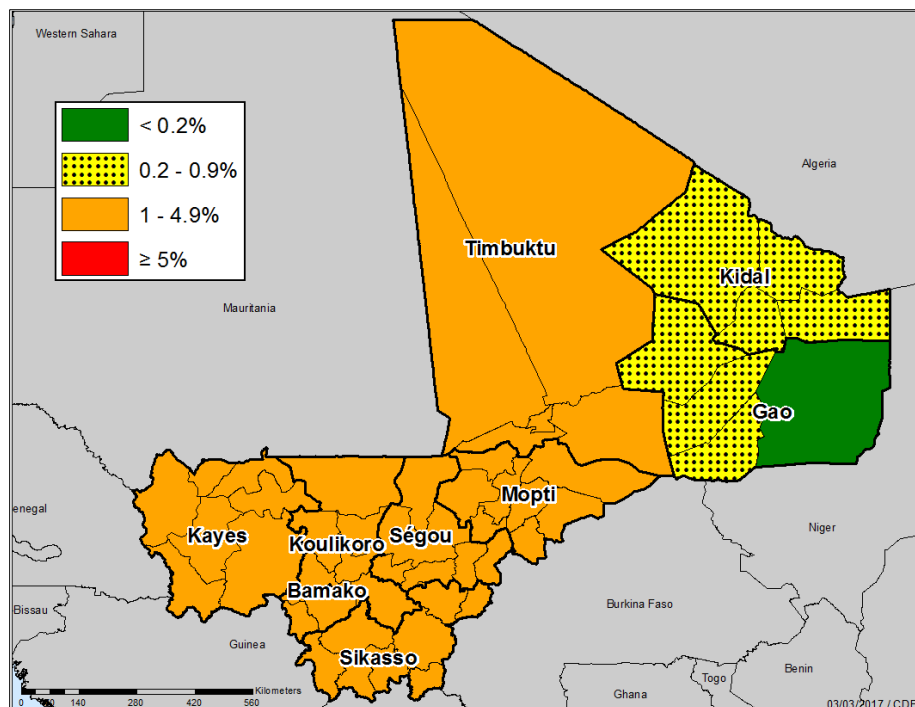
- Provide health education in 300 villages; 200 with Carter Center assistance
- Construct 6,000 latrines; 3,000 with Carter Center assistance
- Continue all current F&E activities

Operational Research

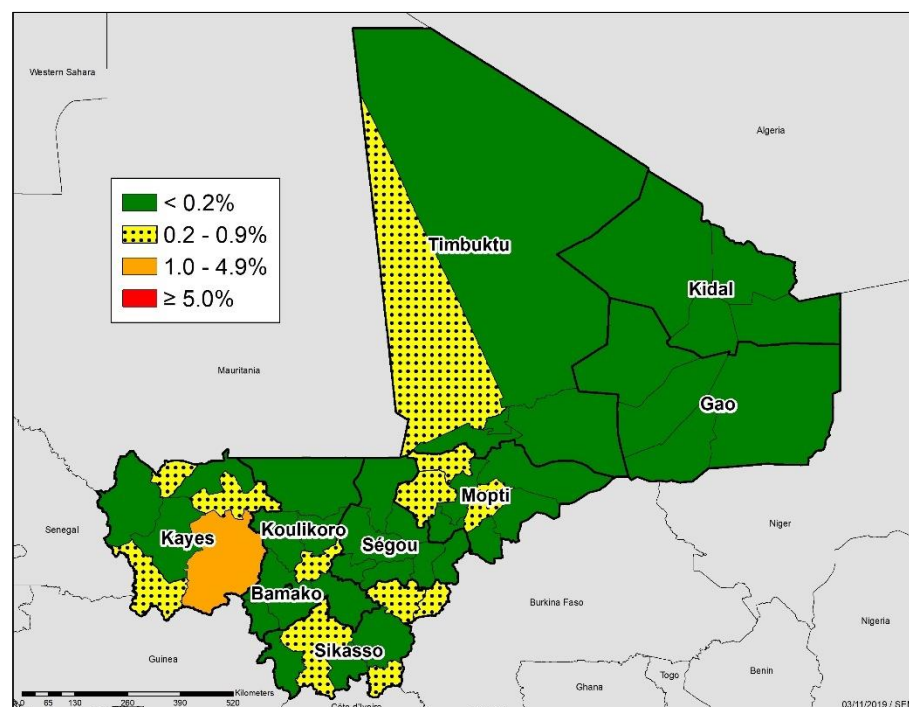
- The program plans to conduct research on case refusals in Kayes region with support from HKI. A pilot study has already been completed.

Mali: TT Prevalence among Adults ≥ 15 years

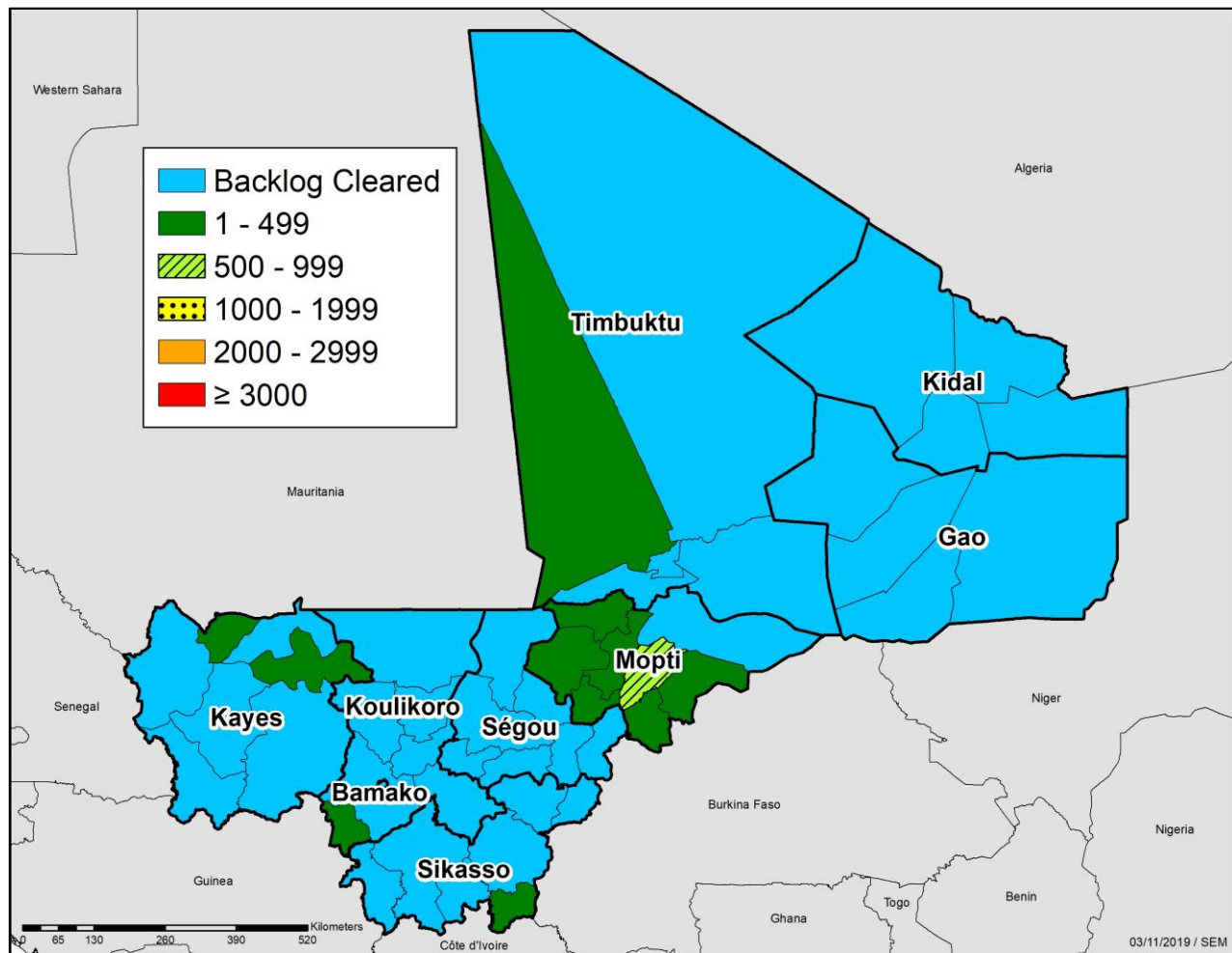
Baseline, 1996



2018

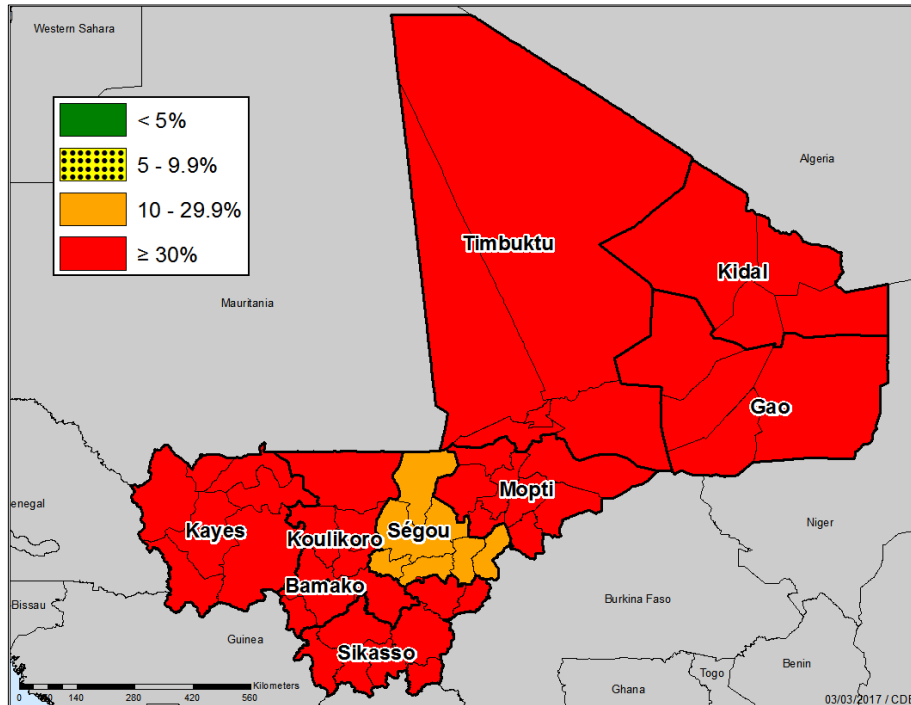


Mali: Surgical Backlog, 2018

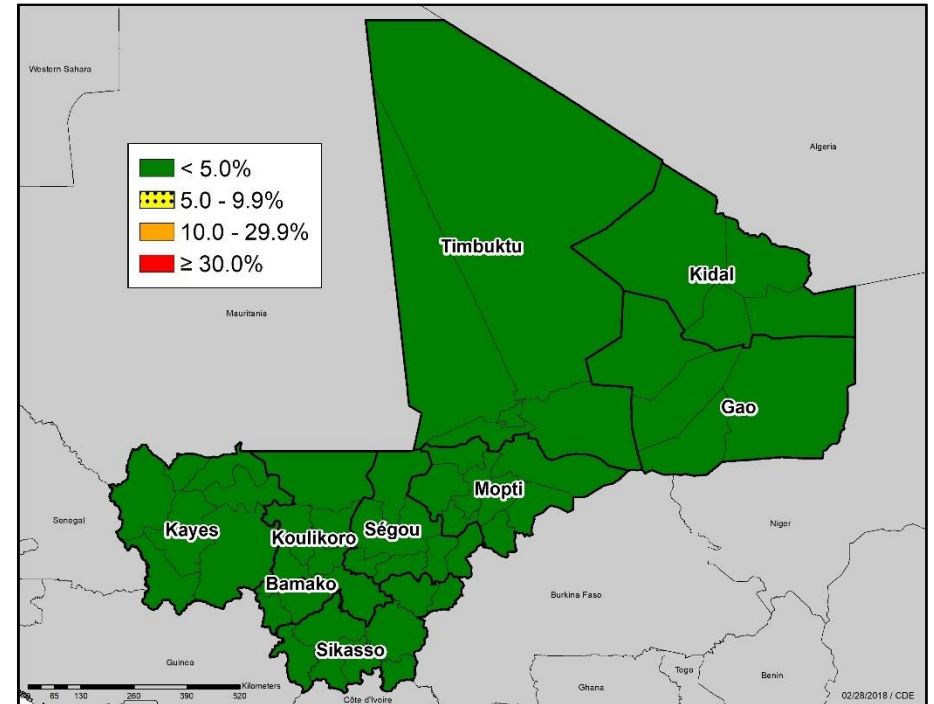


Mali: TF Prevalence among Children 1-9 years

Baseline, 1996



2018



SAFE in Niger

Presented by Dr. Kadri Boubacar, Deputy Coordinator PNSO, Ministry of Health, Niger

Background

The PNLC was established in 1987 following national surveys showing a prevalence of blindness of 2.2%, with one-quarter due to trachoma. Regional baseline surveys conducted from 1997 to 1999 found that 44% of children ages 1 to 9 had active TF and/or trachomatous inflammation-intense and 1.7% of women over 15 years of age had trichiasis. In 1999, the PNLC formed the NTTF, and beginning in 2001, prevalence surveys were conducted at the district level. Currently, trachoma is part of the Department of NTDs and is not considered a high priority disease. Though trachoma is integrated into the NTD department, trachoma partners organize trachoma specific coordination and annual review meetings at the regional level. The program implements all components of the SAFE strategy where warranted.

In 2013, the Minister of Health made a statement of appreciation for the work of the MOH trachoma coordinators and the 2 main partners, The Carter Center and HKI. These statements were made during a TT surgical outreach week in March 2013. Also, in 2013, the program name changed from PNLC to PNSO. Trachoma impact surveys have been conducted per WHO guidelines since 2006, with the most recent surveys conducted in 2018. Based on remaining rounds of MDA and number of TT surgeries required in several areas, the program has revised the target for elimination from 2020 to 2025.

Timeline of Events

1987: PNLC started
1997-1999: Baseline surveys conducted at regional level
2000: The Carter Center begins support of the program
2001: District level baseline surveys started
2002: SAFE strategy implementation begins
2006: Impact surveys conducted
2007: NTD Program launched
2010 and 2012: TIS conducted
2013: PNLC becomes PNSO
2015-2016: Impact surveys conducted
2018: Impact surveys conducted
2025: Updated target date for the elimination of trachoma

Table 1. Program Achievements in 2018

Indicator	Goal	National		Carter Center-Assisted	
		Target	Achieved	Target	Achieved
# of persons operated	20,195	15,000	6,512 (43.4%)	10,000	4,727 (47.3%)
# of women operated			3,735 (57.6%)		2,689 (56.9%)
# of surgeons trained		64	40 (62.5%)	24	26 (108%)
Doses of azithromycin distributed during MDA	4,757,248	4,757,248	3,648,904 (76.6%)	N/A ³	N/A
Doses of tetracycline distributed during MDA	150,000	150,000	150,000 (100%)	150,000	150,000 (100%)
# of villages with health education		600	527 (87.8%)	600	527 (87.8%)
# of household latrines built		10,000	16,372 (164%)	10,000	15,168 (152%)

Surgery (S)

The National Program has been providing TT surgery in Niger since 1999. The Carter Center began assisting TT surgeries in 2009. In 2018, the program conducted 6,512 surgeries, with 3,735, or 57.6%, provided to women. The program also supported training for 40 TT surgeons. As of March 2019, the remaining backlog in Niger is 18,244. At the current pace, the backlog will be cleared in 4 years. The highest remaining backlog is in the Zinder region, with cases also remaining in Dosso, Tahoua, Maradi, and Diffa. In 2018, the National Program experienced a delay in trachoma activities, particularly TT surgeries, due to a cholera epidemic in some areas in the country. The program was on hold while the epidemic was managed by the MOH. Immediately following the epidemic, the farming season in Niger began, so it was difficult to get patients to agree to surgery during this time. This combination of challenges caused the program to miss its targets for the year.

In 2018, the program continued to implement the *ratissage* strategy to identify TT cases in certain districts. This strategy was implemented following cross-border collaboration with Mali. The program was planning to carry out *ratissage* in additional districts, however due to the cholera epidemic, not all districts were able to carry this out. In 2018, the program screened 170,838 people for TT. Of those screened, nearly 98% did not have TT. A total of 3,778 people were identified with TT, and of those, 3,501, or 92.7%, received TT surgery, while 292 people, or 7.7%, refused TT surgical services. For those that did not receive surgery, the program plans to return to those cases to confirm if surgery will be accepted. Some refusals were due to scheduling issues with the patients.

The program conducts TT surgery validation to monitor the quality of TT surgery being conducted and to confirm that all reported cases actually received surgery. Post-operational follow up is conducted on patients 6 months after they receive surgery. The program also conducts follow up activities with TT surgeons who were trained using HEADSTART.

Antibiotic Therapy (A)

Baseline surveys conducted in 2002 indicated that the southern regions of Niger were endemic for trachoma, and many districts had a TF prevalence above 30%. The program has made significant progress to reduce the

³ The Carter Center does not currently assist MDA in Niger.

TF prevalence across the country. Currently 48 districts have reached the TF threshold for elimination. In 2018, the program distributed 3,648,904 doses of azithromycin and 150,000 doses of TEO through MDA. While The Carter Center does not support MDA in Niger, it does purchase all TEO required for MDA. MDA coverage was less than 80% in districts in Diffa and Agadez regions. In these areas, teams are moving door-to-door to distribute antibiotics. The landscape in these districts is difficult for teams to travel across in order to reach the communities that need MDA. Motorcycles are often relied upon for MDA, but it is not possible for these to be used in these areas due to the terrain. Additionally, insecurity is an issue in these areas and can limit the access of MDA teams. Some of the population has been displaced due to insecurity and Boko Haram activities in the area.

In 2018, the program conducted 24 surveillance surveys, 7 impact surveys, 4 TT-only surveys, and 1 baseline survey. Based on the survey results, 1 to 3 rounds of MDA are still required in some districts. Due to this, the National Program has revised the target date for elimination to 2025, which allows for all required impact and surveillance surveys to be carried out following the remaining rounds of MDA that are required.

Facial Cleanliness (F) & Environmental Improvement (E)

In 2018, the National Program supported health education in 527 villages. Trainings on IEC messaging was provided to 440 people. Like Mali, the National Program in Niger supports training for masons, and provides the materials for latrine construction. In 2018, 310 masons were trained, and a total of 16,372 latrines were constructed across the country. Radio broadcasts on trachoma are also supported, along with training of radio hosts.

Health education in schools is also a major focus on the National Program in Niger. In 2018, 400 teachers in the Tahoua and Dosso regions received training on trachoma curriculum. The program met with 125 heads of school as well to ensure their support and understanding of the trachoma curriculum. From 2014 to 2016, 560 schools received training, and in 2018, the program followed up with 280 teachers that were trained in 2016. Outside of the classroom, the program works with schools to construct latrines on the properties for student use. Hygiene kits were also distributed in 200 schools. Trainings in schools are supported by all partners, including the World Bank, HKI, and The Carter Center.

Transition Planning & Dossier

The program is working on collecting all historical data that will be used to complete the dossier. District, regional, and national data is reviewed and confirmed. In doing this, the program is working to ensure that all districts have complete historical data. Each region is being engaged in these activities to ensure data is being collected, stored, and shared in the same way.

Programmatic Challenges

The program noted several challenges faced in 2018. First, the program is working to ensure data collection is standardized from the district to the region to the national level, which has been an ongoing challenge. The program had hoped to make more progress on reducing the backlog in 2018. All strategies must be implemented to reduce the backlog as soon as possible.

Status of 2018 Program Review Meeting Recommendations

Recommendation 1: The Niger Trachoma Control Program should review and possibly revise the current elimination target given the planned MDA schedule.

Status: The elimination target has been revised from 2020 to 2025 based on remaining activities.

Recommendation 2: The Niger Program should consider a strategic planning meeting (in conjunction with their Program Review) during calendar year 2018 to include all stakeholders (including the World Bank).

Status: Meeting have been held every 2 months and include all implementing partners, including the World Bank.

Recommendation 3: The Niger Program should increase the number of surgeons to clear the TT backlog through surgical campaigns as soon as possible.

Status: In 2018, 40 TT surgeons were trained. There are currently 300 total TT surgeons working in Niger.

Recommendation 4: The Niger Program should seek support of all stakeholders and partners to ensure planned and needed activities in Agadez are completed.

Status: In 2018, 4 TT surgeons were trained in TT surgery. The surgeons were given 6 TT kits and 4 autoclaves. A total of 77 TT surgeries were conducted in the region in 2018.

Recommendation 5: The Niger Program should consider implementing ratisage, with priority given to districts or evaluation units with the highest known TT backlog.

Status: Ratisage has commenced in Niger and is currently in process in certain districts. The rollout was delayed slightly by the cholera epidemic.

Recommendation 6: The Niger Program should investigate options for cross border exchange with Nigeria.

Status: The program had a meeting with the national coordinator from Nigeria during the Reseau Africain Francophone des Experts du Trachoma meeting in September 2018. Both programs have agreed to coordinate on activities. The programs are working with International Trachoma Initiative (ITI) to coordinate activities and determine the financing for these cross-border activities.

Recommendation 7: The Niger Program should consider pursuing experience exchange with the Mali Trachoma Control Program.

Status: The program continues to exchange experiences with the Mali national program. The National Program coordinator attends Mali's program review, and participates in other meetings throughout the year.

Targets for 2019 and Plans to Meet Targets

Surgery (S)

- Operate 15,000 TT patients, 7,000 with Carter Center assistance
- Train 38 TT surgeons, 10 with Carter Center assistance

Antibiotic Therapy (A)

- Distribute 3,541,627 doses of azithromycin
- Distribute 100,000 doses of TEO; all doses of TEO will be provided by The Carter Center
- Conduct 6 impact surveys and 6 surveillance surveys

Facial Cleanliness (F) & Environmental Improvement (E)

- Conduct health education 600 villages, all with Carter Center assistance
- Construct 20,000 latrines, 10,000 with Carter Center assistance
- Improve access to drinking water, and improve existing water points

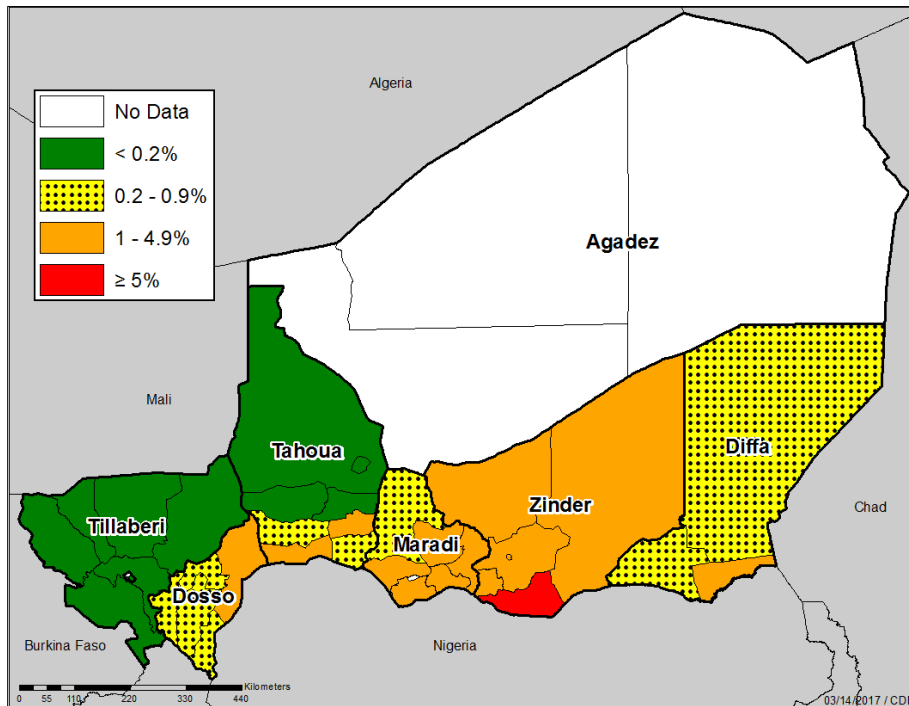
- Construct latrines in health facilities and other public places
- Distribute hand washing kits to schools and health centers
- Expand CLTS activities

Operational Research

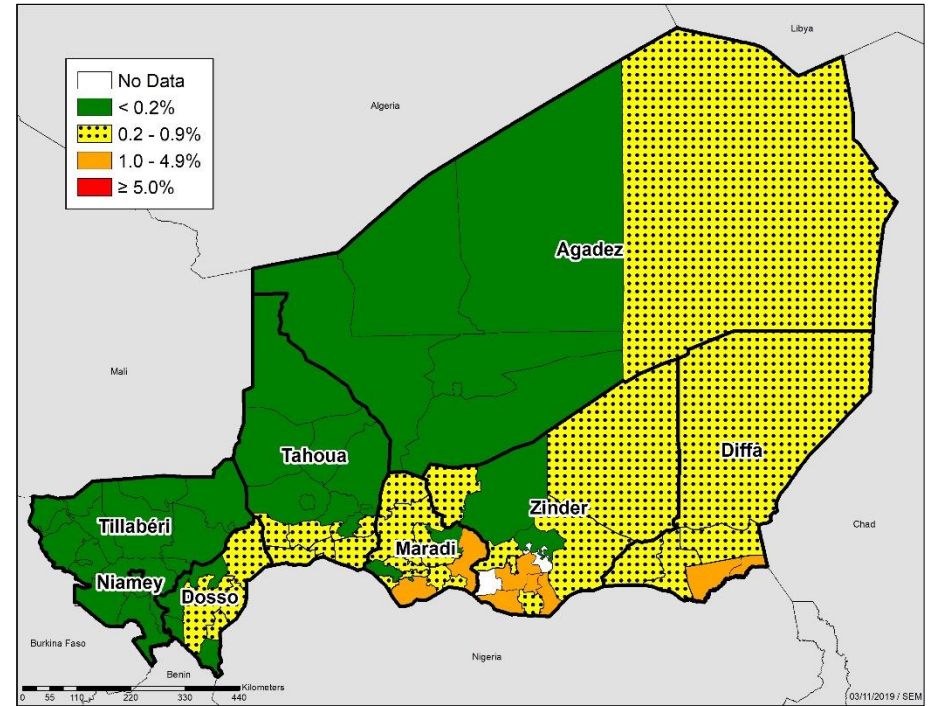
- Current studies:
 - Follow-up with TT surgeons trained with HEADSTART
 - Post-operative follow-up on quality of TT surgery
 - Mortality Reduction After Oral Azithromycin (MORDOR)

Niger: TT Prevalence among Adults ≥ 15 years

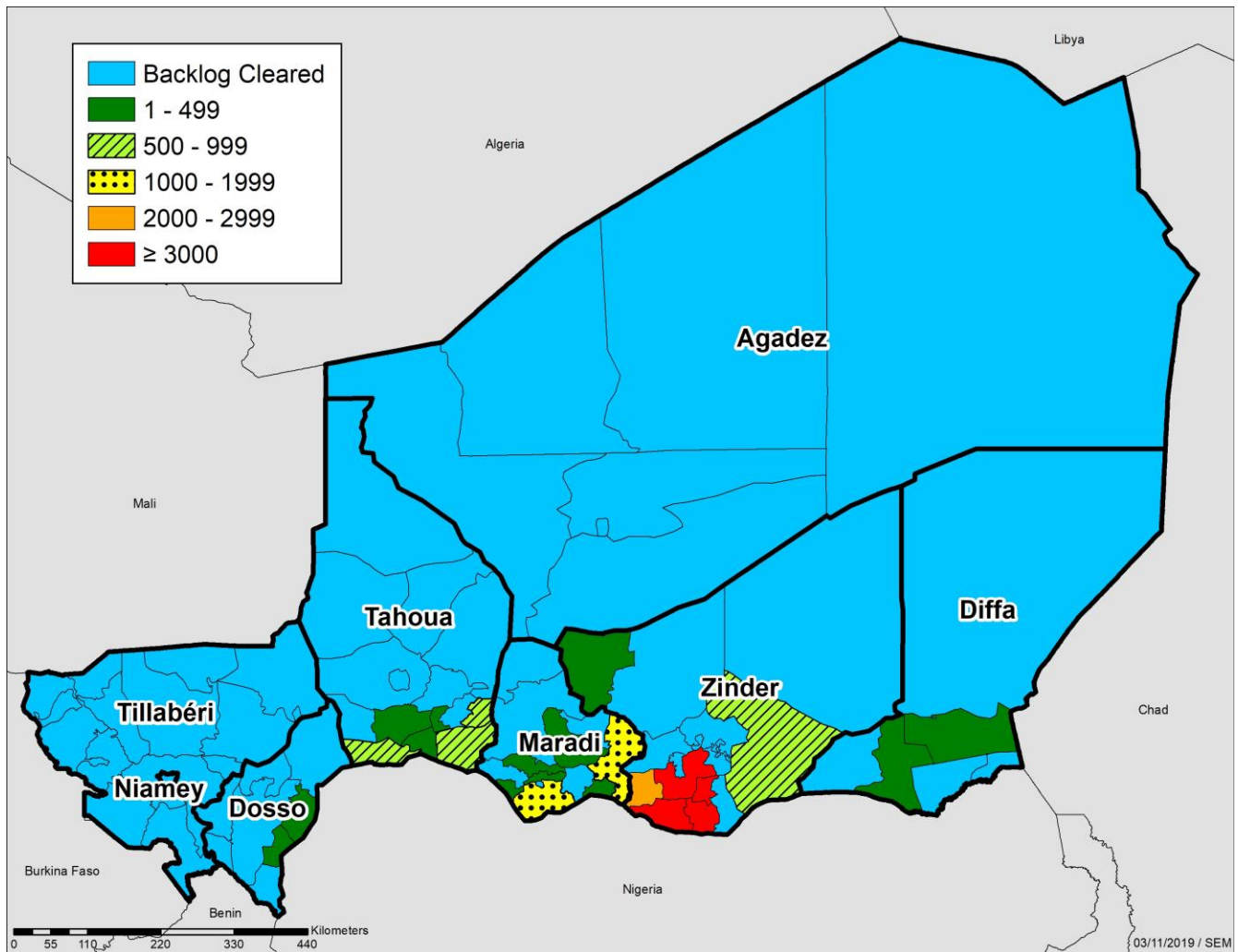
Baseline, 2000-2007



2018

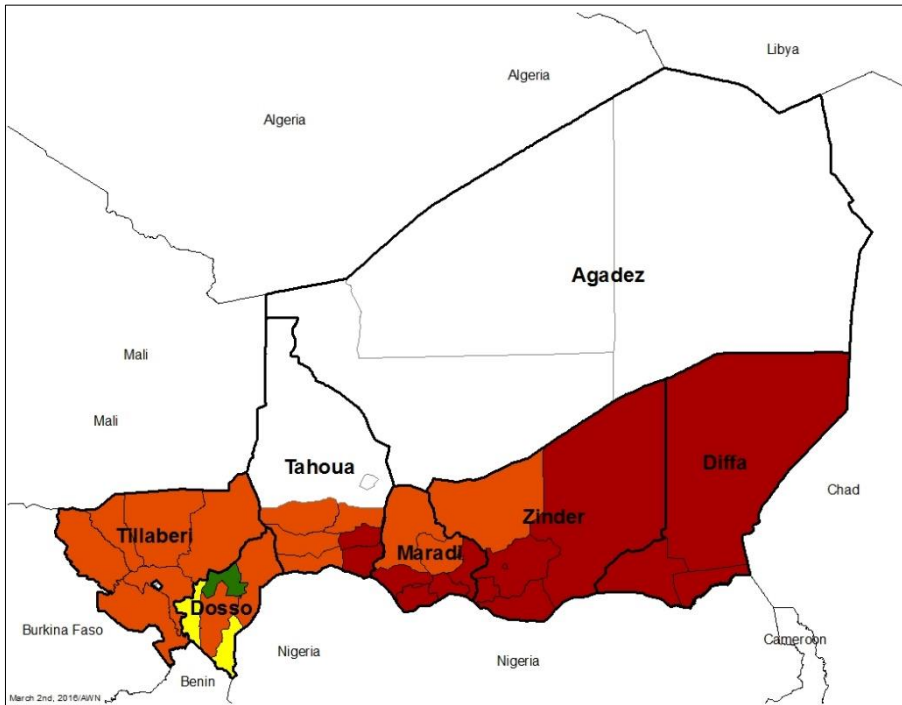


Niger: Surgical Backlog, 2018

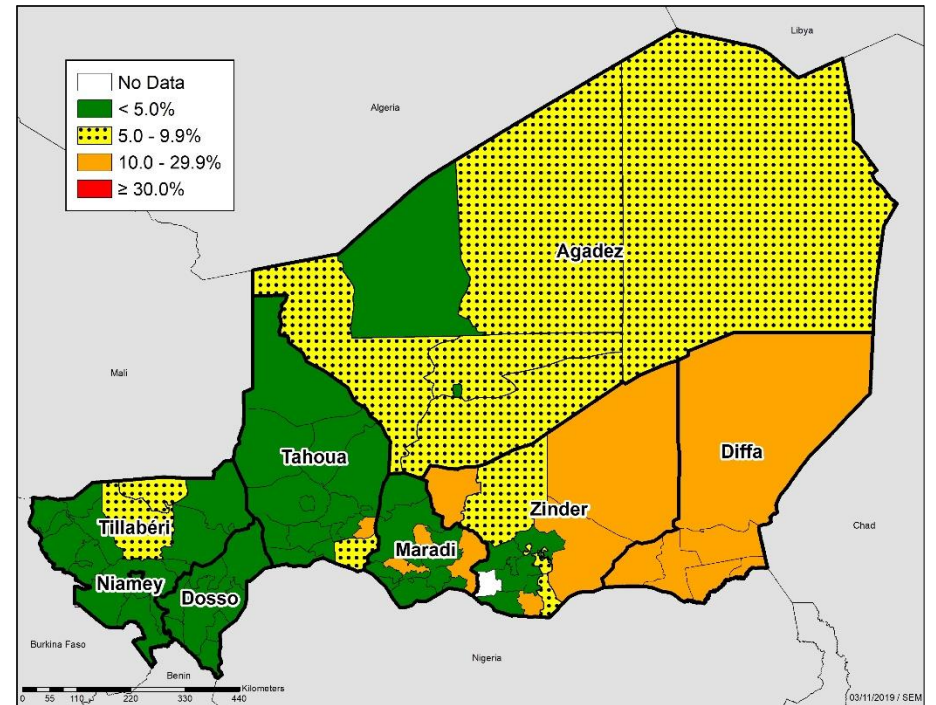


Niger: TF Prevalence among Children 1-9 years

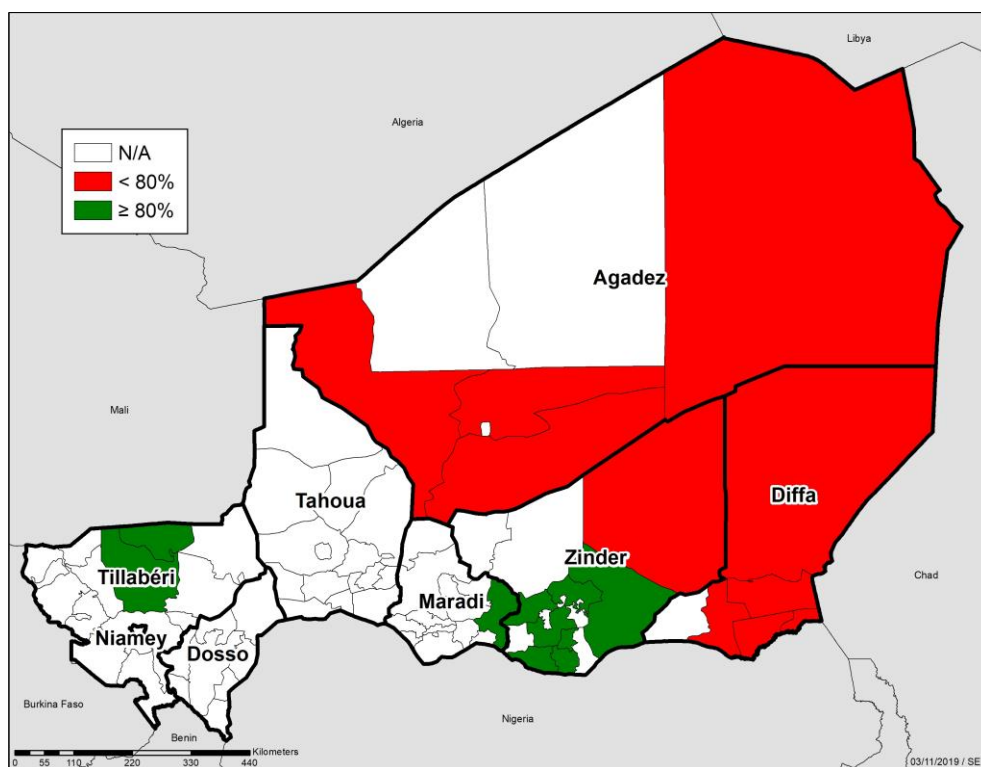
Baseline, 2000-2007



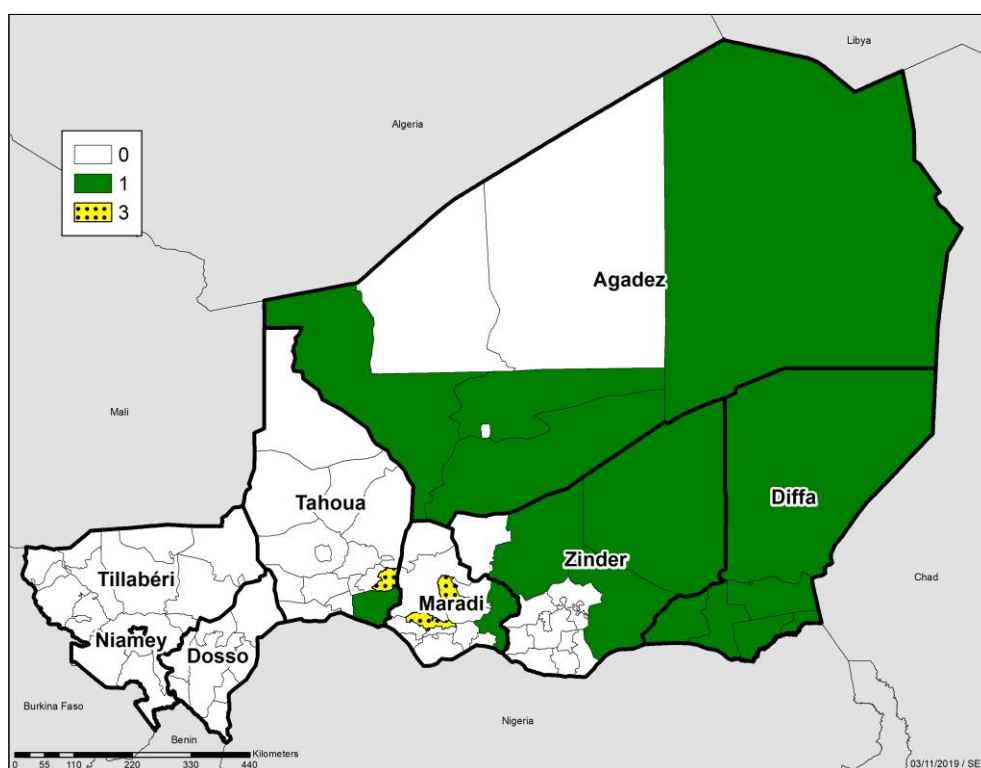
2018



Niger: MDA Coverage, 2018



Niger: MDA Rounds Remaining, 2018



SAFE in South Sudan

Presented by Mr. Makoy Samuel, Director for Preventive Chemotherapy NTDs, Ministry of Health, South Sudan

Background

Prevalence surveys conducted between 2001 and 2006 showed TF prevalence as high as 77.2% among children ages 1 to 9 years old and TT prevalence as high as 15.1% among adults 15 years and older in some districts in the Greater Upper Nile region. Despite the high prevalence, trachoma currently is not a top priority for the government. The trachoma program was previously under the Department of Eye Care Services; however, in late 2013 it was relocated to the Department of NTDs. SAFE activities have not been conducted in all the districts due to a lack of resources. In the districts receiving SAFE interventions, most activities focus on the A component. The first TAP was completed in 2012.

The program had originally planned to conduct baseline surveys in 5 states in South Sudan as part of the GTMP and impact surveys in 8 districts in Carter Center-assisted areas; however, fighting throughout most of 2014 prevented these surveys from occurring. Due to the insecurity, The Carter Center suspended all activities in December 2013. Since the conflict began, more than 800,000 people have fled their homes, many of which were in districts supported by the Trachoma Control Program. The Carter Center recommenced program activities in September 2014.

In October 2014, the NTD task force was reactivated with a full review of a situational analysis and master plan launch. In 2015, the first TIS were conducted in 5 of the 29 districts known to be endemic. Due to insecurity, only 5 districts were accessible, and The Carter Center was the only remaining partner in country. Activities were suspended again from May 2016 through August 2017. Following this, MDA was conducted in Kapoeta East, Kapoeta South, and Kapoeta North. In July 2018, TT surgical services restarted in Kapoeta state, following several years of no activity. In January 2019, a workshop was held to develop a TAP for Kapoeta and Torit states. Based on remaining activities within the country, the National Program has revised the elimination target from 2020 to 2030.

Timeline of Events

1999-2010: Baseline mapping
2001: Trachoma control activities began
2005: Comprehensive Peace Agreement signed
2007: MOH Government of Southern Sudan Trachoma Control Program established
2008: Trachoma Taskforce established
2011: South Sudan gains independence
2012: TAP finalized
2013-2014: Fighting in parts of the country causes displacement of population
2014 Jan-Sept: Suspension of program activities
2015: First impact surveys conducted in Budi, Lopa/Lafon, Kapoeta East, Kapoeta North, and Kapoeta South
2016 May-August 2017: Trachoma activities suspended
2017: MDAs resume in Kapoeta East, Kapoeta South, and Kapoeta North
2018: TT surgeon training in HEADSTART in Kapoeta state
2019: TAP developed for Kapoeta and Torit states
2030: Trachoma elimination goal

Table 1. Program Achievements in 2018

Indicator	Goal	National		Carter Center-Assisted	
		Target	Achieved	Target	Achieved
# of persons operated	3,702 (5 of 29 districts)	1,000	623 (62.3%)	500	530 (106%)
# of women operated			451 (72.4%)		451 (85%)
# of surgeons trained/retrained		10	5 (50%)	4	5 (125%)
Doses of azithromycin distributed during MDA	468,061 (5 of 29 districts)	279,073	248,577 (89.07%)	279,073	248,577 (89.07%)
Doses of tetracycline distributed during MDA	15,130	15,130	17,105 (113%)	15,130	17,105 (113%)
# of villages with health education		1,000	835 (83.5%)	1,000	835 (83.5%)
# of household latrines built		80	0	20	0

Surgery (S)

The National Program has been providing TT surgery across South Sudan since 2001. The program has made progress in mapping districts, with data from Unity, Upper Nile, Jonglei, Western equatorial, Central Equatoria, and Eastern Equatoria states. However, due to ongoing insecurity, much of the country remains to be mapped. Insecurity has also led to delayed or stopped activities across the country at different points in recent years. In 2018, after a long period of disruption, the program restarted surgical activities with assistance from The Carter Center. A total of 530 surgeries were conducted in 2018 in Eastern Equatoria state with assistance from The Carter Center. Additional surgeries were provided at some local hospitals for a total of 623 TT surgeries conducted in 2018. Of the surgeries conducted, 451, or 72.4%, were provided to women. Additionally, 5 TT surgeons were trained, which is 50% of the target for the year. Despite this progress, the TT prevalence remains the same in the 5 states that have been mapped. The current backlog in these 5 states is 3,172 and will take an estimated 6 years to clear. If additional resources were available and the security situation improves, the National Program could clear the backlog in much less time.

In order to identify TT cases for surgery, teams conducted case finding in 272 villages across 4 *payams*, or districts, in Eastern Equatoria. A total of 42 case finders were trained and deployed to the field, and patients identified with TT were directed to one of the 8 surgery camps that occurred. To identify cases, case finders and community mobilizers move from house to house in each village to locate all suspected TT cases. In total, 858 people were screened and 67%, or 571 people, were confirmed to have TT. Of those identified with TT, 530, or 93%, received TT surgery. A total of 41 people refused surgical services due to having other responsibilities at the time of the camps and were unable to take the time to have surgery.

The program implemented a new strategy for patient follow-up in Kapoeta state. All patients that received surgery were provided a place to sleep within the surgery camp facility for 1 night following surgery. A caregiver was allowed to stay with each patient and meals were provided. During this period, surgeons were able to monitor patients, ensure that no bandages were removed prematurely, and that the surgery was conducted correctly. If any additional corrective surgery was needed, the TT surgeon could provide it at that time. Additionally, program officers and health workers provided health education on trachoma to patients through discussions and showing videos about trachoma. Beyond the 1 day follow up, the program was able to follow up with 87% of patients 7 to 14 days following surgery and 72% of patients 3 to 6 months following surgery.

Antibiotic Therapy (A)

Baseline surveys show that many of the districts in South Sudan that have been mapped are hyper-endemic for trachoma. Data shows that TF prevalence has been reduced in 1 county in Eastern Equatoria. In 2018, the program was able to conduct some MDA in Kapoeta East, South, and North. A total of 248,577 doses of azithromycin and 17,105 doses of TEO were distributed through MDA. This represents 89% and 113% of the annual targets respectively. Greater than 80% coverage was achieved in each district.

The program had great success in getting MDA to populations living in cattle camps. A total of 35 cattle camps received MDA, with a total population treated of 10,901. Distance traveled by MDA teams between the camps ranged from 1 hour to 2 days. Reaching these mobile and remote cattle camps requires more resources than a static MDA, but the program was able to achieve success with the strategy used in 2018.

MDA activities will continue in upcoming years in Eastern Equatoria, with 2 to 4 rounds required in districts that have been mapped. In 2018, the program planned to conduct 6 impact surveys, but resources were not available to support these. The program is planning to conduct surveys in 2019.

Facial Cleanliness (F) & Environmental Improvement (E)

The National Program provided health education activities in 835 villages in 2018, reaching 83.5% of its target for the year. Health education activities are conducted alongside surgical and MDA activities. During surgical camps, trachoma flip charts and video messages are utilized daily. During the 1-day follow up with patients, the surgical assistants provide health education, informing patients on how to maintain hand and face hygiene. Health education is also integrated into MDA activities. Training is provided to village chiefs on key trachoma messaging. Flip charts are distributed, and health education sessions are organized while MDA is occurring to promote improved hygiene and sanitation. Also, during MDA, the program promoted implementation of trachoma health education in primary and secondary schools. In October 2018, the National Program participated in World Sight Day for the first time. The celebration provided a global platform to celebrate success and share information on trachoma.

In January 2019, a workshop was held to develop a TAP for Kapoeta and Torit states. The workshop included the ministers of health from both states, along with representatives from the national, state, and county level ministries of health. The workshop was facilitated by Mr. Chad McArthur and included participation from ITI, WHO, The Carter Center, and several key WASH partners implementing at the county levels.

The program continues to promote and support latrine construction, an activity that has been supported by The Carter Center since 2005. While no latrines were constructed in 2018, information about the importance of building, maintaining, and using latrines was included in the health education sessions. The program plans to support this activity in 2019.

Programmatic Challenges

The program faced a range of challenges in 2018. There is a lack of reliable population data on which to base program targets. Large parts of the country still need to conduct baseline mapping. There is very limited funding for trachoma activities in South Sudan, so activities are restricted. In 2018, the program had a shortage of azithromycin POS due to a change in the the dosing guidelines for MDA. The program worked with ITI to resolve this issue quickly, and additional POS was obtained to continue MDA activities. Currently, The Carter Center is the only NGO assisting trachoma activities in the country. While there is success in this partnership, the program would like to see more NGOs operating on the ground. Finally, the program was faced with limited capacity to perform TT surgeries on children, which can require additional resources and training. The program hopes to have more resources available to support this in 2019 and beyond.

Status of 2018 Program Review Meeting Recommendations:

Recommendation 1: The South Sudan Trachoma Control Program should consider a strategic review in 2018 to develop a TAP for Kapoeta state, a stepped approach for expansion, and a plan for future peace.

Status: In January 2019, a state-level TAP workshop for Kapoeta and Torit states was held in Kapoeta Town. The workshop included both state ministers of health, representatives from the national and state level ministries of health, and national, state, and county level representatives from different ministry departments. Chad MacArthur facilitated the workshop, which was also attended by representatives from The Carter Center, ITI, WHO, Ophthalmologist Association of South Sudan, and several key WASH partners implementing at the country level.

Recommendation 2: The South Sudan Trachoma Control Program should prioritize the training of national TT surgeons, and the training should include the use of HEADSTART. Additionally, the program should consider hiring surgeons full time to work in Kapoeta.

Status: In July 2018, a TT surgeon training was held in Mogos in Kapoeta state. Five surgeons were trained on TT surgeries using HEADSTART. New surgeons were trained on the Trabut method, while existing surgeons received refresher training on the bilamellar tarsal rotation (BLTR) method. Three of the 5 surgeons were placed under contract, completing 8 surgical camps in Kapoeta state.

Recommendation 3: The South Sudan Trachoma Control Program should consider, where possible, working with the National Guinea Worm Eradication Program to promote awareness creating and knowledge of cash reward.

Status: The National Program team integrated into the existing structures of Guinea Worm Eradication Program during the Kapoeta State MDA in order to promote awareness of the cash reward offered by the Guinea Worm program. Through this integrated activity 111 rumors and 67 suspected cases were reported and treated.

Targets for 2019 in Kapoeta and Torit states and Plans to Meet Targets:

Surgery (S)

- Operate 2,650 TT patients, 530 with Carter Center assistance
- Train 15 TT surgeons, 5 with Carter Center assistance

Antibiotic Therapy (A)

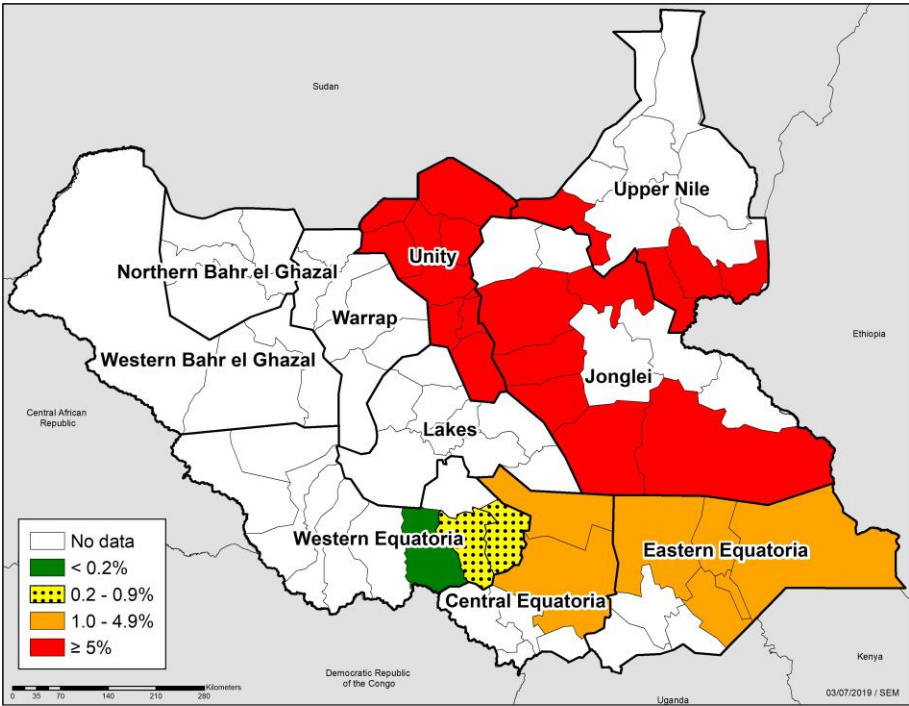
- Distribute 501,582 doses of azithromycin, 303,030 doses with Carter Center assistance
- Distribute 15,575 doses of TEO, all with Carter Center assistance
- Conduct 6 impact surveys

Facial Cleanliness (F) & Environmental Improvement (E)

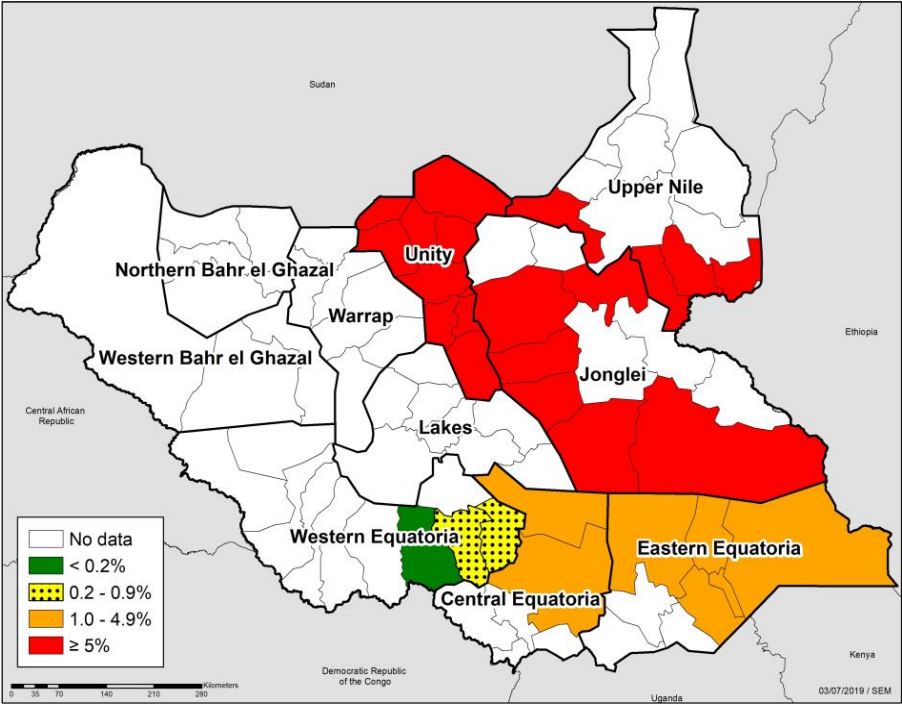
- Conduct health education in 1,000 villages, all with Carter Center assistance
- Construct 80 latrines, 20 with Carter Center assistance
- Disseminate trachoma IEC materials to reach 1,000 villages
- Continue engagement at WASH and health cluster meetings to advocate for latrine construction
- Increase health education in primary schools

South Sudan: TT Prevalence among Adults ≥15 years

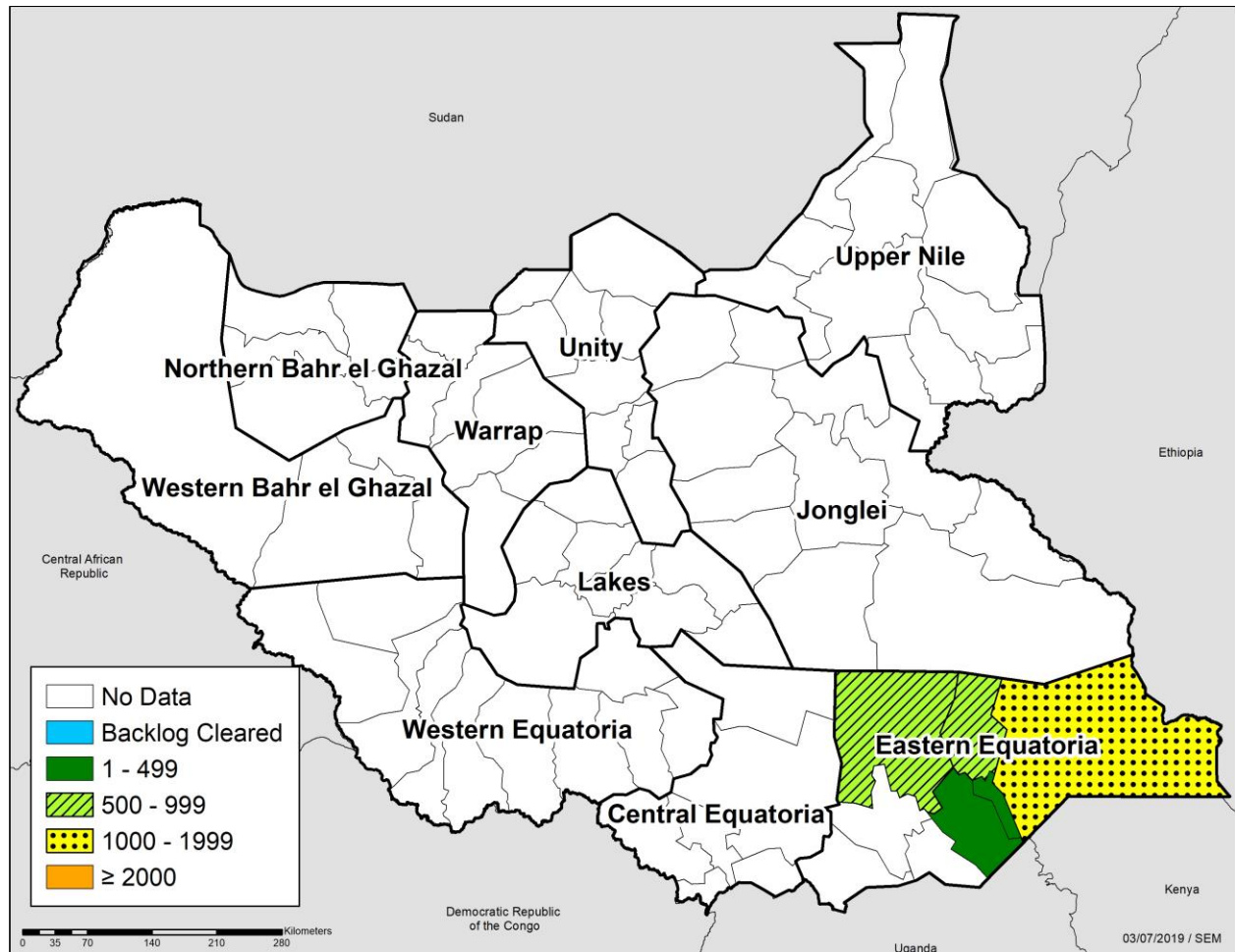
Baseline, 2001-2010



2018

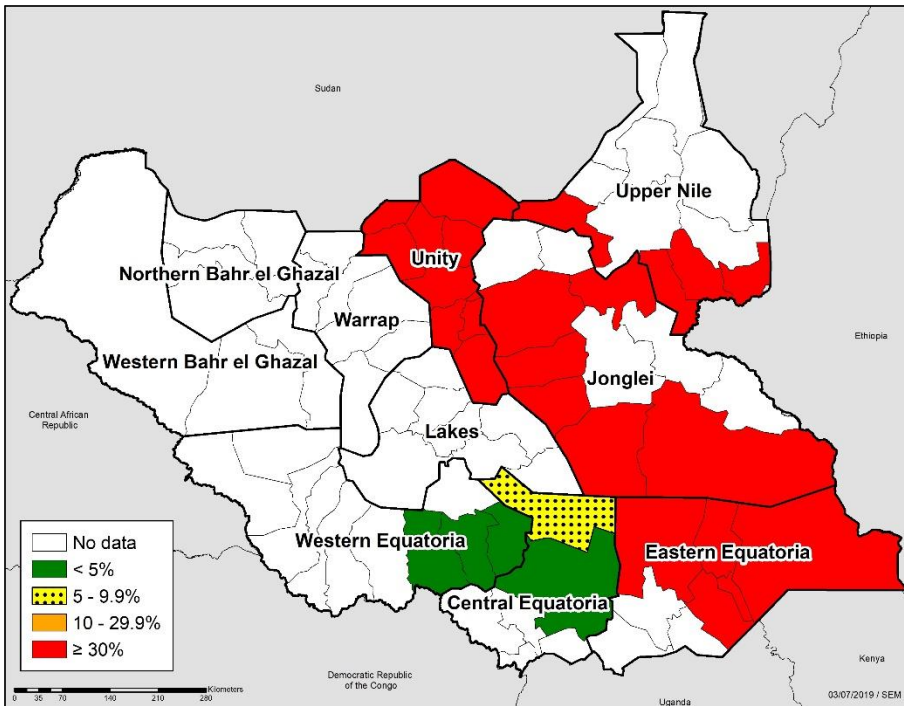


South Sudan: Surgical Backlog, 2018

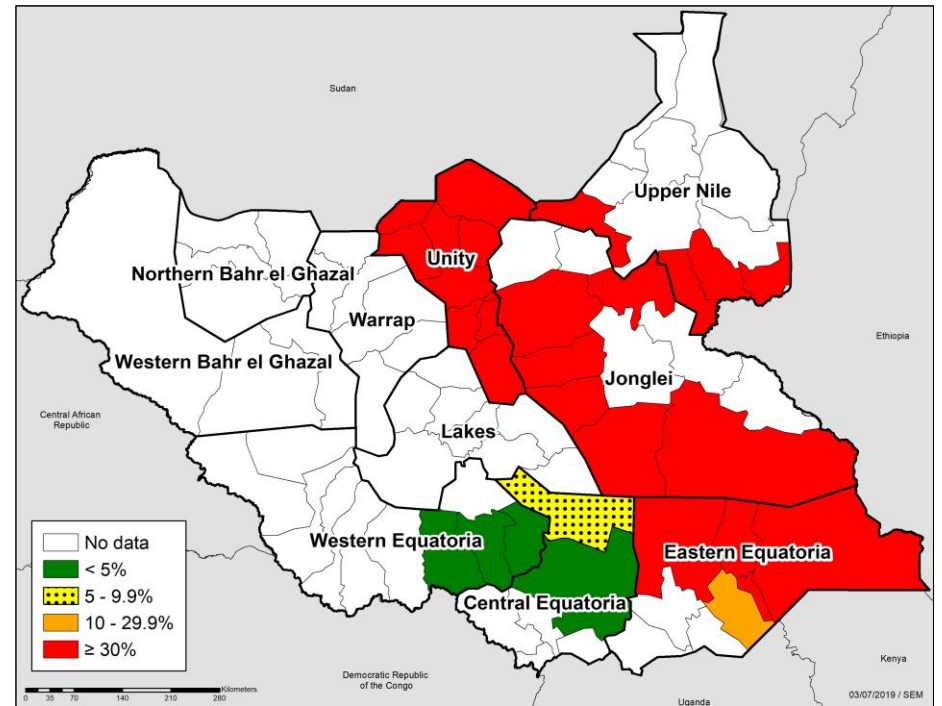


South Sudan: TF Prevalence among Children 1-9 years

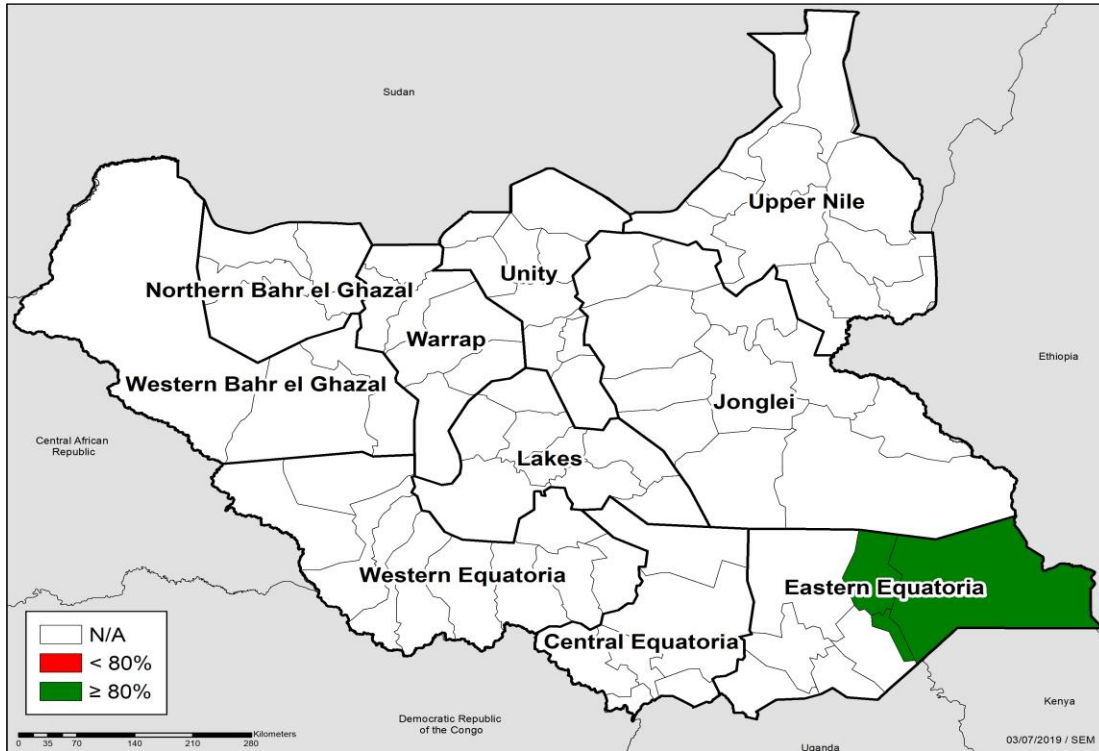
Baseline, 2001-2010



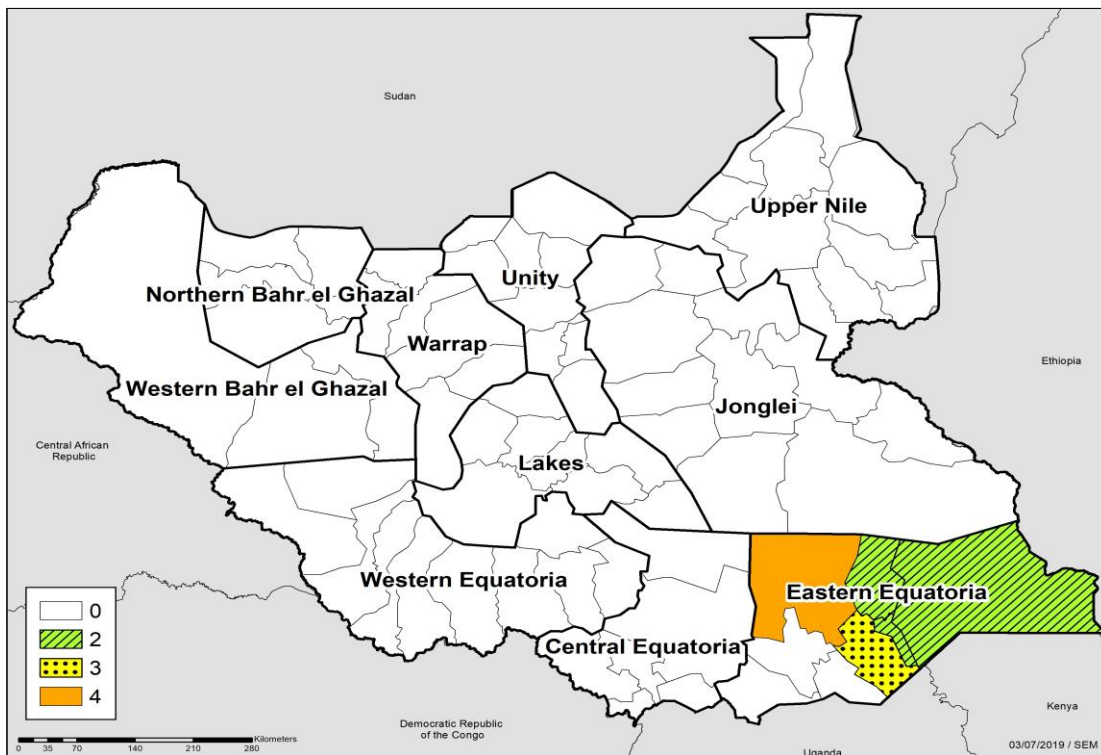
2018



South Sudan: MDA Coverage by District, 2018



South Sudan: MDA Rounds Remaining, 2018



SAFE in Sudan

Presented by Dr. Balgesa Elkheir Elshafie, National Coordinator, Trachoma Control Program, Federal Ministry of Health, Sudan

Background

The FMOH has been working towards trachoma control since 1962, when trachoma was incorporated into the National Program for the Prevention of Blindness (NPPB). The Academy of Medical Sciences and Technology took over the leadership of the program in the 1990s as contractors on behalf of the FMOH. In 2005, the FMOH relocated the Trachoma Control Program to the NPPB. The elimination of blinding trachoma is one of the FMOH's priorities, and government funds are allocated to support the program. In 2012, the government allocated 1.5 million USD for 5 years to help support The Carter Center's partnership for trachoma control. There is a strong coordination mechanism between the government, represented by the FMOH and Federal Ministry of Finance, and implementing partners, such as The Carter Center and Sightsavers.

National prevalence mapping began in 2006 and finished in 2010 in all areas except Darfur. Mapping was almost completed in Darfur in 2015 through the coordination of the FMOH, GTMP, Sightsavers, and The Carter Center; although 14 localities remain. In 2017 and 2018, the first surveillance surveys were conducted in El Jabalain and Dongola localities. Additionally, in 2018, SAFE activities were implemented in South Sudanese refugee camps, after a baseline survey conducted in 2017 showed that full SAFE intervention is warranted. S, A, and F interventions are assisted by The Carter Center, Sightsavers, and the FMOH. The E intervention is implemented by various federal and state ministries and supported by United Nations Children's Fund (UNICEF) and other organizations. Though The Carter Center does not directly fund E activities, it supports advocacy for this component. The program continues to work towards eliminating trachoma as a public health problem by 2020.

Timeline of Events

1999: The Carter Center began supporting the trachoma control program
2000: Zithromax® donation by Pfizer Inc began
2005: National Trachoma Program moved to the FMOH
2005-2010: Baseline prevalence surveys conducted (except for Darfur and Khartoum states)
2010-2016: Impact surveys conducted in Northern, Blue Nile, White Nile, Red Sea, Sinnar, and Gedarf states
2013: Sightsavers begins support of trachoma control program
2014: School health curricula and teacher guidelines on trachoma elimination were completed
2015: Mapping in Darfur and Khartoum is completed in accessible areas; trachoma curricula teacher's training; TAP workshop held
2016: TAP launched; MDA started in Darfur states
2017: First surveillance survey conducted in El Jabalain locality and TT only pilot surveys conducted; F&E workshop completed; baseline survey conducted in South Sudanese refugee camps
2018: Surveillance survey conducted in Dongola locality; impact surveys started in Darfur states; SAFE interventions implemented in South Sudanese refugee camps
2020: Target date for elimination of trachoma

Table 1. Program Achievements in 2018

Indicator	Goal	National		Carter Center-Assisted	
		Target	Achieved	Target	Achieved
# of persons operated	34,296	7,500	1,632 (22%)	2,100	825 (39%)
# of women operated			1,093 (67%)		568 (69%)
# of surgeons trained		30	41 (136%)	N/A	N/A
Doses of azithromycin distributed during MDA	2,277,010	2,277,010	2,092,025 (92%)	845,643	479,167 (56%)
Doses of tetracycline distributed during MDA	45,540	45,540	30,482 (67%)	16,193	9,064 (54%)
# of villages with health education		2,118	2,075 (98%)	277	234 (85%)
# of household latrines built		No target set	Not reported	N/A	N/A

Surgery (S)

The National Program provided 1,632 TT surgeries in 2018, reaching 22% of its annual target of 7,500 surgeries. Of the total surgeries conducted, 1,093, or 67%, were provided to women. The Carter Center assisted 825 of 1,632 surgeries conducted. The estimated remaining backlog is 41,858. At the current pace, the program will require an additional 36 years to clear the backlog. The program is currently developing a TT-only survey/case-finding hybrid protocol to use in non-endemic communities, which may help to reduce the TT estimate and identify patients.

The National Program provided training for TT surgery to 41 surgeons, exceeding its annual target of 30 by 36%. In 2018, the program was able to expand training to non-ophthalmologists for the first time in the history of the program. This may help to increase the pace at which the program is able to conduct surgeries. One of the trainings conducted took place in Gedarif state. Three medical officers and 1 medical assistant received training on TT surgery. The training took place over 5 days and included clinical knowledge, HEADSTART training, and live surgery training. As part of the training, surgeons participated in a surgical camp in 1 locality. Two of the trainees also participated in a camp in West Galabat locality. Moving forward, the program will provide training to medical officers at the state level who express an interest in TT surgery.

The program utilized case finding to identify TT patients in Gedarif state. A total of 203 case finders went from house to house in 32 villages in 2 different localities to identify patients. The case finders were identified within the targeted communities and attended a 1-day training, during which the ICTC curriculum for TT case finders was used. The strategy took 4 days to complete, and patients with suspected TT were directed to 2 surgical camps to confirm their cases and provide surgery as needed. A total of 66,526 people were screened for TT, and 491 people, about 1%, were suspected to have TT. Those patients were examined by trained surgeons, and 369 were confirmed to have TT. Surgery was provided to 48%, or 175 cases. A total of 11 cases were epilated, and 11 cases were referred to a hospital for surgery. The referred cases included those with inflammation and children with TT, who require general anesthesia in order to have the surgery. Surgery was refused by 115 patients for various reasons, including recurrence and a fear that they would not be able to work during harvest times.

Antibiotic Therapy (A)

The National Program has reached TF elimination thresholds in many districts since baseline surveys were conducted in all areas, except Darfur, in 2007. Recent surveys show continued progress of the program, including in some areas of Darfur. MDA activities continued in 2018. The program distributed 2,092,025

doses of azithromycin and 30,482 doses of TEO. The Carter Center assisted in distributing 56% of azithromycin doses. Two localities were scheduled to receive MDA, but teams were unable to gain access for security reasons. The program achieved 80% coverage or greater in all areas that had MDA in 2018. With a change to the dosing guidelines for MDA, the program modified existing dosing polls and will utilize the new calculations for drug distribution in upcoming MDAs. Data shows that MDA rounds remain to be conducted in Blue Nile state, some refugee camps, and in several areas in Darfur.

In 2018, 10 surveys were conducted. The program conducted 9 impact surveys in Red Sea state, Gedarif state, West Darfur state, South Darfur state, and North Darfur state. Data from the impact surveys conducted in Gedarif and Red Sea states shows that localities surveyed have achieved TF below 5%. Localities surveyed in West Darfur have reduced the TF prevalence but have not yet reached the elimination threshold. A surveillance survey was conducted in Dongola locality in Northern state, which showed that TF is still below 5%.

The program also collected data on F&E during impact and surveillance surveys. The indicators included children ages 1 to 9 years with clean face and households with latrines. Results show above 75% of children with clean face in Baldyat el Gedarif, Sawakin, and Dongola localities. Dongola has also achieved nearly 100% of households with latrines.

The program conducted training for graders and recorders for surveys. Training was conducted over 2 days, during which graders were trained on how to screen for trachoma and how to utilize the WHO simplified grading system. Out of the 10 graders at the training, 9 passed the reliability test. Supervisors and numerators were trainings on survey methodology and data entry. Another training was conducted in Sudan for graders and trainers from Libya and Somalia.

Facial Cleanliness (F) & Environmental Improvement (E)

The National Program conducts health education activities during MDA and surgical campaigns. By integrating these activities, the program reached more people in each community. In 2018, with Carter Center assistance, the program trained over 1,500 MDA volunteers on F&E messaging, and activities were carried out in nearly 300 villages. Radio programs and live television broadcasts are also utilized to share messages about trachoma and ways to prevent the disease. More than 165 group discussions were conducted during MDA and TT camps in endemic localities. Religious leaders also received training to deliver messages about trachoma during services in the mosques. Teams distributed thousands of posters, flip charts, leaflets, t-shirts, caps, and bags. TT case finders were also involved in sharing health education messages.

Trachoma curricula is taught in primary and secondary schools. Rabbit (trachoma educator) books, flip charts, and posters are used by teachers and older students in the classroom to teach lessons on trachoma. Schools support the development of Trachoma Friendship Societies, which promote health education activities in schools and in surrounding communities. Students are often sharing lessons learned in the classroom with their families and members of their communities.

The program does not directly support latrine and water supply activities in Sudan. The Ministry of Education, UNICEF, and other WASH organizations are responsible for monitoring these activities. Investment companies are involved in construction of latrines and water points. Partners supporting water provision and latrine construction in trachoma-endemic areas include the dams construction unit, private oil companies, state ministries of engineering, and the communities themselves.

Transition Planning & Dossier

To date, no action has been taken by the National Program regarding transition planning and dossier development.

Programmatic Challenges

The program faced many challenges in 2018. Due to insecurity, the program was unable to access some endemic areas in Blue Nile state. The insecurity has also led to population movement, which may delay the program from completing SAFE activities as it reassesses where trachoma interventions are required. The country experienced a long rainy season, which delayed some activities. The farming and harvesting seasons increase movement of people in certain areas, which makes access difficult for MDA and TT activities. Harvesting responsibilities can also lead to refusals for TT surgery. Finally, there are 14 localities in Darfur that still need to be mapped before any interventions can be implemented.

Status of 2018 Program Review Meeting Recommendations:

Recommendation 1: The Sudan Trachoma Control Program should aggressively implement activities that were previously planned in the TAP to clear the TT backlog, using detailed planning and simultaneous activities, by 2020.

Status: Implementation of activities in 2018 started as planned. The program trained 38 registrars at the Khartoum Eye Hospital, as well as 3 new surgeons in Gedarif state. TT case finding was implemented in coordination with TT camps, and a total of 5 TT camps were conducted in targeted localities and South Sudanese refugee camps.

Recommendation 2: The Sudan Trachoma Control Program should aggressively train the new approved cadre of mid-level health workers (medical doctors and medical assistants) to be TT surgeons in 2018.

Status: In 2018, 3 medical officers received TT surgery training.

Recommendation 3: The Sudan Trachoma Control Program should implement the trachoma school curriculum in trachoma endemic localities in Darfur.

Status: No funding was available for this activity in 2018.

Targets for 2019 and Plans to Meet Targets:

Surgery (S)

- Operate 5,000 TT patients, 1,500 with Carter Center assistance
- Train 40 TT surgeons, 10 with Carter Center assistance

Antibiotic Therapy (A)

- Distribute 1,952,631 doses of azithromycin, 337,602 doses with Carter Center assistance
- Distribute 39,053 doses of TEO, 6,752 doses with Carter Center assistance
- Conduct 2 impact surveys and 4 surveillance surveys

Facial Cleanliness (F) & Environmental Improvement (E)

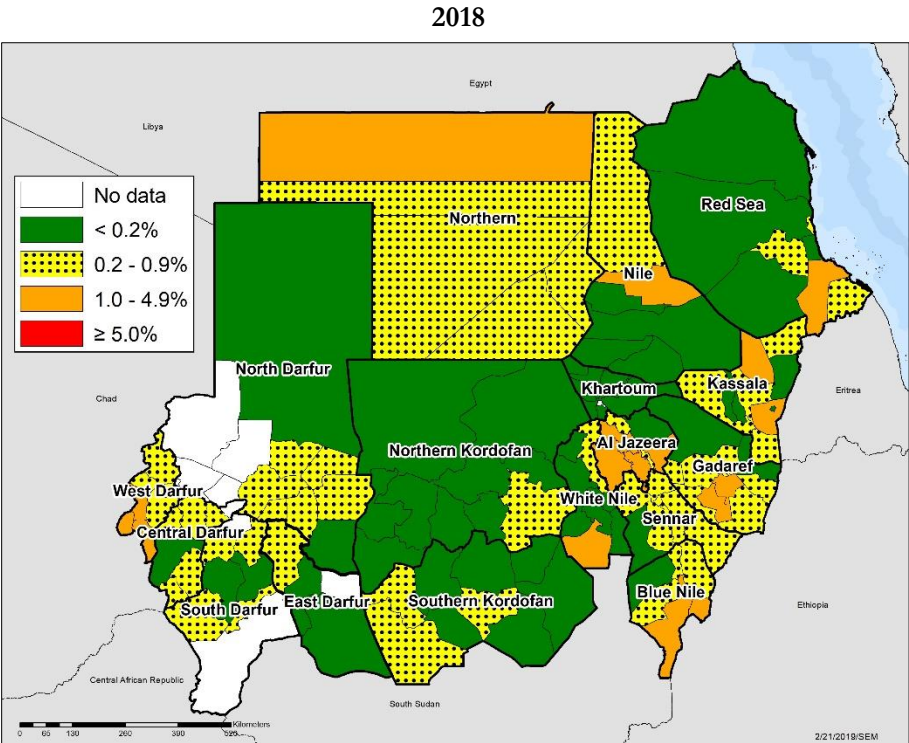
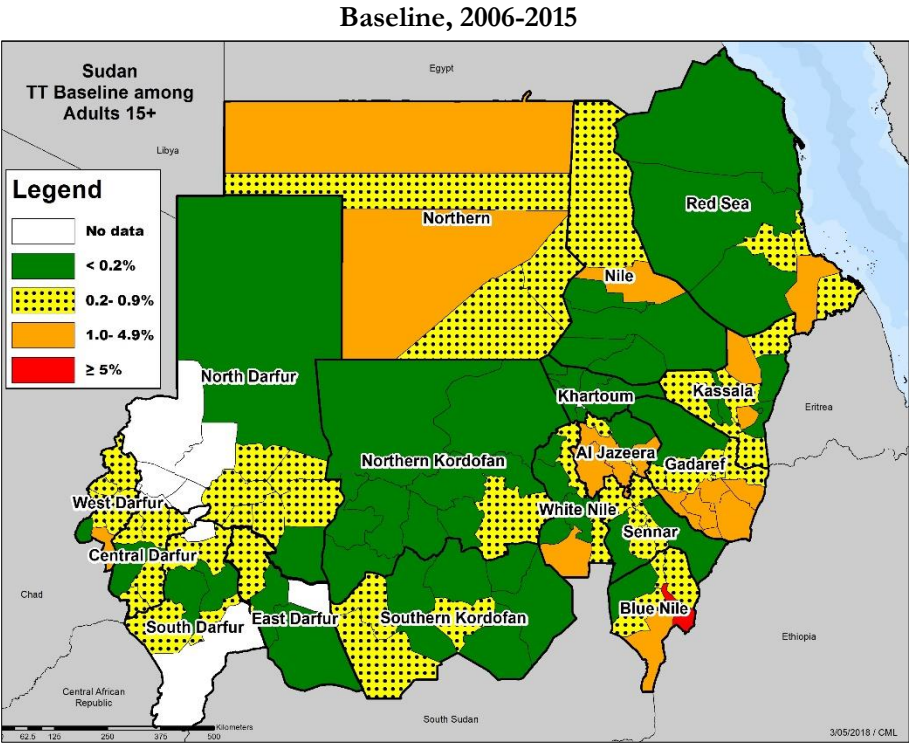
- Conduct health education in 1,583 villages, 131 with Carter Center assistance
- Promote trachoma curriculum in schools in targeted localities
- Introduce trachoma curriculum in primary and secondary schools in Darfur

- Increase awareness for hand and face washing, as well as latrine utilization
- Engage women and youth groups, WASH sector, and WASH NGOs in endemic areas
- Advocate with UNICEF and Water & Sanitation for water and latrine provision
- Continue advocacy to ensure households in targeted areas have their own latrines

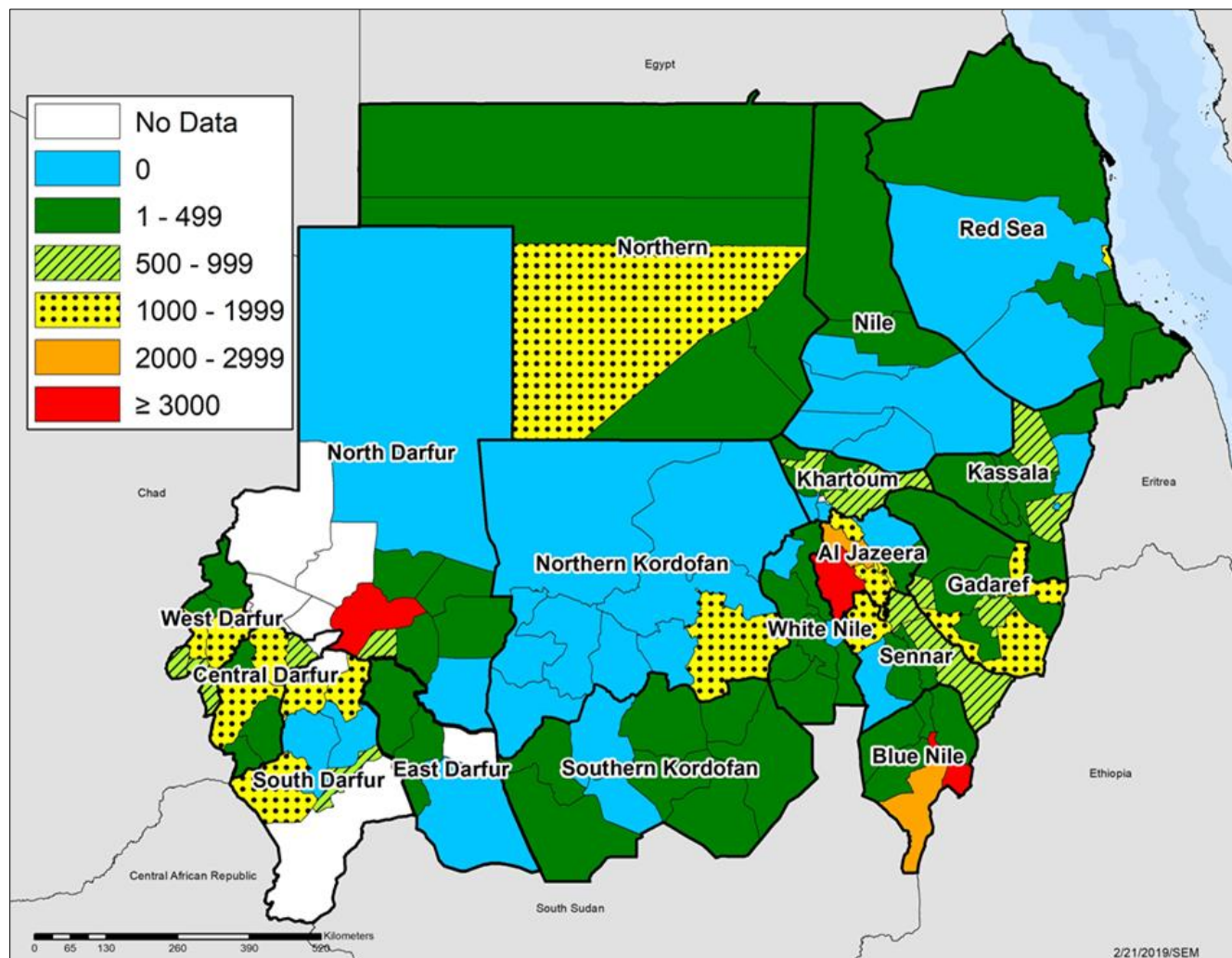
Operational Research

- Current studies:
 - Conjunctival Swab Collection in Al-Rahad locality in Gedarif state, as part of trachoma impact surveys
- Proposed studies:
 - Serological monitoring of *Chlamydia trachomatis* antigens in North Darfur

Sudan: Prevalence of TT among Adults ≥ 15 years

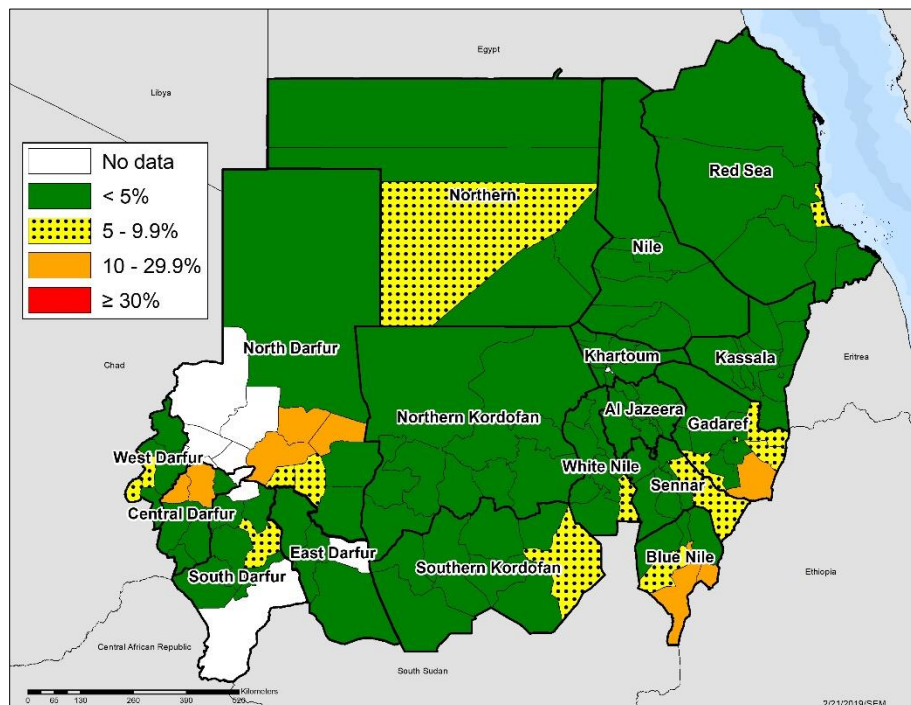


Sudan: Surgical Backlog, 2018

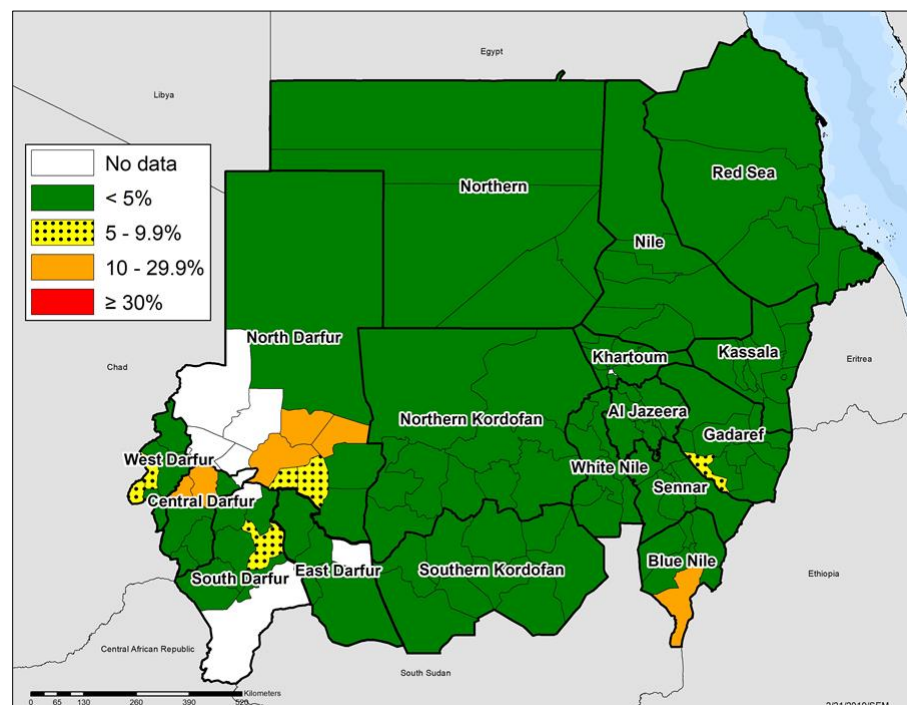


Sudan: TF Prevalence among Children 1-9 years

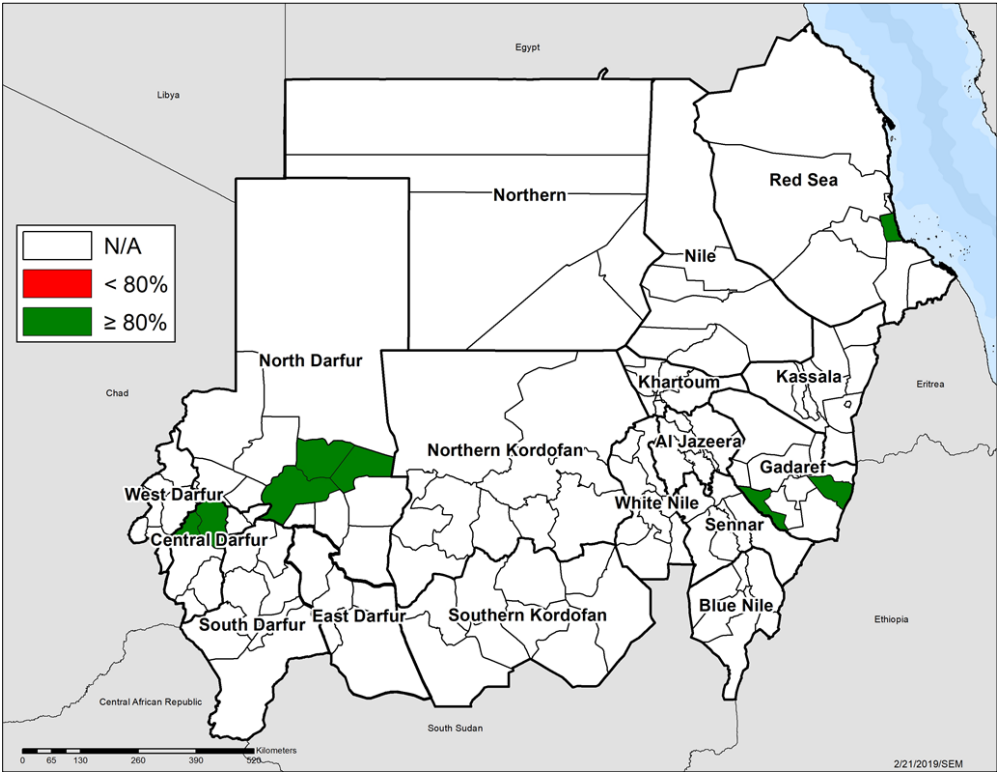
Baseline, 2006-2015



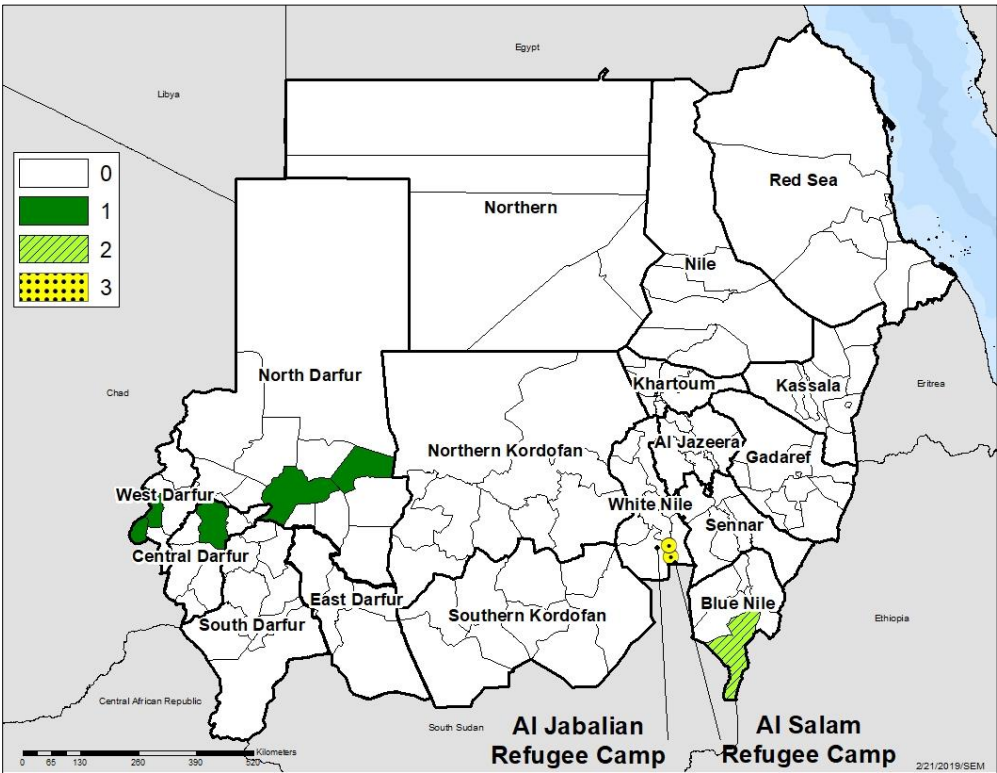
2018



Sudan: MDA Reported Coverage, 2018



Sudan: MDA Rounds Remaining, 2018



SAFE in Uganda

Presented by Dr. Francis Mugume, National Trachoma Program Coordinator, Ministry of Health, Uganda

Background

Eye care is a key component of the Uganda National Minimum Health Care Package. Trachoma is included in the 5-year Integrated NTDs Master Plan and is highlighted in the Uganda National Development Plan for the years 2011-2015. Trachoma and 4 other NTDs are earmarked for elimination by 2020 in the Health Sector Strategic and Investment Plan.

Trachoma is known to be endemic in 36 of 112 districts in Uganda. An estimated one million children less than 10 years old have active trachoma and 10.8 million more people of all ages are at risk. Currently there are approximately 10,000 persons who have become blind due to trachoma. In regard to the implementation of the SAFE strategy, TT surgery is available in the 2 regions of Busoga and Karamoja, and MDAs have been conducted annually in all 36 known endemic districts. The F&E components of SAFE have not been adequately and uniformly addressed in endemic areas.

Following at least 3 years of MDA, impact assessments have been on-going since 2013 showing drastic reduction in TF in most of the surveyed districts. The NTD program has developed advocacy strategies and tools to support the program. In 2014, The Queen Elizabeth Diamond Jubilee Trust initiated its support for the elimination of trachoma as a public health problem in Uganda, and The Carter Center was selected as the coordinating partner for the 5-year funding commitment. In the same year, the MOH launched its TAP. Following the launch of the TAP, the program initiated cross-border meetings in 2015 and received approval to expand the program to implement surgical services in endemic areas that had not yet been reached. The program completed baseline mapping of F&E activities in 2017. Support from The Queen Elizabeth Diamond Jubilee Trust ended in March 2019, and only a few surgical and MDA activities remain to be completed in Uganda. The target date for elimination of trachoma as a public health problem is 2020.

Timeline of Events

2006-2014: Baseline mapping

2007: National Trachoma Control Program began; MDA for trachoma control with Pfizer-donated Zithromax® officially launched

2013: TAP drafted and impact assessments began

2014: The Carter Center becomes coordinating partner for The Queen Elizabeth Diamond Jubilee Trust Trachoma Initiative; TAP launched; Initiation of TT surgeon refresher trainings

2015: Cross-border meetings initiated by ITI

2016: Expansion for surgeries in other endemic areas approved

2017: F&E baseline mapping conducted; National Program hosts the East African Annual Trachoma Cross-Border Partnership meeting; dossier development commenced

2018: Trachoma surveys in refugee settlements started; F&E endtime survey conducted

2019: Last annual review held with support from the Trust

2020: Target date for the elimination of trachoma

Table 1. Program Achievements in 2018

Indicator	National	
	Target	Achieved
# of persons operated	7,000	4,104 (59%)
# of women operated		3,059 (74.5%)
# of surgeons trained	0	0
Doses of azithromycin distributed during MDA	293,922	285,112 (97%)
Doses of TEO distributed during MDA	25,110	20,000 (80%)
# of villages with health education	2,500	2,500 (100%)
# of household latrines built	7,165	5,840 (82%)

Surgery (S)

There has been significant progress made in Uganda to reduce the TT prevalence and operate all estimated remaining TT cases. In 2018, the program conducted 4,104 TT surgeries, achieving 59% of its annual target of 7,000 surgeries. Nearly 75% of surgeries conducted were provided to women. Annual surgical output has increased from 2016 through 2018. The program estimates the remaining TT backlog is 10,888, and at the current pace, will be cleared by 2021.

In 2018, the program used a door-to-door case search methodology to locate TT patients. This activity is supported by Sightsavers. TT case finders were trained and conducted searches in 68 evaluation units (EUs) and refugee settlements where TT prevalence data was available. Suspected cases were confirmed by a TT surgeon and then offered surgery. A total of 9,168 people were screened for TT, and 6,085 people were confirmed to have TT. Of those confirmed cases, 4,104 people accepted surgery, 72 people were epilated, 1,704 people did not present for surgery, and 205 people refused surgery. This strategy is also included in transition planning that is being conducted at the district level and plans for 2019 case searches have been developed.

The program has conducted a surgical audit each year for the past 4 years. Three national trainers, all ophthalmologists, have received training on how to conduct audits, use HEADSTART, and provide supportive supervision. Trainings were conducted by Dr. Amir Bedri in 2016 and 2017, and Dr. Caleb Mpyet in 2018. The audits include a review of TT surgeons and TT surgeon supervisors. If a surgeon has a low TT surgical failure rate, they are allowed to continue with their work. If surgeons have a moderate failure rate, between 10% and 20%, they are provided with refresher training using HEADSTART, increased supportive supervision, and a follow up audit is conducted. If a surgeon has a high surgical failure rate, greater than 20%, the surgeon stops operating immediately and is assigned to support other activities during the surgical camp.

Antibiotic Therapy (A)

The National Program has achieved TF below 5% in all districts in Uganda except for 2 districts in the northern part of the country. The program saw peak MDA activities in 2012 and 2014. There has been a steady decrease in MDA doses since 2014 as districts reach the elimination threshold. In 2018, the program distributed 285,112 doses of azithromycin and 20,000 doses of TEO through MDA, reaching 97% and 80% of the annual targets respectively. Coverage was greater than 80% in all districts that received MDA. Currently, no districts require additional rounds of MDA. Three districts completed their last round of MDA and require an impact survey in 2019. A total of 14 surveys were conducted in 2018, including 12 surveillance surveys and 2 impact surveys. Impact surveys will finish in 2019, and if no further MDA is warranted, the remaining surveillance surveys will continue through 2021.

Facial Cleanliness (F) & Environmental Improvement (E)

The National Program supports health education activities in communities and schools across the country. At the community level, the program supported a wide range of activities in 2018. Ten districts carried out advocacy meetings, and sensitization meetings were held in 109 sub-counties and 587 parishes. Music, dance, and drama shows were conducted in 575 locations. In terms of media, the program supported 47 video shows and 14 radio talk shows. A total of 832 community meetings were conducted to share health education information. Health workers visited 5,785 households to conduct lessons on hygiene and sanitation. In terms of construction, 4,328 hand washing facilities were built, 5,379 sanitation facilities were rehabilitated, and 2,420 new latrines were constructed.

Health education in schools has been critical to the success of the National Program in Uganda. In 2018, 3,064 hand washing facilities were established and 12 school WASH clubs were created. A total of 17,993 sanitation facilities were rehabilitated and 3,420 new latrines were built as part of the CLTS approach. Three villages were declared open-defecation free. Eight existing WASH programs began incorporating F&E messages into their programming. Trainings were provided to 247 teachers and health workers, and 22,637 mother care group members received training. A total of 154 radio spots were broadcast as well.

Transition Planning & Dossier

The National Program held transition meetings in 24% of districts and advocated for inclusion of trachoma activities into routine eye care workplans. The first trachoma elimination dossier meeting was held in December 2018, and a second meeting was held in March 2019. A dossier action plan has been adopted, and a core committee has been established to finalize the dossier moving forward.

Programmatic Challenges

In 2018, the program faced a challenge with increased pastoralist migration from Kenya and South Sudan due to drought in those countries. Additionally, there are refugee communities that have not yet received S, F, & E interventions, and funding for F&E interventions specifically in these areas is not currently available. Finally, the program is reviewing high recurrence and high surgical failure rates in certain districts, such as Amudat.

Status of 2018 Program Review Meeting Recommendations

Recommendation 1: The Uganda Trachoma Control Program should ensure all case search activities are well documented and reviewed to ensure elimination thresholds are met.

Status: All the statistical data from the case searches has been well documented by the National Program.

Recommendation 2: The Uganda Program should start preparing the dossier for the validation of the elimination of trachoma as a public health problem.

Status: The National Program is currently working on the second draft of the dossier and have put in place an action plan for the dossier core committee for implementation.

Recommendation 3: The Uganda Program should complete baseline surveys in all suspect refugee settlements, and depending on the results, request Zithromax® and carry out MDA.

Status: Camps hosting refugees from South Sudan were surveyed and did not require MDA. Surgeries are needed, and plans are in place. Four of the settlements were not surveyed.

Recommendation 4: The Uganda Program should develop transition plans with each district that has met elimination thresholds to ensure sustainability.

Status: Transition plans have been developed for 10 of the 42 districts.

Recommendation 5: The Uganda Program should mobilize resources for TT only surveys in districts and refugee settlements that do not qualify for baseline surveys.

Status: Resources have not yet been mobilized for this activity.

Targets for 2019 and Plans to Meet Targets

Surgery (S)

- Operate 7,000 TT patients

Antibiotic Therapy (A)

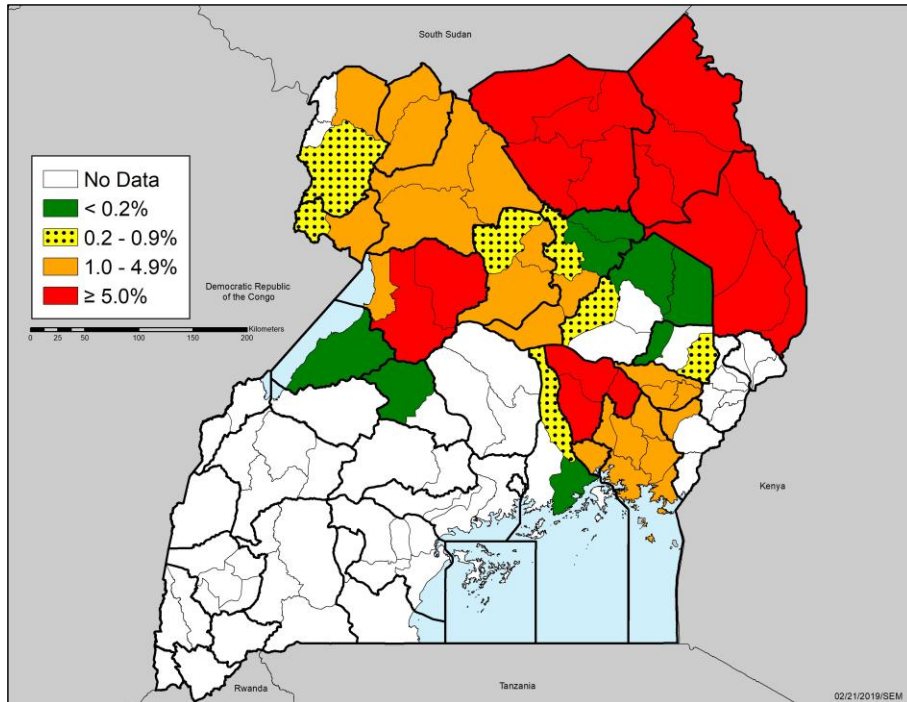
- Targets for doses of azithromycin and TEO to be distributed will be set once survey results are available.

Facial Cleanliness (F) & Environmental Improvement (E)

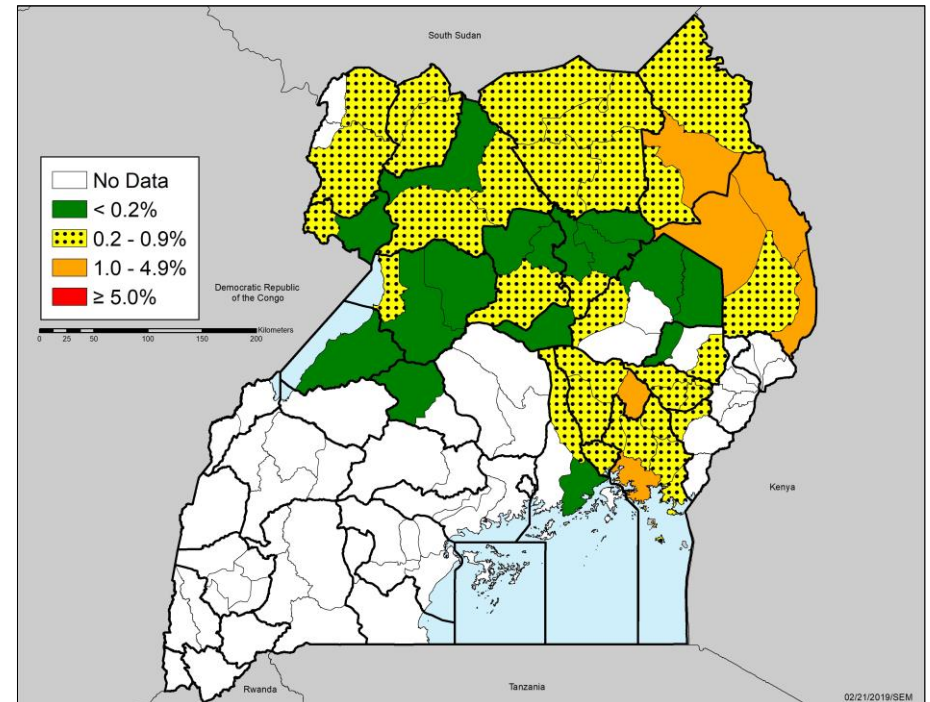
- In Busoga region, the program will advocate for implementation of F&E interventions in 10 districts through the CLTS program with the Ministry of Water and other Water Mission projects that are ongoing.
- In Karamoja region, the program will advocate for F&E interventions to be included in projects carried out by World Vision. These interventions will include CLTS, mother care groups, behavior change communication, school health clubs, video shows, and radio broadcasts.
- The program will continue to push for uptake of national and school sanitation guidelines across the country.
- The program will advocate for WASH-NTD partnerships during the districts transition meetings that are currently ongoing.

Uganda: Prevalence of TT among Adults ≥ 15 years

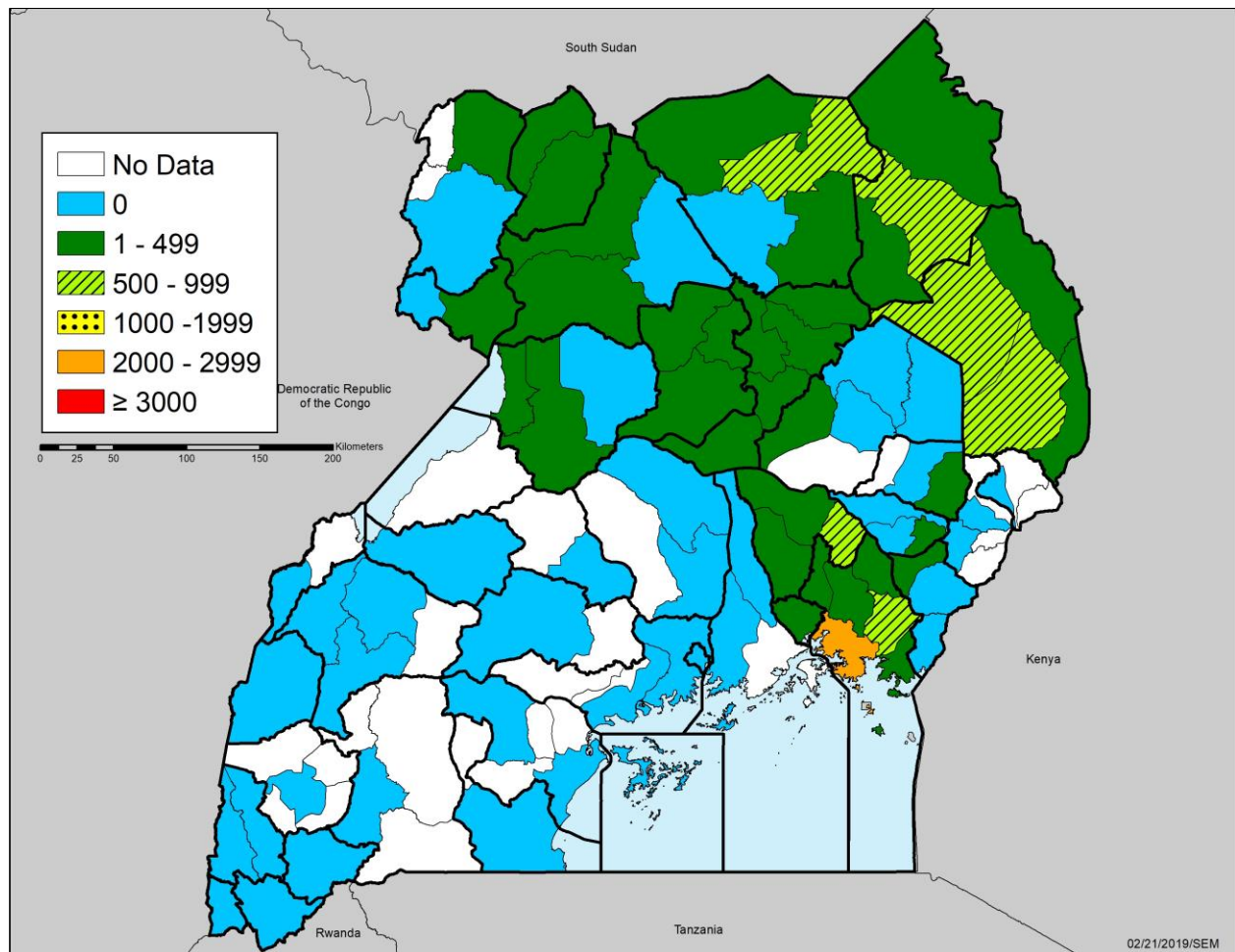
Baseline, 2006-2018



2018

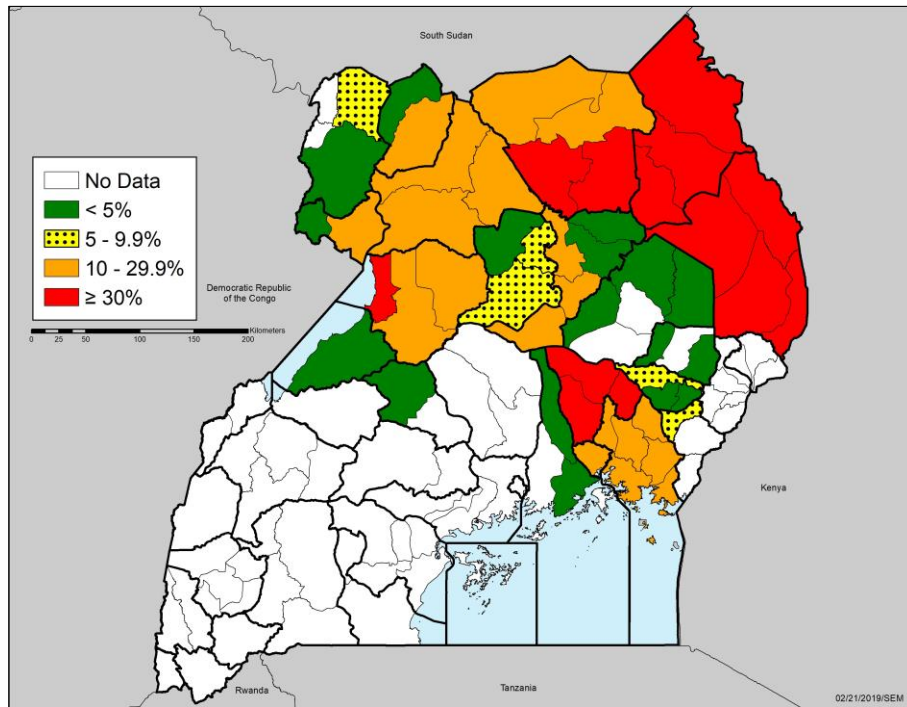


Uganda: Surgical Backlog, 2018

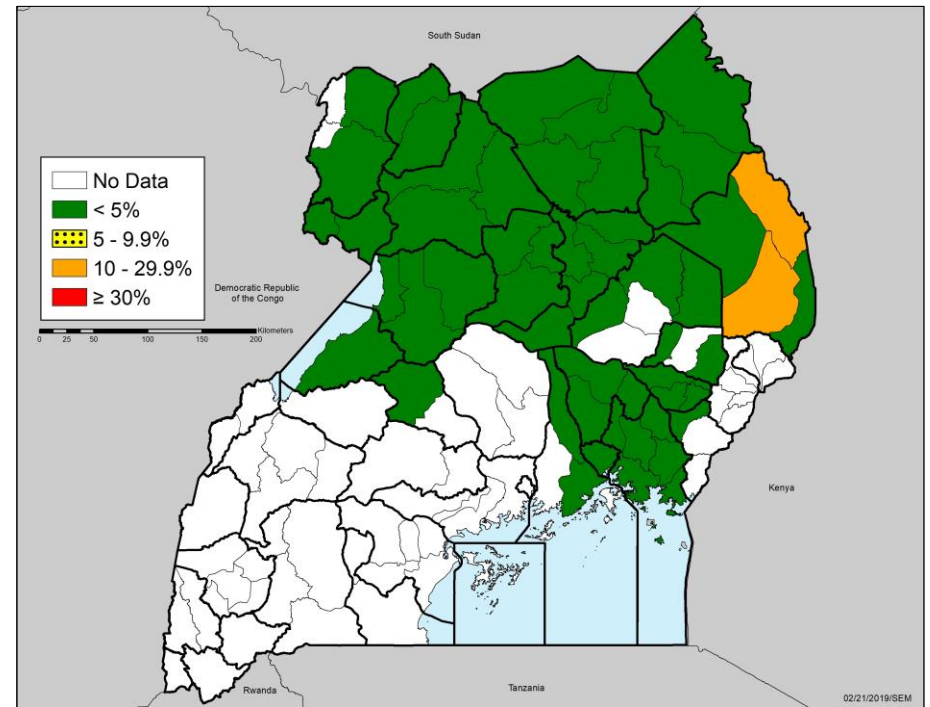


Uganda: TF Prevalence among Children 1-9 years

Baseline, 2006-2018



2018



Uganda: MDA Reported Coverage, 2018

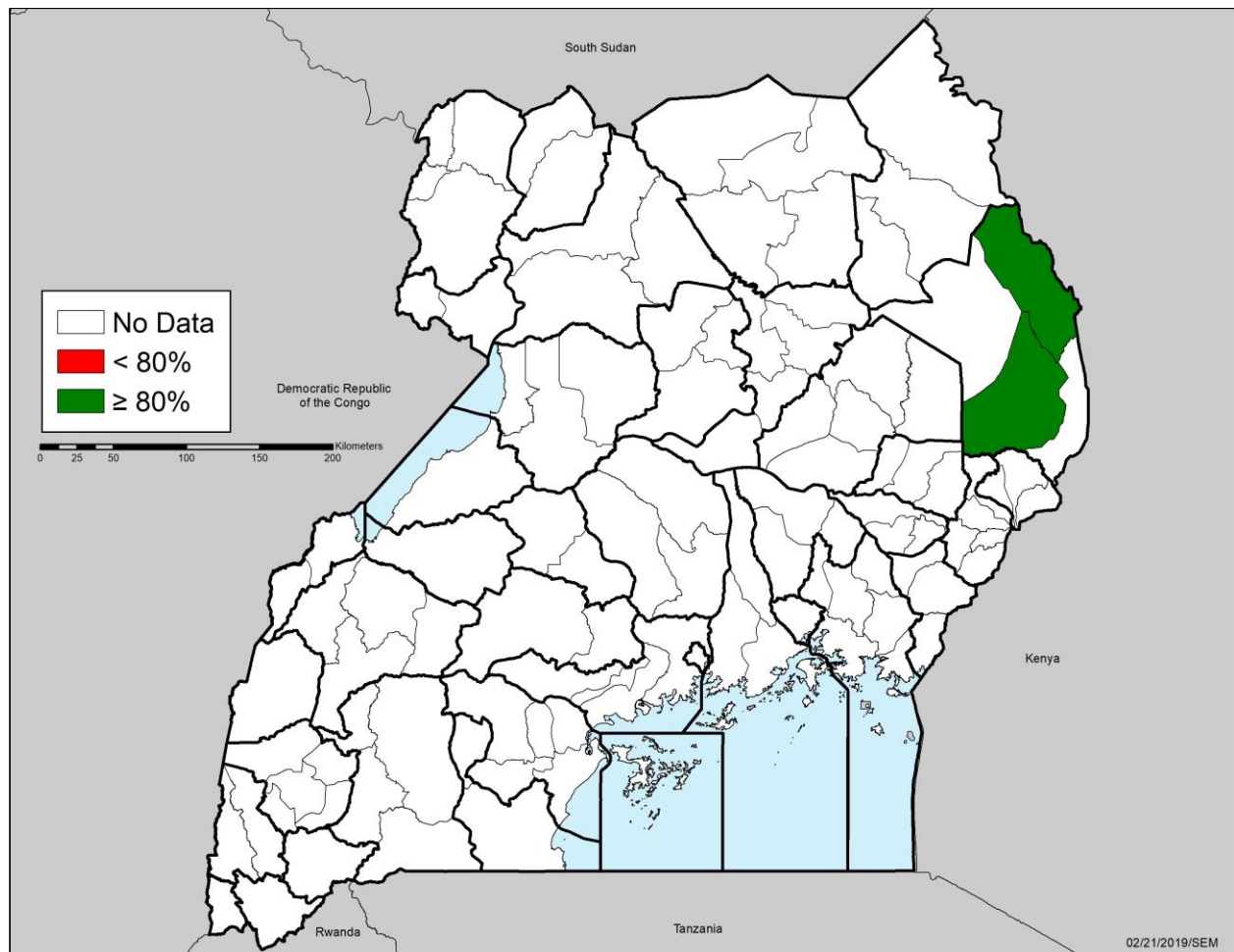


Table 1. Summary of National Data from Trachoma Control Programs (Carter Center-Assisted Countries)

National Data as Reported for 2018 at the Nineteenth Annual Program Review, Atlanta, Georgia, March 18-20, 2019

	Mali	Niger	Sudan	South Sudan	Ethiopia	Uganda	Total
Surgery							
Surgeries	1,996	6,512	1,632	632	90,469	4,104	105,345
2018 Target	5,893	15,000	7,500	1,000	168,325	7,000	204,718
Percent Coverage	33.9%	43.4%	21.8%	63.2%	53.7%	58.6%	51.5%
Antibiotics							
<i>Azithromycin</i>							
Doses	N/A	3,648,904	2,092,025	248,577	57,441,977	285,112	63,716,595
2018 Target	N/A	4,757,248	2,277,010	279,073	69,717,342	293,922	77,324,595
Percent Coverage	N/A	76.7%	91.9%	89.1%	82.4%	97.0%	82.4%
<i>Tetracycline Eye Ointment</i>							
Doses	N/A	150,000	30,482	17,105	1,402,908	20,000	1,620,495
2018 Target	N/A	150,000	45,540	15,130	1,422,802	25,110	1,658,582
Percent Coverage	N/A	100.0%	66.9%	113.1%	98.6%	79.6%	97.7%
Facial Cleanliness and Health Education							
Villages with Health Education	242	527	2,075	835	N/R	2,500	6,179
2018 Target	300	600	2,118	1,000	N/R	2,500	6,518
Percent Coverage	80.7%	87.8%	98.0%	83.5%	N/R	100.0%	94.8%
Environmental Improvements							
Latrines	6,447	16,372	N/A	0	N/R	5,840	28,659
2018 Target	6,000	10,000	N/A	80	N/R	7,165	23,245
Percent Coverage	107.5%	163.7%	N/A	0.0%	N/R	81.5%	123.3%

N/A=Not Applicable

N/R=Not Reported

Totals only include countries and districts where data are available.

Table 2. National Trachoma Control Program Annual Targets 2019 (Carter Center-Assisted Countries)

Targets[†] as Presented at the Twentieth Annual Program Review, Atlanta, Georgia, March 18-20, 2019[§]

	Mali	Niger	Sudan	South Sudan	Ethiopia	Total**
Surgery						
Persons to operate for TT	3,120	15,000	5,000	1,000	185,722	209,842
Antibiotics						
Doses of azithromycin to distribute during MDA [†]	N/A	1,210,961	1,952,631	279,073	59,484,651	62,927,316
Doses of TEO to distribute during MDA	N/A	150,000	39,053	15,130	1,213,972	1,418,155
Facial cleanliness						
Villages to reach through health education	300	600	1,583	1,000	N/R	3,483
Environmental improvement						
Household latrines to construct	6,000	10,000	N/A	80	N/R	16,080

N/A=Not Applicable

N/R=Not Reported

[§]All targets are subject to change.

[†]Antibiotic targets do not reflect ITI-approved allocations of Zithromax[®]

****Totals only include countries where data are available.**

Table 3. Carter Center-Assisted Implementation of SAFE (Carter Center-assisted output)*Summary of Interventions per Country, January - December 2018*

Indicators	Mali	Niger	Sudan	South Sudan	Ethiopia- Amhara	Total
Surgery						
Persons operated for TT	600	4,727	825	530	32,474	39,156
2018 Target	1,500	10,000	2,100	500	93,126	107,226
Percentage	40.0%	47.3%	39.3%	106.0%	34.9%	36.5%
Antibiotics						
Doses of azithromycin distributed	N/A	N/A	479,167	248,577	13,180,791	13,908,535
2018 Target	N/A	N/A	845,643	279,073	14,655,865	15,780,581
Percentage	N/A	N/A	56.7%	89.1%	89.9%	88.1%
Facial cleanliness and health education						
Villages with ongoing health education	142	527	234	835	3,871	5,609
2018 Target	250	600	277	1,000	3,871	5,998
Percent Coverage	56.8%	87.8%	84.5%	83.5%	100.0%	93.5%
Environmental improvement						
Household latrines constructed	3,355	15,168	N/A	0	N/R	18,523
2018 Target	5,000	10,000	N/A	20	N/R	15,000
Percentage	67.1%	151.7%	N/A	0.0%	N/R	123.5%

N/A=Not Applicable

N/R=Not Reported

Table 4. Carter Center-Assisted Implementation of SAFE*Cumulative Interventions per Country, 1999-2018*

Indicators	Mali	Niger	Sudan	South Sudan	Ethiopia-Amhara	Total
Persons operated for TT	30,733	78,752	11,737	10,198	692,019	823,439
Doses of azithromycin distributed (MDA)	698,083	3,780,384	7,621,585	3,316,989	169,431,428	184,848,469
Villages with ongoing health education	2,622	8,203	2,899	3,574	3,871	21,169
Household latrines constructed	114,083	141,631	N/A	646	3,336,513	3,592,873

N/A=Not Applicable

Figure 1. Persons Operated for TT, Carter Center-Assisted Countries

National Program data as presented for January - December 2018

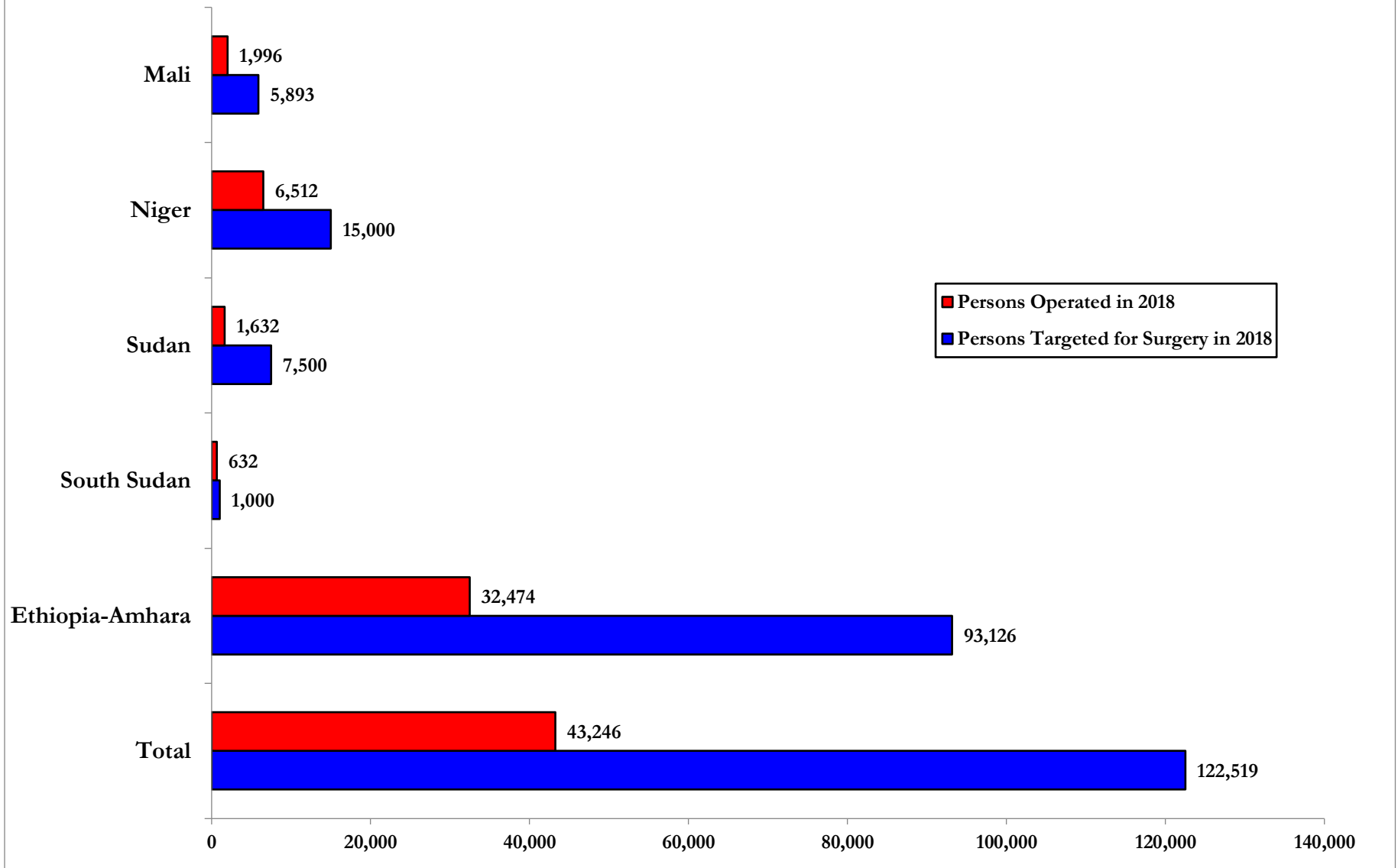


Figure 2. Azithromycin Distribution, Carter Center-Assisted Countries

National Program data as presented for January - December 2018

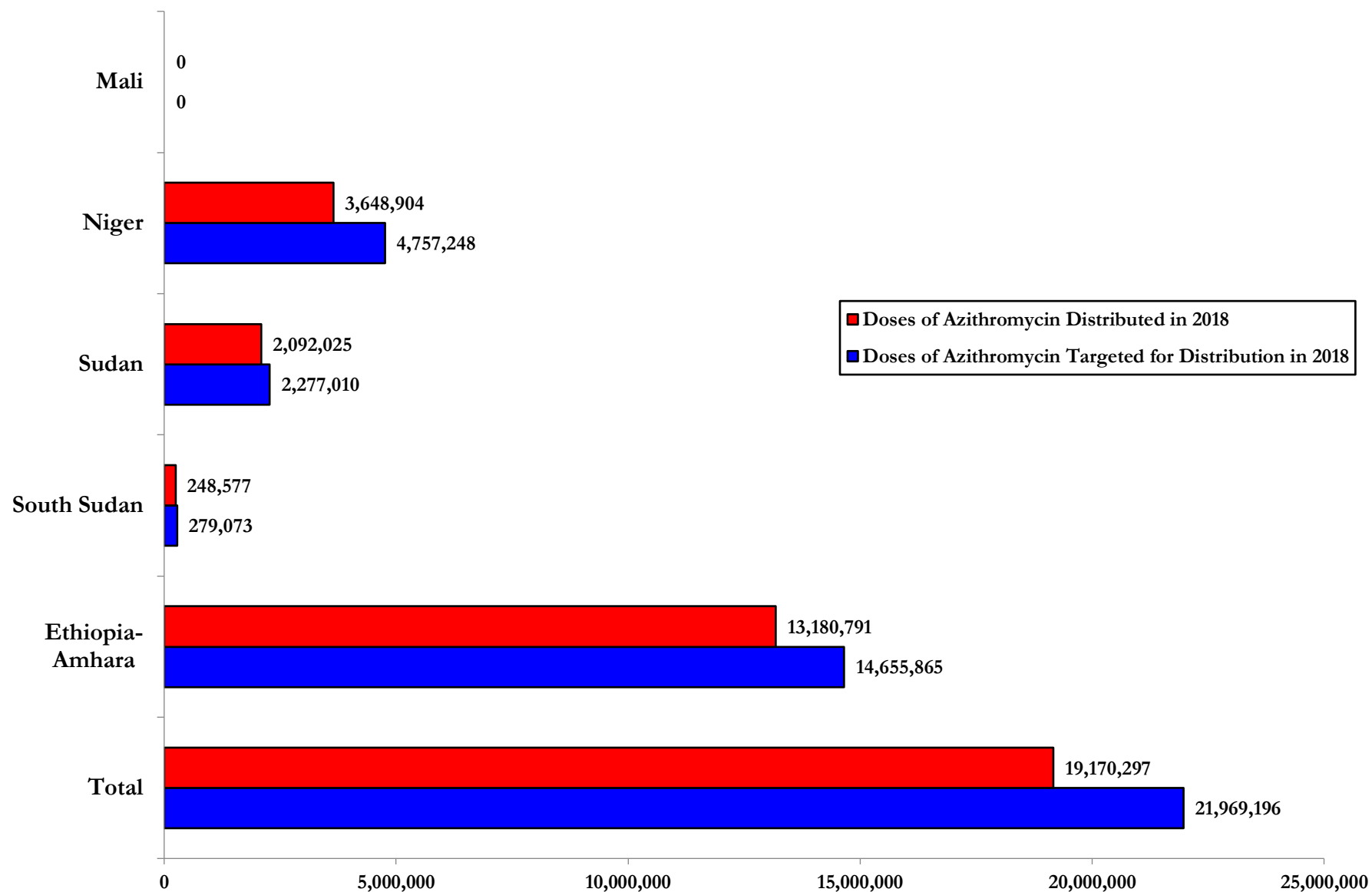


Figure 3. Health Education, Carter Center-Assisted Countries

National Program data as presented for January - December 2018

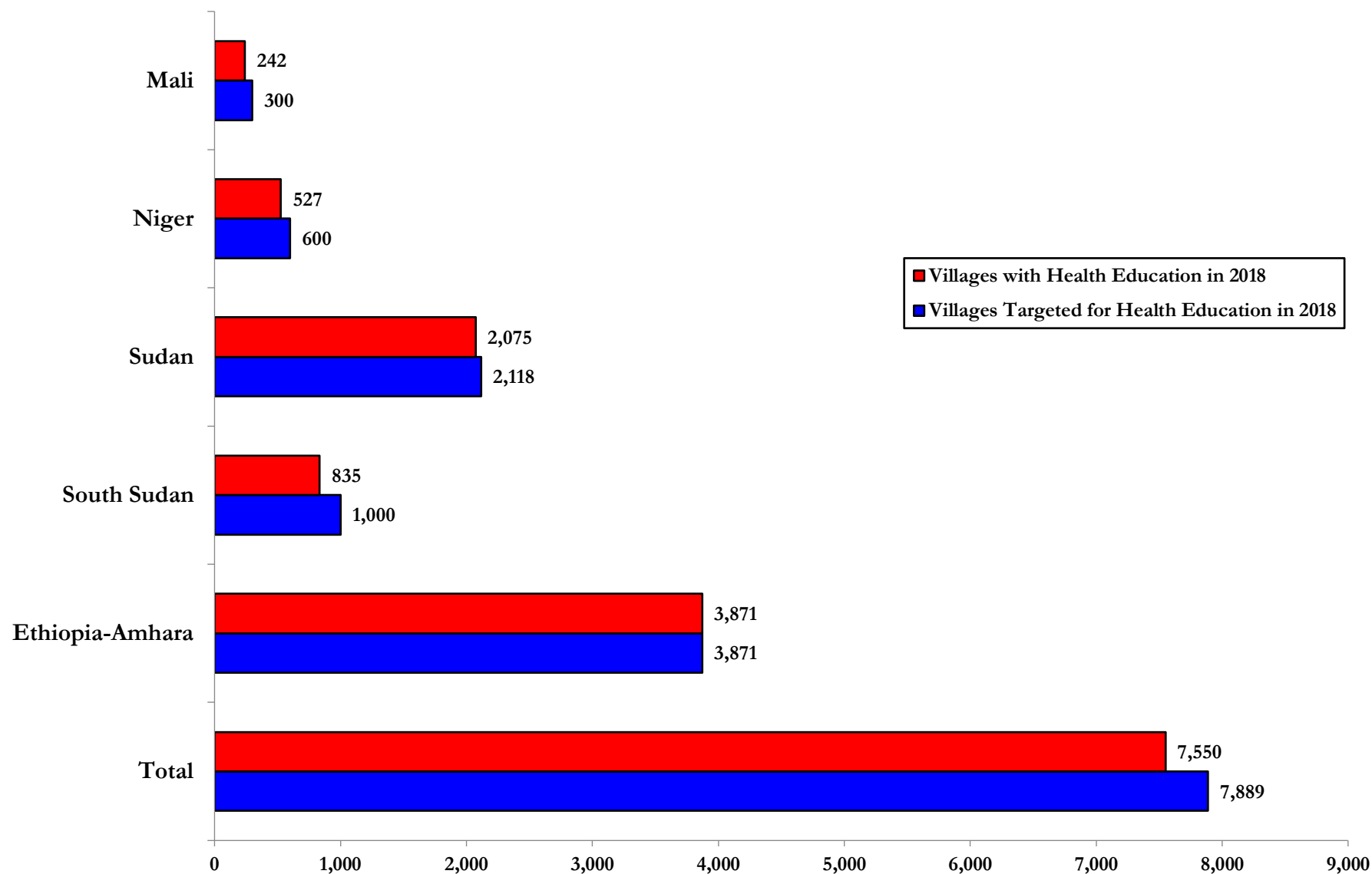
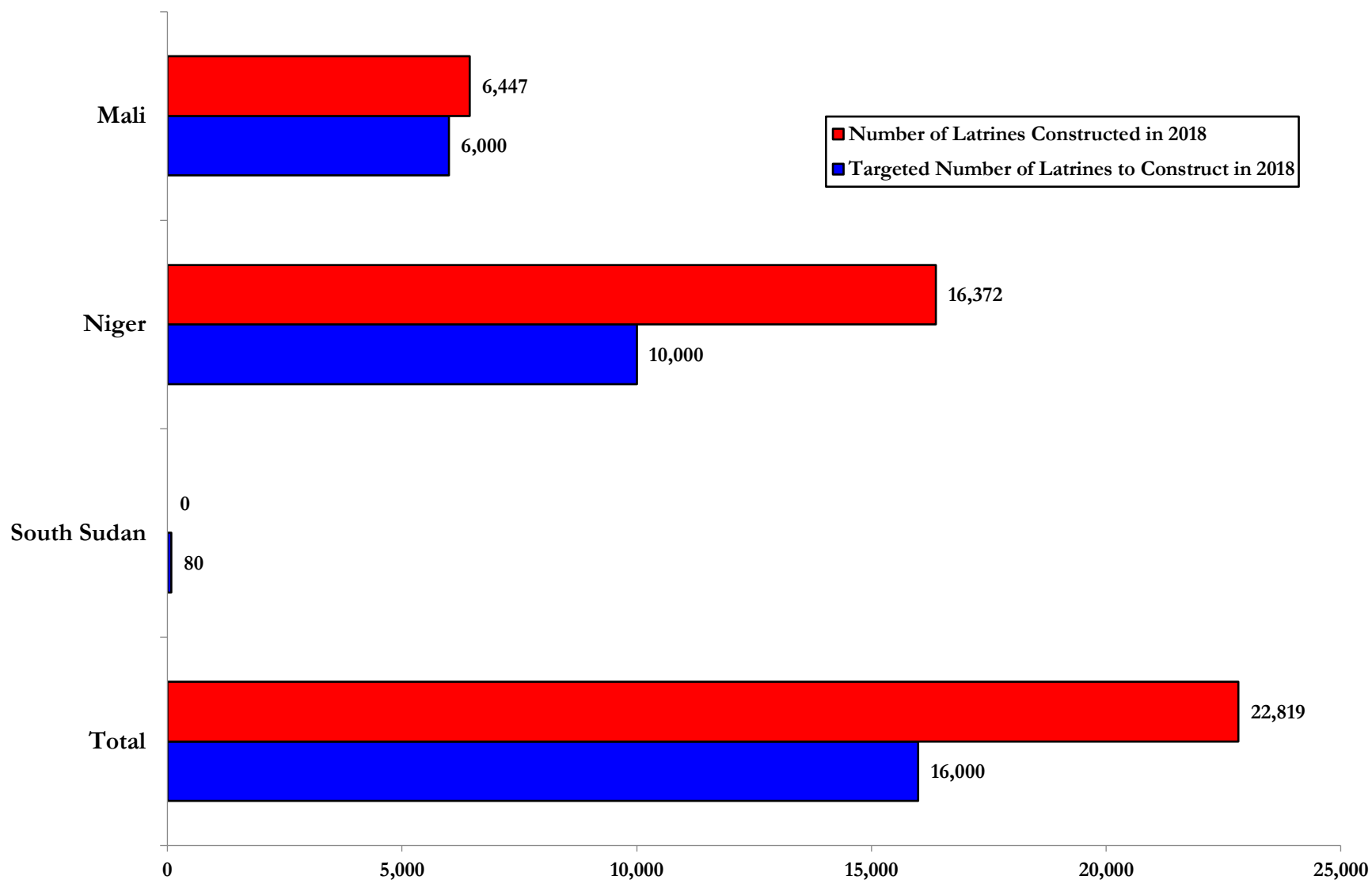


Figure 4. Household Latrines Constructed, Carter Center-Assisted Countries

National Program data as presented for January - December 2018



Keynote Address

Dr. Julius Schachter, Emeritus Professor, Laboratory Medicine, University of California at San Francisco

The causative agent of trachoma, *Chlamydia trachomatis*, was first visualized in 1907. Since then there has been an interplay between research by ophthalmologists, venereologists, and microbiologists that has created the body of knowledge that has led to the MDA component of our current efforts to eliminate blinding trachoma as a public health problem.

The Giemsa stain, first used to demonstrate the characteristic intracellular chlamydial inclusions, was the only diagnostic of value from 1907 until the late 1950s. But it was only a matter of a few years from the first visualization before chlamydial inclusions were demonstrated in conjunctival cells of infants with a nongonococcal form of ophthalmia neonatorum, in cervical cells from the mothers of affected infants and in urethral cells of men with nongonococcal urethritis. Ophthalmologists were important in defining the genital tract infections. Lindner was active in the early days, and Thygeson, renowned for his studies on trachoma, made important contributions to our understanding of the clinical spectrum of sexually transmitted chlamydial infections in the 1930s and 40s. Barrie Jones' work in the early 1960s started the modern era of research on chlamydia in STD.

The trachoma agent was first isolated by T'ang in 1957 using yolk sac inoculation of embryonated hen's eggs. By 1970 tissue culture isolation methods and serologic assays were available that helped to show that *C. trachomatis* was the most common sexually transmitted bacterial pathogen and that it had a clinical spectrum wider than had been recognized earlier. During a study aimed at measuring the incidence of inclusion conjunctivitis of the newborn one of the exposed infants developed pneumonia, and subsequently *C. trachomatis* was isolated from the lungs, nasopharynx, and rectal swabs from infants.

These findings were relevant to trachoma control. Previously *C. trachomatis* infection was assumed to be limited to the columnar epithelial cells of the conjunctiva and genital tract. Topical application of tetracycline ointment was considered the treatment of choice, but if chlamydial infection was more widespread in the body then topical therapy would be inadequate. And indeed, chlamydiae were isolated from the nasopharynx and rectum of children in a trachoma endemic area. Thus, the need for systemic rather than topical therapy was shown. A suggestion for mass therapy was made based on use of oral doxycycline, but while pilot studies demonstrated efficacy, oral doxycycline was rejected because oral tetracyclines were contraindicated for children.

In the mid to latter 1980's azithromycin appeared on the scene and saw promising results in trials aimed at treating chlamydial genital infection and respiratory infections. Workers at Pfizer, anticipating that azithromycin would be a highly profitable drug, wanted to see if the drug could provide benefit to those living in a less developed setting. They remembered my trachoma talks and efforts to get support for doxycycline treatment of trachoma. I was invited to give them a trachoma talk and then a research proposal on use of azithromycin. Ultimately, with further support (NIH, Clark Cares Foundation, Abbott) the project became "Azithromycin in Control of Trachoma" (ACT) where community wide azithromycin treatment was evaluated in trachoma endemic areas in Egypt, Tanzania, and The Gambia. The project found that infection was widely spread throughout the community, not just among those with clinically active trachoma, and that azithromycin was highly effective at reducing chlamydial infection, although there was a lesser clinical response.

Microbiologic research had developed the highly sensitive nucleic acid amplification test (NAAT) that was used in the ACT project, and also provided a laboratory model for persistent infection that supplies a theoretic basis for azithromycin treatment to be less than 100% effective, even in the absence of antimicrobial resistance. It also supports the need for multiple rounds of therapy and stresses the importance of effecting environmental changes aimed at reducing transmission.

The ACT project provided the evidence to support the “A” component off the SAFE approach to trachoma control. However, there are still uncertainties as to how to measure success of treatment or the need for retreatment; should clinical endpoints be used (if so which one, surely not TF at 10%, perhaps a higher TF cutpoint, or TI) or NAAT results? At this point there should be enough results from MDA activities to provide data for modeling studies to help guide future programs.

The development of quantitative NAATs that allow measurement of infectious load adds another variable. High infectious loads have been associated with more severe disease and treatment failures in both genital and conjunctival chlamydial infections. The meaning of quantitative NAAT results on a community basis needs more research.

Trichiasis With and Without Tarsal Conjunctival Scarring: a multi-centre observational study on burden, phenotype, and morbidity

Presented by Dr. Esmael Habtamu, Study Coordinator, London School of Hygiene & Tropical Medicine

Authors and Affiliations: E. Habtamu¹, V. Hu¹, E. Harding-Esch¹, S. McPherson², E. Kelly Callahan³, P. Courtright⁴, D. Macleod¹, and M. Burton¹

¹LSHTM, London, UK. ²RTI International, Durham, USA. ³The Carter Center, Atlanta, USA. ⁴KCCO, Univ of Cape Town, Cape Town, South Africa.

Background

There is a discussion about whether the diagnosis of TT for the purposes of defining prevalence targets for “elimination as a public health problem” should include the presence of tarsal conjunctival scarring (TCS). On this basis, trichiasis cases which are not found to have trachomatous scarring (TS) are presumed to be non-trachomatous in origin. In Tropical Data-supported surveys, TS data are collected for all eyes identified with trichiasis. Most trachoma control programmes currently support interventions for all trichiasis, whether there is co-existing documented TS. There is now a developing view that the disease backlog estimates and therefore the trachoma control programme intervention goals should exclude people with trichiasis without TS. This would have significant implications for control programme planning and resourcing.

However, concerns have been expressed about this practice on several grounds. Conjunctival scarring may not be “easily visible” as defined by WHO, as scars may be mild or obscured by conjunctival inflammation, which is quite common in people with trichiasis. This may result in missing the diagnosis of milder scarring in survey setting grading. In addition, teaching graders to recognize the presence or absence of TS requires additional time. If there is a systematic problem in reliably diagnosing the presence of TS, then this might lead to an underestimate in prevalence of TT and the resources needed to address it. The aim of this project was to estimate the proportion of trichiasis cases identified during surveys in trachoma endemic regions who were originally recorded as having “no trachomatous scarring” that actually have a degree of conjunctival scarring, on expert re-grading.

Methods

A multi-center comparative cross-sectional study has been conducted in 4 study sites with varying trichiasis burden in Ethiopia, Uganda, and Nigeria, to evaluate reliability of TS (refers to the WHO simplified TCS sign) data collected from trichiasis cases in a trachoma survey by comparing with an independent expert in-field and photographic grading of TCS of the same cases using a detailed grading system, which quantifies the amount of scarred eyelid and severity. Un-operated trichiasis cases were identified in surveys for whom TS grading data were available; and frequency matched (age, sex, and location) trichiasis-free individuals (controls) were randomly selected from the same survey population for comparison. Here we report, the results from 2 study sites in Ethiopia: Amhara and Benishangul-Gumuz Regions, from which 400 cases and 100 controls, and 39 cases and 10 controls, respectively, have been enrolled. Independent experts masked to the previously graded TS status of the cases, examined both the selected case and control eyes in their villages with magnifying loupes and torch. Eligible eyes were used for analysis after excluding those who had surgery or PTT. The primary outcome measure was the proportion of eyes who were originally graded in the surveys as “No TS” but who had some degree of TCS: negative predictive value (NPV).

Results

Among the 874 eyes assessed, there were 593 eligible eyes with paired TS and TCS data from the trachoma survey grading and repeat field grading, among which 111/593 (18.7%) were graded as having “No TS” in the trachoma survey grading. However, in the repeat field grading, 99/111 (89.2%) were found to have TCS: NPV 10.8% (95% CI, 5.7%–18.1%); while Positive Predictive Value (PPV) was higher at 96.5% (95% CI 94.4%–97.9%). Sensitivity and specificity of survey graders on TCS identification was 82.4% (95% CI, 79.1%–85.5) and 41.4% (95% CI, 23.5%–61.1%) respectively. Among the 111 eyes diagnosed as having “No TS” by the trachoma survey graders, 63 (56.7%) eyes had significant conjunctival scarring. In the repeat field grading, 529 eyes were found to have trichiasis, among which only 14 (2.6%) had no TCS. Similarly, among the eligible 219 controls eyes, 66 (30.1%) did not have TCS. Almost half the trichiasis cases had severe TCS (251/529 [47.4%]), while controls tended to have milder TCS (124/219 [56.7%]). About 93% of the cases without TCS had no or mild entropion, while about 64% of the cases with TCS had moderate to severe entropion.

Conclusions

TCS is common in these 2 study sites in Ethiopia even in trichiasis-free individuals. Conjunctival scarring may not be “easily visible” as defined in the simplified grading system resulting in difficulty to diagnose under standard survey conditions. However, a significant proportion of trichiasis cases with extensive TCS were also graded as having “No TS” in the trachoma surveys. In this setting, including TS in the definition could result in an underestimate of TT.

Financial Disclosures: This multicenter study is funded by Sightsavers International, UK. EH is supported by The Queen Elizabeth Diamond Jubilee Trust.

An Exploratory Study on Surgeons' Skill Awareness during HEADSTART Training in Niger

Presented by Ms. Stephanie Palmer, Trachoma Technical Advisor, USAID Act to END NTDs, FHI360

Authors: Stephanie Palmer, Emily Gower, Amir Bedri Kello, Kadri Boubacar, Mahamane Abdou, Chano Hamiden, Hadiara Adamon, Abdou Amza

Background

Surgical quality is critical for successful trichiasis surgical programs and to ensure the elimination target is reached. HEADSTART has been shown to improve the skills of new TT surgeon trainees and experienced surgeons. However, little information is available regarding TT surgeons' awareness of their own surgical skill level. We aimed to determine whether HEADSTART can help improve experienced surgeons' awareness of their skill level.

Methods

This study was conducted in the Maradi region of Niger in January-February 2016 as part of a larger study examining the effects of HEADSTART training on experienced TT surgeons. Twenty-three experienced TT surgeons participated in a HEADSTART training. The training was conducted by 2 national HEADSTART trainers with the support of a Master Trainer. Prior to the training on HEADSTART, each surgeon operated on 1 to 2 patients in live surgery to establish a baseline skill level. Participants then participated in a full HEADSTART training, and again operated 2 live surgeries. All steps were observed by one of the national trainers. The participants were scored on 8 skills (placement of the traction sutures; placement of Trabut plate; incision; suture depth, spacing and alignment; whether they were correctly utilizing the instruments; and whether they were correctly following the proper order of steps for TT surgery). Scores from 1-5 (1=poor; 5=excellent) were given for each skill.

Participants were given a self-evaluation form to fill out following the complete HEADSTART training session. The evaluation form included the same skills and scoring system as that filled out by the national trainers. The trainees were asked to provide scores for before and after the HEADSTART training. Participants' self-scores were compared with those given by the national trainers before and after the HEADSTART training. Composite scores (sum of all skills combined) and average scores for each skill were compared.

Results

Results are available for 21 surgeons; one participant did not finish the HEADSTART training, and a second surgeon did not complete the self-evaluation form. Scores for placement of the Trabut plate are available for only 17 participants, as this skill was not originally included in either the evaluation form filled out by the national trainers or the participant self-evaluation form.

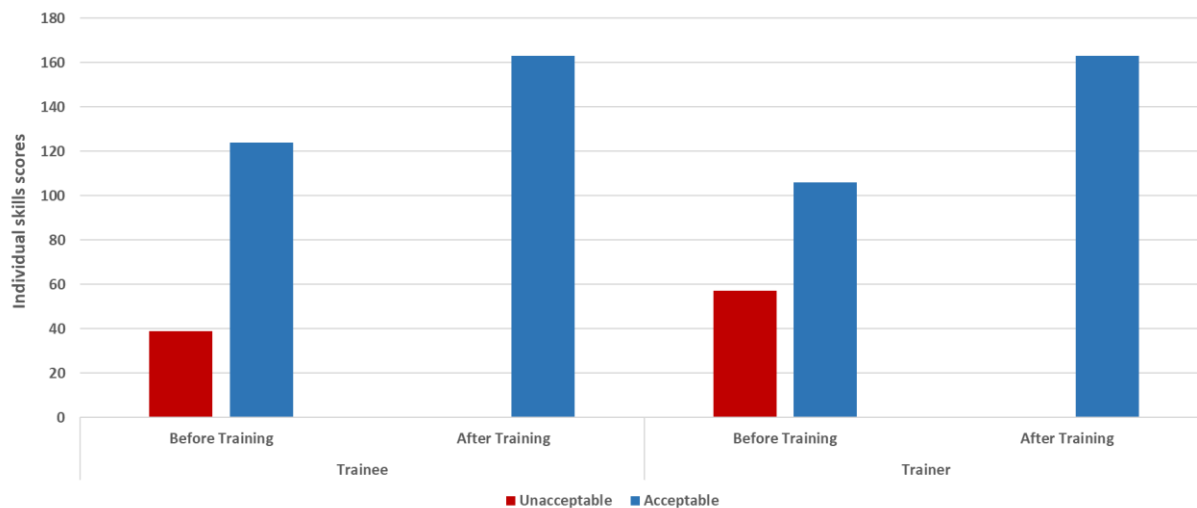
Prior to the HEADSTART training, 13/21 trainees scored themselves higher than the trainers and 3 trainees gave themselves the same composite score. After the training, only 7 participants scored themselves higher than the scores given by the national trainers and 6 composite scores matched. Average scores given by participants and trainers increased following the training and the difference between trainer and self-scores decreased. This pattern held true for each individual skill as well (Table 1).

Table 1. Average scores before and after training, by participants and trainers

	Before HEAD START		After HEAD START	
	Participant	Trainer	Participant	Trainer
Composite skills (N=21)	24.0	20.5	31.7	30.8
Individual skills				
Traction Sutures (N=20)	3.5	2.7	4.2	4.2
Trabut Plate (N=17)	3.4	2.9	4.4	4.3
Correct manipulation of instruments (N=20)	2.9	2.8	4.1	4.2
Incision (N=21)	2.9	2.2	4.2	4.2
Bites (N=21)	3.0	2.4	3.9	4.1
Suture spacing (N=21)	3.0	2.2	3.9	4.0
Suture alignment (N=21)	3.1	2.9	4.0	4.2
Follow logical order (N=21)	3.1	3.1	4.2	4.2

We also analyzed the data using a binary scoring system (scores 1-2=unacceptable; scores 3-5=acceptable). Following the training, all scores converged (Figure 1).

Figure 1. Binary scoring by participant and trainer, before and after HEAD START training



Conclusions/Significance

HEADSTART training provides an opportunity for experienced surgeons to self-reflect and evaluate their skills. Participants appear able to recognize areas where their skills needed improvement following the training, which was evidenced through giving themselves some “unacceptable” scores. As this is an exploratory study, more research is needed into integrating self-evaluation into TT surgery trainings utilizing HEADSTART or through training/supportive supervision outside the context of HEADSTART. This process has potential implications in terms of surgical quality, as surgeons can identify skills where they need more support and “refresher” trainings and supportive supervision can be tailored to those skills. Additionally, in a post-endemic setting, resources will be limited and National Programs will need to determine where and whether to invest in skills maintenance or improvement.

Long term outcome of the two most commonly used surgical procedures to treat trichomatous trichiasis (TT): PLTR vs BLTR

Presented by Mr. Tariku Wondie, Research Coordinator, The Carter Center-Ethiopia

Investigators and Affiliations: Esmail Habtamu^{1,2}, Tariku Wondie², Zerihun Tadesse², Bizuayehu Gashaw³, E. Kelly Callahan⁴, David Macleod¹, and Matthew J. Burton¹

¹London School of Hygiene & Tropical Medicine, London, UK. ²The Carter Center, Addis Ababa, Ethiopia. ³Amhara Regional Health Bureau, Bahirdar, Ethiopia. ⁴The Carter Center, Atlanta, USA.

Background

The 2 most commonly used surgical procedures to treat TT, BLTR and posterior lamellar tarsal rotation (PLTR), were compared in a clinical trial 4 years ago. This found PLTR provided better outcomes than BLTR at 1-year. However, there is no data on the long-term outcome of these 2 surgical procedures in a head to head comparison. We followed and re-examined the trial participants 4 years after enrolment to investigate if these procedures give different results from what has been found at 1-year and to measure the impact of poor surgical outcomes on mental health.

Objectives

Primary Objective:

Determine if the results of PLTR and BLTR surgical procedures are different 4 years after surgery and give different results from what has been found at 1-year.

Secondary Objectives:

1. Determine if eyelid contour abnormality (ECA) resolve or regress through time
2. Determine factors influencing long-term outcomes in PLTR and BLTR surgery
3. Evaluate vision and corneal opacity changes 4 years after trichiasis surgery
4. Evaluate the impact of poor surgical outcomes on depression

Methods

At baseline, 1000 participants with TT were recruited, randomly assigned, and treated (501 in the BLTR group and 499 in the PLTR group) between February and May 2014. A 4-year follow-up for the trial participants was completed between February and May 2018. An independent assessor, masked to allocation, examined the trial participants' eyes using the detailed WHO FPC Trachoma Grading System using the same procedures as for the baseline. Mental health status of the trichiasis cases and their matched controls was assessed using the Patient Health Questionnaire - 9. The primary outcome was the proportion of individuals who developed PTT AT the 4-year follow-up or had repeat surgery between the 1-year and the 4-year follow-up. The intervention effect was estimated by logistic regression, controlled for surgeon as a fixed effect in the model. Secondary outcomes included cumulative proportion of individuals who developed PTT or had repeat surgery during the 4-year period, factors influencing the long-term outcomes of TT surgery, ECA progression, corneal opacity and vision changes, and impact of poor surgical outcomes (PTT and ECA) on depression.

Results

Primary Outcome

At year 4, 943 (94.3%) participants were re-examined (471, PLTR; 472, BLTR). PTT had developed in 168/943 (17.8%) study eyes. PTT was significantly more frequent AT 4 years in the BLTR arm (105/472 [22.2%]) than the PLTR arm (63/471 [13.4%]), after adjusting for surgeon effect: OR 1.85 [95% CI, 1.31–2.61]; $p=0.0004$, with 8.9% (95%CI 4.0–13.7) risk difference.

Secondary Outcomes

BY 4 years, cumulative PTT had developed in 238/996 (23.9%) study eyes, and was significantly more frequent in the BLTR arm (148/499 [29.7%]) than the PLTR arm (90/497 [18.1%]), surgeon adjusted OR 1.91 (95% CI, 1.42–2.57); $p<0.0001$). Major trichiasis (OR 2.03 [95% CI, 1.14–3.61]; $p=0.015$), conjunctival scar severity (OR 1.90 [95% CI, 1.06–3.39]; $p=0.030$), and under correction at any location (OR 3.71 [95% CI, 1.63–8.44]; $p=0.0040$), at baseline independently predicted PTT 4 years after PLTR surgery; while increased number of peripheral dissection with scissor in the PLTR surgery had a long-term protective effect on PTT (OR 0.69 [95% CI, 0.53–0.89]; $p=0.0045$). Major TT (OR 2.30 [95% CI, 1.40–3.76]; $p=0.0009$), mixed trichiasis lash location (OR 3.36 [95% CI, 1.86–6.08]; $p=0.0001$), and central under correction (OR 8.73 [95% CI, 2.02–37.7]; $p=0.0037$), at baseline predicted PTT 4 years after BLTR surgery.

Among the clinically significant ECA diagnosed at 12-months, 44.2% in the PLTR group and 51.5% in the BLTR group regressed to normal or mild ECA (sign test $p<0.0001$). This regression was not significantly different between the PLTR and BLTR group.

More corneal opacity developed in all trial participants between baseline and 4-year follow-up (OR 4.25 [95% CI, 3.44–5.25]; $p<0.0001$). Corneal opacity progression was associated with the presence of PTT (OR 2.06 [95% CI, 1.24–3.42]; $p=0.0052$) at 4-years, old age (OR 1.04 [95% CI, 1.02–1.05]; $p<0.0001$), vision reduction between baseline and 4 years (OR 2.00 [95% CI, 1.30–3.07]; $p=0.0016$), and reduced LogMar visual acuity at 4 years (OR 4.40 [95% CI, 2.57–7.54]; $p<0.0001$). There was a significant improvement in visual acuity at 4 years versus baseline in all study participants (mean improvement 0.6 [95% CI, 0.9–0.3]; $p<0.0001$) regardless of age, presence of other blinding conditions, and corneal scar progression. In adjusted analysis for other blinding conditions, presence of PTT predicted vision reduction between baseline and 4 years (OR 0.84 [95% CI, 0.71–0.97]; $p=0.011$).

Depression was significantly more prevalent in TT cases with poor surgical outcomes at 4 years than those with good outcome (13.7% vs 6.1%; OR 2.15 [95% CI, 1.33–3.47]; $p=0.0018$).

Conclusions

The PLTR surgical procedure was superior to the BLTR with significantly lower risk of PTT, both at and by 4 years after surgery. PTT results in corneal opacity and vision reduction. ECA regresses, but still about 50% of the ECA cases in both procedures remained un-changed, indicating the need to be addressed surgically. The mental health care needs of cases with TT and poor surgical outcomes should be assessed and addressed.

Financial Disclosures: This study received financial support from the Coalition for Operational Research on Neglected Tropical Diseases (COR-NTD) at the Task Force for Global Health. EH is supported by The Queen Elizabeth Diamond Jubilee Trust.

A cohort Study of Post-Epilation Lashes in un-operated and postoperative TT Cases: lash burden, phenotype, and surgical acceptance

Presented by Dr. Esmael Habtamu, Study Coordinator, London School of Hygiene & Tropical Medicine

Authors and Affiliations: Esmael Habtamu^{1,2}, Tariku Wondie², Zerihun Tadesse², Bizuayehu Gashaw³, E. Kelly Callahan⁴, David Macleod¹, and Matthew J. Burton¹

¹London School of Hygiene & Tropical Medicine, London, UK. ²The Carter Center, Addis Ababa, Ethiopia. ³Amhara Regional Health Bureau, Bahirdar, Ethiopia. ⁴The Carter Center, Atlanta, USA.

Background

The blinding stage of trachoma, TT, has varying phenotypes ranging from a single aberrant lash without entropion (the inward rotation of the eyelid margin) touching the eye to a complete entropion with all lashes in-turned towards the eye and scratching the cornea. The WHO recommends corrective eyelid surgery to all severity of TT to reduce the risk of blindness. However, delivering surgical services has considerable challenges including low acceptance of surgery and poor surgical outcomes, such as PTT (the return of the trichiasis after surgery) and eyelid contour abnormalities. Many individuals with TT, particularly those with mild disease, decline surgery, even when this is provided free of charge and close to home. There is adequate evidence that most PTT cases have no entropion (>80%) and are mild (>88% and 68% in trials conducted in Ethiopia and Tanzania respectively), indicating that most of the PTT cases would not require surgical management and are likely to decline when offered and that an alternative management strategy is needed. A recent long-term follow-up data from a clinical trial showed that minor un-operated TT (<6 lashes touching the eye) cases can successfully epilate and that epilation helps to control the trichiasis successfully and limits its progression to major TT (≥6 lashes touching the eye). Thus, WHO endorsed the use of epilation, the repeated plucking of lashes, as an alternative second line treatment to surgery for the management of both minor un-operated trachomatous trichiasis (UTT) and minor PTT.

However, some trachoma programmes have hesitated in implementing epilation, mainly for assumptions that epilation for minor TT could promote the re-growing of larger number, stiffer, and thicker lashes than the original TT lashes, and offering epilation would hamper surgical acceptance. However, there is limited evidences to either support or challenge these claims. The aim of this study is to investigate the burden and phenotypes of post-epilation lashes, and acceptance of TT surgery in UTT, and PTT cases 6-months after frequent epilation.

Methods

Cases of minor (<6 lashes touching the eye) UTT (170) and PTT (169), who refused surgical management but were willing to epilate, were recruited from community-based screening in Amhara Region, Ethiopia. They were enrolled and followed-up every month for 6 months. Patients were advised on and shown how to epilate, and those that requested help were assisted by the examiner at each time point. Trichiasis lashes numbers and characteristics (location, thickness, strength/stiffness, and length) were documented at baseline and each follow-up time point by a single assessor. Corneal opacity, LogMAR visual acuity, and vision related quality of life (VRQoL) were measured at baseline, 1-month and 6-months. Data on frequency of epilation, number of lashes epilated, and surgical acceptance were collected at each time point. Primary outcome measures were (a) trichiasis lash burden change measured using Poisson regression to estimate incidence-rate

ratio (IRR), (b) trichiasis lash phenotype change measured using logistic regression model and, (c) TT surgery acceptance at 6-months.

Results

Primary outcomes:

There was a significant reduction in the number of trichiatric lashes in UTT (IRR=0.50 [95% CI, 0.42–0.62]; $p<0.0001$), and PTT (IRR=0.34 [95% CI, 0.26–0.45]; $p<0.0001$) cases 6-months after frequent epilation. At 6-months, 44.2% and 1.22% (2 persons) in the UTT group, and 58.9% and 0.6% (1 person) in the PTT group had no lash and progressed to major TT respectively. Post-epilation lashes at 6-months had higher odds of being thin (40.2% vs 55.8%, OR=1.88 [95% CI, 1.21–2.93]; $p=0.0048$), weak (39.6% vs 70.8%, OR=3.68 [95% CI, 2.30–5.88]; $p<0.0001$), and half-length (30.9% vs 43.3%, OR=1.71 [1.09–2.68]; $p=0.020$) than the pre-epilation lashes in UTT cases. Most PTT lashes at baseline were weak (66.3%), thin (63.4%), and short in length (51.7%), and at 6-months there was still a significant increase in the proportion of weak lashes to 79.7% (OR=1.99 [95% CI, 1.04–3.83]; $p=0.039$). In all 6 follow-up time points, 120/164 (73.2%) of UTT cases and 134/163 (82.3%) of PTT cases ($P=0.05$) indicated that they would accept surgery if their TT progressed.

Secondary outcomes:

There was no change in corneal opacity ($p=0.39$) and vision ($p=0.12$) in PTT cases, while UTT cases had peripheral corneal opacity progression (OR=1.80 [95% CI, 1.22–2.65]; $p=0.0030$) and vision improvement ($p<0.0001$) at baseline versus 6-months. However, most of the corneal opacity progression in the UTT group occurred in the periphery (12.2%), with only 9.1% progressing into a central corneal opacity. Increasing follow-up time (OR=1.21 [95% CI, 1.13–1.29]; $p<0.0001$), older age (OR=1.05 [95% CI, 1.0–1.10]; $p=0.025$), and increased burden of corneal lashes (OR=1.18 [95% CI, 1.02–1.37]; $p=0.021$) were independently associated with corneal opacity progression, while self-epilation at baseline (OR=0.16 [95% CI, 0.03–0.83]; $p=0.021$) had a protective effect.

The VRQoL score of both UTT and PTT cases had increased both at 1-month and 6-months after frequent epilation in all subscales ($p<0.0001$).

A comparable proportion of people in The UTT (60.0%) and PTT (61.0%) group had plans to epilate for a longer period, with the majority responding that they would keep epilating as much as they need it. About half of the UTT (50.0%) and PTT (53.2%) cases thought “epilation is a good enough treatment” for their TT.

Conclusions

Post-epilation lashes were weaker, thinner, and shorter than pre-epilation lashes in both UTT and PTT cases, suggesting a lower risk of corneal damage and visual impairment posed by these lashes. There is evidence that programmatic implementation of epilation would not hamper surgical uptake. Epilation should be a second line alternative management to surgery for cases with un-operated corneal lashes, and epilation should only be offered to such cases when declining surgery. However, epilation should be provided as a first line option of management along with surgery for minor PTT cases and UTT cases with peripheral TT so that the patients can choose between the 2 management strategies.

Financial Disclosures: This study received financial support from the Coalition for Operational Research on Neglected Tropical Diseases (COR-NTD) at the Task Force for Global Health. EH is supported by The Queen Elizabeth Diamond Jubilee Trust.

3D photography as a field grader training tool for trichomatous trichiasis: an evaluation study in Ethiopia

Presented by Dr. Esmael Habtamu, Study Coordinator, London School of Hygiene & Tropical Medicine

Authors and Affiliations: Jeremy Hoffman¹, Esmael Habtamu¹, Hillary Rono¹, Zeribun Tadesse², Tariku Wondie², Temesgen Minas², Bizuayehu Gasban³, E. Kelly Callahan⁴, David MacLeod¹, Matthew J. Burton¹

¹London School of Hygiene & Tropical Medicine, London, UK. ²The Carter Center, Addis Ababa, Ethiopia. ³Amhara Regional Health Bureau, Bahirdar, Ethiopia. ⁴The Carter Center, Atlanta, USA.

Background

TT will continue to develop after active trachoma is controlled. Detecting and treating affected individuals will remain necessary for years; a long “tail” of incident cases is anticipated. As the prevalence of TT declines, there will be fewer cases available for training trachoma graders (TG), necessitating alternative methods. A recent trial comparing 2 alternative TT surgery procedures used two-dimensional (2D) clinical images to assess the presence of TT following surgery. In this study the photographic grading result was highly concordant with the field grading. However, TT was slightly “over-called” from these images compared to the field-grading; this was thought to be due to the 2D nature of the images, which can give the impression that lashes overlying the globe are touching when there is actually a small gap.

Three-dimensional (3D) images may be able to reduce this limitation of 2D images by providing an additional perspective on whether the eyelashes close to the eye are actually touching the globe. There have been no previous reports of the use of 3D photography to assess TT. In this study, we investigated whether this might be a useful tool in the training and assessment of graders within a trachoma control programme, especially during the anticipated long “tail” of incident TT, following the control of active disease.

Methods

In February 2018, 26 health professionals hereafter referred to as TG, with no prior training or experience of TT case identification were recruited from 17 districts of West Gojam Zone, Amhara region, and were enrolled in a 4-day training programme for TT case identification using 3D images. The training was based on the Amhara region IECW training manual, except for TT case identification training using live subjects. This training included eyelid examination techniques using magnifying loupes, and identification of TT using a series of 3D pictures. The trainees were shown how to view 3D images printed on paper using the Loreo Pixi-Viewer 3D glasses. They were taught how to grade whether TT was present or not and to count the number of eyelashes touching the eye if TT was present. On the final training day, all trainees were tested in an intergrader assessment (IGA) using a set of 3D colour printed images of 50 eyes with and without TT. After the completion of the 3D training and IGA, the TT graders were then taken to the field to assess 50 patients (1 eye per patient) with and without TT, using 2.5x magnifying loupes and a torch. Immediately after the trainee test, a separate group of 27 experienced IECWs examined and graded the same group of 50 patients using same procedure. This was done to compare the grading quality of TT graders trained using 3D images to the grading quality of experienced IECWs, most of whom had previously been involved in trachoma impact assessment surveys. At the end of the exercise, all subjects were re-graded by expert TG.

Results

The pooled overall agreement for the IGA comparing the trainees' 3D image grading to the expert field grading was 71.4% (SD 9.2%, range 52-88%). The pooled sensitivity and specificity were 87.7% (CI 82.4-91.6) and 62.8% (CI 52.1-72.4), respectively. The mean kappa score was 0.46 (CI 0.39-0.52).

In the "live" clinical assessment test of the trainees, the pooled overall agreement was 86.8% (SD 5.3%, range 74-94%), compared to the results of an expert TG. Their pooled sensitivity was 86.7% (95% CI: 83.4-89.4) and pooled specificity was 89.0% (84.9-92.1). The mean kappa score was 0.75 (CI 0.71-0.79).

In the "live" clinical assessment test of the experienced IECWs, the pooled overall agreement was 86.4% (SD 5.9%, range 72-96%), compared to the results of an expert TG. Their pooled sensitivity was 91.9% (95% CI: 89.3-93.9) and pooled specificity was 83.2% (78.3-87.1). Their pooled kappa score was 0.75 (CI 0.70-0.79). There was no evidence of a difference between the trainees and the experienced IECWs in the odds of overall correctly diagnosing the presence or absence of TT (OR = 0.96, 95%CI 0.74-1.24, $p = 0.76$).

Trainees were asked about their views on the use of 3D images for training of TG. About 80% of the trainees found using 3D glasses easy to use and 84% of the trainees found viewing the 3D images using the 3D viewer to be realistic. All trainees found that the 3D images were more useful than 2D images for training and thought that they should be included in future training. Conversely, negative feedback for 3D images centred around taking time to get used to viewing them (62.1%) and suggested more time for training.

Conclusions

Examining live patients after training with 3D images gives comparable results to those of experienced graders trained with live patients. Using standardised 3D images of TT can be a useful tool in training TG to identify TT in settings where there are not enough TT cases for training.

Financial disclosure: This work received financial support from the Coalition for Operational Research on Neglected Tropical Diseases (COR-NTD) at the Task Force for Global Health. In addition, the research was supported by the Wellcome Trust (Senior Research Fellowship Grant to MJB 098481/Z/12/Z) and COR-NTD. JH is supported by the NIHR (3071). EH is supported by The Queen Elizabeth Diamond Jubilee Trust.

ESPEN and the Status of Trachoma in the African Region

Presented by Dr. Amir B Kello, Medical Officer, Trachoma; ESPEN, World Health Organization

The Expanded Special Project for the Elimination of Neglected Tropical Diseases (ESPEN) was established in 2016 as a public-private-partnership between WHO Regional Office for Africa (WHO/AFRO), Member States, and NTD partners in an effort to mobilize political, technical, and financial resources to tackle the 5 most prevalent NTDs in the African Region that are amenable to preventive chemotherapy. The 5 preventive chemotherapy NTDs (PC-NTDs) are trachoma, onchocerciasis, soil-transmitted helminthiasis, lymphatic filariasis, and schistosomiasis.

ESPEN has a light and flexible institutional framework and is housed within the communicable diseases cluster of WHO/AFRO in Brazzaville, Republic of Congo. ESPEN's top priority objectives are the following:

1. Scaling up treatments of the 5 PC-NTDs to reach 100% geographic coverage and ensuring integration of MDA for the PC-NTDs to improve cost efficiency.
2. Scaling down and stopping treatments for the 5 PC-NTDs once elimination threshold has been achieved or transmission is interrupted.
3. Strengthening information systems for evidence-based decision making.
4. Improving the effective use of donated medicines through enhanced supply chain management.

Supplementary objectives include:

- A. Ensuring effective partnership and coordination
- B. Advocacy and resource mobilization

The ESPEN Portal (<http://espen.who.afro.int>) was launched in 2017 with 240 implementation unit level endemicity maps. The Phase II of the Portal was released in March 2018 after being revamped and made user-friendly. It has 4,403 maps and underlying datasets for all the PC-NTDs, including trachoma, with information available at both intervention unit level for endemicity status and treatment coverage, as well as site-level data for mapping and impact assessments. Additionally, a section on resources has been added that allows downloading of country NTD master plans, partners matrix, Regional Programme Review Group reports, ESPEN annual reports, and country disease elimination dossiers.

Some of the highlights of achievements of ESPEN in 2018 include support to 21 countries to scale up MDA for PC-NTDs reaching over 70 million people through promotion of integration of MDA activities for the 5 PC-NTDs as much as possible. With the support of ESPEN, Angola, Central African Republic (CAR), and South Sudan completed their mapping for schistosomiasis, soil-transmitted helminths, and lymphatic filariasis. ESPEN also provided support to close the mapping gap to CAR, Democratic Republic of the Congo (DRC), Sudan, and Zimbabwe to conduct trachoma mapping in suspected endemic districts.

Through its support to the supply chain management of endemic countries and reviewing of Joint Application Packages, ESPEN managed to help countries recover 285,280,139 tablets worth over USD 69,740,537. Furthermore, 44 endemic countries in the African Region were supported to develop their second generation NTD Master Plans for 2016 – 2020.

WHO/AFRO received the Universal Health Coverage (UHC) Innovative Partnership Award from The Access Challenge at the UHC conference organized during the United Nations General Assembly in New

York in 2018 for the achievements of ESPEN, which is recognized as a ground-breaking public-private partnership to help accelerate progress in meeting NTD elimination targets in the African Region.

Status of Trachoma in the African Region

Of the 43 endemic countries for trachoma worldwide, 27 (63%) are in the African Region. In 2018, there were an estimated 139m people living in endemic districts and at risk of trachoma in the Region, which represents 88% of the global burden of trachoma. The Region also bears a disproportionately huge burden of TT cases: 1.7m (61%) of the estimated global total of 2.8m.

Of the 47 countries in the Region, 27 are endemic for trachoma and are known to require interventions, whereas 15 countries are believed to be non-endemic. The status of trachoma endemicity is uncertain in Angola, Botswana, and Namibia. The Gambia claims to have eliminated trachoma. Ghana is the only country in the Region to have been validated in June 2018 as having eliminated trachoma as a public health problem.

In the African Region, with an estimated 70m people living in trachoma endemic districts, Ethiopia has the highest burden of trachoma. At risk population in Ethiopia represents 44% of the global burden and 50% of the burden in the Region. Ethiopia also has the highest national burden of TT cases in the world. Of the estimated 1.7m TT cases in the African Region in 2016, an estimated 693,037 (41%) were found in Ethiopia.

Among the 27 endemic countries in the African Region, there were still 9 countries that did not have their trachoma mapping completed as at June 2018 for all of the suspected endemic districts. These were CAR, Chad, DRC, Guinea, Mauritania, Nigeria, South Sudan, Zambia, and Zimbabwe. The total number of districts that still need to be mapped in already confirmed endemic countries in the African Region as at June 2018 was 137.

In 2017, of the 27 countries endemic for trachoma, 24 had 1,129 districts with a $TF_{1-9} \geq 5\%$ warranting treatment with A, F&E. Of these 24 countries that needed MDA, only 7 (29%) achieved 100% geographical coverage for MDA. These countries were Benin, Eritrea, Guinea, Guinea-Bissau, Malawi, the United Republic of Tanzania, and Uganda. The other 17 countries (71%) had gaps in achieving full geographic coverage, involving a total of 461 known endemic districts. That means only 59% of the total of 1,129 districts that were already identified as endemic and requiring treatment had A, F&E interventions in 2017.

Significant progress has been made by trachoma endemic countries with the support of stakeholders in the implementation of S&A components of the SAFE strategy. However, there are still huge challenges in ensuring the implementation of F&E components in most endemic countries. Additional challenges include insecurity in endemic and suspected endemic districts as well as displacement of populations within and outside of endemic countries.

There is reason for hope as out of 1,129 endemic districts in the Region in 2017, 267 (24%) reached the elimination threshold by 2018 and no longer required MDA. More and more countries are approaching the criteria for elimination of trachoma as a public health problem and are preparing their trachoma elimination dossier for submission.

The non-target effects of mass distribution of azithromycin for trachoma

Presented by Dr. Catherine Oldenburg, Assistant Professor, and Ms. Kieran O'Brien, Study Coordinator, The Francis I. Proctor Foundation, University of California at San Francisco

Azithromycin for child mortality

In spite of substantial progress in reducing child mortality over the past 20 years, under-5 mortality rates remain high in many sub-Saharan Africa settings. Azithromycin has efficacy against pathogens responsible for several infectious childhood illnesses that contribute to the mortality burden, including pneumonia, diarrhea, and malaria. Indeed, trachoma studies evaluating non-target effects of the mass distribution of azithromycin have found reductions in the burden of acute lower respiratory infections, diarrheal disease, and malaria parasitemia.

Several studies have found mortality benefits after mass azithromycin as well. In a cluster-randomized trial comparing azithromycin distribution frequencies for trachoma in Ethiopia, the mortality rate among children 1 to 9 years of age was 50% lower in communities receiving any treatment compared to communities receiving no treatment over 1 year. Similarly, a cohort study conducted in the same population concluded that this relationship persisted when comparing treated and untreated children within a household. In another cluster-randomized trial for trachoma in Niger, communities receiving biannual azithromycin distributions to children over 3 years experienced a mortality rate among children 6 months to 5 years of age 19% lower than communities receiving annual distributions to everyone. These studies provide compelling preliminary evidence that mass distributions of azithromycin may reduce child mortality, but they suffer from limitations and the potential for bias that preclude the ability to draw strong conclusions.

The MORDOR trial was designed to address the limitations of prior studies and directly evaluate the efficacy of azithromycin to reduce child mortality. MORDOR randomized communities in Malawi, Niger, and Tanzania to receive biannual azithromycin or placebo to children 1-59 months over 2 years, and monitored mortality through biannual census data collection. Overall, MORDOR demonstrated a 13.5% reduction in mortality in azithromycin-treated communities compared to placebo-treated communities. The effect of azithromycin on mortality was strongest in Niger, which saw an 18.1% reduction, and in children 1-5 months of age, who experienced a 24.9% reduction.

Future Research Directions

Ongoing studies are currently evaluating long-term effects of azithromycin for child mortality and antibiotic resistance, the use of azithromycin in neonates and young infants, the efficacy of azithromycin integration in platforms other MDA, and implementation science for country level roll-out of azithromycin. Results from these and other studies are expected over the next 5 years.

Safety of Azithromycin in Infants Aged 1-5 Months

Currently, trachoma programs treat children aged 6 months and above with oral azithromycin in endemic communities. There is a paucity of safety data for the use of azithromycin in children under 6 months of age, and some observational studies have linked macrolide use in very young infants (typically under 6 weeks of age) to an increased risk of infantile hypertrophic pyloric stenosis (IHPS). While rare, IHPS is a serious

condition that requires surgical correction. However, large-scale randomized controlled trials have not been done evaluating the safety of macrolide use for young infants.

A random subset of 30 communities in the MORDOR study were chosen to be “morbidity” communities, in which more intensive monitoring was performed compared to what was logistically feasible in the “mortality” communities (communities contributing person-time to the primary outcome). As part of the monitoring, the caregivers of infants aged 1-5 months were interviewed about healthcare-seeking behaviors and specific symptoms following treatment, aiming to interview each caregiver within 2 weeks of treatment.

Caregivers of 1,712 infants were interviewed. The median time to interview was 34 days (interquartile range 21 to 61 days). Caregivers of 70% of infants reported that their child had received the study treatment. Among those, there was no difference in caregivers reporting that they had a health problem (34.1% azithromycin, 40.3% placebo, $P=0.24$) or in visiting a health clinic (12.8% azithromycin, 16.8% placebo, $P=0.27$). The distribution of adverse events was similar between arms ($P=0.43$). The most common adverse events were diarrhea, vomiting, and rash. There was no difference in vomiting (15.9% azithromycin, 21.0% placebo, $P=0.07$), the most common clinical sign of IHPS, nor were any cases of IHPS reported.

Azithromycin appeared to be safe when administered as a single 20 mg/kg dose to infants aged 1-5 months as part of a mass distribution program, with no evidence of a difference in adverse events between groups. Treatment of children as young as 1 month in trachoma programs could be considered, particularly with ongoing evaluation of adverse events in this group.

Antimicrobial resistance

A systematic review was conducted to compile evidence available on selection for macrolide resistance after mass distribution of azithromycin for trachoma in any organism. A total of 19 studies were identified, with 12 reports on resistance in *Streptococcus pneumoniae*, 3 on *Chlamydia trachomatis*, 3 on *Escherichia coli*, 2 on *Staphylococcus aureus*, and 1 on *Plasmodium falciparum*. The diversity of study designs, distribution frequencies, and follow-up time points among included studies prevented a formal meta-analysis, and a qualitative synthesis of evidence was conducted by organism. Overall, resistance was reported in 3 of the 5 organisms for which evidence was available (*S pneumoniae*, *E coli*, and *S aureus*). Several reports on each of these organisms suggested that resistance increases immediately after mass distribution of azithromycin and then declines once distributions are stopped, often returning to baseline or near-baseline prevalence. No resistance was reported in *C. trachomatis* or in *P falciparum*. The lack of resistance seen in *C. trachomatis*, as well as the apparently temporary increase seen in other organisms, are promising for ongoing distribution by trachoma programs, both in terms of continued efficacy in the target organism and potential for minimal impact in others. There is a dearth of research on this topic in several important areas, however, including on higher frequency and longer term distributions and on follow-up time points longer than 6 months. As the mass distribution of azithromycin for trachoma continues and is considered for broader indications like child mortality, continued short- and long-term monitoring of antimicrobial resistance in multiple organisms is needed.

Serology – use in surveillance

Presented by Dr. Diana Martin, Research Microbiologist, U.S. Centers for Disease Control and Prevention

Post-validation surveillance will be critical to ensure that once the SAFE strategy interventions for trachoma are removed, due to the fact that the target is “elimination as a public health problem” and not “zero new infections”. Programs will want assurances that elimination is sustained long-term, and the WHO has required post-validation surveillance plans in the elimination dossier, but there is no guidance for how to undertake surveillance for transmission of ocular *Chlamydia trachomatis*. As it is likely that little funding will be available for post-validation surveillance, an ideal surveillance tool would be both inexpensive and easily integrated into existing health surveillance systems.

Recent work has evaluated the potential for using antibody-based testing for post-validation surveillance. For this type of serosurveillance to be of use, we would need to repeatedly observe, at a minimum, the presence of anti-*C. trachomatis* antibody signal in areas with active transmission, and the absence of anti-*C. trachomatis* antibody signal in areas with low or no transmission. Data from a variety of transmission and programmatic settings will be used to validate the use of antibody responses for surveillance and, if successful, inform methodologies to determine programmatic threshold for antibody responses. This could be in the form of a simple seropositivity cutoff, or more complex models to estimate seroconversion rates as an indicator of transmission could be used.

At the same time we are gathering data to determine if antibody-based surveillance would be appropriate for trachoma, we are also developing the tests to be used. Currently, testing for Pgp3 antibodies can be done using one of three different assays. The first one developed is the most advanced—the multiplex bead assay. This assay is highly reproducible, is quantitative so that the data tells us something about the amount of antibody in the sample and can be multiplexed to detect antibodies against up to 100 other antigens from other pathogens in the same well, and is ideal for integrated surveillance. The disadvantage of the multiplex bead assay is that the instrumentation is more expensive, less readily available, and requires a high level of technical competency and continued maintenance support for the instrument. The Pgp3 ELISA reports back quantitative data but can only test for one thing at a time. However, any public health laboratory will be appropriately equipped to run ELISAs. Finally, the Pgp3 lateral flow assay is simple to use and requires minimal training (<half day) compared to the other two assays but gives only positive or negative results back. Ideally, these tests will provide the same information, allowing national programs the option to select what test will work best for them.

Data were presented from impact surveys conducted in West Amhara in 2017. Fingerprick blood was taken from 1–9-year-olds in 4 EUs, specifically selected to include 2 that were expected to remain above 5% TF at the impact survey, and 2 expected to fall below it. The EUs Andabet and Dera had approximately 30% TF at the most recent survey (2011, and 2014, respectively), and as expected, both had TF >5% at impact survey in 2018. Andabet had TF of 37%, and Dera had TF of 14.7%. These two EUs also had the highest % positive for antibodies against the *C. trachomatis* antigen Pgp3, Andabet at 35.6% and Dera with 11.2%. The prevalence of anti-Pgp3 antibodies was below 5% in each the two EUs with TF below 5%. Serologic data suggest ongoing transmission in Andabet and reflect low transmission in Woreta Town and Alefa. Models suggest that antibody prevalence of 7.5% corresponds with <5% TF, and both Andabe and Dera were above this level. However, based on previous studies, we would expect antibody prevalence to be greater than TF prevalence in areas of ongoing transmission. Currently, we do not know the impact of multiple rounds of MDA on dynamics of antibody response and antibody prevalence. It is possible that MDA, and especially

multiple rounds of MDA, may affect the rate at which people become antibody positive – potentially decreasing this rate - or antibody negative – potentially increasing this rate. This possibility should be further investigated through collection of additional field data and further modeling.

ICTC Updates and Transition Planning

Presented by Ms. Aparna Barua Adams, Project Officer, and Mr. Scott McPherson, Vice Chair, International Coalition for Trachoma Control

About ICTC (Presented by Aparna Barua Adams)

2019 marks 15 years since the International Coalition for Trachoma Control (ICTC) was established. Since then the coalition has grown to 49 non-governmental, donor, private sector, and academic organizations proudly working together to support the WHO Alliance for the Global Elimination of Trachoma by 2020 (GET2020 Alliance).

Each organizational member participates in ICTC through a nominated organizational member lead, who plays a vital role in working with other ICTC members and the ICTC secretariat for the delivery of ICTC's 2015 – 2020 strategic plan which aims to support the global trachoma program by:

1. Increase political will
2. Increase investment
3. Strengthen capacity
4. Coordinate the provision of technical assistance
5. Ensure an effective coalition model

In April 2019 the ICTC Executive Group will change:

- Serge Resnikoff (current ICTC Chair) will become the Immediate Past Chair (2019 – 2021)
- Scott McPherson (current ICTC Vice Chair) will assume the role of Chair (2019 – 2021)
- Virginia Sarah (current Immediate Vice Chair) will have completed her 6-year term on the Executive Group (from Vice Chair to Chair to Immediate Past Chair), but will remain an active and committed member of the ICTC community
- In September 2018, after members were invited to submit nominations for the role of Vice Chair (2019 – 2021), Angelia Sander of The Carter Center was selected to join the Executive Group and will start her official role as ICTC Vice Chair next month

ICTC currently holds two grant funded partnership initiatives (2014 – 2019), with Sightsavers as the member nominated grant manager for both:

- The Queen Elizabeth Diamond Jubilee Trust Trachoma Initiative
- Department for International Development (DFID) SAFE Program
- combined value of £80 million over 5 years
- working across 10 countries in Africa and 5 countries in the Pacific

Since 2014 the ICTC partnership initiatives have supported:

- management of over 215,000 trichiasis cases
- delivery of over 74 million treatments delivered
- F&E behaviour change interventions in 147 endemic districts

Updates from the past year

- Launch of the annual GET2020 database epidemiological overview and infographics communicating progress from the global trachoma program (please see ICTC's resource library for all GET2020 database materials, epidemiological overview and infographics)
- Outcome from the Commonwealth Heads of Government Meeting Summit (April 2018)
 - ICTC was one of 6 core members of the advocacy initiative Vision for the Commonwealth alongside Sightsavers, Fred Hollows Foundation, Peek, Clearly, and led by The Queen Elizabeth Diamond Jubilee Trust.
 - Vision for the Commonwealth was successful in ensuring the inclusion of vision and elimination of trachoma as key commitments on the agenda of the Commonwealth Heads of Government Meeting Summit in 2018, hosted by the UK Government and 52 other participating Heads of State.
 - £20million Commonwealth Fund launched by DFID to support Commonwealth countries to reach elimination of trachoma as a public health problem
- Support to national NTD coalitions to cultivate political champions:
 - As an observer to the UK Coalition against NTDs, ICTC and its members in the UK supported an annual parliamentary report showcasing the impact of DFID investment across NTDs including trachoma
 - Supported joint meetings between UK and German parliamentarians through the UK Coalition against NTDs and the German NTD Network
- Contribution to the Uniting to Combat NTDs/NNN scorecard process
 - Impact Dashboard and Action Framework will be launched in 2019; advocacy and planning tools to support the 10 disease communities included in the 2012 London Declaration on NTDs.
- WHO NTD roadmap: consultation with ICTC members and observers, expected launch in 2020
- Publication of new ICTC resources:
 - ICTC Preferred Practice: Zithromax® MDA Trainers Guide
 - ICTC toolkit for transition planning
- DFID/Trust Evaluative Learning Exercise (end of project) will focus on Africa; findings expected to be launched at GET2020 meeting in Mozambique. Learnings will be captured from 3 key areas:
 1. Effective program delivery: quality, coverage, and equity across the SAFE strategy
 2. Building health systems to sustain elimination
 3. Lessons learned from the partnership model

Spotlight: Progress across the Commonwealth

- GET2020 database identifies:
 - 42 million people at risk
 - 21/53 Commonwealth countries identified as having status uncertain or requiring interventions for trachoma
- Progress across the Commonwealth
 - Ghana, the first Commonwealth country to be validated by WHO for elimination of trachoma as a public health problem

- In 2017, Pakistan conducted its first ever MDA delivering treatments to over 1 million people in endemic areas
- **10** Commonwealth countries are on track to reach elimination thresholds by 2020 (Australia, Kenya, Malawi, Fiji, Kiribati, Mozambique, Solomon Islands, Uganda, Zambia, and Vanuatu)
- **15** Commonwealth countries have programs to tackle trachoma in different stages of implementation (as above plus Cameroon, India, Nigeria, Pakistan, and Tanzania)
- **6 countries** urgently need to start trachoma programs

Activities looking forward

- Release of annual updated data (GET2020 database) and infographics – communications and advocacy tools to communicate progress on the global trachoma program and highlight remaining areas for continued work
- Launch of new ICTC task teams: Hard to Reach Populations and Health Systems Strengthening; both groups will play a key role in gathering and sharing experiences, best practices that support global elimination efforts, but also contribute to wider NTD strategy and programming
- Support WHA resolutions on eye health and NTDs (2020)
- WHO NTD Roadmap: ICTC will continue to support the trachoma community's input through a consultative process
- With new funding coming through in 2019 for WHO AFRO region, ICTC will focus efforts to support resource mobilisation for regional plans in the Eastern Mediterranean Region and the Pan American Health Organization

ICTC Transition Toolkit (Presented by Scott McPherson)

- ICTC has been developing preferred practices since 2012 to capture key lessons and promote evidence for improved programming
- ICTC preferred practices provide evidence on best practices to support implementers and partners in the delivery of the scale up of the SAFE strategy and global trachoma program
- Preferred practices are developed by ICTC members working together through technical working groups and supported by technical leads from ICTC's two grant funded partnership initiatives (DFID SAFE program and The Queen Elizabeth Diamond Jubilee Trust Trachoma Initiative)
- Technical resources are reviewed by the ICTC Program Advisory Committee for the provision of technical and programmatic quality assurance guidance
- Currently all Preferred Practices are available in English, many in French, and some in Portuguese and Spanish. Funding for the development of Preferred Practices is supported by ICTC members in order to improve access to resources and evidence.
 - a. Over the last 12 months, ICTC has undertaken a consultative process with members and observers to develop a series of toolkits to support national programs with addressing transition planning. Work to develop tools to support transition activities for country programmes was identified as a need by the grant manager of the ICTC partnership initiatives (Sightsavers)

- b. ICTC/Sightsavers identified a transition task team to bring together learnings from MOH and implementing partners to identify necessary and sustainable program needs for trachoma elimination and transition into mainstream public health programming.
- c. April 2018, London workshop brought together over 20 ICTC members and observers to contribute additional thinking and review. All ICTC members were invited in September 2018 to review, and editorial inputs were provided by WHO.

In the context of the global trachoma program, transition planning refers to the process undertaken as districts work towards and reach their WHO elimination thresholds, to ensure that successes are maintained, that services are embedded within routine health care, eye care, or water and sanitation services, and that the health system is strengthened.

Three ICTC toolkits have been developed:

1. Transition Planning for Trichiasis Management Services
2. Transition Planning for Mass Drug Administration of Zithromax®
3. Transition Planning Facial cleanliness and Environmental improvement

These toolkits can be used in a variety of ways:

1. As a step by step planning guide
2. As a checklist to ensure planning is on the right path
3. As a reference document on key planning components
4. To engage non-trachoma partners in planning and delivery of transition activities

These toolkits take into consideration discussions needed at both the district and national level and provide suggested agendas and steps to building and strengthening cross sectoral partnerships at the country level needed to support transition planning. These toolkits will be available in English (available this week), French, and Portuguese (available from April).

Key points for TT management in transition planning:

- When Survey indicates district prevalence of TT is below TT elimination threshold, dedicated case finding and outreach should transition to routine eye health services offered at district level
- Including TT surgical responsibilities in the national health system will directly contribute to Global Surgery Goals for 2030 and the achievement of Universal Health Coverage, through quality, availability and readiness for surgery

Principle objectives for MDA in transition planning:

- Remaining stocks of Zithromax® are appropriately managed in accordance with ITI and Pfizer guidelines
- Consideration given to designing surveillance system to identify recrudescence of active trachoma
- Health authorities at each level and affected communities are aware of the cessation of MDA and justification, and the need to continue WASH activities

Key points for F&E in transition planning:

- Unlike surgery and antibiotics components of SAFE strategy, F&E require strong partnership with water and sanitation agencies to improve access to infrastructure, and a longer lead time to allow behaviours and practices to change sustainably
- Focus on embedding trachoma-relevant WASH and health promotion activities in routine service delivery, i.e. through provision of reliable water supplies, access to sanitation services, absence of open defecation, continuing hygiene promotion

World Health Organization Guidelines on Sanitation and Health

Presented by Ms. Yael Velleman, Head of Partnerships, the Schistosomiasis Control Initiative, Imperial College London on behalf of WHO

1. Background

The WHO published the first ever guidelines on sanitation and health⁴ in August 2018. Although guidance on distinct aspects of sanitation already exist, new guidelines were seen as necessary as evaluations of sanitation interventions have shown lower than expected health outcomes, leading to concerns on the quality of implementation of sanitation interventions and programmes. These new comprehensive guidelines consider the full sanitation service chain and its implications for human health, as well as the roles and responsibilities of health actors in securing sanitation-related health gains. They summarize the evidence on the links between sanitation and health, provide evidence-informed recommendations, and offer guidance for encouraging international, national, and local sanitation policies and actions that protect public health.

The main audience for the guidelines is national and local authorities responsible for the safety of sanitation systems and services, including policy makers, planners, implementers, and those responsible for the development, implementation, and monitoring of standards and regulations. This includes health authorities and other agencies with responsibilities for sanitation.

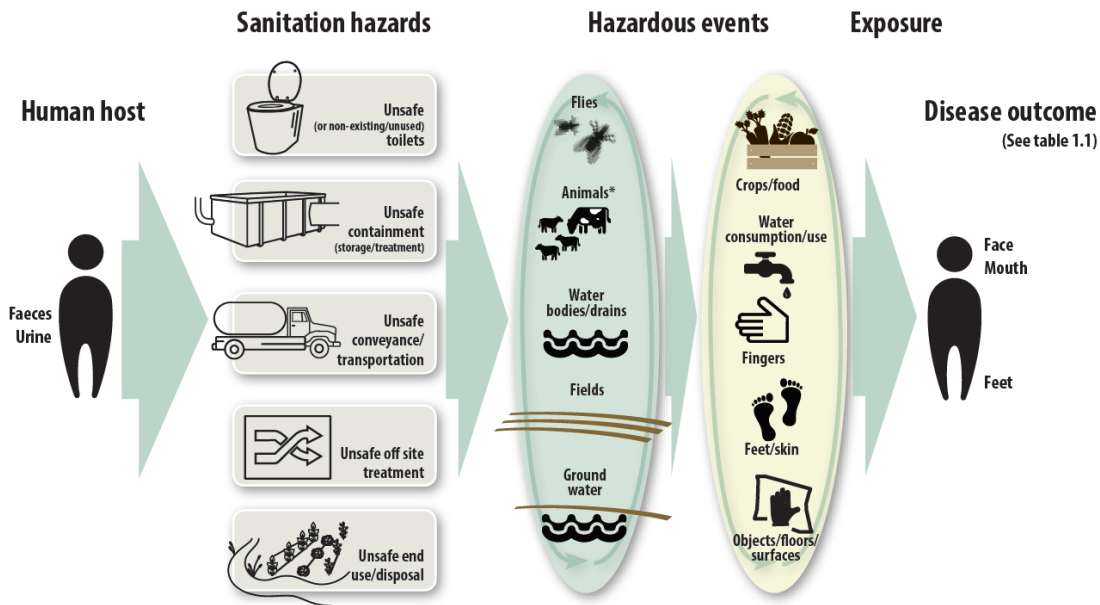
The guidelines were developed in accordance with the processes set out in the WHO Handbook for Guideline Development. The Guidelines Development Group, which oversaw the process, included Kelly Callahan, Director of The Carter Center Trachoma Control Program, as well as two representatives from the WHO Department of NTDs Control, Dr. Anthony Solomon and Dr. Antonio Montresor.

2. Guidelines content

The guidelines include an introduction on the role of sanitation in human health and the need for and scope of the guidelines, followed by Recommendations and Good Practice Actions. These are supplemented by implementation guidance chapters (*Safe sanitation systems*, *Enabling safe sanitation service delivery*, and *Sanitation behaviour change*), technical resource chapters (*Excreta-related pathogens*, *Methods*, *Evidence on the effectiveness and implementation of sanitation interventions*, and *Research needs*), and Annex 1 (*Sanitation system fact sheets*).

⁴ https://www.who.int/water_sanitation_health/publications/guidelines-on-sanitation-and-health/en/

Figure 1.1 The health impact of unsafe sanitation



3. Guidelines Recommendations and Good Practice Actions

1: Ensure universal access and use of toilets that safely contain excreta

- Universal access to toilets that safely contain excreta and elimination of open defecation should be prioritized by governments, ensuring that progress is equitable and in line with the principles of the human right to water and sanitation.
- Demand and supply of sanitation facilities and services should be addressed concurrently to ensure toilet adoption and sustained use and enable scale.
- Sanitation interventions should ensure coverage of entire communities with safe toilets that, as a minimum, safely contain excreta and address technological and behavioural barriers to use.
- Shared and public toilet facilities that safely contain excreta can be promoted for households as an incremental step when individual household facilities are not feasible.
- Everyone in schools, health care facilities, workplaces, and public places should have access to a safe toilet that, as a minimum requirement, safely contains excreta.

2: Ensure universal access to safe systems along the entire sanitation service chain

- The selection of safe sanitation systems should be context specific and respond to local physical, social, and institutional conditions.
- Progressive improvements towards safe sanitation systems should be based on risk assessment and management approaches.
- Sanitation workers should be protected from occupational exposure through adequate health and safety measures.

3: Sanitation should be addressed as part of locally delivered services and broader development programmes and policies

- Sanitation should be provided and managed as part of a package of locally-delivered services to increase efficiency and health impact.

- b. Sanitation interventions should be coordinated with water and hygiene measures, as well as safe disposal of child faeces and management of domestic animals and their excreta to maximize the health benefits of sanitation.

4: The health sector should fulfil core functions to ensure safe sanitation to protect public health

- a. Health authorities should contribute to overall coordination of multiple sectors on development of sanitation approaches and programmes and sanitation investment.
- b. Health authorities must contribute to the development of sanitation norms and standards.
- c. Sanitation should be included in all health policies where sanitation is needed for primary prevention, to enable coordination and integration into health programmes.
- d. Sanitation should be included within health surveillance systems to ensure targeting to high disease burden settings and to support outbreak prevention efforts.
- e. Sanitation promotion and monitoring should be included within health services to maximize and sustain health impact.
- f. Health authorities should fulfil their responsibility to ensure access to safe sanitation in healthcare facilities for patients, staff, and carers and to protect nearby communities from exposure to untreated wastewater and faecal sludge.

Good practice actions for enabling safe sanitation service delivery

The recommendations are complemented by a set of good practice actions to help all stakeholders put the recommendations into effect:

1. Define government-led multi-sectoral sanitation policies, planning processes, and coordination.
2. Ensure health risk management is properly reflected in sanitation legislation, regulations, and standards.
3. Sustain the engagement of the health sector in sanitation through dedicated staffing and resourcing and through action on sanitation within health services.
4. Undertake local health-based risk assessment to prioritize improvements and manage system performance.
5. Enable marketing of sanitation services and develop sanitation services and business models.

4. Relevance for trachoma programmes

The guidelines encourage an active role by health stakeholders in driving progress on sanitation. The following table sets out the potential role of trachoma stakeholders under Recommendation 4, as part of government health agencies or as support agencies:

Recommendation	Potential role of trachoma stakeholders
4.a) Health authorities should contribute to overall coordination of multiple sectors on development of sanitation approaches and programmes, and sanitation investment.	Participate in multi-sectoral coordination platforms and share information to enhance targeting of sanitation investment to endemic districts
4.b) Health authorities must contribute to the development of sanitation norms and standards.	Participate in formulation of norms and standards to help ensure quality and sustainable services that deliver sufficient environmental improvement for trachoma control and elimination
4.c) Sanitation should be included in all health policies where sanitation is needed for primary prevention, to enable coordination and integration into health programmes.	Include importance of sanitation and hygiene and of WASH sector engagement for prevention and control reflected in trachoma policies and plans

4.d) Sanitation should be included within health surveillance systems to ensure targeting to high disease burden settings, and to support outbreak prevention efforts.	Include sanitation in pre- and post-elimination surveillance to ensure the avoidance of recrudescence (information on sanitation situation; mechanism in place for obtaining sanitation-related information on coverage and activities)
4.e) Sanitation promotion and monitoring should be included within health services to maximize and sustain health impact.	Include sanitation promotion in the delivery of trachoma programmes
4.f) Health authorities should fulfil their responsibility to ensure access to safe sanitation in healthcare facilities for patients, staff and carers, and to protect nearby communities from exposure to untreated wastewater and faecal sludge.	Ensure hygienic conditions in TT surgery settings and support advocacy on improved sanitation in healthcare settings

Additionally, the guidelines provide extensive technical guidance that may inform implementation of the F and E components of trachoma programmes and who seek to enhance their understanding of sanitation considerations, in particular:

- **Chapter 3: Safe sanitation systems** - The chapter identifies the key technical and management features to minimize exposure to excreta at each step of the sanitation service chain, from the toilet, through containment, conveyance, treatment, and end use/disposal. It provides specific guidance on safe vs. unsafe systems, the performance of various technologies for risk reduction, and the applicability of different sanitation systems to different physical and institutional settings. Importantly, the chapter also sets out incremental measures for achieving safe sanitation, which is of particular relevance for low-income settings.
- **Chapter 5: Behaviour change** – this chapter sets out desired sanitation behaviours to protect human health and their drivers, as well as the methods to improve behaviours through behaviour change interventions. The chapter also offers a useful summary of sanitation approaches (such as CLTS and sanitation marketing) and the factors that should be considered in their implementation to ensure their success.
- **Chapter 6: Excreta-related pathogens** – the chapter provides comprehensive information on various classes of excreta-related pathogens, as well as an extensive review on 39 specific pathogens, their environmental transmission (including trachoma as part of excreta-related vector breeding), and treatment and control strategies for faecal waste.
- **Chapter 8: Evidence** – this chapter gathers evidence from new and existing systematic reviews on sanitation, either commissioned specifically or analysed as part of the guidelines development process, to inform the recommendations. The updated systematic review by Freeman et al. (2017)⁵ on the impact of sanitation interventions on infectious diseases found that better sanitation access has a protective association against active trachoma.

⁵<https://researchonline.lshtm.ac.uk/3962437/1/The%20impact%20of%20sanitation%20on%20infectious%20disease%20GOLD%20VoR.pdf>

WASH and Health Working Together: a ‘how to’ guide for NTD programmes⁶

Presented by Ms. Angelia Sanders, Associate Director, Trachoma Control Program, The Carter Center, and Ms. Yael Velleman, Head of Partnerships, the Schistosomiasis Control Initiative, Imperial College London

1. Background

WASH interventions are one of the 5 strategies for NTD control and elimination set out in the WHO 2012 NTDs roadmap. In 2015, WHO issued a Global Strategy and action plan on WASH and NTDs⁷ encouraging new ways to partner and invest across programmes in support of the goals of the WHO 2012 NTD roadmap. The Strategy included a comprehensive Action Plan in support of the 4 strategic objectives, which included a commitment by WHO to “Develop operational and normative guidance on integrated WASH and NTDs implementation” (p23). Such normative guidance is deemed necessary in order to ensure that the rhetoric of intersectoral collaboration is implemented practically in endemic countries. Based on this commitment, and on the success of the ICTC “All you need for F&E”⁸, the NNN WASH Working Group, and WHO collaborated to develop a comprehensive toolkit on WASH and NTDs.

The toolkit is primarily targeted at programme managers at country level, to:

- Build multisectoral partnerships with key stakeholders: ministries, national and local WASH agencies, the private sector, local health groups, behaviour change and communication experts, etc.
- Shape smart programme structures focused on accountability and shared goals
- Build an adaptive and flexible approach to programming
- Ensure sustainability by building local capacity at every level
- Support and complement clinical and public health interventions for NTD control

Work began in September 2016, and the toolkit was published in January 2019. It draws on tools and practices used in the delivery of coordinated and integrated programmes for control and elimination of NTDs and incorporates lessons from trachoma programmes (including experience from The Carter Center Trachoma programme, DFID SAFE, and The Queen Elizabeth Diamond Jubilee Trust).

2. Content

The toolkit contains a brief narrative comprised of a context section in which the links between WASH and the BEST Framework for NTD control and elimination are set out, followed by a 5-step guide to collaborative planning and implementation. The narrative is accompanied by 22 tools and resources.

Section	Description	Tools
Setting the scene	Background to the toolkit – the need and context for WASH and NTDs collaboration.	<ul style="list-style-type: none">• <i>Interventions for NTD control and care</i>• <i>NTD-related behaviours</i>• <i>Guide on understanding behaviours for developing behaviour change interventions</i>
Step 1: Setting the programme vision	This section of the toolkit should help you analyse your programme context and begin identifying new	

⁶ https://www.who.int/water_sanitation_health/publications/wash-health-toolkit/en/

⁷ https://www.who.int/water_sanitation_health/publications/wash-and-ntd-strategy/en/

⁸ http://www.trachomacoalition.org/sites/default/files/content/resources/files/All%20you%20need%20for%20FandE%20-%20a%20toolkit%20for%20planning%20and%20partnering_web_incl_tools_0.pdf

	partners, so you can start planning.	
Step 2: Building partnership	Partnership is crucial for the achievement of NTD control and elimination targets and for ensuring that the impact of programmes is long-lasting. This section will guide you on how to link NTDs to the objectives of other partners, and help you address challenges you may face as you bring different types of partners into your programme.	<ul style="list-style-type: none"> • Messages for engagement • Cross sector meeting annotated agenda • Cross sector meeting PowerPoint presentation template
Step 3: Analysing the situation	Being informed and prepared about the national and local context in which you're working can make all the difference to the eventual success of the programme. This section will guide you through the steps to develop a situation analysis, which you can use to identify opportunities and challenges for planning.	<ul style="list-style-type: none"> • <i>Situation analysis protocol</i> • <i>Situation analysis executive summary template</i> • <i>Situation analysis presentation template</i> • <i>WASH NTDs partner form</i>
Step 4: Planning and programme design	This section will help you identify where new actions are needed, as well as where it is feasible to link, coordinate or integrate existing programme activities across different sectors and agencies.	<ul style="list-style-type: none"> • <i>Planning tool</i> • <i>Agenda for planning workshop</i> • <i>Problem analysis approaches</i> • <i>Planning for Elimination: getting NTD programmes across the finish line</i> • <i>Budgeting for joint WASH and NTDs programmes</i> • <i>Improving coordination in low-resource settings</i>
Step 5: Implementing and monitoring	This section will provide useful steps to put in place implementation and monitoring and evaluation structures and processes to ensure results, improve accountability and support learning and adaptive planning.	<ul style="list-style-type: none"> • <i>Routine supervision guide and form</i> • <i>Problem analysis tool</i> • <i>Programme dashboard template</i> • <i>Gantt chart template</i> • <i>Programme risk analysis template</i> • <i>WASH and NTDs indicators and logframe</i> • <i>Definitions & checklist for logframe development</i>

3. Importance for trachoma programmes

The toolkit draws heavily on the experience of delivering the F&E components of the SAFE strategy. As such, it can be viewed as an update to and an expansion on “All you need for F and E”. The following tools and resources may be of particular use to trachoma programmes:

- **Understanding behaviours for developing behaviour change interventions:** This resource provides guidance on the design of behaviour change interventions, incorporating lessons from behaviour science approaches.
- **Situation analysis protocol:** This has been expanded from its former trachoma-focused version to include all NTDs and has been supplemented by accompanying tools (terms of reference for analysis team, executive summary template, PowerPoint presentation template). The analytical aspects of the tool have been strengthened, and it is explicitly linked to the planning process set out in the planning tool (see below).
- **Planning tool:** This comprehensive step-by-step guide to joint planning is unique in its focus on addressing the challenges of intersectoral planning, such as the formation of a joint programme vision and agreement on phasing out ineffective interventions. It is supplemented by comprehensive facilitation notes and accompanying tools.
- **Planning for elimination:** This resource tackles the changes programmes are likely to experience as they move from high endemicity to elimination and post-elimination. It references the forthcoming guidance on transition for trachoma programmes and provides key actions for WASH collaboration to ensure sustained programme impact.
- **Improving coordination in low-resource settings:** This resource provides tips for programme settings in which funding is limited, demonstrating that collaboration can be achieved under various funding scenarios.
- **WASH and NTDs indicators and logframe:** This menu of indicators brings together the outcome of the broad consultation on joint WASH and NTDs programme indicators (which followed the 2014 WASH and NTDs roundtable⁹ recommendation) in a useable format.

⁹ https://assets.publishing.service.gov.uk/media/57a089eb40f0b652dd000482/Briefing_Note_European_Roundtable.pdf

Assessment of WASH intervention uptake in the WUHA trial

Presented by Dr. Solomon Aragie, SWIFT Study Coordinator, The Carter Center-Ethiopia

WASH Upgrades for Health in Amhara (WUHA) is a cluster-randomized trial conducted in 40 clusters in Amhara National Regional State, Ethiopia. Twenty WUHA clusters have received a comprehensive WASH package to be compared with 20 delayed WASH clusters that will receive a WASH intervention at the end of the trial. We have been performing annual monitoring of WUHA study clusters for 3 years. Our primary outcome is the prevalence of ocular chlamydia in 0-5-year-old children at 36 months.

One local “hygiene officer” and 12 “health promotion workers” assist the study coordinator with the WASH package and ensure high uptake of WASH interventions in all study clusters. Twenty water points were constructed, and the local water committees were trained in collaboration with Catholic Relief Services.

Behavior change education and promotion is primarily being done by our hygiene promotion workers (HPWs), who visit each household at least once per month for the duration of the study. We are implementing both a school-based and household-based hygiene intervention. In both, we focus on habit formation surrounding face washing, hand washing, and latrine use. A wash station (jerry can with a faucet) and mirrors were distributed to all households in August-September of 2016. We began distributing 4 bars of soap per household in January 2017. An illustrated, 65-page hygiene book that is being used by the households and HPWs was distributed in October 2016. New households are given the wash materials and added to the intervention on an ongoing basis. We developed a primary school WASH curriculum with teaching aids for grades 1-4. Teachers were trained in July 2016 and began utilizing the curriculum during the 2016-2017 school year. Refresher training for the teachers is conducted annually.

We are using a number of process indicators to assess whether the WASH interventions have been implemented as planned. We have assessed specific metrics of intervention uptake, based on random spot-checks. Additionally, as part of the census household hygiene survey, direct observation of latrines, wash stations, and water points is done each year. We also performed structured observations in 5 randomly selected households from each of the 20 intervention and 20 control communities in September 2017 as a check on the accuracy of our annual WASH survey. We are performing this monitoring on an ongoing basis, and it has helped guide the measures we take to improve wash uptake and behavior change when necessary.

The household survey has helped highlight key successes and shortcomings in the intervention. The month 24 and 36 survey results show that communities randomized to the WASH intervention are more likely to have and use a household WASH station and latrine, and household members from WASH communities are more likely to report having washed their face and used the latrine in the past day. Behavior changes in the WASH arm were most evident after the month 12 visits, which is likely due to 2 main reasons. First, hygiene behaviors are notoriously difficult to change, and hygiene interventions are thought to require long periods of time before they can influence behavior. Second, our WASH intervention has many components, and was not fully implemented until the month 12 visit, meaning that the period of time after month 12 is likely a more accurate reflection of its impact.

Through the household survey, we saw that the uptake of latrine building and utilization, having a functional wash station (had water and soap), and face-washing with soap were not as high as we would like to see. To help better elucidate the barriers to changing these behaviors, we performed 2 rounds of focus group discussions in the intervention communities and review meetings with the community leaders, health officials, and HPWs to assess the impact of the intervention. These meetings were aimed at investigating shortfalls and

helping to guide our intervention moving forward. The qualitative investigations found that the main reason for having low latrine coverage is associated with finance and time constraints; and frequent damages occurred to latrines by flooding and attacks from termites. Shortage of water and soap is also identified as a barrier to adopt the daily hygiene practice. It seems difficult for HPWs to reach households particularly in the large and geographically far apart clusters as frequently as intended. We have found it effective to use the household survey and other process indicators to identify gaps in the WASH intervention uptake and then use focus groups and other qualitative methods to hone in on key barriers to behavior change and intervention uptake.

We are planning to continue the study for additional 4 years. We will provide an MDA for all 40 clusters, which will allow us to assess the effectiveness of MDA+WASH as compared to MDA alone. The 20 clusters randomized to the WASH intervention will continue to receive the WASH package, and the 20 control clusters will receive a WASH intervention at the conclusion of the trial. The intervention will continue to be monitored by the current mechanisms (spot checks, household survey, structured observations, and focus group discussions). Annual census and monitoring visits will continue, with the final assessments at month 84 post-randomization.

Uganda WASH study results

Presented by Mr. Gilbert Baayenda, Trachoma Program Officer, Ministry of Health-Uganda

Background

The Queen Elizabeth Diamond Jubilee Trust (the Trust) supported F&E activities in 17 districts in the Busoga and Karamoja regions. The trachoma elimination program in Uganda, led by the MOH, worked with different partners to provide WASH services and trachoma messaging in the 17 districts in Busoga and Karamoja regions. These partners included: Water Mission Uganda (all 10 districts in Busoga region), Water Aid (Napak and Nakapiripirit districts in Karamoja), Concern International (Amudat, Moroto, Napak, and Nakapiripirit districts in Karamoja), World Vision (Abim, Kaabong, and Kotido districts in Karamoja), and Johns Hopkins University-Center for Communication Programs who supported the development of F&E related education materials. Water Mission and Concern International integrated their WASH health education materials to include trachoma prevention messaging at the household level. World Vision and Water Aid also integrated their health education materials but implemented activities at both the household and school level.

Methodology

This was a pre-post evaluation of interventions in communities in Busoga and Karamoja regions; data was collected using cross-sectional household and school surveys. Sample size was calculated to evaluate at a regional level and 15 schools and 82 communities were selected, stratified by district (figure 1). Within each community, 24 households were selected, and with informed consent, the primary care giver was interviewed regarding access and use of water and sanitation, basic trachoma knowledge, and factors related to hygiene and sanitation practices. In addition, available sanitation facilities were enumerated, and children's faces were observed for cleanliness. Eligibility criteria included the primary caregiver being available for the interview and the presence of children under 9 years old in the house at the time of interview.

Within schools, with informed consent of the head teachers, observations were made of hand and face washing practices of students, WASH facilities were enumerated, and 42 students per school were selected and interviewed regarding their knowledge and awareness of trachoma. The students were selected from 2 classes (21 per class) in each school, 1 class from lower primary levels P1 through P3 and 1 class from upper primary levels P4 through P6 to represent younger and older students. Villages and schools selected in the baseline were revisited in the endline; however, households and students were randomly resampled within villages and schools, respectively.

Sample Breakdown

In the community survey, 1,966 and 1,986 households were reached in the baseline and endline surveys, respectively – this was sufficient to meet the sampling requirements. The respondents were mainly (95% and 85%; baseline and endline) female with an average age of 35 years in both surveys (range 18-83 and 18-93; baseline and endline). In the school survey, 15 schools were reached and agreed to participate. Observations were carried out in 15 schools, and a total of 195 and 604 hand washing events were observed in the baseline and endline surveys, respectively. The baseline survey had fewer observations due to a failure of the data collection tool, rectified in the endline survey. Baseline results based on school observations should be interpreted with caution. The required sample size of children interviewed in schools was reached (630 and 604; baseline and endline).

Results

Household Indicators: The percent of households found to have a face/hand washing station was low and unchanged from baseline to endline (9.3 to 11.5, $p=0.361$). Percent of households with hand/face washing facilities with water was low but increased significantly (4.2 to 7.4, $p=0.03$). Percent of households with hand/face washing facilities with soap was low but increased significantly (1.7 to 4.2, $p=0.016$). There was no significant change in percent of children under 9 with clean face (62.0 to 58.2, $p=.11$). Percent of households free of human feces decreased significantly (95 to 91.5, $p=0.011$). There was moderate increase in the presence of VIP toilets in both Busoga (3.7 to 5.6, $p=.239$) and Karamoja (0.7 to 2.4, $p=.119$).

Percent of respondents who know 1+ symptoms of trachoma increased significantly (70.9 to 90.7, $p<0.001$). Percent of respondents who know 1+ ways trachoma spreads increased significantly (40.3 to 63.4, $p<0.001$). Percent of respondents who saw or heard any message about trachoma was low but increased significantly (6.6 to 14.5, $p<0.001$). In Karamoja, primary caretakers who discussed key messages about trachoma prevention and treatment with friends or family members increased significantly (5.3 to 16.5, $p<.001$), but no such change was seen in Busoga. Belief amongst primary caregivers that health hygiene practices (such as hand and face washing) will reduce chances of getting trachoma increased significantly in Busoga (49.5 to 77.4, $p<.001$) and Karamoja (43.3 to 75.0, $p<.001$).

School Indicators: Knowledge amongst school children of 1+ measure to prevent trachoma increased significantly between surveys (49.9 to 76.3, $p=0.004$). Year-round water accessibility did not change significantly between surveys (43.1 to 50, $p=0.724$). Face cleanliness at schools was greater than 85% in all surveys and saw no change between surveys. Percent of schools with hand/face washing facilities with soap saw no change between surveys (13.9 to 15.3, $p=0.916$). Compound cleanliness and garbage pit availability was low and saw no change between surveys (13.9 to 20.8, $p=0.657$).

Discussion

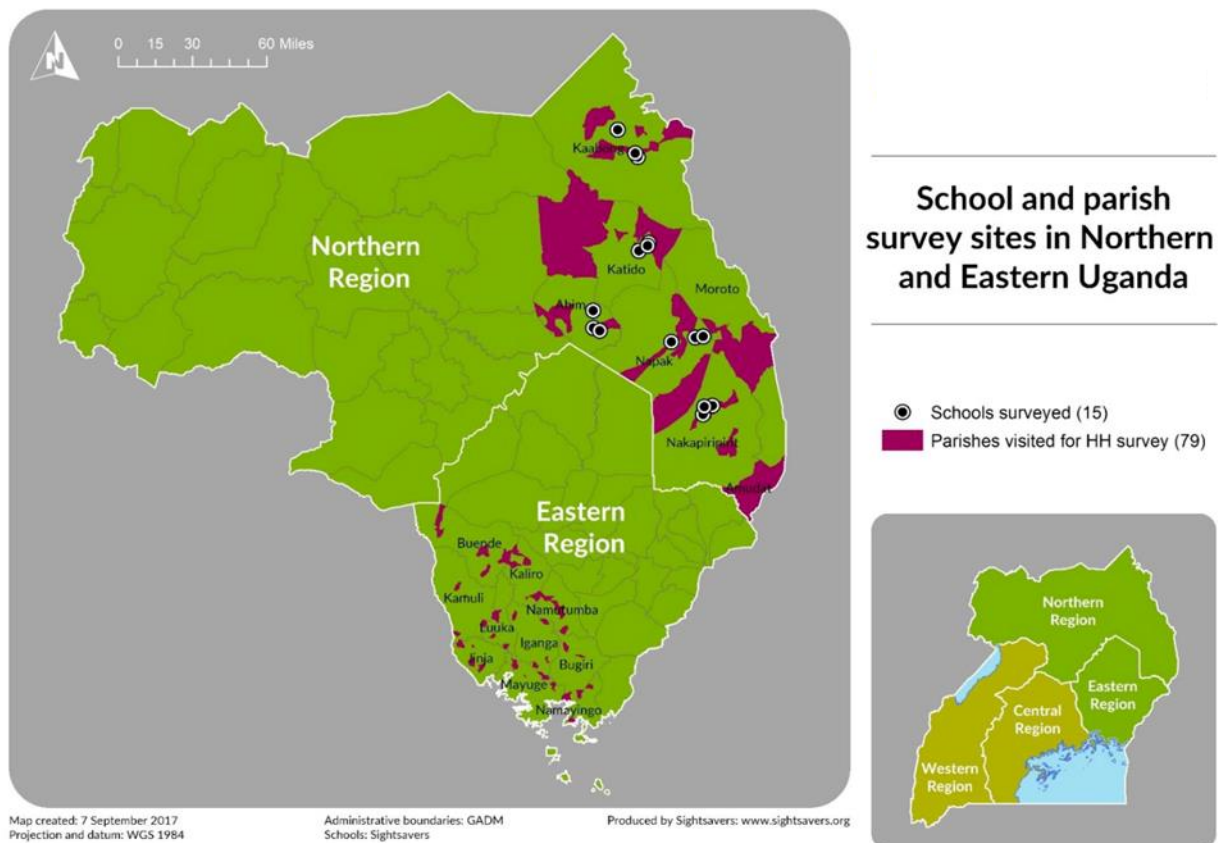
Observations on hand and face washing occurred for 3 hours in all 15 schools in the survey. In some schools, the presence of an observer changed the behavior of the students. Head teachers and health patrons informed students of the observation in 2 schools, and students altered their post-latrine use behavioral patterns under instruction from their teachers. In one of these schools, there were no hand/face washing stations present when the survey team arrived. Following introductory meetings with the school management, students were sent to bring hand/face washing stations out of storage and placed them near to the latrines where they were subsequently used. The observation tool was updated from the baseline so that events where hand/face washing should occur but did not (e.g. going to the toilet and not washing hands) were captured.

Community sample characteristics were largely unchanged from baseline to endline, indicating successful random sampling. The primary difference in sample characteristics was a decrease in average household size from baseline to endline in Karamoja (5.2 to 4.2). School sample characteristics differed mainly in terms of class distribution with classes, 3 and 6 being significantly oversampled and 2 and 7 being significantly undersampled. While the presence of hand/face washing stations in households was low and showed no improvement, the presence of water and soap at these stations increased significantly from baseline to endline. Knowledge of trachoma amongst household respondents also showed significant improvement. In schools, no behavior or cleanliness indicators showed any change between surveys. Knowledge indicators,

however, showed significant increase between baseline and endline. While not statistically significant, there was a marked increase in school compound free of human feces from baseline to endline.

Overall, the results from the household and school surveys showed that while knowledge of trachoma significantly increased, changes in behavior stayed relatively consistent between baseline and endline.

Figure 1: Map showing survey sites



2019 Trachoma Control Program Review Recommendations

General Recommendations:

1. National Trachoma Control Programs should publish quantitative and qualitative data documenting success, lessons learned, and their experiences building the validation dossier.
2. National Trachoma Control Programs should consider collecting data on clean face during surveys to use as warranted for targeted health education.
3. National Trachoma Control Programs should consider epilation as an additional TT management option for patients with minor TT, PTT, and refusals.
4. National Trachoma Control Programs should be cautious in adopting the word “failure” when discussing survey results to describe districts that have not reached TF elimination threshold at impact survey or have shown recrudescence at surveillance survey.
5. National Trachoma Control Programs should consider requesting continuation of MDA from the ITI (through the Trachoma Expert Committee) in districts that have achieved TF thresholds (<5%) but are surrounded by areas with high TF.
6. National Trachoma Control Programs should consider aggregating and compiling multiple sources of data (e.g. door to door data, campaigns, surveys, etc.) to effectively demonstrate that a district has met the elimination target for TT (when the survey data continues to suggest an overestimation of TT).
7. National Trachoma Control Programs should consider demonstrating progress by including the following in the 2020 Carter Center Program Review presentations:
 - Number of endemic districts at baseline (according to TF/TT prevalence) vs. number of current endemic districts (according to TF/TT prevalence)
 - Number of districts meeting TF/TT thresholds
 - Survey confidence intervals (where appropriate)
 - Needs and services for special populations
 - TT estimation investigations (house to house case searches) and initiatives

Country-Specific Recommendations:

Ethiopia

1. The FMOH should consider training nurses, not only IECWs, to serve as graders during trachoma impact and surveillance surveys.
2. The FMOH should consider conducting a multi-centre study on the use of epilation forceps for an additional management tool for patients diagnosed with minor TT, PTT, and refusals.
3. The planned Woreda transformation should include messaging on trachoma control such as facial cleanliness and latrine usage, using the WASH and NTDs Tool Kit.

Amhara, Ethiopia

1. The ARHB Trachoma Control Program should investigate the TT backlog overestimation while continuing efforts to provide TT case management as needed.
2. The ARHB Trachoma Control Program under the standard operating procedures of the NTTTF should consider an epilation pilot for minor TT, PTT, and refusals.
3. The ARHB Trachoma Control Program should consider using the latest survey data to select districts with high TF and lower MDA coverage and conduct qualitative assessments to determine whether there are barriers to MDA.
4. The ARHB Trachoma Control Program should support and participate in longitudinal studies to 1) understand the nature and source of reinfection in persistently high districts, and 2) set up enhanced surveillance for recrudescence in districts that were formerly high TF but are now below TF threshold.

Mali

1. The Mali Trachoma Control Program should work with partners to submit the WHO dossier for the validation of the elimination of trachoma as a public health problem by December 2019.
2. The Mali Trachoma Control Program should ensure ratissage is well documented with clear criteria and consistent data so that it may be submitted with the elimination dossier as evidence that the backlog has been cleared.

Niger

1. The Niger Trachoma Control Program should consider all possible initiatives to clear the TT surgery backlog including increasing the number of TT surgeons, camps, campaigns, ratissage, and case finders, especially and immediately in Zinder.
2. If ratissage is used, the PNSO should establish clear criteria and data needed to properly document and ensure the strategy is implemented with surety that population and or geographic coverage is attained.
3. The Niger Trachoma Control Program should consider training women to conduct case searching and perform TT surgery, especially in areas where reaching women is a challenge.
4. The Niger Trachoma Control Program should strive to improve MDA treatment coverage in districts not achieving at least 80% reported coverage.
5. Niger and Nigeria Trachoma Control Programs should consider cross-border exchange of information in 2019 with the support of partners.
6. The Niger Trachoma Control Program should consider operational research supported by The Carter Center to collect dried blood spots (DBS) for long-term recrudescence monitoring in formerly high endemic areas.

South Sudan

1. The South Sudan Trachoma Control Program should convene a group of TT technical and programmatic experts to develop best practices for TT surgery in South Sudan.
2. The South Sudan Trachoma Control Program should conduct a surgeon audit.
3. The South Sudan Trachoma Control Program should consider publishing a case study on the overnight approach to TT surgical camps (highlighting increasing the 1-day follow up).
4. The South Sudan Trachoma Control Program should conduct MDA in all eligible internally displaced people (IDP) camps.
5. The South Sudan Trachoma Control Program should consider maintaining the 2030 elimination target but with some milestone achievements, such as clear TT backlog in Kapoeta by 2021, baseline mapping by 2025, etc.
6. The South Sudan Trachoma Control Program should consider including DBS in 1 or 2 surveys in areas which are treatment naïve to inform global surveillance methods.

Sudan

1. The Sudan Trachoma Control Program should pilot a house-to-house TT case finding approach that involves clear criteria and data needed to properly document and ensure the strategy is implemented with surety that population and or geographic coverage is attained.
2. The Sudan Trachoma Control Program should aggressively begin surgical camps in Darfur.
3. The Sudan Trachoma Control Program should conduct MDA in all eligible special population (refugee and IDP) camps.
4. The Sudan Trachoma Control Program should consider appointing a TT officer at the FMOH level to work for the national program to supervise increased TT surveys and ensure increased TT outputs.
5. The Sudan Trachoma Control Program should train many additional general medical officers to conduct TT surgery to drastically increase TT surgical services.
6. The Sudan Trachoma Control Program should complete baseline surveys in Darfur as soon as possible.

Trachoma: The Disease

Trachoma, the world's leading cause of preventable blindness, can be found in over 37 countries. An estimated 158 million people are at risk for trachoma, and approximately 3.2 million are at immediate risk for blindness from TT. 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 painful or uncomfortable inflammation with thickening of the conjunctiva. 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 twice as often as men. Trachoma is transmitted through discharge from the eyes and nose of infected individuals by contact with hands, towels and clothing, or by flies, which are attracted to ocular and nasal discharge. As trachoma patients' eyelids are repeatedly infected with *Chlamydia trachomatis*, 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, but also rapidly leads to blindness.

Recent developments have brought new hope that we can effectively eliminate this disease as a public health problem. In 1987, eye care experts and the WHO developed a simplified trachoma grading scale, which facilitated and standardized the diagnosis and identification of all stages of trachoma. In 1997, the WHO established the GET2020 Alliance, which brought international non-governmental development organizations, donors and researchers together to work collectively in controlling trachoma. The World Health Assembly adopted resolution WHA51.11 in 1998, targeting the global elimination of trachoma as a public health problem. In addition, with support from the Edna McConnell Clark Foundation and WHO, the *SAFE strategy* was created to control trachoma through community-based interventions. In 2004, ICTC, a coalition of NGOs, donors, academic institutions, and other partners, was created to support GET2020 and to advocate for the implementation of the SAFE strategy.

Another important development was the finding that the oral antibiotic azithromycin, taken once or twice annually, is as effective in preventing chronic trachoma as 6 weeks of daily treatment with TEO, the previously recommended therapy. In 2009, Pfizer Inc, manufacturer of Zithromax®, recommitted to supporting the WHO GET2020 goal of eliminating blinding trachoma by the year 2020. Since the beginning of the donation in 1998, approximately 770 million doses of Zithromax® have been donated by Pfizer Inc and managed by ITI. The existence of the donation program has served to invigorate national trachoma programs and global support for the elimination of blinding trachoma. In 2016, WHO published the dossier for the validation of the elimination of trachoma as a public health problem. In 2017 and 2018, 7 countries had fulfilled the criteria to be validated by WHO as meeting criteria to declare the elimination of trachoma as a public health problem. In 2018, the global trachoma community celebrated 3 20th anniversary milestones: The Carter Center beginning their pioneering work in 1998; WHA 51.11 calling for the elimination of blinding trachoma; and Pfizer creating the ITI to lead the drug donation program.

“Seeing Trachoma Disappear: The Magic of Passion, Partnerships and Possibilities”

The Twentieth Annual Trachoma Control Program Review

The Carter Center

March 18-20, 2019

Monday, March 18

8:15	<i>~Depart the Sheraton Hotel for The Carter Center~</i>	
8:30 – 9:00	<u>Breakfast</u>	
9:00 – 9:10	Welcome, Introductions & Opening Remarks	Dr. Dean Sienko Vice President, Health Programs The Carter Center
9:10 – 9:30	Program Review Overview & Chairperson Announcements	Ms. Kelly Callahan (Chairperson) Director, Trachoma Control Program The Carter Center
9:30 – 10:15	Keynote	Dr. Julius Schachter Emeritus Professor, Laboratory Medicine University of California at San Francisco
10:15 – 10:45	<u>Coffee Break</u>	
10:45 – 11:45	Mali SAFE Update	Professor Lamine Traoré National Coordinator, National Eye Care Program Ministry of Health - Mali
11:45 – 12:15	Characteristics and distribution of Trachoma Impact (TIS) and Surveillance (TSS) Survey Outcomes	Dr. Jeremiah Ngondi Regional NTD Technical Advisor RTI
12:15 – 1:30	<u>Lunch</u>	
1:30 – 1:35	<u>Chairperson Announcements</u>	
1:35 – 2:05	Trichiasis +/-Tarsal Conjunctival Scarring: a multi-centre observational study	Dr. Esmael Habtamu Study Coordinator London School of Hygiene & Tropical Medicine
2:05 – 3:05	Niger SAFE Update	Dr. Kadri Boubacar National Coordinator, Trachoma Control Program Ministry of Health - Niger
3:05 – 3:35	HEAD START Niger study	Ms. Stephanie Palmer Trachoma Technical Advisor, USAID Act to END NTDs FHI360
3:35 – 4:00	<u>Coffee Break</u>	
4:00 – 4:30	PLTR vs BLTR: Long term outcomes	Mr. Tariku Wondie Research Coordinator The Carter Center - Ethiopia
4:30 – 5:15	A Cohort Study of Post-epilation Lashes: burden, phenotype, surgical acceptance/3D photographs to train trachoma field graders	Dr. Esmael Habtamu Study Coordinator London School of Hygiene & Tropical Medicine
5:15 – 5:45	ESPEN and Status of Trachoma in the African Region	Dr. Amir B. Kello ESPEN Trachoma Focal Point World Health Organization
5:45	<i>~Shuttle Departure to Sheraton Hotel~</i>	
6:30	<i>~Shuttle Departure from Sheraton Hotel to Edgewood Shopping Center~ (6:30-9:00)</i>	

“Seeing Trachoma Disappear: The Magic of Passion, Partnerships and Possibilities”

The Twentieth Annual Trachoma Control Program Review

The Carter Center

March 18-20, 2019

Tuesday, March 19

8:15	<i>~Depart the Sheraton Hotel for The Carter Center~</i>	
8:30 – 9:00	<u>Breakfast</u>	
9:00 – 9:10	<u>Chairperson Announcements</u>	
9:10 – 10:10	Ethiopia SAFE	Mr. Nebiyu Negussu NTD Team Leader Federal Ministry of Health - Ethiopia
10:10 – 10:25	Pfizer Update	Ms. Julie Jenson Director, Corporate Responsibility Pfizer Inc
10:25 – 10:40	ITI Update	Dr. Paul Emerson Director International Trachoma Initiative
10:40 – 11:00	<u>Coffee Break</u>	
11:00 – 12:15	Non-target effects of mass distribution of azithromycin for trachoma	Dr. Catherine Oldenburg and Ms. Kieran O’Brien Assistant Professor and Study Coordinator Francis I. Proctor Foundation, University of California at San Francisco
12:15 – 1:30	<u>Lunch</u>	
1:30 – 1:35	<u>Chairperson Announcements</u>	
1:35 – 2:35	Amhara SAFE	Dr. Abebaw Gebeyehu Head Amhara Regional Health Bureau
2:35 – 3:05	Serology – use in surveillance	Dr. Diana Martin Research Microbiologist U.S. Centers for Diseases Control and Prevention
3:05 – 3:30	<u>Coffee Break</u>	
3:30 – 4:30	Sudan SAFE	Dr. Balgesa Elshafie National Trachoma Program Coordinator Federal Ministry of Health - Sudan
4:30 – 5:30	ICTC Update/ICTC Toolkit: Transition Planning	Ms. Aparna Barua Adams and Mr. Scott McPherson Project Manager and Vice Chair International Coalition for Trachoma Control
5:30 – 5:45	<u>Group Photo</u>	
5:45 – 7:30	<u>Reception</u> (The Carter Center Library and Museum Lobby)	
7:30	<i>~Shuttle Departure to Sheraton Hotel~</i>	

“Seeing Trachoma Disappear: The Magic of Passion, Partnerships and Possibilities”

The Twentieth Annual Trachoma Control Program Review

The Carter Center

March 18-20, 2019

Wednesday, March 20

8:15 ~Depart the Sheraton Hotel for The Carter Center~

8:30 – 9:00 Breakfast

9:00 – 9:10 Chairperson Announcements

9:10 – 10:10 South Sudan SAFE

Mr. Makoy Samuel Yibi Logora
Director for Guinea Worm Eradication and PC-NTDs
Ministry of Health - South Sudan

10:10 – 10:40 WHO Guidelines on Sanitation and Health

Ms. Yael Velleman
Head of Partnerships, Schistosomiasis Control Initiative
Imperial College London

10:40 – 11:10 Coffee Break

11:10 – 11:40 WASH and Health Working Together: a new
 toolkit for NTD program managers

Ms. Angelia Sanders and Ms. Yael Velleman
Associate Director, Trachoma Control Program and Head of
Partnerships, Schistosomiasis Control Initiative
The Carter Center and Imperial College London

11:40 – 12:15 Assessment of WASH Intervention uptake in
 the WUHA trial

Dr. Solomon Aragie
SWIFT Study Coordinator
The Carter Center - Ethiopia

12:15 – 1:30 Lunch

1:30 – 1:35 Chairperson Announcements

1:35 – 2:05 The F in SAFE

Dr. Paul Emerson
Director
International Trachoma Initiative

2:05 – 3:05 Uganda SAFE

Dr. Francis Mugume
National Trachoma Program Coordinator
Ministry of Health - Uganda

3:05 – 3:30 Coffee Break

3:30 – 4:00 F&E Impact Survey

Mr. Gilbert Baayenda
Trachoma Program Officer
Ministry of Health - Uganda

4:00 – 5:00 Closing Remarks

Ms. Kelly Callahan
Director, Trachoma Control Program
The Carter Center

5:00* ~Depart The Carter Center for the Sheraton Hotel~

**Time subject to change. Bus will depart The Carter Center shortly after the conclusion of the meeting.*

Ethiopia

Dr. Solomon Aragie (The Carter Center)
 Ms. Tigist Astale (The Carter Center)
 Mr. Zebene Ayele (The Carter Center)
 Dr. Abebaw Gebeyehu (ARHB)
 Mr. Berhanu Melak (The Carter Center)
 Mr. Nebiyu Negussu (FMOH)
 Mr. Eshetu Sata (The Carter Center)
 Dr. Zerihun Tadesse (The Carter Center)
 Dr. Gizachew Yismaw (APHI)
 Mr. Tariku Wondie (The Carter Center)
 Mr. Mulat Zerihun (The Carter Center)

Mali

Dr. Mohamed Berthe (MOH)
 Dr. Mamadou Dembélé (MOH)
 Mr. Yaya Kamissoko (The Carter Center)
 Mr. Sadi Moussa (The Carter Center)
 Prof. Lamine Traoré (MOH)

Niger

Prof. Amza Abdou
 Dr. Kadri Boubacar (MOH)
 Mr. Mohamed Salissou Kane (The Carter Center)
 Mr. Barmou Moudi (The Carter Center)
 Mr. Abaché Ranaou (MOH)

South Sudan

Ms. Aja Isaac Kuol (MOH)
 Mr. Makoy Samuel (MOH)
 Mr. Jake Wheeler (The Carter Center)
 Ms. Sarah Yerian (The Carter Center)

Sudan

Ms. Maha Adam (The Carter Center)
 Ms. Maymoona Ahmed (The Carter Center)
 Dr. Nabil Aziz Awadalla (The Carter Center)
 Dr. Balgesa Elkheir Elshafie (FMOH)
 Mr. Atif Elamin Ahmed Mohammedsalih (The Carter Center)

Uganda

Mr. Gilbert Baayenda (MOH)
 Dr. Francis Mugume (MOH)
 Dr. Edridah Muheki Tukahebwa (MOH)

Abbott

Mr. Al Reid

Emory University

Dr. Jacquelyn O'Banion

The END Fund

Ms. Molly Anderson

FHI360

Ms. Stephanie Palmer
 Mr. Bolivar Pou

Bill & Melinda Gates Foundation

Mr. Jordan Tappero

Helen Keller International

Mr. Modibo Keita
 Mr. Steven Reid
 Mr. Tchouloum Toudja

Conrad N. Hilton Foundation

Ms. Rachel Huguet

International Coalition for Trachoma Control

Ms. Aparna Barua Adams
 Mr. Scott McPherson

International Trachoma Initiative

Ms. Birgit Bolton
 Dr. Paul Emerson
 Dr. Teshome Gebre
 Ms. PJ Hooper
 Ms. Genevieve LaCon
 Ms. Saman Wijesooriya

Ithaca College

Ms. Megan Hill

Lions Clubs International Foundation

Ms. Gillian Gibbs
 Ms. Karen Kilberg

Lions Clubs of Ethiopia

Hon. Dr. Tebebe Y. Berhan

London School of Hygiene and Tropical Medicine

Dr. Esmael Habtamu
 Dr. Emma Harding-Esch

Manaaki Foundation

Ms. Sue Crothers-Gee
 Ms. Kendal Gee

Noor Dubai Foundation

Dr. Mansur Rabiu

Pfizer Inc

Ms. Niesha Foster

Ms. Julie Jensen

**Francis I. Proctor Foundation at the
University of California at San Francisco**

Dr. Catherine Oldenburg

Ms. Kieran O'Brien

**Rollins School of Public Health, Emory
University**

Dr. Deb McFarland

Mr. Paul Weiss

RTI International

Dr. Jeremiah Ngondi

Sightsavers

Mr. Colin Beckwith

Mr. Philip Downs

Ms. Sarah Huntbach-Noel

Mr. Elie Kamate

Ms. Michaela Kelly

Mr. Tom Millar

Mr. Antandou Telly

The Task Force for Global Health

Mr. William Nichols

Trachoma Expert Committee

Dr. David Addiss

Dr. Joseph Feczko

Dr. M. Babar Qureshi

U.S. Agency for International Development

Mr. Aryc Mosher

**The U.S. Centers for Disease Control and
Prevention**

Dr. Barbara Marston

Dr. Diana Martin

University of California at San Francisco

Dr. Julius Schachter

The Waypoint Foundation

Dr. Clarice Yentsch

World Health Organization

Dr. Amir Kello

Ms. Yael Velleman

The Carter Center

Ms. Laurie Baxley

Ms. Nina Benard

Dr. Stephen Blount

Ms. Kelly Callahan

Ms. Becky Carter

Ms. Kenya Casey

Ms. Tara Davis

Mr. Yohannes Dawd

Mr. Don Denard

Ms. Mushtaq Dualeh

Ms. Janie French

Ms. Emily Griswold

Ms. Madelle Hatch

Ms. Kim Jensen

Dr. Moses Katarbarwa

Mr. Jim Kavanaugh

Mr. Curtis Kohlhaas

Ms. Nicole Kruse

Ms. Elizabeth Long

Ms. Meagan Martz

Ms. Sarah Menz

Ms. Emily Mooney

Dr. Scott Nash

Ms. Anne Nguyen

Dr. Greg Noland

Ms. Seseni Nu

Mr. Andrew Nute

Ambassador Mary Ann Peters

Ms. Faith Randolph

Dr. Frank Richards

Ms. Angelia Sanders

Ms. Alethia Sanon

Ms. Janet Shin

Mr. Randy Slaven

Ms. Aisha Stewart

Ms. Emily Staub

Mr. Adam Weiss

Ms. Jenny White

Mr. Craig Withers