TRACHOMA SURVEILLANCE ANNUAL REPORT, 2008

A report by the National Trachoma Surveillance and Reporting Unit

Betty Tellis, Kathy Fotis, Jill E Keeffe, Hugh R Taylor

Abstract

The National Trachoma Surveillance and Reporting Unit has reported data for trachoma endemic regions and communities in the Northern Territory, South Australia and Western Australia for 2006 to 2008. Aboriginal children aged 1–9 years were examined using the World Health Organization grading criteria. Screening in the Northern Territory was conducted by the primary health care staff from the Healthy School Age Kids program, the Australian Government Emergency Intervention and Aboriginal Community Controlled Health Services. Forty-three of 92 communities in 6 regions were screened and reported data (2,462 children). In South Australia, the Eye Health and Chronic Disease Specialist Support Program and a team of eye specialists visited 11 of 72 communities in regions serviced by 6 Aboriginal Community Controlled Health Services (365 children). In Western Australia, population health unit and primary health care staff screened and reported data for 67 of 123 communities in 4 regions (1,823 children). Prevalence rates of active trachoma varied between the regions with reported prevalence ranging from 4%–67% in the Northern Territory, 0%–13% in South Australia and 8%–25% in Western Australia. Statistical comparisons must be viewed with caution due to the year-to-year variation in the coverage of children examined and the small numbers. Comparisons of 2006, 2007 and 2008 regional prevalence of active trachoma showed that many communities had no change in prevalence, though there were a few statistically significant increases and decreases ($P < 0.05$). The number of communities screened and the number of children examined has improved but still remains low for some regions. The implementation of the World Health Organization Surgery (for trichiasis), Antibiotics (with azithromycin), Facial cleanliness and Environmental improvement (SAFE) strategy has been variable. Few data continue to be reported for the surgery and environmental improvement components. In general, the availability of the community programs for surgery, antibiotic treatment, and facial cleanliness has improved. Reporting of antibiotic treatment has improved from 2006 to 2008. No significant changes were noted in bacterial resistance reported by pathology services from 2007 to 2008; these rates are comparable to national data collected by the Advisory Group on Antibiotic Resistance in 2005. *Commun Dis Intell* 2009;33(3):275–290.

Keywords: active trachoma, antibiotic resistance, facial cleanliness, Northern Territory, SAFE trachoma control strategy, South Australia, trachoma control activities, trachoma endemic, Western Australia

Introduction

This is the third report of the National Trachoma Surveillance and Reporting Unit (NTSRU). This report aims to compare 2008 data with results from the screening in 2006 and 2007 conducted in the Northern Territory, South Australia and Western Australia in regions with endemic trachoma.[1,2] It comments on jurisdictions' implementation of the Communicable Diseases Network Australia (CDNA) trachoma guidelines 'minimum best-practice approach', and makes recommendations regarding future reporting and management.[3]

Methods

Presented below is a summary of the data collection methods used by the jurisdictions and the data analysis and reporting methods used by the NTSRU. A detailed description of the 2008 report is included in the full 2008 report.[4]

Screening and data collection

Key representatives from each jurisdiction categorised communities that were 'At Risk' or 'Not At Risk' for trachoma, and further categorised each group into screened or not screened. Communities considered At Risk were determined using historical reports of trachoma in their regions. In most cases this did not include the large urban regions. For many communities in South Australia there was no information on prior screening for trachoma; these communities have been reported as At Risk and should have been screened.

According to the CDNA guidelines, screening should be conducted annually in Communities At Risk until prevalence of active trachoma is less than 5% for 5 consecutive years. The World Health Organization (WHO) has set the criteria for the elimination of blinding endemic trachoma in a community as being a prevalence of active trachoma greater than 5% in children aged 1–9 years or a prevalence of operable trichiasis of less than 0.1% in the population.

The WHO simplified trachoma grading system was used to report results of screening.[5] Active trachoma includes WHO grades trachomatous inflammation follicular (TF) and/or trachomatous inflammation intense (TI).

In brief, data were reported for prevalence of active trachoma, antibiotic treatment of children, their household contacts and community members, facial cleanliness, trachomatous trichiasis (TT) and surgery for trichiasis. The implementation of the Surgery, Antibiotics, Facial cleanliness and Environmental improvements (SAFE) components of the SAFE trachoma control strategy were also reported. This report focuses on the data for Aboriginal children aged 1–9 years and Aboriginal adults aged 30 years or more—unless otherwise specified—to comply with CDNA guidelines.

The NTSRU monitored antibiotic resistance in Aboriginal communities for 2 years (2007 and 2008). Three pathology services collected and reported data: the Institute of Medical Veterinary Science (IMVS), the Northern Territory Government Pathology Service (NTGPS) and the Western Diagnostics Pathology Service (WDPS). The participating laboratories and health services reported azithromycin resistance (defined as both intermediate and high level resistance) for any invasive and non-invasive isolates of *Streptococcus pneumoniae* specimens collected from Aboriginal people in trachoma endemic regions. Specimens were collected over a 6 month period in 2008 (1 July to 30 December) because too few results were reported within the 3 month collection period in 2007. Information on indigenous status was only reported from the NTGPS. IMVS and WDPS provided data for specimens from those regions or health services that predominately service Aboriginal people.

Northern Territory

Screening for trachoma was conducted between February and November 2008 in 6 regions. The Healthy School Age Kids (HSAK) program conducted most of the screening in the Top End and in Central Australia with collaboration with primary health care staff from the Aboriginal Community Controlled Health Services (ACCHS). In 2008 the HSAK program was fully implemented in Central Australia.

Screening was conducted in an Alice Springs town camp for the first time by the trachoma coordinator in conjunction with the Australian Government Emergency Intervention (AGEI) at the Central Australian Aboriginal Congress. Previously, Alice Springs town camps had not been screened because they were not regarded as At Risk for trachoma and because the HSAK program is responsible for remote areas.

In 2007, the AGEI conducted Child Health Checks throughout the Northern Territory. The AGEI clinical advisory panel decided that trachoma screening was only to be conducted by members of the intervention teams who had appropriate skills and training to do so. During Phase 2 of the AGEI in 2008, some children in the Northern Territory were examined for trachoma during the Child Health Check. The screening reported was not regarded as reliable or consistent by the Northern Territory authorities so has not been included in this report. The communities that were visited by the AGEI (n=14) were not revisited by the HSAK program and this contributed to the smaller number of communities reporting active trachoma data for 2008.

Ophthalmologists examined Aboriginal adults for trichiasis when they conducted outreach visits in the regions.

South Australia

Screening for trachoma was conducted between April and December 2008 in regions serviced by 6 ACCHSs. The Ceduna/Koonibba region includes communities in the Eyre school district (located south-east of the Ceduna/Koonibba Health Service). This incorporates communities serviced by the Port Lincoln ACCHS region where screening has not been conducted. The Pika Wiya region includes communities from within the Flinders school district, and 2 communities from the Northern Country school district, which were reassigned by the Eye Health and Chronic Disease Specialist Support Program (EH&CDSSP) coordinator. For this reason the Australian Bureau of Statistics Census data for the Aboriginal population in the Ceduna/Koonibba and Pika Wiya regions appear larger than what would be expected for some of these regions as serviced by the ACCHS.

In 2006 communities in regions serviced by Oak Valley ACCHS were reported with communities from the Tullawon ACCHS; these data have been combined together in Table 1 so comparisons can be made for each year between 2006 and 2008.

A widespread screening program was not implemented as the EH&CDSSP only visits selected communities serviced by some ACCHS. The project coordinator of the EH&CDSSP assisted a screening team of ophthalmologists and optometrists in recording information on active trachoma. Some communities were visited twice over a 1 year period, however only 1 round of data was reported. Aboriginal children who were identified for screening were seen in schools and others brought to the clinics by family members, Aboriginal health workers or clinic staff.

Table 1: Community coverage, screening coverage and active trachoma prevalence of Aboriginal children aged 1 to 9 years, 2006 to 2008, by state or territory, region and Aboriginal Community Controlled Health Service

State or territory and region	Number of Communities At Risk	Community coverage Number of communities screened (% of Communities At Risk)						Screening coverage Number of children examined (% of children in Communities At Risk)						Prevalence of active trachoma Children 1 to 9 years (% prevalence)					
	2008	2006		2007		2008		2006		2007		2008		2006		2007		2008	
	n	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Northern Territory																			
Alice Springs	1	–		–		1	100	–		–		45	22	–		–		18	40
Alice Springs Remote	30	25	83	19	63	18	60	530	35	231	15	459	29	94	18	46	20	157	34*
Barkly†	8	6	67	6	67	2	25	105	20	68	13	87	26	22	21	18	26	58	67*
Darwin Rural	16	15	94	12	75	11	69	522	27	377	19	907	45	84	16	25	7	183	20*
East Arnhem	12	12	100	12	100	4	33	879	78	465	41	232	20	22	3	23	5	10	4
Katherine†	20	11	52	11	52	7	35	218	12	562	31	732	50	65	30	104	19	287	39*
Total	87	69	78	60	67	43	49	2,254	33	1,703	24	2,462	36	287	13	216	13	713	29*
South Australia																			
Ceduna/Koonibba	21	1	5	1	5	1	5	18	1	16	1	121	6	1	6	1	6	0	0
Nganampa	10	8	80	4	40	6	60	27	8	76	23	167	50	5	19	10	13	4	2*
Oak Valley‡	2	2	100	2	100	2	100	28	108	34	131	25	93	7	25	7	21	2	8
Pika Wiya	33	5	15	–		1	3	51	1	–		37	1	6	12	–		0	0*
Umoona Tjutagku	6	1	17	1	17	1	17	6	7	2	2	15	17	1	17	0	0	0	0
Total	72	17	24	8	11	11	15	130	1	128	1	365	4	20	15	18	14	6	2*
Western Australia																			
Goldfields	20	6	30	10	50	13	65	231	24	227	23	238	23	43	19	8	4	18	8*
Kimberley†	34	28	82	25	83	32	94	1,048	51	1,006	58	1,169	55	192	18	164	16	175	15
Midwest	6	6	100	5	83	6	100	167	90	127	68	122	64	32	19	28	22	12	10*
Pilbara§	16	9	56	14	88	16	100	273	36	306	40	294	37	146	53	50	16	73	25*
Total	76	49	64	54	75	67	88	1,719	43	1,666	45	1,823	44	413	24	250	15	278	15*
Australia	235	135	57	122	52	121	51	4,103	21	3,497	18	4,650	23	720	18	484	14	997	21*

– Data not reported.

* $P < 0.05$ = statistical significant change found between 2006 and 2008 using chi-square test.

† Barkly had 9 Communities At Risk of trachoma in 2006 and 2007; Katherine had 21 Communities At Risk in 2006 and 2007; and the Kimberley had 30 Communities At Risk in 2007.

‡ Communities in regions serviced by the Oak Valley Aboriginal Community Controlled Health Services (ACCHS) were reported with communities from the Tullawon ACCHS.

§ Change in grading from 2007.

Source: Data were collected by the Healthy School Age Kids program in Northern Territory, the Eye Health and Chronic Disease Specialist Support Program in South Australia and population health units in Western Australia.

Data from the Pika Wiya region were collected by the mainstream Health Service and forwarded to the EH&CDSSP coordinator to be included in this report.

The screening team of eye specialists also visited ACCHS clinics twice in the year to examine adults for trichiasis.

Western Australia

Screening for trachoma was conducted between August and September 2008 in 4 regions. Population Health Units collected data in partnership with primary health care staff from state government ACCHS. In most regions letters were sent to parents in order to gain permission for the screening of their children.

Adults were examined for trichiasis as part of an annual influenza vaccination program.

Data analysis and reporting

Comparisons between jurisdictions need to be interpreted with caution because of the variation in methods, data collection and reporting.

In 2008, a community was defined as a group of people where there is a school; larger communities where two or more schools are located were counted as a single community instead of reporting data for each school separately. Community coverage was calculated using the number of communities that were screened as a proportion of those that were identified by each jurisdiction as At Risk. Communities that were reported as Not At Risk and were not screened are not included.

The 2006 Australian Bureau of Statistics (ABS) census data of the number of Aboriginal people resident in a region were used to calculate 2008 high and low series population projections.[6,7] Screening coverage was calculated using the number of children who were examined for trachoma in 2008 as a proportion of those who were estimated by the ABS to be resident in Communities At Risk.

The prevalence of active trachoma in Aboriginal children aged 1–9 years was calculated using the number of children examined as the denominator and 95% confidence intervals were calculated.

CDNA guidelines recommend providing azithromycin treatment to affected children, their households and community members. In some communities the treatment strategy was not reported, although some treatment was distributed. In other communities, treatment was reported to have been distributed where active trachoma was found in children aged 10–14 years without being detected in children aged 1–9 years. Where the data indicated that treatment was only given to affected children, without providing household or community treatment, these communities were regarded as not following the CDNA guidelines.

Comparisons must be viewed with caution due to the year-to-year variation in methods, data collection and reporting, and the small numbers of children examined. For comparisons to be made eligible communities had to report comparable data for at least 2 years. Chi-square tests were used to detect significant differences ($P < 0.05$) in the prevalence of active trachoma for communities that examined 10 or more children in two or more years. Where numbers were less than five in any cell, a Fisher's exact test was used. Analysis could not be conducted on 2006 data for 2 regions in Western Australia: the Kimberley region (where the number of children examined from each community was not reported) and the Pilbara region (where follicular trachoma was not graded according to the WHO grading system). In 2008, comparisons of prevalence of active trachoma were not possible for 4 of the 7 communities in the Katherine region of the Northern Territory where data were provided for children aged 0–15 years.

Results

National overview

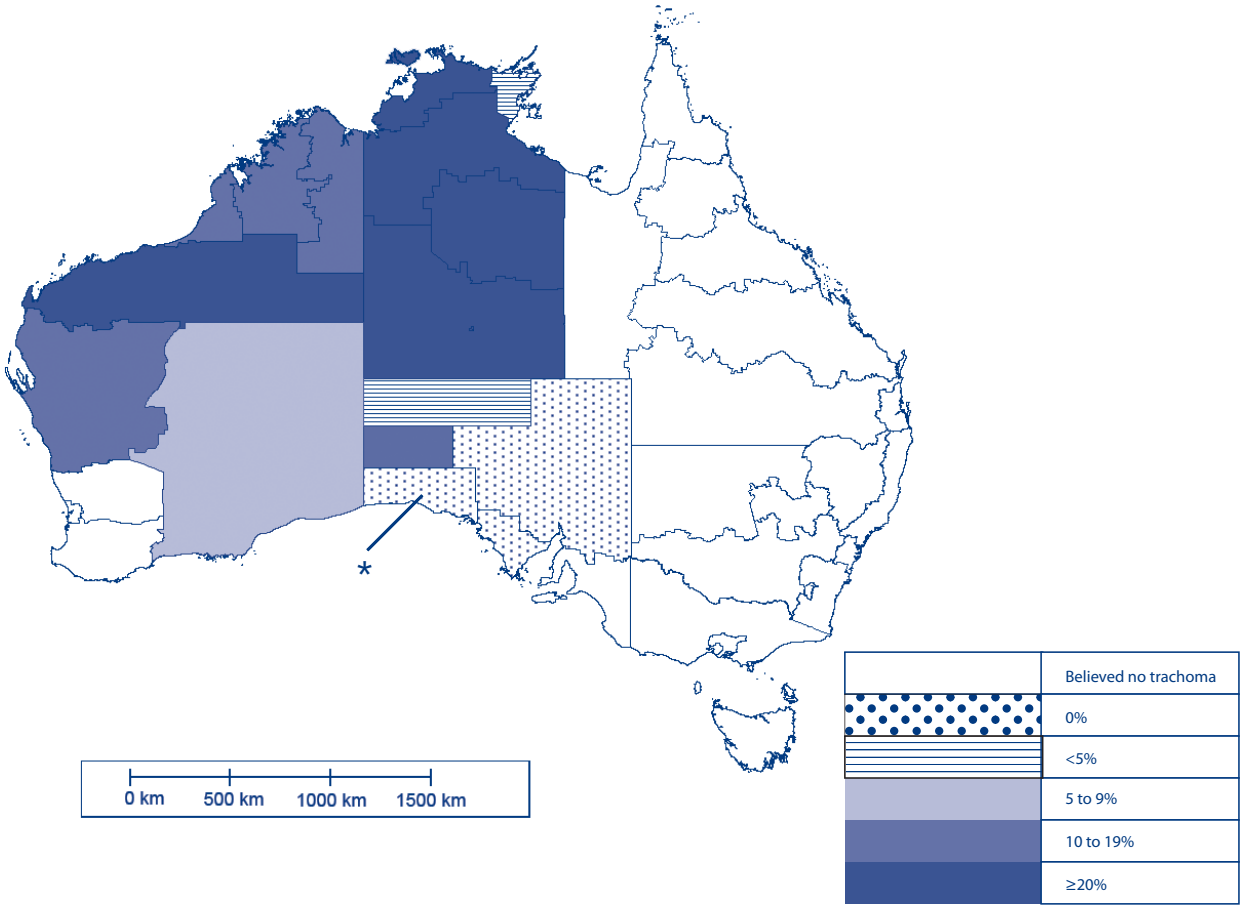
A total of 16 regions in the Northern Territory, South Australia and Western Australia conducted screening. Other jurisdictions were not included in this project (Map).

Data were reported for 121 of the 235 Communities At Risk (51%) in 2008 (Table 2). The overall prevalence of active trachoma in Aboriginal children aged 1–9 years for whom data were reported was 21% (Table 1). A total of 82 communities (68%) had a prevalence of active trachoma ≥ 5% (Table 3), and this occurred in 10 of the 15 regions (67%) (Table 1).

Of the communities where data were reported for the screening of active trachoma, facial cleanliness data were reported by 93 (76%) of 123 communities in 2007 and 108 (89%) of 121 in 2008. Many communities have tried to break the cycle of re-infection by promoting facial cleanliness through the use of programs (70%) and resources (49%) (Table 4).

Treatment was reported to have been distributed in 90 (92%) of the 98 communities in which treatment for trachoma was indicated (Table 5), including 4 communities where active trachoma was found in children aged 10–14 years. Overall, 76 (78%) communities were treated according to CDNA guidelines, this included children found to have active trachoma, their household contacts and community members.

Map: Prevalence of active trachoma in Australia, 2008, by region



* No active trachoma was found, however few children were examined in this area (n=9).

Table 2: Number of communities screened for trachoma by trachoma risk, state and territory, 2008

Communities	Number and percentage of communities						Total	
	Northern Territory		South Australia		Western Australia			
	n	%	n	%	n	%	n	%
Not At Risk								
Screened	0		0		0		0	
Not screened	5	100	0		47	100	52	100
Total Not At Risk	5		0		47		52	
At Risk								
Screened with no trachoma found	4	5	7	10	16	21	27	11
Screened with trachoma found	39	45	4	6	51	67	94	40
Reported screened but no data received	19	22	0		2	3	21	9
Not screened	25	29	61	85	7	9	93	40
Total At Risk	87		72		76		235	
Total communities	92		72		123			

Community coverage varied between each state and territory with higher coverage in Western Australia and consistently low coverage in South Australia (Table 1). Comparisons must be viewed with caution due to the year-to-year variation in methods, data collection and reporting, and the small num-

Table 3: Community prevalence of active trachoma in Aboriginal children aged 1 to 9 years, 2006 to 2008, by state or territory

Community prevalence	Number and percentage of communities where trachoma data were reported						Total	
	Northern Territory		South Australia		Western Australia			
	n	%	n	%	n	%	n	%
2006 data								
0	30	42	0		5	9	35	26
1 to <5	7	10	0		3	6	10	8
5 to <10	7	10	2	25	8	15	17	13
10 to <20	6	8	3	38	6	11	15	11
20 to <50	12	17	3	38	19	36	34	26
≥ 50	10	14	0		12	23	22	17
Total	72	100	8	100	53	100	133	100
2007 data								
0	29	48	2	25	20	36	51	41
1 to <5	7	12	0		0		7	6
5 to <10	4	7	2	25	5	9	11	9
10 to <20	8	13	2	25	12	22	22	18
20 to <50	11	18	2	25	16	29	29	24
≥ 50	1	2	0		2	4	3	2
Total	60	100	8	100	55	100	123	100
2008 data								
0	4	9	7	64	16	24	27	22
1 to <5	4	9	1	9	7	10	12	10
5 to <10	4	9	2	18	8	12	14	12
10 to <20	6	14	1	9	7	10	14	12
20 to <50	16	37	0		21	31	37	31
≥ 50	9	21	0		8	12	17	14
Total	43	100	11	100	67	100	121	100

Table 4: Implementation of trachoma control activities (SAFE strategy), 2008, by state or territory

SAFE trachoma control activities	Number and percentage of communities where trachoma control activities were reported						Total	
	Northern Territory		South Australia		Western Australia			
	n	%	n	%	n	%	n	%
Surgery referral process for trichiasis available	39	91	4	36	26	39	69	57
Antibiotics distributed	35	81	5	45	50	75	90	74
Facial cleanliness resources used	27	63	1	9	31	46	59	49
Facial cleanliness programs implemented	32	74	0		53	79	85	70
Good environmental condition	2	5	0		9	13	11	9
Total number of communities where trachoma screening data were reported	43		11		67		121	

bers of children examined. A comparison between 2006 and 2008 regional prevalence data found there was no change in prevalence in 6 regions, a statistically significant increase ($P < 0.05$) in prevalence was found in 4 regions, and a decrease ($P < 0.05$) in 5 regions (Table 1). Of the 77 communities where comparable data were provided, 53 (69%) communities had no significant change (Table 6).

Trichiasis screening was carried out only in a small proportion of Communities At Risk (62/235), but the overall prevalence in the adults examined was 4% (52/1,407) (Table 7, 8 and 9). Not all communities where data were reported are implementing the components of the SAFE strategy according to the CDNA guidelines, but antibiotic treatment and facial cleanliness programs are being reported by the majority, 74% (90/121) and 70% (85/121) respectively (Table 4).

Northern Territory

Of the 92 communities in 6 regions of the Northern Territory, 87 (95%) communities were categorised as being At Risk for trachoma (Table 2). Included in these communities was a community (town camp) in Alice Springs, previously categorised Not At Risk. After finding a 40% prevalence of active trachoma in children, this community was then re-categorised as At Risk (Table 1). Of the 62 (71%) communities that were screened in 2008, data were reported from 43 (69%) (Table 2). Four (9%) communities had no active trachoma while 35 (81%) had a prevalence of active trachoma of ≥ 5% (Table 3).

Table 5: Reported treatment for trachoma, 2008, by state or territory

Communities	Northern Territory		South Australia		Western Australia		Total	
	n	%	n	%	n	%	n	%
Treated in compliance with CDNA guidelines*								
Community-based	9	26	0		20	49	29	38
Household-based	19	54	0		21	51	40	53
Strategy not reported†	7	20	0		0		7	9
Total treated	35		0		41		76	
Not treated in compliance with CDNA guidelines								
Children only	0		5	100	9	82	14	64
No treatment reported	6	100	0		2	18	8	36
Total not following CDNA	6		5		11		22	
Total communities	41		5		52		98	

* Includes 2 communities in the Northern Territory, 1 in South Australia and 1 in Western Australia, where active trachoma was found in children aged 10 to 14 years without being detected in children aged 1 to 9 years.

† Communities carried out treatment but the strategy was not reported.

The Communicable Diseases Network Australia (CDNA) guidelines recommend that treatment of children and household or community contacts aged over 6 months be completed in as short a time frame as possible where population mobility is high.

Table 6: Changes in the prevalence of active trachoma in Aboriginal children aged 1 to 9 years in communities where ≥10 children were examined, 2006 to 2008, by state or territory

Change in prevalence of active trachoma 2006–2008	State or territory						Total	
	Northern Territory		South Australia		Western Australia			
	n	%	n	%	n	%	n	%
Significant decrease*	2	6	0		8	21	10	13
No change	21	64	6	100	26	68	53	69
Significant increase*	10	30	0		4	11	14	18
Total communities	33		6		38		77	

* Fisher's test used to evaluate change; significant at P < 0.05.

Source: Data were collected by the Healthy School Age Kids program in the Northern Territory, the Eye Health and Chronic Disease Specialist Support Program coordinator and the screening team in South Australia, and population health units in Western Australia.

Table 7: Trichiasis screening reported for Aboriginal adults aged ≥ 30 years in the Northern Territory, 2008, by region

	Alice Springs	Alice Springs Remote	Barkly	Darwin Rural	East Arnhem	Katherine	Total
Regional population (ABS)							
Adults resident:							
In region*	1,838	3,521	1,301	3,297	3,309	3,041	16,307
In Communities At Risk*	514	3,010	542	3,173	2,315	2,038	11,592
Trichiasis							
Communities from which data were reported/Communities At Risk	0/1	12/30	2/8	0/16	0/12	0/20	14/87
Adults examined	–	183	23	–	–	–	206
With trichiasis	–	23	3	–	–	–	26
Prevalence of trichiasis (%)	–	13	13	–	–	–	13
Trichiasis surgery within 12 months prior to the date of reporting	–	36	3	7	–	–	46

– Data not reported.

* Projected 2008 population data for the whole region based on the Australian Bureau of Statistics (ABS) 1.4% low series population growth rate in the Northern Territory.

Table 8: Trichiasis screening reported for Aboriginal adults aged ≥30 years in South Australia, 2008, by Aboriginal Community Controlled Health Service

	Ceduna/ Koonibba*	Nganampa	Oak Valley (Maralinga Tjarutja)	Pika Wiya†	Tullawon	Umoona Tjutagku	Total
Regional population (ABS)							
Adults resident							
In region‡	3,568	673	34	11,772	28	206	16,281
In Communities At Risk‡	3,568	673	34	11,772	28	206	16,281
Trichiasis							
Communities from which data were reported/ Communities At Risk	0/21	6/10	0/1	1/33	0/1	1/6	8/72
Adults examined	–	221	–	26	–	51	298
With trichiasis	–	1	–	0	–	0	1
Prevalence of trichiasis (%)	–	0.5	–	0	–	0	0.3
Trichiasis surgery within 12 months prior to the date of reporting	–	1	–		–		1

– Data not reported.

* Regional population data of Aboriginal adults and the number of Communities At Risk include adults and communities in the Eyre school district in South Australia and incorporates those serviced by the Port Lincoln Aboriginal Community Controlled Health Service region where screening has not been conducted.

† Regional population data of Aboriginal adults, and the number of Communities At Risk, include adults and communities in the Flinders school district in South Australia and two communities from the Northern Country school district which were reassigned by the Eye Health and Chronic Disease Specialist Support Program coordinator.

‡ Projected 2008 population data for the whole region based on the Australian Bureau of Statistics (ABS) 1.9% low series population growth rate in South Australia.

All communities in South Australia were considered At Risk, therefore the number of adults resident in the region and in Communities At Risk is the same.

Table 9: Trichiasis screening reported for Aboriginal adults aged ≥ 30 years in Western Australia, 2008, by region

	Goldfields	Kimberley	Midwest	Pilbara	Total
Regional population (ABS)					
Adults resident:					
In region*	2,063	3,551	2,185	2,384	10,183
In Communities At Risk*	1,761	3,321	406	1,585	7,073
Trichiasis					
Communities from which data were reported/ Communities At Risk	11/20	15/34	5/6	9/16	40/76
Adults examined	67	442	210	184	903
With trichiasis	3	21	1	0	25
Prevalence of trichiasis (%)	4	5	0.5	0	3
Trichiasis surgery within 12 months prior to the date of reporting	–	2	–		2

– Data not reported.

* Projected 2008 population data for the whole region based on the Australian Bureau of Statistics (ABS) 1.8% low series population growth rate in Western Australia.

Of the 6,747 children aged 1–9 years reported by the ABS to be resident in Communities At Risk (Table 10), 2,462 (36%) were examined for trachoma, and 713 had active trachoma (prevalence = 29%, 95% CI, 27%–31%) (Table 1). Comparisons for prevalence of active trachoma were not possible for four of the 7 communities in the Katherine region, where data were provided for children aged 0–15 years instead of 1–9 years, and age breakdowns were not provided. Of the 1,493 children examined for facial cleanliness, 1,004 (67%) had clean faces (Table 10).

Treatment was reported to have been distributed according to the CDNA guidelines in 35 (85%) of the 41 communities in which treatment for trachoma was indicated (Table 5). This included 2 communities where active trachoma was found in children aged 10–14 years.

Comparison of prevalence of active trachoma was made for 33 of 64 communities where data were reported for at least two of the years between 2006 and 2008. No change in prevalence was found in 21 (64%) communities, a statistically significant increase ($P < 0.05$) was found in 10 (30%) and a decrease ($P < 0.05$) was found in 2 (6%) (Table 6).

Data on trichiasis were reported for the Alice Springs Remote and Barkly regions only and 26 Aboriginal adults (13%) aged ≥ 30 years were found to have

Table 10: Number of resident Aboriginal children aged 1 to 9 years, and number of communities and children examined for facial cleanliness in the Northern Territory, 2008, by region

	Alice Springs	Alice Springs Remote	Barkly	Darwin Rural	East Arnhem	Katherine	Total
Regional population (ABS)							
Children resident:							
In region*	954	1,817	661	2,146	1,916	1,991	9,485
In Communities At Risk*	201	1,577	341	2,013	1,155	1,460	6,747
Facial cleanliness							
Communities from which data were reported/ Communities At Risk	1/1	18/30	2/8	5/16	2/12	2/20	30/87
Children examined	45	468	87	627	133	133	1,493
Prevalence of clean faces (%)	12	47	48	79	84	89	67

* Projected 2008 population data for the whole region based on the Australian Bureau of Statistics (ABS) 1.4% low series population growth rate in the Northern Territory.

trichiasis (Table 7). Forty-six adults were reported to have undergone surgery for trichiasis within 12 months prior to the date of reporting.

South Australia

Of the 72 communities in 6 ACCHS of South Australia, all were categorised as being At Risk for trachoma, of which 11 communities (15%) were visited and data reported (Table 2). Seven (64%) communities had no active trachoma while 3 (27%) had a prevalence of active trachoma of ≥ 5% (Table 3).

Of the 9,218 children aged 1–9 years reported by the ABS to be resident in Communities At Risk (Table 11), 365 (4%) were examined for trachoma, and 6 had active trachoma (prevalence = 2%, 95% CI, 1%–4%) (Table 1); 260 (71%) had clean faces (Table 11).

Treatment was reported to have been distributed in all five of the communities in which treatment for trachoma was indicated, including 1 community where active trachoma was found in 1 child aged 10–14 years without being detected in children aged 1–9 years (Table 5). Treatment was given to 7 children (6 aged 1–9 and another aged 14 years) who were examined and found to have active trachoma. CDNA treatment guidelines were not followed as household treatment was not given irrespective of the presence of trachoma. This was similar to 2006 and 2007.

Comparison of prevalence of active trachoma was made for 6 of 11 communities where data were reported for at least two of the years between 2006 and 2008, however no statistically significant changes were found (Table 6).

Data for trichiasis were reported for three of the 6 ACCHSs only, and 1 (0.3%) adult was found to have trichiasis. One adult was reported to have undergone surgery for trichiasis within 12 months prior to the date of reporting (Table 8).

Western Australia

Of the 123 communities in 4 regions of Western Australia, 76 (62%) communities were categorised as being At Risk for trachoma, of which 69 (91%) were screened in 2008 (Table 2). Data were reported from 67 (97%) of these communities. Sixteen (24%) communities had no active trachoma while 44 (66%) had a prevalence of active trachoma ≥ 5% (Table 3).

Of the 4,112 children aged 1–9 years reported by the ABS to be resident in Communities At Risk (Table 12), 1,823 (44%) were examined for

Table 11: Number of resident Aboriginal children aged 1 to 9 years and number of communities and children examined for facial cleanliness in South Australia, 2008, by Aboriginal Community Controlled Health Service

	Ceduna/ Koonibba*	Nganampa	Oak Valley (Maralinga Tjarutja)	Pika Wiya†	Tullawon	Umoona Tjutagku	Total
Regional population (ABS)							
Children resident:							
In region‡	2,083	334	9	6,687	18	87	9,218
In Communities At Risk‡	2,083	334	9	6,687	18	87	9,218
Facial cleanliness							
Communities from which data were reported/ Communities At Risk	1/21	6/10	1/1	1/33	1/1	1/6	11/72
Children examined	121	167	16	37	9	15	365
Prevalence of clean faces (%)	100	47	0	100	100	100	71

* Regional population data of Aboriginal children and the number of Communities At Risk include children and communities in the Eyre school district in South Australia, and incorporates those serviced by the Port Lincoln Aboriginal Community Controlled Health Service region where screening has not been conducted.

† Regional population data of Aboriginal children and the number of Communities At Risk include children and communities in the Flinders school district in South Australia and 2 communities from the Northern Country school district, which were reassigned by the Eye Health and Chronic Disease Specialist Support Program coordinator.

‡ Projected 2008 population data for the whole region based on the Australian Bureau of Statistics (ABS) 1.9% low series population growth rate in South Australia.

All communities in South Australia were considered At Risk, therefore the number of children resident in the region and in Communities At Risk is the same.

trachoma, and 278 had active trachoma (prevalence = 15%, 95% CI, 13%–17%) (Table 1). Of the 1,833 children examined for facial cleanliness, 1,433 (78%) had clean faces (Table 12).

Treatment was reported to have been distributed according to the CDNA guidelines in 41 of the 52 communities (79%) in which treatment for trachoma was indicated (Table 5), including one community where active trachoma was found in children aged 10–14 years.

Comparisons must be viewed with caution due to the year-to-year variation in methods, data collection and reporting, and the small numbers of children examined. Comparison of prevalence of active trachoma was made for 38 out of 62 communities where data were reported for at least two of the years between 2006 and 2008; 11 between 2006 and 2008, and 27 between 2007 and 2008. No change in prevalence was found in 26 communities (68%), a statistically significant increase ($P < 0.05$) was found in 4 (11%) and a decrease ($P < 0.05$) was found in 8 (21%) (Table 6).

Data on trichiasis were reported for all 4 regions, and 25 adults (3%) were found to have trichiasis. Two adults were reported to have undergone surgery for trichiasis within 12 months prior to the date of reporting (Table 9).

Antibiotic resistance

The reporting of azithromycin antibiotic treatment in trachoma endemic jurisdictions has improved from 2006 to 2008 (Table 13).

Overall, 53 of the 261 *S. pneumoniae* isolates (20.3%, 95% CI, 16%–26%) were reported to be resistant or have intermediate resistance to azithromycin (Table 14).

Table 12: Number of resident Aboriginal children aged 1 to 9 years, and number of communities and children examined for facial cleanliness in Western Australia, 2008, by region

	Goldfields	Kimberley	Midwest	Pilbara	Total
Regional population (ABS)					
Children resident:					
In region*	1,184	2,875	1,239	1,199	6,497
In Communities At Risk*	1,017	2,116	192	787	4,112
Facial cleanliness					
Communities from which data were reported/ Communities At Risk	13/20	32/34	6/6	16/16	67/76
Children examined	235	1,182	122	294	1,833
Prevalence of clean faces (%)	72	81	82	72	78

* Projected 2008 population data for the whole region based on the Australian Bureau of Statistics (ABS) 1.8% low series population growth rate in Western Australia.

Table 13: Percentage of people treated with azithromycin (total treated/total requiring treatment) in jurisdictions where trachoma is regarded as endemic, 2006 to 2008

	2006*		2007		2008†	
Northern Territory	–/287		328/533	(62%)	3,069/4,860	(63%)
South Australia‡	19/20	(95%)	18/18	(100%)	7/7	(100%)
Western Australia§	396/471	(84%)	1,675/2,084	(80%)	2,917/3,013	(97%)
Total	415/778	(53%)	2,235/2,635	(85%)	5,993/7,880	(76%)

– Data not reported.

* No jurisdiction reported the number of household or community contacts treated.

† An additional 871 people were treated in 4 communities in the Katherine region (Northern Territory), they have not been included in the total because the number of people requiring treatment was not provided.

‡ Number of children found to have active trachoma at the first screening have been reported, no household or community contacts were treated irrespective of the presence of trachoma.

§ Treatment data were reported for only two out of the 4 regions in 2006.

Table 14: Azithromycin resistance and susceptibility to *Streptococcus pneumoniae* isolates collected from Aboriginal people, 2008, by pathology service and region

Pathology service/ region	Number and percentage of isolates						Total	%
	Resistant	%	Intermediate	%	Susceptible	%		
Institute of Medical Veterinary Science								
Goldfields	0		0		1	100	1	100
Nganampa	3	27	0		8	73	11	100
Pika Wiya	0		0		2	100	2	100
Subtotal	3	21	0		11	79	14	100
Northern Territory Government Pathology Service								
Alice Springs	11	38	1	3	17	59	29	100
Alice Springs Remote	11	30	0		26	70	37	100
Darwin	1	5	0		18	95	19	100
Darwin Rural	4	40	0		6	60	10	100
East Arnhem	3	27	0		8	73	11	100
Goldfields	1	50	0		1	50	2	100
Katherine	3	16	0		16	84	19	100
Kimberley	0		0		1	100	1	100
Nganampa	1	14	0		6	86	7	100
Queensland	0		0		1	100	1	100
Unknown	0		0		5	100	5	100
Subtotal	35	25	1	1	105	74	141	100
Western Diagnostics Pathology Service								
Alice Springs	1	100	0		0		1	100
Alice Springs Remote	4	20	0		16	80	20	100
Darwin	2	10	0		19	90	21	100
Darwin Rural	4	12	0		29	89	33	100
East Arnhem	2	10	0		18	90	20	100
Katherine	1	10	0		9	90	10	100
Perth	0		0		1	100	1	100
Subtotal	14	13	0		92	87	106	100
Total	52	20	1	0.4	208	80	261	100

The 27.4% (95% CI, 18%–40%) and 20.3% (95% CI, 16%–26%) resistance found in isolates reported in this study in 2007 and 2008 are comparable to the 22.7% (95% CI, 21%–25%) resistance found in isolates in Australia reported in the Australian Group on Antimicrobial Resistance survey in 2005 (Table 15).[8] No detectable increase in resistance to azithromycin in the *S. pneumoniae* bacteria was found.

Discussion

Surveillance data presented to the NTSRU clearly indicate that trachoma is still endemic in Australia.

In 2008, 235 of the 287 (82%) communities in the Northern Territory, South Australia and Western Australia were categorised as being At Risk for trachoma in 16 regions. A similar proportion of communities were screened in 2008 (51%) compared with 2006 (57%) and 2007 (52%). However, Western Australia showed a significant increase ($P < 0.05$) in community coverage, 64% in 2006 and 88% in 2008, and Northern Territory showed a significant decrease ($P < 0.05$) in community coverage, 78% in 2006 and 49% in 2008. The community coverage in South Australia has been consistently lower than the other jurisdictions; there was no significant difference between the community coverage in 2006 (24%) and 2008 (15%). A trachoma workshop organised for April 2009 discussed ways in which screening can be implemented to maximise the number of communities screened and the number of children examined in South Australia.

Table 15: Comparison of azithromycin resistance (resistant and intermediate) to invasive and non-invasive *Streptococcus pneumoniae* isolates collected from Aboriginal people (number resistant/total tested), 2005 to 2008, by state or territory

State or territory	AGAR monitoring		NTSRU monitoring			
	2005		2007		2008	
	%	Number resistant/ total tested	%	Number resistant/ total tested	%	Number resistant/ total tested
New South Wales/ACT	27.8	162/583		NR		NR
Northern Territory		NR	23.4	11/47	20.9	48/230
Queensland	28.2	80/284		NR	0	0/1
South Australia	20.9	82/392	40.0	6/15	20.0	4/20
Victoria	14.5	35/221		NR		NR
Western Australia	16.2	48/296		NR	20.0	1/5
Unknown		0		0	0	0/5
Australia	22.7	404/1,776	27.4	17/62	20.3	53/261
(95%CI)	21,25		18,40		16,26	

AGAR Australian Group on Antimicrobial Resistance.
NR Not reported.

The decrease in community coverage in the Northern Territory was in part due to the non-inclusion of communities examined during the AGEI. Data collected by the AGEI have been presented with caution in government reports due to limited training of staff collecting the data. For this reason they have not been presented in this report. The HSAK program, which provided data for other Northern Territory communities, did not re-visit communities screened by the AGEI.

In the years 2006 to 2008 there has been much discussion regarding the best way to report screening coverage of children. The NTSRU has explored the reporting of ABS regional population data of resident children, ABS population data for children resident in Communities At Risk, and the estimated number of children in communities where screening was conducted as provided by health care workers in the communities. Community statements of the children resident in each community vary compared with the ABS data, in part due to the high mobility of Aboriginal people. The ABS population data for children resident in Communities At Risk of trachoma was used to enumerate the children in communities where screening should have been conducted but was not. For example, in South Australia, the majority of communities have not been screened so it is not known whether they have trachoma or not; by including the number of children in these communities there will be a better understanding of the number of children who are not being examined. There were increases and decreases in the regional screening coverage, although the overall coverage for each jurisdiction was similar across the three years. Less than half of the children residing in Communities At Risk are being examined, emphasising that there are still many gaps in the screening.

In each jurisdiction there are regions with endemic trachoma. Across all the jurisdictions the average prevalence of active trachoma in communities from which data were reported, was 21% compared with the 14% reported for 2007 ($P < 0.05$) but there are no consistent changes in regional prevalence. Caution must be exercised due to variable coverage and small numbers. The majority of communities, 53 (69%) of the 77 where comparisons could be made, showed no change. Overall, a decrease ($P < 0.05$) in prevalence was found in South Australia (15% in 2006 and 2% in 2008) and Western Australia (24% in 2006 and 15% in 2008), and an increase ($P < 0.05$) was found in the Northern Territory (13% in 2006 and 29% in 2008). Reports of no active trachoma within some South Australia ACCHS should also be taken with caution because in many of these regions only very small numbers of children were examined.

Screening all children and providing azithromycin treatment as appropriate to household and community members is a necessary component of trachoma control. The surveillance data indicate that household and community treatment has improved from 2006 to 2008 according to the CDNA guidelines and possibly due to the operation of the NTSRU. Treatment was reported to have been distributed according to the CDNA guidelines in 35 communities (85%) in the Northern Territory and 41 (79%) in Western Australia; most of the regions within these

jurisdictions treated more than 80% of the people who required treatment. However, South Australia has consistently examined few children at the schools and continues to treat children found to have active trachoma without providing household or community treatment. Family members can cause a cycle of ongoing re-infection. The issue of re-infection is something that has been considered by CDNA that proposes cross-regional and cross-state treatment where people are known to move frequently across borders because of strong family/cultural links.[3] Western Australia has implemented this coordinated approach to treatment distributing azithromycin to most people who required treatment.

Poor facial hygiene is an important risk factor for trachoma and the promotion of facial cleanliness is a key component of the SAFE strategy. This has improved in 2008, with many communities reporting the promotion of facial cleanliness through the use of programs and resources to integrate behavioural change regarding hygiene.

The reporting of trichiasis data has improved, although still only 4% of those At Risk were examined. In 2007, only Western Australia reported the systematic screening for trichiasis. In 2008, almost every region reported data on trichiasis screening although in many regions this was still incomplete. The inclusion of trichiasis screening into existing programs such as the Adult Health Check and influenza vaccination programs has made it possible to assess the later stages of trachoma. This should lead to appropriate referrals for surgery when trichiasis is identified.

Improvements have been made for the reporting of the Surgery, Antibiotics and Facial Cleanliness activities of the SAFE trachoma control strategy, however these components still need to be strengthened. In 2008, 57% of communities reported having an existing referral process for trichiasis surgery for adults (Table 4), a marked increase compared with the 4% that reported this information in 2007.[2] In 2008, three quarters (74%) of the communities distributed antibiotics to children with active trachoma, but not necessarily as needed to their household and community contacts (Table 4). It is apparent that activities for the Environmental Improvement component of the SAFE strategy have either not been comprehensively implemented or reported. However, there have been reports of the installation of new swimming pools in some of the remote Aboriginal communities. While research has shown considerable health and social benefits of the pools, efforts should also be made to improve housing sanitation, nutrition, education and access to health care.[9]

While the reporting of treatment has improved from 2006 to 2008, no change in antibiotic resistance of *S. pneumoniae* has been detected over this time. It was not possible to make comparisons for Western Australia as PathWest pathology service was not able to provide the NTSRU with antibiotic resistance data in either year due to difficulties in obtaining the necessary clearances.

The trachoma surveillance process has enabled key representatives involved in trachoma programs from each jurisdiction to share successes and ideas relating to trachoma screening and management. A cross-regional 'health blitz' focusing on outreach screening and treatment of multiple conditions has been discussed by some jurisdictions. This will assist with the collection of data from communities that share borders while also aiming to deal with the cycle of re-infection caused by population mobility.

Future control activities in all jurisdictions would benefit from incorporating simple health messages such as keep your face clean as part of existing programs aimed at children and families. Future activities should also consider the responsibilities of members of the screening teams. For example, an efficient team might include at least 2 people responsible for the examination of trachoma, a nurse to administer treatment, and a health worker to assist in engaging with the community. It is important for all health workers and organisations involved in the monitoring of trachoma to be accountable and to take responsibility for their roles.

In summary, jurisdictions have attempted to collate data from both state based and independent data collection authorities where trachoma is still thought to be present. There are still gaps and limitations in the reporting of data, however considerable improvements have been made over the last 3 years. Recommendations for the future include reviewing assumptions that Aboriginal children in urban communities are Not At Risk, screening all Communities At Risk, examining at least all children aged 5 to 9 years in these communities, whether they are attending school or not, and strengthening the implementation of trachoma control activities. Additional effort is required to ensure that azithromycin is appropriately distributed, facial cleanliness is actively promoted and that adults with trichiasis are detected and operated on. An increase in community and screening coverage will enable more stable and reliable estimates of the prevalence and distribution of trachoma, and strengthening the implementation of all four components of the WHO SAFE strategy will lead to the elimination of blinding endemic trachoma.

Acknowledgements

Data collection

The organisations that collected and/or reported data were:

Northern Territory

Aboriginal Community Controlled Health Services staff

Australian Government Emergency Intervention

Centre for Disease Control, Northern Territory Department of Health and Families, Northern Territory

Healthy School Age Kids program: Top End and Central Australia

South Australia

Aboriginal Health Council of South Australia, Eye Health and Chronic Disease Specialist Support Program

Country Health South Australia

Ceduna/Koonibba Health Service

Nganampa Health Council

Oak Valley (Maralinga Tjarutja) Health Service

Pika Wiya Health Service

Tullawon Health Service

Umoona Tjutagku Health Service

Western Australia

Aboriginal Community Controlled Health Services staff

Communicable Diseases Control Directorate, Western Australian Department of Health

Goldfields Population Health Unit

Kimberley Population Health Unit

Midwest Population Health Unit

Pilbara regions Population Health Unit

Antibiotic resistance

Institute of Medical Veterinary Science

Northern Territory Government Pathology Service

Western Diagnostics Pathology Service

National Trachoma Surveillance Reference Group

The NTSRU is advised by the National Trachoma Surveillance Reference Group, members of which include representatives from the following organisations:

Centre for Disease Control, Alice Springs, Northern Territory Department of Health and Families

Centre for Disease Control, Darwin, Northern Territory Department of Health and Families

Communicable Diseases Control Directorate, Western Australian Department of Health

Country Health South Australia

Eye Health and Chronic Disease Specialist Support Program, Aboriginal Health Council of South Australia

Kimberley Population Health Unit, Western Australia

National Aboriginal Community Controlled Health Organisation

Office for Aboriginal and Torres Strait Islander Health, Australian Government Department of Health and Ageing

Surveillance Policy and Systems Section, Office of Health Protection, Australian Government Department of Health and Ageing

Author details

Betty Tellis[1]
Kathy Fotis[1]
Professor Jill E Keeffe[1,2]
Professor Hugh R Taylor[2,3]

1. Centre for Eye Research Australia, Department of Ophthalmology, University of Melbourne
2. Vision Cooperative Research Centre
3. Harold Mitchell Professor of Indigenous Eye Health, Melbourne School of Population Health, University of Melbourne

Corresponding author: Ms Betty Tellis, Centre for Eye Research Australia, University of Melbourne, 32 Gisborne Street, EAST MELBOURNE VIC 3002. Telephone: +61 3 9929 8704. Facsimile: +61 3 9662 3859. Email: btellis@unimelb.edu.au

Abbreviations

ABS	Australian Bureau of Statistics
ACCHS	Aboriginal Community Controlled Health Service(s)
AGEI	Australian Government Emergency Intervention
AHCSA	Aboriginal Health Council of South Australia
CDNA	Communicable Diseases Network Australia
CI	confidence interval
EH&CDSSP	Eye Health and Chronic Disease Specialist Support Program
HSAK	Healthy School Age Kids program
IMVS	Institute of Medical Veterinary Science
NR	not reported
NTGPS	Northern Territory Government Pathology Service
NTSRU	National Trachoma Surveillance and Reporting Unit
SAFE	Surgery, Antibiotics, Facial cleanliness, and Environmental improvement
TF	Trachomatous inflammation – follicular
TI	Trachomatous inflammation – intense
TT	Trachomatous trichiasis
WDPS	Western Diagnostics Pathology Service
WHO	World Health Organization

References

1. Tellis B, Keeffe JE, Taylor HR. Surveillance report for active trachoma, 2006: National Trachoma Surveillance and Reporting Unit. *Commun Dis Intell* 2007;31(4):366–374.
2. Tellis B, Keeffe JE, Taylor HR. Trachoma surveillance annual report, 2007: A report by the National Trachoma Surveillance and Reporting Unit. *Commun Dis Intell* 2008;32(4):388–399.
3. Communicable Diseases Network Australia. *Guidelines for the Public Health Management of Trachoma in Australia*. Canberra: Commonwealth of Australia; 2006.
4. Tellis B, Fotis K, Dunn R, Keeffe JE, Taylor HR. Trachoma Surveillance Report 2008: National Trachoma Surveillance and Reporting Unit: Centre for Eye Research Australia. 2009. Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/health-oatsih-pubs-trachreport
5. Thylefors B, Dawson CR, Jones BR, West SK, Taylor HR. A simple system for the assessment of trachoma and its complications. *Bull World Health Organ* 1987;65(4):477–483.
6. Australian Bureau of Statistics. 2006 Census of Population and Housing. CatNo20680 2006.
7. Australian Bureau of Statistics. Australian Indigenous Geographical Classification Maps and Census Profiles, 2001; 2002.
8. Gotlieb T, Collignon P, Robson J, Pearson J, Bell J. *Streptococcus pneumoniae* Survey: 2005 Antimicrobial Susceptibility Report. The Australian Group on Antimicrobial Resistance: August 2006. Available from: http://antimicrobial-resistance.com
9. Hunter EM, Ellis RG, Campbell D, Fagan PS. The health of Indigenous peoples. *Med J Aust* 1992;156(8):575–577.