

## Epidemiological Report

# Trachoma and Conjunctivitis

Historic Series 2010 – 2020

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## TRACHOMA

### BRIEF HISTORY

Trachoma, an infectious eye disease, did not exist among the native populations of the Americas. It was brought by European colonization and immigration, spreading and becoming endemic throughout Brazil.<sup>1</sup> It was the first eye disease to draw the attention of the country's health authorities to a public health problem that affected the eyes and caused blindness.<sup>2</sup>

During the last century, the prevalence of trachoma was high worldwide. The disease gradually disappeared, mainly in North America, Europe and Japan. It is believed that this control was much more due to the improvement of the living conditions of the populations than to the public health intervention programs.<sup>3</sup>

The state of São Paulo (SSP) was the pioneer in the fight against endemic trachoma disease, when it began planning and executing a disease surveillance and control program in the early 20th century. A network of trachoma dispensaries was established, in which there were fixed posts and itinerant posts that worked to combat the disease.<sup>4</sup>

Its prevalence gradually decreased and in the last survey, conducted in schoolchildren in 1975, the prevalence of active trachoma was below 1%.<sup>5</sup> Therefore, the authorities at the time considered that the disease would be virtually "eradicated" by the end of that decade. With the administrative reform of the São Paulo State Health Department (SHD-SP), the Trachoma Institute and the network of dispensaries were extinguished and transformed into the Sanitary Ophthalmology Service and eye health care services.<sup>6</sup>

In São Paulo, the disease considered controlled in the 1970s, returned to being a concern in the following decade, with the reappearance of important disease focus, with high prevalence. This led SHD-SP to implement epidemiological surveillance (ES) of trachoma and its reinclusion, in 1992, in the list of diseases of compulsory notification of the state.<sup>5,7</sup>

Despite a marked decrease in the prevalence of active trachoma in recent decades in Brazil, Specially since the 1970s, it was observed that the disease persisted as a public health problem in poorer areas of Brazil. Data from the last prevalence survey in schoolchildren, conducted from 2002 to 2008 in 1,514 municipalities in 27 states with Human development Index (HDI-M) lower than the national average (0.742), showed that trachoma, in its transmissible form, had a prevalence of around 5%.<sup>8</sup> In 37.6% of the municipalities sampled, coefficients above 5% were found, which is considered by the World Health Organization (WHO) as an indicative parameter that the disease is not under control. According to this same survey, the prevalence of active inflammatory trachoma (TF and/or IT) was 3.8% in SSP.<sup>8</sup>

The prevalence of the disease in SSP is considered low when compared to data from other endemic countries and some regions of the North and Northeast of Brazil.<sup>9,10</sup> The detection rate, however, reached 10% in 26 municipalities in São Paulo, from 2000 to 2010, considering that a maximum of 31% of them perform VE activities. The prevalence of *Trachomatous trichiasis* (TT) in adults and the elderly is unknown, although there are cases being treated and monitored by eye plastic services of the main universities of SSP.

Since 1996, the WHO has been intensifying efforts to eliminate the disease as a public health problem, so that no more cases of blindness caused by the disease occur. A group of *experts* proposed eliminating trachoma as a cause of blindness by the year 2020. To achieve this goal, advocated a strategy called *SAFE*— English acronym for surgery of *Trachomatous trichiasis* – TT (S), antibiotics (A), in cases of trachomatous inflammation - follicular - TF, cleaning the face (F) and environmental Health (E).<sup>11</sup> For this purpose, WHO has defined the following indicators:<sup>12</sup>

- prevalence of TF lower than 5% in children aged 1 to 9 years sustained for at least two years in the absence of massive antibiotic administration in previously endemic districts;
- prevalence of TT unknown by the health system below 0.2% in people 15 years of age or older, or less than 1 case per 1,000 inhabitants in previously endemic districts and
- written evidence that the health system can ensure the identification and management of incident cases of TT. To do so, it is necessary to assemble a dossier with the collected data.

The WHO Global Alliance for the Elimination of trachoma as a Public Health Problem has already achieved success with a significant decrease in 91% of trachoma cases and 74% of trachoma trichiasis worldwide. However, to date, only 16 countries have reached the target, within which 13 have already officially received elimination validation by WHO.<sup>13</sup>

Despite considerable progress, the target set in 1996 has not been achieved. The Global Trachoma Alliance has adjusted its target date for 2030, in line with the United Nations Agenda for Sustainable Development 2030 for the elimination of various other neglected tropical diseases.<sup>13,14</sup>

## ETIOLOGICAL AGENT

The etiological agent of trachoma is *Chlamydia trachomatis*, an eubacterium of approximately 200 to 300 nm, Gram-negative, of obligatory intracellular life. Chlamydia presents tropism by epithelial cells, where it installs and multiplies, forming cytoplasmic inclusions. It adapts to the

hostile environment of the inside of the host cell and multiplies there through a cycle consisting of the alternation of two types of chlamydial cells.

The species *C. trachomatis* belongs to the order *Chlamydiales* and to the family *Chlamydiaceae*, having several serotypes. The A to K causes of trachoma, inclusion conjunctivitis, sexually transmitted urethritis, and cervicitis. Traditionally, serotypes A, B, Ba and C have been associated with trachoma.

The immunological response to repeated *C. trachomatis* reinfections of any serotype from A to K would be the main determining factor in the development of active trachoma.

## TRANSMISSION MODE

The transmission of the disease occurs in a direct way from person to person, that is, from eye to eye, through secretions, or indirectly, by means of contaminated objects such as scarves, towels and pillowcases. Some insects can act as mechanical vectors, especially the housefly and “eye - licker” (*Liohippelates* sp – *Diptera: Chloropidae*).

## EPIDEMIOLOGICAL SITUATION

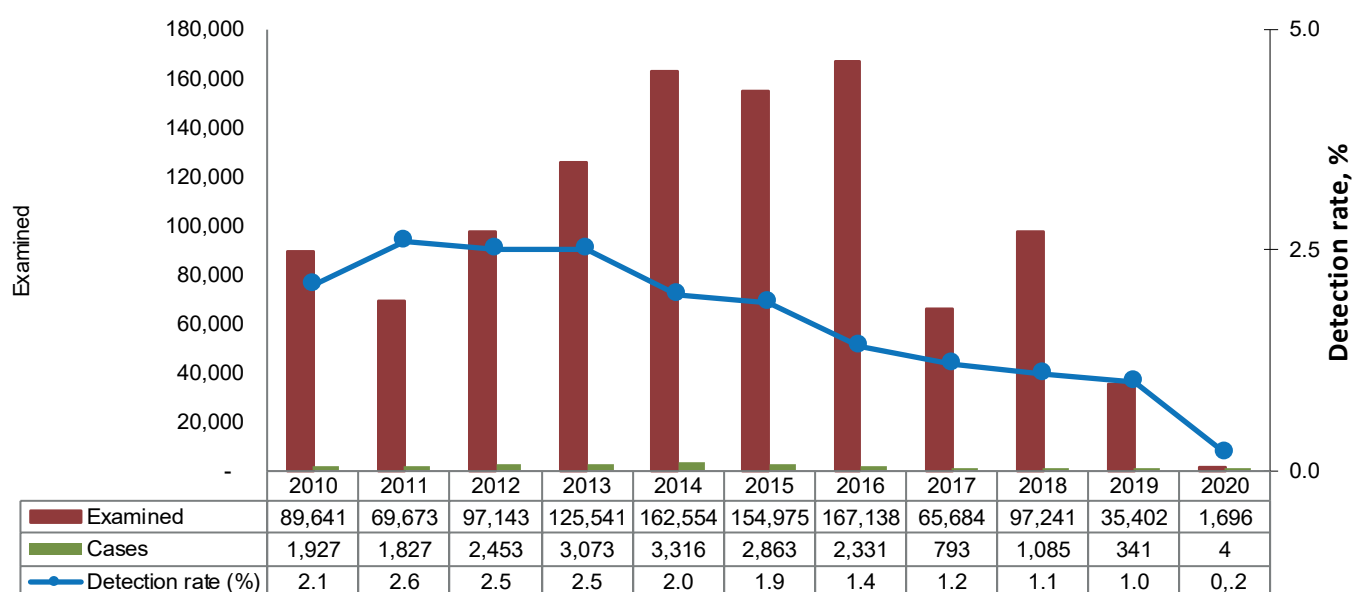
According to the WHO, it is currently estimated that there are 21 million people affected by active trachoma in the world needing of treatment; approximately 1.9 million people have visual impairment or blindness and about 125 million live in areas endemic to trachoma at risk of blindness by the disease.<sup>13</sup>

From 2008 to 2019, data recorded in the Notifiable Diseases Information System (Sinan) revealed that 5,719,967 individuals were examined in Brazil 191,048 cases of trachoma were identified. The mean percentage of positivity of the disease in this period was 3.3%, with mean variations between 1.4 and 4.9%, with values that reveal percentages of positivity below 5%.<sup>10</sup>

Data from the trachoma ES system of the São Paulo State Health Department show the occurrence of trachoma in several municipalities of São Paulo. Disease surveillance activities were interrupted in March 2020 due to the Covid-19 pandemic and resumed only in 2022. Therefore, the ideal is to evaluate the data history until 2019.

In the historical series from 2010 to 2020, 1,066,688 people were examined and 20,013 positive cases were recorded in SSP. The detection rate remained below 3% and the prevalence per 100,000 inhabitants ranged from 7.5 in 2014 to 0.7 in 2019 ([Graph 1](#) and [Table 1](#)).

**Graph 1.** Number of examined, positive cases and trachoma detection rate, in SSP, 2010-2020.\*



Source: Epidemiological surveillance system – ESC/SHD-SP. \*Data updated in July 2022, subject to review.

**Table 1.** Prevalence of trachoma per 100,000 inhabitants, detection rate and participation of municipalities to the SSP trachoma ES program, 2010 to 2020.\*

Year	N. of notifying municipalities	Program participation rate (%)	N. of positive cases	N. of people examined	Detection rate (%)	Population	Prevalence per 100,000 inhabitants
2010	123	19.1	1,927	89,641	2,1	41,262,199	4.7
2011	115	17.8	1,827	69,673	2,6	41,586,892	4.4
2012	141	21.9	2,453	97,143	2,5	41,901,219	5.9
2013	165	25.6	3,073	125,541	2,5	43,663,669	7.0
2014	201	31.1	3,316	162,554	2,0	44,035,304	7.5
2015	201	31.1	2,863	154,975	1,9	44,396,484	6.5
2016	194	30.1	2,331	167,138	1,4	44,749,699	5.2
2017	98	15.2	793	65,684	1,2	45,094,866	1.8
2018	167	25.9	1,085	97,241	1,1	45,538,936	2.4
2019	75	11.6	341	35,402	1,0	45,919,049	0.7
2020	9	1.4	4	1,696	0,2	46,289,333	0.0

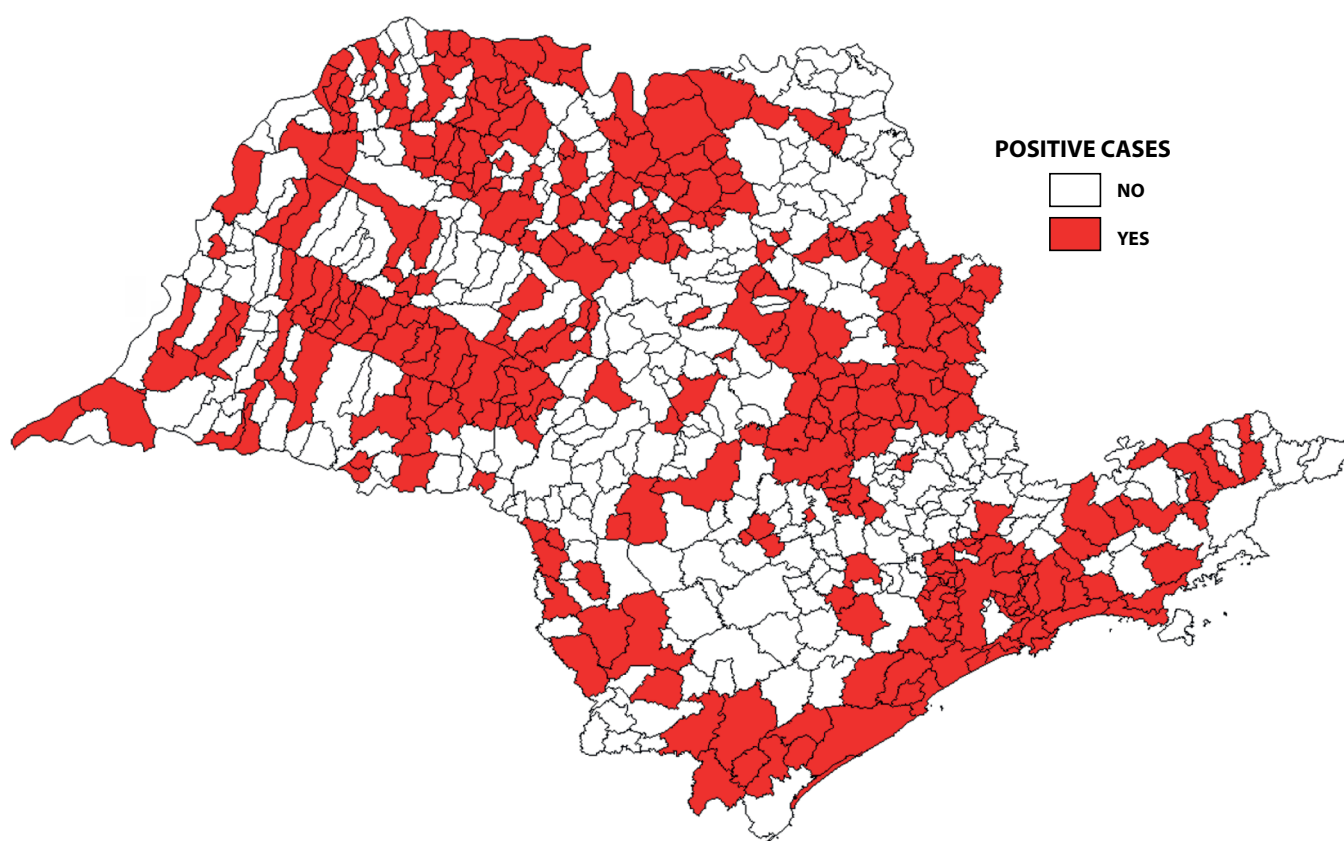
Source: Sinan Net Database – Trachoma Survey. \*Data updated in July 2022, subject to review.

Over the years there was a low participation of the municipalities of São Paulo to the epidemiological surveillance system of trachoma, presenting an average of 23% of them performing activities and reaching 31.1% in the years 2014 and 2015 (Table 1). This low participation has repercussions on the data, as there is no up-to-date information from most municipalities. There

are those who perform trachoma ES activities with notification of many cases in one year and, in the following year, do not perform active search, not presenting, therefore, cases of the disease.

From 2012 to 2018, a national campaign of leprosy, verminosis and trachoma were carried out in schoolchildren, with an increase in the number of eye exams and recorded cases of trachoma. During the years of the campaign, more than 500,000 students aged 5 to 14 years were examined, and approximately 10,000 cases of the disease were detected and treated. This increase was mainly recorded between 2013 and 2016. There are cases in all regions of São Paulo, and the distribution of positive cases by municipality of residence can be observed in Figure 1.

**Figure 1.** Distribution of confirmed cases of trachoma according to the municipality of residence. SSP: 2010- 2020.\*



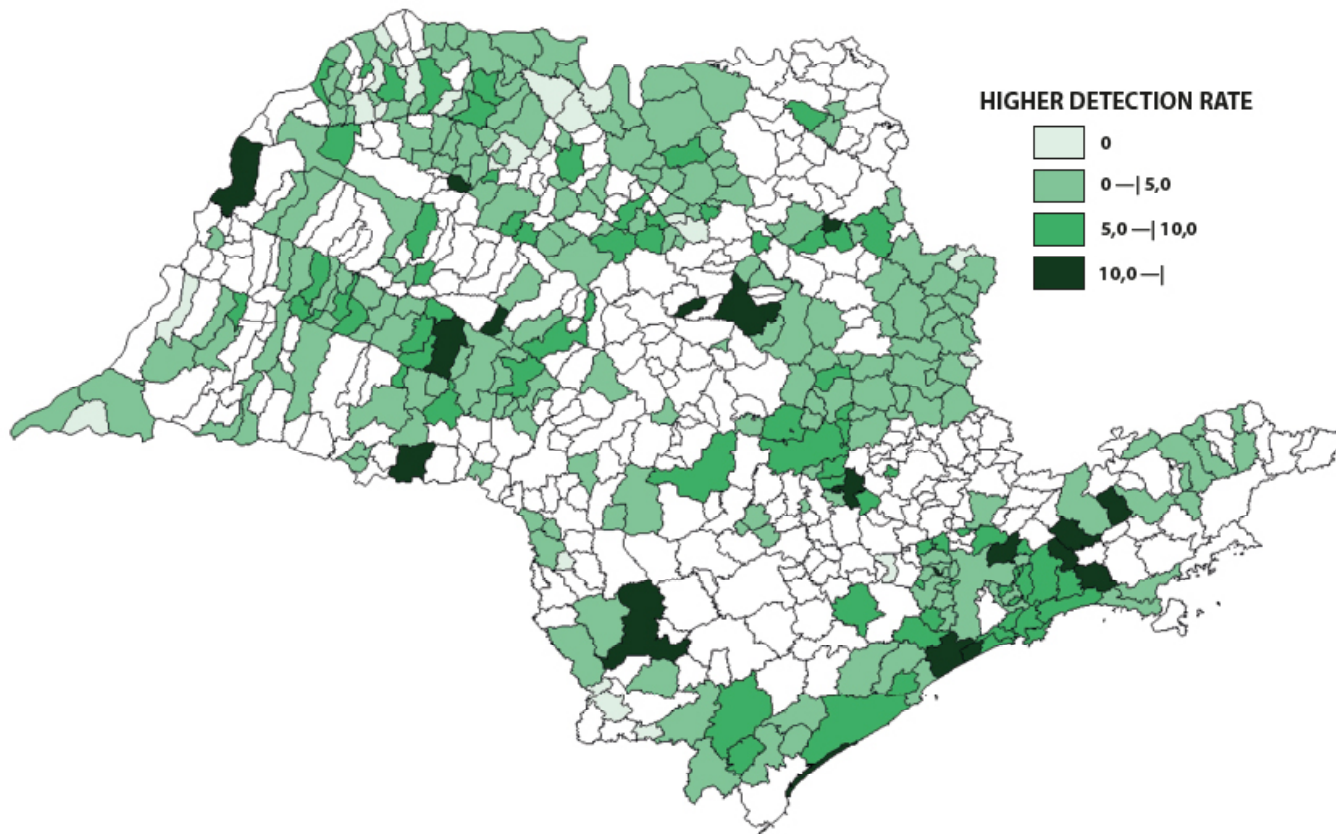
Source: Sinan Net – Trachoma survey. \*Data updated in July 2022, subject to review.

[Figure 2](#) shows the highest detection of trachoma from 2010 to 2020, when it was observed that 21 municipalities in São Paulo showed 10% or higher detection and 77 had a detection rate of 5% to 9%. Those who presented a detection rate of 5% or higher are considered priority for the performance of trachoma ES activities.



The fact that there are municipalities that are “blank” in Figure 2 does not necessarily mean the absence of cases. This may simply represent localities that did not perform trachoma ES actions in the period studied.

**Figure 2.** Distribution of higher trachoma detection rate according to the municipality of residence. SSP: 2010 – 2020.\*



Source: Sinan Net – Trachoma Survey. \*Data updated in July 2022, subject to review.

Despite a total of 20,013 cases of the disease recorded in the period in the Trachoma Survey of Sinan Net, the Sanitary Ophthalmology Center of the ESC received only 10,019 epidemiological investigation forms (FIE), showing that the system can only investigate 50.1% of the notifications. Of these cases investigated, the highest frequency of trachoma was in females and in children aged 1 to 9 years. The predominant clinical form was trachomatous inflammation - follicular and/or intense, with a higher frequency of complaints of itching, burning and tearing, nonspecific symptoms of conjunctivitis, as shown in [Table 2](#).

As for the place of residence of the cases, most of them live in urban areas, have piped water from a public network, with access to the public network or septic tank for the disposal of waste. Trachoma is described as more prevalent in rural areas with poor sanitation and hygiene conditions. In SSP, however, most of the cases recorded occur in urban areas, perhaps due to the ease of health services in performing active search in a place close to the health units.

The interpretation of the results is subject to limitations. It should be considered that the active search activities were carried out mainly in schools selected for the convenience of the municipalities and, therefore, the data presented are not representative of the general population. It is a convenience sample, in which urban schools are more accessible for the performance of the work. This occurs despite the orientation for performing trachoma ES activities in places where there is a higher probability of occurrence of the disease, which are the rural and peripheral areas of cities with lack of basic sanitation and that present low living conditions and health.

**Table 2.** Distribution of the frequency of confirmed cases of trachoma by gender, age group, clinical form and associated conjunctivitis. SSP, 2010 – 2020.\*

Variable	Number	%
<b>Gender</b>		
Male	4,287	42.8
Female	5,730	57.1
Ignored	2	0.01
<b>Age group</b>		
1 to 9	5,994	59.8
10 to 19	3,540	35.3
20 to 50	367	3.7
51 and >	101	1.0
Ignored	17	0.2
<b>Zone</b>		
Urban	7,408	73.9
Rural	761	7.6
Peri urban	65	0.7
Ignored	1,785	17.8
<b>Inflammatory form</b>		
TF/TI	9,763	97.4
<b>Sequelae form</b>		
TS/TT/CO	256	2.6
<b>Associated Conjunctivitis</b>		
Bacterial	113	1.1
Viral	120	1.2
Others	18	0.2
No	7,652	76.4
No specification	146	1.5
Ignored	1,970	19.7

Source: data bank of FIE data from the Sanitary Ophthalmology Center – ESC. N=10.019. \*Data updated in July 2022, subject to review.



To meet the elimination goals of the World Health Organization, data should be collected through household surveys by sampling children aged 1 to 9 years in regions with higher epidemiological risk of trachoma, including a laboratory sample of positive cases to determine the prevalence and confirmation of the circulation of *Chlamydia trachomatis* in the study area. Following the guidelines of the WHO and the Ministry of Health, the Epidemiological Ophthalmology Center/ESC initiated the “Trachoma Elimination as a Cause of Blindness in SSP Plan”, to assemble a dossier with municipal data.

To achieve elimination, the SSP adopted two strategies: household epidemiological survey by sampling children from 1 to 9 years of age in places with low living and health conditions; and trachoma census in small municipalities, in which 90% of children in the priority age group should be examined. Ten epidemiological surveys were planned in priority cities, that is, those that in the last ten years had a prevalence of trachoma 5% or higher in active search activities and with IBGE poverty rate of 0.46 or higher.<sup>15</sup> Since 2012, 85 municipalities in São Paulo have reached the goal.

The elimination plan had pilot projects Francisco Morato (Epidemiological Surveillance Group [ESG] Franco da Rocha and Itapevi (ESG Osasco), cities with high poverty rates, according to IBGE. The sample included 5,573 children and 11,629 family members, totaling 17,202 people, of whom 15,275 (85%) participated in the study. A total of 179 cases of the disease were identified, a prevalence of 1.2%. There were 178 cases of trachomatous inflammation - follicular (TF) and only 1 cases of trachomatous scarring (TS). In children aged 1 to 9 years, the prevalence was 1.5%, below 5% in all neighborhoods sampled and lower when compared to other studies in Brazil. These data confirm that trachoma is not a cause of blindness nor public health problem in the municipalities of Itapevi and Francisco Morato, both located in Greater São Paulo.

Household surveys are in the field: ESG Mogi das Cruzes, ESG Franco da Rocha and ESG Campinas (regional collegiates of Bragança Paulista and Jundiaí), ESG Osasco (Carapicuíba, Cotia, Embu das Artes, Embu-Guaçu, Jandira, Juquitiba, Taboão da Serra, São Lourenço da Serra and Vargem Grande Paulista), Northwest (ESG Jales, ESG Barretos and ESG São José do Rio Preto), West (ESG Araçatuba, ESG Assis, ESG Marília, ESG Presidente Prudente, ESG Presidente Venceslau), Vale do Paraíba (ESG Taubaté, ESG São José dos Campos and ESG Caraguatatuba).

## POST-ELIMINATION SURVEILLANCE OF TRACHOMA

When the WHO verifies that trachoma is no longer a public health problem, therefore, it does not have high transmission or the ability to advance to more severe conditions, the elimination of

the disease in SSP will be validated. The activities of the ES program and trachoma control should be redirected and new action strategies should be implemented in order to keep the disease eliminated.

It is recommended to implement a sentinel surveillance for monitoring the epidemiological situation after elimination in communities with suspected cases. The active search activities for trachoma should be directed to the age group from 1 to 9 years, in places with precarious living conditions and health. The number of children to be examined should be at least 300 per community. Ocular examination should be performed by professionals trained for the diagnosis.<sup>16</sup>

These activities also include the control of home and institutional communicators, that is, from the confirmation of a case, arrangements for the examination of communicators should be performed. The treatment of inflammatory cases of trachoma will continue to be oriented to all sick patients and their home contacts, as well as collective treatment, if the prevalence of TF in children from 1 to 9 years of age in a community/territory is  $\geq 5\%$ .<sup>16</sup> In municipalities where this prevalence is verified, supervision should be carried out for confirmation. In this case, if the prevalence of TF/IT is confirmed  $\geq 5\%$ , then trachoma can no longer be considered eliminated from the country.

Among the procedures to be adopted to establish the trachoma focus, it is recommended to collect laboratory PCR tests to confirm the circulation of *C. trachomatis* in that population. Supervision of the diagnosis should be carried out by professionals duly standardized by WHO guidelines.

Active search activities for cases of trichomatous trichiasis (TT) should be maintained in the population aged 15 years and over, especially in those over 60 years of age, in priority areas, former endemic pockets and areas where trachoma has been prevalent in the past, to verify the occurrence of TT unknown by the health system. It should also be ensured that all suspected cases of trichomatous trichiasis are referred for ophthalmologic consultation, monitored and evaluated on the need for corrective surgical procedure of the eyelids.

Health education work should be carried out with the aim of preventing trachoma and other conjunctivitis. This is one of the disease surveillance and control activities that should be developed, preferably, in rural communities and in the peripheries of cities with deficient socioeconomic and sanitary conditions, in order to keep low prevalence levels and, consequently, transmission.

Eye health activities should continue to be performed in schools and day care centers, such as visual acuity measurement and referral of cases of low visual acuity to ophthalmic examination and the allocation of glasses to all who need it. All actions to prevent blindness and promote eye health developed by health teams should also continue.

Ensuring basic sanitation and improvements in access to water, housing and health conditions to guarantee the sustainability of disease surveillance and control interventions are essential conditions for maintaining the basic indicators of trachoma elimination as a public health problem in the country.

The SSP is about to validate the elimination of trachoma as a public health problem, thus avoiding the occurrence of sequelae of the disease. Continuous post-elimination surveillance should be conducted by the teams so that in the future trachoma does not affect the population again.

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## REFERENCES

1. Conde HB. Geografia do tracoma no Brasil. Departamento Nacional de Endemias Rurais (DNERu). Rio de Janeiro: Ministério da Saúde; 1957. 58p.
2. São Paulo (estado). Decreto-lei n. 1.255, de 17 de dezembro de 1904: proíbe a entrada de imigrantes com tracoma no estado. Diário Oficial da União, 21 dez. 1904, p. 2615. Disponível em: <https://www.al.sp.gov.br/repositorio/legislacao/decreto/1904/decreto-1255-17.12.1904.html>
3. Reinhardt J. Trachoma control in European region. WHO Chronicle. 1967;21:57-61.
4. Toledo AS. O combate ao tracoma no estado de São Paulo. Arquivos de Higiene e Saúde Pública. 1945;10(24): 162-282.
5. Freitas CA. Prevalência do tracoma no Brasil. Rev Bras Malariol Doenças Trop. 1976;28(1/4):227-76.
6. São Paulo (estado). Decreto n. 52.182, de 16 de julho de 1969 [internet]. Dispõe sobre a organização da Secretaria de Estado da Saúde e dá outras providências. Art. 125. São Paulo; 1965 [acesso em 19 set 2022]. Disponível em: <https://www.al.sp.gov.br/repositorio/legislacao/decreto/1969/decreto-52182-16.07.1969.html>
7. São Paulo (estado). Resolução SS n. 60, de 17 de fev. de 1992. Dispõe sobre a lista de doenças de notificação compulsória. Diário Oficial do Estado de São Paulo; 1994.
8. Luna EA, Lopes MF, Medina NH, Favacho J, Cardoso MR. Prevalence of trachoma in schoolchildren in Brazil. Ophthalmic Epidemiol. 2016; 23:1-6.
9. Alves APX, Medina NH, Cruz, AAV. Trachoma and ethnic diversity in the upper Rio Negro basin of Amazonas State, Brazil. Ophthalmic Epidemiol. 2002;9(1):29-34.

10. Gomes DV, Lopes MF, Medina NH, Luna EJ. Tracoma: aspectos epidemiológicos e perspectivas de eliminação como problema de saúde pública no Brasil. *eOftalmo*. 2018;4(4):147-53.
  11. World Health Organization. Future approaches to trachoma control: report of a global meeting. Geneva; 1997. WHO/PBL/96.56 44p.
  12. World Health Organization. Report of the 2<sup>nd</sup> Global Scientific Meeting on Trachoma [internet]. Geneva; 25-27 August 2003 [acesso em 19 set 2022]. WHO/PBD/GET/03.1, 28p. Disponível em: <https://apps.who.int/iris/bitstream/handle/10665/329076/WHO-PBD-GET-03.1-eng.pdf>
  13. World Health Organization. WHO Alliance for the Global elimination of trachoma by 2020: progress report on elimination of trachoma, 2021 [internet]. *Weekly epidemiological record*. 2021; 97 (31): 353-64 [acesso em 19 set 2022]. Disponível em: <https://apps.who.int/iris/bitstream/handle/10665/361290/WER9731-eng-fre.pdf>
  14. World Health Organization. Ending the neglect to attain the sustainable development goals: a road map for neglected tropical diseases 2021–2030 [internet]. Geneva: WHO; 2020 [acesso em 19 set 2022]. <https://www.who.int/publications/i/item/9789240010352>
  15. Instituto Brasileiro de Geografia e Estatística. World Bank. Mapa de pobreza e desigualdade: municípios brasileiros, 2003 [internet]. Rio de Janeiro; 2008 [acesso em 19 set 2022]. Disponível em: <http://biblioteca.ibge.gov.br/index.php/biblioteca-catalogo?id=2100513&view=detalhes>
  16. Brasil. Ministério da Saúde. Recomendações sobre as ações de vigilância e controle do tracoma com vistas à eliminação da doença como problema de saúde pública. Nota informativa nº 1/2022 – CGZV/DEIDT/SVS/MS. Brasília; 2022.
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## CONJUNCTIVITIS

### BRIEF HISTORY

The first described epidemic of acute epidemic hemorrhagic conjunctivitis in the world occurred in Africa in the late 1960s, when an excessive increase in the number of cases of conjunctivitis was recorded, whose etiological agent identified was enterovirus 70. Since then, several epidemics have been reported elsewhere in the world. Viral conjunctivitis epidemics typically have cyclic variation around 10 years.<sup>1</sup>

Outbreaks of conjunctivitis became the subject of epidemiological surveillance in the 1980s, due to the occurrence of the first cases of Brazilian purpuric fever in São Paulo. The disease is transmitted by ocular secretion of bacterial conjunctivitis by *Haemophilus influenzae*, biogroup *aegyptius* invasive strain.<sup>2</sup>

In Brazil, in the years 1983 and 1984 there was an occurrence of a large epidemic of acute hemorrhagic conjunctivitis due to enterovirus 70, including in the state of São Paulo (SSP).<sup>3</sup> In 2003 there was an epidemic of viral conjunctivitis in the country, initially in the South, which extended to several regions of São Paulo, Mato Grosso do Sul and Ceará. Then, the National Health Foundation (FUNASA) received notification of the occurrence of conjunctivitis outbreaks in most states of the country.<sup>4</sup>

The conjunctivitis epidemic began in the coast of São Paulo, predominantly in the regions of epidemiological surveillance group (ESG) XXIII – Registro and ESG XXV – Santos, where 114,565 cases of the disease were identified and reported., Coxsackievirus A24 was identified by collected samples, using the reverse transcription technique – polymerase chain reaction (RT-PCR).<sup>4,5</sup>

At the time, the SHD-SP implemented epidemiological and laboratory surveillance actions of conjunctivitis, implemented rapid notification to the Epidemiological Surveillance Center, and prepared and made available technical reports and educational brochures. Throughout the state network of health services, training was carried out for clinical diagnosis, sample collection for etiological diagnosis, control and ES of cases. Since 2004, the municipalities began to report cases of conjunctivitis that were attended in these services and to carry out health education activities for the prevention of the disease.<sup>4</sup>

## ETIOLOGICAL AGENT

### Bacterial conjunctivitis

The main etiological agents are: *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Streptococcus sp*, *Haemophilus influenzae* (children), *Neisseria gonorrhoeae* (neonates and adults) and *Moraxella sp.*<sup>6</sup>

### Viral conjunctivitis

The most common etiological agents are adenoviruses and enteroviruses:<sup>6</sup>

- adenovirus species 8, 19 and 37, causing epidemic keratoconjunctivitis;
- adenovirus species 3 and 7, leading to pharyngoconjunctival fever and
- enterovirus of the picornavirus family (poliovirus - enterovirus 70, echovirus, coxsackievirus – coxsackie A24), responsible for acute epidemic hemorrhagic conjunctivitis.

*Herpes simplex virus*, molluscum virus (family of pox virus), herpes-zoster, measles and coronavirus (Covid-19) are examples of less frequent etiologies.

## TRANSMISSION MODE

Direct transmission occurs from person to person and eye to eye, and the indirect form through contaminated objects such as scarves, towels, pillowcases, cosmetics and contact lenses. Infectious conjunctivitis usually starts in one eye and passes to the other. It is spread in collective environments (school, day care centers, factories, swimming pools etc.), more easily when personal hygiene care is not observed.

Flies and “eye – licking” mosquitoes (*Hippelates sp.*) can also act as mechanical vectors.

## EPIDEMIOLOGICAL SITUATION

Conjunctivitis is not a disease of compulsory notification, but becomes of notification in the presence of outbreaks and epidemics.

Conjunctivitis is endemical all over the world, meaning it occurs regularly. However, they may have seasonal characteristics. This is the case of conjunctivitis of allergic etiology, which tend to occur more in spring, and those of viral etiology, more frequent in summer and winter.



Viral conjunctivitis are responsible for most outbreaks and epidemics epidemics, because they are highly contagious. Its evolution, however, is usually benign. Epidemics of acute hemorrhagic conjunctivitis due to enterovirus occur from time to time, with a very rapid and large dissemination, presenting important socioeconomic repercussions due to the high degree of absenteeism at work and school.

When conjunctivitis occurs in the form of outbreaks or epidemics should be reported to the “SinanNet-Surto” information system.

At the beginning of the implementation of the new instruments for collecting information from the ES system for conjunctivitis in the SSP, only 36 municipalities reported it regularly. Over the years, there has been an increase in the number of notifying municipalities and cases of the disease, showing more the recovery of the information system and less the increase in cases.

In 2011, the largest conjunctivitis epidemic occurred in São Paulo history, beginning in the Western region and, later, spreading to the rest of the state. Sinan Net reported 9,040 outbreaks, with a total of 1,078,939 cases and incidence coefficient of 2,594 cases/100,000 inhabitants. Most of them had a clinical picture compatible with viral conjunctivitis and there was laboratory confirmation of the circulation of an enterovirus, coxsackievirus A24 as the etiological agent. As shown in [Graph 1](#), there was a large increase of the number of municipalities notifying, reaching 458, corresponding to 71% of the territory of São Paulo. In 2017 and 2018, the highest participation to the system occurred, with 73% of municipalities notifying cases of the disease in 2018.<sup>7</sup>

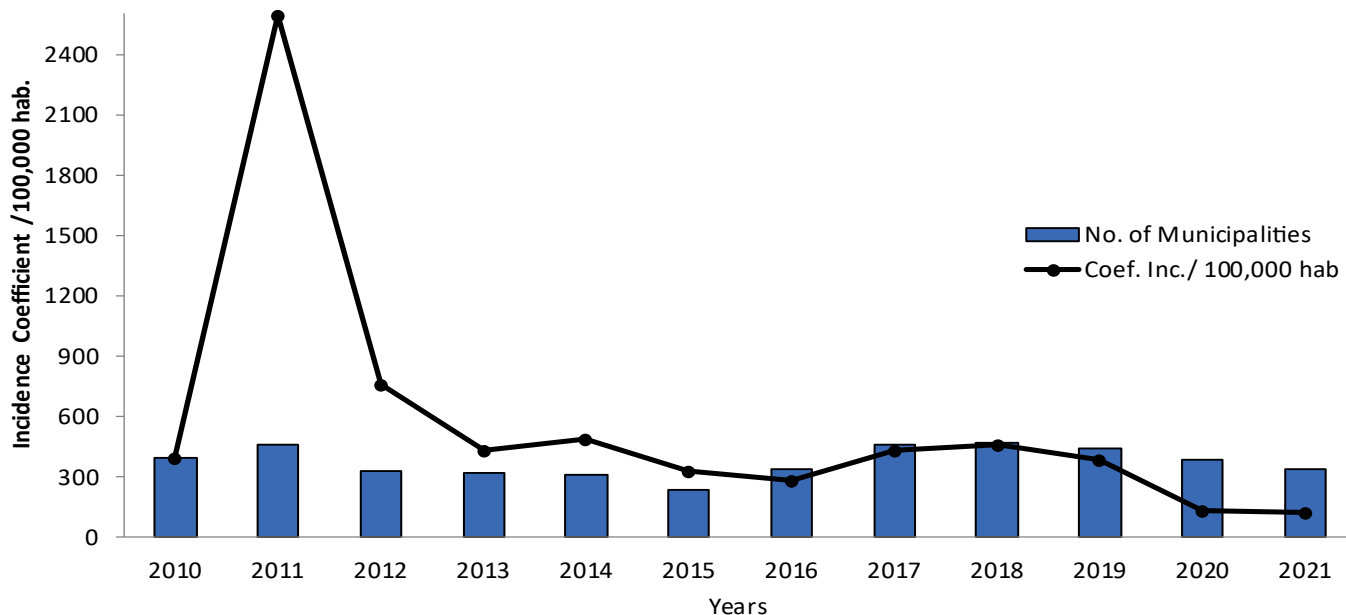
The average notification of conjunctivitis in SSP is more than 190,000 cases per year, showing that the disease is endemic, occurring epidemics of viral conjunctivitis from time to time.

The greater coefficient of incidence of the disease in SSP was in 2011, when there was an epidemic of the disease and the lowest incidence was recorded in 2021, with 126 cases/100,000 inhabitants (58,740 cases).

In early 2018, the VE identified an increase in the number of cases of conjunctivitis in São Paulo, when there were also rumors in the press of an epidemic of viral conjunctivitis in the Northeast region of Brazil, during the Carnaval. The epidemic event was confirmed by the conjunctivitis control diagram of that year ([Graph 2](#)).

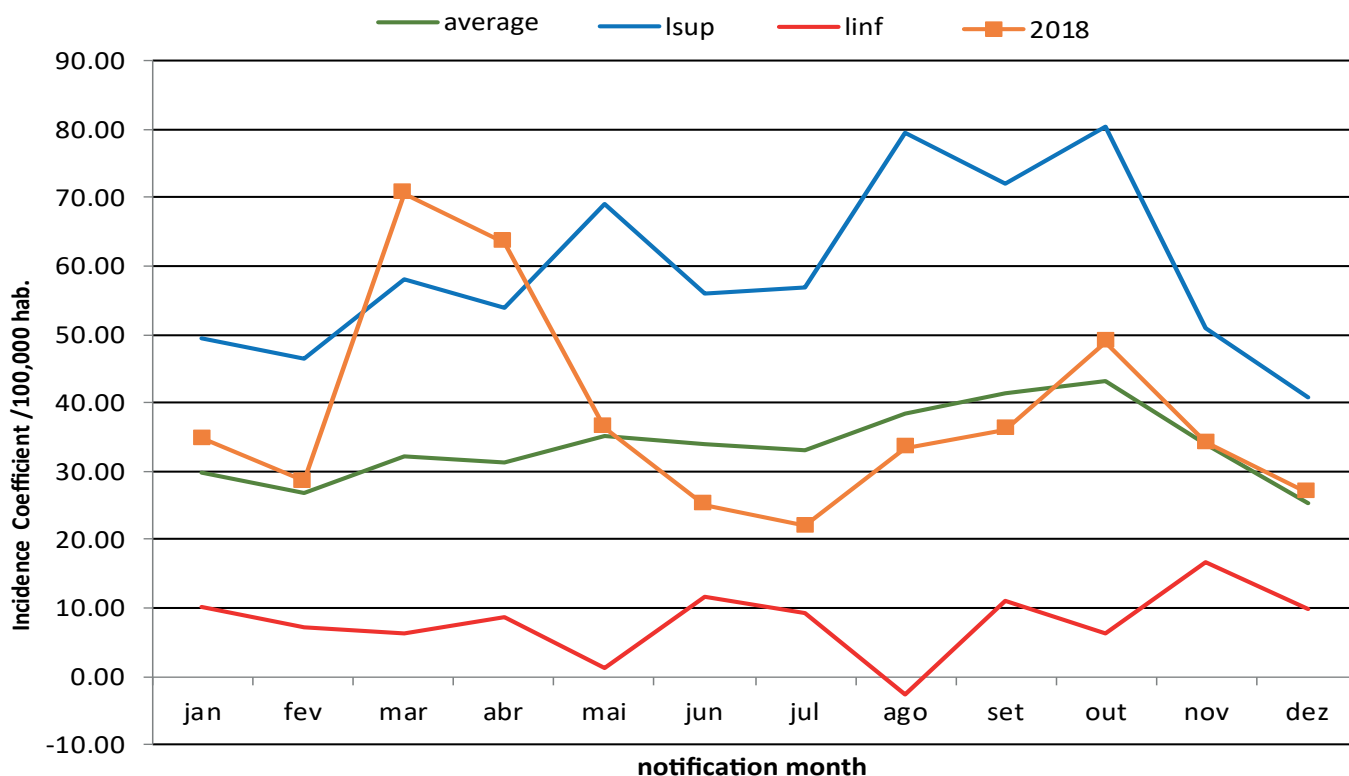
In the years 2020 and 2021, during the pandemic of Covid-19, there was a 67% decrease in the number of cases reported in the system, although most municipalities continue to report cases, as shown by the rate of participation of the municipalities ([Table 1](#) and [Graph 1](#)). Health education activities emphasizing hand washing and personal hygiene, as well as social distancing, with a significant decrease in agglomerations, decreased the incidence of the infectious conjunctivitis in SSP.

**Graph 1.** Incidence coefficient of conjunctivitis/100,000 inhabitants and number of notifying municipalities SSP, 2010 – 2021.\*



Source: Epidemiological surveillance system/CVE/SES/SP. \*Data updated in July 2022, subject to review.

**Graph 2.** Case control diagram reported in conjunctivitis outbreaks, SSP, 2008-2018\* (except 2011\*).



Source: Epidemiological surveillance System/CVE/SES/SP. \*Data updated in July 2022, subject to review.

**Table 1.** Number of cases of conjunctivitis reported to the epidemiological surveillance system of conjunctivitis per year, number of notifying municipalities and rate of participation and number of outbreaks reported in “Sinan Net – Surto”, SSP, 2010- 2021.\*

Year	No. of notifying municipalities #	participation %	No. of positive cases	Sinan Net - surto	
				n	%
2010	390	60.5	161,801	346	2.5
2011	457	70.9	1,078,939	9,040	65.3
2012	325	50.4	318,394	776	5.6
2013	322	49.9	190,127	292	2.1
2014	306	47.4	208,275	253	1.8
2015	231	35.8	144,649	166	1.2
2016	337	52.3	125,304	232	1.7
2017	461	71.5	193,016	252	1.8
2018	473	73.3	207,600	889	6.4
2019	438	67.9	182,064	245	1.8
2020	387	60.0	62,554	26	0.2
2021	337	52.3	58,740	22	0.2

Source: Sinan Net – Outbreak and epidemiological surveillance system of conjunctivitis of the Sanitary Ophthalmology Center CVE/SES-SP.

\*Data updated in July 2022, subject to review.

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Although conjunctivitis are not of compulsory notification in SSP or Brazil, epidemiological surveillance of the ESG and municipalities have contributed greatly to the knowledge of the disease situation, quickly identifying outbreaks and epidemics, promptly developing activities for the identification of the etiological agent and control of the disease.

## REFERENCES

1. Chatterjee S, Quarcoopome CO, Apenteng A. Unusual type of epidemic conjunctivitis in Ghana. *Br J Ophthalmol.* 1970; 54:628-30.
2. São Paulo (estado). Secretaria da Saúde. Centro de Vigilância Epidemiológica. Manual de vigilância epidemiológica da febre purpúrica brasileira. São Paulo; 1994. 42p.
3. Waldman EA, Takimoto S, Ishida MA, Kitamura C, Mendonça LIZ. Enterovírus 70 na Região Metropolitana de São Paulo, Brasil de 1984 a 1887: aspectos da infecção em períodos epidêmico e endêmico. *Rev Inst Med Trop.* 1990;32:221-8.
4. Medina NH et al. Organização do sistema de vigilância epidemiológica na vigência da epidemia de conjuntivite viral - 2003. In: VI Congresso Brasileiro de Epidemiologia, 2004, Recife. Anais, 2004. v. Unico. p. 10-10.

5. Carmona RCC et al. An Epidemic of Acute hemorrhagic conjunctivitis caused by Coxsackievirus A2.4 in South and Southeastern Brazil. In: XIV Encontro Nacional de Virologia. *J Braz Soc Virology*. 2003, 8(1):184.
  6. Freitas D, Belfort R. Conjuntivites – atualização em oftalmologia [internet]. *Arq Bras Oftalmol*. 1992;196-55(5): [acesso em 20 jul 2022]. Disponível em: <https://www.scielo.br/j/abo/a/7fxJp7fRy8pm9vvSP8jvV/Dk/?format=pdf&lang=pt>
  7. Medina NH, Haro-Muñoz E, Pellini AC, Machado BC, Russo DH, Timenetsky MC et al. Acute hemorrhagic conjunctivitis epidemic in São Paulo State, Brazil, 2011. *Rev Panam Salud Publica*. 2016; 39(2):137-41.
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