Surveillance system
for trachoma in Oman

Mr. Saleh AL-Harbi
National Supervisor
National program of Eye and Ear care
Sultanate of Oman in 2012

11 Health Governorates

61 Wilayats

241 MOH Institutions

Pop = 3,623,001
Tertiary eye care unit in MOH
9 eye units at governorate hospitals
21 eye clinics (no beds)
192 PHCs with primary eye care
2 hospitals with eye units (Sister organization)
3 hospitals & 15 eye clinics
150 optical outlets
50 contact lens clinics

Wilayat Health, Wilayat Health Committees
Al Noor Association for the Blind
Surveillance for Trachoma in Oman

1st Primary students of all M of Education schools (n=38,222)

Contacts of students with active trachoma detected in schools (n=23) 0.06%

Patients at 193 MOH Institutions

Cases & Management at eye Units

TF in children & TT >40 years old population in community surveys in 2011 less than 1% in all region
Flow of Health Information

Schools

Governorate eye supervisor

Private sector

National Eye Health Care Program

Governorate I Eye Health Care Program

MOH Publications Alliance WHO EMR IAPB

MOH Institutions

Wilayat Health Information Officer (1st week of next month)

Regional Health Information Officer (2nd week of next month)

Department of HIMS Muscat (3rd week of next month)

Private sector
<table>
<thead>
<tr>
<th>Building / School Code</th>
<th>Examining Doctor</th>
<th>Date</th>
<th>Landmark</th>
<th>Village / School</th>
<th>House No / Class No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

### Columns
- **Trachoma**: TRACHOMA
- **Hardness**: HARDNESS
- **Lashes**: LASHES
- **Pupil**: PUPIL
- **Cornea**: CORNEA
- **Opacity**: OPACITY
- **Ulcer**: ULCER
- **Conjunctiva**: CONJUNCTIVA
- **Vision**: VISION
- **Squint**: SQUINT
- **Sex**: SEX
- **Age**: AGE
- **Full Name & Tribe**: FULL NAME & TRIBE
- **Serial No**: SERIAL NO
Primary Health Center in Oman

**Trained Physician**
- Ophthalmic loupe
- Torchlight
- Trachoma grading card
- Poster on ocular hygiene

**Active Trachoma Group ‘B’ of Notification system**
- Confirmation by regional supervisor
- Action: Home visit and health education for trachoma control
- 2012–13 cases of TF

**HIMS**
- Monthly reporting
- TF cases 96 cases
- Trachomatous Trichiasis – 14 cases
Prevalence of Active trachoma in 1st primary students
1993 to 2001
Prevalence of Active trachoma in 1st primary students 2001 to 2012
Active Trachoma (TF)

Chapter 4.5

Case-based Surveillance Initiative for the Elimination of Active trachoma

4.5.1 EPIDEMIOLOGICAL BACKGROUND

Trachoma is still the world's leading infectious cause of blindness and the leading cause of ocular morbidity. It is estimated by the WHO that 146 million people suffer from active trachoma and are in need of antibiotic treatment. In view of its public health implication, the World Health Organization (WHO) along with its partners initiated a program titled 'Global Elimination of Trachoma by 2020' (GET 2020). For the endemic areas, WHO proposed the member countries to adopt SAFE strategy (Surgery for trachoma complications, Antibiotic for treating infectious stage of trachoma, Facial cleanliness to decrease transmission and Environmental improvements mainly for access to clean water and control of flies.

Trachoma is a communicable bacterial infection caused by *Chlamydia trachomatis*. The serotypes A, B and C affect the conjunctival and sub-conjunctival tissues, cause inflammation which is followed by scarring and sequelae. Human is the natural reservoir. It is transmitted through contaminated fingers and nasopharyngeal secretions aerosol and also by flies and fomites like kohl stick, towels, pillows, etc. Since there is no natural long-term immunity against trachoma infection, the host will continue to be susceptible to subsequent cycles of infection. A large number of asymptomatic cases and cases with mild discomfort is a major barrier for the early detection of active trachoma cases.

4.5.2 TRACHOMA IN OMAN

Oman is a trachoma endemic country and estimations by WHO in 70's suggested 70% to 80% prevalence of trachoma which declined to 20% to 30% in mid 80s. Marked improvement in socioeconomic situation and active health interventions further reduced the incidence. The Ministry of Health, through the Eye Health Care Program has implemented the 'SAFE' strategy for trachoma control since 1991. In addition, the primary health care approach was introduced for detecting and treating symptomatic active trachoma cases since 1995. In 1999, the Vision 2020 planning document trachoma was one of the six priority eye diseases in Oman and the program aimed at elimination of Blinding Trachoma by 2010. Stringent indicators were laid down by WHO.
in 2004 to certify a country to achieve this goal. For active trachoma, Trachomatous Follicular (TF) stage in ≤0 years of age will be the indicator. A smallest administrative unit (Wilayat of Oman) should have less than 5% TF and such information should be community based. Such a stage should be maintained for three consecutive years. A survey of ≤5 children in three hyper endemic regions of trachoma in the past namely Dakhliyah, North Sharqiyyah and South Bahtinah had less than 1% TF in each of its Wilayat in 2005. The primary school children in 2004 in one Wilayat of each of these regions also had TF prevalence of 0%. The ‘P’ Face washing and ‘E’ environmental improvement strategies for trachoma control is closely linked to ‘A’ antibiotic treatment for active trachoma. The former makes the efforts sustainable. The WHO Alliance for global trachoma control acknowledged the progress made in this field by Oman especially due to its strong ‘P’ and ‘E’ components and encouraged other member countries to apply Oman’s trachoma control model in their countries.

Following figure shows the decline in trachoma in the last three decades.

**Fig. 21**
Prevalence of Trachoma amongst 1st Primary School Children 1986-87 to 2002-03

Eye Health Care Programme Launched in 1995

New reporting system introduced

4.5.3 CASE DEFINITION (WHO)

Presence of TF &/or TI is termed as active trachoma

- TF (Trachomatous Follicular) Presence of five or more follicles in the upper tarsal conjunctiva with normal blood vessel pattern visible on the tarsal conjunctiva.
- TI (Trachomatous Intense) Pronounced inflammatory thickening of the upper tarsal conjunctiva that obscures more than half of the normal deep tarsal vessels.

*Note: Use of ophthalmic 2.5X loupe is recommended to look for evidence of trachoma.*

4.5.4 INCUBATION & TRANSMISSION

After an incubation period of 5 to 12 days it begins as a mild conjunctivitis and then explodes as a keratoconjunctivitis, characterized by large amounts of ocular and nasal discharge.

Trachoma spreads through contact with contaminated ocular or nasal discharges, either directly (finger) or indirectly (tissue papers, flies - Musca sorbens).

4.5.5 SURVEILLANCE & REPORTING

For the purpose of surveillance clinical criteria are considered adequate. The case-based surveillance system aims to locate all the active trachoma cases, examine their epidemiological profile and establish correlation with risk factors. The community action as well as reporting will be done at the regional level. The epidemiologist or the regional focal point of communicable diseases will be responsible for the monitoring and supervision as well as data analysis.

4.5.6 COMMUNITY ACTION & CONTROL

The assigned Health Inspector from the Wilayat should take following action within 14 days of receiving the copy of notification of active trachoma case:

- Visit the house of the case & screen all household members for TF.
- Provide single dose Azithromycin (children 20 mg/kg & adult 1 g) therapy to all family members with TF. It should not be given to pregnant women, lactating mothers or an infant of less than 6 months of age. Mild gastric discomfort, diarrhoea are reported in some patients hence should be given after eating some food.
- Impart health education on ocular hygiene.
- Report action taken in form (PR-15) to the Epidemiologist or the focal point of communicable diseases in the Region.

*Note: The follicles due to active trachoma take long time to respond hence it should not be used as the parameter to determine the success of the treatment.*

4.5.7 LABORATORY INVESTIGATION PROTOCOL

None required.

Acknowledgement:

This chapter was contributed by Dr. Rajiv Khdekar, I/C, Eye Health Care Programme, Ministry of Health.
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- Impart health education on ocular hygiene.
- Report action taken in form (PR-11) to the Epidemiologist or the focal point of communicable diseases in the Region.

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4.3.7 Laboratory Investigation Protocol
None required.

Acknowledgement:
This chapter was contributed by Dr. Rajiv Khandsar, I.C. Eye Health Care Programme, Ministry of Health.
In 2012, surveillance system reported 26 TF cases.

Azithromycin oral medication

TF Cases reported by PHCs in 2012 = 26
ICD 10 code Morbidity data by Ophthalmologists

Active Stages of Trachoma (T.F., T.I.)

Other stages of trachoma

Eye unit

Electrolysis

Entropion Correction

In 2012

TF in children <15 years: 110
TT: 1,624
Entropion correction - 76
Electo-epilation: 29
Elimination of TRACHOMA – Oman Successful Journey 1970 to 2012

Trachoma 70% to 80%
Dawood WHO (1980)

Trachoma 39% TT 9%
Darougar WHO (1981-84)

Active trachoma 15% to 18%
TT: 23,000 Thylefors WHO (1991)

'OSAFE' strategy launched 1991

Oman survey (1997)
2.2% active trachoma
1% TT

survey (2011)
1/1000

Less than 10y
2012
0.06%

Trachoma was a public health problem in the past
Active Surveillance for TF & TT in 1996-97
(Sample based part of blindness survey for all ages)
The distribution of active trachoma in children in Oman

The distribution of trichiasis in adults >15 in Oman

Prevalence of active trachoma

- 0%
- <1%
- 1 - 3%
- No data

Prevalence of Trichiasis

- <1%
- 1 - 4.9%
- No data

1996-97 survey
Active Surveillance for TT in 2005-06
(Sample based part of glaucoma survey for >30 years old)
Prevalence of TT in >40 years old Population in 2005
Active surveillance for TF in preschool children

<table>
<thead>
<tr>
<th>Region</th>
<th>Pop</th>
<th>n</th>
<th>TF</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dhakhiliya</td>
<td>28,823</td>
<td>1,779</td>
<td>12</td>
<td>1.0</td>
</tr>
<tr>
<td>N Sharqiya</td>
<td>15,024</td>
<td>1,190</td>
<td>5</td>
<td>0.4</td>
</tr>
<tr>
<td>S Batinah</td>
<td>28,645</td>
<td>600</td>
<td>10</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>72,491</strong></td>
<td><strong>4,205</strong></td>
<td><strong>27</strong></td>
<td><strong>0.78</strong></td>
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</tbody>
</table>
Active surveillance for TF in primary school children of three Wilayats – 2004 -05
Prevalence of TF in 6 to 12 years old children

Izki: 1.02
Mudhaibi: 1.61
Rustaq: 4.77
TT registry – active surveillance

1996-98

Reintroduced in three regions in 2004
**TT Register**

**Follow up Details:** (1 year after surgery)

<table>
<thead>
<tr>
<th>RE</th>
<th>Vision: _______ with glasses.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trichiasis: Present Absent</td>
</tr>
<tr>
<td></td>
<td>Site of Trichiasis: Central Peripheral</td>
</tr>
<tr>
<td></td>
<td>Symptoms of Trichiasis: Present Absent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LE</th>
<th>Vision: _______ with glasses.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trichiasis: Present Absent</td>
</tr>
<tr>
<td></td>
<td>Site of Trichiasis: Central Peripheral</td>
</tr>
<tr>
<td></td>
<td>Symptoms of Trichiasis: Present Absent</td>
</tr>
</tbody>
</table>
**Management Details:**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Agreed for surgery</th>
<th>Refused surgery</th>
</tr>
</thead>
</table>

Referred to: __________________________ Date of ref.: ____/____/____

Name of Operation: __________________________ Operated on: ____/____/____

**Defaulter Retrieval Details:**

(To be carried out for all cases refusing surgery or no management details received from ophthalmic Unit within two months of reference)

Visited by: __________________________ Date: ____/____/____
### Registered TT cases

<table>
<thead>
<tr>
<th></th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>2035</td>
<td>36.2</td>
</tr>
<tr>
<td>Female</td>
<td>3584</td>
<td>63.8</td>
</tr>
<tr>
<td>Total</td>
<td>5619</td>
<td>100</td>
</tr>
</tbody>
</table>

### H/o Past lid surgery

<table>
<thead>
<tr>
<th></th>
<th>#</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>No</td>
<td>4681</td>
<td>83.3</td>
</tr>
<tr>
<td>yes</td>
<td>934</td>
<td>16.6</td>
</tr>
</tbody>
</table>

### H/o Past lid surgery

<table>
<thead>
<tr>
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<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor</td>
<td>3200</td>
<td>58.7</td>
</tr>
<tr>
<td>Major</td>
<td>1770</td>
<td>31.5</td>
</tr>
<tr>
<td>recent epilation</td>
<td>549</td>
<td>9.8</td>
</tr>
<tr>
<td>Total</td>
<td>5619</td>
<td>100</td>
</tr>
</tbody>
</table>
Assessment of Trachomatous Trichiasis in >40 years old Omani citizen
For ‘Elimination of Blinding Trachoma in Oman’

(A) Personal Information:
1st Name: ______________________ 2nd Name: ______________________ 3rd Name: ______________________
Kabila: ______________________ Age: _____ Years Sex: Male/Female Status of examination: Examined/absent/refused
Village: ________________ Wilayat: ________________ Region: __________ Contact Phone: ________________

(B) Past History:
Trachomatous Trichiasis surgery in Right Eye: Yes/No/I don’t know
Epilation done in PHC/eye department: Yes/No/I do not know
Epilation done at home: Yes/No/I do not know
Other surgery done in Right eye: Yes/No
Eye doctor advised lid surgery in right eye: Yes/No/I don’t know
Trachomatous Trichiasis surgery in Left eye: Yes/No/I don’t know
Epilation done in PHC/eye department: Yes/No/I do not know
Epilation done at home: Yes/No/I do not know
Other surgery done in Left eye: Yes/No
Eye doctor advised lid surgery in Left eye: Yes/No/I don’t know

(C) Present status of eye
Trachomatous Trichiasis in Right Eye: Major/Minor/Not present
Evidence of recent epilation in Right eye: Yes/No
Vision in Right eye: <3/60/>3/60 (as presented)
Trachomatous Trichiasis in Left Eye: Major/Minor/Not present
Evidence of recent epilation in Left eye: Yes/No
Vision in Left eye: <3/60/>3/60 (as presented)

(D) Action taken:
Patient referred to eye doctor: Yes/ reference not required
Patient agreed/Refused for consultation Health education: Given/not given
Name of eye examiner: __________________________ Name of doctor completing census: __________________________ Date of examination: __/__/2008
<table>
<thead>
<tr>
<th>Wilayat</th>
<th>Old definition of UIG for TT</th>
<th>New Definition of UIG for TT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nizwa</td>
<td>5.2%</td>
<td>0/1,000</td>
</tr>
<tr>
<td>Mudhaiby</td>
<td>4.3%</td>
<td>8/10,000</td>
</tr>
<tr>
<td>Rustaq</td>
<td>8.9%</td>
<td>0/1,000</td>
</tr>
<tr>
<td>Barka</td>
<td>4.8%</td>
<td>0/1,000</td>
</tr>
<tr>
<td>Musanaa</td>
<td>14.6%</td>
<td>5/10,000</td>
</tr>
</tbody>
</table>
‘S’ Surgery for TT

- 20% to 30% recurrence (Graz 89)
- BTR & electrolysis is SOP - 1995
- TT register: 6,600 cases
- 56% recurrence after 3.5 years (99)
- Health education material
- Presence of dysplastic & distichiasis
- Laser trichiolysis
<table>
<thead>
<tr>
<th>'A' strategy of trachoma control</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Early detection: screening in schools</td>
</tr>
<tr>
<td>• PHC approach</td>
</tr>
<tr>
<td>• Tetracycline oral – tetracycline ointment - Azithromycin oral since ‘99</td>
</tr>
<tr>
<td>• Treatment at secondary level</td>
</tr>
<tr>
<td>• Operational research: response to Azithromycin PHC X school approach for surveillance</td>
</tr>
<tr>
<td>• Mapping of active trachoma &lt;10 children</td>
</tr>
</tbody>
</table>
‘F’ Face Washing

- Poster and booklet on ocular hygiene
- Health education to school children
- Cases with active trachoma & conjunctivitis at Health institutions
- Integration with school curriculum and diarrhea control initiative of Child Health in IMCI
- Prompt treatment of nasal and ocular infections by school nurse
- Improved literacy rate in mothers
<table>
<thead>
<tr>
<th>‘E’ Environmental Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Source of water: desalination plants, wells</td>
</tr>
<tr>
<td>• Distribution: Pipes, tankers</td>
</tr>
<tr>
<td>• Excellent garbage disposal by Municipality</td>
</tr>
<tr>
<td>• Scanty rains: low risk of fly breeding</td>
</tr>
<tr>
<td>• Malaria eradicated from Oman since 1997 &lt;600/year imported cases in last five years</td>
</tr>
<tr>
<td>• Over 50% reduction in the rate of diarrhea amongst under-five children in last decade</td>
</tr>
</tbody>
</table>
• Biannual indicators on school environment

  – Quality of water

  – Ventilation

  – Latrine and toilet sanitation
In 2012, several countries (the Gambia, Ghana, Morocco, Myanmar, Oman and Viet Nam) reported to WHO the achievement of the intervention targets for the elimination of blinding trachoma as a public health problem (i.e. <1 case of trichiasis per 1000 population and a prevalence of active trachoma (grade TF)\(^3\) in children aged 1–9 years of <5%). Among these, Oman was the first country where verification of the elimination of blinding trachoma was carried out. The verification mission reviewed the following evidence: the historical intervention data available on the elimination programme; medical records relevant to the surgical operations performed for trachomatous entropion trichiasis (grade TT);\(^3\) data from registries of blind
Eastern Mediterranean Region

Trachoma is endemic in 10 of the 22 countries in the Region. In 2011, 2 countries (Sudan and South Sudan) reported the implementation of elimination campaigns. Iran reported the elimination of trachoma after carrying out a rapid assessment in the historically known endemic regions; Oman was verified for achieved elimination in November 2012, and Morocco will be verified in October 2013. Pakistan and Afghanistan are estimated to host the largest population living in endemic areas in the Region but they are not yet reporting large scale implementation of SAFE; a planning workshop arranged by the Eastern Mediterranean Regional Office will define the current situation, identify the best strategies for expansion of the work on trachoma elimination and mobilize the resources needed for implementation. Egypt, historically associated with blinding trachoma, reported presence of trachoma to the WHO GET 2020 Alliance in 2007 but a comprehensive assessment of the extent of the problem has not yet been carried out. Yemen has progressed significantly since 2011 in the planning for SAFE implementation; surveys are being planned and funding has been secured. Sudan is pursuing the completion of its elimination efforts with the support of international partners.
<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Journal/Year</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Prevalence of Blindness in Oman</td>
<td>Br J Ophthalmol 2002</td>
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<tr>
<td>2</td>
<td>Long-term outcome of Trachomatous Trichiasis surgery in Oman</td>
<td>Ophthalmic Epidemiology J 2001</td>
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<tr>
<td>3</td>
<td>Trachoma status after Azithromycin treatment of active trachoma cases in 1st grade Omani school children - A cohort study</td>
<td>EMRO Health J (in press)</td>
</tr>
<tr>
<td>4</td>
<td>Active trachoma, ‘F’ Face washing &amp; ‘E’ Environmental improvement in high risk population of Nizwa Wilayat of Oman – A descriptive study</td>
<td>EMRO Health J (in press)</td>
</tr>
<tr>
<td>5</td>
<td>Distichiasis &amp; dysplastic eye lashes in TT cases in Oman</td>
<td>EMRO Health J (in press)</td>
</tr>
</tbody>
</table>
## Publications on Trachoma

1. **KAP of health staff for primary eye care in Oman** SQUH J of Health research (in press)


4. ‘Surveillance of trachoma health center approach is complementary to school approach in Oman’ article in Synopses of 4th Meeting of Global Alliance for Trachoma control Initiatives WHO Geneva

5. **Eye Health Care Activities in Omani schools** Newsletter of DSDC, MOH, Oman 1994

6. **Trichiasis management in South Batinah region** Newsletter of DSDC, MOH, Oman

7. **Evaluation of eye health care program in South Batinah region** Newsletter of DSDC, MOH, Oman
Summary

• Surveillance helped

• in monitoring the progress

• Focus on the trouble areas

• Internationally acceptable indicators

• Timely action

• Additional resources

• Warned about resurgence
Take home messages

Surveillance for trachoma

• As per the program goals
• Part of Diseases surveillance
• TF in children could be part of school health
• Case finding of TT - screening of high risk population
• Health Information & Management System
EMRO WHO STC
Visit to Oman
2003
Thank You