



Anne-Marie Moulin, Jeanne Orfila, Doulaye Sacko et Jean-François Schemann (dir.)

## Lutte contre le trachome en Afrique subsaharienne

IRD Éditions

---

## General

---

DOI: 10.4000/books.irdeditions.5077

Publisher: IRD Éditions

Place of publication: IRD Éditions

Year of publication: 2006

Published on OpenEdition Books: 29 October 2013

Série: Expertise collégiale

Electronic ISBN: 9782709917735



<http://books.openedition.org>

### Electronic reference

*General* In: *Lutte contre le trachome en Afrique subsaharienne* [online]. Marseille: IRD Éditions, 2006 (generated 07 mai 2019). Available on the Internet: <<http://books.openedition.org/irdeditions/5077>>. ISBN: 9782709917735. DOI: 10.4000/books.irdeditions.5077.

---

# General

Blindness is a real affliction in Africa, affecting more than six million people, with a prevalence exceeding 2% in certain countries of the Sahel. Although a blind person often has a privileged place in society compared with other forms of handicap, blindness remains an immense hardship because of sensory deprivation, difficulties in providing for one's needs and the associated complications in everyday life. Blindness often obliges blind people to leave the village, where they have been marginalized, and go to beg in the cities, where they sometimes gather together. Blindness occurs relatively late in life: 80% of blind people are over 60. Women suffer most, accounting for more than three quarters of blind people. Their disability is often more serious because of their duty to carry out domestic tasks, bear and look after children. Women may also have great difficulty in finding a partner, which would give them the possibility of having a family and sighted children to take care of them.

Yet, around 80% of this form of blindness is preventable, like those due to childhood infectious diseases (trachoma, measles, gonococcal conjunctivitis), food deficiencies (vitamin A deficiency), or curable ailments like cataracts.

Today, life expectancy is increasing in most southern countries. The number of blind people can therefore be expected to increase. Governments and international organizations are now aware of the seriousness of the problem. In 1999, the WHO, in partnership with the International Agency for the Prevention of Blindness, launched the program "Vision 2020-the right to sight", which aims to eliminate preventable blindness due to five causes: cataracts, trachoma, onchocerciasis, vitamin A deficiency and refractive errors of the eye. Three of these causes affect Africa in particular. The target set for year 2020 is to halve the present number of blind people, which, according to some, would have the advantage of generating a saving equivalent to the total budget of Ethiopia.

Trachoma is considered responsible for almost three million cases of blindness in the nineteenth century. However, this cause of blindness is pre-

ventable, if it is caught in time. Indeed, blindness itself is not curable. However, the surgical treatment to correct in-turned eyelashes (known as trichiasis), which ulcerate the cornea and cause its opacification, prevents it from reoccurring. Similarly, the treatment of initial conjunctival infections prevents trichiasis from developing.

Trachoma remains very much present in poor rural areas of most Middle Eastern countries, the Indian subcontinent, South East Asia, and certain parts of Latin America.

In 1995, the WHO estimated that 146 million people were carrying the pathogenic agent and required treatment. Furthermore, that 10 million suffered from trichiasis. Approximately 6 million people were regarded as blind or partially sighted because of trachoma.

In March 2004, the latest information communicated during the eighth meeting of the WHO Alliance for the elimination of trachoma reported that approximately 84 million people carried the infectious agent and required treatment. Also, that 7.6 million people suffered from trichiasis.

Africa is the second most affected continent. More than a quarter of the people with active trachoma live in sub-Saharan Africa.

## **WHAT IS TRACHOMA?**

Trachoma is defined today as an infection of the cornea and conjunctiva, due to a bacterium called *Chlamydia trachomatis*. This infection is characterized by the presence of follicles, abnormal increase in papilla cell growth and granulation of the cornea. The infection develops chronically and causes an uncontrolled growth of the eyelashes, which rub the cornea (trichiasis), leading to opacification and thus blindness.

Trachoma has been known since ancient times. The famous papyrus of Ebers, from the time of the pharaohs, already mentions a disease where the eyelashes turn inwards into the eye, a characteristic sign of the infection. The term trachoma was used by the Greek doctor Dioscorides and indicates a roughness of the eyelid. It is nevertheless probable that throughout history, trachoma was far from being responsible for all the red or purulent eyes described by travelers or doctors.

In the nineteenth century, trachoma was prevalent over the whole planet. It particularly attracted the attention of doctors in Europe, where it was a real plague in communities (armies, schools). At the beginning of the twentieth century, America, the land of mass immigration, viewed the trachoma of the Old World as a terrible threat. On the small island of Ellis, at the entrance to the port of New York, the medical departments examined newcomers and checked the condition of their conjunctiva. Today, Europe has forgotten a disease that doctors knew as an everyday occurrence.

It was only in the 1950s that we managed to identify the exact nature of the agent in question and the way in which the eyes were attacked. Observation of germ cultures gave a precise idea of what occurs in the organism. The trachoma germ multiplies exclusively inside the cells of the conjunctiva following a complex cycle. When the infected cell bursts, the virulent elements that it contains then infect new cells, and the cycle continues.

The seriousness of the disease results from the inflammation provoked by the infection, from reinfection and superinfection.

Trachoma starts in infancy. When the child reaches the age when he can complain, the infection is marked only by stinging, discomfort when closing the eye and a sensation of a foreign body. More rarely, it takes the form of acute or chronic conjunctivitis. It is only in its severe forms that the signs are symptomatic: continuous eye-watering and visual intolerance of light.

Cures can occur spontaneously, but the infection may also persist for several years. If the inflammation continues, even in the absence of germs, the formation of scar tissue causes a retraction of the upper eyelid which turns inwards (entropion), with uncontrolled growth and in-turned eyelashes (trichiasis). Trichiasis occurs after a very variable period of evolution. Friction of the eyelashes on the cornea is painful and favors ulceration, which develops into complete and irreversible blindness, usually affecting the adult in middle age. On the upper part of the cornea, the dilated vessels may appear accompanied by a thick, fibrinous deposit (pannus).

The risk of evolution towards blindness depends on the duration and especially the intensity of chronic inflammation. It is probably favored by bacterial superinfection and reinfection by the *Chlamydia*. However, we do not know of any clinical or biological element allowing us to unfailingly predict an unfavorable evolution towards trichiasis and blindness.

During its evolution, the disease can affect the lachrymal glands. The lack of tears and secretions leaves the eye dry, which encourages corneal superinfection and ulceration even more.

### **An essentially clinical diagnosis**

Diagnosis is not very difficult providing that the free edge of the eyelid is turned outwards. The telltale lesions then appear: small yellowish-white protuberances (follicles) on the back of the upper eyelid and/or whitish scars indicating an old infection. A binocular magnifier is very useful.

However, although it is relatively simple to identify trachoma without too much mistake when the disease is very frequent in the population, diagnosis is more complex when it is rare. It can be difficult to detect a few follicles on the back of the eyelid or scars not very visible, depilation or disorganization of a few eyelashes. When the disease retreats, it is less easy "to track trachoma". It is because of failure to carry out this simple examination of the eyelids that many countries have forgotten the presence of the infection.

A classification of ocular lesions due to trachoma was formulated at the beginning of the twentieth century by the doctor Arthur McCallan. Classification was then improved to specify the degree of inflammation of the lesions in order to facilitate the prognosis and more precisely to identify populations at risk of blindness. Nevertheless, at the same time, this classification, with its eighteen levels, has become a genuine research tool, difficult to put into the hands of everyone. In 1985, to facilitate investigations and comparisons between regions and countries, Thylefors and his collaborators at the WHO prepared a simplified method for coding the signs of trachoma:

- follicular trachoma (FT) is marked by the presence of granulations,
- a more severe infection (ST, severe trachoma) shows a thickening of the conjunctiva, which covers the eyelid masking at least half of the vessels normally visible on its surface,
- years later, scars on the connective tissue in the eyelid are seen (CT, cicatricial trachoma). Then the eyelid turns inwards with uncontrolled growth of the eyelashes (TT, trachomatous trichiasis), which ends in corneal opacity (CO) causing blindness if they are located in the center of the cornea.

This robust and reliable simplified coding, easy to teach and implement on the ground, has been very helpful.

## The laboratory used in research

Since the diagnosis is primarily clinical, cultivation techniques for *C. trachomatis* in the laboratory do not play a routine role. These techniques are delicate and expensive, and are only performed in specialist laboratories.

Laboratories will necessarily be involved in epidemiological investigations, when the rate of infection decreases and we reach the threshold of eliminating the disease. At that moment, it will be necessary to accurately evaluate the remaining human reservoir of the virus and the circulation of *Chlamydia* in the environment.

The most sensitive method of diagnosis is the recent technique of molecular biology known as PCR (Polymerase Chain Reaction). This is a method of amplifying the genes, which makes it possible to detect typical fragments of the components of *Chlamydia*, even in small quantities. First used for diagnosing genital chlamydiosis, it is also applicable to conjunctival samples and could in the future become the reference method. It is relatively expensive and requires special equipment. It is currently practiced only in rich countries but seems the best strategy for the future. Several firms market the reagents and we can expect lower prices, simplification and automation of procedures allowing an examination of a great number of samples in very short time.

Through culture, it is possible to test the effectiveness of the antibiotics, which must have an intracellular action. In the past, locally applied sulfonamides had a certain effectiveness (applied generally was abandoned after accidents). Cyclins in the form of ointment applied to the eyes were for a long time the reference treatment. More recently, the family of macrolides has supplanted them. Within this family, the superiority of azithromycin is due to its persistence in the cell for around ten days. It functions as a true delay molecule, which progressively eliminates the intracellular bacterial particles.

## Trachoma, a contagious disease

The disease is transmitted by direct contact with ocular secretions or nasal droplets, or indirectly by fingers, towels or soiled loincloths; also by flies, which intervene as passive vectors.

Contamination generally takes place during the first two years of life.

### **Several factors at the origin of trachoma**

In the last century, hereditary factors were often accused for the occurrence of trachoma. Today, it is accepted that susceptibility to trachoma, under the probable control of several genes, seemingly varies within the same family. The evolution of the disease also depends on the functioning of each person's immune system. The organism reacts to the infection of the conjunctiva by releasing cascades of molecules involved in the inflammation. The result of these reactions decides the type of cicatrization and the evolution of the disease.

However, for the moment, immunology and genetics do not provide markers that can be used on the ground for the early prediction of cases evolving to severe trichiasis and for identifying groups at risk. This will perhaps be possible with the new molecular biology techniques.

Biological factors do not constitute elements usable on the ground for detecting trachoma. However, poverty indicators such as lack of water, illiteracy, dirt and pullulation of flies, absence of latrines, etc, were and still are very much associated with trachoma throughout the world, especially in Africa.

### *THE HISTORY OF TRACHOMA IN SUB-SAHARAN AFRICA*

Throughout the colonial period, research into trachoma concerned North Africa then sub-Saharan Africa.

Doctors of that time had a good knowledge of trachoma. They described the disease in Senegal in 1915. In 1924, Lefèvre evaluated at 33% the percentage of trachoma in schoolchildren of the district of Mopti in French Sudan, now Mali. In 1926, Motais drew up the first map of trachoma in French Africa and noted that trachoma, exceptional south of the eleventh parallel, was more rife on approaching the desert when going north, raising the question of the role of wind and dust in conjunctival irritation. However, according to Motais, trachoma tended to move along the main caravan routes from north to south. It is possible that shifts in the population associated with colonization (civil engineering work, conscription, etc.) played a role in the geographical extension of endemic disease.

In 1924, Jamot examined 30,000 people in the district of Fort Foureau in Chad and reported 10.5% of trachoma and 0.66% of blind people. This figure appears surprisingly low compared with figures from modern investigations, but is partly explained through a different definition of blindness; the blind person was “someone who now does not see at all”. Today, according to the WHO, a blind person is someone who cannot count fingers at a distance of three meters.

In 1949, at a time when trachoma retreated in most European countries, people began to be alarmed at the extent of the disease in sub-Saharan Africa. In Fort Lamy (N'Djamena), in Chad, 35% of the inhabitants were announced as trachomatous. This level increased up to 50% in certain villages of French West Africa. However, it is only at the end of the 1970s that one really became aware of the amount of endemic disease in sub-Saharan Africa.

Today, the spread of trachoma in Africa looks like a large cross with the vertical extending north to south, from Morocco and Egypt as far as South Africa and the horizontal extending from west to east, embracing most of the Sahel.

## *THE WHO ALLIANCE FOR ELIMINATING TRACHOMA*

In 1949, the WHO decided on an ambitious policy aimed at eradicating infectious diseases over the whole planet. The great success of the eradication of smallpox, announced in 1980, encouraged it to continue and choose other targets such as leprosy and tuberculosis. However, for a variety of reasons, the smallpox model has proved difficult to reproduce.

The ambitious program for combating malaria, founded on the hopes placed in insecticides, encountered many difficulties and has given way to a more realistic approach: “Roll Back Malaria”.

Programs against more circumscribed diseases like onchocerciasis, a cause of blindness in West Africa, and the Guinea worm, were less spectacularly successful than that for combating smallpox. However, they are instructive especially concerning the role of communities in fighting disease.

In spite of the familiarity of all the countries with the disease, trachoma has not mobilized populations very much and has not interested governments. It was known that trachoma was serious in many countries of

Sahelian Africa, the Horn of Africa and Latin America (Brazil, Southern Mexico, Chile, Peru), but there was ignorance as regards the exact topography or the true burden of endemic disease in the absence of a data collection system. For countries emerging from war, like Afghanistan or Kampuchea, knowledge was even more fragmentary.

However, trachoma appeared the type of disease about which the international scientific community had unparalleled historical experience, provided that the effort was made to analyze it. Since trachoma had disappeared from many countries, one could hope to accelerate this natural evolution. Thus, combating trachoma had what was needed to draw the attention of international organizations. Countries now free of trachoma could remember their late sufferings and help to spare others from them.

What is more, in 1996, the WHO had noted the exemplary evolution of a small number of countries like Gambia, Myanmar and Morocco. An analysis of the evolution of endemic disease in these countries provided guidelines for future strategies and allowed one to think that, even without spectacular economic development, it was reasonable to hope to eradicate blindness due to the disease. Countries on the way to being freed from the pestilence could help countries most afflicted to benefit from their very recent experience, allowing them to take the same route.

It is in this context that the WHO created the international Alliance in 1996 to eradicate blinding trachoma by 2020. The Alliance, a coordinating body, brings together the countries that request it because they believe that trachoma is a public health problem for them.

The Alliance leads and coordinates action to combat trachoma, helps to circulate documents and develop elimination procedures, training and education. It collects data, currently still very unequal, on the level of the disease in these countries. Its mission is to sensitize countries for whom trachoma is not necessarily a priority, foster the exchange of experience and information, and encourage partnerships with the NGOs and foundations concerned with blindness.

The number of countries joining the Alliance has increased over the years (4 countries in 1996, 37 in 2004), indicating an increased awareness of the problem of health posed by trachoma. Specific national programs have been created, national committees organized, and numerous workshops have studied the various aspects of trachoma control.

The Alliance does not aim at eradication but at elimination of the disease, which supposes a drop in the prevalence of active trachoma to under a certain threshold and not its total disappearance. The term “blinding” was added to mean the elimination of trachoma as a cause of blindness. Trachoma would thus be brought down to the level of a childhood disease without effect on sight. The date 2020 was chosen, leaving an interval of about a generation, reasonably sufficient to prepare for a change in mentalities and facts.

Since 1996, Mali has been one of the countries with reliable epidemiological data and a governmental determination to attack the problem. Thus, together with other African countries, it was in the first wave of the war on trachoma. The review of the IRD, which is in progress there today, testifies to a historical continuity.

### **The SAFE strategy**

As a means of action, the Alliance has developed an original strategy, the “SAFE” strategy: S for Surgery, A for Antibiotic treatment, F for Facial cleanliness, E for Environmental improvement. This strategy, which was worked out in 1995, is an eclectic way of associating a wide variety of measures:

- medical and “technical” measures such as surgery and the distribution of antibiotics;
- other wider measures call upon major, complex and durable changes in the environment (improvements in water resources, fly control, managing refuse) or behavior (education, personal and collective hygiene), etc.

The hygiene element, limited to facial cleanliness, refers to behavior dependent on physical conditions (water and soap) and sociocultural standards. It is in this respect that the historical lesson is both impossible to circumvent and difficult to seize because of the complexity of the changes occurring simultaneously in societies that got rid of trachoma before antibiotic therapy like Western Europe or the United States.

The SAFE strategy highlights the role of the population, the importance of its understanding the risk of blindness and the resources used to prevent it. The strategy has deliberately emphasized medical action involving the participation of the “community”, even if these simple watchwords represent complex facts varying from one country to the next and suppose a local definition of what one calls community.

Nevertheless, within this complex, ecological strategy appear innovative technical factors, which because of their weight, are likely to polarize attention to the detriment of other strategies.

In 1996, a new antibiotic, azithromycin, active against *Chlamydia trachomatis* because of its good intracellular penetration, has been recognized as particularly effective for treating trachoma. Administered orally just once (as a tablet or drinkable solution for young children), azithromycin was obviously tempting compared with the existing standard treatment, which involved the prolonged use (for at least six weeks) of tetracycline ointment, difficult to apply to the eye, and poorly accepted by children.

This antibiotic did not immediately seem to be a solution for countries with limited resources. In 1998, the International Trachoma Initiative (ITI) was created by the philanthropic section of Pfizer, which manufactures azithromycin, with the help of the Edna McConnell Clark Foundation. Up to now, Pfizer has provided the molecule free of charge to carry out tests in Tanzania, Gambia, Egypt, and Morocco, comparing azithromycin to the standard treatment of ointment with 1% tetracycline. These tests showed an equal reduction in the infection. In November 2003, Pfizer announced a gift of 135 million doses of azithromycin for the next five years, via the International Trachoma Initiative.

Azithromycin, capable of treating trachoma in one single application, and therefore of being distributed in mass campaigns to the population, appeared for certain as the "magic bullet", the wonder drug, the search for which has played such a major role in the history of infectious diseases.

At the moment, the worldwide acceptance of the SAFE strategy reflects a consensus within the community of specialists in public health at the WHO and in the countries concerned. No alternative point of view has been supported by trachoma specialists in recent years. The SAFE strategy, by associating technical and medical resources concerning society and the environment, aims at a positive effect on trachoma control.

In existing documentation, there is no reason for limiting this strategy to one or more of its components, even if certain scientists or policies are nostalgic as regards eradication policies followed on the basis of administering a single product in a mass campaign.

However, work is far from being completed on the principle of the strategy. As soon as a country decides to engage in trachoma control, it must define the precise action of each element and the way of using them.

### **The elements of the SAFE strategy**

The SAFE strategy favors an “ecological” approach of multiple attacks on the disease. It combines surgical and medical measures to work on the environment and behavior, which stabilize and extend their effects.

#### ***Trichiasis surgery***

This surgery, relatively simple in principle, aims at rectifying the eyelid so that the in-turned eyelashes no longer rub against the cornea. There are several variants of this surgery, but the problem is not so much choosing the technique, rather organizing the screening, training of operators, and choice of strategy to offer good quality surgery as close as possible to the patient’s home. It is also important to understand the obstacles restricting access to this surgery.

#### ***Antibiotic therapy***

The distribution of azithromycin is a key factor in the strategy. Several questions arise concerning the methods of administration of the antibiotic (frequency of distribution and choice of target population, etc.), strategies to adopt to obtain the product and distribute it, ways of avoiding any misappropriation, and finally the consequences of distribution on the health system.

The use of this antibiotic in mass campaigns raises questions about possible side effects, regarding resistance to *C. trachomatis* or other bacteria. Thus, vigilance is needed.

#### ***Hygiene measures***

The SAFE strategy includes a hygiene component relying primarily on facial cleanliness. The school could be one of the ways of modifying the behavior of children in this direction, also that of their family. Education is a key to development.

However, the school, the poor relation in most African countries, is going through a crisis in training and recruiting teachers, and its prestige has decreased a great deal. In what conditions can it become a genuine tool in the service of the community?

***Water in the service of health***

It is not enough to recommend hygienic behavior. The use of water firstly supposes an availability of sources. The decrease in trachoma depends directly on the efforts made to increase the quantity of water available used for personal washing. When water is relatively abundant, the behavioral factor becomes dominant. Furthermore, improvements in access to water include many secondary benefits for daily comfort, and a strong motivation for the community.

***Environmental measures***

Certain species of flies are indisputably able to convey *C. trachomatis* and consequently increase the risk of infection. The season of fly proliferation often coincides with an increase in cases of trachoma. Thus, building latrines, domestic waste disposal systems, cleaning the yards of habitations will help to reduce the spread of trachoma. So, the SAFE strategy, which aims at improving the environment, should not neglect the management of liquid and solid waste and excrement.

Among problems arising from the environment, as regards trachoma and the pullulation of flies, the collection of refuse nowadays attracts the attention and thought of the world. A major issue is the authorities' assumption of responsibility for garbage collection and destruction. In most countries in the southern part of the world, garbage collection was long in the hands of specialist corporations, like the ragmen of Europe, who were skilled at sorting and recovery. Now, big multinational companies are asking for refuse to be managed, and propose solutions in the name of environmental cleanliness. However, the recovery of waste is proving much lower than when it was in the hands of local people working on the job. Moreover, this has led to unemployment among former street sweepers. This is therefore a rapidly changing situation, where the sub-Saharan African countries have to invent their own solutions.

As regards trachoma, the effects of sanitation only appear after a varying time. Nevertheless, they will concern many other diseases apart from trachoma (diarrhea, respiratory infection, intestinal parasites, etc.).

**The financial cost of trachoma and prospects for development**

Blinding trachoma has an impact on the economy and on output of the countries affected.

Only identification in the field of the financial cost and handicap suffered by individuals, depending on age, profession and the family context, can accurately reflect the diversity of the situations. In the absence of such work, the documentation provides models that rest above all on a certain number of assumptions concerning the percentage of drop in individual productivity according to disability.

The difficulty of economically evaluating trachoma is increased by the fact that trachoma affects the poorest populations the most. The loss of income of these poorest – women, the elderly, all persons in the “informal sector” – is particularly difficult to estimate.

### **Assessment and outlook for the SAFE strategy**

The SAFE strategy partly aims to simulate the historical development of the countries that freed themselves from trachoma before the age of antibiotics, but retaining modern advantages such as antibiotic therapy. It is difficult to evaluate as a whole because of the variety of factors, which do not evolve at the same rate. How can we compare the effects of improvements in hygiene, which take a generation to appear, with the effects of surgery on the elderly and antibiotic therapy on children? How can we model and quantify the effects of washing face and hands?

Nevertheless, its effects can be evaluated globally, and its promoters have maintained its unified quality, even if changes in certain components are foreseeable between now and 2020.

Economic considerations are in the forefront as regards an overall evaluation of the SAFE strategy during coming years. They also affect the importance of its various components, among which a balance needs to be found. Each component may take different forms, at a measurable cost, such as the distribution of azithromycin. Also, changes in costs of the various measures over the next two decades have to be considered.

### **The Malian program in the world**

The proposal of the WHO “Vision 2020-the right to sight” has adopted the same timescale as the Alliance against trachoma. Because of the amount of endemic disease in its land, and through the swiftness and determination with which it has organized its national program, Mali is one of the leading

pilot countries endeavoring to eliminate blinding trachoma and bring other countries in the region along this route. It is with such efforts, that a reasonable hope to halve the population of blind people in the world rests.

### *GENESIS OF THE SYNOPSIS*

The review on trachoma in sub-Saharan Africa is addressed to governmental decision-makers and organizations concerned, providing them with accurate information and solutions to help them implement an effective, coherent plan and follow it through.

The sponsors' questions cover three different areas:

- epidemiology: identifying the risk factors;
- social sciences: aiming at a finer, more qualitative analysis of the environment;
- public health: proposing ways of implementing the strategy as close as possible to decisions.

This review, which brings together French- and English-speaking specialists from around the world, also reflects the expectations and debates of the various communities concerned.

The group of specialists involved in the review, with their own training and inevitable preconceptions, pool their knowledge of the field and their bibliographies. The question of trachoma control in sub-Saharan Africa has been defined, if not tackled, from a deliberately medical angle ("trachoma is an infection of the conjunctiva due to *Chlamydia trachomatis*" ...). However, the aim of the review is not to establish the terms of ideal action, but to clarify the terms of alternative solutions and weigh up the consequences of practical choices, relying on the present state of scientific information.

This review differs from an open forum of people because of the scientific requirements that it has to respect. Nevertheless, it is open to suggestions from members of the scientific community and the department of the IRD that guided it. Everyone's relevant and pertinent questions, the vision of the role of the reviews by the department director, Marianne Berthod and her team, have contributed to opening up and extending the review beyond the strict limits of trachoma.

In spite of the always strong temptation of specialists to build an ideal and technocratic model of the projected action, the final synopsis has insisted on the problems underlying the various questions while considering the practical conditions for fighting trachoma.

After considering the “lessons of history” and examining the trajectory of elimination of trachoma in the past, the synopsis looks at the experience of the populations and their attitudes towards eye diseases. It presents the data on the economic cost of trachoma and examines the links between development and the disappearance of trachoma, before studying the action needed. It reviews the available resources: Firstly, an assessment of the medical-surgical resources. Surgery, when and how should we operate? By whom and with what results? Next, the antibiotic therapy, with all the questions that its use raises: monitoring of side effects and resistance, obtaining and distributing the product, possibility of misappropriation and local malfunctioning. The work on behavior and environment, more difficult to define but capable of development, includes changes in collective and private hygiene, the role of the school and media, improving water, fly control and managing waste and excrement.

Who should we call on to accomplish these initiatives? Women, the first concerned as mothers? The personnel of the health organizations? The communities? Which part should be played in these procedures by the communities?

Finally, the document considers the continuation, monitoring, planning and models for guiding estimates on the route to eliminating trachoma between now and 2020. If there are any recommendations, they are given in the chapters. The conclusion completes the reasoning and consolidates the arguments intended for the policy-makers.

The SAFE strategy is the current horizon of the trachoma control. In 2003, with the aim of facilitating policy-making and national planning, the WHO proposed the ultimate intervention objectives (UIO) to provide tools suitable for monitoring the programs. The precise objectives of the various aspects of the SAFE strategy and the indicators enable us to decide if the aims have been achieved or not. They may obviously differ from country to country. The review provides useful elements of thought for adjusting the definitions, especially where they are most difficult to apply (environment and hygiene), from the point of view of public health.