

# Trachoma rapid assessment of children aged 1 to 9 years in Hainan Province of China

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**Foundation item:** Supported by grants from Science and Technology Planning Project of Hainan (No. ZDYF2016111)

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Received:2016-11-08 Accepted:2017-05-15

## 海南省1~9岁儿童沙眼快速评估

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**基金项目:**海南省重点研发计划-社会发展(课题编号ZDYF2016111)

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## 摘要

**目的:**调查海南省1~9岁儿童沙眼患病情况,确定海南省沙眼高发流行和非流行区,为沙眼的防治方案的制定提供依据。

**方法:**根据既往的相关文献、眼科专家访谈及实地摸底调查等方法确定调查地点。于2013年由海南省防盲办公室组织调查队在东方市、五指山市、乐东县、白沙县、保亭县、临高县、昌江县7个调查市县抽取小学生共计356名进行了沙眼快速评估工作,其中男192人,女164人,平均年龄7(1~9)岁。采用世界卫生组织推荐的沙眼简化分级系统,对以上小学生进行沙眼快速评估调查。

**结果:**在受检的356名小学生中,未发现有活动性沙眼的患者。

**结论:**海南省1~9岁儿童的沙眼患病率<5%,活动性沙眼在海南省不再是一个公共卫生问题。

**关键词:**沙眼;快速评估;海南省;儿童

**引用:**郑海生,何宏,劳伟,等. 海南省1~9岁儿童沙眼快速评估. 国际眼科杂志 2017;17(7):1212-1214

## Abstract

• **AIM:** To investigate the incidence of trachoma in children aged 1 to 9y in Hainan Province and determine high-risk trachoma endemic and non-endemic areas in Hainan, and thus provide evidence for developing trachoma control and prevention therapy.

• **METHODS:** The areas of investigation were chosen on the basis of past literatures, expert interviews and survey on the spot. In 2013, Hainan Provincial Office of Blindness Prevention carried out the survey in 7 counties including Dongfang City, Wuzhishan City, Ledong County, Baisha County, Baoting County, Lingao County and Changjiang County. In these districts, 356 pupils including 192 boys and 164 girls were examined, their age ranging from 1 to 9 and their average age being 7 years old. The targeted students received the trachoma rapid assessment by the adoption of simplified trachoma classification system which was recommended by the World Health Organization.

• **RESULTS:** No case of active trachoma was found among the 356 students.

• **CONCLUSION:** The prevalence rate of trachoma in children under 9 years is less than 5% in Hainan Province. Active trachoma is not a public health issue in Hainan Province.

• **KEYWORDS:** trachoma; rapid assessment; Hainan Province; children

DOI:10.3980/j.issn.1672-5123.2017.7.04

**Citation:** Zheng HS, He H, Lao W, Meng B, Xing JQ, Zhong XW. Trachoma rapid assessment of children aged 1 to 9 years in Hainan Province of China. *Guoji Yanke Zazhi(Int Eye Sci)* 2017;17(7):1212-1214

## INTRODUCTION

Trachoma, the leading cause of infectious avoidable blindness globally, is a chronic, recurrent inflammatory disease that is caused by bacterium *Chlamydia trachomatis*<sup>[1-2]</sup>. Trachoma usually impacts the poverty-stricken regions of the world. The prevalence of active trachoma, mostly in pupils, is the main indicators of trachoma popularity in the region<sup>[3]</sup>.

VISION 2020: *The Right to Sight*, launched in 1999, the global initiative launched by the World Health Organization (WHO). Trachoma was listed as a major eye disease leading to blindness and should be eradicated globally to achieve the goal of eliminating avoidable blindness by 2020<sup>[4-5]</sup>. China

**Table 1 Risk factors in 7 sub-districts**

Districts	Unclean faces		Absence of water flushing toilets		Absence of running water	
	Yes	No	Yes	No	Yes	No
Zhongscha villages	2	48	2	48	3	47
Maodao villages	3	47	5	45	6	44
Angwai villages	2	48	1	49	2	48
Nanxun villages	4	46	3	47	3	47
Damei villages	3	47	0	50	0	50
Nanchao villages	2	54	2	54	4	52
Yalaosidui villages	3	47	2	48	2	48
Total	19	337	15	341	20	336

joined the “VISION 2020” in 1999 and thus entered a new phase of prevention and treatment of trachoma. In the middle of the 20<sup>th</sup> century, China used to be a trachoma hyperendemic region because of its poor sanitation and economic backwardness<sup>[6]</sup>. But the disease has been eliminated in many endemic regions because significant advancement in the social and antibiotic available to people and economic conditions makes sanitary measures in China. However, in some regions stricken with trachoma previously, there are still cases of trachoma to be dealt with<sup>[7-8]</sup>. Hainan province, an island province located in the southernmost in China has a population of 8.3 million people and some previously hyperendemic areas of trachoma. But no recent study has been conducted on the prevalence of trachoma in these areas. Trachoma rapid assessment (TRA) is a simple, quick and inexpensive examination method that can help collect a large amount of relevant and up-to-date information and data about trachoma<sup>[9]</sup>. The aim of this survey was to assess the burden of active trachoma through the rapid assessment technique among children aged 1 to 9y in some previously hyperendemic areas in Hainan Province of China.

**SUBJECTS AND METHODS**

**Ethics Standards** Ethical approval was obtained from the Ethics Review Committee of Chinese Academy of Medical Sciences and Peking Union Medical College Hospital. The research protocol received approval from the Health and Family Planning Commission of Hainan Province. Permission to do a survey about trachoma was obtained from the District Commissioner and local administrative authorities. The written informed consent were signed by the guardians of the subjects because all the participants were minor.

**Ophthalmic Examination** Assessment methodology was conducted in accordance with the *Guidelines for Rapid Assessment of Blinding Trachoma* from the WHO<sup>[10]</sup>. This methodology included purposive sampling of selected areas where trachoma may still exist. Some alterations were made so as to customize the survey design to Chinese conditions. The epidemiological survey team was composed of one team leader, two ophthalmologists, two assistants and one driver. To ensure the work quality, team members were trained by ophthalmologist.

During the survey, all subjects were examined with 2.5 × binocular loupe by two ophthalmologists. The children were

graded on the basis of the WHO simplified grading system, which includes trichomatous follicular inflammation (TF), trichomatous inflammation intense (TI), trichomatous scarring (TS), trichomatous trichiasis (TT) and corneal opacity (CO)<sup>[11]</sup>. In these districts, 356 pupils were examined for “active trachoma”, which was defined as TF and/or TI in either eye. To guarantee the accuracy of clinical grading of trachoma, two ophthalmologists had to reach agreement in confirming trachoma case.

Seven villages were selected in the TRA, the sample size being in accordance with the recommended size for rapid assessment of trachoma in *Guidelines for Rapid Assessment for Blinding Trachoma* and *Operation Manual of Trachoma* issued by China’s Ministry of Health<sup>[12]</sup>. A total of 356 children aged 1 to 9y were examined for clinical signs of active trachoma. In each village the number of children ranged from 50 to 56, average number being 51. Boys and girls accounted for 53.9% and 46.1% of the children in the study respectively.

**Risk Factor Assessment** Risk environmental factors of trachoma were studied and the results were recorded<sup>[13-14]</sup>. A child was recorded as “unclean faces” if the child had presence of discharge or flies around eye/nose. “Absence of running water” was defined as there was no running water source in a living house for home use. “Absence of water flushing toilets” was defined as functional water flushing latrine was absent in house or school.

**RESULTS**

Three hundred and fifty – six children were examined from selected seven villages of Hainan Province in TRA. No active trachoma case was found in any villages. In the survey, we discovered that most children had clean faces and majority of the surveyed areas boasted of water flushing toilets and running water (Table 1).

**DISCUSSION**

The prevalence of trachoma has a high correlation with low level of economic development, insufficient medical and drug resources, water shortage, and poor living conditions<sup>[15-18]</sup>. Moreover, children with unclean face or living without running water or flushing toilets were at a high risk level of having active trachoma<sup>[3,19]</sup>.

WHO has suggested estimation of prevalence among children aged 1 to 9y in estimating prevalence of TF/TI. There is limited data on the burden of active trachoma from Hainan

Province<sup>[20]</sup>. That is why we use the rapid assessment technique to evaluate the burden of active trachoma in a previously hyperendemic area in Hainan Province among children aged 1 to 9y.

In this research, seven sub-districts were selected. The socioeconomic standards and hygiene situation of these sub-districts rank poorly in Hainan Province. Some of these areas are suffering from a shortage of running water and water flushing toilets. More importantly, there was previously reported result of trachoma incidence confirm the perception that there were hyperendemic areas in these sub-districts<sup>[20-22]</sup>.

In this study, no active trachoma case was found in seven villages, where trachoma had previously been documented to be prevalent. The reduction in active trachoma cases is due to changes in clinical diagnosis standard, use of antibiotics and improvement of local people's living standard which leads to noticeable improvement in environmental and personal hygiene.

TRA can help researchers understand the current risk factors for trachoma, pinpoint and prioritize the intervening measures, as well as decide whether to implement cost-effective and large-scale intervening measures to eliminate blinding trachoma.

Although a rapid assessment is not able to quantify the size of the problem in the community in an accurate manner, it helps to pinpoint the community areas that should be given priority. It's our firm belief that this study, being reliable, provides an insight into the worst-case scenario, as it is conducted in the least developed areas, to confirm whether trachoma remains a public health issue in these areas and hence to provide guidance to intervene program of trachoma. Elimination of trachoma, according to the guideline of the WHO, means that the detection rate of active trachoma in 1 to 9y children in the districts is less than 5%<sup>[8,10]</sup>. This study illustrates that there is no necessity of a more detailed active trachoma survey in Hainan Province. We can declare that active trachoma is not a public health issue in Hainan Province. The WHO recommends that in districts where the detection rate is less than 5%, SAFE that stands for surgery for trichiasis, antibiotics, face washing, environmental improvement is not a priority requirement, but an encouraging measure<sup>[5,23-24]</sup>. This research shows that other areas should be surveyed and be under continuous active surveillance so as to achieve elimination of avoidable blindness trachoma from China.

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