

A conversation with Dr. Anthony Solomon, July 23, 2015

Participants

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Note: These notes were compiled by GiveWell and give an overview of the major points made by Dr. Anthony Solomon.

Summary

GiveWell spoke with Dr. Anthony Solomon of the World Health Organization (WHO) as an introduction to the funding landscape for trachoma elimination. Conversation topics included WHO's work on trachoma elimination, other organizations working on trachoma elimination, and the funding landscape.

Trachoma

Trachoma is an infectious disease that causes swelling of the eyelids, irritation, and purulent discharge. These symptoms alone do not carry a significant burden of disease. However, in some communities, individuals acquire repeated infections over many years which can lead to trichiasis — the inversion of the eyelids in such a way that the eyelashes rub against the surface of the eye. Scar tissue accumulates on the inner surface of the eyelid as a result of the immunological clearance of repeated infections and gradually draws eyelashes inward, causing them to scrape the cornea. This can cause irreversible blindness. Trichiasis is painful and significantly decreases quality of life even before the in-turned eyelashes begin to impair vision.

Trachoma is transmitted among populations in situations of extreme poverty. It is rare for children with trachoma to go to medical facilities for treatment, for the following reasons:

- Most infections are not very symptomatic.
- People who have these infections tend to get them frequently, and they are often viewed as a normal part of childhood.
- People who have these infections tend to have limited access to healthcare.

Once trichiasis is present, it is too late for antibiotics to reverse the pathology: an operation is required to redirect the eyelashes so that they no longer rub on the eyeball.

Scope of the problem

Based on WHO's current estimates, trachoma is a public health problem in 51 countries, in which about 232 million people are at risk. Approximately 77% of these people are in the

WHO African region. Trachoma was previously a problem in 7 other countries, which have now claimed elimination of trachoma as a public health problem.

WHO's work on trachoma elimination

The SAFE strategy

WHO employs an integrated package of community-level interventions called the SAFE strategy that involves combating trachoma at all stages of the disease process. This includes preventing people from developing trichiasis, as well as preventing further vision loss and restoring a small amount of residual vision in people who have already developed trichiasis. The components of the SAFE strategy are:

- Surgery for patients with in-turned eyelashes
- Antibiotics to clear infection
- Facial cleanliness
- Environmental improvement to reduce transmission of infection in the community

There are reasonable data supporting the effectiveness of the SAFE strategy. Several of the countries that have eliminated trachoma employed the SAFE strategy to do so.

Because this is a package of interventions, in order to quality for drug donations (for the A component), a ministry of health must ensure that all four components are used. Supporting non-governmental development organizations (NGDOs) must ensure that the other three components are implemented, but are not required to provide funding for all components. This package approach often results in a collaboration between multiple NGDOs and governments.

Surgery

There is good evidence for the effectiveness of surgery for improving visual acuity in people suffering from trichiasis. Repositioning the eyelashes through surgery so that they no longer rub on the surface of the eye reduces edema in the cornea, which slightly improves visual acuity. Unit costs are difficult to identify because they vary widely in different locations, but published data suggest that it is a very cost-effective intervention.

Antibiotics

The antibiotic azithromycin is used to lower the prevalence of both infection and active trachoma (inflammation associated with infections). Azithromycin is usually distributed in a mass drug administration (MDA) to all members of a population over 6 months of age. An eye ointment is offered as an alternative for people who choose not to use azithromycin and those under 6 months of age.

There is good evidence, including a randomized controlled trial in Ethiopia, that MDAs of azithromycin have the additional benefit of significantly reducing child mortality in children 1-5 years old, although the exact reasons for this are not yet clear.

To determine where an MDA is needed, ministries of health measure the population-level prevalence of the sign of "trachomatous inflammation-follicular" (TF) in children 1-9 years

old. In populations where the prevalence of TF is 10% or greater, annual MDAs are recommended for a minimum of 3 years before a review is conducted to determine whether further intervention is needed. Where the prevalence of TF is 30% or greater, annual MDAs are recommended for 5 years before further review.

Facial cleanliness and environmental improvement

It can be difficult to determine the best strategy to address facial cleanliness and environmental improvement. The evidence for interventions in these areas is limited, in part because it is difficult to conduct studies adequately powered to estimate their effectiveness.

Water, sanitation, and hygiene (WASH) interventions are generally not very strongly supported by randomized controlled trial-level evidence, but are nevertheless generally believed to be effective, and in any case are worth supporting from a human rights perspective.

Dr. Solomon's role at WHO

Dr. Solomon is responsible for leading and coordinating global elimination of trachoma within WHO. His work includes:

- Coordinating with other Neglected Tropical Diseases (NTDs)
- Coordinating with WHO's Water, Sanitation & Health group within the Department of Public Health, Environmental and Social Determinants. They recently produced a joint strategy on using WASH interventions to combat NTDs.
- Advocating for trachoma elimination amongst governments, potential donors, and NGDO partners.
- Working to mobilize resources such as money, sutures, and drugs.
- Providing technical support to countries, sometimes through regional and country offices.
- Acting, ex officio, as the Secretary to the WHO Alliance for the Global Elimination of Trachoma by 2020 (GET2020).

Data collection

WHO collects data on the epidemiology of trachoma and the implementation of trachoma elimination activities at a national level and uses these data to monitor international progress toward the goal of trachoma elimination. Dr. Solomon has a research brief and is gathering a network of WHO Collaborating Centres for trachoma to carry out research that is necessary to help refine trachoma elimination strategies.

Other groups working on trachoma elimination

Other groups working on trachoma elimination include:

- National ministries of health of trachoma-endemic countries
- Bilateral donors, particularly the UK's Department for International Development and US Agency for International Development

- WHO Alliance for GET 2020
- International Coalition for Trachoma Control (ICTC) - a list of NGOs and academic partners can be found at <http://www.trachomacoalition.org/about-us/members>
- Pfizer, Inc
- The Queen Elizabeth Diamond Jubilee Trust
- The Global Trachoma Mapping Project (GTMP), which is a collaboration between Sightsavers, the London School of Hygiene & Tropical Medicine, the International Trachoma Initiative, and WHO.

Ministries of health

Ministries of health working to protect their populations from the risk of blindness play a major role in trachoma control. The Ethiopian government provides a good example of a ministry that strongly supports trachoma control. Its Minister of Health, Dr. Kesetebirhan Admasu, launched the Ethiopian Initiative to Clear the Trachomatous Trichiasis Backlog, in February 2015. This initiative aims to eliminate trichiasis in Ethiopia by the end of 2016. It uses Ministry of Health funds to train trichiasis surgeons and asks donors to match the Ministry's commitment. The initiative seems to be making good progress.

NGDOs

ICTC is a coalition of non-governmental development organizations (NGDOs), donors, research institutions, and private sector organizations working to eliminate trachoma by 2020. ICTC offers its members guidance on best practices and helps them to conform to standard operations. Sightsavers has been the conduit for several major trachoma-related grants over the last few years and appears to use donated funds effectively. It ensures that money that is earmarked for a certain country is channeled through NGOs that have experience working in that country and are likely to manage the money well.

RTI's ENVISION project offers a program of integrated preventive chemotherapy for seven NTDs including trachoma.

ITI is the steward of the azithromycin donation from Pfizer, which has been donating azithromycin for trachoma elimination since 1998 and will donate its 500 millionth dose this year.

GTMP

When Dr. Solomon worked at the London School of Hygiene and Tropical Medicine, he helped to launch GTMP, which is funded by the United Kingdom's Department for International Development (DFID). The original goal of GTMP was to complete trachoma mapping in 1238 districts in 34 countries between 2012 and the end of 2015, but acquisition of data from some districts and more detailed conversations with ministries of health revealed that there was a total of about 1800 districts in need of mapping. The GTMP is close to achieving this goal. In the last 3 years, GTMP has mapped about 1400 districts in 21 countries, and there are about 100 districts that remain to be mapped in areas that are secure enough for GTMP to work in. This will complete the global baseline trachoma map in all areas that are secure and suspected to be endemic. There are several hundred more districts that are insecure, which GTMP is unlikely to be able to map during the lifespan of the Project.

Dr. Solomon continues to work on trachoma mapping in his position at WHO.

Funding for trachoma elimination

Funding breakdown of the SAFE strategy

Surgery and antibiotics are the best funded of the four components of the SAFE strategy, and Dr. Solomon believes that antibiotics are likely better funded than surgery. USAID has given a \$35 million grant to HKI through the Morbidity Management and Disability Prevention for Blinding Trachoma and Lymphatic Filariasis (MMDP) Project. This grant funds both trichiasis surgery and hydrocele surgery for lymphatic filariasis (LF), another NTD. USAID regards this grant as a "research space," being an investment that should generate information to guide morbidity management and disability prevention efforts in its own programs and elsewhere. The portion of this funding that is spent on trichiasis surgery is directed to three countries. The other components of the SAFE strategy implemented in these countries are funded by USAID via RTI International, and other sources. USAID also provides considerable funding to RTI International to support trachoma-related MDA in a range of other countries.

Sightsavers has received £39.4 million from DFID and £42.8 million from the Queen Elizabeth Diamond Jubilee Trust for implementation of the SAFE strategy. These donations are to be used primarily for surgery and antibiotics. A small amount of this funding is allocated for facial cleanliness and environmental improvement, which is intended to support behavior change interventions.

Significant resources would be required for effective environmental improvement, and the funding allocated in this area from trachoma-specific donors is not enough to have a big impact. Partnership with existing major players in the water and sanitation sector is therefore critical.

When Sightsavers receives a grant, it contracts with a coordinating NGDO in the country where the grant is being administered, which engages with the ministry of health to determine an appropriate allocation of funds among regions where trachoma is endemic. It then makes sub-grants to NGDOs with established track records working in particular parts of that country.

Scaling up trichiasis surgery

Case-finding and delivery of services

The amount of funding necessary for case-finding and delivery of services depends on local epidemiology. These costs are low in places that have a high prevalence of trichiasis, including some parts of Ethiopia, and higher in areas with a low prevalence.

Training surgeons

The people who are selected to be trained as trichiasis surgeons are generally ophthalmic nurses who also have good visual acuity and good dexterity. Ophthalmic nurses are good candidates for this work because they have experience providing ophthalmic services and

handling eye tissues. Their training allows them to both perform surgery on patients who come to the clinic and work on community outreach campaigns to deliver surgical services to people who are unable to get to the clinic.

If no ophthalmic nurses are available, general nurses can be trained as well. Cataract surgeons and ophthalmologists are generally not selected to be trained in trichiasis surgery. In areas where trachoma is endemic, the number of people that every ophthalmologist needs to serve is extremely high. For this reason, and the fact that trained ophthalmic nurses can achieve excellent outcomes, it would not be a good use of resources to employ ophthalmologists to perform trichiasis surgeries.

It is typically more efficient to have full-time mobile surgical teams than to have part-time surgeons working in a fixed location, but the blend of tactics chosen depends to a large extent on local epidemiology of disease.

Areas most in need of additional funding

Additional funding is needed for surgery and antibiotics.

Surgery

There is currently less funding available for surgery than for antibiotics, in part because surgery is more difficult to deliver, and in part, perhaps, because donors prefer to fund interventions that allow them to quote their impact in terms of large numbers. It seems to be more attractive from a publicity standpoint to say that antibiotics have been distributed to 1 million people than to say that 1,000 surgeries have been performed.

Antibiotics

The MDAs of azithromycin that will be necessary from 2015-2020 will cost approximately \$39 million per year, or approximately \$240 million total. If that is funded, and appropriate facial cleanliness and environmental partnerships can be forged, it is likely that trachoma will be eliminated as a public health problem.

Funding gap

There are good data showing where trachoma interventions are required and what interventions are needed, but these interventions are currently only about 20% funded. The best estimate so far is that approximately \$750 million will be needed in order to eliminate trachoma by 2020, and \$150-160 million has already been committed. This leaves a funding gap of approximately \$590 million.

Best uses of additional funding

The International Coalition for Trachoma Control is a large network of NGOs, the constituent organizations of which seem to spend money effectively and work well with governments. Ministries of health provide trichiasis surgeons and/or individuals who can be trained as surgeons, personnel to be trained to assist with MDA campaigns, and convene water and sanitation organizations.

Trichiasis surgery is the most urgent intervention in trachoma control because it can prevent irreversible blindness in people who are beginning to lose their vision.

All GiveWell conversations are available at <http://www.givewell.org/conversations>