



Australian Government

**Australian Institute of
Health and Welfare**

*Better information and statistics
for better health and wellbeing*

Eye health labour force in Australia

August 2009

Australian Institute of Health and Welfare
Canberra

Cat. no. PHE 116

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ISBN 978 1 74024 948 5

Suggested citation

Australian Institute of Health and Welfare 2009. Eye health labour force in Australia. Cat. no. PHE 116. Canberra: AIHW.

This publication is available in a RTF (rich text) Word version at <www.aihw.gov.au> in order to facilitate access for vision-impaired persons.

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Published by the Australian Institute of Health and Welfare

Printed by Elect Printing

Please note that there is the potential for minor revisions of data in this report. Please check the online version at <www.aihw.gov.au> for any amendments.

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Acknowledgments

This report was written by Brendan Brady with guidance from David Braddock and Felicity Summers and assistance from Scott Sims of the Labour Force Unit of the Australian Institute of Health and Welfare (AIHW). Mark Cooper-Stanbury and Robert Long from the Population Health Unit of the AIHW provided guidance and comments throughout the process. Staff of the AIHW Information Services and Publishing Unit provided support with the design and publication process.

This project was funded by the Australian Government Department of Health and Ageing through the 2006–2010 National Eye Health Initiative.

Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
ASCED	Australian Standard Classification of Education
ASGC	Australian Standard Geographical Classification
DEEWR	Department of Education, Employment and Workplace Relations
DoHA	Department of Health and Ageing
FTE	Full-time equivalent
MBS	Medicare Benefit Schedule
MLFS	Medical Labour Force Survey
MTRP	Medical Training Review Panel
NCVER	National Centre for Vocational Education Research
NMLFS	Nursing and Midwifery Labour Force Survey
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
RA	Remoteness Area
RANZCO	Royal Australian and New Zealand College of Ophthalmologists
SA	South Australia
Tas	Tasmania
VET	Vocational Education Training
Vic	Victoria
VTP	Vocational Training Program
WA	Western Australia

Symbols and notes

Throughout this publication, data from the AIHW Medical Labour Force Survey and AIHW Nursing and Midwifery Labour Force Survey may not add to the totals shown, due to the estimation process used for non-responses. As a result, numbers of practitioners may be in fractions, but are rounded to whole numbers for publication. Percentages are calculated on the unrounded figures. Where tables contain a 'not stated' category, percentage calculations exclude this category. Percentage distributions may not sum to 100 due to rounding.

For data from the 2006 Census, the confidentiality technique applied by the Australian Bureau of Statistics (ABS) slightly adjusts all cells to prevent any identifiable data being exposed. This means data in one table may be slightly different to the same data presented in another table.

Italics within a table denote a subtotal.

- Nil or rounded to zero
- .. Not applicable
- n.a. Not available
- n.p. Not publishable. Cells may be suppressed for confidentiality reasons or where estimates are based on small cells, resulting in low reliability.

Summary

Eye health labour force in Australia is the fourth in a series of national reports providing an overview of eye health and eye health care in Australia. This report contains national information on the characteristics of the eye health labour force from a range of data sources.

The eye health labour force consists of the health professionals: ophthalmologists, ophthalmic nurses, optometrists and orthoptists; and tradespersons such as optical dispensers and optical mechanics.

Key findings

- The prevalence of eye problems increases with age. As a result of population ageing, the demand for eye health workers is likely to increase in the future.
- According to the AIHW health labour force surveys the Australian eye health labour force includes 735 full-time equivalent (FTE) ophthalmologists (2006 estimate) and 421 FTE ophthalmic nurses (2004 estimate).

Based on the 2006 ABS Census of Population and Housing there were also:

- 3,329 FTE optometrists
 - 471 FTE orthoptists
 - 3,177 FTE optical dispensers
 - 1,081 FTE optical mechanics.
- For those occupations where time series data are available, there has been evidence of growth. The number of FTE ophthalmologists and optometrists increased by 15% and 11% respectively between 2001 and 2006. The number of FTE orthoptists increased by 20%.
 - There has been a slight increase, both in the number of trainee ophthalmologists and course completions in ophthalmology, as a proportion of employed ophthalmologists between 2001 and 2006. The same is true of optometrists.
 - Ophthalmologists are on average older than other eye health workers. In 2006 the average age of ophthalmologists was 52 years. The average age of the other eye health occupations ranged from 36 years (orthoptists) to 46 years (ophthalmic nurses).
 - The data suggest a trend towards feminisation of the eye health workforce. The proportion of female ophthalmologists, optometrists and orthoptists increased by between 3 and 4 percentage points between 2001 and 2006. Ophthalmic nurses and orthoptists had the highest proportion of females amongst eye health workers (96.3% and 90.1% respectively). Ophthalmologists had the lowest proportion of female workers (15.7%).
 - The majority of eye health workers work in *Major cities*. In 2006 about 80% of eye health workers lived in *Major cities*, while less than 70% of the Australian population and 67% of Australians with eye disorders lived in *Major cities* (ABS 2006a).

1 Introduction

In the 2006–07 Federal Budget, the Australian Government allocated \$13.8 million over 4 years to a new National Eye Health Initiative (see Box 1). This initiative supports a range of activities to raise public awareness of eye health issues and to strengthen the delivery of eye health care.

Box 1: Background to this report

In response to the World Health Assembly resolution WHA56.26 on the elimination of avoidable blindness in member states, the Australian Health Ministers' Conference endorsed the National Framework for Action to Promote Eye Health and Prevent Avoidable Blindness and Vision Loss (the Framework). The Framework focuses on eliminating avoidable blindness and vision loss in Australia, providing an outline for nationally coordinated action by governments, health professionals, non-government organisations, industry and individuals to work in partnership (Commonwealth of Australia 2005).

In the 2006 Federal Budget, the Australian Government allocated \$13.8 million over 4 years to a new National Eye Health Initiative. This initiative supports a range of activities to raise public awareness of eye health issues and to strengthen the delivery of eye health care.

The Australian Government Department of Health and Ageing commissioned the AIHW through the National Eye Health Initiative to do this report. This follows on from work done for earlier publications: Vision problems among older Australians, released in July 2005, A guide to Australian eye health data, released in May 2007, Eye health in Australia: a hospital perspective, released in August 2008, Eye health among Australian children, released in November 2008 and Eye-related injuries in Australia, released in February 2009.

One action of the Framework is to monitor requirements and supply projections for eye care practitioners (Commonwealth of Australia 2005). This report provides an overview of the Australian eye health labour force in order to assist analysis of the supply of eye health workers in comparison to level of need within the community. Data presented in this report includes the number of eye health workers by occupation, demographic and geographic distribution characteristics of each occupation and inflow of new graduates and trainees.

This is the fourth in a series of national reports providing an overview of eye health in Australia. The other reports are *Eye health in Australia: a hospital perspective*, *Eye health among Australian children* and *Eye-related injuries in Australia*.

Background

Based on the results of the 2007–08 ABS National Health Survey approximately 10.5 million Australians (about half the population) have at least one vision problem. Nearly 4.7 million experienced short sightedness and 5.3 million experienced long sightedness. Almost 2% of the population had cataracts and 1% had glaucoma (ABS 2009).

Older people are more susceptible to eye diseases and disorders. Although only comprising 24.5% of the Australian population, persons aged 55 years and over made up 43.5% of all persons with eye diseases and disorders (ABS 2009 and ABS population estimates).

Diabetes is also a risk factor for a variety of eye diseases and disorders, especially diabetic retinopathy (retinal disease), cataracts and glaucoma. Those with diabetes are 1.3 times as likely as people without diabetes to be blind or have visual disturbances. The prevalence of diagnosed diabetes more than doubled between 1989–90 and 2004–05 (AIHW 2008a).

The ageing of the population and the increase in prevalence of diabetes alone are likely to lead to an increase in the level of demand for eye health workers in the future.

Eye health labour force

The delivery of eye health care in Australia is undertaken by an eye health labour force that consists of the following professionals:

- ophthalmologists
- ophthalmic nurses
- optometrists
- orthoptists.

This eye health labour force also includes the following tradespersons:

- optical dispensers
- optical mechanics.

It should be noted that ophthalmic nurses are those nurses that report ophthalmology as their area of main practice and does not necessarily mean that they have specialised qualifications. A full description of each occupation is contained in the Glossary.

General practitioners (GPs), although not included in the specialised eye health labour force, play a critical role in the delivery of eye health care in Australia and often refer patients to eye health care specialists. During 2006–07, general practitioners managed 2.5 eye health problems per 100 encounters. GPs referred problems to ophthalmologists at a rate of 0.8 referrals per 100 encounters and optometrists, at a rate of 0.1 referrals per 100 encounters (Britt et al 2008).

Data sources

This report presents data on the number and full-time equivalent (FTE) number of eye health care workers, their location and demographic characteristics, from a range of data sources including:

- the AIHW Medical Labour Force Survey (MLFS)
- the AIHW Nursing and Midwifery Labour Force Survey (NMLFS)
- the ABS Census of Population and Housing (Census)
- the Australian Government Department of Health and Ageing's Medicare data (Medicare).

The AIHW survey data are collected annually during health professional registration procedures and provide a comprehensive range of information on demographic and work characteristics on all medical practitioners and registered and enrolled nurses. Data in this report on ophthalmologists and ophthalmic nurses are drawn from these surveys.

For eye health workers not covered by these surveys, data from the Census on those reporting to be optometrists, orthoptists, optical dispensers and optical mechanics have been used.

These data are supplemented with data from relevant registration boards, where available, to provide information on the number actually registered in the relevant profession.

Medicare data are also presented on ophthalmologists and optometrists as the predominant professions that provide private eye health care subsidised by that scheme.

A number of sources have been used for the training data. Data on the number of ophthalmology trainees and Fellows were sourced from the Royal Australian and New Zealand College of Ophthalmologists (RANZCO). Data on the tertiary education of optometrists was drawn from the higher education student data collections held by the Department of Employment, Education and Workplace Relations (DEEWR). Data on vocational training of optical dispensers and optical mechanics were provided by the Vocational Education Training (VET) Provider Collection held by the National Centre for Vocational Research (NCVER).

Detail on the collection methods and underlying definitions for each of these data sources are presented in Appendix A.

2 Ophthalmologists

An ophthalmologist is a specialist medical practitioner who specialises in eye-related diseases, injuries and deficiencies (ABS 2006c). An ophthalmologist is also known as an eye specialist or an eye surgeon.

RANZCO Fellows

The total number of registered ophthalmologists in Australia can not be determined from the MLFS. Registered medical practitioners who are qualified to practise ophthalmology but who are not working in medicine, or who are practising overseas, are not identified in the MLFS. In this report the number of RANZCO Fellows (not including Honorary and Associate Fellows) is used as a proxy measure of the number of registered ophthalmologists in Australia. However, it should be noted that the number of RANZCO Fellows is an undercount of the total number of registered ophthalmologists because not all ophthalmologists are RANZCO Fellows.

RANZCO is the body responsible for ophthalmology training in Australia. The majority of ophthalmologists practising in Australia are Fellows of the college. To become a Fellow a candidate is required to:

- be a qualified medical practitioner registered as a medical practitioner in Australia or New Zealand
- have completed the appropriate training to practise ophthalmology in Australia or New Zealand as deemed by RANZCO's Qualification and Education Committee and achieve other training outcomes determined by the committee (RANZCO 2008a)
- have their membership application approved by a majority of Councillors present at the meeting at which the application is considered (RANZCO 2008a).

Table 1 shows the number of RANZCO Fellows from 2001 to 2007 inclusive. In 2007 there were 887 Australian RANZCO Fellows, an increase of 17.8% since 2001. Of these 40.1% belonged to the New South Wales branch, 24.8% belonged to the Victoria branch and 16.9% to the Queensland branch.

Table 1: Number^(a) of Fellows of the Royal Australian and New Zealand College of Ophthalmologists, by branch^{(b)(c)} 2001–2007

RANZCO branch	2001	2002	2003	2004	2005	2006	2007
NSW	308	304	320	311	341	339	356
Vic	191	186	194	199	202	202	220
Qld	110	120	125	130	136	141	150
WA	62	65	66	67	65	70	73
SA	70	68	69	68	70	74	72
Tas	12	15	16	15	15	15	16
Australia	753	758	790	790	829	841	887

(a) As at 30 June.

(b) There are no RANZCO branches in the Australian Capital Territory and the Northern Territory.

(c) Does not include New Zealand branch Fellows.

Source: RANZCO Annual Report 2004–2005 (RANZCO 2005) 2006–2007 (RANZCO 2007).

Employed ophthalmologists

Not all ophthalmologists registered in Australia actually work as ophthalmologists or work in Australia. Table 2 shows the number of employed ophthalmologists in Australia in 2001 and 2006, according to data obtained from three different data collections: the MLFS, the Census and Medicare data.

The definition of an ophthalmologist differs slightly for each of these collections. In the MLFS an ophthalmologist was a registered medical practitioner who reported their main specialty as ophthalmology. In the Census an ophthalmologist was a person whose responses to the occupation-related questions resulted in an ophthalmologist code being assigned. For Medicare data, an ophthalmologist was defined as a medical practitioner listed in the Medicare Provider File with a Medicare specialty code of ophthalmology and deriving the majority of their schedule fee income from ophthalmology services.

The three data sources also use different time periods for data collection. The AIHW MLFS data are collected at the time of medical registration renewal, the Medicare data are collected throughout the year and the Census data are collected on Census night.

Medicare data is not directly comparable to MLFS and Census data because full-time salaried ophthalmologists in hospitals who do not render services on a fee for service basis are not included in Medicare data. The number of ophthalmologists in this category is not known.

Table 2: Employed ophthalmologists, number and FTE rates, states and territories, 2001 and 2006

Measure and source	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
2001									
Number									
MLFS ^(a)	229	175	104	55	64	12	11	n.p.	653
Census ^(b)	146	105	81	39	41	8	5	6	431
Medicare 2000–01 ^(c)	275	177	111	61	67	13	12	4	720
FTE									
MLFS ^(d)	225	177	105	53	53	12	13	n.p.	639
Census ^(d)	146	98	81	37	36	11	9	6	421
Medicare 2000–01 ^(e)	177	108	82	39	43	9	8	2	468
2006									
Number									
MLFS ^(a)	280	199	131	71	56	17	7	n.p.	769
Census ^(b)	230	149	115	60	60	9	5	3	631
Medicare 2005–06 ^(c)	303	189	133	68	59	13	13	8	786
FTE									
MLFS ^(d)	261	187	126	67	55	16	6	n.p.	735
Census ^(d)	230	146	123	61	56	8	6	4	631
Medicare 2005–06 ^(e)	190	113	91	43	39	10	8	2	496

(a) Medical practitioners whose main specialty of practice was ophthalmology.

(b) Persons who were coded to the occupation of 'ophthalmologist' based on their responses to the occupation-related questions in the survey.

(c) Providers who have a derived specialty code of ophthalmology (see *Derived specialty code of Medicare providers* in Glossary) and who rendered at least one service under Medicare during the year. Medicare data is not directly comparable to MLFS and Census data because full-time salaried ophthalmologists in hospitals who do not render services on a fee for service basis are not included in Medicare data.

(d) Full-time equivalent based on a 45 hour week. Excludes persons who did not work any hours during the last week prior to the Survey/Census.

(e) See Glossary for Medicare FTE methodology.

Note: Census data has been randomly adjusted to avoid the release of confidential data. Details of the exact nature of the methodology applied are available from the ABS on request.

Sources: AIHW Medical Labour Force Surveys, 2001 and 2006, ABS 2001 and 2006 Census of Population and Housing data, DoHA Medicare statistics 2000–01 and 2005–06.

The number of ophthalmologists increased between 2001 and 2006 in all three collections. In the MLFS it increased by 17.8% (from 653 in 2001 to 769 in 2006). In the Census it increased by 46.4% (from 431 in 2001 to 631 in 2006). The number of providers who had a derived specialty code of ophthalmology (see *Derived specialty code of Medicare providers* in Glossary), and who rendered at least one Medicare-funded service during the year, increased by 9.2% (from 720 in 2000–01 to 786 in 2005–06).

In 2006, the total number of ophthalmologists obtained from the MLFS and Census was less than the number of RANZCO Fellows. This is to be expected as some Fellows would not have been in the medical labour force (that is, employed elsewhere, not employed and not looking for work in medicine, retired from work, or working overseas). If the number of employed RANZCO Fellows corresponds to the number of registered medical practitioners employed in the medical labour force in the 2006 MLFS (87%) (AIHW 2008b), then the number of employed RANZCO Fellows employed in the ophthalmology labour force would be 731 (almost 40 less than the MLFS estimate but 100 more than the Census count). Given

that the number of RANZCO Fellows is an undercount of registered ophthalmologists then the true number of employed ophthalmologists is more likely to be closer to the higher MLFS estimate than the lower Census estimate.

Census data are subject to potential sources of error such as respondent error, partial response, processing error and undercount (ABS 2006b). The Census data may have been affected by difficulties coding and lack of detail in, written responses to the occupation and main tasks questions. This may partially explain the low number of employed ophthalmologists in the Census. However, the number of ophthalmologists from the MLFS may also have been incorrectly estimated by the weighting process used to account for non-responses in the survey (see Appendix A for more detail).

Characteristics of employed ophthalmologists

Table 3 shows selected characteristics of employed ophthalmologists based on MLFS data. Between 2001 and 2006 the proportion of female ophthalmologists increased from 12.1% to 15.7%. The average number of hours worked in the week prior to the survey, declined from 44.0 hours in 2001 to 43.0 hours in 2006.

Table 3: Characteristics of employed ophthalmologists^(a), states and territories, 2001 and 2006

Characteristics	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
2001									
Number	229	175	104	55	64	12	11	n.p.	653
% female	13.6	13.1	9.5	15.0	3.9	37.3	—	n.p.	12.1
Average age	51.8	50.5	52.7	52.2	56.1	n.a.	54.7	n.p.	52.2
% aged 55 years and over	39.9	30.3	40.8	40.0	51.7	n.a.	62.5	n.p.	38.5
Average hours worked per week	44.3	45.4	45.5	43.3	36.7	44.3	50.0	n.p.	44.0
FTE ^(b)	225	177	105	53	53	12	13	n.p.	639
FTE rate ^(c)	3	4	3	3	3	3	4	n.p.	3
2006									
Number	280	199	131	71	56	17	7	n.p.	769
% female	18.2	16.9	8.7	20.6	9.6	18.2	n.p.	n.p.	15.7
Average age	51.4	51.1	53.9	51.5	51.9	50.6	n.p.	n.p.	51.6
% aged 55 years and over	37.0	31.6	40.4	35.3	39.3	36.3	n.p.	n.p.	36.0
% initial medical qualification obtained in Australia	85.1	88.6	82.7	70.6	80.8	63.7	n.p.	n.p.	83.4
Average hours worked per week	42.0	42.3	43.3	42.4	44.4	42.3	n.p.	n.p.	43.0
FTE ^(b)	261	187	126	67	55	16	n.p.	n.p.	735
FTE rate ^(c)	4	4	3	3	4	3	n.p.	n.p.	4

(a) Medical practitioners whose main specialty of practice was ophthalmology.

(b) FTE based on a 45 hour week.

(c) Per 100,000 population.

Sources: AIHW Medical Labour Force Surveys, 2001 and 2006.

The average age of ophthalmologists declined slightly from 52.2 years in 2001 to 51.6 years in 2006. During this period the percentage of ophthalmologists aged 55 years and over declined from 38.5% to 36.0%. Figure 1 shows the age profiles for ophthalmologists in 2001 and 2006. Although there was a slight decline in average age, the age profile of employed ophthalmologists has shifted. Between 2001 and 2006 the percentage of ophthalmologists aged 35–44 years decreased from 31.5% to 28.2%. The proportion of ophthalmologists aged 45–54 years increased from 25.6% to 33.1%.

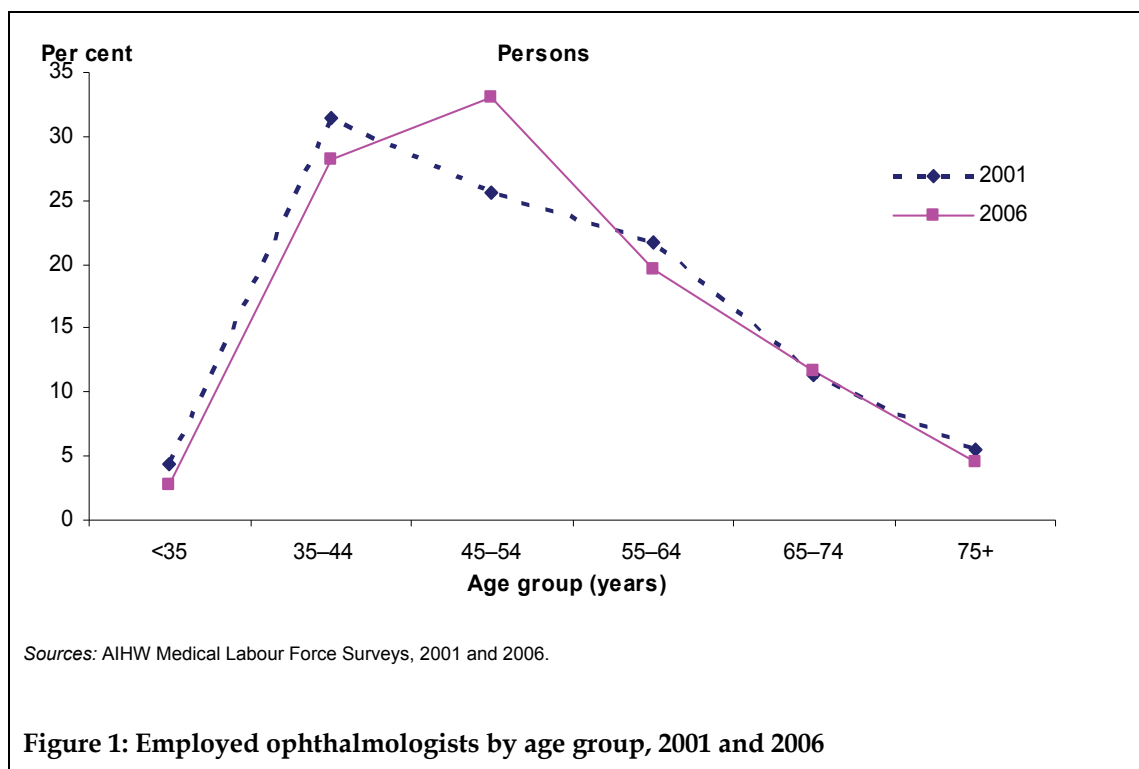


Table 4 shows selected characteristics of ophthalmologists by the location of their main job, according to the Remoteness Area (RA) structure of the Australian Standard Geographical Classification (see Glossary).

The majority of ophthalmologists work in *Major cities*. In 2006 82.5% of ophthalmologists worked in *Major cities* yet only 68.5% of the Australian population and 67% of Australians with eye disorders lived in *Major cities* (ABS 2006a). In contrast 12% of ophthalmologists worked in *Inner regional* areas, yet only 20% of the Australian population and 20.5% of Australians with eye disorders lived in *Inner regional* areas.

There were 4 ophthalmologists per 100,000 population working in *Major cities* in 2006 compared to 2 per 100,000 population working in both *Inner regional* and *Outer regional* areas. Very few ophthalmologists work in *Outer regional*, *Remote* and *Very remote* areas.

Between 2001 and 2006 the proportion of female ophthalmologists in *Major cities* increased from 11.4% to 16.4%.

Table 4: Characteristics of employed ophthalmologists^(a) by Remoteness Area, 2001 and 2006

Characteristics	Major cities	Inner regional	Outer regional	Remote/Very remote ^(b)	Total ^(c)
2001					
Number	538	64	14	5	653
% female	11.4	14.4	35.7	n.p.	12.1
Average age	51.7	49.3	56.6	n.p.	52.2
% aged 55 years and over	38.3	18.4	64.7	n.p.	38.5
% initial medical qualification obtained in Australia	85.2	78.6	65.9	n.p.	85.2
Average hours worked per week	44.3	45.0	40.6	n.p.	44.0
FTE ^(d)	529	64	13	n.p.	639
FTE rate ^(e)	4	2	1	n.p.	3
2006					
Number	634	92	25	n.p.	769
% female	16.4	11.1	5.1	n.p.	15.7
Average age	52.0	49.3	44.4	n.p.	51.6
% aged 55 years and over	37.2	29.0	10.2	n.p.	36.0
% initial medical qualification obtained in Australia	83.6	82.1	83.5	n.p.	83.4
Average hours worked per week	42.6	42.8	58.9	n.p.	43.0
FTE ^(d)	601	88	32	n.p.	735
FTE rate ^(e)	4	2	2	n.p.	4

(a) Medical practitioners whose main specialty of practice was ophthalmology.

(b) Due to small numbers the *Remote Australia*, *Very remote Australia* and *Migratory* categories have been collapsed and reported as *Remote/Very remote*.

(c) Includes 33 ophthalmologists who did not state their region of main job in 2001, and 15 ophthalmologists who did not state their region of main job in 2006.

(d) FTE based on a 45 hour week.

(e) Per 100,000 population.

Sources: AIHW Medical Labour Force Surveys, 2001 and 2006.

Work setting and sector of employed ophthalmologists

Work setting refers to the type of service or facility in which ophthalmologists work and sector refers to whether the care is provided in a public or private organisation.

There were 318 ophthalmologists who reported working some hours in one or more public sector work settings in 2006 (a decline of 1.5% from 323 in 2001). By contrast 707 ophthalmologists worked in one or more private sector work settings (a rise of 14.6% from 617 in 2001) (Table 5).

Ophthalmologists worked more than three times as many weekly hours in private sector than in public sector work settings, with an average of 37.5 hours worked per week in the private sector, and 11.3 hours in the public sector.

Average weekly hours worked by ophthalmologists in the public sector decreased from 12.2 hours in 2001 to 11.3 hours in 2006 and from 39.5 hours to 37.5 hours per week in the private sector.

Table 5: Employed ophthalmologists^(a): work setting and sector^(a), 2001 and 2006

Work setting	Public sector		Private sector	
	Number	Average weekly total hours	Number	Average weekly total hours
	2006			
Private medical practitioners' rooms or surgery	690	34.1
Hospital	260	10.3	155	11.9
Ambulatory centre, day procedure centre, outpatient clinic	59	9.4	103	6.5
Educational institution	23	6.6	15	8.9
Other ^(b)	21	9.7	35	8.4
Total^(c)	318	11.3	707	37.5
	2001			
Total	323	12.2	617	39.5

(a) Medical practitioners whose main specialty of practice was ophthalmology.

(b) Includes Community health centre, 24-hour or other medical centre, Other residential care facility, Aboriginal health service, Aero retrieval service, Mobile clinic, Commercial/industry/business, Government/Defence, Laboratory or radiology facility (not in a hospital), Non-clinical office, and Other.

(c) Data for work sector are based on self-reported hours worked in each sector and may be an underestimate of the actual numbers. A medical practitioner may be double counted if they work more than 1 hour in both sectors.

Note: The sum of total average hours worked in each sector does not equal the total average hours worked in Tables 3 and 4 because ophthalmologists who did not work in the sector are excluded from average hours calculations for that sector.

Source: AIHW Medical Labour Force Surveys 2001 and 2006.

Training of ophthalmologists

The Vocational Training Program (VTP) for ophthalmologists in Australia and New Zealand is administered by the RANZCO. Training commences once the applicant has obtained an appointment to a first-year accredited hospital post and passed the induction assessment. The training program is a minimum of four years in duration and it relies on the trainee obtaining an appointment to an advanced training post in the third year (RANZCO 2008b).

Table 6 shows the predicted number of first-year ophthalmology trainees for the years 2001 to 2007 inclusive. The number of new RANZCO Fellows is the best indicator of the number of trainees who have successfully completed all aspects of the VTP and are now practising ophthalmology (DoHA 2007).

It appears that the majority of trainee ophthalmologists complete their training. Between 2001 and 2006 the average predicted number of first-year ophthalmology trainees was 23 and the average number of new RANZCO Fellows was 22. The number of new Fellows as a proportion of employed ophthalmologists averaged around 3% during this period. The total number of ophthalmology trainees per year averaged around 100 and was highest in 2004 with 105 trainees that year.

Table 6: Royal Australian and New Zealand College of Ophthalmologists: trainee numbers and new Fellows, Australia, 2001–2007

	2001	2002	2003	2004	2005	2006	2007
Total college trainee numbers	100	95	102	105	101	102	97
First-year vocational trainee places for the year ^(a)	18	18	26	28	25	22	26
New Fellows	21	20	30	20	26	16	..
New Fellows as a % of employed ophthalmologists	3.1	2.8	4.1	2.7	3.4	2.1	..

(a) This is the number of first year vocational trainee places in ophthalmology predicted by RANZCO in the previous year. Actual numbers of first-year trainees was not available prior to 2007. In 2007 the actual number of first year trainees (24) was only 2 fewer than the predicted number (26) (DoHA 2007).

Sources: DoHA Medical Training Review Panel Reports 4–11 (DoHA 2000–2007), AIHW Medical labour force surveys 2001–2006.

AIHW MLFS data on trainee ophthalmologists are presented below in order to examine characteristics of this group. According to the AIHW MLFS there were an estimated 132 trainee ophthalmologists in 2006 (Table 7). This was 29% higher than the number of RANZCO trainees (Table 6). This difference is largely due to the effect of the weighting process used to account for non-response in the MLFS (see Appendix A for more detail).

The number of trainee ophthalmologists increased by 7.3% between 2001 and 2006. Approximately one-third of trainees were female, in both 2001 and 2006. This is much higher than the proportion of employed female ophthalmologists (12.1% in 2001 and 15.7% in 2006) (Table 3).

Trainee ophthalmologists work, on average, longer weekly hours than other ophthalmologists. In 2006 they worked on average 52.1 hours compared to 43.0 hours for other ophthalmologists. In 2006 trainees worked almost 3 hours per week longer than they worked in 2001.

Table 7: Characteristics of trainee ophthalmologists, states and territories, 2001 and 2006

Characteristics	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
2001									
Number	60	30	8	6	13	n.p.	—	n.p.	123
% female	42.3	26.4	15.5	—	11.9	n.p.	—	n.p.	33.1
Average age	33.6	38.4	32.2	31.5	34.0	n.p.	—	n.p.	33.9
% initial medical qualification obtained in Australia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Average hours worked per week	48.8	50.6	51.5	60.0	45.3	n.p.	—	n.p.	49.3
FTE ^(a)	65	33	10	7	13	n.p.	—	n.p.	135
FTE rate ^(b)	1	1	—	—	1	n.p.	—	n.p.	1
2006									
Number	54	41	14	6	7	n.p.	—	n.p.	132
% female	24.5	33.0	27.5	66.7	41.1	n.p.	—	n.p.	34.8
Average age	32.0	29.9	32.0	34.3	33.7	n.p.	—	n.p.	31.5
% initial medical qualification obtained in Australia	94.5	95.8	90.9	50.0	100.0	n.p.	—	n.p.	92.3
Average hours worked per week	52.3	52.6	56.0	45.7	50.0	n.p.	—	n.p.	52.1
FTE ^(a)	63	48	17	6	8	n.p.	—	n.p.	153
FTE rate ^(b)	1	1	—	—	1	n.p.	—	n.p.	1

(a) FTE based on a 45 hour week.

(b) Per 100,000 population.

Sources: AIHW Medical Labour Force Surveys, 2001 and 2006.

The majority of trainee ophthalmologists worked in *Major cities* (86.4%) in 2006 (Table 8).

Table 8: Characteristics of trainee ophthalmologists by Remoteness Area, 2001 and 2006

Characteristics	Major cities	Inner regional	Outer regional	Remote/ Very remote ^(a)	Total ^(b)
2001					
Number	90	7	15	n.p.	123
% female	35.3	n.p.	11.3	n.p.	33.1
Average age	32.5	n.p.	35.6	n.p.	33.9
% initial medical qualification obtained in Australia	n.a.	n.a.	n.a.	n.a.	n.a.
Average hours worked per week	50.5	n.p.	48.3	n.p.	49.3
FTE ^(c)	101	n.p.	16	n.p.	135
FTE rate ^(d)	1	n.p.	1	n.p.	1
2006					
Number	114	n.p.	6	6	132
% female	31.7	n.p.	n.p.	n.p.	34.8
Average age	31.4	n.p.	n.p.	n.p.	31.5
% initial medical qualification obtained in Australia	92.8	n.p.	n.p.	n.p.	93.8
Average hours worked per week	52.9	n.p.	n.p.	n.p.	52.1
FTE ^(c)	134	n.p.	n.p.	n.p.	153
FTE rate ^(d)	1	n.p.	n.p.	n.p.	1

(a) Due to small numbers the *Remote Australia*, *Very remote Australia* and *Migratory* categories have been collapsed and reported as *Remote/Very remote*.

(b) Includes 9 ophthalmologists-in-training who did not state their region of main job in 2001 and 3 ophthalmologists-in-training who did not state their region of main job in 2006.

(c) FTE based on a 45 hour week.

(d) Per 100,000 population.

Sources: AIHW Medical Labour Force Surveys, 2001 and 2006.

3 Ophthalmic nurses

Ophthalmic nurses are registered or enrolled nurses who reported ophthalmology as their main area of practice. They typically provide nursing care to patients being treated by an ophthalmologist and do not necessarily have specialised qualifications. The latest data on ophthalmic nurses comes from the 2004 AIHW Nursing and Midwifery Survey. Data for ophthalmic nurses are not available prior to 2003 and were not of publishable quality for 2005 and 2006.

In 2004 there were an estimated 475 ophthalmic nurses in Australia (Table 9). Over one-third (34.5%) were employed in New South Wales, 21.1% in Queensland and a further 18.1% in Victoria. The majority (83.0%) were registered nurses. The average age of ophthalmic nurses was 46.5 years, with 20.2% aged 55 years and over. They worked, on average, 31.0 hours per week in 2004. More than half (52.6%) worked part-time (less than 35 hours per week).

Table 9: Characteristics of registered and enrolled nurses employed as clinical ophthalmic nurses^(a), states and territories, 2004

Characteristics	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Number	164	86	100	53	42	19	10	n.p.	475
% aged 55+	21.4	18.1	21.8	21.0	20.8	8.7	—	n.p.	20.2
Average age	47.3	43.9	47.6	44.6	49.5	43.7	46.5	n.p.	46.5
% female	96.3	92.9	94.7	100.0	100.0	100.0	100.0	n.p.	96.3
% registered	88.9	93.6	84.4	63.6	68.0	70.8	67.6	n.p.	83.0
Average hours worked	30.8	30.9	32.3	31.1	26.1	34.0	32.4	n.p.	31.0
% part-time	50.2	53.1	53.5	50.0	66.7	52.3	48.4	n.p.	52.6
FTE ^(b)	145	75	92	47	31	18	9	n.p.	421
FTE rate ^(c)	2	2	2	2	2	4	3	n.p.	2

(a) Includes Clinician nurses, Clinical nurse managers and Supervisors of new nurses.

(b) FTE based on a 35 hour week.

(c) Per 100,000 population.

Sources: AIHW Nursing and Midwifery Labour Force Survey 2004.

In 2004, 76.8% of ophthalmic nurses worked in *Major cities*. There were more FTE ophthalmic nurses per 100,000 population in *Outer regional* areas (2 per 100,000 population) than there were in *Inner regional* areas (1 per 100,000 population) (Table 10).

Table 10: Characteristics of registered and enrolled nurses employed as clinical ophthalmic nurses^(a), Remoteness Area, 2004

Characteristics	Major cities	Inner regional	Outer regional	Remote/ Very remote ^(b)	Total
Number	365	64	40	6	475
% aged 55+	20.3	20.7	21.6	n.p.	20.2
Average age	46.3	47.2	47.3	n.p.	46.5
% female	96.1	94.9	100.0	n.p.	96.3
% registered	84.8	76.2	75.1	n.p.	83.0
Average hours worked	31.3	28.6	31.4	n.p.	31.0
% part-time	51.2	64.1	49.8	n.p.	52.6
FTE ^(c)	327	52	36	n.p.	421
FTE rate ^(d)	2	1	2	n.p.	2

(a) Includes Clinician nurses, Clinical nurse managers and Supervisors of new nurses.

(b) Due to small numbers the *Remote Australia*, *Very remote Australia* and *Migratory* categories have been collapsed and reported as *Remote/Very remote*.

(c) FTE based on a 35 hour week.

(d) Per 100,000 population.

Sources: AIHW Nursing and Midwifery Labour Force Survey 2004.

4 Optometrists

Optometrists specialise in the management of disorders of the eyes and visual system. They prescribe spectacles and contact lenses and carry out treatment for eye disorders. Unlike ophthalmologists, optometrists do not perform surgery but may use drugs to treat eye diseases in some jurisdictions (OAA 2008a). To practise optometry in Australia optometrists need to be registered with a state or territory optometry registration board (DIAC 2009).

Registered optometrists

Table 11 shows the number of optometrists registered with the optometrist registration boards in each jurisdiction for the most recent date where data are available. For jurisdictions other than Tasmania and the Northern Territory, it is those registered at 30 June 2006. For Tasmania it is those registered at 31 December 2006 and for the Northern Territory it is those registered at 11 December 2008. The total may include optometrists registered in more than one jurisdiction.

Table 11: Number of registered optometrists, states and territories, 2006^(a)

	NSW ^(a)	Vic ^(a)	Qld ^(a)	WA ^(a)	SA	Tas ^(b)	ACT	NT ^(c)	Australia ^(d)
Registered optometrists	1,664	978	882	363	272	120	83	52	4,414

(a) As at 30 June 2006.

(b) Registered at 31 December 2006.

(c) Historical data on the number of registered optometrists in the Northern Territory is not available. The number provided is at 11 December 2008.

(d) The Australian total may include optometrists registered in more than one jurisdiction.

Sources: NSW Optometrists Registration Board 2006, Optometrists Registration Board of Victoria 2006, Optometrists Board of Queensland 2007, The Optometrists Registration Board of Western Australia 2006, South Australia Optometrists Board 2006, Optometrists Registration Board of Tasmania 2007, Northern Territory Health Professionals Licensing Authority and ACT Health 2006.

Employed optometrists

Table 12 shows the number and FTE number of optometrists in Australia in 2001 and 2006 according to the Census and Medicare data.

In 2006 the number of optometrists in the Census was much less than the estimated number of registered optometrists (3,066 compared with 4,414). A number of registered optometrists may not have been employed in optometry (that is, employed elsewhere, not employed and not looking for work in optometry, retired from work or working overseas) at the time of the Census.

Occupation data in the Census is subject to respondent error, partial response, processing error and undercount (ABS 2006b). Each of these issues could have potentially contributed to the differences in the total number of registered optometrists and the Census count of optometrists. The number of registrations may have been inflated by double counting optometrists registered in more than one state. The two data sources also differ in their timing, with Census data collected at a point in time whereas the Medicare data are collected throughout the year.

Table 12: Employed optometrists, number and FTE rates, states and territories, 2001 and 2006

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
2001									
Number									
Census	987	658	526	244	163	62	36	21	2,697
Medicare 2000–01 ^(a)	1,072	742	579	262	190	72	44	22	2,983
FTE									
Census ^(b)	1,100	714	601	265	191	73	35	26	3,005
Medicare 2000–01 ^(c)	560	399	327	155	125	45	29	14	1,654
2006									
Number									
Census	1,118	730	650	258	173	67	48	22	3,066
Medicare 2005–06 ^(a)	1,258	900	735	315	235	92	54	34	3,623
FTE									
Census ^(b)	1,214	793	706	280	178	73	45	30	3,329
Medicare 2005–06 ^(c)	666	492	410	187	144	54	33	17	2,003

(a) Providers who have a derived specialty code of optometry (see Derived specialty code of Medicare providers in Glossary) and who rendered at least one service under Medicare during the year.

(b) FTE based on a 35 hour week.

(c) See Glossary for Medicare FTE methodology.

Note: Census data has been randomly adjusted to avoid the release of confidential data. Details of the exact nature of the methodology applied are available from the ABS on request.

Sources: ABS 2001 and 2006 Census of Population and Housing data; DoHA Medicare statistics 2000–01 and 2005–06.

The number and FTE number of optometrists increased between 2001 and 2006 in both collections. According to the Census, the total number of optometrists increased by 13.7% (from 2,697 to 3,066) and the number of FTE optometrists increased by 10.8% (from 3,005 to 3,329).

The number of optometrists who provided at least one optometry-related Medicare-funded service, increased by 21.5% (from 2,983 in 2000–01 to 3,623 in 2005–06). Similarly the number of FTE optometrists who provided at least one Medicare-funded service increased by 21.1% (from 1,654 to 2,003). The Australian population increased by 6.6% during this period.

Table 13 shows selected characteristics of employed optometrists based upon Census data. In 2006, 44.2% of employed optometrists were female (up from 41.0% in 2001). The average age of optometrists was 40.0 years (up from 38.0 years). Optometrists worked, on average, 38.0 hours per week in 2006 (marginally down from 39.0 hours). New South Wales had the most optometrists per 100,000 population (18 compared with the national average of 16 in 2006).

Table 13: Characteristics of employed optometrists, states and territories, 2001 and 2006

Characteristics	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
2001									
Number	987	658	526	244	163	62	36	21	2,697
% female	41.6	45.1	37.8	36.5	35.6	37.1	55.6	42.9	41.0
Average age	39.0	37.0	36.0	38.0	39.0	38.0	35.0	36.0	38.0
% 55 and over	7.0	6.0	5.4	14.3	15.3	13.1	—	—	7.6
% Australian born	60.4	73.3	83.4	59.3	76.7	71.7	62.2	75.0	69.3
Average hours worked per week	39.0	38.0	40.0	38.0	41.0	41.0	34.0	43.0	39.0
FTE ^(a)	1,100	714	601	265	191	73	35	26	3,005
FTE rate ^(b)	17	15	17	14	13	15	11	13	15
2006									
Number	1,118	730	650	258	173	67	48	22	3,066
% female	48.2	45.5	41.8	34.5	35.3	34.3	58.3	54.5	44.2
Average age	40.0	40.0	38.0	42.0	42.0	40.0	35.0	39.0	40.0
% 55 and over	7.3	9.5	8.5	13.6	11.6	16.4	—	—	8.9
% Australian born	56.0	69.1	75.8	54.7	65.3	63.2	60.9	65.0	64.0
Average hours worked per week	38.0	38.0	38.0	38.0	36.0	38.0	33.0	47.0	38.0
FTE ^(a)	1,214	793	706	280	178	73	45	30	3,329
FTE rate ^(b)	18	15	17	14	11	15	14	14	16

(a) FTE based on a 35 hour week.

(b) Per 100,000 population.

Note: Census data has been randomly adjusted to avoid the release of confidential data. Details of the exact nature of the methodology applied are available from the ABS on request.

Sources: ABS 2006 Census of Population and Housing data.

The majority of optometrists practise in *Major cities* (78.6%). The supply of optometrists decreased with increasing remoteness. In 2006 the number of FTE optometrists ranged from 18 per 100,000 in *Major cities* to 3 per 100,000 population in *Remote/ Very remote* areas (Table 14).

Table 14: Characteristics of employed optometrists by Remoteness Area, 2001 and 2006

Characteristics	Major cities	Inner regional	Outer regional	Remote/Very remote ^(a)	Total
2001					
Number	2,031	461	179	26	2,697
% female	42.8	33.0	40.2	50.0	41.0
Average age	38.0	40.0	38.0	34.0	38.0
% 55 and over	n.a.	n.a.	n.a.	n.a.	n.a.
% Australian born	n.a.	n.a.	n.a.	n.a.	n.a.
Average hours worked per week	38.0	40.0	39.0	37.0	40.0
FTE ^(b)	2,205	527	199	27	3,005
FTE rate ^(c)	17	13	10	5	15
2006					
Number	2,410	466	168	15	3,066
% female	46.3	34.4	40.0	50.0	44.2
Average age	39.0	42.0	42.0	50.0	40.0
% 55 and over	8.6	11.2	6.5	20.0	8.9
% Australian born	59.8	80.3	78.7	75.0	64.0
Average hours worked per week	37.0	38.0	39.0	31.0	38.0
FTE ^(b)	2,548	506	187	13	3,330
FTE rate ^(c)	18	12	10	3	16

(a) Due to small numbers the *Remote Australia*, *Very remote Australia* and *Migratory* categories have been collapsed and reported as *Remote/Very remote*.

(b) FTE based on a 35 hour week.

(c) Per 100,000 population.

Note: Census data has been randomly adjusted to avoid the release of confidential data. Details of the exact nature of the methodology applied are available from the ABS on request.

Sources: ABS Census of Population and Housing data, 2001 and 2006.

Training of optometrists

Optometry training is conducted at the University of New South Wales, University of Melbourne and Queensland University of Technology. Until recently, optometry students at the University of New South Wales and Queensland University of Technology completed 4 year degrees. Optometry undergraduate courses are now 5 years duration at all three institutions (OAA 2008b, QUT 2008, UNSW 2008).

At all three institutions there was a high number of course completions in optometry in 2006, compared to the five previous years. There were 265 course completions in 2006. This number was equivalent to 8.6% of employed optometrists, compared with 7.4% in 2001 (Table 15).

Table 15: Course completions in optometry^(a) by tertiary institution, 2001 to 2006

Tertiary institution	2001	2002	2003	2004	2005	2006
University of NSW	68	50	75	89	75	91
University of Melbourne	105	63	93	82	20	104
Queensland University of Technology	27	39	37	41	79	70
Total	200	152	205	212	174	265

(a) Australian Standard Classification of Education (ASCED) code 60901.

Source: DEEWR Higher education student data.

5 Orthoptists

Orthoptists specialise in: the diagnosis and management of disorders of eye movements and associated vision problems; performance of investigative procedures appropriate to disorders of the eye and visual system; and rehabilitation of patients with vision loss (OAA 2009).

Registered orthoptists

There were 307 orthoptists registered with the Australian Orthoptic Board as at 25 September 2008 (AOB 2008a).

Employed orthoptists

Orthoptists do not need to be registered to practise (AOB 2008b) so there are more orthoptists practising in Australia than the number that are registered. In 2006, there were 515 orthoptists employed during the week of the Census (up from 432 in 2001, an increase of 19.2% (Table 16).

The average number of hours worked per week by orthoptists declined from 33.0 hours in 2001 to 32.0 hours in 2006. The number of FTE orthoptists increased by 15.7% (from 407 FTE to 471 FTE).

The majority of orthoptists are female. In 2006, 90.1% of orthoptists were female (up from 86.3% in 2001). The average age was 36.0 years (up from 34.0 years in 2001).

In both 2001 and 2006 approximately 87% of orthoptists lived in *Major cities* (Table 17). There were very few orthoptists in *Outer regional* areas and none in *Remote* or *Very remote* areas.

Table 16: Characteristics of employed orthoptists, states and territories, 2001 and 2006

Characteristics	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
2001									
Number	197	171	36	12	6	3	7	—	432
% female	89.3	84.8	75.0	75.0	n.p.	n.p.	n.p.	—	86.3
Average age	35.0	33.0	34.0	25.0	n.p.	n.p.	n.p.	—	34.0
% 55 years and over	6.4	1.8	—	—	n.p.	n.p.	n.p.	—	4.4
% Australian born	77.2	89.5	83.9	58.3	n.p.	n.p.	n.p.	—	82.9
Average hours worked per week	33.0	31.0	36.0	37.0	n.p.	n.p.	n.p.	—	33.0
FTE ^(a)	186	151	37	13	n.p.	n.p.	n.p.	—	407
FTE rate ^(b)	3	3	1	1	n.p.	n.p.	n.p.	—	2
2006									
Number	240	202	39	17	5	8	4	—	515
% female	91.7	89.6	82.1	82.4	n.p.	n.p.	n.p.	—	90.1
Average age	34.0	35.0	42.0	41.0	n.p.	n.p.	n.p.	—	36.0
% 55 years and over	4.2	3.0	23.1	—	n.p.	n.p.	n.p.	—	6.6
% Australian born	77.3	85.0	71.1	77.8	n.p.	n.p.	n.p.	—	79.2
Average hours worked per week	32.0	30.0	41.0	39.0	n.p.	n.p.	n.p.	—	32.0
FTE ^(a)	219	173	46	19	n.p.	n.p.	n.p.	—	471
FTE rate ^(b)	3	3	1	1	n.p.	n.p.	n.p.	—	2

(a) FTE based on a 35 hour week.

(b) Per 100,000 population.

Note: Census data has been randomly adjusted to avoid the release of confidential data. Details of the exact nature of the methodology applied are available from the ABS on request.

Sources: ABS Census of Population and Housing data 2001 and 2006.

Table 17: Characteristics of employed orthoptists by Remoteness Area, 2001 and 2006

Characteristics	Major cities	Inner regional	Outer regional	Remote/Very remote	Total
2001					
Number	377	47	5	—	432
% female	85.9	87.2	n.p.	—	86.3
Average age	33.0	35.0	n.p.	—	34.0
% 55 years and over	n.a.	n.a.	n.p.	—	n.a.
% Australian born	n.a.	n.a.	n.p.	—	n.a.
Average hours worked per week	32.0	35.0	n.p.	—	33.0
FTE ^(a)	345	47	n.p.	—	395
FTE rate ^(b)	3	1	n.p.	—	2
2006					
Number	450	59	9	—	518
% female	88.7	94.7	n.p.	—	89.6
Average age	35.0	44.0	n.p.	—	36.0
% 55 years and over	5.1	15.3	n.p.	—	6.2
% Australian born	78.0	94.6	n.p.	—	79.2
Average hours worked per week	32.0	29.0	n.p.	—	32.0
FTE ^(a)	411	49	n.p.	—	474
FTE rate ^(b)	3	1	n.p.	—	2

(a) FTE based on a 35 hour week.

(b) Per 100,000 population.

Note: Census data has been randomly adjusted to avoid the release of confidential data. Details of the exact nature of the methodology applied are available from the ABS on request.

Sources: ABS Census of Population and Housing data 2001 and 2006.

Training of orthoptists

The University of Sydney and La Trobe University in Victoria offers degree programs in orthoptics recognised by the Australian Orthoptic Board (AOB 2008c). Data on course completions for orthoptists are not available.

6 Optical dispensers and optical mechanics

Optical dispensers interpret optical prescriptions as well as fit and service optical appliances such as spectacle frames and lenses. Optical mechanics operate machines to grind, polish and surface optical lenses to meet prescription requirements. Optical mechanics also fit lenses to spectacle frames (ABS 2006c).

Licensing is compulsory for optical dispensers in New South Wales and South Australia only. Licensing or registration is not required for optical mechanics (DIAC 2008).

Employed optical dispensers and optical mechanics

In 2006, there were 3,270 optical dispensers in Australia (Table 18). They worked, on average, 34.0 hours per week. Almost 70% of optical dispensers were female. The average age of optical dispensers was 37 years. Optical dispensers in the Australian Capital Territory and Tasmania had the highest number of FTE optical dispensers with 20 and 19 per 100,000 population, respectively.

In 2006, there were 996 optical mechanics in Australia. The supply of optical mechanics was highest in South Australia (16 per 100,000 population compared to the national average of 5 per 100,000). Approximately two-thirds of optical mechanics were male. The average age of optical mechanics was 38 years. They worked, on average, 38 hours per week in 2006.

The supply of optical dispensers decreased with increasing remoteness. In 2006 the number of FTE optical dispensers ranged from 16 per 100,000 in *Major cities* to 3 per 100,000 population in *Remote/Very remote* areas (Table 19).

In 2001, optical dispensers and optical mechanics were coded as optical mechanics for the Census. Therefore there is no separate data available on optical dispensers and optical mechanics for 2001. In 2001 there were 3,584 optical mechanics. In 2006 the combined number of optical mechanics and optical dispensers was 4,266, an increase of 19% between 2001 and 2006.

Table 18: Characteristics of optical dispensers and optical mechanics, states and territories, 2006

Characteristics	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
Optical dispensers									
Number	1,077	722	637	354	295	95	68	22	3,270
% female	62.8	65.1	78.0	73.2	79.3	90.5	63.2	77.3	69.8
Average age	38.0	36.0	35.0	36.0	39.0	30.0	35.0	27.0	37.0
% 55 years and over	9.3	9.6	8.3	10.2	11.9	4.2	13.2	—	9.4
% Australian born	69.0	79.3	79.2	62.6	78.9	87.6	83.3	88.0	74.5
Average hours worked per week	35.0	34.0	32.0	35.0	32.0	34.0	35.0	34.0	34.0
FTE ^(a)	1,077	701	582	354	270	92	68	21	3,177
FTE rate ^(b)	16	14	14	17	17	19	20	10	15
Optical mechanics									
Number	338	183	140	86	222	18	6	3	996
% female	37.3	30.1	24.3	20.9	40.5	50.0	n.p.	n.p.	33.3
Average age	39.0	37.0	37.0	39.0	38.0	45.0	n.p.	n.p.	38.0
% 55 years and over	11.8	13.7	17.9	10.5	9.5	—	n.p.	n.p.	12.0
% Australian born	35.4	79.8	72.0	51.8	71.5	100.0	n.p.	n.p.	59.6
Average hours worked per week	39.0	38.0	38.0	38.0	39.0	37.0	n.p.	n.p.	38.0
FTE ^(a)	377	199	152	93	247	19	n.p.	n.p.	1,081
FTE rate ^(b)	6	4	4	5	16	4	n.p.	n.p.	5

(a) FTE based on a 35 hour week.

(b) Per 100,000 population.

Note: Census data has been randomly adjusted to avoid the release of confidential data. Details of the exact nature of the methodology applied are available from the ABS on request.

Sources: ABS Census of Population and Housing data 2001 and 2006.

Table 19: Characteristics of optical dispensers and optical mechanics by Remoteness Area, 2006

Characteristics	Major cities	Inner regional	Outer regional	Remote/Very remote ^(a)	Total ^(b)
Optical dispensers					
Number	2,438	608	199	17	3,270
% female	67.4	74.1	82.6	100.0	69.8
Average age	37.0	36.0	35.0	30.0	37.0
% 55 years and over	10.0	7.6	4.5	—	9.4
% Australian born	70.0	88.1	85.5	68.4	74.5
Average hours worked per week	33.0	35.0	34.0	35.0	34.0
FTE ^(b)	2,299	608	193	17	3,177
FTE rate ^(c)	16	15	10	3	15
Optical mechanics					
Number	880	90	20	6	996
% female	33.8	23.6	36.8	n.p.	33.3
average age	39.0	39.0	37.0	n.p.	38.0
% 55 years and over	11.6	15.6	—	n.p.	12.0
% Australian born	55.7	88.0	85.0	n.p.	59.6
Average hours worked per week	38.0	38.0	36.0	n.p.	38.0
FTE ^(b)	955	98	21	n.p.	1,081
FTE rate ^(c)	7	2	1	n.p.	5

(a) Due to small numbers the *Remote Australia*, *Very remote Australia* and *Migratory* categories have been collapsed and reported as *Remote/Very remote*.

(b) FTE based on a 35 hour week.

(c) Per 100,000 population.

Note: Census data has been randomly adjusted to avoid the release of confidential data. Details of the exact nature of the methodology applied are available from the ABS on request.

Sources: ABS Census of Population and Housing data 2001 and 2006.

Training in optical science

To become an optical dispenser or optical mechanic an applicant must have obtained an appropriate Vocational Education Training (VET) qualification (see Glossary). The number of potential entrants into these occupations can be estimated from the number of VET students completing courses in optical sciences (Australian Standard Classification of Education (ASCED) code 0609). Table 20 shows that there were, on average each year, 117 students completing VET qualifications in optical sciences from 2002 to 2006.

Table 20: Vocational Education Training qualification completions for Optical science^(a) (excluding optometry)^(b), states and territories, 2002 to 2006

Year	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
2002	73	12	—	9	8	—	—	—	102
2003	97	8	—	4	1	—	—	—	110
2004	103	—	—	2	15	—	—	—	120
2005	119	—	—	6	—	1	—	—	126
2006	114	—	—	8	7	—	—	—	129
<i>Average 2002–2006</i>	<i>101</i>	<i>4</i>	<i>—</i>	<i>6</i>	<i>6</i>	<i>—</i>	<i>—</i>	<i>—</i>	<i>117</i>

(a) Optical sciences (ASCED 0609) is the study of measuring and assessing vision, and prescribing, preparing and dispensing corrective lenses (ABS 2001).

(b) Optometry courses are not available through Vocational education training.

Sources: National Centre for Vocational Education Research (NCVER) VET Provider Collection (NCVER 2007 Time series Award Cube).

Appendix A: Data sources and methods

ABS Census of Population and Housing

The Census of Population and Housing is undertaken every five years. The objective of the Census is to accurately measure the number and key characteristics of people in Australia on Census Night. It includes all people in Australia on Census Night, including overseas visitors, but excludes foreign diplomats and their families. Australian residents out of the country on Census Night are out of scope of the Census (ABS 2006d).

All Census data in this publication are the counts of people as recorded in the Census (raw counts), without adjustment for non-response or under-enumeration. Full details of the Census methodology may be obtained on the internet at <www.abs.gov.au>.

Census counts of persons in a given occupation vary from one table to the next. For practical reasons in analysis, counts at the occupational group level (e.g. medical practitioners and nursing workers) have been adjusted to be consistent; however, the counts adding up to these totals may not always match. Reasons for the variations are:

- Varying response rates to individual questions in the Census may result in some persons being excluded from the analysis of a given variable.
- The ABS routinely applies small random changes to cells in order to protect the confidentiality of individuals. This leads to small differences in total values between tables.

AIHW Medical Labour Force Survey

The AIHW Medical Labour Force Survey collects information on the demographics, employment characteristics, work locations and work activity of medical practitioners who are renewing their medical registration with medical boards in each state and territory.

The survey population is drawn from the medical registers maintained by each state and territory medical board (or council). Each medical board conducts an annual renewal of registration of medical practitioners who are qualified and eligible to practise. In association with this process, survey questionnaires are sent to registered practitioners at that time.

Only practitioners who were on the register at the time of the survey and who were required to renew their registration received a survey questionnaire for completion. The questionnaire was sent to all registrants in New South Wales, Victoria, Western Australia, South Australia, the Australian Capital Territory and the Northern Territory. In Queensland questionnaires were only sent to general registrants and conditionally registered specialists. In Tasmania, only general registrants, conditional specialists and non-practising practitioners were surveyed. Medical practitioners registering for the first time, or who were not required to renew their registration in the survey year, were not surveyed. In addition, not all medical practitioners who received a questionnaire responded.

Returned questionnaires were processed by, or on behalf of, the respective health authority. Each state and territory then forwarded a data file of de-identified responses to the AIHW for further cleaning, final coding, collation into a national data set, application of national range and edit checks, estimation for item and population non-response, and finally, analysis.

AIHW Medical Labour Force Survey data may not add to the totals shown, due to the estimation process used for non-responses. As a result, numbers of practitioners may be in fractions, but are rounded to whole numbers for publication. Percentages are calculated on the unrounded figures. Where tables contain a 'not stated' category, percentage calculations exclude this category. Percentage distributions may not sum to 100 due to rounding.

A full description of the survey's methodology (including the weighting process and non-response rates) can be found in Appendix A of Medical labour force 2006 (AIHW 2008b).

AIHW Nursing and Midwifery Labour Force Survey

All nurses must be registered with a state or territory nursing/midwifery registration board to practise in that state or territory. Each nursing/midwifery board conducted an annual renewal of registration and enrolment. As part of this process, survey questionnaires were sent to nurses on renewal of their registration. Returned questionnaires were processed by, or on behalf of, the respective health authority. Each state and territory then forwarded a data file of de-identified responses to the AIHW for further cleaning, final coding, collation into a national data set, application of national range and edit checks, estimation for item and population non-response, and finally, analysis.

The scope of the survey was all nurses who were registered or enrolled with the nursing/midwifery board in each state or territory at the time of the survey. Coverage excludes nurses who registered or enrolled for the first time in the 12 months prior to the survey. This is because the survey questionnaire was distributed as part of the registration renewal process and only those who were renewing their registration/enrolment received a questionnaire. Nurses who registered for the first time in the preceding 12 months did not receive a questionnaire, as they were not yet required to renew their registration.

AIHW Nursing and Midwifery Labour Force Survey data may not add to the totals shown due to the estimation process used for non-responses. As a result, numbers of practitioners may be in fractions, but are rounded to whole numbers for publication. Percentages are calculated on the unrounded figures. Percentage distributions may not sum to 100 due to rounding.

A full description of the methodology of the Nursing and Midwifery Labour Force Survey (including the weighting process and non-response rates) can be found in Appendix A of Nursing and midwifery labour force 2005 (AIHW 2008c).

Medicare Benefits Schedule (MBS) dataset

Medicare data in this report comes from the Department of Health and Ageing's MBS dataset. This dataset derives from the Medicare Benefits Schedule, the aim of which is to provide an entitlement to benefits for medical and hospital services for all Australian residents. These benefits are based on fees determined for each service provided. These services are itemised, forming the schedule of fees. Statistics on each item are collected through claims to Medicare Australia.

It should be noted that not all eye health-related medical and optometry services will be captured by the MBS. Examples of this include: when a practitioner is not eligible to provide services attracting a Medicare benefit, when a patient is ineligible for Medicare (e.g. public patients) and for services which are not listed in the schedule.

Ophthalmology trainee and RANZCO Fellowship data

Data on predicted first-year ophthalmology trainees, other ophthalmology trainees and new RANZCO Fellows presented in this report are provided by RANZCO and reported in the Medical Training Review Panel (MTRP) annual reports. The MTRP was established under the Health Insurance Act 1973 to look at the demand for and supply of medical training opportunities, and to monitor the implementation of particular measures in the Health Insurance Amendment Act (No 2) 1996 (DoHA 2009).

Australian Government Department of Education, Employment and Workplace Relations - Higher Education Student Data collection

Data on course completions in optometry (Table 15 in this report) come from the Higher Education Student Data collection. Under subsection 19-70(1) of the Higher Education Support Act 2003, higher education providers are required to provide statistical and other information for this collection to the Department of Education, Employment and Workplace Relations (DEEWR 2009a).

A course completion is the successful completion of all the academic requirements of a course which includes any required attendance, assignments, examinations, assessments, dissertations, practical experience and work experience in the particular industry (DEEWR 2009b).

National Centre for Vocational Education Research (NCVER) - Vocational Education Training (VET) Provider collection

VET qualification completed data (Table 20 in this report) comes from the VET provider collection. The purpose of the collection is to provide data on publicly funded training programs delivered by government funded and privately operated training providers (NCVER 2009a). Qualification completed is based on the Qualification/Course Field of Education Identifier which uniquely identifies the purpose of learning that is the ultimate aim of the skills and knowledge gained by the student in a qualification or course (NCVER 2009b).

Glossary

Derived specialty codes of Medicare providers

Derived specialty codes of Medicare providers come from the Medicare Provider File. The system classifies Medicare providers for each quarter, regarding the nature of services rendered by the practitioner during the period and their existing specialty codes on the Medicare Provider File. If, for example, a practitioner has an existing specialty code of ophthalmology and the majority of Schedule fee income was from ophthalmology services, then the medical practitioner is classified as a specialist ophthalmologist.

If a practitioner does not have an existing specialty code of ophthalmology and the majority of Schedule fee income was from ophthalmology services, then the medical practitioner is classified as a non-specialist ophthalmologist. In this report, Medicare data is reported for specialist ophthalmologists and specialist optometrists.

Employed medical practitioner

In the MLFS a medical practitioner is one who, in the four weeks prior to the survey, reported as working in medicine mainly, or only, in their state of registration. In this report, data on employed medical practitioners include those who are either:

- practising medicine
- involved with work that is principally concerned with the discipline of medicine (including medical research, administration, or teaching of medicine), or
- on leave for three months or longer.

Enrolled nurse

An enrolled nurse is one who is on the roll maintained by the nursing/midwifery registration board in each state and territory. The minimum educational requirement for an enrolled nurse is a 1-year diploma from a VET provider, or the equivalent from a recognised hospital-based program. To maintain enrolment, nurses must have practised for a specified minimum period in the previous 5 years (this is referred to as 'recency of practice', with the requirements depending on the registration board). Enrolled nurses include mothercraft and dental nurses where the educational course requirements are less than a 3-year degree course or equivalent. They usually work with registered nurses to provide patients with basic nursing care, undertaking less complex procedures than registered nurses (AIHW 2008c).

Full-time equivalent (FTE)

A full-time equivalent (FTE) is a measure of the workforce that takes into account both the absolute number of workers and the average hours per week that they work. In this report, 45 total hours per week is assumed to be equivalent to 1.0 FTE for ophthalmologists. For ophthalmic nurses, optometrists, orthoptists, optical dispensers and optical mechanics, 35 hours per week is assumed to be the equivalent of 1.0 FTE. This is because the average amount of hours worked per week in these occupations is less than the average hours worked by ophthalmologists.

The number of full-time equivalent practitioners equals the number of practitioners multiplied by the average weekly hours worked, divided by the number of hours in a 'standard' full-time week. The FTE number is converted to a rate per 100,000 population (FTE rate).

Medicare FTEs are calculated differently (see Medicare FTEs).

Hours worked

In the MLFS, the total number of weekly hours worked is self-reported by practitioners and relates to the total number of hours worked, including non-clinical work. In editing survey responses, the accepted maximum hours worked was 126 hours per week. Reported hours greater than 126 are considered unreliable and are not included in the analysis.

In the Census employed persons are asked how many hours they worked in all jobs in the week prior to Census night. For this report it is assumed that hours worked in all jobs were the same as hours worked in the occupation under analysis.

Medicare FTEs

Medicare FTEs are calculated differently to other FTEs. All practitioners of a particular specialty, who earned equal to, or above the average, Medicare Benefits Schedule fee for the year for that specialty are counted as 1.0 FTE. All practitioners of a particular specialty who earned less than the average Medicare Benefits Schedule fee for the year for that specialty are counted as a proportion of 1.0 FTE. For example, an ophthalmologist who earned 90% of the average schedule fee would be counted as 0.9 FTE.

Ophthalmic nurse

An ophthalmic nurse typically provides nursing care to patients being treated by an ophthalmologist. In the NMLFS an ophthalmic nurse is a registered or enrolled nurse who indicated ophthalmology as their main specialty of practice. Ophthalmic nurses do not necessarily have specialised qualifications.

Ophthalmologist

An ophthalmologist is a specialist medical practitioner who specialises in eye-related diseases, injuries and deficiencies (ABS 2006c). An ophthalmologist is also known as an eye specialist or an eye surgeon.

The definition of an ophthalmologist differs slightly for the MLFS, the Census and Medicare data. For the MLFS an ophthalmologist was a registered medical practitioner who reported ophthalmology as their main specialty of practice. For the Census an ophthalmologist was a person whose responses to the occupation-related questions resulted in an ophthalmologist code being assigned. For the Medicare data, an ophthalmologist was defined as a medical practitioner listed in the Medicare Provider File with a Medicare specialty code of ophthalmology and deriving the majority of their schedule fee income from ophthalmology services.

Optical dispensers

An optical dispenser interprets optical prescriptions as well as fits and services optical appliances such as spectacle frames and lenses (ABS 2006c).

Optical mechanics

An optical mechanic operates machines to grind, polish and surface optical lenses to meet prescription requirements. They also fit lenses to spectacle frames (ABS 2006c).

Optometrists

An optometrist specialises in the management of disorders of the eyes and visual system. An optometrist prescribes spectacles and contact lenses and carries out treatment for eye disorders. Unlike ophthalmologists optometrists do not perform surgery but may use drugs to treat eye diseases in some jurisdictions (OAA 2008a). To practise optometry in Australia optometrists need to be registered with an Australian optometrists registration board (DIAC 2009).

Orthoptists

An orthoptist specialises in the diagnosis and management of disorders of eye movements and associated vision problems, performs investigative procedures appropriate to disorders of the eye and visual system and rehabilitates patients with vision loss (OAA 2009).

Registered nurse

A registered nurse is a nurse who is on the register maintained by the state or territory nurses and midwives board or council in each state or territory. The minimum educational requirement for a registered nurse or midwife is a 3-year degree from a higher education institution or equivalent from a recognised hospital-based program. To maintain registration, nurses must have practised for a specified minimum period in the previous 5 years (this is referred to as 'recency of practice', with the actual requirements depending on the registration board) (AIHW 2008c).

Remoteness Area

The Remoteness Area (RA) structure within the Australian Standard Geographical Classification (ASGC), produced by the ABS, has been used in this publication to present regional data.

The RA structure of the ASGC is based on the Accessibility/Remoteness Index of Australia (ARIA), where the Remoteness index value of a point is based on the physical road distance to the nearest town or service in each of six population size categories, based on the 2006 Census of Population and Housing. These categories are:

- *Major cities* of Australia
- *Inner regional* Australia
- *Outer regional* Australia
- *Remote* Australia
- *Very remote* Australia
- *Migratory*.

Due to the small numbers in the *Remote* Australia, *Very remote* Australia and *Migratory* categories, they have been collapsed and reported as *Remote/Very remote* in this report.

Specialist

A specialist, in the MLFS, is a medical practitioner with a qualification awarded by, or which equates to that awarded by, the relevant specialist professional college in Australia, to treat certain conditions. They are self-identified on the survey questionnaire.

Specialist-in-training

A specialist-in-training, in the MLFS, is a medical practitioner who has been accepted by a specialist medical college into a training position, supervised by a member of the college. They are self-identified on the survey questionnaire.

Specialty

A specialty, in the MLFS, is the area of medicine in which a specialist practises. This is work for which the specialist is qualified for recognition under the Health Insurance Act 1973.

Vocational Education Training (VET)

VET is post-compulsory education and training, excluding degree and higher level programs delivered by further education institutions, which provides people with occupational or work-related knowledge and skills. VET also includes programs which provide the basis for subsequent vocational programs (NCVER 2009c).

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