Prevalence of Trachoma in Ethiopia

Yemane Berhane[1, 2], Alemayehu Worku[2], Abebe Bejiga[2], Liknaw Adamu[3], Wondu Alemayehu[3], Amir Bedri[3], Zegeye Haile[3], Allehone Ayalew[3], Yilikal Adamu [2], Teshome Gebre[3], Tewodros D. Kebede [2], Emily West[4], Sheila West[4]

Abstract

Background: Trachoma is known to be one of the major causes of blindness in Ethiopia. However recent data that indicate the disease burden were lacking.

Objective: To determine the prevalence of active trachoma and trachomatous trichiasis at national and regional levels.

Methods: A population based cross sectional design with multistage sampling strategy was used. All nine regional states and two city administrations of the country were involved in the survey. Survey subjects were drawn from permanent households. Trachoma grading was done by standardized ophthalmic nurses following the WHO grading system.

Results: The national prevalence of active trachoma (either TF or TI) for children in the age group 1-9 year is 40.14%. Considerable regional variations are observed in the occurrence of active trachoma; the highest prevalence is in Amhara (62.6%), Oromia (41.3%), SNNP (33.2%), Tigray (26.5%), Somali (22.6%) and Gambella (19.1%). The rural prevalence of active trachoma is almost fourfold compared to the urban (42.5% rural Vs 10.7% urban). The national prevalence of trachomatous trichiasis (TT) is 3.1% with the highest prevalence in Amhara regional state (5.2%). Trachomatous trichiasis is higher in females compared to males (4.1% Vs 1.6%). Over 9 million 1-9 year old children live with active trachoma, and 1.3 million people 15 years and older have trachomatous trichiasis.

Conclusion: Active Trachoma and trachomatous trichiasis are concentrated in the regions of the country with high population density, namely the Amhara, Oromia, and SNNP regional states. The prevalence of trachoma is three to fourfold in rural residents and among females. The demand for trachoma mass treatment with Azithromycin, provision of lid surgery to correct trachomatous trichiasis, and the need to improving hygienic conditions is enormous. [*Ethiop.J.Health Dev.* 2007;21(3):211-215]

Introduction

Although effective prevention strategies and treatment are available, trachoma still remains the major cause of infectious blindness worldwide (1). Trachoma is a bacterial infection of the eye caused by *Chlamydia trachomatis* leading to blindness if untreated. Approximately 80% of blindness in Ethiopia is believed to be avoidable; i.e., either preventable or curable (2) and trachoma is one of the major causes of low vision and blindness.

A number of studies on trachoma were conducted in Ethiopia since the early 1980's (3). These studies have greatly contributed to our understanding of many aspects of the trachoma problem and interventions in Ethiopia including the magnitude of trachoma (4-6); risk factors (7-10); and effectiveness of interventions (11-13). They helped us to understand the complexity of not only the problem but also the need for sustained and coordinated interventions to effectively prevent and control eye problems related to trachoma infection. However, none of these studies were large enough to provide information at a national level. The objective of this survey was thus to provide a national and regional level information on trachoma in Ethiopia.

Methods

The survey was conducted nationwide among all age groups. The survey excludes individuals living in institutions and homeless people. Active trachoma is assessed among 1-9 year old children and trachomatous trichiasis (TT) is assessed among people 15 years of age and over. Detailed description of the study population and sampling procedures is given in another paper (14).

Trachoma assessment was done for each member of the household by trained ophthalmic nurses. The ophthalmic nurses received refresher training on trachoma grading in the form of lecture using standard slides showing various grades of trachoma. Standardization of eye examinations for trachoma was then done in Butajira among school children and in community settings. Each ophthalmic nurse was standardized against highly experienced ophthalmologist in trachoma diagnosis (gold standard). Each ophthalmic nurse examined 50 children who were rated by the gold standard ophthalmologist. Only those that achieved at least 60% agreement level with the gold standard were assigned for trachoma grading.

Trachoma grading was done using the WHO grading system (15). All individuals were examined for trichiasis; either inturned eyelashes actually rubbing on the eye or evidence of previously removed lashes. In order to check for inturned eyelashes the upper lid is pulled upwards slightly to expose the lid margins. The cornea is then carefully examined for opacities. The inside of the upper eyelid, the tarsal conjunctiva of both eyes, were examined in children 1-9 years for follicles, intense inflammation and scarring.

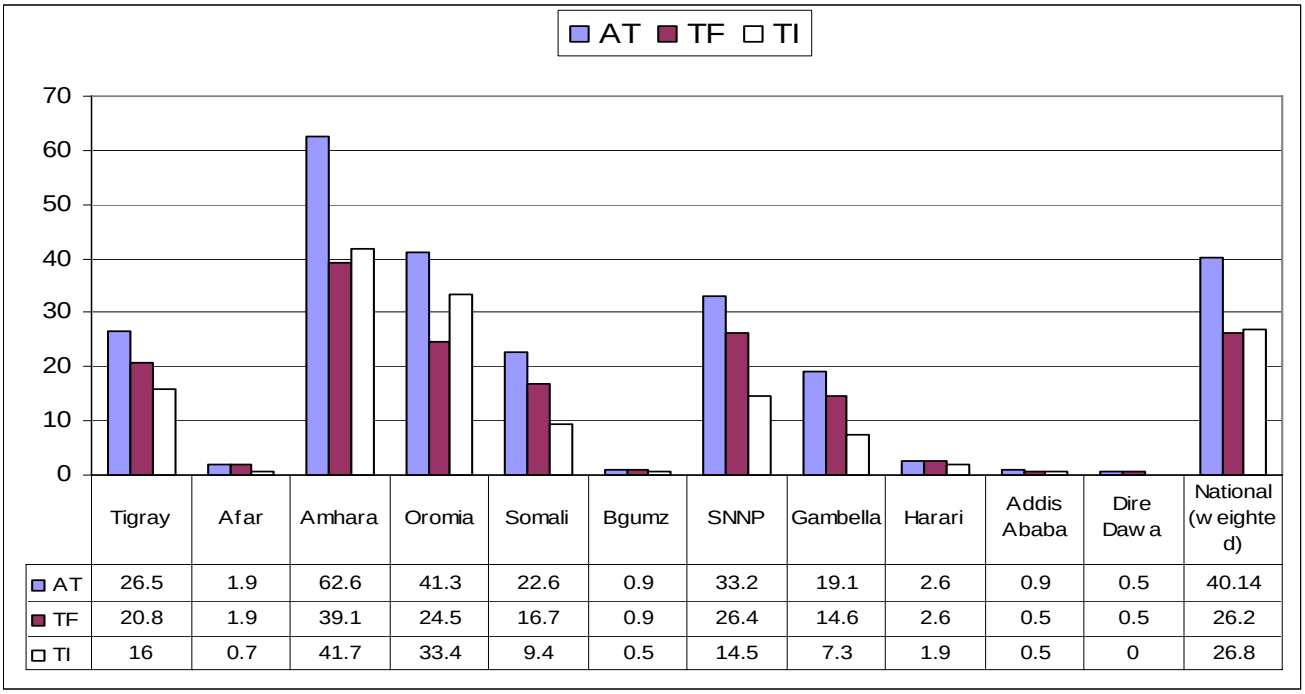
The prevalence of active trachoma (TF or TI) is calculated for 1-9 year old children while the prevalence

[1]Addis Continental Institute of Public Health, Addis Ababa, Ethiopia; [2]Addis Ababa University; [3] National Committee for the Prevention of Blindness (NCPB), Technical working group for National Blindness, Low vision and Trachoma survey; [4]Johns Hopkins University

of trichiasis is calculated for people 15 years of age and over. Appropriate weight that is proportionate to the population size is used to adjust the prevalence at the national level. Regional estimates are self weighted and no adjustment is made. Individuals with active trachoma were treated with antibiotics.

Results

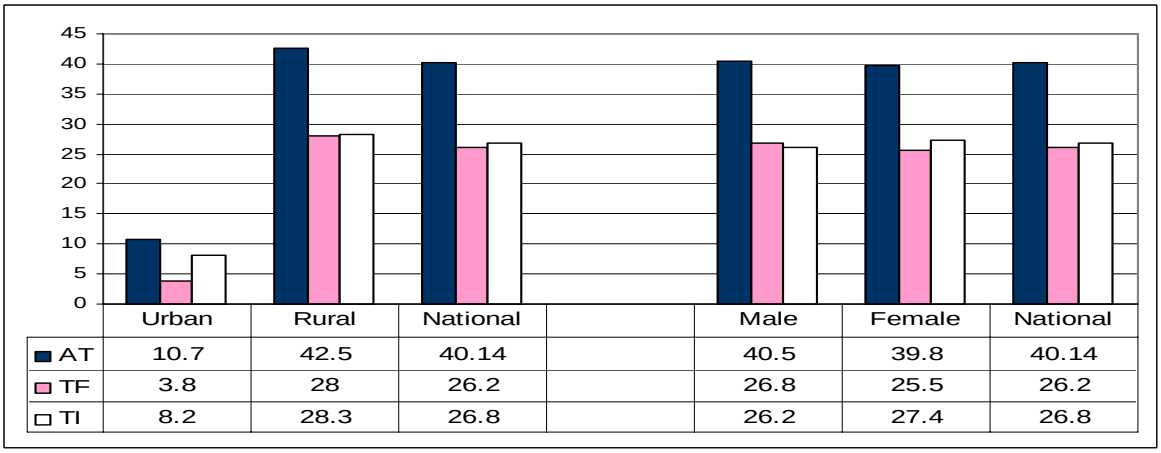
A total of 26163 individuals were examined for trachoma during the survey, of which 9289 were children under the age of 10 years. As shown in Figure 1, the national prevalence of active trachoma (either TF or TI) for children in the age group 1-9 year is 40.1%. Moreover, the highest prevalence is registered in the big regional states of the country; namely, Amhara (62.6%), Oromia (41.3%), and SNNP (33.2%). In major towns of the country the prevalence of active trachoma is very low. The prevalence of active trachoma is also observed to be low in the Benshangul Gumuz and Afar regional state.



	Tigray	Afar	Amhara	Oromia	Somali	Bgumz	SNNP	Gambella	Harari	Addis Ababa	Dire Daw a	National (w eighte d)
AT	26.5	1.9	62.6	41.3	22.6	0.9	33.2	19.1	2.6	0.9	0.5	40.14
TF	20.8	1.9	39.1	24.5	16.7	0.9	26.4	14.6	2.6	0.5	0.5	26.2
TI	16	0.7	41.7	33.4	9.4	0.5	14.5	7.3	1.9	0.5	0	26.8

Figure 1: **Prevalence of Active Trachoma (AT) for Children 1-9 Year. National Survey on Blindness, Low Vision and Trachoma in Ethiopia (2005-6)**

Figure 2 shows the prevalence of active trachoma by area of residency and gender. The prevalence of active trachoma is four-fold in the rural population as compared to the urban (42.5% Vs 10.7%). Although over 95% of the children were reported to wash their face at least once a day, inspection of the face by ophthalmic nurses revealed that about 55% of the children had either ocular discharge, nasal discharge or fly on their face.



	Urban	Rural	National		Male	Female	National
AT	10.7	42.5	40.14		40.5	39.8	40.14
TF	3.8	28	26.2		26.8	25.5	26.2
TI	8.2	28.3	26.8		26.2	27.4	26.8

Figure 2: **Weighted prevalence of active trachoma for children 1-9 years stratified by residency and sex. National Survey on Blindness, Low Vision and Trachoma in Ethiopia (2005-6)**

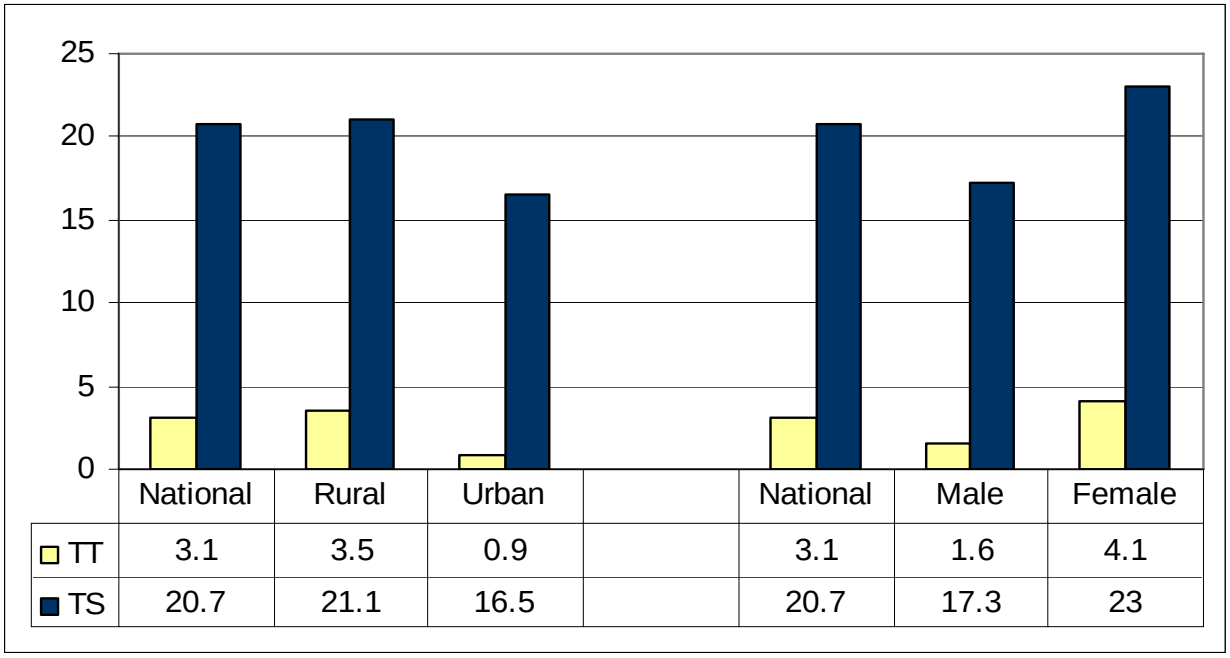
The national prevalence of trachomatous trichiasis (TT) for the age group 15 and above is 3.1% (Table 2). Figure 3 indicates about fourfold increase in prevalence of trachomatous trichiasis in the rural population as compared to the urban (3.5% Vs 0.9%; statistically significant with p-value < 0.001). The prevalence among females is also over twofold as compared to males (4.1% Vs 1.6%; statistically significant with p-value < 0.001).

Table 1: **Face Washing Habit and Face Cleanliness of children 1-9 year. National Blindness and Low Vision Survey in Ethiopia, 2005-6**

	Number	Percent
Frequency of Face Washing		
Never	54	0.6
Once a day	4954	58.3
Twice a day	3221	37.4
Sometime: Once a week	100	1.2
Sometime: Once a month	2	0.0
Other	164	1.9
Total	8495	100
Facial observation		
Ocular discharge	2713	29.3
Nasal discharge	3832	41.3
Fly on the child's face	3293	35.6
Either ocular discharge or nasal discharge	4338	46.8
Either ocular discharge, nasal discharge or fly on the child's face	5114	55.5

Table 2: **Prevalence of trachomatous trichiasis (TT) for the 15 years and above population. National Survey on Blindness, Low Vision and Trachoma in Ethiopia (2005-6)**

Region	TT Prevalence
Tigray	2.3
Afar	1.0
Amhara	5.2
Oromia	2.8
Somali	4.2
B-Gumz	0.1
SNNP	2.0
Gambella	2.5
Harari	1.2
Addis Ababa	0.9
Dire Dawa	0.7
National (weighted)	3.1



	National	Rural	Urban		National	Male	Female
TT	3.1	3.5	0.9		3.1	1.6	4.1
TS	20.7	21.1	16.5		20.7	17.3	23

Figure 3: **Weighted prevalence of TT and TS for the 15 years old and above. National Survey on Blindness, Low Vision and Trachoma in Ethiopia (2005-6)**

Discussion

Overall, the prevalence of active trachoma among children and trachomatous trichiasis among 15 years and above population is very high in Ethiopia. Rural/urban differences in active trachoma and gender differences in trachomatous trichiasis are marked indicating the general inequality in the availability of clean water and sanitation facilities in the population; and the gender inequality in accessing prevention and treatment services. Considering the population of Ethiopia in 2006; it was estimated that over 9 million children are affected by active trachoma and over 1.2 million people 15 years and above are suffering from trachomatous trichiasis (TT).

The prevalence of active trachoma is four-fold in the rural population compared to the urban (42.5% Vs 10.7%). This could be attributed to the poor sanitation and water supply conditions in rural areas. According to the Health Status Indicators published by the Federal Ministry of Health for the year 2004/5 (16) safe water is available for 25.2% of the rural population and 91.7% of the urban population. Similarly, proper human waste disposal coverage is about 80% for urban and 22% for rural population. There was no marked gender difference in the prevalence of active trachoma. The survey revealed that in major towns where sanitation status and water supply is better the prevalence of active trachoma is very low. The prevalence of active trachoma is also low in the Benshangul Gumuz and Afar regional states for reasons that are not obvious; further studies are needed to understand better the reasons for low prevalence in these areas. The availability of water and sanitation services in rural Ethiopia makes trachoma prevention very challenging. Considering the reported face washing habit and the facial cleanliness observations coupled with the general poor hygienic practices, it is not perhaps surprising to see such high prevalence of trachoma. Efforts to reduce the burden of trachoma must seriously consider improving hygienic practices.

Several studies in Sub-Saharan Africa have reported high prevalence of active trachoma in areas where water supply and sanitary conditions are poor. Trachoma was also identified as one of the major causes of blindness in these settings (17). The high prevalence of trachomatous trichiasis among women 15 years and above was also reported previously. Many people suffering from trichiasis do not seek medical care due to lack of transportation and cost of treatment (18).

Trachoma, both active trachoma and trachomatous trichiasis, is concentrated in some regions of the country (Amhara, Oromia, SNNPR) that account for the large proportion of the country's population. These regions have large rural population, and poor environmental and hygienic conditions favor trachoma transmission. A study from central Ethiopia has demonstrated that altitude and sanitation status directly or indirectly affects the magnitude of active trachoma (19). Another study in southern Ethiopia also reported that living in low and mid altitude and farther away from water source is a risk factor for active trachoma (8). The density of 'eye-seeking' flies is also high in areas where the prevalence of active trachoma is very high; the fly density is also highest in the lower altitudes (20).

In conclusion, it is clear that trachoma is a leading cause of eye problem in children as well as adult populations.

The burden of disease and the number of individuals affected also indicate the formidable challenge in providing mass antibiotic treatment with Azithromycin (Zithromax®) and establishing health services for provision of trachomatous trichiasis (TT) surgery. The Federal Government of Ethiopia and the regional governments need to enhance their commitment to eliminate the unnecessary loss of sight by increasing resources allocation and improving health services capacity at all levels to effectively and timely provide preventive and curative eye care services. Supporting development of basic infrastructure and human capacity for prevention, treatment and rehabilitation services at all levels; and putting emphasis on comprehensive and integrated prevention and treatment eye care programs is essential to reduce the disease burden in the long term. The need for effective and repeated application of treatment and preventive interventions is required to achieve successful elimination of trachoma (21). Improvement in one component of trachoma control intervention such as improving water supply or reaching population with health education messages may not provide the necessary results (12, 22).

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