

# Vision problems among older Australians

## Treatment

Treatment of trachoma is usually by antibiotics. Surgery may be used for trichiasis and may have to be repeated after some years (Taylor et al. 2003).

## Prevalence

Prevalence data for trichiasis are few. A 1998 study of trichiasis among Aboriginal people aged 50 years or more in the Kimberley region found an overall prevalence rate of 2.8%. The rate was 11.0% in the Halls Creek Shire, which is also the highest area of trachoma prevalence in the Kimberley (Mak & Plant 2001).

A study of trachoma in a large, remote Central Australian Aboriginal community during 1998–2000 found the prevalence of trachoma among children aged less than 13 was 40% at baseline and changed little over the following 21 months (Ewald et al. 2003).

Although there is evidence of high prevalence rates of trachoma in some areas of Western Australia, South Australia and the Northern Territory, there are no data available for New South Wales, Victoria, Queensland and Tasmania (Taylor et al. 2003).

## Main findings and discussion

This bulletin has shown that visual impairment and its causes are highly prevalent among older Australians and are strongly age-related. They have a significant effect on many aspects of living.

## Main findings

The information presented in this bulletin represents the most robust and up-to-date estimates available of the prevalence of visual impairment and its causes in Australia in 2004. Estimates show that 9.4% (444,400) of Australians aged 55 or more have some degree of visual impairment, much of which is caused by uncorrected refractive error and the eye diseases cataract and AMD. Blindness occurs in 1.2% (56,100) of older Australians and is most commonly caused by AMD, glaucoma and cataract.

Of the main causes of visual impairment:

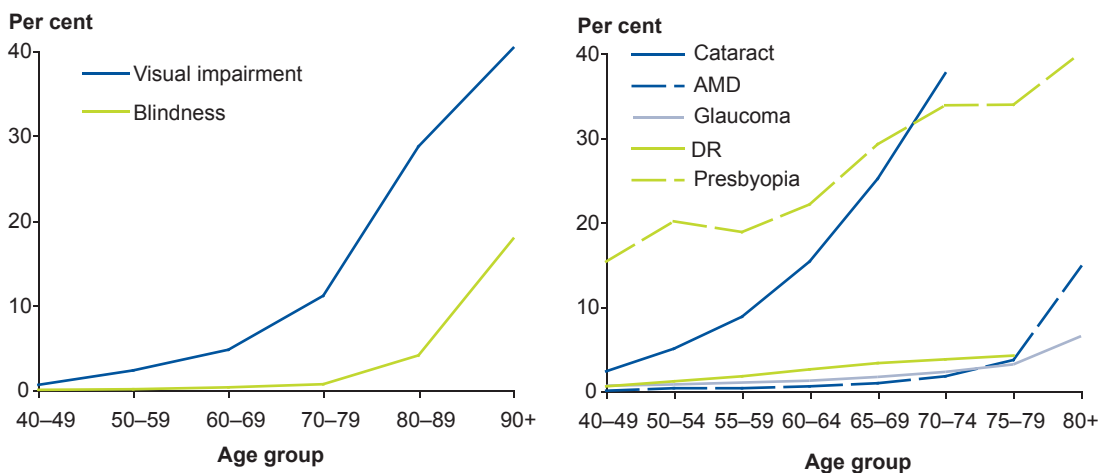
- Cataract is present in 31% (1.46 million) of older Australians. It accounts for 40% of cases of visual impairment (excluding uncorrected refractive error) and 12% of cases of blindness in this age group. About 9.1% (430,000) of Australians aged 55 or more have indications of cataract surgery.
- AMD (late stage ARM), which is usually associated with severe vision loss, affects 3.1% (147,000) of older Australians. A further 10.4% (491,900) have early ARM, which is often asymptomatic. In total, ARM is present in 13.5% (638,900) of older Australians. AMD accounts for 28% of cases of visual impairment and 50% of cases of blindness in older Australians. Its prevalence increases sharply after 70 years of age.
- Glaucoma is present in 2.3% (109,300) of older Australians and accounts for 8% of cases of visual impairment and 16% of cases of blindness.
- DR is present in 2.8% (133,900) of older Australians and accounts for 4% of cases of visual impairment.

- Presbyopia is generally considered to be a natural part of the ageing process and can be corrected by eyewear. Based on self-report, it affects the vision of 27.9% (1.32 million) of older Australians.

## The ageing factor

Ageing is the major contributing factor to visual impairment and blindness. Prevalence rates are greater among successive age groups and rates of major vision-threatening conditions are also strongly age-related (Figure 2). Unless these rates fall markedly, the number of older people with vision problems will increase over future decades as the population ages.

**Figure 2: Prevalence rates of visual impairment and its causes by age**



Some vision problems among older Australians are acquired early in life (e.g. congenital eye disorders, retinitis pigmentosa and eye trauma) but at a population level their prevalence is small compared with vision problems associated with ageing towards the end of life.

## The impact of vision problems

Visual impairment is an important health issue facing present and future generations of older Australians. It can markedly reduce quality of life by affecting physical, functional, emotional and social wellbeing. Reduced ability to perform activities of daily living leads to decreased independence and is often accompanied by isolation, depression and poorer social relationships. The ability to participate in the workforce can also be affected. Visual impairment is also strongly associated with falls and hip fractures (College of Optometrists & British Geriatrics Society 2003).

Since prevalence rates are strongly age-related and Australia has an ageing population, the number of people with visual impairment might be expected to increase nationally which will have significant economic implications and affect the provision of health and welfare services.



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## Data issues

The pooled analyses of relevant international studies that included the two Australian population-based clinical studies can be used to derive acceptable prevalence estimates for most of the major eye conditions affecting older Australians. These estimates are more robust and accurate than would have applied if only the Australian studies had been used.

The overview in this bulletin of Australian data sources for vision problems has highlighted a number of data quality issues, data gaps and deficiencies, and a lack of data standards. In particular:

- There have been no agreed standard national definitions of indicators or key concepts.
- There have been no authoritative, systematic or ongoing monitoring and reporting of visual impairment and its causes.
- Population surveys have used different approaches and methods of data collection. Limited geographical coverage leads to uncertainty about their capacity, independently, to produce nationally representative estimates.
- Coverage has varied, e.g. people in institutions, who represent a significant proportion of the population in older age groups, are often excluded.
- There are sample size and reliability issues regarding estimates for the older age groups.

These factors have resulted in variation in estimates of prevalence between data sources, less reliable estimates in older age groups, and a lack of reliable data on which to assess trends.

Data gaps exist for age-related macular degeneration and for diabetic retinopathy for which the only national data source of prevalence is AusDiab.

## Aboriginal and Torres Strait Islander peoples

There are limited data available on the eye health of Aboriginal and Torres Strait Islander peoples. There are no estimates of cataract prevalence based on ophthalmic examination and the data based on self-report is inconclusive. Reliable prevalence estimates are also lacking for AMD and glaucoma. Diabetic retinopathy is likely to be an important vision-threatening condition among Indigenous Australians because of the high rate of type 2 diabetes in some communities. The prevalence of trachoma is very high among the children of some Indigenous communities and its sequel, trichiasis, is relatively high among older Indigenous Australians in some areas. There are few recent data on the prevalence of trachoma, or of trichiasis among older Indigenous Australians. There are no eye examination data on the eye health on Indigenous people living in urban and rural settings.

## Conclusion

The ageing of the Australian population will increase the number of people with vision problems, even if rates of visual impairment remain constant. Although there are

sufficient data on the magnitude and causes of visual impairment on which to plan interventions, there is no monitoring system in place to assess the impact of those interventions. Any national approach for improving eye health will need to take into account the lack of regular, reliable and comparable objective data for monitoring vision problems based on standard definitions, and the particular need for regular data on the eye health of Aboriginal and Torres Strait Islander peoples.

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## Appendix: Statistical tables

**Table A1: Prevalence of visual impairment in Australian studies (clinical and self-report data)**

BMES 1992–1994 <sup>(a)</sup>		MVIP 1992–1996 <sup>(b)</sup>		NHS 1995 <sup>(c)</sup> & 2001 <sup>(d)</sup>			NSDAC 1998 <sup>(e)</sup> & 2003 <sup>(e)</sup>		
Age (years)	Rate (%)	Age (years)	Rate (%)	Age (years)	Rate (%)		Age (years)	Rate (%)	
					1995	2001		1998	2003
		40–49	0.6	45–49	1.3	2.8	45–49	0.9	1.0
49–59	0.6	50–59	1.6	50–54	1.4	3.6	50–54	1.0	1.1
				55–59	1.9	3.8	55–59	1.6	1.5
60–69	1.1	60–69	4.1	60–64	2.6	4.5	60–64	2.2	1.7
				65–69	2.6	5.7	65–69	3.2	2.4
70–79	5.4	70–79	8.6	70–74	3.4	6.2	70–74	4.9	4.1
				75–79	4.5	8.1	75–79	10.3	6.3
80+	26.3	80–89	27.3	80+	6.0	11.1	80–84	14.2	10.1
		90+	41.8				85+	25.9	17.4
<b>Total</b>	<b>4.6</b>		<b>7.1</b>		<b>2.5</b>	<b>4.9</b>		<b>4.0</b>	<b>3.1</b>
<b>Estimates for ages 55 or more<sup>(f)</sup></b>									
<b>Year</b>	<b>1993</b>		<b>1994</b>		<b>1995</b>	<b>2001</b>		<b>1998</b>	<b>2003</b>
<b>Number</b>	182,600		283,400		118,000	261,700		231,000	193,600
<b>Rate (%)</b>	5.2		7.9		3.2	6.1		5.9	4.3
<b>Estimates for ages 55 or more<sup>(g)</sup>, 2004</b>									
<b>Number</b>	269,000		390,300		153,000	288,100		282,500	202,900
<b>Rate (%)</b>	5.7		8.3		3.2	6.1		6.0	4.3

(a) Visual impairment was defined as visual acuity of 6/12 or worse in the better eye.

(b) Visual impairment was defined as visual acuity of 6/12 or worse, and/or homonymous hemianopia or worse.

(c) Vision loss was defined by self-report as blindness and other vision disturbances which cannot be corrected by spectacles, and is a long-term sight problem which has lasted or is expected to last for 6 months or more.

(d) Vision loss was defined by self-report as blindness and other vision disturbances regardless of whether it cannot be corrected by spectacles, and is a long-term sight problem which has lasted or is expected to last for 6 months or more.

(e) Vision loss was defined by self-report as total or partial loss of sight, which cannot be corrected by spectacles.

(f) Estimated for the Australian population at 30 June 1993, 1994, 1995, 1998 and 2001 respectively.

(g) Estimated for the Australian population at 30 June 2004.

Sources: AIHW analysis of 1995 and 2001 National Health Surveys confidentialised unit record files; AIHW analysis of 1998 and 2003 National Survey of Disability, Ageing and Carers confidentialised unit record files; Wang et al. 2000; Weih et al. 2000.

**Table A2: Prevalence of cataract<sup>(a)</sup> in Australian studies (self-report data)**

NHS 1995		NHS 2001	
Age (years)	Rate (%)	Age (years)	Rate (%)
45–49	0.4	45–49	0.5
50–54	0.5	50–54	0.6
55–59	1.9	55–59	2.1
60–64	2.8	60–64	4.0
65–69	6.4	65–69	5.8
70–74	9.0	70–74	10.1
75–79	14.5	75–79	14.2
80+	20.8	80+	23.0
<b>Total</b>	<b>4.9</b>	<b>Total</b>	<b>5.2</b>
<b>Estimates for ages 55 or more<sup>(b)</sup>, 2004</b>			
<b>Number</b>	375,500		403,900
<b>Rate (%)</b>	8.0		8.6

(a) Cataract was defined by self-report as a long-term condition that has lasted or is expected to last for 6 months or more, and cannot be corrected by spectacles.

(b) Estimated for the Australian population at 30 June 2004.

Source: AIHW analysis of ABS 1995 and 2001 National Health Surveys confidentialised unit record files.

**Table A3: Prevalence of AMD<sup>(a)</sup> in Australian studies (clinical data)**

BMES 1992–1994			MVIP 1992–1996		
Age (years)	Rate (%)		Age (years)	Rate (%)	
	Men	Women		Men	Women
49–54	0.0	0.0	40–49	0.0	0.0
55–64	0.0	0.3	50–59	0.0	0.0
65–74	0.6	0.9	60–69	0.6	0.2
75–84	4.3	6.1	70–79	1.9	1.6
85+	12.5	21.8	80–89	2.0	7.0
			90+	58.6	20.0
<b>Total</b>	<b>1.3</b>	<b>2.4</b>	<b>Total</b>	<b>0.6</b>	<b>0.8</b>
<b>Estimates for ages 55 or more<sup>(b)</sup>, 2004</b>					
<b>Number</b>	33,100	86,500		36,600	52,100
<b>Rate (%)</b>	1.5	3.5		1.6	2.1

(a) AMD was diagnosed using fundus photographic grading following an eye examination. The estimates for AMD prevalence do not include early age-related maculopathy, which is the pre-symptomatic stage of AMD.

(b) Estimated for the Australian population at 30 June 2004.

Sources: Mitchell et al. 1995; VanNewkirk et al. 2000.



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**Table A4: Prevalence of glaucoma in Australian studies (clinical and self-report data)**

BMES 1992–1994 <sup>(a)</sup>		MVIP 1992–1996 <sup>(a)</sup>		NHS 1995 <sup>(b)</sup>		NHS 2001 <sup>(b)</sup>	
Age (years)	Rate (%)	Age (years)	Rate (%)	Age (years)	Rate (%)	Age (years)	Rate (%)
		40–49	0.1	45–49	0.5	45–49	0.4
50–59	0.2	50–59	0.6	50–54	1.0	50–54	1.0
				55–59	1.2	55–59	2.2
60–69	1.1	60–69	1.9	60–64	1.7	60–64	1.9
				65–69	3.7	65–69	3.4
70–79	4.3	70–79	5.2	70–74	3.9	70–74	4.7
				75–79	5.4	75–79	5.5
80+	8.2	80–89	5.5	80+	4.2	80+	6.6
		90+	11.8				
<b>Total</b>	<b>2.4</b>		<b>1.7</b>		<b>2.2</b>		<b>2.5</b>
<b>Estimates for ages 55 or more<sup>(c)</sup>, 2004</b>							
<b>Number</b>	127,300		144,000		140,300		173,700
<b>Rate (%)</b>	2.7		3.1		3.0		3.7

(a) Glaucoma (primary open-angle glaucoma) was defined by eye examination. Incomplete eye examinations were excluded.

(b) Glaucoma was defined by self-report as a long-term sight problem which had lasted or is expected to last for 6 months or more.

(c) Estimated for the Australian population at 30 June 2004.

Sources: ABS 1995 and 2001 National Health Surveys confidentialised unit record files; Mitchell et al. 1996; Wensor et al. 1998.

**Table A5: Prevalence of diabetic retinopathy in Australian studies (clinical data)**

Study	BMES 1992–1994	MVIP 1992–1996	AusDiab 2000
<b>Description</b>	Urban area, W of Sydney Population-based sample of 3,650 people aged 49 or more	Victoria State Population-based sample of 4,740 people aged 40 or more	National Population-based sample of 11,250 people aged 25 or more
<b>Diabetes prevalence<sup>(a)</sup> (per cent)</b>	7%	5.1%	7.4%
	Based on self-report and fasting glucose	Based on self-report	Based on self-report and OGTT <sup>(b)</sup>
<b>DR (as per cent of people with diabetes)</b>	32.4%	29.1%	15.3%
<b>DR (as per cent of study population)</b>	2.3%	1.5%	1.1%
<b>Estimates for ages 55 or more<sup>(c)</sup>, 2004</b>			
<b>Number</b>			
<b>Diabetes</b>	..	..	805,900
<b>DR</b>	..	..	133,900
<b>Rate %</b>			
<b>Diabetes</b>	..	..	17.1
<b>DR</b>	..	..	2.8

.. Not applicable.

(a) Diabetes types 1 and 2.

(b) Oral glucose tolerance test.

(c) Estimated for the Australian population at 30 June 2004.

Sources: Dunstan et al 2002; Tapp et al 2003; McKay et al. 2000; Mitchell et al. 1998.

## Abbreviations

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
AMD	age-related macular degeneration
AREDS	Age-Related Eye Disease Study
ARM	age-related maculopathy
AusDiab	Australian Diabetes, Obesity and Lifestyle Study
BMES	Blue Mountain Eye Study
DoHA	Australian Government Department of Health and Ageing
DR	diabetic retinopathy
ICO	International Council of Ophthalmology
IDI	International Diabetes Institute
IOP	intraocular pressure
MVIP	Melbourne Visual Impairment Project
NHMRC	National Health and Medical Research Council
NHS	National Health Survey
NSDAC	National Survey of Disability, Ageing and Carers
OAG	open-angle glaucoma
OATSIH	Office for Aboriginal and Torres Strait Islander Health

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## Glossary

<b>anterior chamber</b>	The space in the eye that is behind the cornea and in front of the iris, which is filled with a clear, watery fluid known as aqueous humour.
<b>aphakia</b>	Absence of the lens of the eye; the state of the eye after a cataract has been removed.
<b>aqueous humour</b>	A clear, watery fluid normally present in the front and rear chambers of the eye that nourishes the lens and the cornea.
<b>astigmatism</b>	Irregular curvature of cornea or lens resulting in a distorted image because light rays are not focused on a single point on the retina.
<b>central vision</b>	The ability to see objects in space without moving the head or eyes; corresponds to an area within 30 degrees of the fixation point.
<b>cornea</b>	The clear curved structure that constitutes the front of the eyes; a refractive surface through which light first enters the eye.
<b>focus</b>	The point at which light rays meet after passing through the cornea and lens; in normal eyes this point is on the fovea of the retina.
<b>fovea</b>	A small depression in the macula of the retina that provides the clearest vision.
<b>homonymous hemianopia</b>	Partial blindness which affects the same part of the visual field of each eye.
<b>hyperopia</b>	See <i>long-sightedness</i> .
<b>iris</b>	Coloured circular membrane in front of the lens which controls the size of the opening at its centre (pupils) thereby regulating the amount of light entering the eye.
<b>lens</b>	The transparent crystalline body situated behind the pupil of the eye.
<b>long-sightedness (hyperopia)</b>	A refractive error where distant objects are seen more clearly than near objects; the focal point of light rays is behind the retina.
<b>long-term condition</b>	A condition that has lasted or is expected to last for 6 months or more.
<b>meta-analysis</b>	The process of synthesising research results by using statistical methods to combine results from separate but related studies.
<b>macula</b>	An area at the centre of the retina that surrounds the fovea and is responsible for best central vision.
<b>myopia</b>	See <i>short-sightedness</i> .

<b>optic nerve</b>	Special nerve of sight beginning in the retina as the optic disk, which carries messages from the retina to the brain, resulting in visual images.
<b>oral glucose tolerance test</b>	Measures the body's ability to use glucose — a blood glucose measurement is taken after a period of fasting and additional measurements are taken after consuming a set amount of glucose.
<b>peripheral vision</b>	The ability to see objects outside the direct line of vision.
<b>posterior chamber</b>	The space in the eye that is behind the iris and in front of the lens, which is filled with a clear, watery fluid known as aqueous humour.
<b>prevalence</b>	Total number of cases of a problem or disease in the population at a given time.
<b>pseudophakia</b>	Presence of an intraocular lens after cataract extraction.
<b>retina</b>	Innermost layer of the eye containing light-sensitive nerve cells and fibres connecting with the brain through the optic nerve.
<b>short-sightedness (myopia)</b>	A refractive error of the eye where near objects are seen more clearly than distant objects; the image of more distant objects is formed in front of the retina and cannot be seen distinctly.
<b>tunnel vision</b>	A constriction of the visual field as though one is looking through a tunnel.
<b>type 2 diabetes</b>	A chronic condition marked by high levels of glucose in the blood and which mostly arises in middle age or older. It is caused by a relative insufficiency of insulin (a hormone released by the pancreas that helps to metabolise glucose) or resistance to its action.
<b>visual acuity</b>	Measurement of the ability of the eye to perceive the shape of objects in the direct line of vision and to distinguish detail; generally determined by finding the smallest symbol on an eye chart that can be recognised at a given distance. Visual acuity of 6/12 describes reduced acuity because it is the ability to see only at 6 metres objects that the normal eye can see at 12 metres. Visual acuity of 6/60 describes the ability to see objects only at 6 metres what the normal eye can see at 60 metres. Normal vision is 6/6.
<b>visual field</b>	The entire expanse of space visible at a given instant without moving the head or eyes.



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