The end ~~of~~ in sight.

2020 INSight

ICTC International Coalition for Trachoma Control

"If we have any hope of achieving 2020, we need a global plan and this is the time to lay it out."

– Global Public Health Expert

"Our trachoma grants are up for renewal and I will need to explain to my board why they should invest in trachoma over competing priorities. I would benefit greatly from a document that explains where we are, what the next steps are and how we'll get to 2020. We all know how important it is to invest in trachoma, but we need to show the case."

- International Donor Program Director

"We think about the world in terms of NTDs and are very closely involved with other development programs such as water and sanitation as well. Yet, the SAFE strategy is so complex and unique that I see a lot of value in a document explaining how it will all come together for trachoma specifically."

- Ministry of Health Representative

"The community has done a great job in advancing the fight against trachoma, but in an often fragmented way. More coordination is needed and a global plan can be an excellent first step to start that discussion."

- In-country Representative

"We are very keen to increase our advocacy efforts but we need facts that will stick with people and a credible plan so people know where their contributions will go."

- Neglected Tropical Disease (NTD) Expert

"I am very happy that this plan is the result of so many conversations. It is very important that the entire community can rally around this and use it to speak with one voice."

- Operational Partner

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Executive summary

Trachoma is an eye infection that for thousands of years caused many people to go blind across all continents. As the result of development and targeted interventions, trachoma is now limited to an estimated 57 countries, often affecting the poorest populations of the world. Today, more than 2 million people are either blind or suffer from a very painful disability as the result of trachoma.

Where are we?

In 1998, the World Health Organization (WHO) Alliance for the Global Elimination of Blinding Trachoma by 2020 (GET 2020) was created to tackle this challenge and the Fifty-first World Health Assembly (WHA) in 1998 called upon its member states to collaborate in the WHO alliance to eliminate the public health impact of trachoma by 2020. At that time, Pfizer Inc. also committed to donate Zithromax® for the preventative antibiotic program that can help stem transmission of the disease. These efforts have catalyzed many other organizations to participate in the challenge and seeded a broad community of partners tackling trachoma today.

There is much great news to report since then. The value of the WHO-endorsed SAFE strategy (Surgery – Antibiotics – Facial cleanliness – Environmental improvements) has been firmly established and continues to be improved by smart innovation; the first countries have reached or are reaching their intervention goals; the total burden is shrinking; and players are starting to prepare for the end-game by 2020. While progress is encouraging, a significant upward trajectory is needed to make the 2020 ambitions come true.

This global strategic plan was written in the spring of 2011 with input from a diverse set of stakeholders to accelerate progress and has three specific objectives: (a) sketch the current situation of trachoma and lay out what is left to be done, (b) describe milestones needed to reach global elimination of blinding trachoma by the year 2020, (c) convince donors and partners that a dollar spent on trachoma is a dollar well spent.

Today, best estimates suggest that close to 110 million people live in areas where trachoma is confirmed to be endemic and implementation of the full SAFE strategy is needed. Another 210 million people live in districts where trachoma is suspected but where no data are available to guide interventions. In the confirmed districts, an estimated 4.6 million people suffer from the final stages of the disease and require surgery to prevent them from going blind. Additionally, more than 80% of the burden of active trachoma is concentrated in 14 countries, where immediate action is needed.

We believe that no one should suffer needlessly from the agonizing effects of trachoma.

What's next?

In order to achieve GET 2020, we urgently need to fill the data void and map the full extent of the challenge. In addition, a significant scale-up is needed across all components of the SAFE strategy. This, of course, needs to happen in close coordination with the broader Neglected Tropical Diseases (NTD) agenda (especially for the A component) and with the help of other development activities (especially for the F and the E components). This global strategic plan contains a list of milestones to ensure we stay on track to 2020 and will allow us to celebrate our progress and plan our next steps. Reaching the milestones will depend on country leadership, international coordination, logistical and planning support, and adequate financing.

Photo credit: Judd Frankel

Is it worth it?

The total cost of implementing the SAFE strategy in all remaining known endemic countries can be estimated at $430 - $748 million. The potential of this funding, in combination with the significant drug donation (just over about 1 billion USD in 2010 alone), could make an enormous impact. Four dollars spent per person on trachoma elimination could enable implementation of full SAFE in endemic areas. Further, we could stop a disease that makes one person experience severe sight loss every four minutes and blinds four people every hour.

The elimination of blinding trachoma in Africa alone would boost the continent's GDP around 20-30 percentage points based on conservative annual productivity loss estimates. We know that every $20 invested in trachoma elimination translates into one additional year without severe vision loss or blindness. With coordinated action to meet milestones and scale up activities, the elimination of blinding trachoma by 2020 is well within sight.

This global strategic plan and simultaneous planning at the national level can help mobilize partners and resources to accelerate our efforts along a common path, giving us a good chance of reaching the ambitious but achievable WHA goal of global elimination of blinding trachoma by 2020.

Photo credit: Mark Tuschman

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Photo credit: Mark Tuschman

Introduction

Trachoma is the largest infectious cause of blindness in the world and the eighth most common blinding disease worldwide. It mainly affects people living in the poorest areas of the world. At least 110 million people live in areas where the disease is confirmed to be endemic and about 4.6 million are in advanced stages of the disease (trichiasis), steadily progressing along a painful path to blindness. In addition, another 210 million people live in areas where insufficient data have been gathered to date, but where there are strong indications that trachoma is present. [1,2,3] In those areas, an additional 3.6 million cases of trichiasis can be expected. [4]

The path to blinding trachoma starts with a benign infection of the eye with *Chlamydia trachomatis*. The disease presents in young children as a chronic inflammation of the eyelid: Trachomatous Inflammation – Follicular (TF) and Intense (TI). Repeated re-infection can start a downward spiral and cause scarring of the eyelid, which leads to entropion and trichiasis; the in-turning of the eyelid with painful contact between eyelashes and the eyeball (Trachomatous trichiasis or TT) and scarring of the cornea. The combination of repeat cornea trauma and secondary infections can cause severe pain and will ultimately lead to corneal opacification (CO) and blindness.

Typically, children get infected at an early age and develop vision loss and blindness mostly later in life (about 45-60 years). Women are almost twice as likely as men to develop TT from trachoma. [5] Trachoma has disappeared from large parts of the world as the result of economic development but the disease continues to affect some of the most vulnerable populations.

While estimates vary, it is likely that at least 1 million people worldwide suffer from low vision and an additional 750,000 are blind as the result of trachoma. [6] This means that at least one new person starts to experience severe vision loss every four minutes and one additional person is going blind roughly every 15 minutes as the result of this devastating disease. [7]

In 1998, the Alliance for the Global Elimination of Blinding Trachoma by 2020 (GET 2020) was formed to drive the systematic roll-out of the SAFE strategy that has been proven to lead to elimination with a clear and ambitious vision (see Exhibit 1).

The Fifty-first World Health Assembly in 1998 also called upon its member states to "implement … the SAFE strategy for elimination of blinding trachoma" and to "collaborate in the WHO alliance for the global elimination of trachoma and its network of interested parties for the global coordination of action and specific support." [8]

1 Estimates of epidemiology are based on the Trachoma Atlas (www.trachomaatlas.org), maintained by the London School of Hygiene & Tropical Medicine, International Trachoma Initiative, and The Carter Center, and related databases. The confirmed population is the total number of people that live in districts where district-level surveys found prevalence of TF in children between ages 1 and 9 years old to be 10% or higher. The suspected population lives in districts (a) where TF > 10% from a Trachoma Rapid Assessment (TRA) or a regional level survey, or (b) that is categorized as suspected endemic by local experts.

2 India, China and Brazil have not been included in any of the analysis in this document because of the high degree of data uncertainty. Some estimate that in those countries alone 750 million people are living in areas that could be endemic, and they could contribute ~2.8 million cases of TT. (Mariotti et al., 2009).

3 The TT estimates are based on the best available data. We used 3 sources in order of preference: backlog as reported by countries to the GET 2020 meeting in 2010, Mariotti et al., 2009, and estimates based on TT prevalence communicated to ITI in 2010 (for details see appendix 1).

4 3.6 million is the gap between the calculated trichiasis in the confirmed region and the total estimate in Mariotti et al., 2009.

5 "Women and Trachoma", The Carter Center & Kilimanjaro Centre for Community Ophthalmology, 2009.

6 The 2nd scientific meeting of trachoma in 2003 estimated about 1.8 million and 1.3 million to have reduced vision and be blind respectively (WHO GET 2020 Alliance. Report of the 2nd scientific meeting on trachoma. Geneva, 25-27 August, 2003 and Burton et al., 2009). Of these, ~1.05 million and 750,000 respectively can be considered confirmed while the rest are currently suspected.

7 The yearly incidence of trichiasis can be estimated at 8%, and ~10% and 35% respectively are blind or suffer from low vision (Ngondi et al., 2007 and Ngondi et al., 2009). These estimates are in line with field observations by Munoz et al., 1999 and mathematic modeling by Gambhir et al., 2009.

Photo credit: Mark Tuschman

The GET 2020 Alliance defines its goal of elimination by 2020 using WHO criteria:

(a) reduction of TF prevalence to <5% in children aged 1 - 9 years,

(b) maximum trichiasis burden of 1/1000 in the total population, and

(c) significant activity to address F and E components.

All of the above need to apply in every endemic district.

Trachoma was one of five priority diseases identified as part of the VISION 2020 "The Right to Sight" global initiative for the elimination of avoidable blindness launched by the World Health Organization and the International Agency for the Prevention of Blindness in 1999. [9] It continues to be an important part of that campaign which seeks to eliminate avoidable blindness by the year 2020. The importance of the control of trachoma was further affirmed in the WHA resolution 62.1, adopted in 2009. The following year, the WHO proposed an action plan that called upon the international partners to continue to support the existing partnerships for trachoma control and onchocerciasis until these diseases are eliminated as public health problems. [10]

In October 2010, WHO released its first-ever report on Neglected Tropical Diseases (NTDs) and listed trachoma as one of seven NTDs that can be prevented through mass drug administration (MDA). WHO's director general noted at the report's launch how addressing NTDs as a group can facilitate greater operational efficiency and how drug donations have been the true turning point in terms of prospects for control and eventual elimination of NTDs.

Elimination of blinding trachoma has potential to be high impact

The interventions for trachoma are well-described and well-documented. Their impact on lives is enormous. While an estimated 750,000 people are blind and an additional 1 million visually impaired, many more people have been affected indirectly, including the children and grandchildren deprived of education and other personal development because of the care they provide to help parents at home. Importantly, the affected population is poor and often living in challenging life conditions. The additional challenge of vision loss or, worse, blindness, is often very hard to adjust to and may lead to loss of social status, stigmatization and reclusion from society.

The economic burden of trachoma is considerable

Several estimates of the economic burden of trachoma have been made in recent years. [11] Extrapolation of the most conservative methods to 2010 burden estimates suggests a total loss of productivity for the vision-impaired or blind and their caregivers between $3 billion and $6 billion every year. [12] As economic development is increasing the GDP per capita, this burden will only increase.

We have turned the page on the first half of the effort to eliminate blinding trachoma and significant progress has been made. There is a much better understanding of the disease and how to tackle it, and the implementation of a multipronged approach has led to elimination in a small but growing number of countries. However, the challenges are still great and it will be very important to coordinate efforts and scale up interventions in the near future to reach the 2020 mark.

The purpose of this global strategic plan

At the time of the 14th GET 2020 Alliance meeting in 2010, the International Trachoma Initiative was tasked by the global alliance to "develop a trachoma action plan template for distribution by the alliance." The Trachoma Action Plan (TAP) template was designed to delineate specific actions and milestones focused on elimination by 2020 at the level of individual nations. The development of the country-specific TAP served as a catalyst for the creation of this global strategic plan, 2020 INSight, which charts the path to global elimination of blinding trachoma by the year 2020 and serves as a tool to continue to drive collective action, coordination, and focus. In addition, 2020 INSight can be used to demonstrate current progress and, as an advocacy document, to increase awareness, political will and funding.

The calculations in this document are based on the best available data as of summer 2011 – we are aware of several ongoing efforts in costing and epidemiology that will improve upon the current data set. This document is also the result of discussions with many country representatives, national and international partners, and donors.

This document seeks to answer four important questions:

1. *Where are we?* – review of the current state of trachoma elimination
2. *Where do we want to go?* – overview of the aspiration, analysis of the interventions needed and examples of paths to success
3. *How do we get there?* – lay out milestones for progress to 2020 based on overarching principles and a detailed approach to an individual district
4. *What is the impact of eliminating blinding trachoma?* – review total cost to eliminate blinding trachoma and the impact of the investment

8 WHA resolution 51.11, 1998.

9 WHO/PBL97.61 Rev.2, page 13

10 Action Plan for the Prevention of Avoidable Blindness and Visual Impairment, 2009-13; WHO 2010, page 15, paragraph 87.

11 Frick et al., 2003 (1), Frick et al., 2003 (2), and Burton et al., (2009).

12 These estimates are based on Frick et al., 2003(1) and Frick et al., 2003(2) that estimated annual productivity losses of $5-8 billion for 5.8 million people with reduced vision and 3.8 million people that were blind. The numbers reported here are based on lower estimates of the burden (1.05 million and 750,000 respectively), but corrected for the applicable inflation (21% between 2003 and 2020) and economic growth (34% as weighted average of countries with TT backlog between 1998 and 2010).

1. Where are we?

Trachoma can be prevented by the roll-out of a WHO-endorsed strategy

Extensive research has shown that the four-pronged WHO-endorsed SAFE strategy (illustrated in Exhibit 1) can be effective to eliminate trachoma in vulnerable populations: **Surgery** is needed to stop eye lashes from rubbing against the cornea and halt the cycle of trauma and secondary infection that leads to blindness. **Antibiotics** are key to treat the infection and decrease disease prevalence and transmission in endemic regions. **Facial** cleanliness helps to reduce transmission by fingers, flies and fomites, and **Environmental** improvements (such as access to water and basic sanitation) reduce exposure and re-infection. The F and E components should be put in place whenever TF prevalence exceeds the 5% mark in children aged 1-9 years [13] and district-wide distribution of antibiotics should be added in any district with prevalence of TF higher than 10%. In addition, surgery programs should be put in place when district TT prevalence exceeds 0.1%.

EXHIBIT 1 – Illustration of each of the SAFE components

Surgery

Antibiotics

Facial cleanliness

Environmental improvements

13 District-wide antibiotic administration is not required if the TF prevalence is between 5 and 10% but targeted intervention may still be required in communities or subdistricts.

Photo credit: Elizabeth Kurylo

About 320 million are at risk and at least 110 million need treatment

In total, about 320 million people are estimated to live in areas where they can be exposed to trachoma, excluding Brazil, China and India. [14] Of those, about 110 million people live in areas where surveys have confirmed that implementation of the full SAFE strategy is warranted, of which two thirds live in Ethiopia, Niger, Nigeria, Tanzania, and Uganda. An additional 210 million live in areas where the countries themselves suspect trachoma to be endemic, but where specific data to conclusively judge the need for SAFE interventions are lacking at this time. [15] Several countries have a particularly high number of people living in areas where trachoma is suspected but not confirmed including Pakistan and Mozambique, which have more than 30 million and 10 million people in that situation respectively (see Exhibit 2).

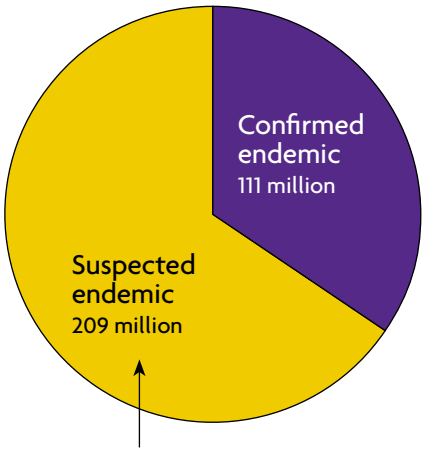
The disease burden is partially understood

The WHO recommends mapping of trachoma burden at the district level. [16] This level often aligns with health-systems' boundaries and is also the unit of planning for SAFE interventions. By 2010, district surveys have mapped the disease burden in only 1,115 districts, of which 559 are confirmed endemic today. Data need to be gathered from at least 1,293 more districts to complete the picture. [17] This is a daunting task given that it took about 12 years to survey the first 1,000 districts. [18]

It will also be important to address local challenges, such as the presence of a nomadic population or people living in border regions that can fall between the cracks of a district-based mapping approach, and to adapt to changes in district boundaries and definition, such as the dramatic increase in number

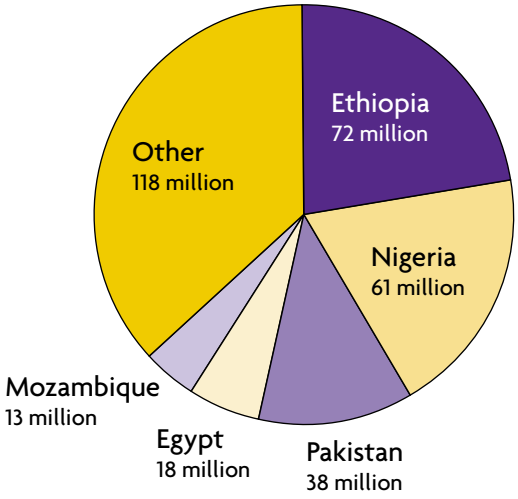
EXHIBIT 2 – Overview of confirmed and suspected endemic areas

Population living in confirmed or suspected endemic areas, by survey status [1]
Millions



Two thirds of the people live in districts where trachoma is suspected. 1,293 district surveys are needed to confirm the endemicity.

People living in confirmed and suspected endemic areas, by country [1]
Millions



63% of all people living in suspected or confirmed endemic areas live in 5 countries; this graph may be under-representing the magnitude in some data-poor countries.

Elimination of blindness due to trachoma in Sub-Saharan Africa is possible through advocacy, country ownership and deployment of all components of the SAFE strategy at scale:

Ghana is coming very close to eliminating trachoma as a public health problem. The Ghana National Trachoma Control Program run by the Ghana Health Service/Ministry of Health started in 2000 and needed to tackle an estimated 2.8 million people at risk of trachoma infection, with 11,600 cases of trachoma-related blindness, and about 13,000 people with trichiasis - the potentially blinding stage of the disease. The program has been running for about 10 years, implementing the SAFE strategy: national and international partners have provided surgery to people suffering from trichiasis, distributed about 3.5 million doses of Zithromax® to about 1 million people, rolled out health education programs on face washing and built household latrines and safe water sources. From 2000 to 2010, the Ghana Trachoma Control Program reduced the prevalence of active trachoma from 9.7 -16.1% to less than 3.0% in endemic districts. The backlog of people with trichiasis has been reduced to about 1,500 cases. The Program also managed to increase water coverage to more than 90%, and latrine coverage from a low 1% to a high 30.8% of households. Ghana is set to achieve the elimination of blinding trachoma thanks to this comprehensive implementation of the SAFE strategy. Ghana Health Service is the overall owner, implementer and coordinator for the program. But they have been supported by a strong partnership that helped create this success. The strong collaboration between the health, education and water/sanitation sectors within the National Trachoma Taskforce has demonstrated how a disease of poverty can be successfully eliminated. Finally, the ability to identify and operate on the remaining 1,500 people with trichiasis, as well as new cases, is being developed within the health system with support from partners. In order to ensure Ghana's advances are sustained, plans have been developed for ongoing surveillance and continued advocacy for water and sanitation to governments, agencies, and organizations.[19]

of districts that recently took place in Kenya as the geographic borders were redrawn.

Great progress has been made, but significant action is needed now

The progress over the last decade has been remarkable by any measure.

A number of countries recently reported having achieved WHO elimination targets. These successes illustrate that trachoma elimination is possible and is a strong encouragement to continue fighting.

The trachoma community is bound by a very strong partnership that exemplifies how an international public-private partnership can achieve remarkable results. The success of the trachoma campaign is the result of a powerful and sustained collaboration between the ministries of health, education, water and sanitation in the affected countries; international organizations such as the WHO; a long list of donors (e.g., DFID, Hilton Foundation, Lavelle Fund for the Blind, Lions Clubs International Foundation, USAID); international NGOs (including The Carter Center, CBM, The Fred Hollows Foundation, Helen Keller International, International Trachoma Initiative, Light for the World, Operation Eyesight Universal, ORBIS, Organisation pour la Prévention de la Cécité, Sightsavers, Ulls del Mon, World Vision); a large number of academic institutions (e.g., Emory University, Johns Hopkins University, Kilimanjaro Centre for Community Ophthalmology, London School of Hygiene & Tropical Medicine, University of California, San Francisco, University of Melbourne); and a corporate sponsor, Pfizer Inc., that donates the antibiotic Zithromax®

14 India, China and Brazil have not been included in any of the analysis in this document because of the high degree of data uncertainty.

15 192 million people live in "suspected endemic areas", where either a TRA or regional survey has found trachoma prevalence above 10%; or where other strong evidence exists of trachoma presence.

16 A district is defined as the administrative unit for health care management and for purposes of clarification consists of a population unit between 100,000-250,000 people.

17 District estimates based on Trachoma Atlas database and in line with other published estimates.

18 Trachoma Atlas database and historic data.

19 Ghana case study based on literature review, data review and expert discussions with Dr. Agatha Aboe and Dr. Oscar Debrah.

used to treat trachoma in many endemic countries and provides certain financial support for ITI and GET 2020.

The power of the trachoma community partnership is evidenced in how the number of surgeries per year has exploded from about 40,000 in 2005 to about 160,000 confirmed at the GET 2020 meeting in 2010;[20] antibiotic distribution has rapidly expanded from about 1 million in 1998 to about 37 million doses in 2010 [21] and important efforts have been made on both the F and E components, often in collaboration with other programs. Overall, more than 30 countries have elimination programs underway.

However, all of this energy and progress might still fall short of the 2020 target date. At the current prevalence and intervention levels, it would take until 2032 to address the surgery backlog in isolation with 160,000 surgeries per year. [22] And if we continue to expand the drug distribution program at the same speed, all districts with a confirmed need for treatment will only be reached by 2028. Reaching non-confirmed districts would take many more years – and no significant activity is currently ongoing or planned.

While the trachoma community is working closely together with other partners to help address the F and the E components of the SAFE strategy, challenges remain:

- **F activities:** while the national teams in some countries have a number of tools (e.g., promotional campaigns using local radio), collaboration with other partners is very important (e.g., work with ministry of education to get face-washing and hand-washing in school curriculums). Today, these approaches are used and tested throughout the world but are not often well coordinated.
- **E activities:** access to clean water in endemic areas is a prerequisite to successfully promote other elements of the SAFE strategy. Today, organizations like UNICEF, CARE, WaterAid and others have dedicated water programs, but it is only on rare occasions that they are well-aligned with trachoma or broader plans that address other NTDs.

Urgent intervention is needed in 14 countries that make up the majority of the challenge

In the early 2000's, trachoma was believed to be present in 57 countries worldwide and the total burden was at least double the burden today. [23] Details about each country can be found in Appendix 1, but two segments stand out (see Exhibit 3):

- **9 countries have reported achieving elimination targets** – Approximately 15% of the initial countries with trachoma have reported that they have reached their ultimate intervention goals [24] and are now clearing the final surgery backlog.
- **14 countries carry the bulk of the burden** [25] – there are 14 countries that make up more than 80% of the population in confirmed and suspected endemic areas, as well as about 80% of the total surgery backlog. While it will, of course, be important to continue to drive progress in all other countries to achieve the 2020 objectives, these are the 14 high burden countries where the challenges are so big that intervention is urgent to meet the timeline (e.g., in these countries alone, about 170 million people live in districts that still need to be mapped). All 14 countries, apart from Pakistan and Mozambique, have a drug distribution program in place in some districts.

20 Estimate based on country reports to GET 2020 for 2010 meeting.

21 WHO, GET 2020.

22 Projections based on time series modeled using incidence and survival data in the published literature.

23 Mariotti et al., 2003.

24 GET 2020; these countries have reported that they achieved the UIGs, but certification by WHO is pending.

25 High burden countries are defined as countries with either >1 million people living in confirmed areas, or >5 million people living in confirmed and suspected areas. Egypt and Yemen were excluded from the list because of uncertainty about the population in the suspected and confirmed districts. Nepal was excluded because of preliminary findings from impact surveys. See Appendix 1.

EXHIBIT 3 – Segmentation of countries based on the current status

	Have reported achieving UIGs	High burden countries	Other countries	
Countries	Algeria Ghana Iran Libya Mexico Morocco Oman The Gambia Vietnam	Burkina Faso Ethiopia Sudan South Sudan Guinea Kenya Mozambique Niger Nigeria Pakistan Senegal Tanzania Uganda Zambia	Afghanistan Australia Benin Botswana Burundi Cambodia Cameroon CAR Chad Côte d' Ivoire Djibouti Egypt Eritrea Fiji Guatemala Guinea Bissau Iraq	Kiribati Laos Mali Malawi Mauritania Myanmar Namibia Nauru Nepal Papua NG S. Islands Somalia Togo Vanuatu Yemen Zimbabwe
# of countries	9	14	33	
% of endemic population	0%	83%	17%	
% of TT burden	6%	71%	23%	

Ghana and Vietnam have only reported reaching Ultimate Intervention Goals (UIGs) for active trachoma, not yet for surgery; The Gambia is awaiting final results from surveys, however, preliminary data show that UIG have been reached.

2. Where do we want to go?

"With elimination of blinding trachoma, millions of people will be spared the painful and disabling path towards blindness. Additionally, helping individuals retain their sight for the duration of adulthood will allow them to be more productive, and will help break the cycle of poverty. With hard work and continued commitment, the world can be free of the burden of blinding trachoma"

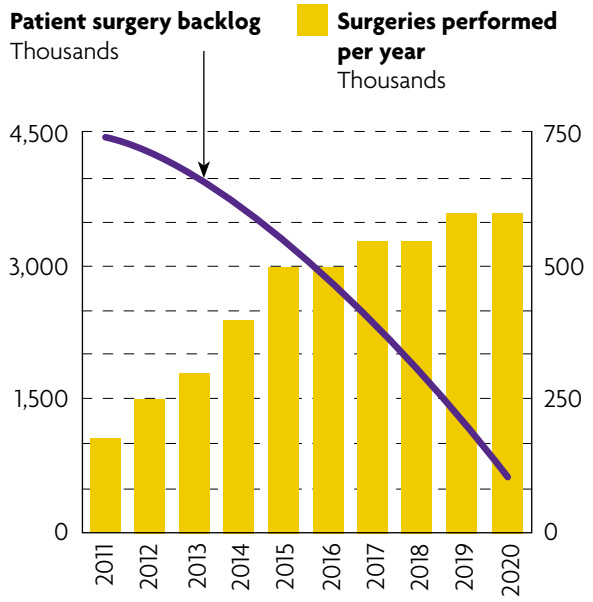
– K. Schlosser, History of Trachoma

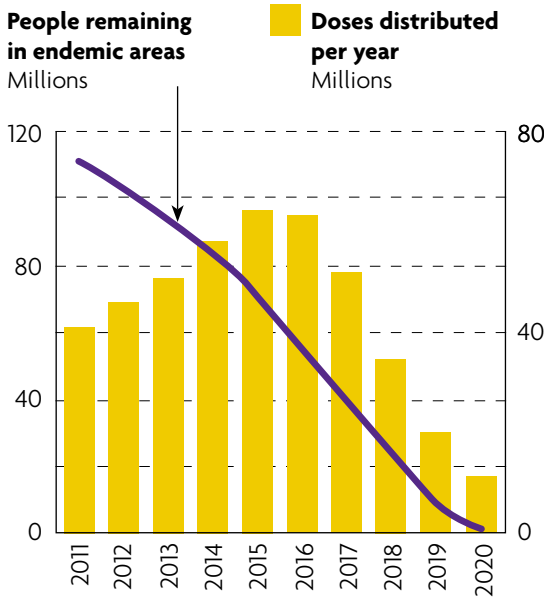
Scale-up of interventions is critical but will require addressing important barriers

The goal of elimination by 2020 can be brought within reach by scaling up each of the interventions as modeled in two scenarios illustrated in Exhibit 4 for the S and A components. A focused scale-up plan is needed for each of the four components of the SAFE strategy.

In addition to the intervention-specific requirements and barriers discussed below, elimination will require epidemiological assessments in the 1,293 districts where trachoma is currently suspected to be endemic. While the optimal geographic level to conduct the survey and tactics can vary, the outstanding challenge is equal to what has already been done (about 1,115 districts surveyed in last 12 years). It is also important to determine whether trachoma initiatives can be combined with surveys for other diseases to save time and cost.

EXHIBIT 4 – a) scenario for surgery scale-up, and b) scenario for antibiotics scale-up with the impact on surgery back-log and number of people remaining in confirmed endemic areas [26]





26 The scenarios in Exhibit 4 are only one of the possible paths to scale-up surgery and antibiotics to 2020. The specific rate of growth and year-over-year change depends on choices made by individual countries and individual partners.

Photo credit: Mark Tuschman

S

- **Scale-up: Address backlog of about 4.6 million people needing surgeries** – There are an estimated 4.6 million people needing surgery in the confirmed districts. Exhibit 4A lays out one of the scenarios to be able to clear this backlog. This would require the community to scale up from 160,000 to more than 500,000 surgeries per year. [27] VISION 2020 plans for comprehensive eye care will need to continue to address any remaining cases of trichiasis after achievement of the ultimate intervention goals. [28]

- **Main barriers: Training trichiasis operators is only the first step** – There are at least six other important challenges beyond training operators (who are often not physicians but skilled healthcare workers receiving special training): (a) high surgeon attrition rates, (b) low productivity due to lack of materials and lack of supervisory support, (c) cultural barriers limiting uptake, (d) difficulty of assessing trichiasis burden among populations living in remote, rural and/or dangerous environments, and (e) regulatory challenges to using non-physicians as part of the surgery programs.

A

- **Scale-up: Roll out more Mass Drug Administration (MDA) programs** – More than 200 million doses have been distributed since the start of the Zithromax® drug donation program in 1998. In addition to the Pfizer donation, certain countries purchase azithromycin for limited mass distribution. For the confirmed endemic population alone, approximately 380 million more antibiotic treatments will be needed to achieve the 2020 targets. In addition to obtaining the medication, countries will need to commit to support MDA programs within the context of the SAFE strategy, and increase distribution and monitoring capacity of confirmed districts. [29] Countries may apply to the International Trachoma Initiative (ITI) Trachoma Expert Committee for the donation but strong political commitment and a viable plan for antibiotic distribution as well as plans for activities for the S, F and E components are essential. Exhibit 4B lays out one of the scale-up scenarios to achieve the MDA scale-up needed.

- **Main barriers: Getting drugs to the target population** – Drug distribution is an enormous task in endemic countries given the geographic challenges. The lack of solid distribution channels and funding for distribution programs, import limitations and inventory control and management are important additional barriers to success. Co-distribution with other drug programs, particularly in the context of the broader NTD agenda, can help mitigate some of these challenges.

F

- **Scale-up: Behavioral change initiatives needed in all districts, including about 500 new districts** – A wide range of initiatives need to be combined to achieve a higher proportion of clean faces, drive uptake of surgical services, and increase latrine utilization to limit transmission risk. This behavioral change is the foundation of sustaining the impact of MDA campaigns. The tactics include using community workers and training teachers and local public leaders. Each trachoma-endemic district needs to have a comprehensive approach in place to ensure the public is informed of the benefits of facial cleanliness. This involves scale-up in districts where activities are ongoing as well as initiation of activities in additional districts. [30]

- **Main barriers: Behavioral change is not easily achieved** – Educational programs and focused campaigns can help penetrate deeply into some target groups, but behavioral change remains a difficult public health intervention to achieve, maintain and measure. Coordination with broader campaigns and other NTDs can be part of the solution (e.g., include face washing in national hand washing campaigns).

- **Scale-up: Access to clean water and latrines needs to be improved dramatically** – Because trachoma is concentrated in poor areas, access to clean water and latrines is often very limited. While the trachoma community cannot in itself ensure both elements are addressed in each community, it is important to advocate and work with partners to materially improve the situation and to reach in trachoma-endemic areas the objectives set by Target 7c of the Millennium Development Goals: [31] "Reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation." This scale-up is needed both in districts where trachoma activities are ongoing today and in new districts.

- **Main barriers: Coordination and cost** – In some countries, less than 25% of the population has access to clean water. The last component of the SAFE strategy would in this context require significant infrastructural activities as part of a broader development agenda. The trachoma community can push for more coordination and better information sharing with ministries and non-NTD partners focused on water and sanitation.

Advocacy needed to increase political will and funding for SAFE strategy

Overcoming the barriers to scaling up SAFE interventions requires advocacy to increase political will and funding at both a global and a national level. Global partners need to do a better job of coordinating their efforts at the global level and within countries. An increase in global funding for trachoma with greater multi- and bi-lateral support can help generate a budget for countries that do not have the necessary health budget to finance a trachoma control program. It is, however, very important that national governments own and take the lead to fund, promote, and manage their own trachoma control programs. For that reason, it will be important to develop and roll out a coordinated advocacy program that increases awareness amongst all key stakeholders at all levels.

Different paths to elimination can work depending on the context

Many roads have led to elimination across the wide range of countries that were previously endemic. The main elements contributing to disease elimination in the U.S. and large parts of Europe were an improving economic situation and strengthening of the health system, even before the arrival of antibiotics. In the absence of those two elements, each of the components of the SAFE strategy contributes to the reduction of burden (S) and stopping disease transmission (AFE). Each country can learn from others, but balanced SAFE implementation, country commitment, collaborative partnerships, engagement of a broader community, funding, consistent advocacy, and well-planned interventions are present in most success stories so far. Some examples include:

27 Surgery intervention need is calculated based on time series using assumption that new incidence rate equals the loss of patients for other reasons. If 50% of the non-confirmed burden turns out to be positive, then the scale-up would need to reach over a million surgeries per year towards 2019.

28 The ultimate intervention goal for trichiasis is less than one case per one thousand people in the total population.

29 Estimates are based only on people living in confirmed endemic districts. Total doses required would increase to about 700 million if 50% of the suspected endemic areas are confirmed to be endemic and require MDA.

30 Based on discussions with many trachoma experts, and Emerson et al., 2008.

31 United Nations Development Programme Millenium Development Goals http://www.undp.org/mdg/goal7.shtml.

- **Data gathering above the district level can help create useful data quickly and cost-effectively** – Ethiopia is one of the countries with the biggest trachoma burden in the world and its Amhara region had, until recently, an important data gap. In 2005, a national survey was conducted and Amhara National Regional State was identified as the state with the highest prevalence. The traditional next step would have been to conduct individual surveys in each of the 140 districts. Instead an innovative sampling approach was developed. The program sampled trachoma and malaria prevalence in 10 administrative zones, with 16 clusters of 125 people surveyed in each zone. This approach closed an important trachoma data gap at low cost and was powerful enough to allow program managers to conclude that the SAFE strategy was needed throughout the region. In addition, the surveys showed which district clusters had the largest surgery backlog. These surveys allowed the team to start realistic planning and intervention for the approximately 20 million inhabitants of Amhara rather than waiting for the results of 140 district surveys, which might have taken years. More refinement of the data over time can provide more detail. [32]

- **Clear alignment and planning amongst the broadest set of stakeholders is key** – Morocco has recently achieved the elimination goals for trachoma and is currently pursuing WHO certification. The success of its program was heavily dependent on the exemplary alignment of government bodies and partners - the Trachoma Planning Team at the Ministry of Health, a large number of other government departments (sanitation, water and environment, education, national affairs, youth and sport, agriculture, communication, etc) and different decision levels (national, provincial, local). In addition, the Ministry took on the task of coordinating the activities of the many partners, minimizing overlap and helping to ensure impact. This strategic management of partners greatly contributed to the success of the effort. [33]

- **Community-based comprehensive programs can work** – In a 1986 survey in The Gambia, trachoma was the second leading cause of blindness at 17% of all cases, leading to the creation of a national eye-care program that covered interventions from the smallest communities up to a tertiary treatment setting. Within that framework, surgical activities were developed and investments made in face washing at the community level. As a result, the contribution of trachoma to blindness dropped from 17% to 5% in a 1996 survey. At that time, a dedicated trachoma program was implemented with five key components: 1) a database was developed to better understand trachoma burden and geographic distribution and to prioritize participation in various trachoma research initiatives; 2) community work focused on better communication to change people's attitudes and calm their fears about trichiasis surgery; 3) F and E interventions were structured so that the community took greater ownership of projects such as building latrines and installing water points; 4) key opinion makers such as elder women and village development committees were engaged to help drive awareness and interventions for all elements of SAFE; and, 5) the local health system leadership formed a trachoma task force with all key players.

  As of 2010, the TT backlog in The Gambia was resolved and active trachoma prevalence is limited to areas where cross-border movement creates new sources of infection (e.g., international religious gatherings). The Gambia team is now helping its large neighbor Senegal to adopt its successful, comprehensive and community-driven approach. [34]

While these examples illustrate only a few ways to succeed, it is clear that continued innovation is needed and that sharing of best practices will help increase the efficiency of trachoma control programs as we near 2020.

32 Based on discussions with many trachoma experts, and Emerson et al., 2008.

33 The Morocco case study was based on interviews with Dr. Hammou and the document describing the surveillance system published by the Morocco National Program to Prevent Blindness (PNLC) in 2006.

34 The case study about The Gambia was developed with Dr. Hannah Faal.

3. How do we get there?

SAFE interventions in a district take at least four to six years from start of the survey to elimination - and often longer. In addition, elements of S, F and E need to be scaled-up alongside the 'A' component and continue beyond the time when the targets are first met. This timeline presents a major logistical challenge for the global community, as each of the endemic districts needs enough time and focused effort to work through the elimination sequence before 2020. Coordination and sequencing of interventions in each district and among all districts will be a key factor for success in reaching 2020.

This strategic plan contains five guiding principles that provide a framework for the path to elimination. Combined with the sequence of activities in an individual district, they result in five specific strategic drivers that help determine and sequence activities between now and 2020. Finally, this plan then translates the principles into a set of very specific milestones to lay out the annual progress needed to make 2020 a reality.

Five guiding principles form the basis of the approach

The guiding principles set out how the trachoma community thinks about its fight for elimination. They make the underlying philosophy of the strategic plan explicit.

1. **Urgency** – There is an urgent need for action to avoid additional suffering and unnecessary blindness in hundreds of thousands of people. In most trachoma-endemic countries, there is a need for immediate and rapid scale-up to achieve the 2020 elimination target.

2. **Accountable ownership** – Countries should be the leaders of the elimination strategy and entire elimination process (including planning, implementation, and integration into national health services). They can solicit and coordinate contributions from donors and partners with whom they work to achieve the 2020 goals but, in the end, they are responsible to their own people for eliminating trachoma as a blinding disease.

3. **Integration** – The trachoma-focused efforts of global and local communities need to be aligned with other plans and activities, including (a) broader NTD activities and plans, (b) VISION 2020, integrated, comprehensive eye care models that provide sustainable opportunities to deliver the S component (c) national health and development strategies, and (d) initiatives focused on the F and E components of the SAFE strategy such as the ones led by the ministries and partners focused on water, sanitation and education.

4. **Efficient, coordinated partnerships** – The coordinated contribution of all partners and stakeholders is key to scale-up of interventions and increased coverage, especially as efforts expand into new countries. Partners should coordinate their activities to maximize the impact of the contributions of each stakeholder.

5. **Tailored** – Interventions should be tailored to local needs using best available data and knowledge. Where not currently available, information on the magnitude of trachoma needs to be generated as soon as possible. Research is still needed to help influence the adoption of appropriate programs and policies; these often need to be tailored to the local context.

Individual districts take at least four to six years from start to elimination, often more

The timeline for an individual district defines how much coordination and time it takes to eliminate

blinding trachoma in one district and forms a basis for the timing of global activities.

There is a wide range in the total time it takes a district to reach the elimination targets (Exhibit 5). In general, the fastest possible path is about four years in areas where the baseline prevalence of TF in children 1-9 years old is between 10 and 30% (three years of SAFE strategy implementation are required).[35] This fast track increases to six years or more if prevalence is higher.

Once the elimination goals have been achieved, countries need to maintain the WHO intervention thresholds for three years before they qualify for certification.

While these timelines are possible, realistically they are often longer because data gathering may be delayed, significant time might need to be invested in planning interventions and raising funds, and, finally, scale-up of each of the components of the SAFE strategy might take longer than expected to implement and therefore further stretch the timelines.

- **Data** (about 6 months) – A detailed epidemiological survey needs to be conducted in all suspected geographies. The methodology and approach are well established but can be adapted (e.g., regional surveys helped accelerate impact in Ethiopia, while sub-district surveys in Kenya helped to narrow down the area where interventions are required). Impact surveys are needed to assess whether active trachoma is below thresholds, and post-elimination surveillance is important to confirm that the program has indeed met the thresholds for 3 years and is likely to continue afterwards.

- **Planning** (about 6 months and ongoing) – Once the survey data are available, each of the SAFE components needs to be planned, partnerships built, and funding acquired. While timing varies greatly between districts, interventions can be implemented as soon as 6 months after survey results are made available. The planning of the scale-up of the interventions has a big impact on the total timeline. If, for example, the application for drug donation is not timely or complete, six months to a year might be added to the timeline.

- **Fundraising and advocacy** (ongoing) – To increase awareness and available funds, significant fundraising and advocacy efforts are needed both at the national and international levels. It is important to evaluate the options and design an advocacy strategy at the start of the planning, but also to revise and update that strategy as needs and circumstances change.

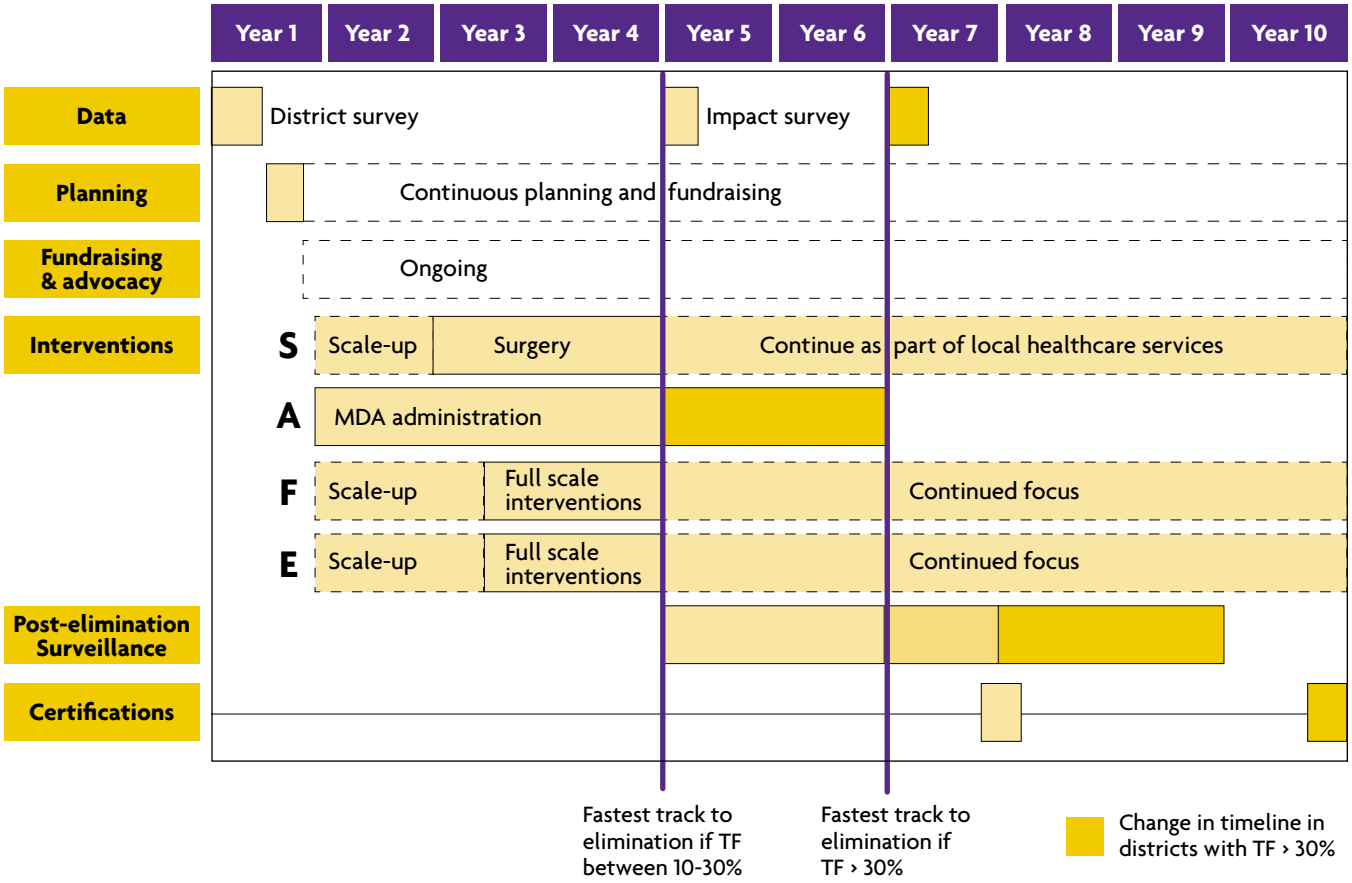
- **Scale-up and implementation of SAFE elements** (3-5 years) – Once the SAFE elements are in place, A, F and E interventions can be started right away, but three to five years of consistent annual MDA are needed to meet elimination criteria. The timeline is mainly determined by the duration of scale-up and interventions and the length of MDA. However, implementation of behavior change programs in schools and communities as well as latrine and water programs take time. Also, some districts manage to implement each of the SAFE interventions at full scale within a year, but others go through a much longer scale-up phase. MDA should be conducted for at least three years where prevalence of TF is 10-30% and at least five years if it is above 30%. The time to reach the elimination criteria for TT depends largely on the burden, surgical capacity and productivity.

- **Time to certification** (3 years) – A district needs to maintain its performance through three years of post-elimination surveillance before WHO certification can be granted. It is important to note that surveillance as well as the behavior change and surgery programs need to continue throughout and even beyond certification as part of the core tasks of local health care systems.

Five strategic drivers help to define the path to 2020

The strategic drivers help determine the activities along the path to 2020 based on the guiding principles and the timeline of an individual district. They explain the rationale for the path to 2020 and form the basis of the main milestones.

EXHIBIT 5 – Overview of timeline to elimination for an individual district



1. **Additional data should be collected, but should not delay scale-up** – Countries need to assess their trachoma burden by 2013 to have hopes of reaching elimination by 2020.

   There are currently at least 17 countries where lack of data is a roadblock to planning efforts. An estimated 210 million people are living in the 1,293 districts where trachoma is suspected but where more detailed information is needed before an appropriate set of interventions can be designed. It is therefore of primary importance to investigate the size of the challenge in the currently uncharted areas. Methods to gather necessary data across multiple districts can be considered if it helps to speed up this process. [36]

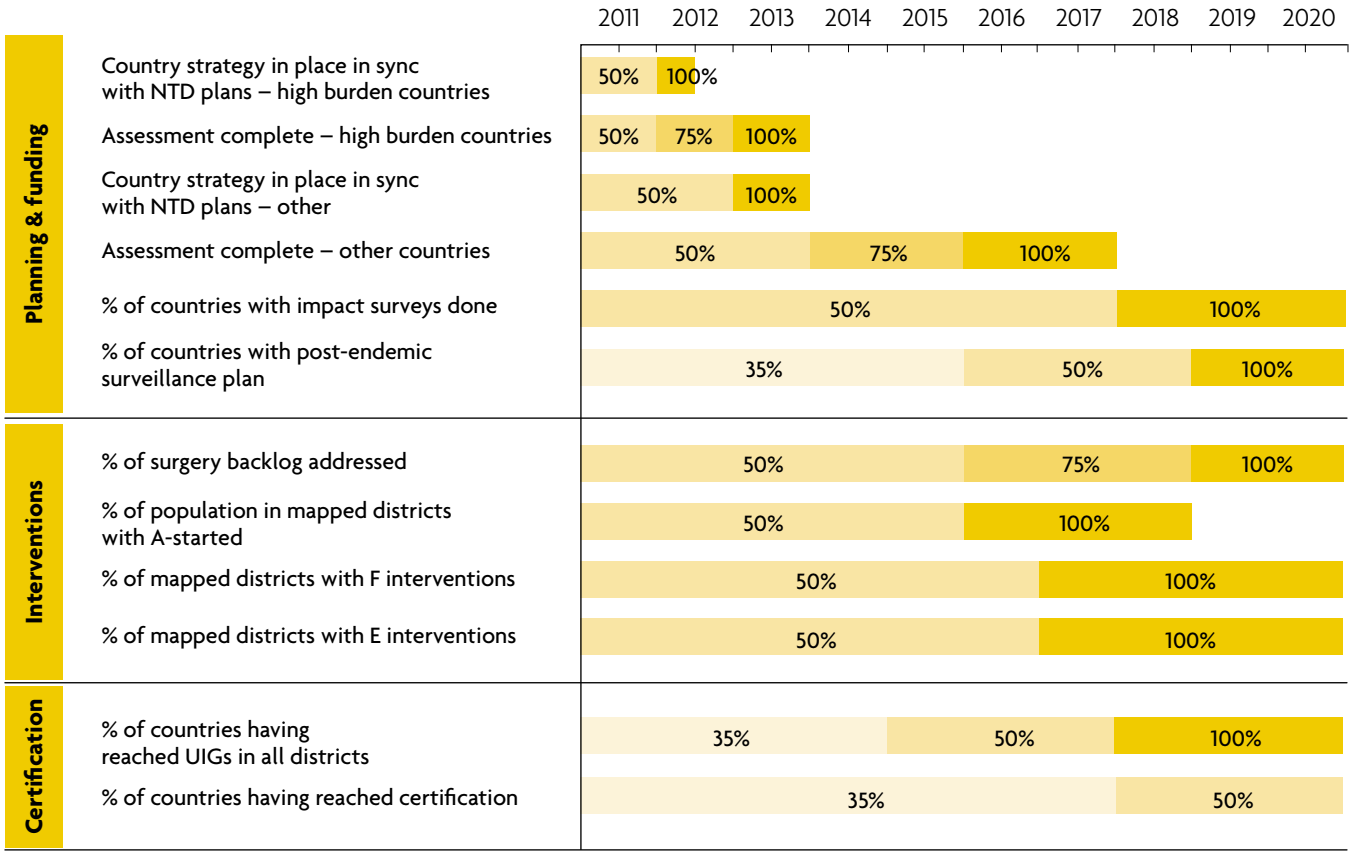
2. **Aim for the fastest timeline possible in each district** – The 4-6 year timeline is aggressive and requires seamless transition between phases, parallel planning and execution of different activities (e.g., mapping and planning), and rapid scale-up. Meeting these timelines is challenging; however it will speed up the overall path to elimination.

Example 1: Pre-plan surgery and antibiotics interventions before full epidemiological data is available to avoid start-up delays once a decision to initiate an intervention is made (3-9 months).

35 Timing based on WHO-treatment guidelines and interviews

36 The decision to survey by district or across multiple districts needs to be made case by case. If the burden is high and the timeline pressing, regional surveys can make a real difference. If a district level survey can help identify those subdistricts that need or don't need treatment, they can be helpful to target the interventions and resources.

EXHIBIT 6 – Overview of major milestones to hit in order to achieve the 2020 goal of elimination



Example 2: Avoid creating new programs to achieve the F components, but build on existing efforts that are focused on broader behavioral change (e.g., general hand washing campaigns, include in school curriculum, etc.).

Example 3: Leverage interventions and advocacy efforts across NTDs and other diseases (e.g., joint malaria-trachoma surveys such as those pioneered in Ethiopia). [37]

Example 4: Continue to innovate and share best practices rapidly with other countries and partners to revise conventional wisdom or strengthen service delivery.

3. Focus early on high-burden countries – Given that it can take six or more years to eliminate trachoma in high burden districts and countries, the global community should ensure adequate attention is given to the highest burden countries and the most complex situations early in the path to 2020.

The district lifecycle of 4-6 years is aspirational – many countries require more time. The 2020 goal can only be achieved if partners ensure that activities are initiated everywhere while prioritizing particularly challenging areas sooner. This will help ensure all countries can make the 2020 goal. Swift action and thoughtful coordination in high burden countries, along with specific attention to those communities that live in border areas or are nomadic, is necessary.

4. Proactively tailor approaches based on progress – Interventions need to be planned according to WHO and the ITI Trachoma Expert Committee guidelines but tailored to each context. [38] Periodic impact surveys help to assess impact and adjust interventions, saving both time and money. For example, prevalence in Baw (district in Sudan) and

in areas of The Gambia was around 10% when MDA started. TF practically disappeared after one or two years of intervention.

5. **Plan beyond elimination** – While the first priority is to drive towards the elimination targets, it is important to prepare soon for the time post-elimination when the programmatic efforts will likely be reduced but not completely discontinued.

   The main driver of success is integration of trachoma surveillance initiatives within the local health and eye care systems. Several initiatives can help smooth the transition from the focused programmatic approach pre-elimination to integration in the local health care system post-elimination, such as: proactive planning of transition of interventions, training of local health administrators and professionals, preparation of surveillance surveys, and investment in data management capacity.

Specific milestones to 2020 and beyond

"What gets measured, gets done"

The 2020 goal is ambitious, and success is highly dependent on the rapid scale-up of interventions across countries and districts. Exhibit 6 lays out the most important milestones that need to be achieved over the coming 10 years. These milestones are a proxy for the actual elimination events; they are not the end goal. They serve as guideposts laying out what needs to get done to stay on track for success.

They are not only useful for planning but are also excellent tools to track overall progress of the global trachoma community against its goals and to celebrate success. In addition to these milestones, the global trachoma community should track other metrics such as the total spent per year on trachoma, percent of countries making progress, and number of people going blind from trachoma per year.

Plan for post-elimination

As indicated in the strategic drivers, planning for post-elimination activities is very important. Dedicated financial support will likely diminish once the thresholds are met, but a series of activities will need to continue to ensure trachoma remains under control:

- **Post-elimination surveillance and certification** – Once the ultimate intervention goals are met, regular surveillance needs to be carried out to detect potential resurgence early enough that appropriate action can be taken. In addition, post-elimination surveillance will likely become an important part of the certification criteria that WHO is developing.

- **Continued F and E activities** – The behavioral changes that result from F and E interventions can form an effective barrier against resurgence, so it is important to continue to drive for facial cleanliness, latrine use, and improvement of the water and sanitation infrastructure. Inclusion of facial washing in educational programs and other washing campaigns as well as coordination with other water programs is key to making elimination sustainable.

- **Maintained surgery capacity for new cases** – The trichiasis backlog needs to be addressed before the elimination goals are reached, but new cases of trichiasis will continue to appear post elimination. Some people that grew up in endemic areas and were exposed to the active disease and eyelid scarring will continue to progress towards trichiasis. It is therefore of utmost importance to maintain sufficient surgical capacity to provide the necessary services to prevent this group of people from going blind. [39]

- **Integration of trachoma capabilities in the health system** – A deliberate and well-planned shift of capabilities and responsibilities from trachoma-focused initiatives to the local health system is important to ensure all of the above can be maintained post elimination.

37 Emerson et al., 2008.

38 See list of recommended resources for stakeholders on pg. 33.

39 The incidence of progression to trichiasis in the absence of continued exposure is unclear. Munoz et al., 1999, and Gambhir et al., 2009, are sources for further reading.

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4. What is the cost of eliminating trachoma?

The human cost of trachoma occurs when vision loss or worse, blindness, leads to loss of social status, stigmatization and reclusion from society. The economic burden of trachoma on the lives of individuals, families, and communities is enormous. Even conservative estimates suggest an annual loss of productivity due to trachoma between $3 billion and $6 billion. Eliminating blinding trachoma will clearly bring benefits at the human and economic level. What is the cost of achieving that elimination goal?

Total cost estimated at about $430 million for confirmed burden [40]

(Please see Appendix 2 for details about the calculations)

Based on the current best available data, the total cost of all interventions to address the confirmed disease burden is expected to be about $430 million. This estimate excludes the cost of the drugs, a large portion of which are donated as part of the Pfizer donation program, and only includes a minimal cost for building of latrines and digging of boreholes, which are often part of a broader health and development agenda. This estimate will need to be refined as countries finalize their own costing exercise (in the context of the NTD and trachoma planning process) and as standardized costing tools become available.

- **Data gathering: $14 million** – District mapping, impact surveys post-intervention and post-elimination surveillance each make up about a third of the total data cost. This estimate may be affected by the use of multi-district surveys and changes in the method of surveillance and impact measurement over time.

- **Surgery: $182 million** – The total cost of surgery depends largely on the cost assumptions for individual interventions, which vary widely by country. While it is possible to perform a procedure in some countries for $27 or less, [41] difficult terrain and need for extensive case finding can drive the price above $50 in other settings. For this estimate, an average fully loaded cost of $40 was used. [42]

- **Drug distribution: $94 million** – In many countries, the cost of distributing antibiotic [43] to beneficiaries is only a small proportion of the total cost of the A component because of the Zithromax® donation. Distribution cost varies widely by region and includes provision of vehicles, fuel, hiring drivers and personnel and training on drug distribution. A distribution cost of $0.25 per treatment was used as a consensus estimate. It is important to note that this cost can be reduced further if azithromycin distribution is integrated with treatment for other NTDs, a practice which is highly recommended in co-endemic areas. Although this $94 million investment in distribution costs is significant, it is necessary to maximize the impact of the estimated $10 billion Zithromax® donation by Pfizer. [44]

- **Encourage face washing: $28 million** – The cost of the F component will vary widely by district and depends on how well the programs can be integrated into other behavioral change activities. This estimate includes the need for $5,000 per district per year. The specific campaigns vary, but the budget will likely be used to train educators and set up some targeted interventions to change behavior of the endemic population, (e.g., direct promotional campaigns using local radio, efforts focused on women).

40 Because of the important concentration of both the people living in endemic districts (83%) and the trichiasis burden (77%) in the 14 high burden countries, it would cost $355 million to eliminate the confirmed burden of blinding trachoma from these countries.

41 Based on partner interviews.

42 Average cost per surgery based on expert consensus; this fully loaded cost includes training, supervision, material, post-operative care, planning, both for the case finding and the actual surgery.

43 In addition to azithromycin, distribution of tetracycline eye ointment is also needed for children less than 6 months old.

44 Any analysis of antibiotics use and cost in this document is based on Zithromax® data only.

Photo credit: Elizabeth Kurylo

- **Contribute to E efforts: $112 million** – Similarly, the trachoma community may need to contribute part of the cost of latrine construction and borehole drilling, which often happens by partners that focus on broader development of water and sanitation. This estimate reflects the need for $20,000 per district per year which can be used to build latrines or contribute to clean water provision in select cases.

This estimate will increase to $748 million if 50% of suspected districts are confirmed

Importantly, the estimates above only include the currently confirmed districts and are likely to change as more data becomes available from regions that are currently suspected but not yet confirmed. If 50% of the suspected districts turn out to be positive (which is similar to the proportion of the district surveys that were executed to date), an additional $320 million will be needed to achieve the 2020 goal. This is mainly driven by an increase in cost for antibiotics distribution (about $85 million) and contributions to the E component (about $130 million). [45]

New investment is needed and can have a great impact

No matter how the impact is assessed, money spent on blinding trachoma is well spent:

- **Significant reduction of human burden** – Every $20 invested in trachoma elimination translates into one additional person spending one additional year without severe vision loss or blindness. [46]

- **Clear economic impact** – The elimination of trachoma in Africa alone would give the GDP of the continent a boost of around 20-30 percentage points based on conservative annual productivity loss estimates. The impact on individual countries can be orders of magnitude bigger. [47]

- **Important collateral effects outside of trachoma** – The elimination of blinding trachoma will have a direct impact on other disease prevalence and morbidity because the F and E activities will also help prevent the transmission of other disease. Also, the integration of trachoma efforts in the context of other NTDs (e.g., co-administration and co-survey) will also help foster that agenda. Finally, eliminating trachoma will release a financial burden on families that are often already in disadvantaged situations.

- **Massive multiplier effect of drug donations** – Pfizer's very significant drug donation program makes trachoma one of the diseases where a dollar spent could be met with a very significant multiplier effect. If a country is committed to the elimination of blinding trachoma and putting in place the full SAFE strategy, [48] there is a potential opportunity to receive donated antibiotic through ITI. Thus, in recipient countries, every dollar spent on the SAFE strategy can generate about $35 to $40 in drug donations.

Trachoma is a disabling disease that has made millions of people blind but is readily preventable. It still affects some of the poorest communities in the world and continues to be an important public health burden. A large community of many national and international partners has made great progress since the start of the alliance aiming at elimination by 2020, but is not on track to achieve that goal. There is an urgent need to rapidly scale up data collection and start SAFE strategies in all endemic regions. The total cost is relatively small, the potential for impact enormous.

45 See Appendix 2 for details.

46 Over the next 10 years, new trichiasis burden can be estimated at least at 2.4 million new cases based on 9% incidence assumption. This translates in about 19.7 million years spent with blindness or vision loss based on the health expectancy data from Ngondi et al., 2007 (corrected for 1.5 year higher life expectancy in all endemic countries on average vs Sudan). The total cost of preventing this from occurring is 420 million, or about 20$ per year of morbidity that has been prevented.

47 Total GDP of Africa in 2008 was estimated to be $1520 billion. Avoiding annual loss due to trachoma (estimated between $3 and $6 billion as described in the introduction) would result in 0.19 and 0.38% growth.

48 Receipt of Pfizer donated Zithromax® is dependent upon approval of an application to the International Trachoma Initiative Trachoma Expert Committee.

Photo credit: Harvey Wang

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Recommended resources for stakeholders

- A guide for environmental sanitation and improved hygiene, WHO/PBD/GET/00.7/Rev.1, WHO, 2000
- http://www.cartercenter.org/health/trachoma_education/mtResources.html
- Implementing the SAFE Strategy for Trachoma Control, a Toolbox of Interventions for Promoting Facial Cleanliness and Environmental Improvement, Emerson P and Frost L, The Carter Center and the International Trachoma Initiative, 2006
- Trachoma Action Plan; template submitted to GET 2020 during April 2011 meeting
- Trachoma Atlas, London School of Hygiene & Tropical Medicine/ ITI/Carter Center (www.trachomaatlas.org)
- Trachoma epidemiologic survey control, WHO/PBL/93.33, WHO, 1993
- Trachoma Control: a guide for programme managers, WHO, 2006
- Zithromax® In The Elimination Of Blinding Trachoma: A Program Manager's Guide, ITI, 2010 (http://www.trachoma.org/guides-and-manuals)
- WHO grading protocol (www.who.int/blindness/causes/priority/en/index2.html)
- WHO protocol for sampling populations (www.who.int/blindness/prevalence_protocol_English.pdf)
- Women and trachoma manual: see Cromwell et al., under references

Appendix 1 – Overview epidemiology

		POPULATION AT RISK			NUMBER OF DISTRICTS			TRICHIASIS BURDEN	
Country	Total country population	Confirmed endemic [1]	Suspected endemic [2]	Total confirmed & suspected endemic	Total	Confirmed endemic [1]	Suspected endemic [2]	Best available	Source [3]
Afghanistan	29,100,000	183,417	392,910	576,327	368		58	83,100	b
Algeria	36,000,000	2,012		2,012	1,544	1	51	86,700	b
Australia [4]	22,400,000	160,900		160,900				1,100	b
Benin	9,800,000		188,037	188,037	77			7,600	b
Botswana	1,800,000		192,303	192,303	25			32,900	b
Burkina Faso	16,200,000	7,205,383		7,205,383	63	30		23,000	a
Burundi	8,500,000	887,063		887,063	45	4		746	a
Cambodia	15,100,000		909,336	909,336	183		74	7,559	a
Cameroon	20,000,000	1,744,698	2,450,813	4,195,511	178	13	23	47,200	b
CAR	4,900,000		238,998	238,998	51		21	1,000	b
Chad	11,500,000		4,914,030	4,914,030	14		8	34,300	b
Cote d' Ivoire	22,000,000			0	58			-	N/A
Djibouti	880,000			0	6			50-100	a
Egypt	80,400,000	7,787,893	10,500,937	18,288,830	26	2	3	35,400	b
Eritrea	5,200,000	694,543	539,148	1,233,691	58	8	11	15,238	a
Ethiopia	85,000,000	25,538,950	46,329,091	71,868,041	649	209	434	1,100,000	a
Fiji	850,000		840,000	840,000				800	b
Ghana	24,000,000			0	137			4,000	a
Guatemala	14,400,000			0				25,100	b
Guinea	10,800,000	3,745,300		3,745,300	38	15		25,528	a
Guinea Bissau	1,700,000	191,338	1,339,170	1,530,508	N/A	20	38	7,361	c
Iran	75,100,000			0				43,900	b
Iraq	31,500,000			0	102			43,900	b
Kenya	40,100,000	2,239,677	3,229,515	5,469,192	80	5	10	67,253	a
Kiribati	100,000		100,000	100,000				900	b
Laos	6,400,000			0				13,200	b
Libya	6,600,000			0				33,400	b
Malawi	15,500,000	1,311,420	1,861,174	3,172,594	27	2	5	33,400	b
Mali	15,200,000	1,179,501		1,179,501	61	10		37,943	a
Mauritania	3,400,000	23,336		23,336	53	3		1,017	a
Mexico	110,700,000			0	2,422			-	N/A
Morocco	31,900,000			0	46			-	b
Mozambique	23,400,000	151,788	13,103,767	13,255,555	131	3	72	60,500	b
Myanmar	53,400,000	175,789		175,789	65	1		65,800	b
Namibia	2,200,000			0	107			6,100	b
Nauru	10,000		10,175	10,175				-	N/A
Nepal	28,000,000	3,343,912	5,355,326	8,699,238	75	10	15	42,886	a
Niger	15,900,000	9,274,849		9,274,849	42	23		58,870	a
Nigeria	158,300,000	18,091,360	43,383,782	61,475,142	774	79	209	1,291,001	a
Oman	3,100,000			0	61			600	b
Pakistan	184,800,000		38,003,995	38,003,995	133		31	71,700	b
Papua New Guinea	6,800,000			0				-	N/A
Senegal	12,500,000	2,589,103	7,412,734	10,001,837	34	13	12	91,500	a
Solomon Islands	550,000		530,000	530,000				500	b
Somalia	9,400,000			0	74			10,300	b
Southern Sudan	8,260,490	2,933,718	2,560,867	5,494,585	80	26	28	91,245	c
Sudan	30,894,000	546,240	10,458,198	11,004,438	133	3	37	67,799	c
Tanzania	45,000,000	9,906,874		9,906,874	121	43		130,000	a
The Gambia	1,800,000	120,695		120,695	41	7		-	N/A
Togo	6,800,000			0	30			2,900	b
Uganda	33,800,000	8,283,225	1,966,671	10,249,896	80	22	6	167,538	a
Vanuatu	250,000		248,935	248,935				210,000	b
Viet Nam	88,900,000			0	659			100,000	a
Yemen	23,600,000	2,162,140	6,152,568	8,314,708	333	2	111	270,800	b
Zambia	13,300,000	625,984	5,320,720	5,946,704	72	5	36	8,500	b
Zimbabwe	12,600,000			0	59			-	b
Sub-total	**1,520,594,490**	**111,101,108**	**208,533,200**	**319,634,308**	**9,415**	**559**	**1,293**	**4,562,158**	**N/A**
Brazil	193,300,000	1,316,656		1,316,656	5,564	38		58,000	b
China	1,338,100,000		455,201,200	455,201,200	256			2,330,600	b
India	1,188,800,000	12,565,900	412,626,832	425,192,732	565	2	198	443,000	b
Sub-total	**2,720,200,000**	**13,882,556**	**867,828,032**	**881,710,588**	**6,385**	**40**	**198**	**2,831,600**	**N/A**
Total	**4,240,794,490**	**124,983,664**	**1,076,361,232**	**1,201,344,895**	**15,800**	**599**	**1,491**	**7,393,758**	**N/A**

1 >10% prevalence of TF from district level population-based prevalence surveys

2 >10% prevalence of TF from district level TRA/other survey type, >10% prevalence of TF from region level surveys, or classified as suspected endemic by MoH

3 Three sources were used to compile to most accurate list of TT burden: (a) numbers reported by the countries in the 2010 GET2020 meeting, (b) as reported in Mariotti et al., 2009, and (c) estimates based on prevalence data reported to ITI in the 2011 Zithromax® Applications (applying the prevalence data to the appropriate population segments). In general, trichiasis estimates are based on the confirmed districts only, but variability per country might occur.

4 Indigenous populations in Australia is spread over 80 confirmed and 238 suspected communities; this is estimated to be the equivalent of 5 and 15 districts in cost and intervention.

Appendix 2 – Assumptions cost estimates

Key inputs			
Data gathering	**Number**	**Unit**	**Source**
Number of suspected districts to be surveyed	1,293	Number of districts	Trachoma Atlas database
Number of confirmed districts that need Impact and surveillance surveys	559	Number of districts	Trachoma Atlas database
S - expected number of surgeries	4,562,158	People in need of surgery	See Appendix 1
A - expected azithromycin distribution	375,382,407	Number of doses that need to be distributed	Time series analysis based on total number of people living in confirmed districts; assume 85% coverage rate (Appendix 1)
F - Districts that need F-interventions	559	Number of districts	Trachoma Atlas database
E - Districts that need E-interventions	559	Number of districts	Trachoma Atlas database

Notes: This analysis excludes China, India and Brazil

Calculations					
	Number of interventions		**Cost per interventions**		**Total cost**
Data gathering	1293	District surveys	$ 5,000	Per district survey	$ 6,465,000
	559	Impact surveys	$ 7,500	Per impact survey program per district	$ 4,192,500
	559	Surveillance surveys	$ 6,000	Per surveillance program per district	$ 3,354,000
Surgery	4,562,158	Surgeries	$ 40	$ per case	$ 182,486,320
Antibiotic distribution	375,382,407	Individual distributions	$ 0.25	$ per distribution per person	$ 93,845,602
Facial Cleanliness	559	Contribution per district	$ 5,000	$ per district per year	$ 27,950,000
Environmental Improvements	559	Contribution per district	$ 20,000	$ per district per year	$ 111,800,000
				Total	$ 430,093,422

Blinding trachoma is bringing extraordinary human suffering and economic devastation to tens of millions of people. Our goal is to eliminate it by 2020 – less than nine years from now. It's an achievable goal and organizations around the world are uniting like never before.

We can stop trachoma, a Neglected Tropical Disease (NTD).

Our plan is set. Our resolve is clear. Our promise must be kept.

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Mradi wa macho

International Centre
for Eye Health

LIGHT
FOR THE WORLD

iTi
International Trachoma Initiative

LIONS
INTERNATIONAL
Lions Clubs International
FOUNDATION

OPERATION™
EYESIGHT
UNIVERSAL
For All The World To See

SCI
Schistosomiasis
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ORBIS
saving sight worldwide

Sightsavers

OPC
préserver la vue

THE TASK FORCE FOR GLOBAL HEALTH

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The End *of* Sight

- Trachoma causes 1 person to experience severe sight loss every 4 minutes.
- Trachoma blinds 4 people every hour.
- About 300 million people are at risk of trachoma and at least 100 million need treatment.

Proven Strategy

- The 4-part SAFE strategy (**S**urgery, **A**ntibiotics, **F**acial cleanliness, **E**nvironmental improvements) prevents and treats this largest infectious cause of blindness in the world.

Reduces the human burden

- Every $20 invested in trachoma elimination translates into 1 additional person living 1 additional year free from severe vision loss or blindness.

Makes clear economic impact

- The elimination of blinding trachoma in Africa alone would give the GDP of the continent a boost of around 20-30 percentage points. The impact on individual countries can be far greater.

The End *in* Sight

- This global strategic plan and simultaneous planning at the national level can help mobilize partners and resources to accelerate our efforts along a common path to reach our ambitious but achievable goal – global elimination of blinding trachoma by 2020.

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