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# Indigenous eye health measures

2016

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*to promote better health and wellbeing*

# Indigenous eye health measures 2016

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# Contents

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# Abbreviations

| | |
|---|---|
| AATSIHS | Australian Aboriginal and Torres Strait Islander Health Survey |
| ABS | Australian Bureau of Statistics |
| ACHI | Australian Classification of Health Interventions |
| AHPRA | Australian Health Practitioner Regulation Agency |
| AIHW | Australian Institute of Health and Welfare |
| AR-DRG | Australian Refined Diagnosis Related Groups |
| ASR | age-standardised rate |
| ATSR | Australian Trachoma Surveillance Reports |
| BEACH | Bettering the Evaluation and Care of Health |
| CDNA | Communicable Diseases Network Australia |
| CI | confidence interval |
| DoH | Department of Health |
| FTE | full-time equivalent |
| GP | general practitioner |
| HPF | Aboriginal and Torres Strait Islander Health Performance Framework |
| ICD-10-AM | International Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification |
| ICPC-2 | International Classification of Primary Care-2 |
| IEHU | Indigenous Eye Health Unit |
| IPNF | Implementation Plan under the National Framework for Action to Promote Eye Health and Prevent Avoidable Blindness and Vision Loss |
| MBS | Medicare Benefits Schedule |
| MOICDP | Medical Outreach Indigenous Chronic Disease Program |
| MSOAP | Medical Specialist Outreach Assistance Program |
| NEHS | National Eye Health Survey |
| NHMD | National Hospital Morbidity Database |
| NHMRC | National Health and Medical Research Council |
| NHWDS | National Health Workforce Data Set |
| NSW | New South Wales |
| NT | Northern Territory |
| NTSRU | National Trachoma Surveillance and Reporting Unit |
| OES | Outback Eye Service |
| PHN | Primary Health Network |

| | |
|---|---|
| Qld | Queensland |
| RDN | Rural Doctors Network |
| RHOF | Rural Health Outreach Fund |
| SA | South Australia |
| SAFE | surgery, antibiotics, facial cleanliness and environmental improvement |
| VA | visual acuity |
| VII | Voluntary Indigenous Identifier |
| VOS | Visiting Optometrists Scheme |
| WA | Western Australia |
| WHO | World Health Organization |

# Symbols

| | |
|---|---|
| – | nil or rounded to zero |
| . . | not applicable |
| n.a. | not available |
| n.p. | not publishable because of small numbers, confidentiality or other concerns about the quality of the data |
| < | less than |
| ≥ | greater than or equal to |

# Summary

- This first national report on the Indigenous eye health measures compiles data from a range of sources and presents findings at the national, state and regional levels.
- In 2016 the prevalence of bilateral vision impairment for Indigenous Australians aged 40 and over was 10.5% and the prevalence of bilateral blindness was 0.3% (both affecting an estimated 18,300 Indigenous Australians aged 40 and over).
- The 3 leading causes of vision impairment for older Indigenous adults were refractive error (63%), cataract (20%) and diabetic retinopathy (5.5%).
- Repeated untreated trachoma infections are a cause of vision loss in some remote Indigenous communities, but the prevalence of active trachoma in children aged 5–9 in at-risk communities fell from 14% in 2009 to 4.6% in 2015.
- The age-standardised proportion of Indigenous Australians who had had an eye examination by an eye-care professional in the preceding 12 months increased from 13% in 2005–06 to 15% in 2014–15.
- There were 6,404 hospitalisations (4.5 per 1,000) of Indigenous Australians for eye procedures in the two year period 2013—15.
- Between 2005–07 and 2013–15 the age-standardised Indigenous hospitalisation rate for cataract surgery increased by over 40% from 4,918 to 7,052 per 1,000,000.
- In 2014–15, the median waiting time for elective cataract surgery was 142 days for Indigenous Australians, with 3.4% of Indigenous Australians who waited for more than 1 year for cataract surgery.
- Hospitalisation rates for cataract surgery were higher for Indigenous Australians in *Remote* and *Very remote* areas combined, while waiting times were longest in *Inner regional* areas.
- The number of occasions of service for Indigenous patients under the Visiting Optometrists Scheme (VOS) almost tripled between 2009–10 and 2014–15 rising from 6,975 to 18,890.

**Comparison with non-Indigenous Australians**

- Indigenous Australians suffered from vision impairment or blindness at 3 times the rate of non-Indigenous Australians, based on age-standardised rates.
- In 2014–15, a lower proportion of Indigenous Australians (15%) had had an eye examination by an optometrist or ophthalmologist in the preceding 12 months compared with non-Indigenous Australians (20%), based on age-standardised rates.
- Indigenous Australians had a lower age-standardised rate of hospitalisations for eye diseases compared with non-Indigenous Australians (10 and 13 per 1,000, respectively), but 3 times the rate for injuries to the eye (1.3 and 0.4 per 1,000, respectively).
- Indigenous Australians also had a lower age-standardised rate of hospitalisations for cataract surgery than non-Indigenous Australians (7,044 and 8,415 per 1,000,000, respectively).
- In 2014–15, the median waiting time in days for those who had elective cataract surgery was longer for Indigenous Australians (142) than for non-Indigenous Australians (84).

### Table S1: Trends in the Indigenous eye health measures

| Measures | Reporting periods | Indigenous trends |
|---|---|---|
| **Prevalence** | | |
| 1.1 Prevalence of<br>(i) Vision impairment (%, aged 40 and over) (n=1,738)<br>(ii) Blindness (%, aged 40 and over) (n=1,738) | <br>2008 and 2016<br>2008 and 2016 | <br>↔<br>↓ |
| 1.3 Prevalence of<br>(i) Trachoma (%, aged 5–9, NSW, WA, SA and NT)<br>(ii) Trichiasis (%, aged 40 and over, WA, SA and NT) | <br>2009–2015<br>2010–2015 | <br>↓<br>↓ |
| **Diagnosis and screening services** | | |
| 2.2 Annual health assessments (%) | 2004–05 to 2014–15 | ↑ |
| 2.3 Eye examinations undertaken by an eye care professional (%) | 2005–06 to 2014–15 | ↑ |
| 2.5 Screening coverage<br>(i) Trachoma (%, aged 5–9, NSW, WA, SA and NT)<br>(ii) Trichiasis (%, aged 40 and over, WA, SA and NT) | <br>2011–2015<br>2010–2015 | <br>↑<br>↑ |
| **Treatment services** | | |
| 3.1 Hospitalisations for diseases of the eye (number per 1,000) | 2005–07 to 2013–15 | ↑ |
| 3.2 Hospitalisations for injuries to the eye (number per 1,000) | 2005–07 to 2013–15 | ↔ |
| 3.3 Hospitalisations for eye procedures (number per 1,000) | 2005–07 to 2013–15 | ↑ |
| 3.4 Cataract surgery rate (number per 1,000,000) | 2005–07 to 2013–15 | ↑ |
| 3.6 Waiting times for elective cataract surgery (median waiting time in days) | 2012–13 to 2013–14 | ↔ |
| 3.7 Treatment coverage<br>(i) Trachoma (% community members treated, all ages, WA, SA and NT)<br>(ii) Trichiasis (number aged 40 and over who had surgery, WA, SA and NT) | <br>2011–2015<br>2010–2015 | <br>↑<br>↑ |
| **Workforce and outreach services** | | |
| 4.1 Number and rate of optometrists (FTE per 100,000) | 2011–2015 | ↑ |
| 4.2 Number and rate of ophthalmologists (FTE per 100,000) | 2012–2015 | ↔ |
| 4.4 Occasions of eye health services provided under outreach programs<br>(i) Visiting Optometrists scheme (VOS) (number per 1,000)<br>(ii) Rural Health Outreach Fund (RHOF) (number per 1,000)<br>(iii) Medical Outreach Indigenous Chronic Disease Program (MOICDP) (number per 10,000) | <br>2009–10 to 2014–15<br>2011–12 to 2014–15<br>2013–14 to 2015–16 | <br>↑<br>↑<br>↑ |

*Note:* ↑ = increased over time, ↓ = decreased over time, ↔ = no change over time or no clear trend, for Indigenous Australians. Trend data were not available for measures: 1.2, 2.1, 2.4, 2.6, 3.5, 3.8, 3.9 and 4.3.

*Source:* See table C1 for summary results by measure.

# 1 Introduction

## 1.1 Background

Eye diseases and vision problems are the most common long-term health conditions reported by Aboriginal and Torres Strait Islander Australians, with one-third of Indigenous Australians (33%) reporting 1 or more long-term eye conditions (ABS 2013a). While Aboriginal and Torres Strait Islander children have a lower incidence of poor vision than other Australian children, Aboriginal and Torres Strait Islander people over the age of 40 have 3 times the rate of blindness of other Australians.

Most of the blindness and vision loss experienced by Indigenous Australians is potentially preventable. For example, spectacle correction and cataract surgery are 2 relatively low-cost, effective interventions that can address the main causes of vision loss among Indigenous Australians (Foreman et al. 2016). It is important to monitor the magnitude and causes of vision impairment at the population level, and how these change over time. This information can assist governments and service providers in the development of more effective eye health policies and programs (WHO 2013).

The Department of Health has funded the AIHW for 3 years to develop and report annually on a set of Indigenous eye health measures. This first report includes wide-ranging and comprehensive eye health data at the national, state and regional levels. The measures cover the prevalence of vision impairment and blindness; diagnosis and screening; treatment; workforce; and outreach programs. They provide an evidence base for monitoring changes in Indigenous eye health over time, for assessing access to and use of eye health services, and for identifying gaps in service delivery.

### Issues for Indigenous Australians

The Australian Burden of Disease Study found that Indigenous Australians experienced more than 3 times the burden from vision impairment, compared with non-Indigenous Australians, not including vision loss caused by trachoma or diabetes (AIHW 2016b). The 2016 National Eye Health Survey estimated that 18,300 (11%) of Indigenous adults suffer from vision impairment or blindness (Foreman et al. 2016). The prevalence of vision impairment among Indigenous Australians increases markedly with age, and is mostly caused by conditions that are preventable or amenable to treatment—that is, refractive errors, cataract and diabetic retinopathy (Foreman et al. 2016; Box 1.1).

Despite higher rates of visual impairment, previous studies found that Indigenous Australians used eye-health services at lower rates than non-Indigenous Australians. For example, over one-third of Indigenous adults report that they had never had an eye examination (AIHW 2011). One important barrier to service use was the lack of specialist eye health services in rural and remote areas, where many Aboriginal and Torres Strait Islander Australians live. But even in areas where services were available, Indigenous Australians did not use them to the same extent as non-Indigenous Australians (AIHW 2011).

The complexity of the eye health system and the skills and knowledge required to successfully navigate it, have also been cited as significant barriers to appropriate eye health care. Treatment of eye conditions, such as diabetic retinopathy and cataract for example, involve complex clinical pathways and a series of visits to different providers

(Taylor et al. 2012). Aboriginal and Torres Strait Islander Australians are more likely to drop out at different points in the system and therefore not receive the comprehensive eye health services required to address more complex eye conditions.

Australian governments have put in place programs and services to address these barriers to service use for Indigenous Australians, including eye health outreach services, many of which are delivered through Indigenous specific primary health-care services. In 2014–15, for example, 94% of these Indigenous organisations offered access to optometrists and 89% offered access to ophthalmologists (AIHW 2016a). Other government initiatives include spectacle subsidies, surgical support and funding for the coordination of eye health care. This report provides national data that will assist in monitoring how well health services and programs are meeting the eye health needs of Indigenous Australians.

### Box 1.1: Main eye health conditions affecting Indigenous Australians

**Refractive error** refers to problems with the focusing of light and occurs when the shape of the eye prevents light from focusing directly on the retina. It causes long- or short-sightedness and is a frequent cause of reduced visual acuity. The error can generally be corrected with the use of spectacles and contact lenses, or through laser surgery (National Eye Institute 2010).

**Cataract** is a mostly degenerative condition in which the lens of the eye clouds over, obstructing the passage of light to the retina and causing vision impairment and, potentially, blindness. Cataracts usually develop slowly and at different rates in each eye, and most cataracts are due to ageing. Other risk factors include smoking, exposure to the sun, diabetes, and injury to the eye. Cataracts can be treated with surgery which involves replacing the clouded lens with one made from plastic (Taylor et al. 2012). Surgery can be necessary when the cataract begins to interfere with daily activities.

**Diabetic retinopathy** is a complication of diabetes and refers to damage to the blood vessels in the retina. People with diabetes are all at risk of developing diabetic retinopathy, but factors that increase the risk include poor control of diabetes; having diabetes for a long period of time; high blood pressure; high cholesterol; and smoking (Biotext 2008). Initially, the condition may cause no symptoms or only mild vision problems, but if poor diabetes management continues it can result in blindness, so early diagnosis is important. A retinal camera is used by eye specialists to screen for diabetic retinopathy. Treatment includes laser surgery to repair leaking blood vessels, injections to decrease inflammation and, in more severe cases, surgery (Healthinfonet 2016).

**Trachoma** is an infectious disease of the eye caused by *Chlamydia trachomatis*. If left untreated, it can result in scarring, in-turned eye-lashes (trichiasis) and blindness. The early stage of trachoma usually occurs in young children aged 2–3, but can also occur in older children. Trachoma is highly infectious and easily spread; it is generally found in dry and dusty environments where people live in overcrowded conditions and where personal and community hygiene are hard to maintain. The 'SAFE' strategy—surgery to prevent blindness by correcting inverted eyelashes; antibiotics to treat active infection; face washing to stop eye-seeking flies that spread infection; and improving environmental access to water and improved sanitation—is the approach recommended by the WHO to control trachoma (Kirby Institute 2015). Antibiotics (azithromycin) are used to treat trachoma, while surgery is required to prevent blindness for people who have trichiasis. Facial cleanliness and environmental improvements are required to stop the spread of the condition (Healthinfonet 2016).

## 1.2 Eye health services and programs

Responsibility for eye health services in Australia is shared by governments, the private sector, health-care professions and non-government organisations. The Australian Government, through Medicare, funds eye-health services provided by general practitioners (GPs), optometrists and ophthalmologists, as well as procedures for private patients in public hospitals. It also funds some targeted eye health programs designed to improve access to eye care services for Aboriginal and Torres Strait Islander Australians. Public hospitals are funded by state, territory and Australian governments, are managed by state and territory governments and provide services to public and some private patients. States and territories also provide funding for various other eye health services, including outreach programs and spectacle schemes.

**Box 1.2: Australian Government Policy context**

The *National Framework for Action to Promote Eye Health and Prevent Avoidable Blindness and Vision Loss* was developed as Australia's response to the World Health Assembly's call for member nations to develop a national Vision 2020 plan. The framework focuses on eliminating avoidable blindness and vision impairment in Australia, providing an outline for nationally coordinated action by governments, health professionals, non-government organisations, industry and individuals to work in partnership (AHMC 2005). The 2014–16 implementation plan under the national framework promotes and draws together Australian Government activity on eye health. Aboriginal and Torres Strait Islander eye health is the first of three key priority areas outlined (Department of Health 2014).

The *National Aboriginal and Torres Strait Islander Health Plan 2013–23* was developed to provide an overarching framework and areas of focus for investment and effort in relation to improving Aboriginal and Torres Strait Islander health (Department of Health 2013). The 2013–23 Implementation Plan outlines actions to be taken by the Australian Government, the Aboriginal community controlled health sector and other key stakeholders. Eye health is a clear priority under this plan (Department of Health 2015). Partnering with Aboriginal and Torres Strait Islander people is a fundamental principle underlying the Implementation Plan.

The Australian Government currently funds a range of initiatives to prevent and address vision loss including:

- trachoma control, surveillance and reporting
- coordination and integration of eye health services to improve patient journey, and activities to improve access to eye surgery through surgical support
- delivery of health outreach services
- provision of eye health equipment and associated training for health professionals
- better data to inform eye health need
- new MBS items to cover testing for diabetic retinopathy, as well as the purchase of retinal cameras by health services in priority areas.

## Delivery of eye health services

Eye health services covering the continuum of care include prevention; diagnosis and screening; diagnosis and treatment services. These services are provided by a range of different health-care providers including GPs, optometrists, ophthalmologists and allied health workers (see Box 3.5 for details of the eye health workforce). A broad overview of these services—including the main providers, settings, and how they are accessed—is provided in Table 1.1.

**Table 1.1: Overview of eye health services**

| Continuum of eye care | | |
|---|---|---|
| **Primary** | **Secondary** | **Tertiary** |
| *Services*<br>• Eye health promotion<br>• Screening for eye health and vision; basic eye checks<br>• Treatment of minor eye conditons (e.g. conjuctivitis, removal of foreign bodies)<br>• Diagnosis and referral of more complex cases (e.g. diabetes)<br>• Coordination of care<br>• Follow-up, post operative care | *Services*<br>• Eye examinations<br>• Diagnosis and treatment of refractive error<br>• Diagnosis and referral for more complex conditions (e.g. cataracts, treatment for diabetic retinopathy)<br>• Prescription and supply of visual aids | *Services*<br>• Medical treatment of eye conditions<br>• Cataract surgery, laser treatment and other eye surgery<br>• Prescription of all eye care medications |
| *Providers*<br>• GPs<br>• Nurses<br>• Aboriginal Health Workers | *Providers*<br>• Optometrists<br>• Ophthalmologists<br>• Eye health support staff | *Providers*<br>• Ophthalmologists<br>• Ophthalmic nurses<br>• Hospital staff |
| *Settings*<br>• Private general medical practices<br>• Indigenous primary health-care services<br>• Community clinics and health centres | *Settings*<br>• Private practices and clinics<br>• Sessional services in Indigenous primary health-care and community health centres<br>• Outreach services in various settings (e.g. Indigenous primary health-care services; private rooms) | *Settings*<br>• Hospitals<br>• Private clinics<br>• Outreach services in various settings (e.g. regional hospitals; Indigenous primary health-care services) |
| *Access*<br>• No referral required, but optometrists may refer clients | *Access*<br>• No referral required, but GPs can refer clients | *Access*<br>• Referral required if claiming Medicare<br>• GPs and optometrists can refer clients |

*Sources:* Adapted from Taylor et al. 2012; Maher & Brown 2011.

The Medical Benefits Schedule (MBS) provides for general consultations with GPs. All Aboriginal and Torres Strait Islander people are also eligible for an annual Indigenous-specific health check (item 715, which incorporates a basic eye health check). The MBS also provides for a comprehensive optometric consultation every 3 years (formerly every 2 years), as well as for consultations for people with existing conditions or significant changes in vision.

In November 2016, 2 new MBS items were listed for GPs to cover testing for diabetic retinopathy through retinal photography. The item covering Indigenous patients can be claimed annually, and the item for other Australians can be claimed every second year. Patients can then be referred to an optometrist or ophthalmologist when retinopathy is suspected or identified. This is supported by funding from the Australian Government for the purchase of retinal cameras for eligible Aboriginal Medical Services and by other health services in priority areas with large numbers of Indigenous patients, mainly in rural and regional Australia (Optometry Australia 2016).

## Outreach programs

Outreach programs aim to improve access to medical specialists, GPs, allied and other health providers for people living in rural, regional and remote areas where these services are generally not available. Outreach services for eye health exist in all states and territories, though the models of service delivery vary. These services are provided through a mix of funding from the Australian Government; and state and territory governments, as well as from philanthropic and educational organisations.

### Australian Government outreach programs

There are 3 Australian Government outreach programs relevant to eye health (see 'Chapter 3 Box 3.6' for more details):

- the Visiting Optometrists Scheme (VOS)
- the Rural Health Outreach Fund (RHOF)
- the Medical Outreach Indigenous Chronic Disease Program (MOICDP).

These are delivered through single fund holder arrangements in each jurisdiction. Most fund holders are responsible for the key eye health outreach services, though there is some variation across states in the models used to deliver these services. Access too many of the outreach services for Indigenous Australians is provided through Indigenous specific primary health care services.

## State and territory programs

There are a range of Indigenous eye health programs delivered, or supported by, state and territory governments, including outreach programs and coordination of services in regional and remote areas. The models of care and types of programs differ somewhat across states and territories (See Box 1.3, which includes a New South Wales case study).

All jurisdictions have subsidised spectacle schemes which provide eye care and visual aids to clients at low or no cost. These schemes have varying eligibility criteria and different levels of entitlements. The schemes generally provide access for those eligible for pensioner or benefit concessions, through participating optometrists and ophthalmologists. Some states also provide access for Indigenous people through Aboriginal Community Controlled Health Services. This report includes data on state spectacle schemes, and services delivered in hospitals, but not on other state-funded services.

## Trachoma control, surveillance and reporting

Australia is a signatory to the World Health Organization's Alliance for the Global Elimination of Trachoma by 2020. The Australian Government funds trachoma surveillance and control services for Indigenous Australians through project agreements with 5 states and territories (New South Wales, Queensland, South Australia, Western Australia and the Northern Territory).

### Box 1.3 Case study: Outreach services in NSW and the ACT

The NSW Rural Doctors Network (RDN) is the fund holder responsible for Australian Government funded eye health outreach programs in New South Wales and the Australian Capital Territory. The RDN uses a model of centralised planning and coordination of the health outreach programs, with service delivery decentralised across the state.

The RDN’s preferred approach to the delivery of services is through a ‘hub and spoke’ model, where a provider based in a larger regional centre provides regular outreach clinics in surrounding smaller towns. Under this model, health professionals can be more readily available for patients requiring follow-up care or in the event of an emergency, and local referral pathways are used where follow-up care is provided.

Where a ‘hub and spoke’ model is not suitable, an urban based ‘fly-in fly-out’ model is implemented. To maximise effectiveness, outreach eye care clinics receive the support of local health organisations. For example, many outreach optometry (VOS) services provided within an Aboriginal Community Controlled Health Service have the dedicated support of an Aboriginal Health Worker or Regional Eye Care Coordinator. This facilitates cultural accessibility and allows follow-up care for patients to be coordinated locally.

In 2015–16, the RDN reported 11,330 occasions of care in outreach optometry clinics across NSW, including 6,000 occasions of care for Aboriginal patients. Outreach optometrists supported by VOS refer patients to the NSW Spectacle Program, which provides free optical appliances for patients who meet access criteria. VOS optometrists are the biggest providers of subsidised spectacles in New South Wales.

The majority of medical specialist eye care outreach, however, is conducted outside the Department of Health outreach programs. For example, the Outback Eye Service (OES) provides fly-in public ophthalmology services in Western NSW. These clinics rely on various NSW and Australian Government funds in order to provide accessible and affordable eye care clinics for patients in rural and remote locations. Other specialist eye care outreach services are delivered privately, with varying arrangements adapted to the local region.

The RDN also co-ordinates eye health services in New South Wales and the Australian Capital Territory. This includes the establishment of a state-wide partnership that will provide oversight and support for the Aboriginal eye health system in New South Wales and the Australian Capital Territory; the establishment of regional eye care working groups that identify opportunities for improvements among visiting and local eye health services; and a comprehensive needs assessment for the Aboriginal eye care pathway. The state group includes representatives from a range of sectors, and regional groups will also be established based on advice from Aboriginal Community Controlled Health Services across the state.

This funding provides for comprehensive and systematic trachoma and trichiasis screening and treatment programs in communities where these conditions are prevalent, or where communities are assessed as being 'at-risk'. The surveillance and management of trachoma is guided by the 2014 National guidelines for the public health management of trachoma in Australia, which were developed in the context of the WHO SAFE strategy (surgery, antibiotics, facial cleanliness and environmental improvement) (Kirby Institute 2015). Funding also supports the reporting of annual trachoma screening and control data by the National Trachoma Surveillance Unit, currently managed by the University of New South Wales Kirby Institute.

## 1.3 The Indigenous eye health measures

The Indigenous eye health measures were designed to provide ongoing data on the prevalence of eye health conditions for Indigenous Australians, and on access to and use of eye health services; and to help identify gaps in service provision (Table 1.2).

The framework for the development and grouping of the measures was to use the continuum of eye health care, and to seek to answer the following key questions:

- What is the extent of eye health problems among Indigenous Australians?
- How are eye health problems identified?
- How are eye health problems treated?
- What is the size and distribution of the eye health workforce and outreach programs?

The particular measures reported on were selected through a review of existing Australian eye health indicators and available data, as well as a review of international eye health indicators (Table 1.2). The eye health measures also include the 7 indicators proposed in the *Roadmap to close the gap for vision* developed by the Indigenous Eye Health Unit, University of Melbourne in September 2014; and 3 WHO eye health indicators (with 6 sub-measures) outlined in the Australian Governments' Implementation Plan under the National Framework for Action to Promote Eye Health and Prevent Avoidable Blindness and Vision Loss (Table 1.2). Baseline Australian data for these WHO indicators were reported by AIHW in 2015 <http://www.aihw.gov.au/eye-health/>.

**Table 1.2: The Indigenous eye health measures**

| Measures | Main data source | Reference to existing indicators/ measures |
|---|---|---|
| **Prevalence** | | |
| 1.1 Prevalence of vision impairment and blindness | NEHS | IPNF indicator 1 |
| 1.2 Main causes of vision impairment and blindness | NEHS | IPNF indicator 1 |
| 1.3 Prevalence of trachoma and trichiasis | ATSR | HPF indicator 1.16 |
| **Diagnosis and screening services** | | |
| 2.1 Eye health problems managed by GPs | BEACH | HPF indicator 1.16 |
| 2.2 Annual health assessments | MBS | IEHU indicator 1 |
| 2.3 Eye examinations undertaken by an eye care professional | MBS | New measure |
| 2.4 Target population screened for diabetic retinopathy | NEHS | IEHU indicator 4 |
| 2.5 Trachoma and trichiasis screening coverage | ATSR | HPF indicator 1.16 |
| 2.6 Undiagnosed eye conditions | NEHS | New measure |
| **Treatment services** | | |
| 3.1 Hospitalisations for diseases of the eye | NHMD | HPF indicator 1.16 |
| 3.2 Hospitalisations for injuries to the eye | NHMD | HPF indicator 1.16 |
| 3.3 Hospitalisations for eye procedures | NHMD | HPF indicator 1.16 |
| 3.4 Cataract surgery rate | NHMD | IPNF indicator 3.1<br>IEHU indicator 2 |
| 3.5 Cataract surgical coverage rate | NEHS | IPNF indicator 3.2 |
| 3.6 Waiting times for elective cataract surgery | NHMD | IEHU indicator 3 |
| 3.7 Trachoma and trichiasis treatment coverage | ATSR | HPF indicator 1.16 |
| 3.8 Treatment of refractive error | NEHS | New measure |
| 3.9 Spectacles dispensed under state schemes | State admin data | IEHU indicator 8 |
| **Workforce and outreach services** | | |
| 4.1 Number and rate of optometrists | NHWDS | IPNF indicator 2.1 |
| 4.2 Number and rate of ophthalmologists | NHWDS | IPNF indicator 2.2 |
| 4.3 Number and rate of allied ophthalmic personnel | AIHW | IPNF indicator 2.3 |
| 4.4 Occasions of eye health services provided under outreach programs | DoH admin data | IEHU indicators 6&7 |

*Note:* IPNF = *Implementation Plan under the National Framework for Action to Promote Eye Health and Prevent Avoidable Blindness and Vision Loss*, Department of Health; IEHU = Indigenous Eye Health Unit, *The roadmap to close the gap for vision*, University of Melbourne; HPF = Aboriginal and Torres Strait Islander Health Performance Framework.

## Data sources

The main data sources used in this report were:

- National Eye Health Survey 2016 (NEHS), Centre for Eye Research and Vision 2020
- National Hospital Morbidity Database (NHMD), AIHW
- Australian Trachoma Surveillance Reports (ATSR), Kirby Institute
- Medical Benefits Schedule (MBS) data, Australian Government Department of Health
- National Health Workforce Data Set (NHWDS), Department of Health

- Department of Health administrative data on outreach programs
- State government administrative data on the spectacle subsidy schemes.

More details about the data sources and the quality of the Indigenous data reported are provided under each measure and in Appendix B.

## Reporting by Primary Health Network

PHNs are 31 geographic areas covering Australia, with boundaries defined by the Department of Health. They were established with the key objectives of increasing the efficiency and effectiveness of medical services for patients, particularly those at risk of poor health outcomes, and improving coordination of care. Wherever possible, data on the measures were reported at the PHN level.

The PHNs, however, vary in relation to the size of the Indigenous population that live there, as well as the proportion of the total population that is Indigenous. The estimated number of Indigenous Australians in a PHN in 2014 ranged from 3,156 in Northern Sydney to 80,458 in Northern Queensland, while the proportion of the PHN population that was Indigenous ranged from 0.4% in Northern Sydney to 29% in the Northern Territory (Table 1.3).

The classification of PHN areas with similar characteristics can help when making comparisons between PHNs. The 'metropolitan' PHN area boundaries align well with the ABS remoteness category *Major cities*—a PHN area was categorised as a metropolitan PHN area if at least 85% of the population was in an area classified in the *Major cities* category. All other PHN areas were categorised as 'regional' PHN areas (AIHW 2016d). Within regional PHNs, however, there is a large variation, with the proportion of the population in *Major cities* ranging from 0% to 64%.

## Measures of need for eye health services

The Indigenous Eye Health Unit at the University of Melbourne developed a 'Calculator for the delivery and coordination of eye care services', based on the 2008 National Indigenous Eye Health Survey and models of service delivery developed in the *Roadmap to close the gap for vision* (IEHU 2017). This calculator uses the Aboriginal and Torres Strait Islander population for a community or region to estimate the annual need for eye care services in that area.

The calculator allows eye health need measures to be calculated for optometry consultations, ophthalmology consultations, hospital surgery and workforces. The results for 2 of the eye health measures in this report were comparable to the needs measures derived using the calculator. Indicator results for *3.4 Cataract surgery rate* and *3.9 Spectacles dispensed under state schemes* are compared to the need estimated using the calculator.

**Table 1.3: Selected characteristics of PHNs**

| PHN | Indigenous population[(a)] (no.) | Indigenous as a % total population[(a)] | % of PHN population in *Major cities*[(b)] |
|---|---|---|---|
| Central and Eastern Sydney (NSW) | 15,316 | 1.0 | 100 |
| Northern Sydney (NSW) | 3,156 | 0.4 | 99 |
| Western Sydney (NSW) | 15,036 | 1.6 | 99 |
| Nepean Blue Mountains (NSW) | 11,623 | 3.2 | 85 |
| South Western Sydney (NSW) | 16,714 | 1.8 | 90 |
| South Eastern NSW | 21,270 | 3.5 | 53 |
| Western NSW | 35,834 | 11.5 | 0 |
| Hunter New England and Central Coast (NSW) | 63,121 | 5.1 | 64 |
| North Coast (NSW) | 27,800 | 5.5 | 14 |
| Murrumbidgee (NSW) | 12,078 | 5.0 | 0 |
| North Western Melbourne (Vic) | 10,684 | 0.7 | 96 |
| Eastern Melbourne (Vic) | 6,643 | 0.5 | 96 |
| South Eastern Melbourne (Vic) | 7,514 | 0.5 | 98 |
| Gippsland (Vic) | 5,141 | 1.9 | 0 |
| Murray (Vic, NSW) | 15,092 | 2.6 | 0 |
| Western Victoria (Vic) | 8,017 | 1.3 | 30 |
| Brisbane North (Qld) | 19,516 | 2.1 | 95 |
| Brisbane South (Qld) | 26,255 | 2.4 | 96 |
| Gold Coast (Qld) | 8,582 | 1.5 | 98 |
| Darling Downs and West Moreton (Qld) | 25,251 | 4.6 | 34 |
| Western Queensland | 14,331 | 19.9 | 0 |
| Central Queensland, Wide Bay, Sunshine Coast | 31,142 | 3.8 | 31 |
| Northern Queensland | 80,458 | 11.5 | 0 |
| Adelaide (SA) | 20,110 | 1.7 | 99 |
| Country SA | 20,113 | 4.1 | 10 |
| Perth North (WA) | 17,310 | 1.6 | 98 |
| Perth South (WA) | 20,823 | 2.1 | 98 |
| Country WA | 56,620 | 10.3 | 0 |
| Tasmania | 26,142 | 5.1 | 0 |
| Northern Territory | 72,823 | 29.4 | 0 |
| Australian Capital Territory | 6,804 | 1.8 | 100 |

(a) Indigenous population at 31 December 2014. AIHW analysis of Prometheus Information Pty Ltd population data.

(b) *Major cities* (as per ABS Australian Statistical Geography Standard Remoteness Areas). Metropolitan PHNs (shaded light blue) have at least 85% of the population living in *Major cities*. Other PHNs were defined as Regional PHNs (shaded dark blue). AIHW 2016d.

## 1.4 Structure of the report

**Chapter 2** outlines the key issues identified and provides a synthesis of the data.

**Chapter 3** presents the detailed results for the 22 measures in the 4 groups: prevalence; diagnosis and screening; treatment; and workforce and outreach programs. Each chapter begins with a brief section providing information about the measures and why they are important. The detailed results are then presented for each measure. Where possible, the data for each measure are presented:

- for both Indigenous and other Australians
- over time
- by age and sex
- by state/territory, remoteness areas and/or PHN.

**Appendix A** provides information on the data sources, as well as notes about the interpretation of the data to assist users to understand data issues and limitations.

**Appendix B** provides technical specifications for the measures reported, including information on relevant classification codes.

**Appendix C** provides summary data for each of the measures presented in Chapter 3.

**Supplementary tables** corresponding to each figure in the report are provided in an attachment. These tables are available on the AIHW website <www.aihw.gov.au>.

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# 2 Synthesis and discussion of key issues

**Box 2.1: Overview of key results**

- In 2016 the estimated prevalence of bilateral vision impairment for Indigenous Australians was 10.5% and the prevalence of bilateral blindness was 0.3% (which together would represent around 18,300 Indigenous Australians aged 40 and over).
- The main causes of vision impairment for Indigenous Australians were refractive error (63%), cataract (20%) and diabetic retinopathy (5.5%).
- Between 2009 and 2015 the estimated prevalence of active trachoma for children aged 5–9 in at-risk communities fell from 14% to 4.6%.
- In 2014–15, around 84,000 Indigenous Australians had had an eye examination by an optometrist or ophthalmologist in the preceding 12 months. But the proportion of Indigenous Australians who had had an eye examination in the preceding 12 months (15%) was lower than for non-Indigenous Australians (20%), based on age-standardised rates.
- Over half (57%) of Indigenous Australians with vision impairment or blindness attributed to 1 of 5 main causes, reported that they had not previously had, or could not recall having, that condition diagnosed.
- Indigenous Australians had a lower age-standardised rate of hospitalisations for eye diseases compared with non-Indigenous Australians (10 and 13 per 1,000, respectively), but 3 times the rate for injuries to the eye (1.3 and 0.4 per 1,000, respectively).
- In 2014–15, the median waiting time for those who had elective cataract surgery was 142 days for Indigenous Australians, with 3.4% who waited for more than 1 year.
- Hospitalisations for cataract surgery were higher for Indigenous Australians in *Remote* and *Very remote* areas combined, while waiting times were longest in *Inner regional* areas.

**Issues**

- The rates of eye examinations for Indigenous Australians have increased over the last 10 years but are still lower than for non-Indigenous Australians.
- Undiagnosed cataracts are a particular problem, with over two-thirds of Indigenous participants with cataracts identified in the 2016 NEHS stating that they had not previously been told they had the condition.
- The rates of cataract surgery have increased over the last 8 years, but there has been no decrease in waiting times—suggesting increasing demand for these services. Cataract surgery rates for Indigenous Australians varied considerably by PHN and were lowest in metropolitan areas, suggesting a need to investigate the reasons for this.
- Almost half (47%) of Indigenous Australians with diabetes had not had a diabetic eye examination in the preceding 12 months as recommended in the NHMRC guidelines.
- High rates of eye injuries among Indigenous Australians, particularly in *Remote* areas, suggests a need for broader preventive measures to address this.

This chapter draws out the main findings and highlights the key issues to emerge from the detailed results presented in Chapter 3, and some suggestions to improve future reporting are provided at the end of the chapter. For more information about data sources and methodologies used, refer to Chapter 3.

# 2.1 Synthesis of the findings

## What is the extent of eye health problems?

Data from representative sample surveys are required to determine the prevalence of eye health problems in the population. The 2016 National Eye Health Survey (NEHS) and the 2008 Indigenous Eye Health Survey both included eye examinations and provided estimates of the prevalence and main causes of vision impairment and blindness for the Indigenous population (Table 2.1). But these surveys are conducted fairly infrequently and the small sample size means that it is difficult to provide estimates at lower geographic levels, such as state and territory, or for different groups within the population.

Data on self-reported eye or sight problems from the 2012–13 AATSIHS were therefore also included in this report. This survey has a larger sample size that enables greater disaggregation of the data. Self-reported problems, however, don't include any conditions that respondents do not know that they have or that were misdiagnosed.

### Prevalence

The 2016 NEHS included 1,738 Indigenous Australians aged 40 and over and found that the prevalence of bilateral vision impairment for Indigenous Australians was 10.5% and the prevalence of bilateral blindness was 0.3% (Foreman et al. 2016). It was estimated from these survey results that around 18,300 Indigenous Australians aged 40 and over suffer from vision impairment or blindness. Rates of blindness for Indigenous Australians have decreased significantly since 2008, but these results are based on small numbers.

Indigenous Australians suffered from vision impairment and blindness at 3 times the rate of non-Indigenous Australians (Foreman et al. 2016). The prevalence of vision impairment increased markedly with age, and was highest for Indigenous Australians aged 80 and over.

The 2012–13 AATSIHS of 12,000 Indigenous Australians found that one third of Indigenous Australians reported that they had an eye or sight problem, which included those with corrected refractive error.

### Main causes

The main causes of vision impairment found in the 2016 NEHS for older Indigenous adults were uncorrected refractive error (63%), cataract (20%), and diabetic retinopathy (5.5%). While diabetic retinopathy was 1 of the main causes of vision impairment for Indigenous Australians, it was not a main cause for non-Indigenous Australians.

The 2015 Trachoma Surveillance Report found that there were 118 children aged 5–9 with active trachoma in at-risk communities (Kirby Institute 2016). The estimated prevalence rate for those aged 5–9 screened in at-risk communities fell markedly, from 14% in 2009 to 4.6% in 2015.

Table 2.1: Key results for the Indigenous eye health measures by main eye conditions, 2016

| Prevalence (Section 3.1) | Diagnosis and screening (Section 3.2) | Treatment (Section 3.3) | Workforce and outreach (Section 3.4) |
|---|---|---|---|
| **All conditions** | | | |
| **Measure 1.1** Vision impairment/blindness: 11% of Indigenous Australians aged 40 and over (18,300 persons) | **Measure 2.1** Eyes: 1.1% of problems at GP encounters with Indigenous Australians<br>**Measure 2.2** Health assessments: 167,221 (23% of Indigenous Australians per year)<br>**Measure 2.3** Eye examinations by an eye professional: 84,000 (12% of Indigenous Australians) | **Measure 3.1** Hospitalisations for eye diseases: 6,500 (4.6 per 1,000 Indigenous Australians)<br>**Measure 3.2** Hospitalisations for eye injuries: 1,700 (1.2 per 1,000 Indigenous Australians)<br>**Measure 3.3** Hospitalisations for eye procedures: 6,400 (4.5 per 1,000 Indigenous Australians) | **Workforce**<br>**Measure 4.1** Optometrists: 4,559 (18 FTE per 100,000)<br>**Measure 4.2** Ophthalmologists: 896 (4.0 FTE per 100,000)<br>**Measure 4.3** Allied ophthalmic personnel: 6,464 (29 FTE per 100,000)<br>**Outreach occasions of service**<br>**Measure 4.4**<br>Optometrist (VOS): 18,890 (26 occasions of service per 1,000 Indigenous Australians)<br>Specialists/other (RHOF): 7,829 (17 occasions of service per 1,000 Indigenous Australians)<br>Chronic disease diabetes (MOICDP): 1,156 (20 occasions of service per 10,000 Indigenous Australians) |
| **Cataract** | | | |
| **Measure 1.2** 20% of vision-impaired Indigenous Australians aged 40 and over (3,600 persons) | **Measure 2.6** Undiagnosed rate: 69% of those tested not previously diagnosed | **Measure 3.4** Cataract surgery: 2,020 per annum<br>**Measure 3.5** Cataract surgery coverage rate: 62% of those with cataract<br>**Measure 3.6** Median waiting time for cataract surgery: 142 days | |
| **Diabetic retinopathy** | | | |
| **Measure 1.2** 5.5% of vision-impaired Indigenous Australians aged 40 and over (1,010 persons) | **Measure 2.4** Screening coverage: 53% of those with diabetes | n.a. | |
| **Trachoma** | | | |
| **Measure 1.2** 118 cases of Indigenous children aged 5–9: estimated prevalence 4.6% | **Measure 2.5** Screening coverage: 89% of Indigenous children aged 5–9 in at risk communities | **Measure 3.7** Treatment coverage: 87% of community members where active trachoma was identified | |
| **Refractive error** | | | |
| **Measure 1.2** 63% of vision-impaired Indigenous Australians aged 40 and over (11,500 persons) | **Measure 2.6** Undiagnosed rate: 55% of those tested not previously diagnosed | **Measure 3.8** Treatment rate: 83% of Indigenous participants with refractive error requiring treatment | |

*Note:* This table summarises the detailed data on the measures presented in chapter 3. See chapter 3 for more information on the data sources and methodologies used.

## State and regional differences

The NEHS used *Major cities* as the reference region and found that the age-standardised prevalence of vision impairment was significantly higher in *Outer regional* areas. The prevalence rates for other regions were not significantly different to *Major cities*. In relation to states and territories, New South Wales was used as the reference state. There was no state or territory that had a statistically significant difference in the age-standardised prevalence of vision impairment compared with New South Wales (Foreman et al. 2016).

The 2012–13 AATSIHS found that Indigenous Australians in *Non-remote* areas (35%) had a higher prevalence of self-reported eye or sight problems than those in *Remote* areas (28%).

This survey also found that the prevalence of eye or sight problems self-reported by Indigenous Australians was highest in the Australian Capital Territory (43%) and lowest in the Northern Territory (24%).

Among the 4 jurisdictions with at-risk communities in 2015, the prevalence of active trachoma among 5–9 year olds in communities that were screened was highest in South Australia (7.0% or 51 children) and lowest in New South Wales, where there were no children found with active trachoma.

## How are eye health problems identified?

The measures in this category provide information on the numbers and rates of people who were screened by different health-care providers. While some of the screening data included information about conditions that were identified, some do not. Data from the 2016 NEHS provide useful information on the rates of undiagnosed conditions.

### The role of general practitioners

In 2014–15, Bettering the Evaluation and Care of Health (BEACH) data showed that eye health problems accounted for 1.1% of all problems managed by GPs for Indigenous patients. The 3 main eye problems managed by GPs were conjunctivitis, cataract and glaucoma. The overall rate of problems managed was similar for Indigenous and other Australians except for cataracts, where the rate for Indigenous Australians was 3.5 times the rate for other Australians.

MBS data showed that just under one-quarter (23% or 167,221) of Indigenous Australians had an Indigenous-specific health assessment (MBS item 715) in 2014–15. These health assessments were undertaken by GPs and a basic eye health check is a mandatory component. The proportion of the Indigenous population who had health assessments increased with age and was highest for those aged 55 and over.

There were large variations, by jurisdiction and PHN, in the rates of Indigenous-specific health checks. Across jurisdictions, the proportion of Indigenous Australians who had an Indigenous specific health check ranged from 7.6% in Tasmania to 30% in Queensland. Across PHNs, rates were lowest in the metropolitan areas of Sydney and Melbourne, where less than 7% of the population had an Indigenous-specific health check, and highest in Western New South Wales and Northern Queensland, where rates were over 32%.

### Eye examinations by an eye care professional

In 2014–15, around 84,000 Indigenous Australians had had an eye examination by an optometrist or ophthalmologist in the preceding 12 months. The age-standardised proportion of Indigenous Australians who had had an eye examination by an eye care professional increased from 13% in 2005–06 to 15% in 2014–15. But in 2014–15, a lower proportion of Indigenous Australians (15%) had had an eye examination in the preceding 12 months, compared with non-Indigenous Australians (20%), based on age-standardised rates.

The rates of eye examinations for Indigenous Australians also varied by region and jurisdiction. In 2014–15, the age-standardised rates ranged from 17% in *Major cities* to 12% in *Remote* and *Very Remote* areas combined. For jurisdictions, rates were highest in the Australian Capital Territory (18%) and lowest in Western Australia (11%). The rate difference between Indigenous and non-Indigenous Australians was largest in the Northern Territory

(7.9 percentage points). Data on eye examinations were not available by PHN, due to issues in estimating the proportion of Indigenous patients in smaller geographic regions.

NHMRC guidelines recommend that diabetic eye checks should be undertaken annually for Indigenous Australians and biennially for non-Indigenous Australians. The 2016 NEHS found that a lower proportion of Indigenous participants with diabetes had the diabetes eye check within the recommended time frame compared with non-Indigenous Australians with diabetes (53% and 77%, respectively).

### Screening for trachoma and trichiasis

In 2015, a total of 3,173 Indigenous children in the target group of 5–9 years, were screened for trachoma in the 67 communities that undertook screening (Kirby Institute 2016). Screening coverage for this group was 89% just above the 85% recommended in the guidelines for trachoma control (CDNA 2014). In 2015, 3,812 (16%) Indigenous Australians aged 15–39 and 4,544 (33%) Indigenous adults aged 40 and over were screened opportunistically for trichiasis in at-risk communities (Kirby 2016).

### Undiagnosed eye conditions

The 2016 NEHS found that 57% of Indigenous participants found to have vision impairment and blindness attributed to 1 of 5 main causes (refractive error, cataract, diabetic retinopathy, age-related macular degeneration and glaucoma) reported that they had not previously had, or could not recall having, that condition diagnosed (Foreman et al. 2016). The corresponding rate for non-Indigenous Australians was 52%. The proportion of Indigenous Australians with an undiagnosed condition was highest for cataract (69%), followed by refractive error (55%).

## How are eye health problems treated?

Many of the measures on the treatment of eye problems were from the NHMD which provides good information on treatment of eye health problems for patients admitted to hospital. There are also data on the treatment of trachoma and trichiasis from the Trachoma Surveillance Reports (Kirby Institute 2016). There were no available data on treatment rates for diabetic retinopathy, though in the future this may be able to be derived from MBS data. It was also difficult to get comprehensive data on the treatment of refractive error, with some information available from the 2016 NEHS, as well as from subsidised state spectacle schemes.

### Hospitalisations for eye diseases and injury

Over the two year period 2013–15 there were around 6,500 hospitalisations of Indigenous Australians for eye diseases and around 1,700 for eye injuries. Indigenous Australians had lower rates of hospitalisation for eye diseases compared with non-Indigenous Australians (10 and 13 per 1,000, respectively), but 3 times the rate of hospitalisation for injuries to the eye compared with non-Indigenous Australians (1.3 and 0.4 per 1,000, respectively). The most common diagnosis of eye disease was disorders of the lens, while for eye injury it was an open wound of the eyelid and periocular area.

Hospitalisation rates for Indigenous Australians for eye diseases increased with age, peaking in the 75–84 age group, while rates for eye injuries peaked in the middle years and then declined. Hospitalisation rates for both eye diseases and eye injuries were highest for Indigenous Australians in *Remote* and *Very remote* areas combined.

Between 2005–07 and 2013–15, the age-standardised hospitalisation rate for Indigenous Australians for diseases of the eye doubled from 4.8 per 1,000 to 9.9 per 1,000, while the rate due to injury to the eye remained fairly constant at 1.1 and 1.3 per 1,000.

In 2013–15 Indigenous Australians had lower age-standardised rates of hospitalisations for eye procedures compared with non-Indigenous Australians (10 and 13 per 1,000, respectively). There were around 6,404 hospitalisations of Indigenous Australians for eye procedures in 2013–15, with 3,677 of these for lens procedures (mainly cataract surgery) and 989 for retinal procedures. Between 2005–07 and 2013–15, the age-standardised hospitalisation rate for eye procedures for Indigenous Australians increased from 6.7 to 9.7 per 1,000.

### Cataract surgery

Despite higher rates of cataracts, Indigenous Australians had lower age-standardised rates of hospitalisations for cataract surgery compared with non-Indigenous Australians (7,044 and 8,415, per 1,000,000, respectively). There were around 4,034 hospitalisations of Indigenous Australians for cataract surgery in 2013–15. The number of hospitalisations for cataract surgery for Indigenous Australians over this 2-year period was below the estimated annual number of Indigenous people needing cataract surgery (6,850).

Hospitalisations for eye procedures and cataract surgery increased with age and were highest for those aged 75–84. Between 2005–07 and 2013–15, the age-standardised Indigenous hospitalisation rate for cataract surgery increased from 4,918 to 7,052 per 1,000,000. But cataract surgery rates for Indigenous Australians varied significantly across PHNs ranging from less than 900 to 5,000 per 1,000,000. This may, however, in part reflect variations in Indigenous identification across PHNs.

In the 2016 NEHS the cataract surgical coverage rate (that is the proportion of the population with cataracts who have had cataract surgery) was much lower for Indigenous participants than for non-Indigenous participants (62% compared with 88%). The median waiting time for elective cataract surgery in 2014–15 was also longer for Indigenous Australians than for non-Indigenous Australians (142 days and 84 days, respectively).

### Treatment of trachoma and trichiasis

In 2015, 87% of community members where active trachoma was identified received treatment (Kirby Institute 2016). Treatment is generally through implementation of the SAFE strategy, involving antibiotics and health promotion activities (Box 1.1). Between 2011 and 2015, the proportion of community members who received treatment rose from 65% to 87% in communities where active trachoma was identified. In 2015, of the 41 Indigenous adults with trichiasis, there were 25 who were offered an ophthalmic consultation and 13 who had surgery. The reporting of trichiasis data on referral and surgery, however, is limited due to incomplete data collection and compilations.

### Correction of refractive error

The 2016 NEHS survey found that the treatment rate for refractive error for Indigenous participants was 83%, lower than the treatment rate for non-Indigenous participants (94%).

State spectacle schemes provide subsidised spectacles for those on low incomes, though the eligibility criteria used for these schemes is different in each jurisdiction. Among the 3 jurisdictions that provided data for 2014–15, there were around 6,232 Indigenous Australians who had received glasses under the New South Wales state scheme (28 per 1,000 population), and 2,192 who received glasses under the Queensland state scheme (11 per 1,000 population). In Victoria, 2,386 spectacles were dispensed under the state scheme (44 per 1,000 population). This compares with an estimated 14,271 Indigenous Australians in New South Wales needing spectacles each year, 13,146 in Queensland and 3,303 in Victoria.

## Size and distribution of the workforce and outreach programs

Measures of the size and distribution of the eye health workforce provide some indication of the availability of specialised services across regions. There is information available on the number and distribution of registered optometrists and ophthalmologists from the NHWDS, and data on the allied health eye workforce compiled by AIHW (AIHW 2016c).

Outreach programs are designed to address the uneven distribution of the health workforce and to improve access to health services across Australia. The Australia Government has three targeted programs that cover eye health specialists and related services, mainly delivered in regional and remote areas (VOS, RHOF and MOICDP).

### The eye health workforce

In 2015, there were around 4,559 optometrists employed in Australia, (an increase on the 4,034 employed in 2011), and 896 ophthalmologists (compared with 836 in 2012). In 2010, of all allied ophthalmic personnel in Australia, there were around 4,239 optical dispensers, 720 optical mechanics and 643 orthoptists.

The rates of employed optometrists were highest in some Sydney, Melbourne and Brisbane metropolitan areas where FTE rates were over 20 per 100,000 population. The FTE rates were generally lower in more remote PHNs, though some PHNs closer to the cities also had relatively low rates of optometrists. The 4 PHNs with the lowest FTE rates for optometrists were Country Western Australia, the Northern Territory, Country South Australia and Murrumbidgee in New South Wales.

Ophthalmologists showed a similar distribution, though numbers and FTE rates were much lower than for optometrists. The highest rates were in some Sydney and Melbourne metropolitan areas where FTE rates were over 6 per 100,000 population, while many PHNs had too few ophthalmologists (less than 10) to calculate rates. The 3 PHNs with fewer than 5 employed ophthalmologists were the Northern Territory, Western Queensland and Gippsland.

### Eye health outreach programs

The number of occasions of eye health services by an optometrist for Indigenous Australians under the VOS almost tripled from 6,975 in 2009–10 to 18,890 in 2014–15. The number of occasions of service was highest in the regional PHNs which generally had low numbers of registered optometrists. The PHNs with high numbers of patients included the Northern Territory, Northern Queensland, Western New South Wales, Country Western Australia and Western Queensland.

The eye health component of the Rural Health Outreach Fund (RHOF) supports specialists, GPs, and allied health professionals to provide services in regional and remote areas. For eye health services, the number of RHOF occasions of service for Indigenous patients rose by over 50%, from 4,977 in 2011–12 to 7,829 in 2014–15. As is the case with the VOS, the highest number and rate of occasions of service for Indigenous patients under this program was in regional PHNs including Country Western Australia, the Northern Territory, Country South Australia, Western New South Wales and Western Queensland.

The MOICDP supports medical specialists, GPs, allied health and other health professionals to provide services for Aboriginal and Torres Strait Islander people living with chronic disease. As part of this program, eye health services are provided to those suffering from chronic conditions such as diabetes. In 2015–16, there were 1,156 occasions of service with an eye health professional for Indigenous patients under the MOICDP. Data are available for MOICDP patients seen by state, with New South Wales and Western Australia having the highest rates.

## 2.2 Key issues identified

This section outlines some of the key issues for Indigenous Australians and gaps in screening and treatment. The 3 main causes of vision impairment for Indigenous participants in the 2016 NEHS were refractive error (63%), cataract (20%), and diabetic retinopathy (5.5%) (Foreman et al 2016). Trachoma has also been a problem in some remote areas of Australia, but the prevalence of the condition has decreased markedly over the last 6 years.

The diagnosis and treatment of cataract, diabetic retinopathy and refractive error among Indigenous Australians is especially important as the prevalence of all 3 conditions increases markedly with age, and the number of Indigenous Australians aged over 55 is projected to more than double between 2011 and 2026 (AIHW 2015b). In addition, the increasing prevalence of diabetes, as well as obesity which will impact on diabetes prevalence, will lead to increasing rates of vision impairment due to diabetic retinopathy unless screening and treatment programs are effective in detecting and managing the condition (AIHW 2015b; Foreman et al. 2016).

### Eye examinations by an eye care professional

The proportion of Indigenous Australians who had had an eye examination by an eye care professional in the preceding 12 months increased over the last 10 years, but was still lower than the proportion for non-Indigenous Australians, despite higher rates of eye health problems. As well as refractive error, undiagnosed cataracts were a particular problem. Over two-thirds of Indigenous participants in the 2016 NEHS who were found to have cataracts reported that they were either unsure if, or had never been told by a doctor that, they had the condition.

MBS data on the proportion of the population that had had an eye examination in the preceding 12 months were available by state and region, but not by PHN. The lowest rates of eye examinations for Indigenous Australians were in remote areas, and in Western Australia and the Northern Territory. These areas have large Indigenous populations and the data point to a need for more specialist eye services to undertake diagnosis in these areas.

## Diagnosis and treatment of refractive error

The data indicate that over half of Indigenous people with refractive error have not previously had their condition diagnosed, and that untreated refractive error continues to be a major cause of vision loss. State spectacle schemes are meeting some of the need for low-cost spectacles, but there is a need for Indigenous Australians to have access to more diagnosis and treatment services.

## Cataract surgery in metropolitan PHNs

The age-standardised rates of cataract surgery for Indigenous Australians have increased over the last 8 years from 4,918 to 7,052 per 1,000,000. There has, however, been no major decrease in waiting times for elective cataract surgery, suggesting increasing demand for these services. There are also large variations in the rates of cataract surgery across PHNs, which should be investigated.

The PHNs with the highest rates of cataract surgery were mainly in regional and remote areas (Western Queensland, Country Western Australia, North Coast NSW, Northern Territory and Country South Australia). While the high surgery rates may reflect higher prevalence rates, the data suggest that the outreach programs have been effective in getting ophthalmological services to these more regional and remote areas.

The 10 PHNs with the lowest rates of cataract surgery for Indigenous Australians were all metropolitan ones. Some of these PHNs have significant numbers of Indigenous Australians living there, for example, Brisbane North and South Western Sydney, but the proportion of the total population that is Indigenous in these PHNs is relatively low. The relatively low rates of surgery for Indigenous Australians may be related to fewer Indigenous primary health care services in metropolitan PHNs, or to the under-identification of Indigenous people in metropolitan areas.

Mainstream ophthalmological services are generally more available to people living in metropolitan areas compared with more remote areas, but the data suggest that Indigenous Australians are not accessing these services. This may be due to the lack of cultural appropriateness of mainstream services; to fewer outreach activities and support services for Indigenous Australians; and to less awareness among those living in these areas about the need to seek treatment.

## Screening for diabetic retinopathy

Current NHMRC guidelines recommend a diabetic eye examination annually for Indigenous Australians with diabetes. Among Indigenous participants in the NEHS with self-reported diabetes, just over half (53%) had had a diabetic eye examination in the preceding 12 months. And while diabetic retinopathy was 1 of the 3 most common causes of bilateral vision impairment for Indigenous Australians (5.5% of those with vision impairment), data on treatment rates for diabetic retinopathy were not available.

From November 2016, 2 new MBS items were listed for GPs to cover testing for diabetic retinopathy in those diagnosed with diabetes. One of these items can be claimed annually for Indigenous patients, and the other every second year for non-Indigenous patients. The new MBS items provide greater incentives for GPs to provide these services, and may also generate better data on testing for diabetic retinopathy. Ongoing monitoring of screening rates is required to ensure that these continue to increase.

### High rates of eye injuries

The relatively high rate of Indigenous hospitalisations for eye injuries is consistent with the findings of the Australian Burden of Disease Study, which showed that 15% of the Indigenous burden of disease was attributable to injury (AIHW 2016b). The PHNs with the highest rates of eye injuries (Country Western Australia, Western Queensland and the Northern Territory) had high proportions of the population living in remote areas. This suggests there is a need to consider ways to address the rate of injuries among Indigenous Australians in these areas.

## 2.3 Future reporting

Some proposals and areas to be investigated further for future reports are outlined below:

- The disaggregation of MBS data on eye examinations for Indigenous Australians by PHN, rather than just by region and state, to provide a better indication of geographic areas with service gaps.
- The separation of the MBS data on eye examinations into services provided by optometrists and ophthalmologists.
- The development of better data for measurement of diabetic screening and treatment for diabetic retinopathy, possibly based on the new MBS items for diabetic retinopathy introduced in November 2016.
- More frequent data on the prevalence of eye health conditions would be useful for tracking progress in addressing eye health problems.
- Greater use of Indigenous eye health needs measures to assist in better identifying gaps in service provision.

# 3 The measures—detailed results

## 3.1 Prevalence—what is the extent of eye health problems?

**Box 3.1: Overview of prevalence**

- The 2016 NEHS showed that the prevalence of bilateral vision impairment for Indigenous Australians was 10.5% and the prevalence of bilateral blindness was 0.3% (together affecting an estimated 18,300 Indigenous Australians aged 40 and over).
- Indigenous Australians suffered from vision impairment and blindness at 3 times the rate of non-Indigenous Australians in 2016, based on age-standardised rates.
- The most common causes of vision impairment for Indigenous Australians were refractive error (63%), cataract (20%) and diabetic retinopathy (5.5%).
- Diabetic retinopathy was one of the three most common causes of vision impairment for Indigenous participants in the 2016 NEHS, but not for non-Indigenous participants.
- The prevalence of vision impairment increased markedly with age, and was highest for Indigenous Australians aged 80 and over.
- The age-standardised rate of vision impairment for Indigenous Australians was significantly higher in *Outer regional* areas than in *Major cities*.
- In 2015, there were 118 children aged 5–9 in at-risk Indigenous communities with active trachoma.
- Between 2009 and 2015, the estimated prevalence of active trachoma for children aged 5–9 in at-risk communities fell from 14% to 4.6%

Measures of the prevalence of vision impairment and blindness are important for ongoing monitoring. Two of the 3 measures in this category—*1.1 Prevalence of vision impairment and blindness*, and *1.2 Main causes of vision impairment and blindness* – were in the Australian Government's National Framework for Action to Promote Eye Health and Prevent Avoidable Blindness and Vision Loss and in the World Health Organization's Universal Eye Health Global Action Plan 2014–19 (WHO 2013). The data for these measures come from sample surveys. The 2016 NEHS included a sample of 1,738 Indigenous Australians aged 40 years and included ophthalmologic examinations to assess vision impairment and blindness.

The third measure relates to trachoma and trichiasis. These conditions can cause preventable blindness and are still endemic in some *Remote* and *Very remote* Indigenous communities in Australia. Australian governments have committed to eliminating trachoma by 2020 and have funded surveillance and management programs that provide data on prevalence. This measure—*1.3 Prevalence of trachoma and trichiasis*—provides important information for assessing whether this target will be met. Data for this measure were collected through state and territory screening programs and collated by the Trachoma Surveillance and Reporting unit at the University of New South Wales Kirby Institute (Kirby Institute 2016).

## Measure 1.1: Prevalence of vision impairment and blindness

**Measure:** The number of Indigenous Australians with vision impairment and blindness, proportion of the population and age-standardised rates.

### Results

**1.1.1 Prevalence of vision impairment and blindness**

**Overall:** The 2016 NEHS found that the prevalence of bilateral vision impairment for Indigenous Australians aged 40 and over was 10.5% and the prevalence of bilateral blindness was 0.3% (Figure 3.1.1a).

The estimated age-standardised prevalence of bilateral vision impairment and blindness for Indigenous Australians were both 3 times the rate for non-Indigenous Australians (Figure 3.1.1b). Based on the age-standardised data, it was estimated that up to 18,300 Indigenous Australians aged 40 and over suffer from vision impairment or blindness.

**Time trend:** The 2 national eye health surveys that included Indigenous Australians found that rates of blindness decreased significantly from 1.9% in 2008 (CI 1.1%–2.6%) to 0.3% (CI 0.1% to 0.7%) in 2016, but these results are based on small numbers. There was no significant change in the rates of vision impairment over the 2 periods (Figure 3.1.1a).

**Sex and age:** The prevalence of vision impairment for both Indigenous and non-Indigenous survey participants in 2016 increased markedly with age. For Indigenous Australians, the prevalence of vision impairment was 5.7% among those aged 40–49, compared with 46% among those aged 80 and over. Indigenous rates were higher than non-Indigenous rates for all age groups (Figure 3.1.1c).

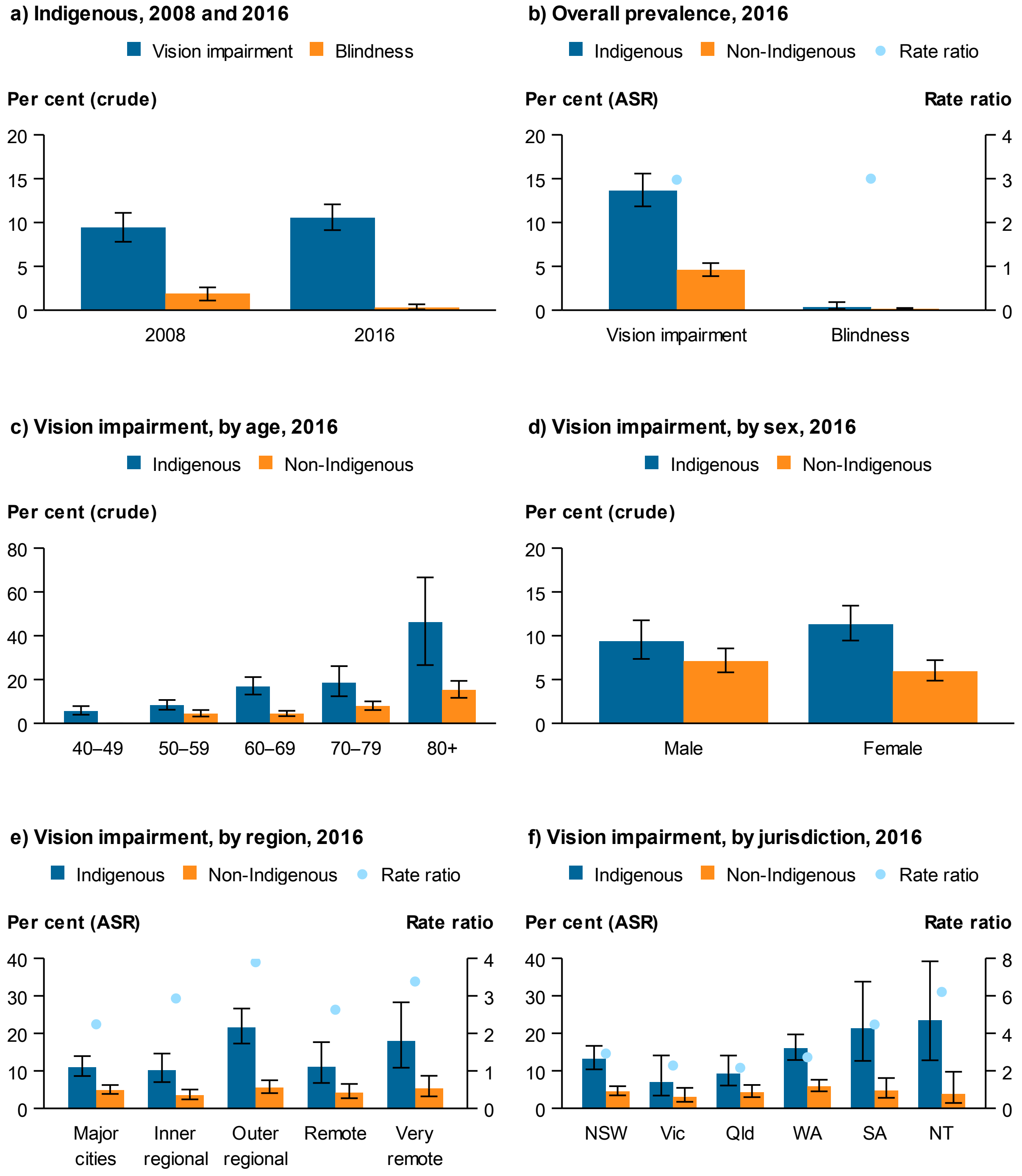
There was no significant difference between Indigenous males and female in the rates of vision impairment (Figure 3.1.1d).

**Remoteness:** In 2016, the age-standardised prevalence of vision impairment in *Outer regional* areas was significantly higher than in *Major cities*, the reference area (Figure 3.1.1e).

**Jurisdiction:** There was no jurisdiction with a statistically significant difference in the age-standardised prevalence of vision impairment in 2016 compared with New South Wales, the reference state (Figure 3.1.1f).

### Things to consider

- Data are from the 2016 NEHS, a sample survey of 1,738 Indigenous Australians aged 40 and over and 3,098 non-Indigenous Australians aged 50 and over. The survey included an eye examination.
- The survey results reported are crude unadjusted sample proportions. These results are subject to sampling errors, so the 95% confidence intervals (CI) are provided to indicate the reliability of the estimates reported.
- Time trend data were based on the 2008 Indigenous Eye Health Survey and the 2016 NEHS, but there were some differences in the methodologies used, so caution should be used when interpreting time trends.
- Vision impairment does not include corrected refractive error.



*Notes*

1. Age-standardised rates (ASR) are shown in figures b), e) and f). All other figures show crude rates.
2. Error bars show 95% confidence intervals.
3. Data for these figures are available in the online supplementary tables.

*Sources:* NEHS 2016 and Taylor 2009.

**Figure 3.1.1: Prevalence of vision impairment and blindness, by various characteristics**

### 1.1.2 Self-reported eye or sight problems

**Overall:** In 2012–13, one-third (33%) or 213,000 Indigenous Australians reported that they had an eye or sight problem.

After adjusting for age, 48% of Indigenous Australians had an eye or sight problem, compared with 52% of non-Indigenous Australians (Figure 3.1.2a).

**Time trend:** Since 2001, the age-standardised proportion of Indigenous Australians who had an eye or sight problem increased from 47% to 48% in 2012–13, whereas for non-Indigenous Australians it remained stable at 52% (Figure 3.1.2b).

**Sex and age:** The prevalence of self-reported eye or sight problems was highest for Indigenous people aged 55 and over (92%), compared with 9% for those aged 0–14 (Figure 3.1.2c).

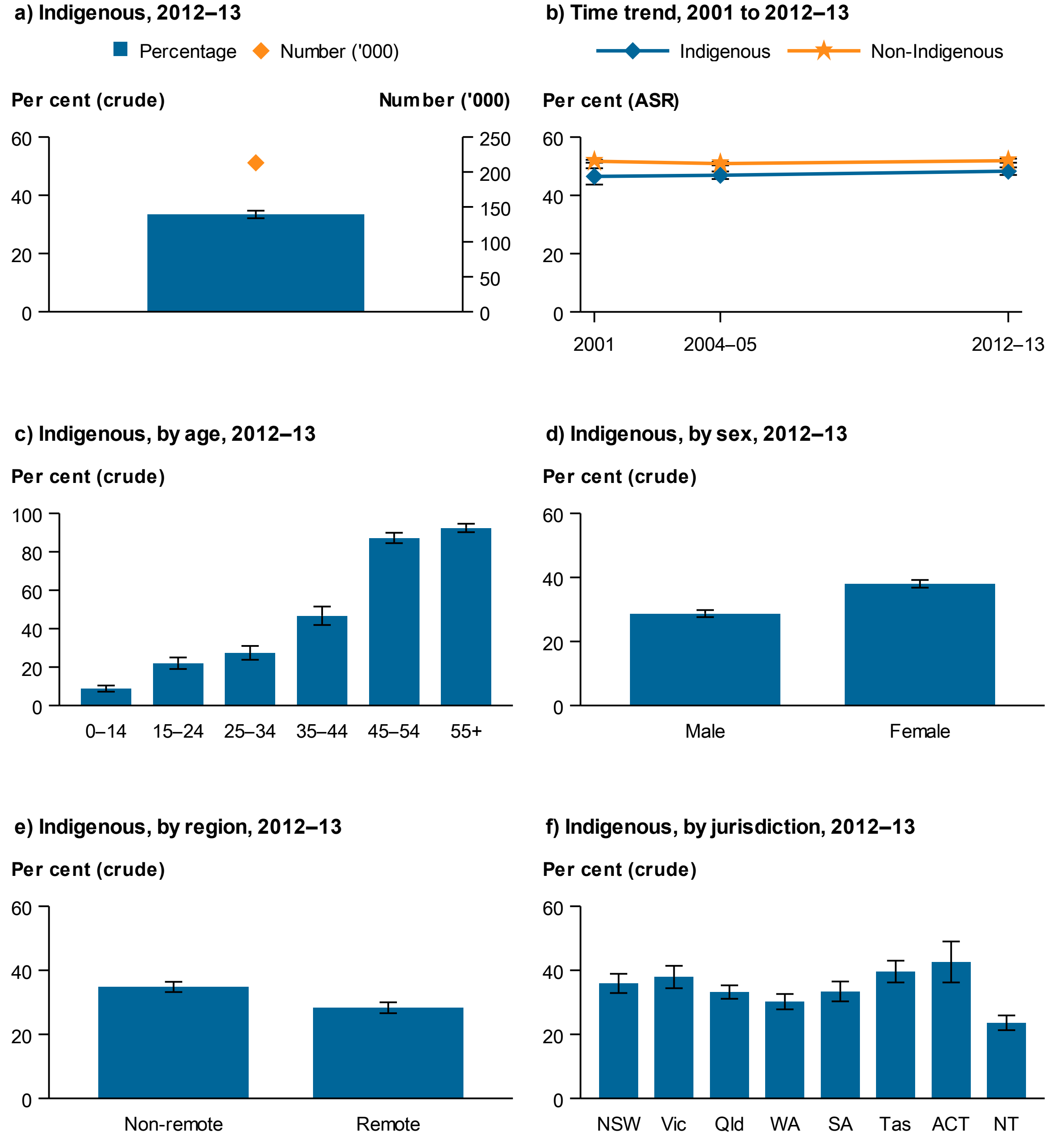
A higher proportion of Indigenous females reported an eye or sight problem (38%), than males (29%) (Figure 3.1.2d).

**Remoteness:** Indigenous Australians in non-remote areas (35%) reported a higher prevalence of eye or sight problems than those in remote areas (28%) (Figure 3.1.2e).

**Jurisdiction:** The prevalence of self-reported eye or sight problems was highest in the Australian Capital Territory (43%) and lowest in the Northern Territory (24%) (Figure 3.1.2f).

## Things to consider

- The 2012–13 AATSIHS included 12,000 Indigenous Australians for the core sample. Survey results are subject to sampling errors as only a small proportion of the population is used to produce estimates that represent the whole population.
- These data are self-reported eye or sight problems and have not necessarily been diagnosed by a health professional. They therefore don't include eye conditions that respondents are not aware that they have, or which were misdiagnosed.
- Eye or sight problems include corrected refractive error.



*Notes*

1. Age-standardised rates (ASR) are shown in Figure b). All other figures show crude rates.
2. Error bars show 95% confidence intervals.
3. Data for these figures are available in the online supplementary tables.

*Source:* ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey.

**Figure 3.1.2: Self-reported eye/sight problems, by various characteristics**

## Measure 1.2: Main causes of vision impairment and blindness

**Measure:** Main causes of vision impairment for Indigenous Australians, as a proportion of those with vision impairment.

### Results

#### 1.2.1 Main causes of vision impairment and blindness

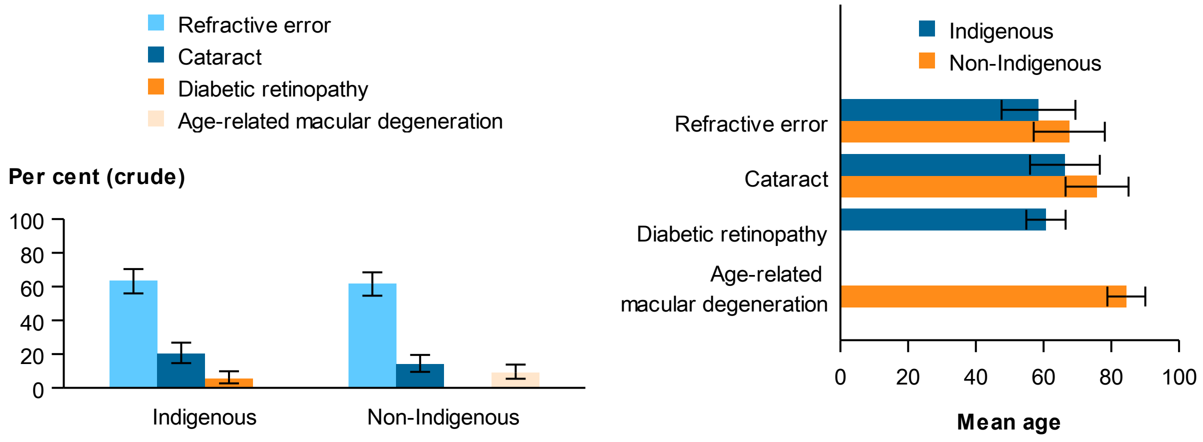
**Overall:** In the 2016 NEHS the main causes of vision impairment among Indigenous participants were refractive error (63%), cataract (20%) and diabetic retinopathy (5.5%) (Figure 3.1.3a). For non-Indigenous Australians with vision impairment, the main causes were refractive error (62%), cataract (14%) and macular degeneration (9%) (Figure 3.1.3a).

**Sex and age:** The main causes of vision impairment for Indigenous males and females were similar, though a higher proportion of Indigenous females had cataracts as a main cause (Figure 3.1.3c). For non-Indigenous Australians, the pattern of causes for males and females was similar (Figure 3.1.3d).

There were no significant differences in the mean age of participants by cause of vision impairment (Figure 3.1.3b).

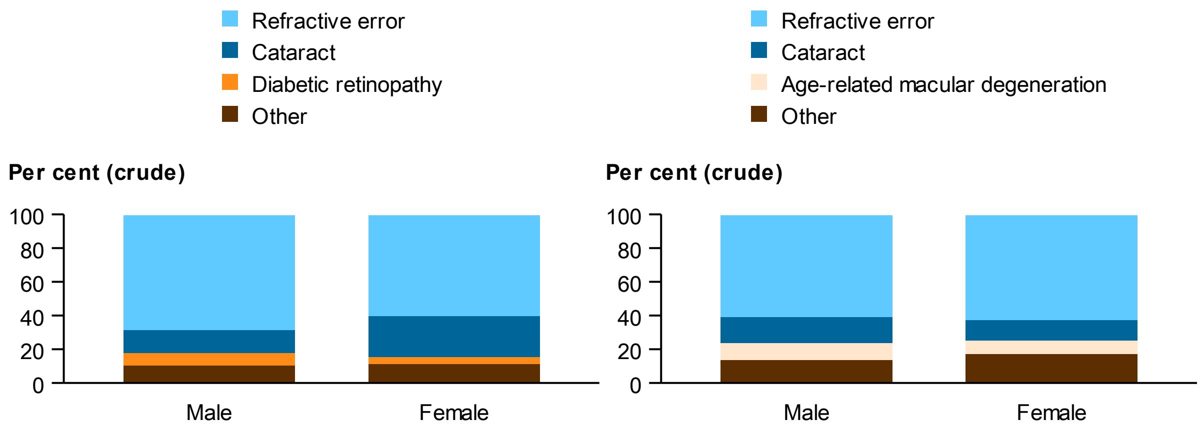
### Things to consider

- Data are from the 2016 NEHS, a sample survey of 1,738 Indigenous Australians aged 40 and over and 3,098 non-Indigenous Australians aged 50 and over. The survey included an eye examination.
- The survey results reported are crude unadjusted sample proportions. These results are subject to sampling errors, so the 95% confidence intervals are provided to indicate the reliability of the estimates reported.
- Time trend data were based on the 2008 Indigenous Eye Health Survey and the 2016 NEHS, but there were some differences in the methodologies used, so caution should be used when interpreting time trends.
- Vision impairment does not include corrected refractive error.
- The main causes of blindness were not provided, due to small numbers.



a) By Indigenous status, 2016

b) Mean age, 2016



c) Indigenous, by sex, 2016

d) Non-Indigenous, by sex, 2016

*Notes*

1. Crude rates are shown in figures a), c) and d), whereas Figure b) shows mean age.
2. Error bars in Figure a) are 95% confidence intervals, whereas in Figure b) they represent the standard deviation. Confidence intervals were not available for figures c) and d).
3. Figures a) and b) show the top 3 main causes of vision impairment for Indigenous Australians.
4. Data are not presented for some groups, due to small numbers.
5. Data for these figures are available in the online supplementary tables.

*Source:* NEHS 2016.

**Figure 3.1.3: Main causes of vision impairment, by various characteristics**

### 1.2.2 Self-reported causes of eye or sight problems

**Overall:** The main causes of sight problems reported by Indigenous Australians were long-sightedness (57%), short-sightedness (38%) and cataract (3%) (Figure 3.1.4a).

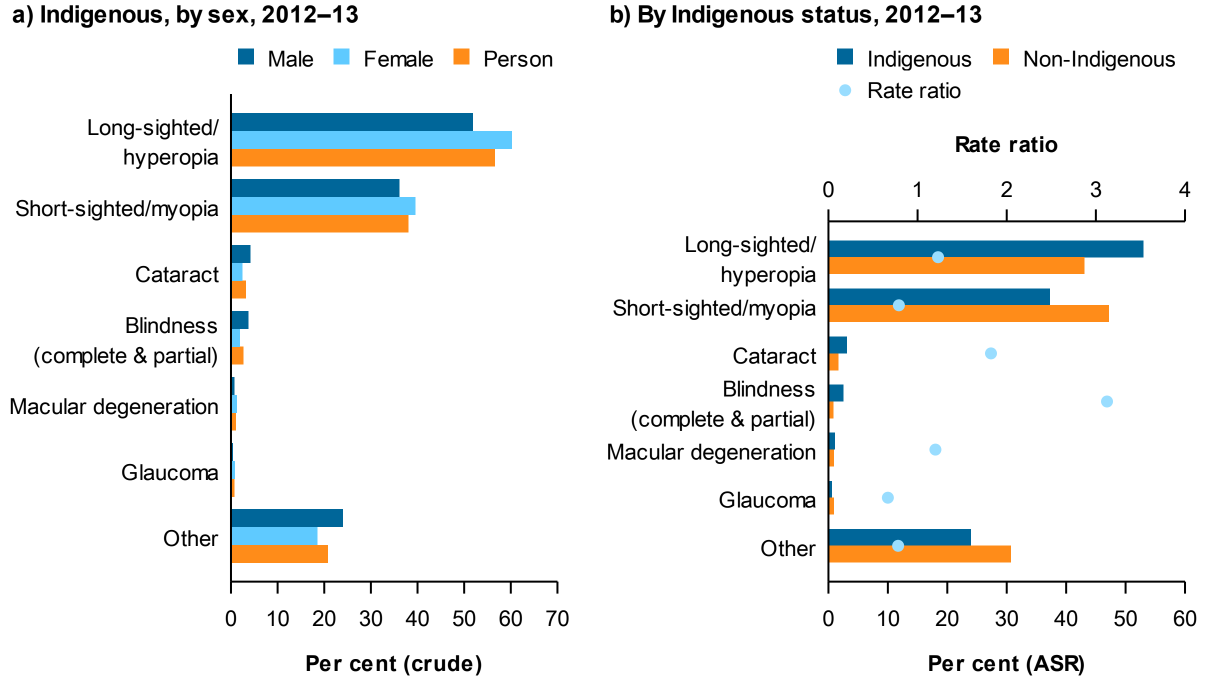
Indigenous Australians were more likely than non-Indigenous Australians to report blindness (3.1 times as likely) and having a cataract (1.8 times as likely) as a cause of sight problems based on age-standardised rates (Figure 3.1.4b).

**Sex and age:** The prevalence of long-sightedness was higher for Indigenous females than for Indigenous males (60% and 52%, respectively) (Figure 3.1.4).

Rates of long-sightedness and cataract were highest for those aged 45 and over.

## Things to consider

- The 2012–13 AATSIHS included a sample of 12,000 Indigenous Australians for the core sample. Survey results are subject to sampling errors, as only a small proportion of the population is used to produce estimates that represent the whole population.
- These data are self-reported eye or sight problems and have not necessarily been diagnosed by a health professional. They therefore don't include eye conditions that respondents are not aware that they have, or which were misdiagnosed.
- Eye or sight problems include corrected refractive error.



*Notes*

1. Age-standardised rates (ASR) are shown in Figure b), whereas Figure a) shows crude rates.
2. The following estimates have a relative standard error between 25% and 50% and should be used with caution: Figure a): Macular degeneration for males, females and persons, glaucoma for males and females; and Figure b): Macular degeneration for Indigenous Australians.
3. Multiple responses are allowed for this question, so proportions may add to more than 100%.
4. Data for these figures are available in the online supplementary tables.

*Source:* ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey.

**Figure 3.1.4: Prevalence of eye/sight problems, by main cause, by various characteristics**

## Measure 1.3: Prevalence of trachoma and trichiasis

**Measure:** The estimated number, and proportion of:

1) Indigenous children in at-risk communities with active trachoma
2) Indigenous adults in at-risk communities with trichiasis.

### Results

#### 1.3.1 Trachoma

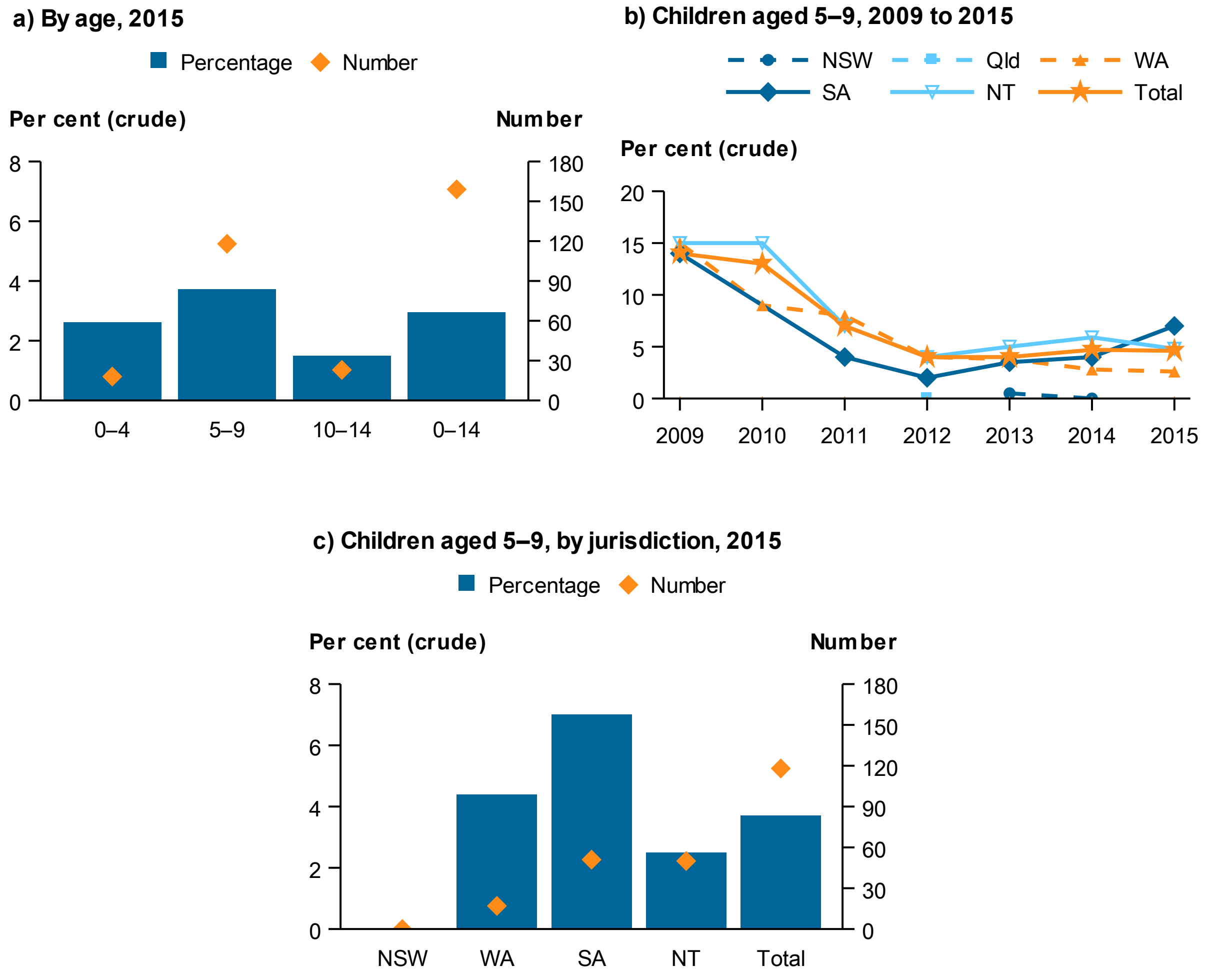
**Overall:** In 2015, there were a total of 159 children aged 0–14 with active trachoma in the 67 at-risk communities that were screened for trachoma. This was 2.6% of 0–4 year olds screened (18 children), 3.7% of 5–9 year olds screened (118 children), and 1.5% of 10–14 year olds screened (23 children) (Figure 3.1.5a).

**Time trend:** Between 2009 and 2015, the estimated prevalence of active trachoma in children aged 5–9 screened in all at-risk communities fell from 14% to 4.6% (Figure 3.1.5b).

**Jurisdiction:** In 2015, the proportion of children aged 5–9 with active trachoma in the screened communities was 4.4% in Western Australia (17 children), 7.0% in South Australia (51 children) and 2.5% in the Northern Territory (50 children). In New South Wales no children were found with active trachoma (Figure 3.1.5c).

### Things to consider

- In 2015, trachoma screening was undertaken in 67 at-risk communities in 4 jurisdictions (Northern Territory, Western Australia, South Australia and New South Wales), while trichiasis screening was undertaken in 103 at-risk communities in 3 jurisdictions (Northern Territory, Western Australia and South Australia) (Kirby Institute 2016).
- The CDNA guidelines for trachoma control were revised in 2014 so that at-risk communities were not all required to be screened each year. These guidelines were implemented in the Northern Territory in 2014, and in all 4 states in 2015.
- In line with CDNA guidelines, the 5–9 age group is the target group for screening programs in all regions, with variable screening undertaken for other age groups.



*Notes*

1. All figures show crude rates.
2. Data in figures a) and c) cover the 67 communities and 5,403 children screened in 2015 (40 communities and 3,095 children in the NT; 15 communities and 594 children in WA; 11 communities and 1,688 children in SA; and 1 community and 26 children in NSW).
3. The rates shown in Figure b) are based on the most recent data for all at-risk communities (for 2015 this includes data from 67 communities that screened as well as data carried forward from 64 at-risk communities that did not screen). Data for SA are for children aged 1–9, which could not be separated into smaller age groupings.
4. Data for these figures are available in the online supplementary tables.

*Source:* Australian Trachoma Surveillance report (Kirby Institute, 2016).

**Figure 3.1.5: Prevalence of active trachoma in at-risk Indigenous communities, by various characteristics**

### 1.3.2 Trichiasis

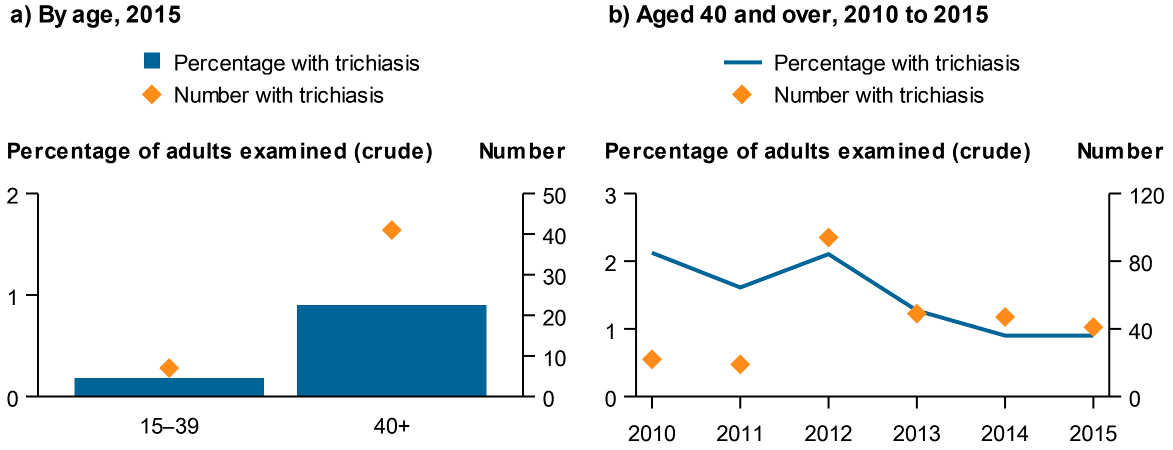
**Overall:** In 2015, of the 4,544 Indigenous Australians aged 40 and over, examined in at-risk communities, there were 41 with trichiasis, a prevalence rate of 0.9%. There were another 7 people aged under 40 with trichiasis in these communities (Figure 3.1.6a).

**Time trend:** From 2010 to 2015 the proportion of Indigenous Australians aged 40 and over with trichiasis fell from 2.1% in 2010 to 0.9% in 2014 and 2015 (Figure 3.1.6b).

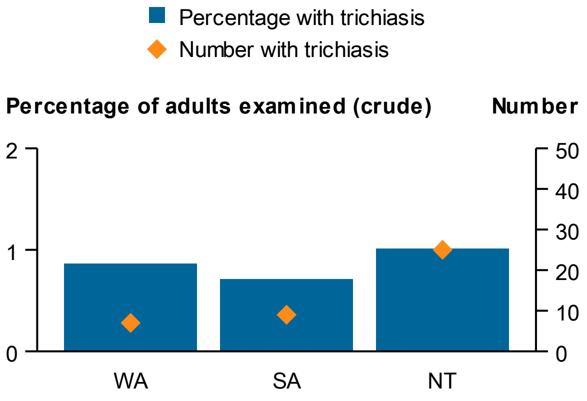
**Jurisdiction:** The prevalence of trichiasis in Indigenous Australians aged 40 and over was similar, at around 1%, in the 3 jurisdictions that undertook screening in 2015 (Figure 3.1.6c).

## Things to consider

- Screening for trichiasis is undertaken opportunistically, such as during adult health checks.



c) Aged 40 and over, by jurisdiction, 2015



*Notes*

1. All figures show crude rates.
2. The 2015 data covers the 103 communities screened in 2015 (67 in the NT, 25 in WA and 11 in SA).
3. Data for these figures are available in the online supplementary tables.

*Sources:* Australian Trachoma Surveillance reports (Kirby Institute 2011, 2012, 2013, 2014, 2015, 2016).

**Figure 3.1.6: Prevalence of trichiasis in at-risk Indigenous communities, by various characteristics**

## 3.2 Diagnosis and screening—how are eye health problems identified?

**Box 3.2: Overview of diagnosis and screening**

- In 2014–15, eye health problems accounted for 1.1% of all problems managed by GPs at encounters with Indigenous patients.
- Just under one-quarter (23% or 167,221) of Indigenous Australians had an Indigenous-specific health assessment (MBS item 715) in 2014–15. Health assessments increased with age and were highest for those aged 55 and over.
- In 2014–15, around 84,000 Indigenous Australians had had an eye examination by an optometrist or ophthalmologist in the preceding 12 months. But a lower proportion of Indigenous Australians (15%) had had an eye examination in the preceding 12 months compared with non-Indigenous Australians (20%), based on age-standardised rates.
- Age-standardised rates of eye examination for Indigenous Australians decreased with increasing remoteness, and were lowest in Western Australia (11%) and the Northern Territory (12%).
- The 2016 NEHS found that just over half of Indigenous participants (53%) with diabetes had a diabetic eye examination in the preceding 12 months, the period recommended in the NHMRC guidelines.
- In 2015, 3,173 (89%) Indigenous children aged 5–9 were screened for trachoma in the 67 communities that undertook screening.
- In 2015, 3,812 Indigenous Australians aged 15–39 (a rate of 16%) and 4,544 Indigenous adults aged 40 and over (a rate of 33%) were screened for trichiasis in at-risk communities.
- In the 2016 NEHS, over half (57%) of Indigenous participants with vision impairment or blindness attributed to 1 of 5 main conditions had not previously had their condition diagnosed. The corresponding rate for non-Indigenous participants was 52%.
- The proportion of Indigenous participants found to have a condition that had not previously been diagnosed condition was highest for cataract (69%), followed by refractive error (55%).

Screening plays a very important preventive role in eye health as early detection and treatment of eye problems (for example, diabetic retinopathy and trachoma) can prevent vision impairment and even blindness (Taylor et al. 2012). It is therefore important to monitor and report data on Indigenous Australians' access to, and use of, diagnosis and screening services, which are generally provided by GPs and optometrists. The measures in this group were based on both survey and administrative data.

Primary health-care providers play a key role in detecting problems, treating more minor eye conditions and referring patients to more specialised care. Measure *2.1 Eye health problems managed by GPs* comes from the BEACH survey of GPs. This annual survey of a random sample of 1,000 GPs who provide information on 100 encounters, is currently the best data source on the types of eye health problems managed in primary health-care settings. Due to the small numbers of Indigenous clients in the survey, 5 years of BEACH data were aggregated to allow for analysis by Indigenous status and other characteristics.

The MBS provides an entitlement to benefits for specified medical and hospital services, including items for general health screening, as well as eye health screening services. The MBS database was the data source for 2 of the measures in this category: *2.2 Annual health assessments* and *2.3 Eye examinations undertaken by an eye care professional*.

All Aboriginal and Torres Strait Islander Australians are eligible for an annual Indigenous-specific health assessment provided by GPs and rebated through the MBS. It includes assessment of vision and, where applicable, for trichiasis—along with referral to an optometrist if required. Measure *2.2 Annual health assessments* is based on claims for MBS item 715. Optometrists and ophthalmologists provide more specialised eye health screening services and can detect more serious eye problems. Various types of eye examinations are rebated through the MBS. Measure *2.3 Eye examinations undertaken by an eye care professional* includes those MBS items most likely to be used for screening for eye problems.

Measures *2.4 Target population screened for diabetic retinopathy* and *2.6 Undiagnosed eye conditions* come from the 2016 NEHS and provide some indication of the effectiveness of screening for diabetic retinopathy among those with diabetes, and for all eye health conditions. These measures were based on a fairly small sample, so caution should be used in interpreting these data.

Trachoma and trichiasis surveillance is undertaken in 'at-risk' communities in remote areas of Australia. Measure *2.5 Trachoma and trichiasis screening coverage*, captures data on screening activities and coverage in 'at-risk' communities in Australia. The data for this measure were collected through screening programs in state and territory jurisdictions and collated by the Trachoma Surveillance and Reporting Unit at the University New South Wales Kirby Institute (Kirby Institute 2016).

## Measure 2.1: Eye health problems managed by GPs

**Measure:** The number of eye health problems managed by GPs, by type of problem, per 1,000 encounters and age-standardised rates.

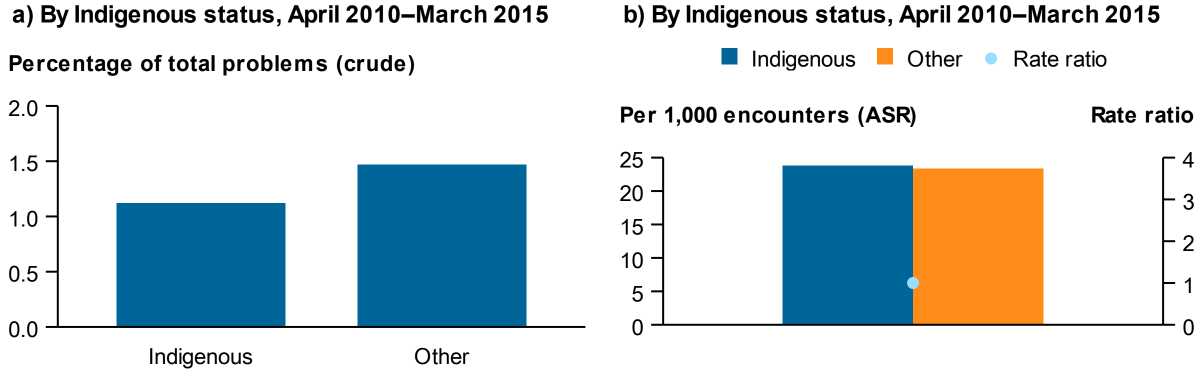
### Results

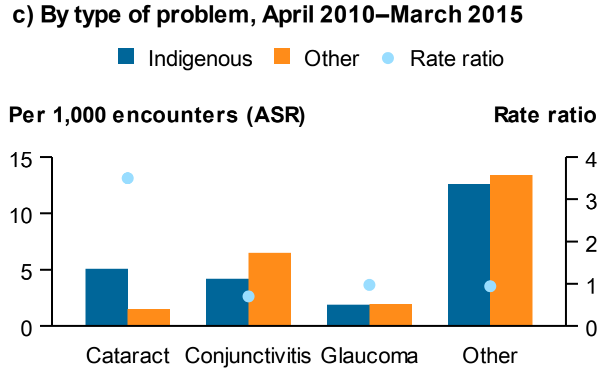
**Overall:** Based on GP survey data, eye health problems accounted for 1.1% of all problems managed by GPs at encounters with Indigenous patients during 2010–15 (Figure 3.2.1a).

After adjusting for age, the overall rate of problems managed was similar for Indigenous and other Australians (24 and 23 per 1,000 encounters, respectively), except for cataracts, where the rate for Indigenous Australians was 3.5 times the rate for other Australians (figures 3.2.1b and 3.2.1c).

### Things to consider

- The BEACH survey collects information from a random sample of 1,000 GPs across Australia each year.
- BEACH data may underestimate the number of encounters with Indigenous Australians.





*Notes*

1. Age-standardised rates (ASR) are shown in figures b) and c), whereas Figure a) shows crude rates.
2. Figure c) shows the top 3 problems managed.
3. Figure a) shows eye health problems as a percentage of total problems, whereas figures b) and c) show eye health problems managed per 1,000 encounters. More than 1 problem can be managed in each encounter.
4. Data for these figures are available in the online supplementary tables.

*Source:* Analyses conducted by the Family Medicine Research Centre, University of Sydney, of BEACH data collected by that Centre.

**Figure 3.2.1: Eye health problems managed by general practitioners, by various characteristics**

## Measure 2.2: Annual health assessments

**Measure:** The number of Indigenous people who had an MBS health assessment within a 12-month period, proportion of the population and age-standardised rates.

### Results

**Overall:** In 2014–15, just under one-quarter (23% or 167,221) of Indigenous Australians had an Indigenous-specific health assessment (MBS item 715). An additional 1.5% (about 10,620) of Indigenous Australians had another type of MBS health assessment (Figure 3.2.2a).

**Time trend:** Between 2004–05 and 2014–15, the age-standardised proportion of Indigenous Australians who had an MBS item 715 health assessment increased from 2.8% to 25%. This increase occurred across all age groups (0–14, 15–54 and 55+), but was highest for those aged 55 and over (Figure 3.2.2b).

**Sex and age:** In 2014–15, the number and proportion of Indigenous males and females aged 0–14 who had an MBS 715 health assessment were very similar—28,332 (23%) and 26,031 (22%), respectively. For all other age groups, health assessments for Indigenous females outnumbered those for Indigenous males (Figure 3.2.2c).

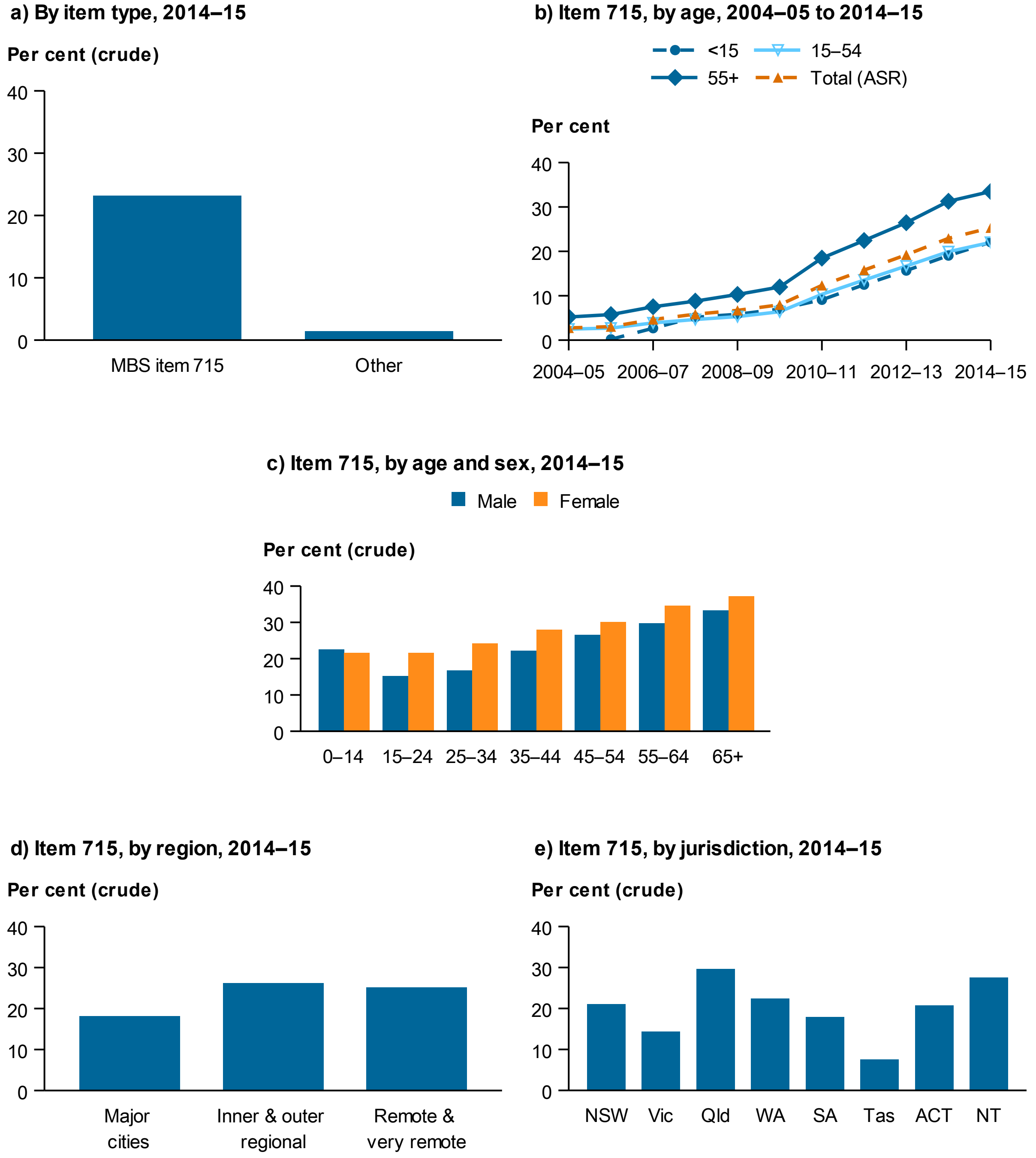
**Remoteness:** The proportion of Indigenous Australians who had an MBS 715 health assessment was very similar in the combined *Inner* and *Outer regional* areas and the combined *Remote* and *Very remote* areas (26% and 25% respectively). The proportion was lowest in *Major cities* (18%) (Figure 3.2.2d).

**Jurisdiction:** The proportion of Indigenous Australians who had an MBS 715 health assessment was highest in Queensland (30%) followed by the Northern Territory (28%), and was lowest in Tasmania (7.6%) (Figure 3.2.2e).

**PHN:** The PHNs with the lowest proportion of Indigenous Australians who had an MBS 715 health assessment were Northern Sydney (3.2%) and Eastern Melbourne (3.3%). The PHNs with the highest rates for MBS health assessments were Western NSW (34.9%) and Northern Queensland (32.5%) (Figure 3.2.3; Map 3.2.1).

### Things to consider

- A basic eye check is a mandatory component of the MBS 715 health assessment.
- MBS data reflect billing practices and do not necessarily reflect all services received. For example, MBS data do not generally capture equivalent services provided by state and territory funded primary health care or by public hospitals. Equivalent or similar care may also be billed as a different MBS item (such as a standard consultation).
- The general health assessments data were adjusted for estimated Indigenous under-identification.

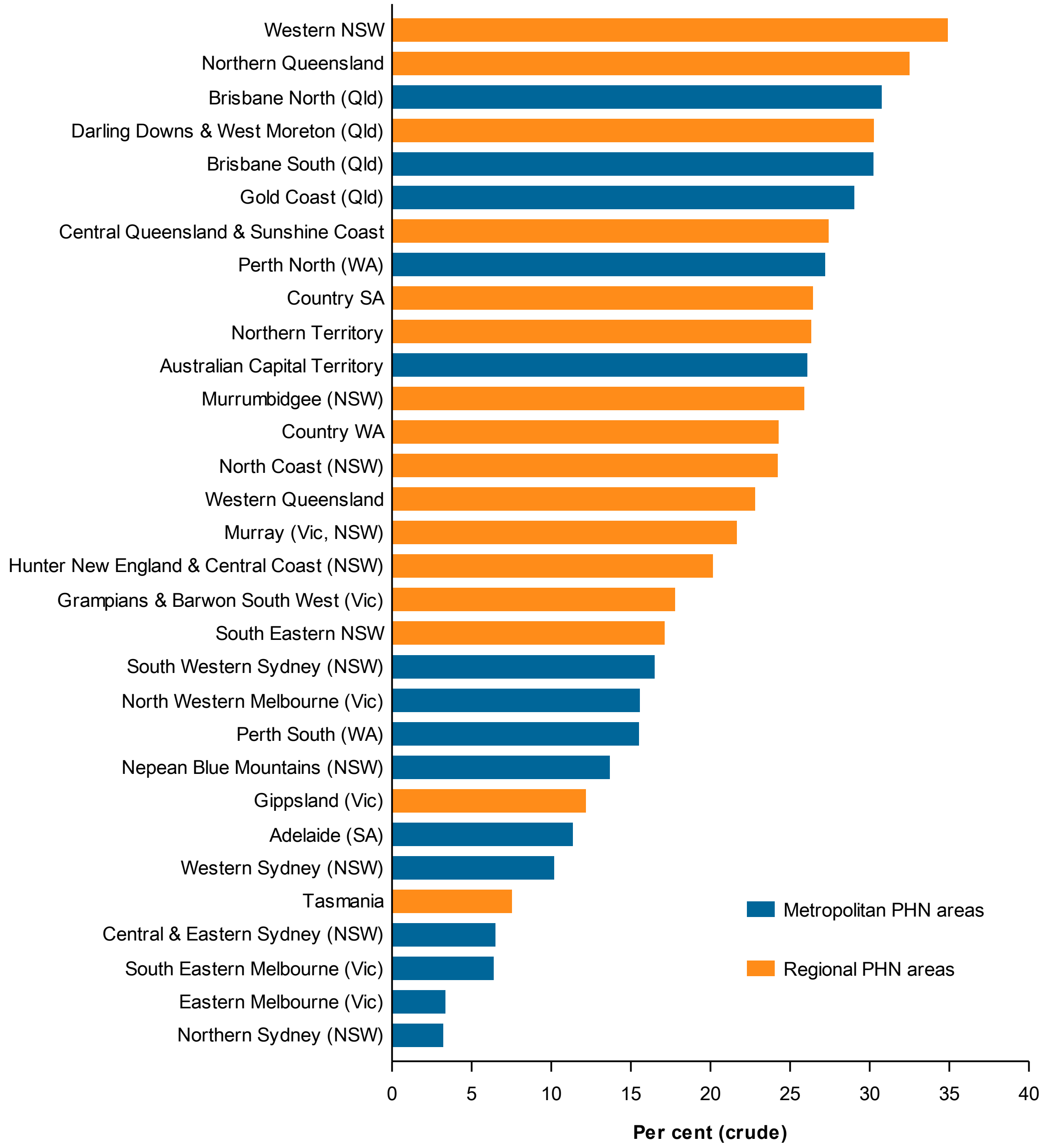


*Notes*

1. Age-standardised rates (ASR) are shown in Figure b) for total, whereas all other figures show crude rates.
2. Data are based on patient's street address.
3. Data for these figures are available in the online supplementary tables.

*Source:* AIHW analysis of MBS data.

**Figure 3.2.2: MBS health assessments, by various characteristics**

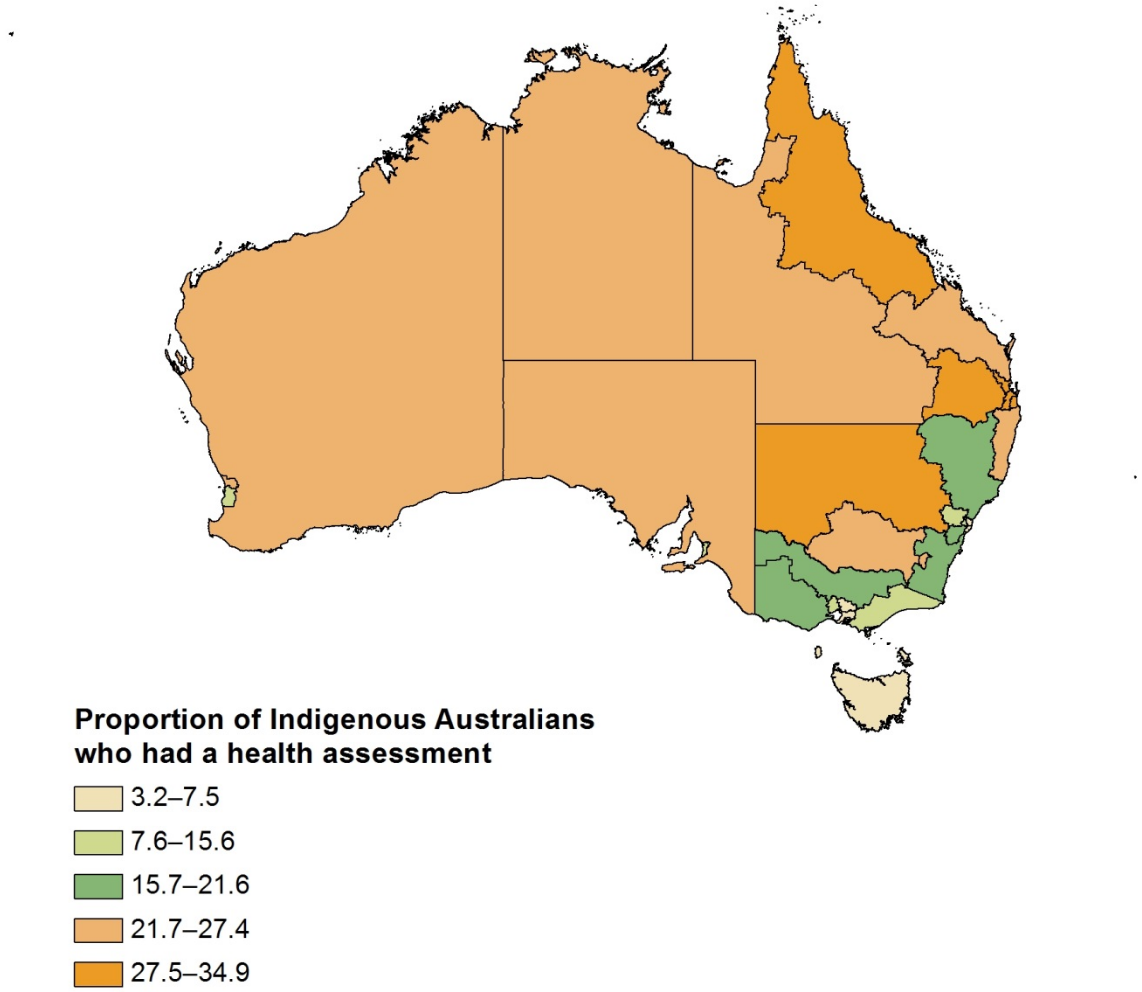


Notes

1. Data are crude rates.
2. Data are based on provider's street address.
3. Data for this figure are available in the online supplementary tables.

*Source:* AIHW analysis of MBS data.

**Figure 3.2.3: MBS health assessments (item 715), by PHN, 2014–15**



*Notes*

1. Data are based on provider's street address.
2. The PHN data for this map are available in the online supplementary tables.

*Source:* AIHW analysis of MBS data.

**Map 3.2.1: MBS health assessments (item 715), by PHN, 2014–15**

## Measure 2.3: Eye examinations by an eye care professional

**Measure:** The number of Indigenous Australians who had an eye examination by an optometrist or ophthalmologist in the last 12 months, proportion of the population, age-standardised rate and Indigenous to non-Indigenous rate ratio.

### Results

**Overall:** In 2014–15, there were around 84,000 Indigenous Australians who had had an eye examination undertaken by an optometrist or ophthalmologist in the preceding 12 months—12% of the population (Figure 3.2.4a).

Based on 2014–15 age-standardised rates, a higher proportion of non-Indigenous Australians (20%) had an eye examination by an optometrist or ophthalmologist in the preceding 12 months, compared with Indigenous Australians (15%)—a rate ratio of 0.7.

**Time trend:** Between 2005–06 and 2014–15, the age-standardised proportion of the Indigenous population that had had an eye examination by an optometrist or ophthalmologist increased from 13% to 15%. Over the same period, the proportion for non-Indigenous Australians increased from 16% to 20% (Figure 3.2.4b).

**Sex and age:** In 2014–15, the proportion of both the Indigenous and non-Indigenous population that had had an eye examination in the preceding 12 months increased with age for both males and females, and was highest for those aged 65 and over.

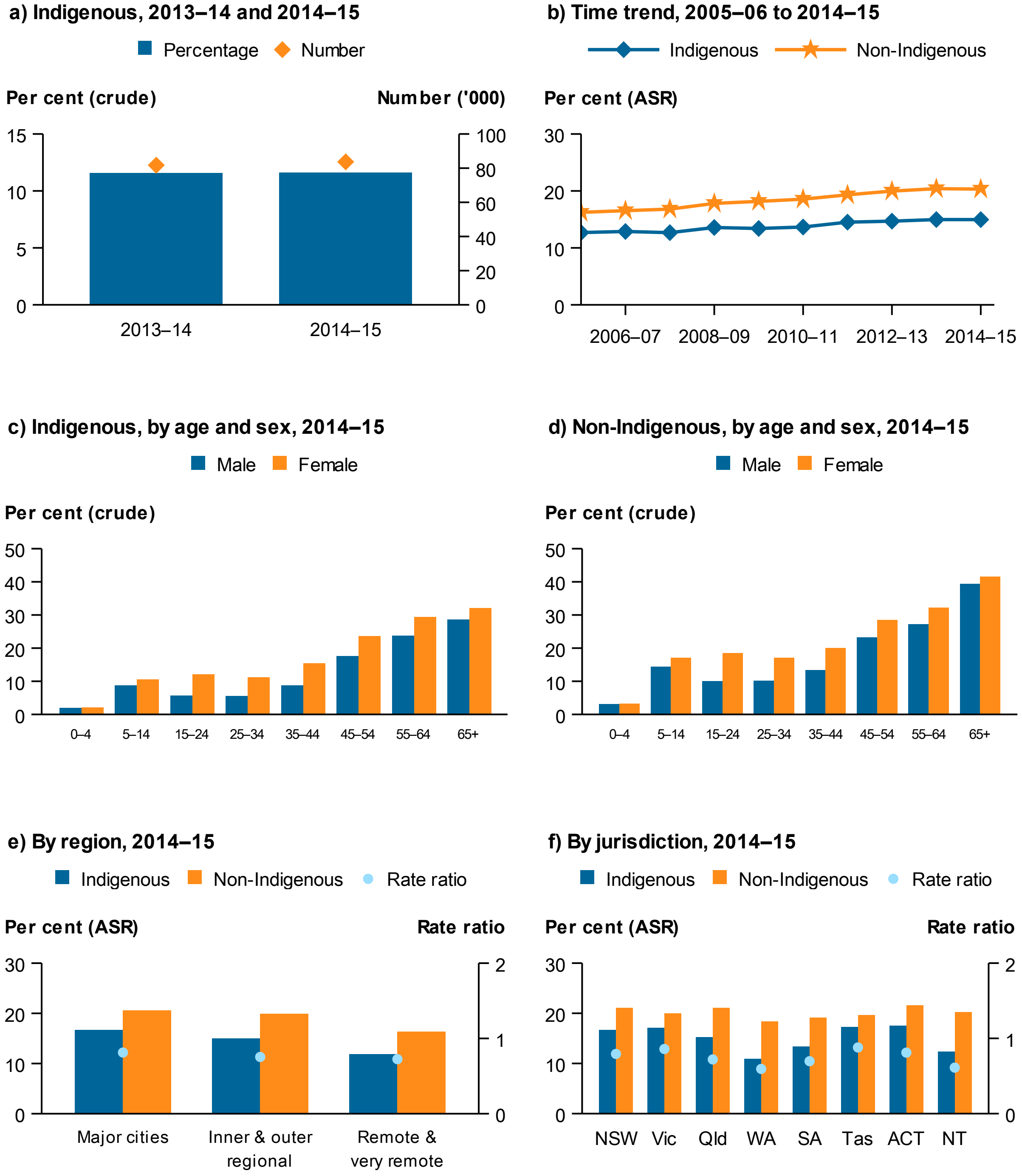
At all ages, the proportion of non-Indigenous males and females that had had an eye examination was higher than for Indigenous males and females (figures 3.2.4c and 3.2.4d).

**Remoteness:** The proportion of both Indigenous and non-Indigenous Australians who had had an eye examination in the preceding 12 months decreased as remoteness increased. In all remoteness areas, eye examination rates were higher for non-Indigenous than for Indigenous Australians, after adjusting for age. The differences between the 2 were similar across remoteness areas (Figure 3.2.4e).

**Jurisdiction:** Age-standardised eye examination proportions for Indigenous Australians were lowest in Western Australia (11%) followed by the Northern Territory (12%) and were highest in the Australian Capital Territory (18%). The rate ratio was lowest in Western Australia and the Northern Territory (0.6 in both jurisdictions) (Figure 3.2.4f).

### Things to consider

- MBS data reflect billing practices, and not necessarily all services received. For example, MBS data do not generally capture equivalent services provided by jurisdictional-funded primary health care or by public hospitals; for example, eye examinations undertaken by salaried ophthalmologists in public hospitals.
- Equivalent or similar care may also be billed as a different MBS item (such as a standard consultation).
- MBS data shown for this measure were adjusted for Indigenous under-identification.



*Notes*

1. Age-standardised rates (ASR) are shown in figures b), e) and f), whereas all other figures show crude rates.
2. Data for these figures are available in the online supplementary tables.

*Source:* AIHW analysis of MBS data.

**Figure 3.2.4: Proportion of the population that had an eye examination by an eye care professional in the last 12 months, by various characteristics**

## Measure 2.4: Target population screened for diabetic retinopathy

**Measure:** The number of Indigenous Australians with diabetes who had a diabetic eye examination in the last year, as a proportion of the population with diabetes, age-standardised rates and rate ratios.

### Results

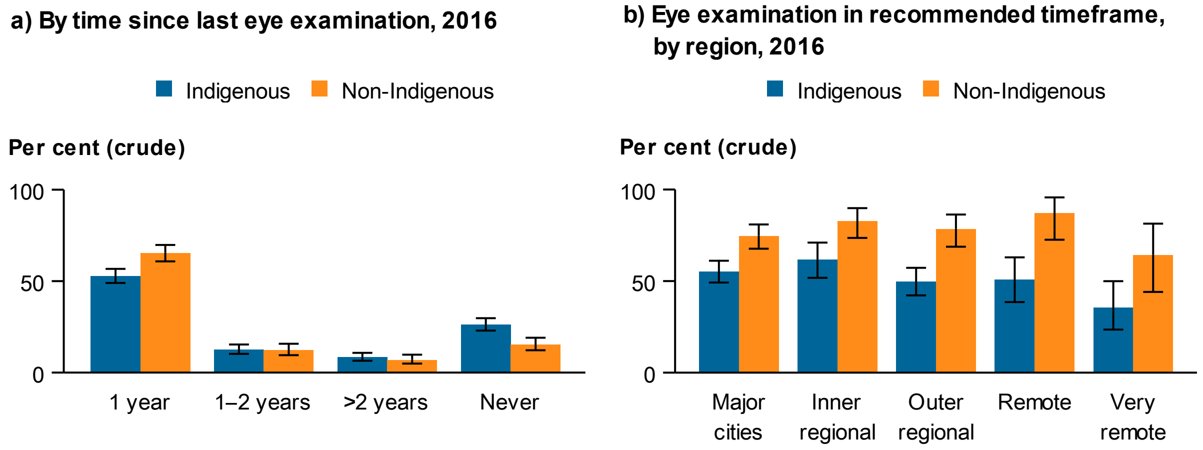
#### 2.4.1 Target population screened for diabetic retinopathy (survey data)

**Overall:** In 2016, just over half (53%) of Indigenous participants in the eye health survey aged 40 and over with self-reported diabetes had had a diabetic eye examination in the preceding 12 months, the period recommended in the NHMRC guidelines. For non-Indigenous participants with diabetes aged 50 and over, over three-quarters (78%) had a diabetic eye examination in the preceding 2 years, the period recommended in the NHMRC guidelines for non-Indigenous Australians (Figure 3.2.5a).

**Remoteness:** The proportion of Indigenous participants in the NEHS with self-reported diabetes who had had a diabetic eye examination in the preceding 12 months varied by remoteness, with participants in *Very remote* areas having the lowest rate (35%). Proportions of non-Indigenous participants who had had an eye examination in the preceding 12 months were also lowest in *Very remote* areas, but were higher than Indigenous rates in each remoteness category (Figure 3.2.5b).

### Things to consider

- Data are from the 2016 NEHS, a sample survey of 1,738 Indigenous Australians aged 40 and over and 3,098 non-Indigenous Australians aged 50 and over. The survey included an eye examination.
- The survey results reported are crude unadjusted sample proportions. These results are subject to sampling errors, so the 95% confidence intervals are provided to indicate the reliability of the estimates reported.
- Current NHMRC guidelines recommend a diabetic eye examination annually for Indigenous Australians with diabetes, and at least every 2 years for non-Indigenous Australians with diabetes.



a) By time since last eye examination, 2016

b) Eye examination in recommended timeframe, by region, 2016

*Notes*

1. All figures show crude rates.
2. Error bars show 95% confidence intervals.
3. Data for these figures are available in the online supplementary tables.

*Source:* NEHS 2016.

**Figure 3.2.5: Proportion of those with diabetes who had an eye examination in the recommended timeframe, by various characteristics**

**2.4.2 Target population screened for diabetic retinopathy (MBS data)**

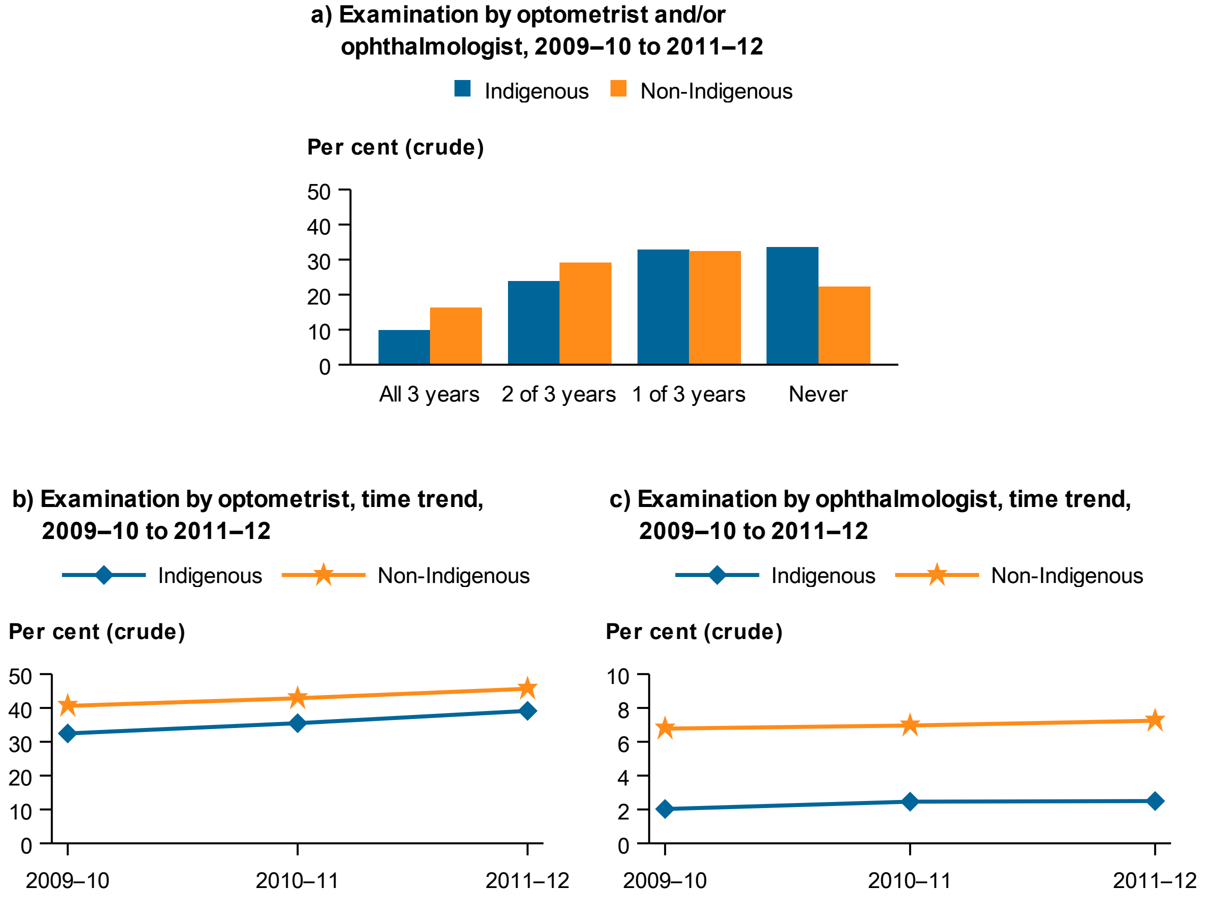
**Overall:** Between 2009–10 and 2011–12, an estimated 10% of Indigenous Australians with diabetes had an eye examination by an optometrist and/or an ophthalmologist each year, compared with 16% of non-Indigenous Australians. In the same period, one-third (33%) of Indigenous people did not receive any eye examination, compared with 22% of non-Indigenous people (Figure 3.2.6a).

**Time trend:** Between 2009–10 and 2011–12, the estimated proportion of Indigenous Australians with diabetes who had an examination by an optometrist increased from 32% to 39%. For non-Indigenous Australians, the proportion rose from 41% to 46% (Figure 3.2.6b).

The estimated proportion of Indigenous Australians with diabetes who had an eye examination by an ophthalmologist remained at 2% between 2009–10 and 2011–12. Similarly, for non-Indigenous Australians, the proportion remained at 7% (Figure 3.2.6c).

## Things to consider

- MBS data reflect billing practices, and not necessarily all services received. For example, MBS data do not generally capture equivalent services provided by jurisdiction-funded primary health care or by public hospitals—for example, eye examinations undertaken by salaried ophthalmologists in public hospitals.
- Equivalent or similar care may also be billed as a different MBS item (such as a standard consultation).
- MBS data shown for this measure were adjusted for Indigenous under-identification.



*Notes*

1. All figures show crude rates.
2. Data for these figures are available in the online supplementary tables.

*Source:* AIHW analysis of MBS data.

**Figure 3.2.6: Proportion of those with diabetes who had an eye examination, by various characteristics**

## Measure 2.5: Trachoma and trichiasis screening coverage

**Measure:** The estimated number, and proportion, of:

1) Indigenous children in at-risk Indigenous communities screened for trachoma.
2) Indigenous adults screened for trichiasis.

### Results

#### 2.5.1 Trachoma

**Overall:** In 2015, in the 67 communities that undertook screening, there were a total of 5,403 children aged 0–14 screened for trachoma, a rate of 54%. This included 689 children aged 0–4 (23%), 3,173 aged 5–9 (89%), and 1,541 aged 10–14 (45%) (Figure 3.2.7a).

**Time trend:** Between 2011 and 2015, the proportion of children aged 5–9 screened for trachoma in at-risk communities rose from 65% in 2011 to 89% in 2015 (Figure 3.2.7b).

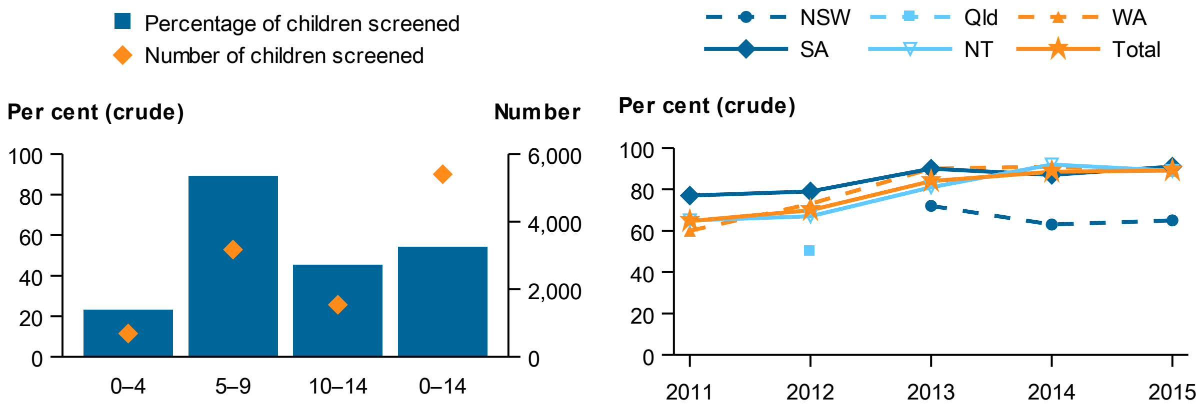
**Jurisdiction:** In 2015, the proportion of children aged 5–9 screened for trachoma was 89% in Western Australia (387 children), 91% in South Australia (729 children), 65% in New South Wales (26 children) and 89% in the Northern Territory (2,031 children) (Figure 3.2.7c).

### Things to consider

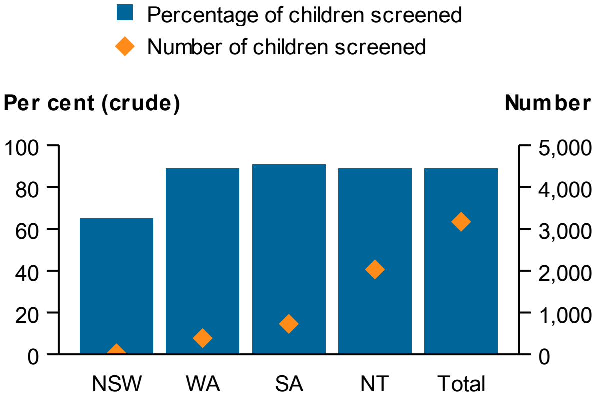
- In 2015, trachoma screening was undertaken in 67 at-risk communities in 4 jurisdictions (Northern Territory, Western Australia, South Australia and New South Wales), while trichiasis screening was undertaken in 103 at-risk communities in 3 jurisdictions (Northern Territory, Western Australia and South Australia) (Kirby Institute 2016).
- The CDNA guidelines for trachoma control were revised in 2014 so that all at-risk communities were not required to screen each year (CDNA 2014). These guidelines were implemented in the Northern Territory in 2014, and in all 4 states in 2015.
- The 5–9 age group is the target group for screening programs in all regions, in line with the CDNA guidelines, with variable screening undertaken for other age groups.

**a) By age, 2015**

**b) Children aged 5–9, 2011 to 2015**



**c) Children aged 5–9, by jurisdiction, 2015**



*Notes*

1. All figures show crude rates.
2. Includes data from the 67 communities that screened for trachoma.
3. In Figure a data for NSW are only for children aged 5–9.
4. Data for these figures are available in the online supplementary tables.

*Sources:* Australian Trachoma Surveillance reports (Kirby Institute 2012, 2013, 2014, 2015, 2016).

**Figure 3.2.7: Trachoma screening coverage in Indigenous communities, by various characteristics**

### 2.5.2 Trichiasis

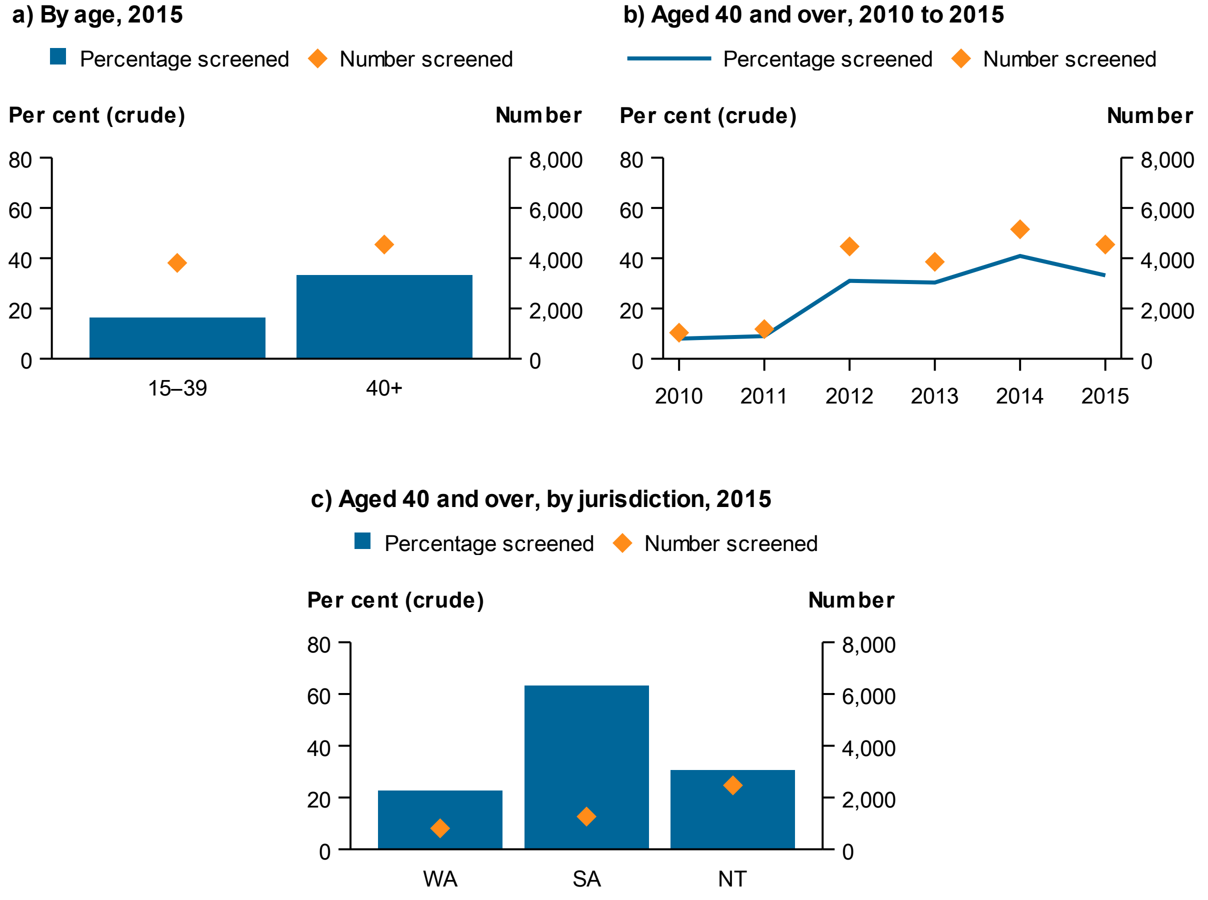
**Overall:** In 2015, 3,812 Indigenous Australians aged 15–39 (a rate of 16%) and 4,544 Indigenous adults aged 40 and over (a rate of 33%) were screened for trichiasis in at-risk communities (Figure 3.2.8a).

**Time trend:** In the jurisdictions that undertook screening, the proportion of Indigenous adults aged 40 and over screened for trichiasis rose from 1,036 (8%) in 2010 to 4,544 (33%) in 2015 (Figure 3.2.8b).

**Jurisdiction:** In 2015, the proportion of Indigenous adults aged 40 and over screened for trichiasis was highest in South Australia (1,264 adults, a rate of 63%) and lowest in Western Australia (810 adults, a rate of 23%) (Figure 3.2.8c).

## Things to consider

- Screening for trichiasis is undertaken opportunistically, such as during adult health checks.



*Notes*

1. All figures show crude rates.
2. 2015 data cover the 103 communities that screened for trichiasis.
3. Data for these figures are available in the online supplementary tables.

*Sources:* Australian Trachoma Surveillance reports (Kirby Institute 2011, 2012, 2013, 2014, 2015, 2016).

**Figure 3.2.8: Trichiasis screening coverage in Indigenous communities, by various characteristics**

## Measure 2.6: Undiagnosed eye conditions

**Measure:** The number of Indigenous Australians with vision impairment or blindness attributed to 1 of the 5 main causes who had not had their condition diagnosed, as a proportion of those with vision impairment or blindness attributed to 1 of the 5 main causes.

### Results

**Overall:** In 2016, around 57% of Indigenous participants in the 2016 NEHS had vision impairment or blindness attributed to 1 of 5 main cause, and had not previously had their condition diagnosed.

The rates varied by condition (Figure 3.2.9a), with the highest rate being for undiagnosed cataract:

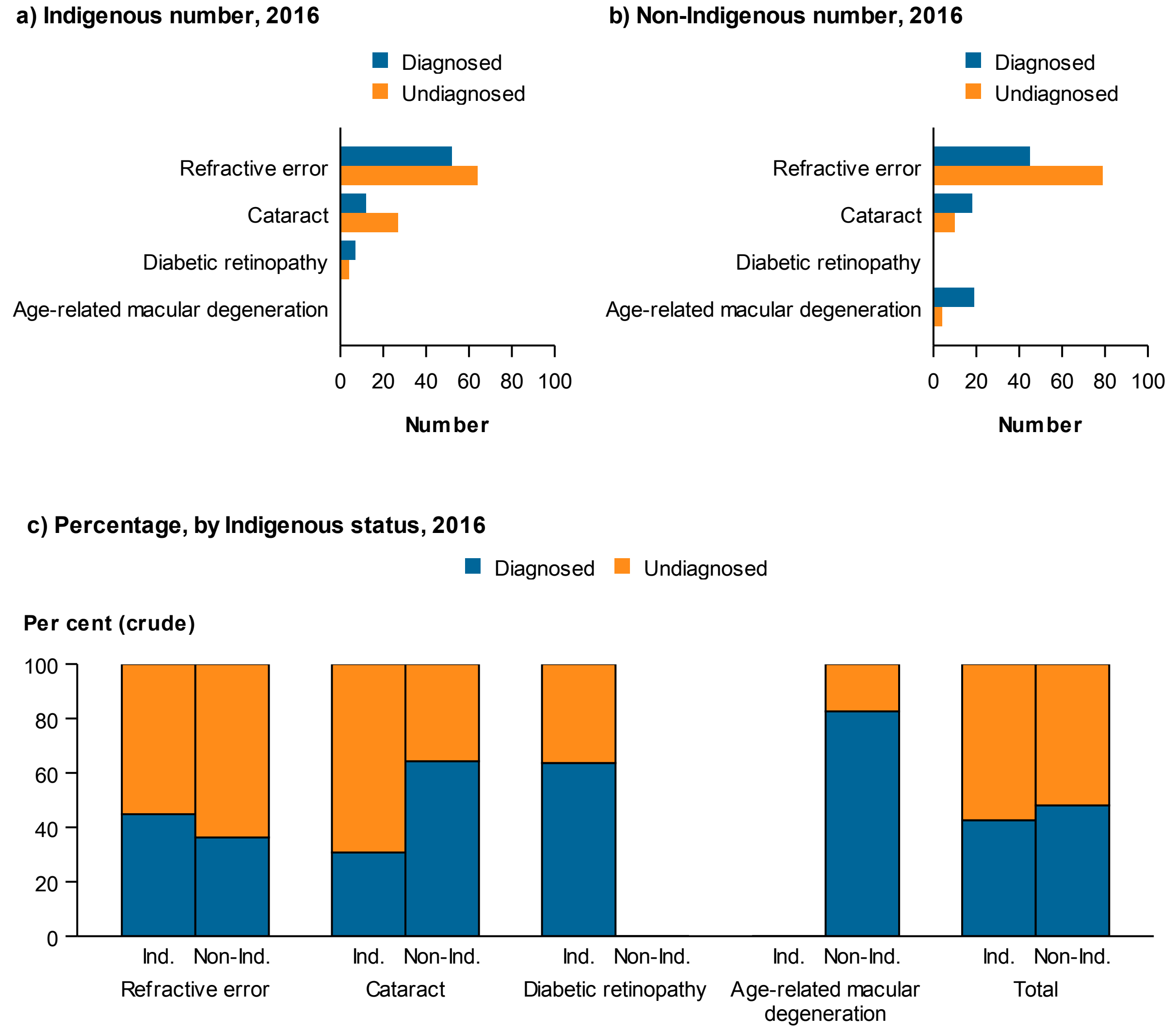
- 64 of 116 (55%) Indigenous participants tested had undiagnosed refractive error
- 27 of 39 (69%) Indigenous participants tested had undiagnosed cataract
- 4 of 11 (36%) Indigenous participants tested had undiagnosed diabetic retinopathy.

For non-Indigenous participants, there were a total of 52% with vision impairment or blindness who had not previously had their condition diagnosed. The rates for non-Indigenous participants were highest for refractive error, with 79 out of 124 (64%) having undiagnosed refractive error (Figure 3.2.9b).

Rates of undiagnosed eye diseases were higher for Indigenous participants than for non-Indigenous for cataract and diabetic retinopathy, and lower for refractive error and age-related macular degeneration (Figure 3.2.9c).

### Things to consider

- Data are from the 2016 NEHS, a sample survey of 1,738 Indigenous Australians aged 40 and over and 3,098 non-Indigenous Australians aged 50 and over. The survey included an eye examination.
- The survey results reported are crude unadjusted sample proportions. These results are subject to sampling errors.
- The 5 main causes of vision impairment or blindness were refractive error, cataract, diabetic retinopathy, age-related macular degeneration and glaucoma.
- 'Undiagnosed major eye condition or disease' was identified as the main attributed cause of vision impairment in participants who reported 'No' or 'Unsure' to the question 'Have you ever been told by a doctor that you have the following condition?'



| | |
|---|---|
| Ind. | Indigenous. |
| Non-Ind. | Non-Indigenous. |

*Notes*

1. Data are crude rates.
2. Some numbers and rates are not presented, due to small numbers.
3. Data for these figures are available in the online supplementary tables.

*Source:* NEHS 2016.

**Figure 3.2.9: Diagnosis rates for top 3 eye diseases and refractive error, by various characteristics**

## 3.3 Treatment—how are eye problems treated and in what settings?

**Box 3.3: Overview of treatment**

- In the two year period 2013–15, there were around 6,500 hospitalisations of Indigenous Australians for eye diseases and around 1,700 for eye injuries.
- Indigenous Australians had lower age-standardised rates of hospitalisation for eye diseases as non-Indigenous Australians (10 and 13 per 1,000, respectively), but 3 times the rate of hospitalisations for injuries to the eye (1.3 and 0.4 per 1,000, respectively).
- The most common eye diseases diagnosed for Indigenous Australians were disorders of the lens, while the most common eye injury was an open wound of the eyelid and periocular area.
- Hospitalisation rates for eye diseases increased with age, and peaked at ages 75–84. Hospitalisation rates for eye injuries peaked in the middle years.
- Age-standardised hospitalisation rates for both eye injuries and eye diseases were highest for Indigenous Australians in the combined *Remote* and *Very remote* areas.
- There were 6,404 hospitalisations of Indigenous Australians for eye procedures and 4,034 hospitalisations of Indigenous Australians for cataract surgery in the two year period 2013–15.
- Indigenous Australians had lower age-standardised rates of hospitalisation for eye procedures, compared with non-Indigenous Australians (10 and 13 per 1,000, respectively), and for elective cataract surgery (7,044 and 8,415 per 1,000,000, respectively).
- The cataract surgical coverage rate (or the proportion of people with cataracts who had had surgery) for Indigenous participants in the 2016 eye health survey was lower than for non-Indigenous participants (62% and 88%, respectively).
- In 2014–15, the median waiting time for elective cataract surgery was longer for Indigenous Australians than for non-Indigenous Australians (142 days and 84 days, respectively).
- Hospitalisations for eye procedures and cataract surgery were higher for Indigenous Australians in *Remote* and *Very remote* areas combined, while waiting times for elective cataract surgery were longest in *Inner regional* areas.
- In 2015, there were 8,720 community members where active trachoma was identified who received treatment, a rate of 87%. In 2015, of the 41 Indigenous adults identified with trichiasis, 25 were offered ophthalmic consultation and 13 had surgery.
- In 2016, treatment rates for refractive error were higher for non-Indigenous participants than for Indigenous participants in the 2016 NEHS, at 94% and 83%, respectively.
- In 2014–15, there were 6,232 Indigenous Australians who received glasses under state spectacle schemes in New South Wales (28 per 1,000 population) and 2,192 in Queensland (11 per 1,000 population), while in Victoria there were 2,386 spectacles dispensed (44 per 1,000 population).

Information on Indigenous Australians' use of eye health treatment services allows for ongoing monitoring and for identification of particular services, regions or groups within the Indigenous population, where access to and use of services can be improved. These measures reflect both the prevalence of particular conditions in the population as well as the use of health services. Hospitalisation rates for eye diseases; for example, reflect both the occurrence in the population of eye diseases which are serious enough to require hospitalisation, and access to, and use of, hospitals by people with these conditions.

This group includes 5 measures (3.1, 3.2, 3.3, 3.4 and 3.6) based on admitted patient care data from the NHMD. Hospitalisation numbers and rates are based on episodes of care and not the number of people who are hospitalised. These data are provided by state and territory health departments to the AIHW which manages the national data collection. Two financial years of data were aggregated to allow for analyses by Indigenous status and other characteristics, including PHN.

The first 2 measures, *3.1 Hospitalisations for diseases of the eye* and *3.2 Hospitalisations for injuries to the eye,* are hospitalisations where the principal diagnosis—the problem that was mainly responsible for the admission—was either eye disease or eye injury. The third measure, *3.3 Hospitalisations for eye procedures*, is for hospitalisations with an eye procedure. For some analysis in this measure, hospitalisations were classified using Australian Refined Diagnosis Related Groups (AR-DRG), a class of admitted patient episodes with similar clinical conditions that require similar hospital resources.

The next 3 measures relate specifically to the treatment of cataracts. Measure *3.4 Cataract surgery rate* is hospitalisations for cataract surgery, a subset of eye procedures and is calculated per 1,000,000 to align with the international standards. Measure *3.5 Cataract surgical coverage rate* is the proportion of those who have been identified as having cataracts who have had surgery. The data source was the 2016 NEHS, the only source of data that includes an estimate of the surgery rates for persons who have been identified as having cataracts. Measure *3.6 Waiting times for elective cataract surgery* comes from the records of patients on waiting lists for elective surgery in public hospitals who have had surgery. It includes the median waiting time and the 90th percentile waiting time, as well as the proportion of patients who had surgery within 90 days and those who waited more than 365 days for cataract surgery.

The next measure, *3.7 Trachoma and trichiasis treatment coverage,* captures data on treatment provided in 'at-risk' communities. For trachoma, treatment data are provided on the community members were active trachoma was identified who received treatment. For trichiasis, data are shown on treatment for those who have been identified as having the condition. The data for this measure are collected through state and territory screening programs and are collated by the National Trachoma Surveillance and Reporting Unit (Kirby Institute 2016).

The final 2 measures relate to refractive error, a major cause of vision impairment which can generally be corrected easily by providing spectacles. Measure *3.8 Treatment of refractive error* comes from the 2016 NEHS and compares treatment rates for refractive error for non-Indigenous and Indigenous Australians. All state governments have subsidised spectacle schemes targeted to low income people. The final measure in this category, *3.9 Spectacles dispensed under state schemes,* captures data on Indigenous Australians use of these schemes, although only 3 jurisdictions could provide these data.

## Measure 3.1: Hospitalisations for diseases of the eye

**Measure:** The number of hospitalisations for diseases of the eye and adnexa, per 1,000 Indigenous population, age-standardised rate and rate ratio.

### Results

**Overall:** In 2013–15, there were around 6,500 hospitalisations for Indigenous Australians for diseases of the eye—a crude rate of 4.6 per 1,000 population. For Indigenous Australians, the most common principal diagnosis for hospitalisations for diseases of the eye was disorders of the lens (2.8 per 1,000) (Figure 3.3.1a).

In 2013–15, the age-standardised hospitalisation rate for diseases of the eye for Indigenous people was lower than that for non-Indigenous people (10 and 13 per 1,000, respectively, a rate ratio of 0.8) (Figure 3.3.1b). The age-standardised rate for disorders of the lens was 7.0 per 1,000 for Indigenous Australians, compared with 8.3 per 1,000 for non-Indigenous Australians, a rate ratio of 0.8.

**Time trend:** Between 2005–07 and 2013–15, the age-standardised hospitalisation rate for Indigenous Australians for diseases of the eye doubled from 4.8 to 9.9 per 1,000. Over the same period, the rate for non-Indigenous Australians increased from 10 to 13 per 1,000 (Figure 3.3.1c). There was a narrowing of the gap between Indigenous and non-Indigenous rates over this period.

**Sex and age:** In 2013–15 hospitalisation rates for diseases of the eye were lowest for Indigenous males and females at younger ages, but increased sharply for Indigenous males and females from age 55. The rates were highest for those aged 75–84 (Figure 3.3.1d).

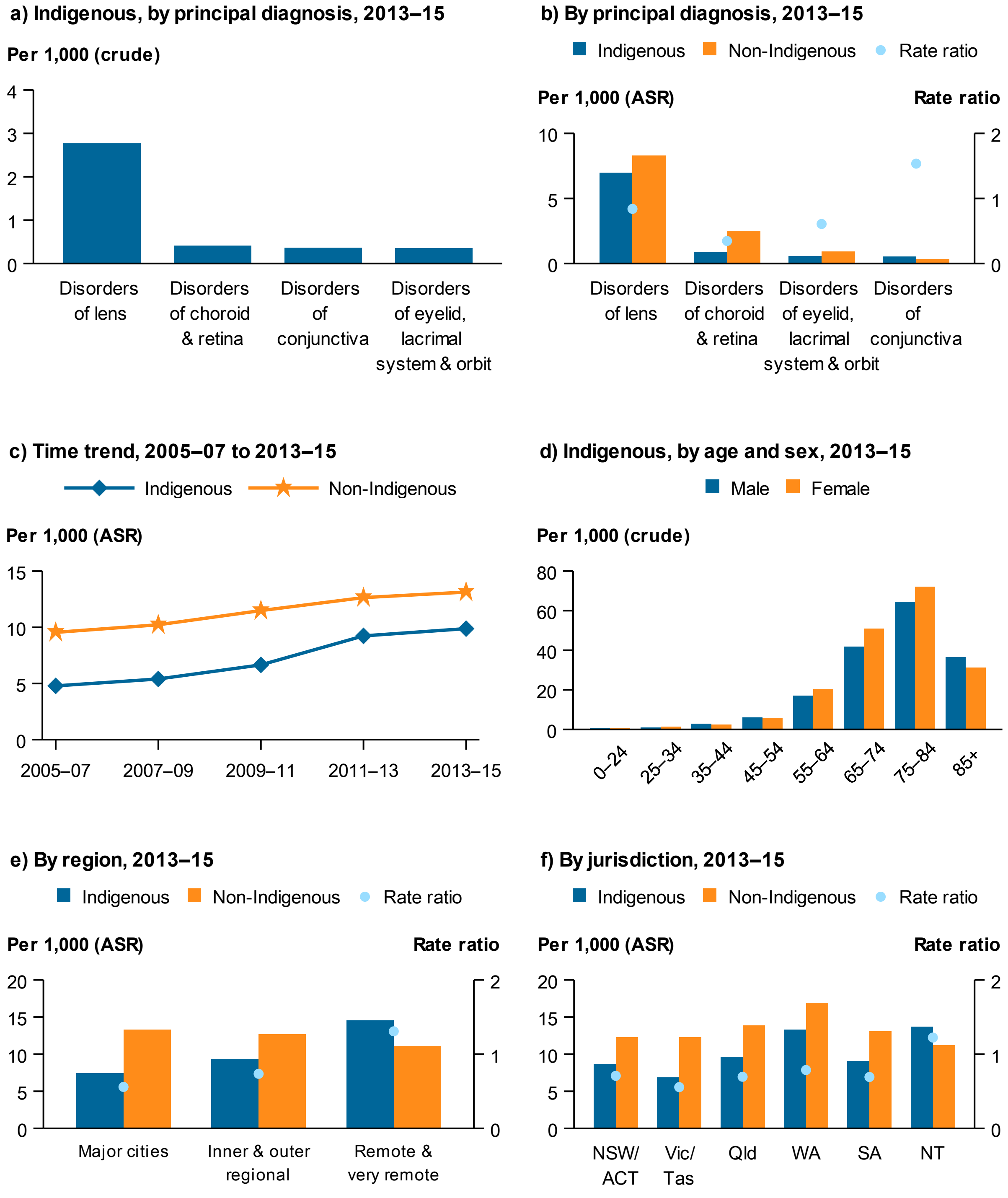
**Remoteness:** Hospitalisation rates were higher for non-Indigenous than for Indigenous Australians in *Major cities* and in combined *Inner* and *Outer regional* areas, after adjusting for age. In contrast, in combined *Remote* and *Very remote* areas, hospitalisation rates were higher for Indigenous Australians (Figure 3.3.1e).

**Jurisdiction:** Hospitalisation rates for Indigenous Australians for diseases of the eye were lowest in Victoria and Tasmania combined (6.8 per 1,000) followed by New South Wales and the Australian Capital Territory combined (8.7 per 1,000) and in South Australia (9.0 per 1,000) and were highest in the Northern Territory (14 per 1,000), followed by Western Australia (13 per 1,000) (Figure 3.3.1f).

**PHN:** The PHNs with the lowest hospitalisation rates for Indigenous Australians for diseases of the eye were Eastern Melbourne, Nepean Blue Mountains and Western Sydney (all under 2 per 1,000). The PHNs with the highest hospitalisation rates for Indigenous Australians were Country WA and Western Queensland (over 7 per 1,000) (Figure 3.3.2; Map 3.3.1).

### Things to consider

- The quality of data provided for Indigenous status varies.
- Time series analyses may be affected by changes in the quality of Indigenous identification over time.
- Data by state and territory, and by PHN, should be interpreted with caution due to variations in admission practices; and because patients may be hospitalised outside the state or territory, or PHN, where they reside.



a) Indigenous, by principal diagnosis, 2013–15

b) By principal diagnosis, 2013–15

c) Time trend, 2005–07 to 2013–15

d) Indigenous, by age and sex, 2013–15

e) By region, 2013–15

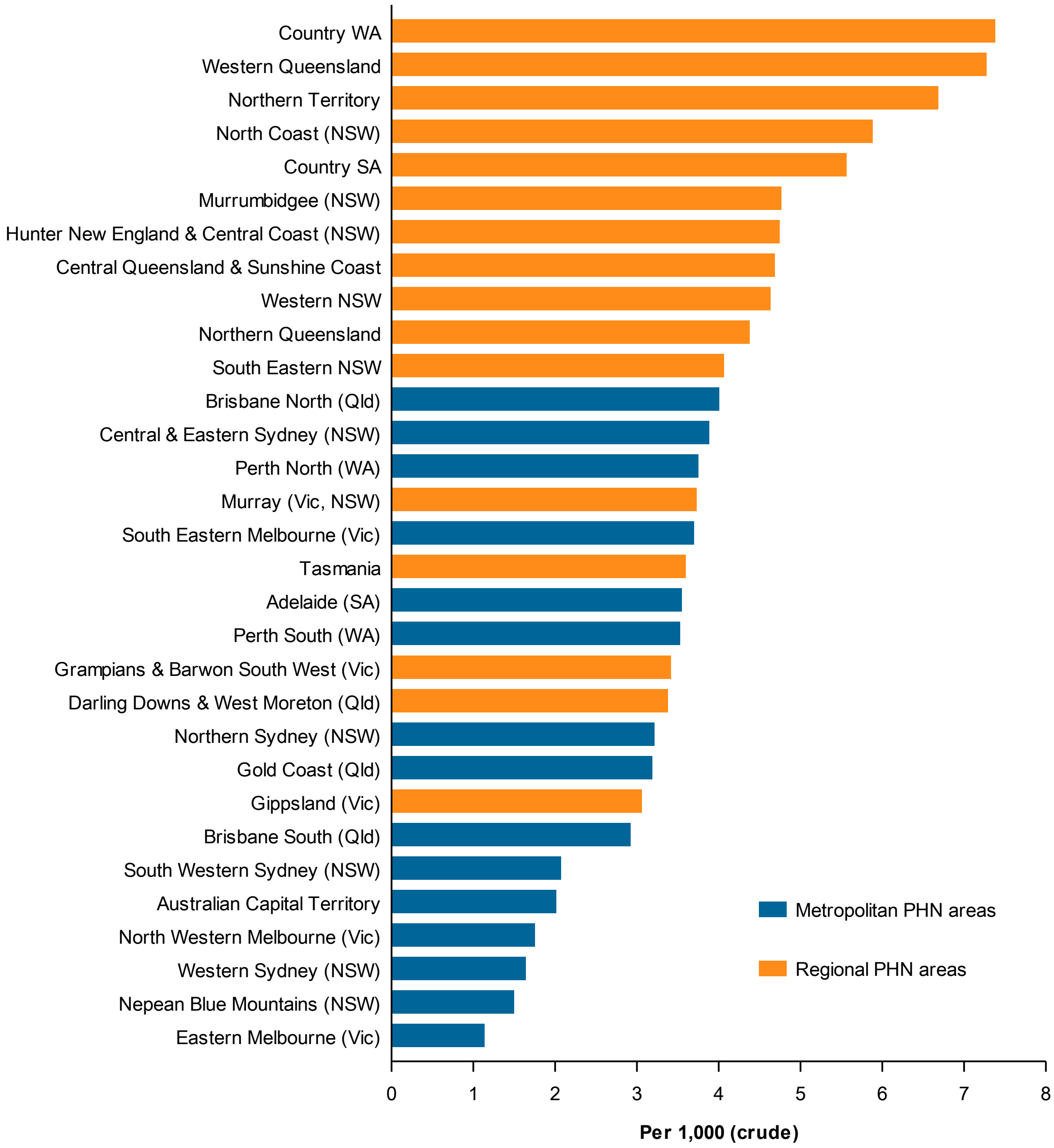
f) By jurisdiction, 2013–15

*Notes*

1. Age-standardised rates (ASR) are shown in figures b), c), e) and f), whereas all other figures show crude rates.
2. Figures a) and b) show the top 4 principal diagnoses for Indigenous Australians.
3. Figure c) includes NSW, Vic, Qld, WA, SA and NT combined.
4. Data for these figures are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Figure 3.3.1: Hospitalisation rates for diseases of the eye and adnexa, by various characteristics**

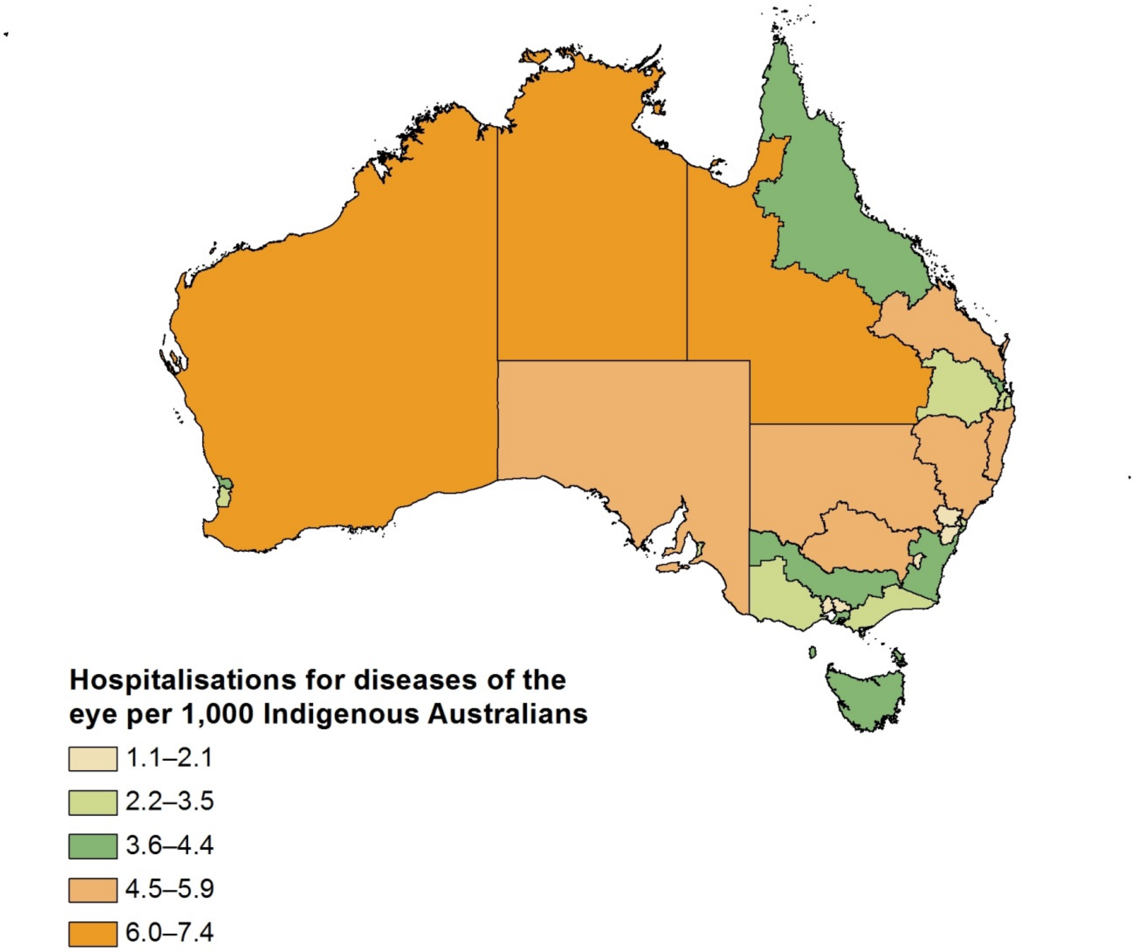


*Notes*

1. Data are crude rates.
2. Data for this figure are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Figure 3.3.2: Hospitalisation rates for diseases of the eye and adnexa for Indigenous Australians, by PHN, 2013–15**



*Note:* The PHN data for this map are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Map 3.3.1: Hospitalisation rates for diseases of the eye and adnexa for Indigenous Australians, by PHN, 2013–15**

## Measure 3.2: Hospitalisations for injuries to the eye

**Measure:** The number of hospitalisations for injuries to the eye and adnexa, per 1,000 Indigenous population, age-standardised rate and rate ratio.

### Results

**Overall:** In 2013–15, there were around 1,700 hospitalisations for Indigenous Australians for injury to the eye—a rate of 1.2 per 1,000 population. For Indigenous Australians, the most common principal diagnosis for hospitalisations for injury to the eye was an open wound of eyelid and periocular area (0.4 per 1,000) (Figure 3.3.3a).

In 2013–15, the age-standardised hospitalisation rate due to injury to the eye for Indigenous people was 3 times that of non-Indigenous people (1.3 and 0.4 per 1,000, respectively, a rate ratio of 3.1). The age-standardised rate for open wound of the eyelid and periocular area for Indigenous Australians was 0.4 per 1,000 compared with 0.1 for non-Indigenous Australians, a rate ratio of 3.6 (Figure 3.3.3b).

**Time trend:** Between 2005–07 and 2013–15, the age-standardised hospitalisation rate due to injury to the eye for Indigenous Australians was fairly constant (1.1 and 1.3 per 1,000, respectively). Over the same period, the rate for non-Indigenous Australians was also fairly constant, at around 0.4–0.5 per 1,000 (Figure 3.3.3c).

**Sex and age:** For Indigenous Australians in 2013–15, age-specific hospitalisation rates for eye injuries were highest in the middle age groups. The rates for Indigenous males aged 35–44, 45–54 and 55–64 were higher than those for Indigenous females of the same age (Figure 3.3.3d).

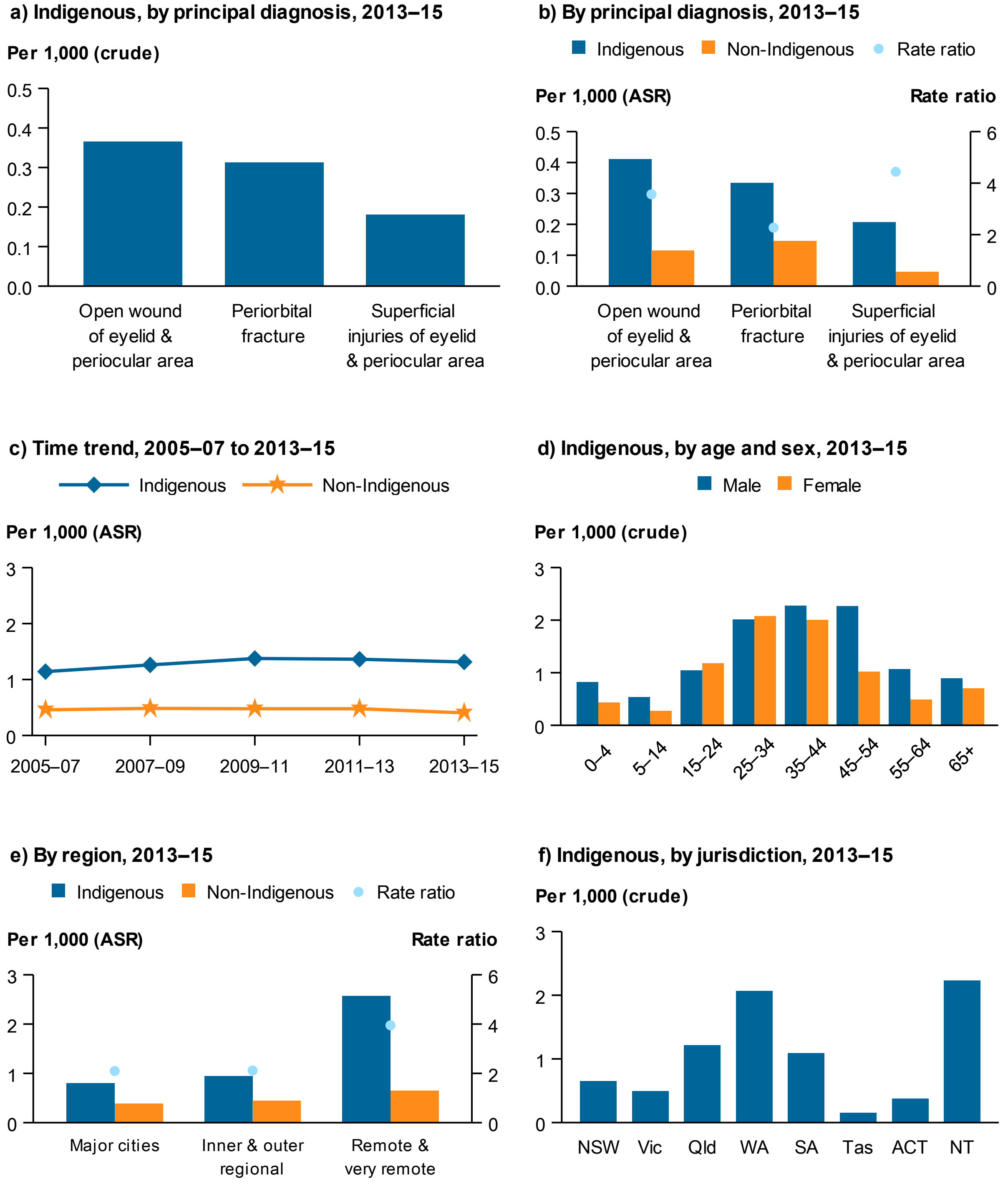
**Remoteness:** In all remoteness areas, hospitalisation rates for eye injuries were higher for Indigenous than for non-Indigenous Australians, after adjusting for age. The difference was largest in *Remote* and *Very remote* areas combined—a rate ratio of 4.0 (Figure 3.3.3e).

**Jurisdiction:** Hospitalisation rates for Indigenous Australians for eye injuries were highest in the Northern Territory and Western Australia (over 2 per 1,000) (Figure 3.3.3f).

**PHN:** The PHNs with the highest hospitalisation rate for Indigenous Australians for injury to the eye were Country WA, Western Queensland and the Northern Territory (over 2 per 1,000) (Figure 3.3.4; Map 3.3.2).

### Things to consider

- This measure is a count of hospitalisations for injury, not of occurrence of injury—as some injuries would result in more than 1 hospitalisation.
- The quality of data provided for Indigenous status varies.
- Time series analyses may be affected by changes in the quality of Indigenous identification over time.
- Data by state and territory, and by PHN, should be interpreted with caution due to variations in admission practices; and because patients may be hospitalised outside the state or territory, or PHN, where they reside.

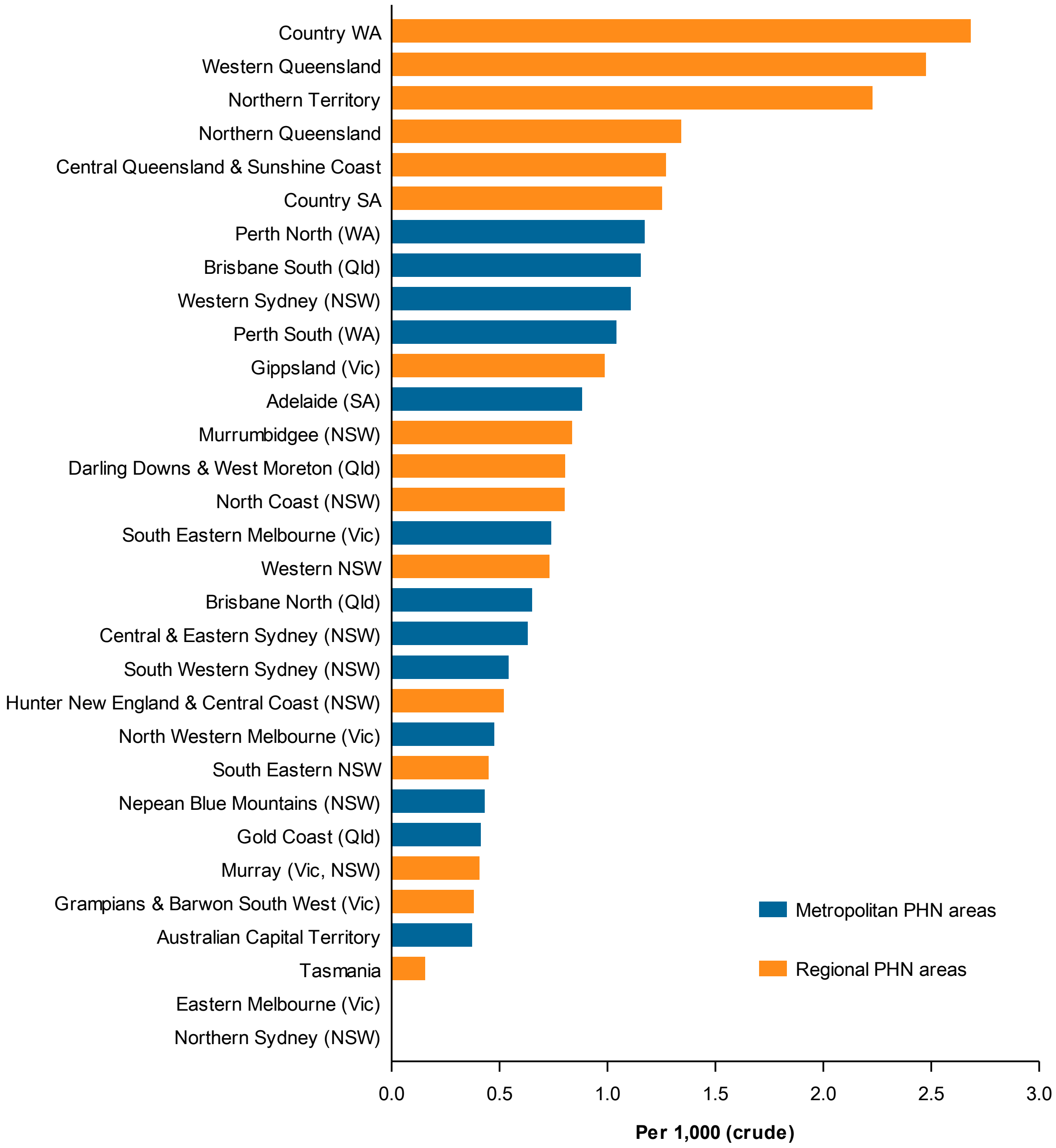


*Notes*

1. Age-standardised rates (ASR) are shown in figures b), c) and e), whereas all other figures show crude rates.
2. Figures a) and b) show the top 3 principal diagnoses for Indigenous Australians.
3. Figure c) includes NSW, Vic, Qld, WA, SA and NT combined.
4. Data for these figures are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Figure 3.3.3: Hospitalisation rates for injuries to the eye, by various characteristics**

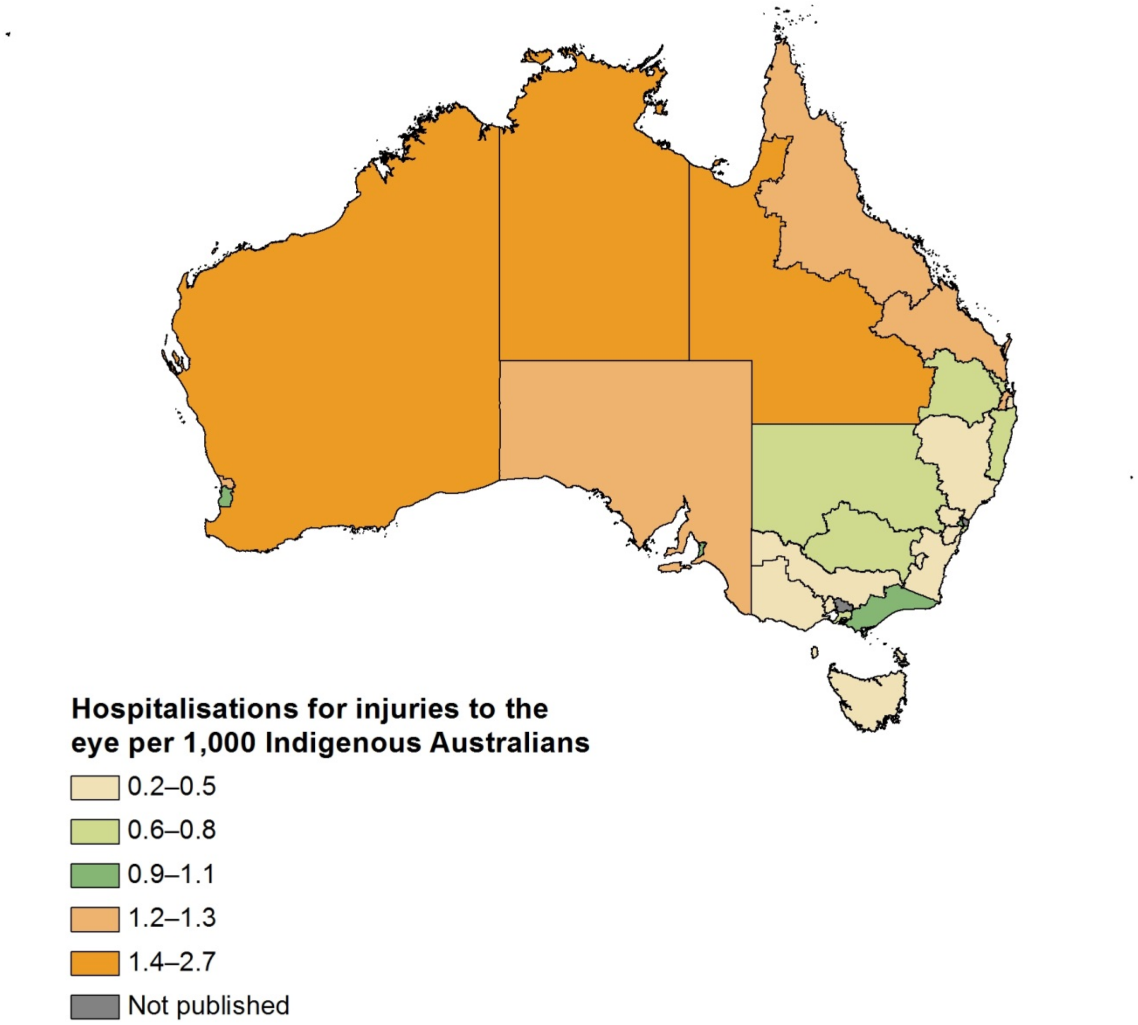


*Notes*

1. Data are crude rates.
2. Data are not presented for Eastern Melbourne and Northern Sydney because the number of hospitalisations was less than 5.
3. Data for this figure are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Figure 3.3.4: Hospitalisation rates for injuries to the eye for Indigenous Australians, by PHN, 2013–15**



*Notes*

1. Data were not published where the number of hospitalisations was less than 5.
2. The PHN data for this map are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Map 3.3.2: Hospitalisation rates for injuries to the eye for Indigenous Australians, by PHN, 2013–15**

## Measure 3.3: Hospitalisations for eye procedures

**Measure:** The number of hospital separations with a procedure on the eye and adnexa, per 1,000 Indigenous population, age-standardised rate and rate ratio.

### Results

**Overall:** In 2013–15, there were around 6,404 hospitalisations of Indigenous people for eye procedures—a crude rate of 4.5 per 1,000 population. For Indigenous Australians, the most common AR-DRG for hospitalisations for an eye procedure were lens procedures (2.6 per 1,000) (Figure 3.3.5a).

In 2013–15, the age-standardised hospitalisation rate for eye procedures was lower for Indigenous Australians compared with non-Indigenous Australians (10 and 13 per 1,000, respectively, a rate ratio of 0.8). The rate ratio was lowest for retinal procedures, where the age-standardised Indigenous rate was half the non-Indigenous rate (Figure 3.3.5b).

**Time trend:** Between 2005–07 and 2013–15, the age-standardised hospitalisation rate for eye procedures for Indigenous Australians increased from 6.7 per 1,000 to 9.7 per 1,000. Over the same period, the age-standardised rate for non-Indigenous Australians increased from 11 per 1,000 to 13 per 1,000 (Figure 3.3.5c).

**Sex and age:** In 2013–15, hospitalisation rates for eye procedures were low for Indigenous males and females in the younger age groups, but increased from age 45. Rates were highest for those aged 75–84: 64 per 1,000 for Indigenous males and 71 per 1,000 for Indigenous females (Figure 3.3.5d).

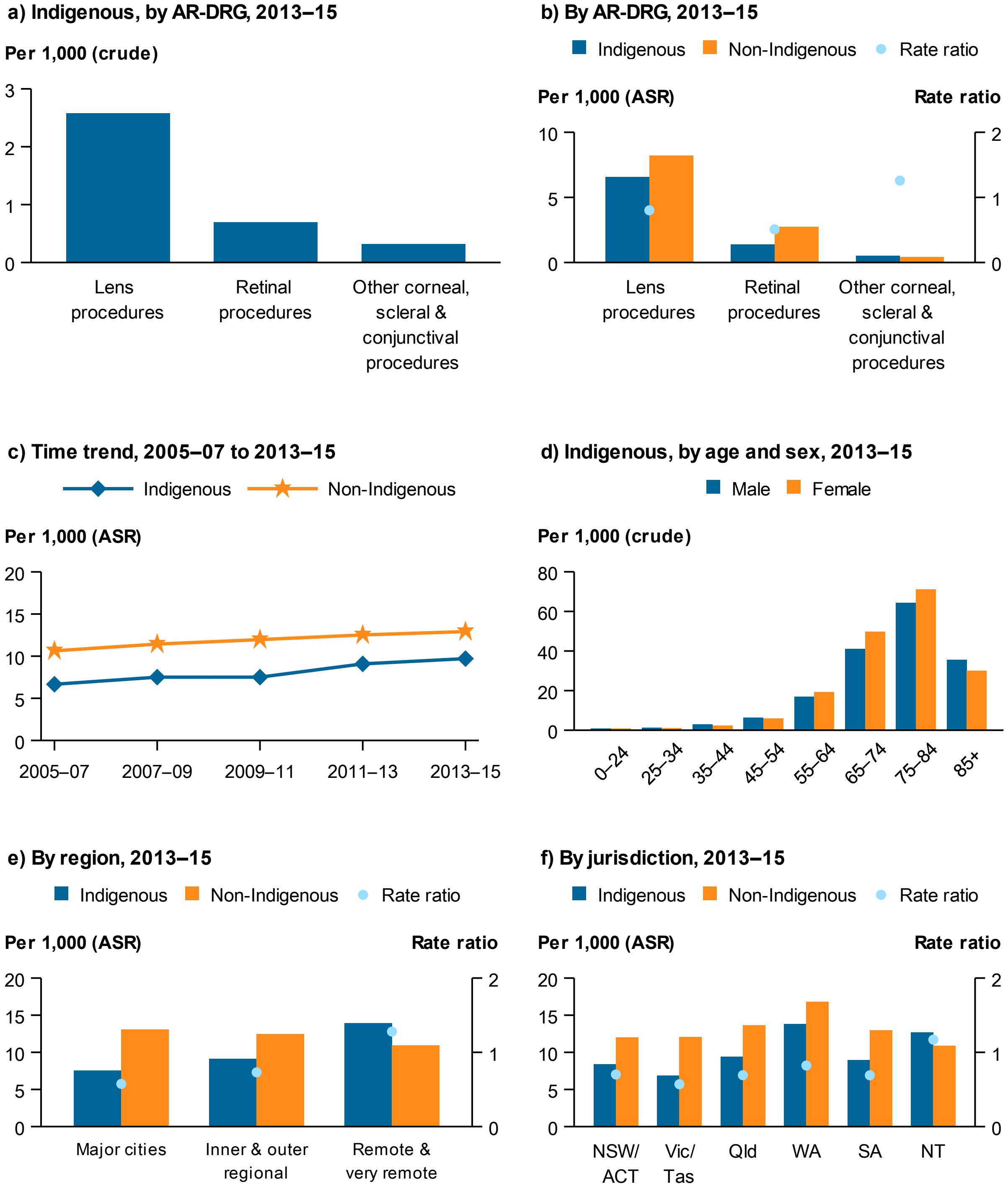
**Remoteness:** In *Major cities* and combined *Inner* and *Outer regional* areas, hospitalisation rates for eye procedures were higher for non-Indigenous Australians than for Indigenous Australians, after adjusting for age. In *Remote* and *Very remote* areas combined rates were higher for Indigenous Australians—a rate ratio of 1.3 (Figure 3.3.5e).

**Jurisdiction:** Hospitalisation rates for Indigenous Australians for eye procedures were lowest in Victoria and Tasmania combined (6.9 per 1,000) and were highest in Western Australia (14 per 1,000), followed by the Northern Territory (13 per 1,000) (Figure 3.3.5f).

**PHN:** The PHN with the lowest reported hospitalisation rate for Indigenous Australians for eye procedures was Nepean Blue Mountains (1.2 per 1,000), while the PHNs with the highest rates were Country WA and Western Queensland (7.6 and 7.3 per 1,000) (Figure 3.3.6; Map 3.3.3).

### Things to consider

- The AR-DRG represents a class of patients with similar clinical conditions that require similar hospital resources.
- The data may underestimate the number of procedures provided, as they do not include those undertaken on an outpatient basis.
- Data by state and territory, and by PHN, should be interpreted with caution due to variations in admission practices; and because patients may be hospitalised outside the state or territory, or PHN, where they reside. Also Australian Capital Territory private day hospitals are not included in the dataset.
- The quality of data provided for Indigenous status varies. Time series analyses may also be affected by changes in the quality of Indigenous identification over time.

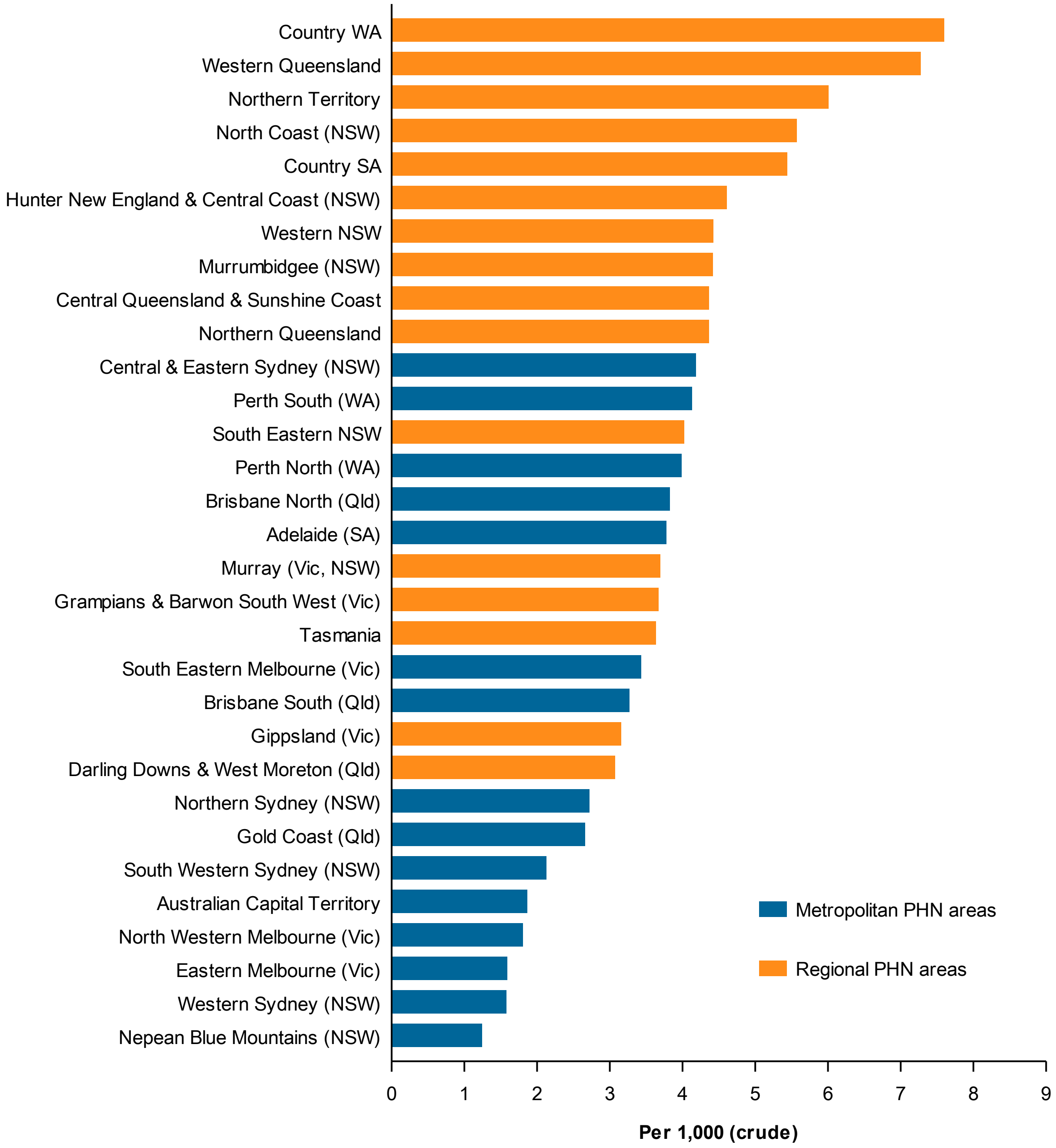


*Notes*

1. Age-standardised rates (ASR) are shown in figures b), c), e) and f), whereas all other figures show crude rates.
2. Figures a) and b) show the top 3 AR-DRG for Indigenous Australians.
3. Figure c) includes NSW, Vic, Qld, WA, SA and NT combined.
4. Data for these figures are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Figure 3.3.5: Hospitalisation rates for eye procedures, by various characteristics**

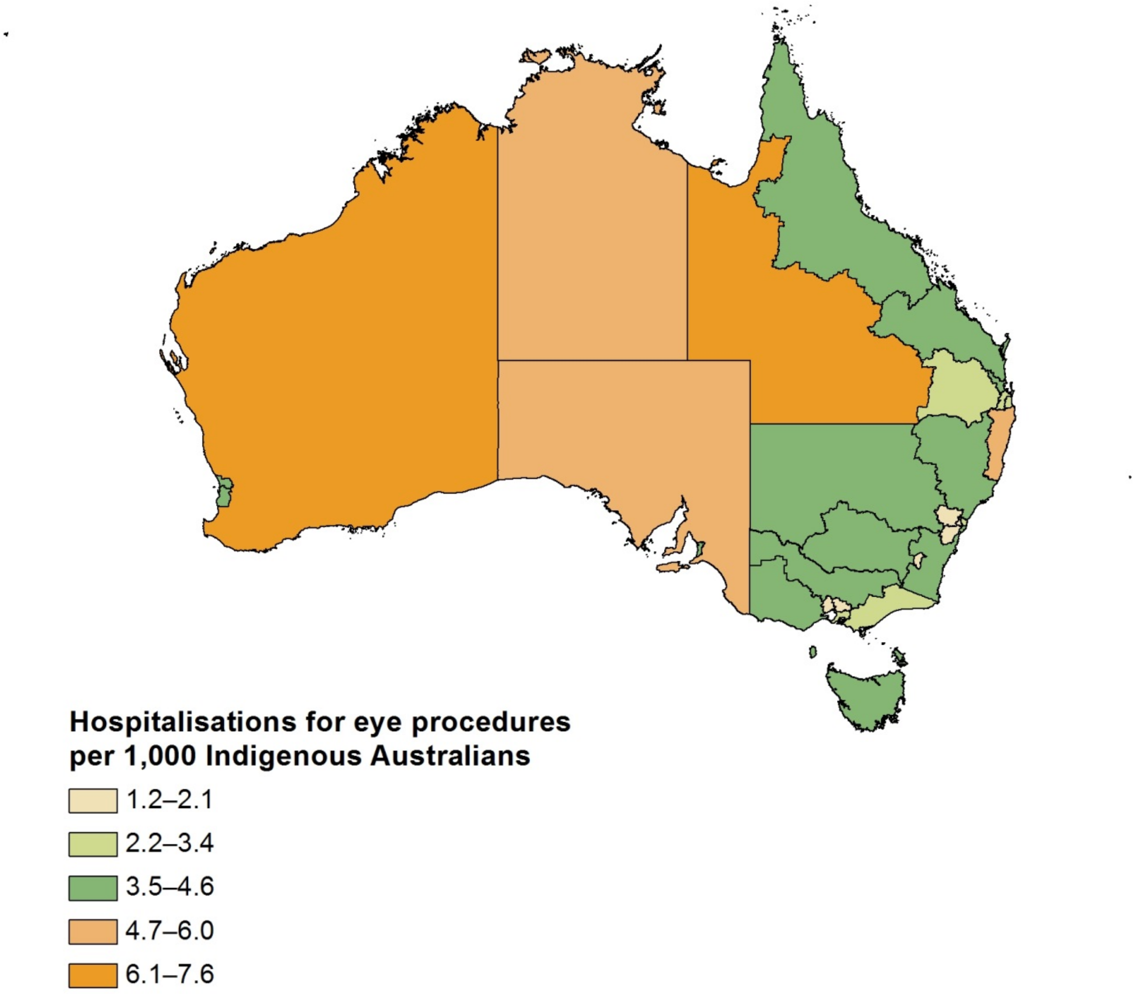


*Notes*

1. Data are crude rates.
2. Data for this figure are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Figure 3.3.6: Hospitalisation rates for eye procedures for Indigenous Australians, by PHN, 2013–15**



*Note:* The PHN data for this map are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Map 3.3.3: Hospitalisation rates for eye procedures for Indigenous Australians, by PHN, 2013–15**

## Measure 3.4: Cataract surgery rate

**Measure:** The number of hospital separations with a procedure for cataract surgery, per 1,000,000 Indigenous population, age-standardised rate and rate ratio.

### Results

**Overall:** In 2013–15, there were 4,043 hospitalisations for Indigenous Australians for cataract surgery—a rate of 2,832 per 1,000,000 population (Figure 3.3.7a). The number of hospitalisations for cataract surgery over the 2 year period 2013–15 was below the estimated annual number of Indigenous people needing cataract surgery (6,850) (IEHU 2017). The differences between hospitalisations for cataract surgery and estimated need were largest in New South Wales (931) followed by Queensland (900), Victoria (297) and Western Australia (237). It was lowest in the Australian Capital Territory (47) followed by Tasmania (126), the Northern Territory (131) and South Australia (153) (see online supplementary tables).

The age-standardised hospitalisation rates for cataract surgery for Indigenous Australians were lower than for non-Indigenous Australians (7,044 and 8,415 per 1,000,000, respectively, a rate ratio of 0.8) (Figure 3.3.7b).

**Time trend:** Between 2005–07 and 2013–15, the age-standardised Indigenous hospitalisation rate for cataract surgery increased from 4,918 to 7,052 per 1,000,000. Over the same period the age-standardised rate for non-Indigenous Australians increased at a slower rate, from 8,058 to 8,475 per 1,000,000, so there was a narrowing of the gap (Figure 3.3.7c).

**Sex and age:** Age-specific hospitalisation rates for Indigenous Australians for cataract surgery increased with age and were highest for those aged 75–84 in 2013–15 (Figure 3.3.7d).

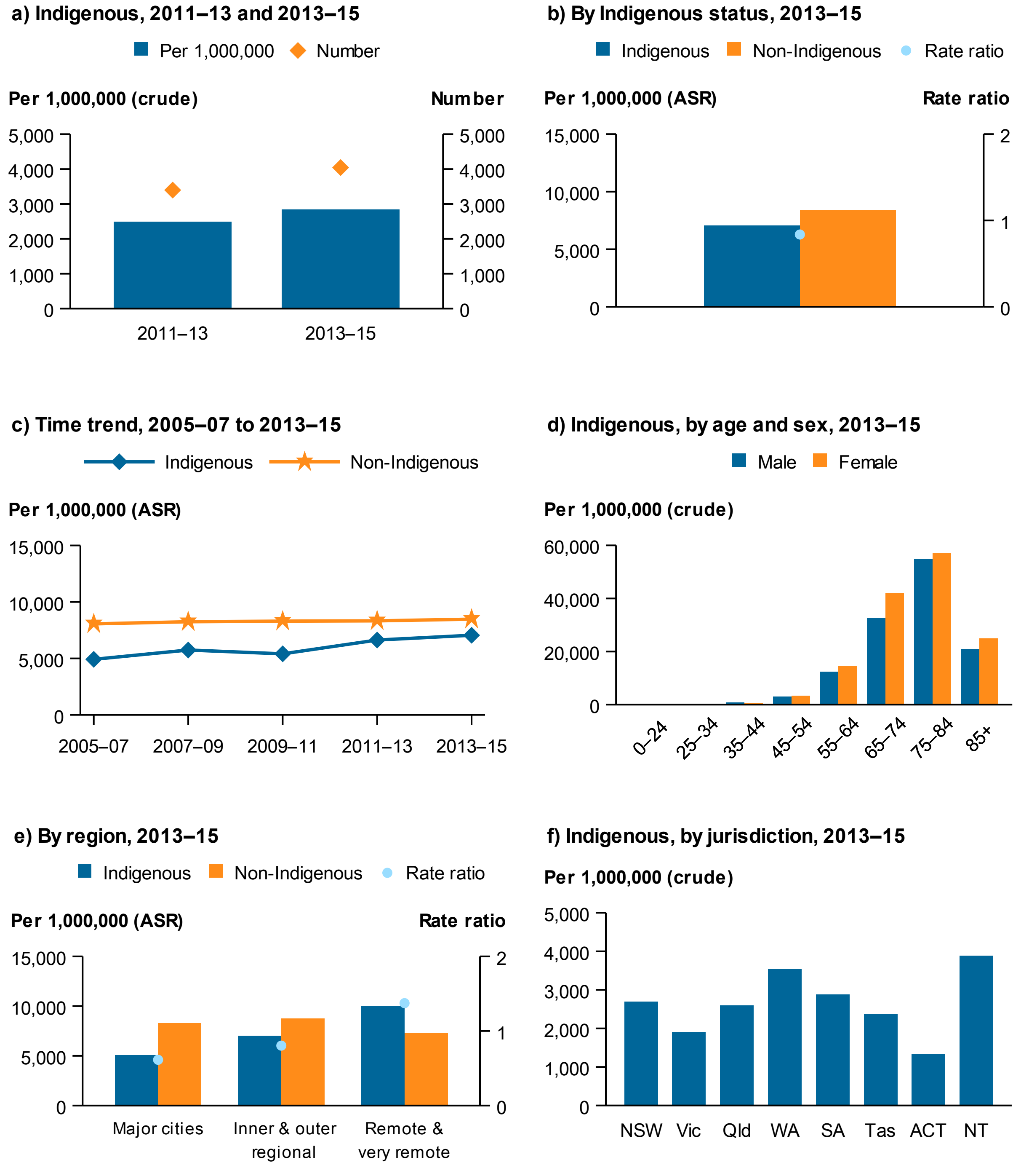
**Remoteness:** For Indigenous Australians, age-standardised rates of cataract surgery were lowest in *Major cities* and highest in the combined *Remote* and *Very remote* areas. Indigenous rates were higher than non-Indigenous rates in combined *Remote* and *Very remote* areas, but lower in the other regions, after adjusting for age (Figure 3.3.7e).

**Jurisdiction:** Rates of hospitalisations for cataract surgery for Indigenous Australians were highest in the Northern Territory and Western Australia (3,882 and 3,534 per 1,000,000) (Figure 3.3.7f).

**PHN:** Indigenous Australians hospitalisation rates for cataract surgery by PHN ranged from 428 to almost 5,000 per 1,000,000. The PHN with the highest rate for Indigenous Australians was Western Queensland (4,887 per 1,000,000) (Figure 3.3.8; Map 3.3.4).

### Things to consider

- The cataract surgery rate was calculated per 1,000,000, to align with international standards (WHO 2013).
- Almost all (96%) cataract surgery in Australia is undertaken on a same-day basis. The data may underestimate the number of procedures provided as they do not include those undertaken on an outpatient basis.
- Data by state and territory, and by PHN, should be interpreted with caution due to variations in admission practices; and because patients may be hospitalised outside the state or territory, or PHN, where they reside.
- The quality of data provided for Indigenous status varies. Time series analyses may also be affected by changes in the quality of Indigenous identification over time.

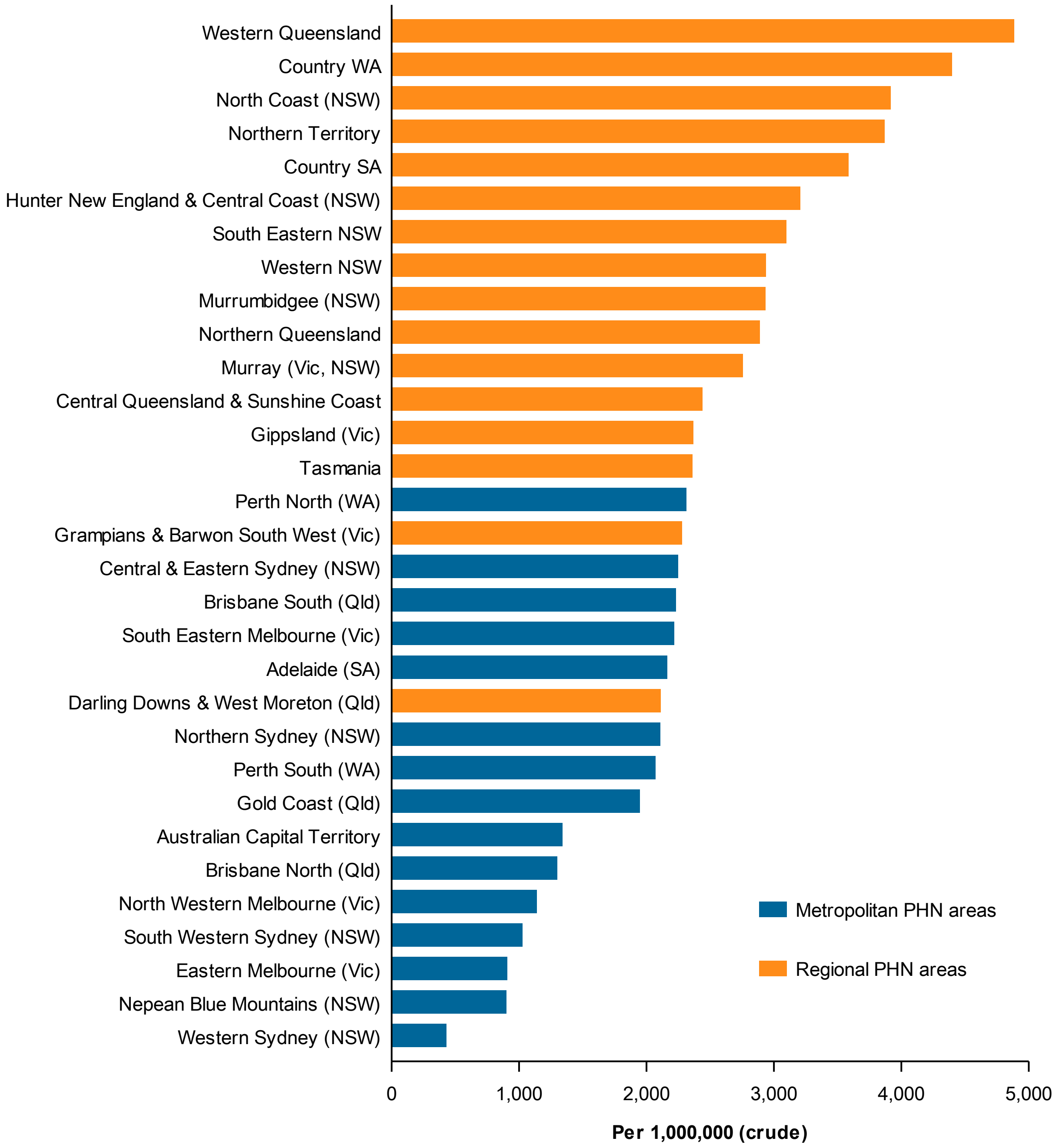


*Notes*

1. Age-standardised rates (ASR) are shown in figures b), c) and e), whereas all other figures show crude rates.
2. Figure c) includes NSW, Vic, Qld, WA, SA and NT combined.
3. Data for these figures are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Figure 3.3.7: Hospitalisation rates for cataract surgery, by various characteristics**

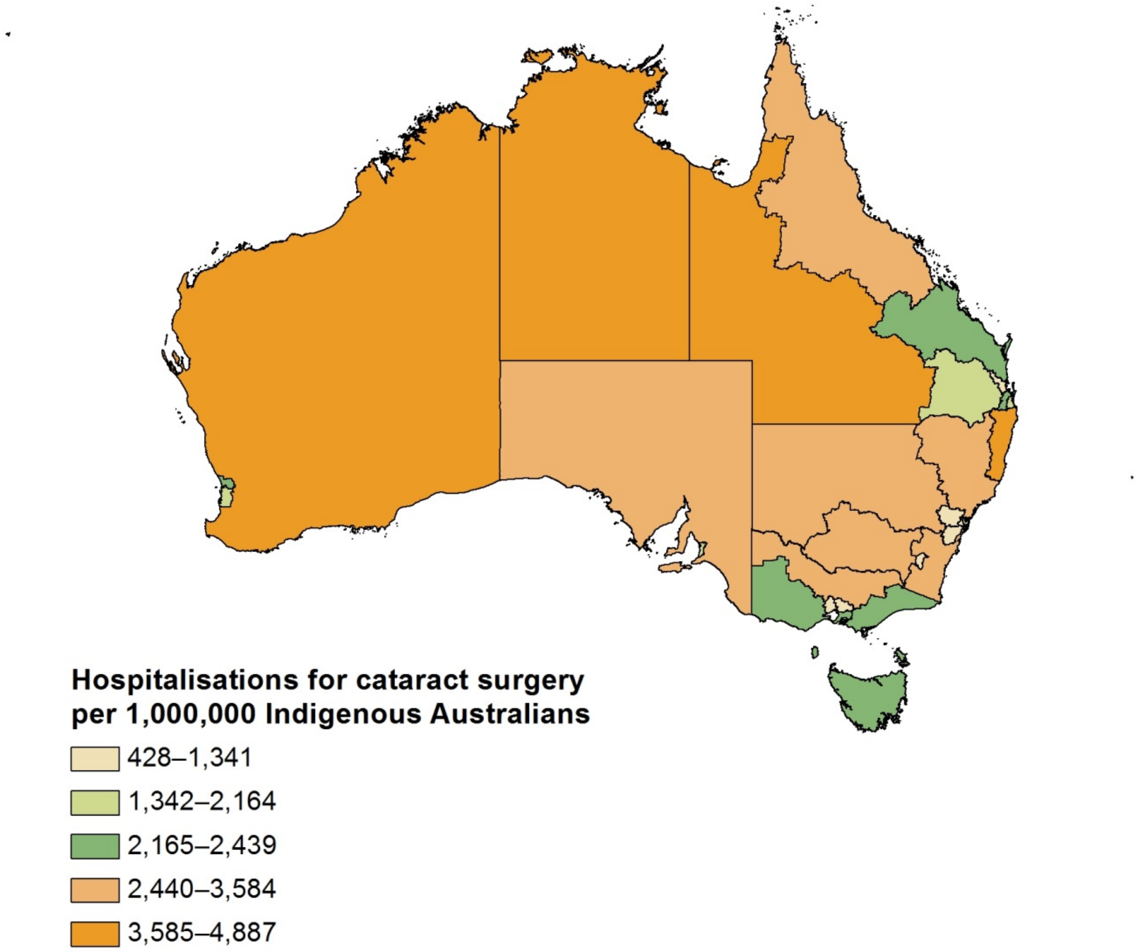


*Notes*

1. Data are crude rates.
2. Data for this figure are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Figure 3.3.8: Hospitalisation rates for cataract surgery for Indigenous Australians, by PHN, 2013–15**



*Note:* The PHN data for this map are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Map 3.3.4: Hospitalisation rates for cataract surgery for Indigenous Australians, by PHN, 2013–15**

## Measure 3.5: Cataract surgical coverage rate

**Measure:** The number of Indigenous Australians who have had cataract surgery, as a proportion of those who have had cataract surgery plus those who have vision impairment or blindness and cataracts in 1 or both eyes.

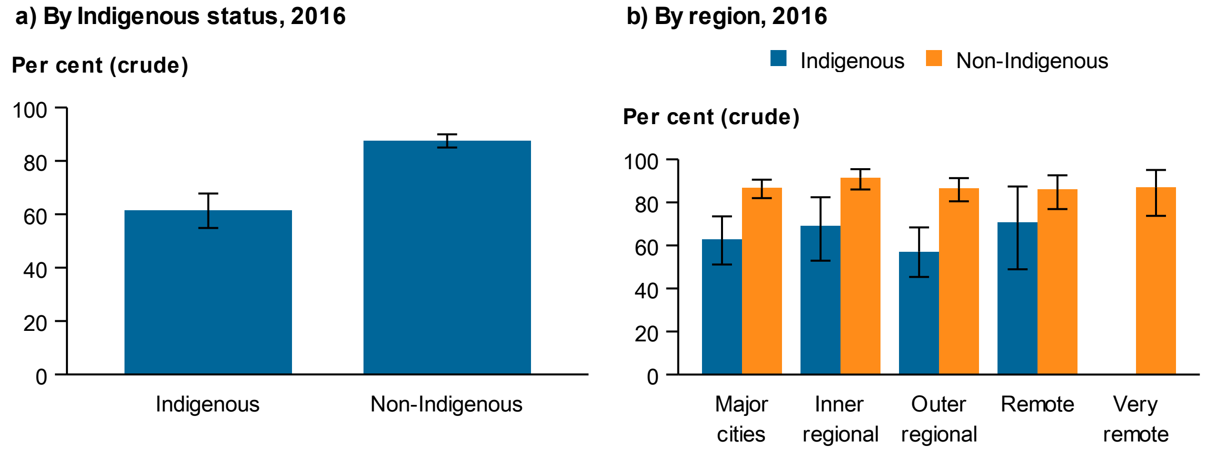
### Results

**Overall:** In 2016, the cataract surgical coverage rate for Indigenous participants in the 2016 NEHS was 62%. This was significantly lower than the rate for non-Indigenous participants (88%) (Figure 3.3.9a).

**Remoteness:** Cataract surgical coverage rates for Indigenous participants did not differ significantly by remoteness (Figure 3.3.9b).

### Things to consider

- Data are from the 2016 NEHS, a sample survey of 1,738 Indigenous Australians aged 40 and over and 3,098 non-Indigenous Australians aged 50 and over. The survey included an eye examination.
- The survey results reported are crude unadjusted sample proportions. These results are subject to sampling errors, so the 95% confidence intervals are provided to indicate the reliability of the estimates reported.



*Notes*

1. Cataract surgery coverage was calculated by dividing the number of who have had cataract surgery, by the number who had cataracts and vision impairment or blindness plus the number who had cataract surgery.
2. All figures show crude rates.
3. Error bars show 95% confidence intervals.
4. Rates for Indigenous people in *Very remote* areas have not been published, due to small numbers.
5. Data for these figures are available in the online supplementary tables.

*Source:* NEHS 2016.

**Figure 3.3.9: Cataract surgery coverage, by various characteristics**

## Measure 3.6: Waiting times for elective cataract surgery

**Measure:** The waiting time for elective cataract surgery, expressed as:

1) the median waiting time (or the number of days within which 50% of patients who completed their wait were admitted for cataract surgery) and the 90th percentile waiting time (or the number of days within which 90% of patients who completed their wait were admitted for cataract surgery)
2) the proportion of patients who completed their wait who had cataract surgery within 90 days, and the proportion who waited more than 365 days for cataract surgery.

### Results

#### 3.6.1 Median and 90th percentile waiting times

**Overall:** In 2014–15, there were 1,473 admissions from public hospitals waiting lists for elective cataract surgery for Indigenous Australians. The median waiting time for elective cataract surgery for Indigenous Australians was longer than that for non-Indigenous Australians (142 days and 84 days, respectively). The time waited before 90% of Indigenous Australians were admitted for cataract surgery was also longer than that for non-Indigenous Australians, though the difference between the 2 groups was not as large (345 days and 334 days, respectively).

**Time trend:** Between 2012–13 and 2013–14, the median waiting time for elective cataract surgery for Indigenous Australians dropped from 140 days to 112 days, before rising to 142 days in 2014–15. Over the same period, the median waiting time for non-Indigenous Australians remained fairly stable at around 84–88 days (Figure 3.3.10a).

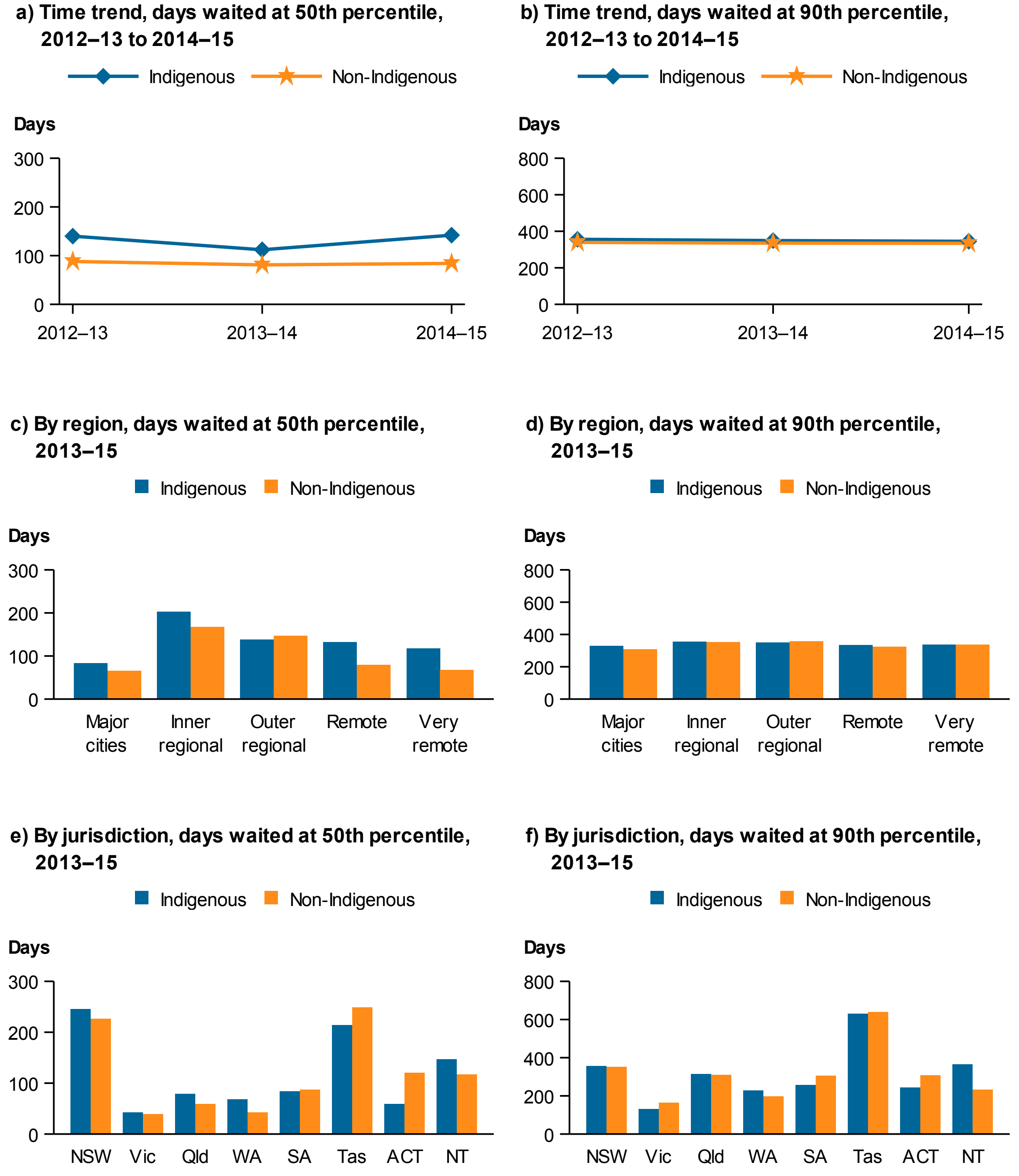
Between 2012–13 and 2014–15, the number of days waited at the 90th percentile was similar for Indigenous and non-Indigenous Australians and remained relatively stable for both groups (Figure 3.3.10b).

**Remoteness:** The median number of days waited by Indigenous and non-Indigenous Australians was longest in *Inner regional* areas, 203 and 168 days respectively. By comparison, both Indigenous and non-Indigenous Australians in *Major cities* had the shortest waiting times, 83 and 66 days respectively (Figure 3.3.10c).

The amount of time within which 90% of patients were admitted for elective cataract surgery was longest for Indigenous Australians in *Inner regional* areas, 356 days, and shortest in *Major cities*, 330 days. For non-Indigenous Australians, waiting times were longest in *Outer regional* areas, 359 days, and shortest in *Major cities*, 310 days (Figure 3.3.10d).

**Jurisdiction:** Median waiting times were longest for Indigenous Australians in New South Wales (245 days) while for non-Indigenous Australians median waiting times were longest in Tasmania (249 days). Median waiting times for Indigenous and non-Indigenous Australians were shortest in Victoria (42 and 39 days, respectively) (Figure 3.3.10e).

At the 90th percentile, waiting times were longest for Indigenous and non-Indigenous Australians in Tasmania (631 and 638 days respectively), and were shortest in Victoria (130 and 163 days, respectively) (Figure 3.3.10f).



*Note:* Data for these figures are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Figure 3.3.10: Waiting times for elective cataract surgery (days waited at 50th and 90th percentiles), by various characteristics**

### 3.6.2 Proportion of patients treated within 90 days and waiting more than 365 days

**Overall:** In 2014–15 the proportion of Indigenous Australians who had elective cataract surgery and were treated within 90 days was lower than the proportion of non-Indigenous Australians who were treated within this time (40% and 52%, respectively).

Similarly, the proportion of Indigenous Australians who waited more than 365 days for cataract surgery was higher than the proportion of non-Indigenous Australians who waited this long (3.4% and 1.8%, respectively).

**Time trend:** Between 2012–13 and 2014–15, the proportion of both Indigenous and non-Indigenous Australians who were treated within 90 days for elective cataract surgery remained relatively stable (Figure 3.3.11a). The proportion of Indigenous and non-Indigenous Australians who waited more than 365 days for cataract surgery, however, declined (Figure 3.3.11b).

**Remoteness:** The proportion of Indigenous Australians who were treated within 90 days for elective cataract surgery was highest in *Major cities*, whereas for non-Indigenous Australians it was highest in *Very remote* areas. For both Indigenous and non-Indigenous Australians, the proportion was lowest in *Inner regional* areas (Figure 3.3.11c). The proportion of Indigenous and non-Indigenous Australians who waited more than 365 days for surgery was highest in *Very remote* areas and was lowest in *Major cities* (Figure 3.3.11d).

**Jurisdiction:** The proportion of Indigenous and non-Indigenous Australians who were treated within 90 days for elective cataract surgery was highest in Victoria (75% and 77%, respectively) and lowest in New South Wales (23% and 28%, respectively) (Figure 3.3.11e).

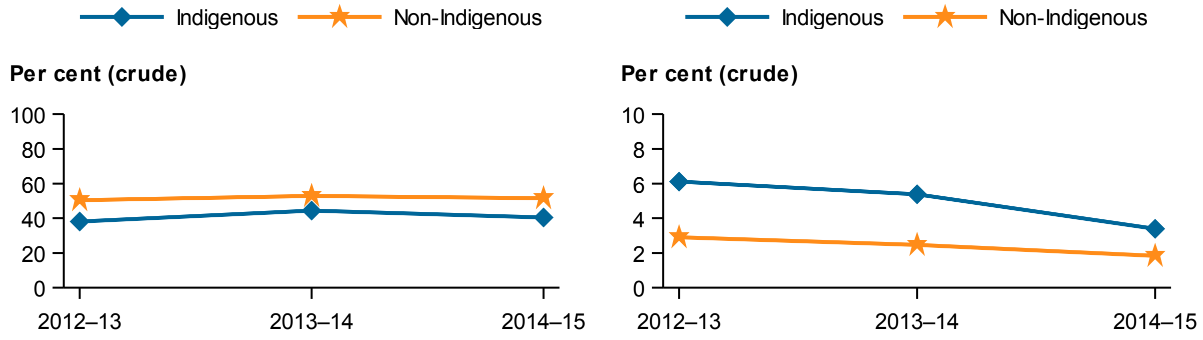
The proportion of Indigenous and non-Indigenous Australians waiting more than 365 days for cataract surgery was highest in Tasmania (29% and 36%, respectively) (Figure 3.3.11f).

## Things to consider

- This measure includes data for waiting lists managed by public hospitals—and may include public patients admitted from waiting lists to private hospitals.
- The number of days waited does not include the time waited for the initial appointment with the specialist (from the time of referral by the patient's GP), because this information is not currently available.
- The data may underestimate the number of procedures provided, as they do not include those undertaken on an outpatient basis.
- Most cataract surgery is non-urgent, and therefore not clinically recommended as being required within 90 days.
- The quality of data provided for Indigenous status varies.
- Time series analyses may be affected by changes in the quality of Indigenous identification over time.

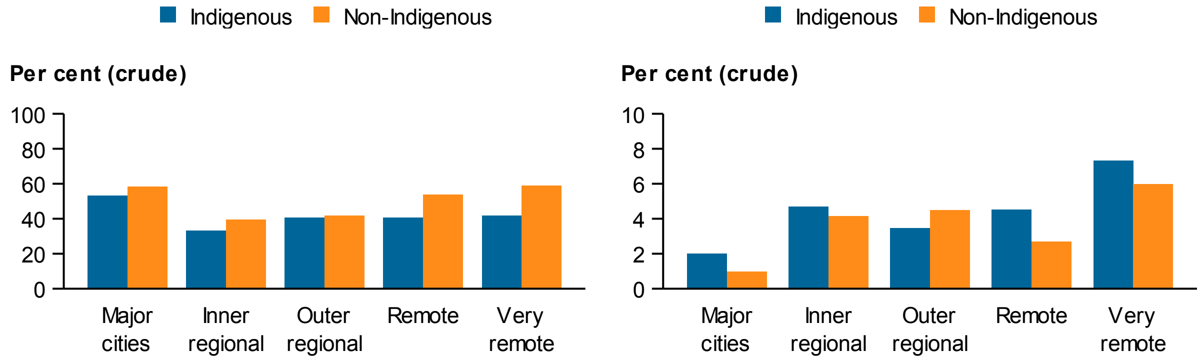
**a) Time trend, treated within 90 days, 2012–13 to 2014–15**

**b) Time trend, waiting >365 days, 2012–13 to 2014–15**



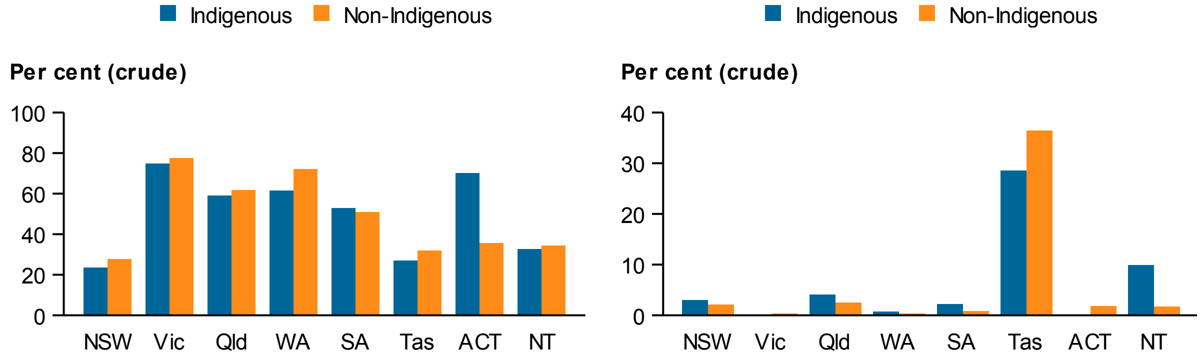
**c) By region, treated within 90 days, 2013–15**

**d) By region, waiting >365 days, 2013–15**



**e) By jurisdiction, treated within 90 days, 2013–15**

**f) By jurisdiction, waiting >365 days, 2013–15**



*Note:* Data for these figures are available in the online supplementary tables.

*Source:* AIHW NHMD.

**Figure 3.3.11: Waiting times for elective cataract surgery (percentage of patients treated within 90 days and waiting >365 days), by various characteristics**

## Measure 3.7: Trachoma and trichiasis treatment coverage

**Measure:** The estimated number, and proportion of:

1) community members who were treated in communities where active trachoma was identified
2) Indigenous adults with trichiasis who were treated or offered treatment.

### Results

#### 3.7.1 Trachoma

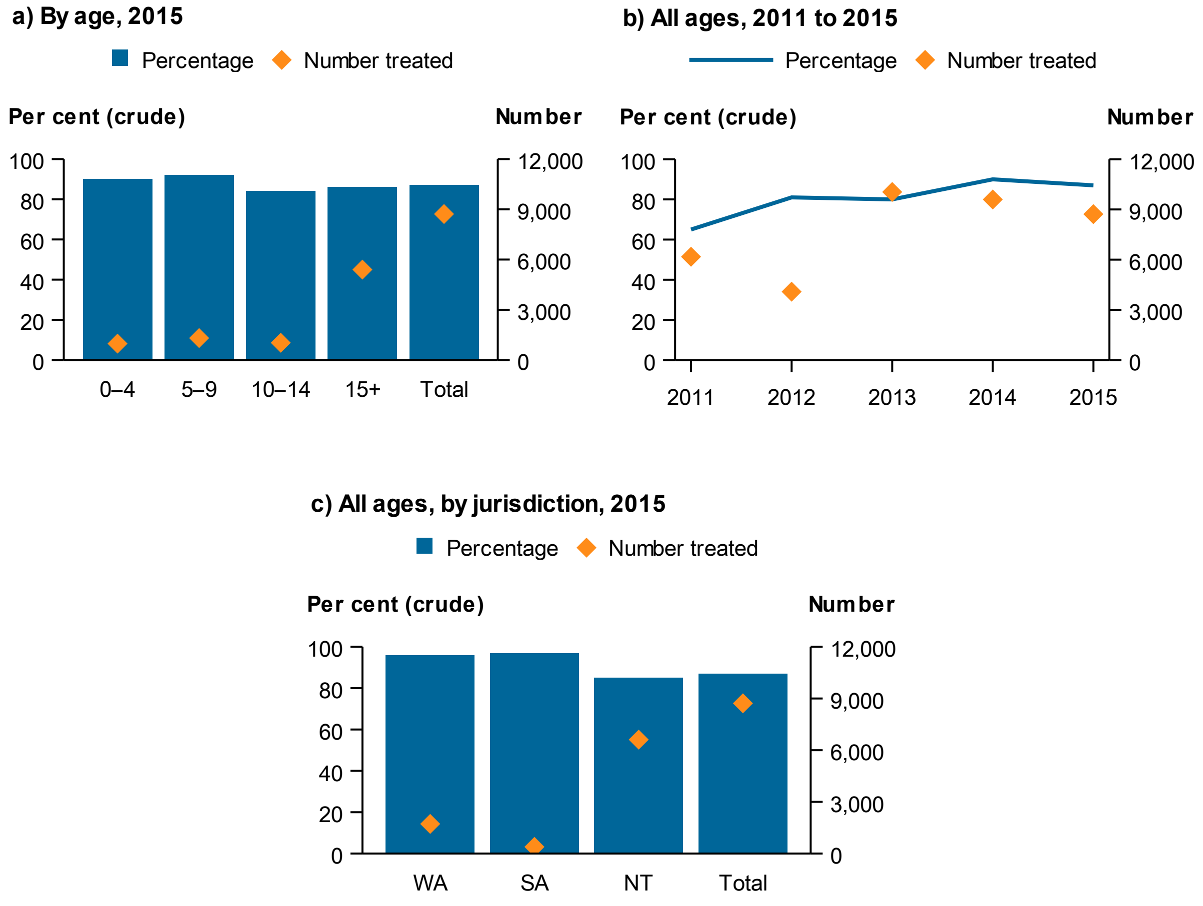
**Overall:** In 2015 in communities where active trachoma was identified, a total of 8,720 community members received treatment, a rate of 87% (Figure 3.3.12a). This included 979 children aged 0–4 (90%), 1,311 aged 5–9 (92%), 1,030 aged 10–14 (84%) and 5,400 community members aged 15 and over (86%) (Figure 3.3.12a).

**Time trend:** Between 2011 and 2015, the proportion of community members who received treatment in communities where active trachoma was identified rose from 65% to 87% (Figure 3.3.12b).

**Jurisdiction:** In 2015, the proportion of community members who received treatment in communities where active trachoma was identified was 96% in Western Australia (1,720), 97% in South Australia (388), and 85% in the Northern Territory (6,612) (Figure 3.3.12c).

### Things to consider

- Trachoma treatment strategies were applied in 51 communities. Treatment was delivered to active cases and households in 25 communities and to the whole of the community in 26 communities.
- There were 5 communities in the Northern Territory that did not deliver treatment in line with CDNA guidelines due to staffing restraints, road conditions and cultural ceremonies (Kirby Institute 2016).
- The 5–9 age group is the target group for screening programs in all regions.



*Notes*

1. All figures show crude rates. 'Per cent' relates to percentage of community members where active trachoma was identified who were treated.
2. Includes data from the 51 communities where trachoma treatment strategies were applied.
3. Data for these figures are available in the online supplementary tables.

*Sources:* Australian Trachoma Surveillance reports (Kirby Institute 2012, 2013, 2014, 2015, 2016).

**Figure 3.3.12: Community members where active trachoma was identified who were treated by various characteristics**

### 3.7.2 Trichiasis

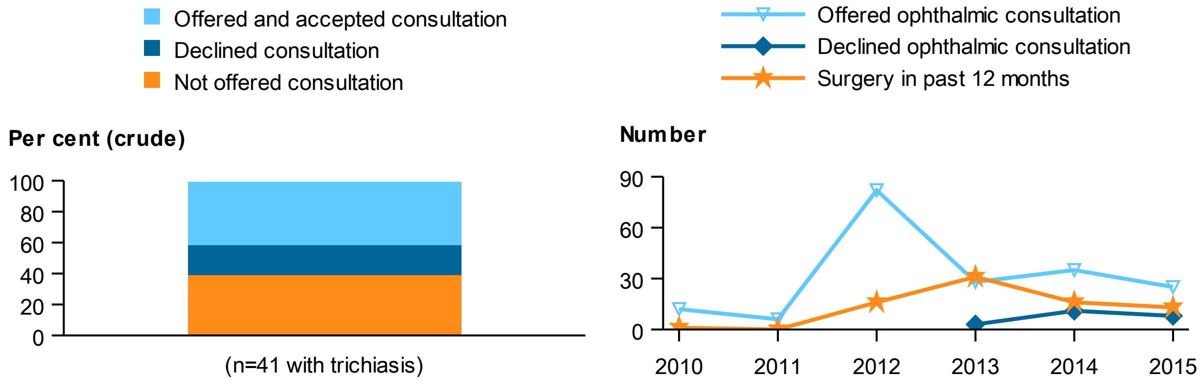
**Overall:** In 2015, of the 41 Indigenous adults aged 40 and over with trichiasis in the 3 jurisdictions with at-risk communities, 17 (41%) were offered an ophthalmic consultation and accepted, and 8 (20%) were offered but declined (Figure 3.3.13a).

**Time trend:** The number of Indigenous adults aged 40 and over who were offered an ophthalmic consultation increased, from 12 out of 22 with trichiasis in 2010 to 82 out of 94 in 2012, and then decreased to 25 out of 41 in 2015. Between 2013 and 2015, the number who declined a consultation was 11 or less. The number of Indigenous adults aged 40 and over who had surgery for trichiasis rose from 1 adult in 2010 to 31 in 2013, and then declined to 13 in 2015 (Figure 3.3.13b).

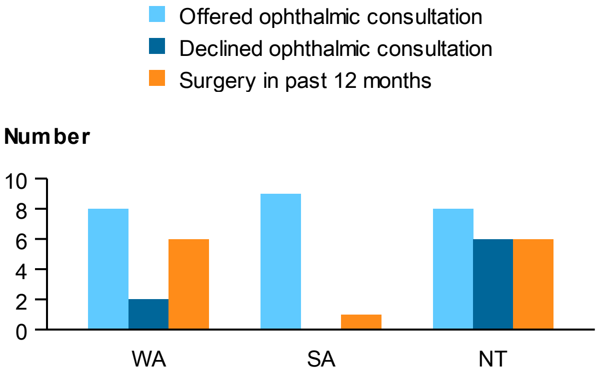
**Jurisdiction:** All of those aged 40 and over with trichiasis in South Australia and Western Australia were offered an ophthalmic consultation. In the Northern Territory, 6 people declined an ophthalmic consultation and in Western Australia, 2 people declined. Western Australia and the Northern Territory had the largest number of adults aged 40 and over who had surgery: 6 out of the 8 adults with trichiasis in both jurisdictions (Figure 3.3.13c).

## Things to consider

- Screening for trichiasis is undertaken opportunistically, such as during adult health checks.
- The reporting of trichiasis data on referral and surgery undertaken is limited due to incomplete data collection and compilation.


a) Aged 40 and over, 2015

b) Aged 40 and over, 2010 to 2015


c) Aged 40 and over, by jurisdiction, 2015

*Notes*

1. Includes data from the 103 communities that screened for trichiasis, though data may be incomplete.
2. Data for these figures are available in the online supplementary tables.

*Sources:* Australian Trachoma Surveillance reports (Kirby Institute 2011, 2012, 2013, 2014, 2015, 2016).

**Figure 3.3.13: Trichiasis treatment coverage, by various characteristics**

## Measure 3.8: Treatment of refractive error

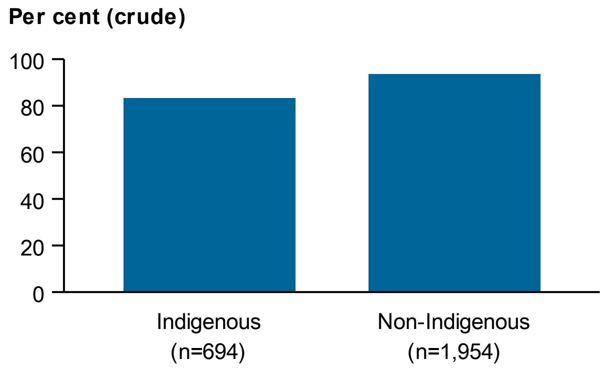
**Measure:** The number of Indigenous Australians who required treatment for refractive error and had spectacle or contact lens correction, as a proportion of those who had spectacle or contact lens correction plus those who had refractive error as a main cause of vision impairment or blindness.

### Results

**Overall:** In 2016, treatment rates for refractive error were higher for non-Indigenous than Indigenous participants in the 2016 NEHS, 94% and 83%, respectively (Figure 3.3.14).

### Things to consider

- Data are from the 2016 NEHS, a sample survey of 1,738 Indigenous Australians aged 40 and over and 3,098 non-Indigenous Australians aged 50 and over. The survey included an eye examination.
- The survey results reported are crude unadjusted sample proportions. These results are subject to sampling errors.
- These proportions were estimates only as refractive error was not measured as part of the survey testing protocol in participants without vision impairment or blindness.



*Notes*

1. This figure shows crude rates.
2. Data for this figure are available in the online supplementary tables.

*Source:* NEHS 2016.

**Figure 3.3.14: Treatment of refractive error, by Indigenous status, 2016**

## Measure 3.9: Spectacles dispensed under state schemes

**Measure:** The number of Indigenous people receiving glasses under state subsidised spectacles programs, per 1,000 population.

### Results

Only 3 jurisdictions could provide data for this measure, with the type of data available varying.

**Overall:** In 2014–15, there were around 6,232 Indigenous Australians who received glasses under the New South Wales state scheme (28 per 1,000 population), and 2,192 who received glasses under the Queensland state scheme (11 per 1,000 population). There were 2,386 spectacles dispensed under the Victorian state scheme (44 per 1,000 population) (Figure 3.3.15a).

In 2014–15, Indigenous Australians received glasses under the Victorian state scheme at a rate of 44 per 1,000 population. In New South Wales the rate was 28 per 1,000 population and in Queensland it was 11 per 1,000 population (Figure 3.3.15b).

Comparing the numbers receiving spectacles with the estimated annual need for Indigenous Australians, showed that the number of glasses received in Victoria (2,386) was closest to the estimated number of glasses needed for people over 40 (3,303). In New South Wales and Queensland the estimated need was considerably greater than the number received—in New South Wales 6,232 glasses were received and an estimated 14,271 were needed and in Queensland 2,192 were received and an estimated 13,146 were needed (Figure 3.3.15a).

**Sex and age:** In New South Wales in 2014–15, there were higher rates of Indigenous females than males who received glasses under the spectacles program in all age groups. Numbers and rates of Indigenous clients who received glasses were highest for males and females aged 65 and over (Figure 3.3.15c).

In Queensland in 2014–15, the number of Indigenous clients receiving glasses under the spectacles program increased with age. Rates were highest among those aged 65 and over (82 per 1,000), followed by those aged 50–64 (38 per 1,000) (Figure 3.3.15d).

**PHN:** Victoria was the only jurisdiction to provide data by PHN. In Victoria, the rate of glasses dispensed to Indigenous people ranged from 17 per 1,000 population in Eastern Melbourne to 65 in North Western Melbourne (Figure 3.3.15e).

### Things to consider

- The data for New South Wales and Queensland relate to the number of clients receiving glasses, whereas data for Victoria relate to the number of glasses provided.
- The eligibility criteria and entitlements provided by the state schemes vary across jurisdictions:
  - In New South Wales and Queensland clients are eligible for subsidised glasses every two years.
  - In Victoria, each client may receive more than 1 pair of glasses.
- The estimated annual numbers of Indigenous people needing spectacles were derived from the Calculator for the delivery and coordination of eye care services developed by the Indigenous Eye Health Unit at the University of Melbourne (IEHU 2017).

*Notes*

1. All figures show crude rates.
2. Data for New South Wales and Queensland are the number of persons receiving spectacles, while data for Victoria are number of spectacles provided.
3. The estimated number of people needing spectacles was derived from the Calculator for the coordination and delivery of eye care services (IEHU 2017).
4. Data for these figures are available in the online supplementary tables.

*Sources:* AIHW analysis of NSW Department of Family and Community Services data (unpublished); Australian College of Optometry Victorian data (unpublished); Queensland Health data (unpublished); IEHU 2017.

**Figure 3.3.15: State spectacles schemes, by various characteristics**

# 3.4 Workforce and outreach programs—size and distribution

**Box 3.4: Overview of workforce and outreach services**

- In 2015, there were around 4,559 optometrists employed in Australia, an increase of 525 on the number of employed optometrists in 2011 (4,034).
- In 2015, there were around 896 ophthalmologists, compared with 836 employed in 2012.
- In 2010, of all allied ophthalmic personnel, there were around 4,239 optical dispensers, 720 optical mechanics and 643 orthoptists, registered in Australia.
- The number and FTE rate of registered optometrists, ophthalmologists and allied ophthalmic personnel decreased with remoteness. There were insufficient numbers of eye health workforce specialists to calculate rates in both *Remote* and *Very remote* areas.
- In 2014–15, there were 18,890 occasions of service for Indigenous patients under the VOS, with the numbers generally highest in those areas with fewer registered optometrists.
- The number of occasions of service for Indigenous patients under the VOS almost tripled between 2009–10 and 2014–15 rising from 6,975 to 18,890.
- In 2014–15 there were 7,829 occasions of service for Indigenous clients in relation to eye health under the RHOF, while in 2015–16 there were 1,156 occasions of service for Indigenous clients with an eye health professional under the MOICDP.

The size and location of the eye health workforce gives a broad indication of access to specialist and allied eye health services. Specialist eye health practitioners are required to treat more serious eye problems and to undertake the more complex procedures, such as cataract surgery. National data are available for 3 eye health workforce measures: *4.1 Number and rate of optometrists; 4.2 Number and rate of ophthalmologists* and *4.3 Number and rate of allied ophthalmic personnel*. These 3 measures are in the Australian Government's National Framework for Action to Promote Eye Health and Prevent Avoidable Blindness and Vision Loss and the World Health Organization's Universal Eye Health Global Action Plan 2014–19 (WHO 2013). The rates used are FTEs.

The data on optometrists and ophthalmologists come from the National Health Workforce Dataset (NHWDS). These data are derived from the annual registration process required for health workforce professionals and are available annually. The data on allied ophthalmic personnel come from various sources, including the ABS Census, professional associations and employer organisations, and were collated by AIHW (AIHW 2016c). These data are not updated on a regular basis.

The measure on occasions of eye health services provided under outreach programs includes data on the VOS which supports optometrists to deliver outreach services; the RHOF which supports the delivery of medical specialities, GPs and allied and other health outreach services in rural, regional and remote areas; and the MOICDP on chronic disease patients seen by eye health specialists. The data for *4.4 Occasions of eye health services provided under outreach programs* were provided to the Department of Health by the fund holders for these programs in each jurisdiction. The outreach data does not include outreach services funded by state governments or other sources.

### Box 3.5: The eye health workforce

**Optometrists** perform eye examinations and vision tests to determine the presence of visual, ocular and other abnormalities; ocular diseases; and systemic diseases with ocular manifestations. They also prescribe lenses, other optical aids, therapy and medication to correct and manage vision problems and eye diseases.

**Ophthalmologists** provide diagnostic, treatment and preventive medical services related to diseases, injuries and deficiencies of the human eye and associated structures**.**

**Optical dispensers** fit and service optical appliances such as spectacle frames and lenses.

**Orthoptists** diagnose and manage eye movement disorders and associated sensory deficiencies.

**Optical mechanics** operate machines to grind, polish and surface optical lenses to meet prescription requirements and to fit lenses to spectacle frames.

**Orientation and mobility specialists** assist people who are experiencing difficulties in moving about due to vision loss.

**Occupational therapists who specialise in eye health** assess the functional limitations of people resulting from eye illnesses and disabilities, and provide therapy to enable them to perform their daily activities and occupations.

**Ophthalmic nurses** have completed general nurse training as well as specialist training in the nursing care of patients with eye problems, whether in hospital, clinics or the community. These nurses test vision and perform other eye tests under medical direction.

*Source:* AIHW 2016c.

### Box 3.6 Australian Government outreach programs

**Visiting Optometrists Scheme (VOS)** supports optometrists to deliver outreach services in remote and very remote locations and in rural communities with an identified need for optometric services. From July 2015, new guidelines expanded the program to include urban locations for Aboriginal and Torres Strait Islander patients. Many of the services for Indigenous Australians are delivered by visiting optometrists in Aboriginal and Torres Strait Islander primary health-care organisations.

**Rural Health Outreach Fund (RHOF)** supports the delivery of medical specialities, GPs and allied and other health outreach services in rural, regional and remote areas. These include eye health services.

The **Medical Outreach Indigenous Chronic Disease Program (MOICDP)** improves access to medical specialists, GPs, allied health and other health professionals for Aboriginal and Torres Strait Islander people living with chronic disease. As part of this program, eye health services can be provided to those suffering from chronic conditions such as diabetes.

Funding is also provided to jurisdictional fund holders to improve the co-ordination of Indigenous eye health services.

## Measure 4.1: Number and rate of optometrists

**Measure:** The number of employed optometrists, full-time equivalent (FTE) per 100,000 Australian population.

### Results

**Overall:** In 2015, there were around 4,559 optometrists employed in Australia (18 FTE per 100,000).

**Time trend:** Between 2011 and 2015, the number and rate of optometrists increased. In 2011 there were 4,034 (17 FTE per 100,000) employed optometrists and by 2015 this had increased to 4,559 (18 FTE per 100,000) (Figure 3.4.1a).

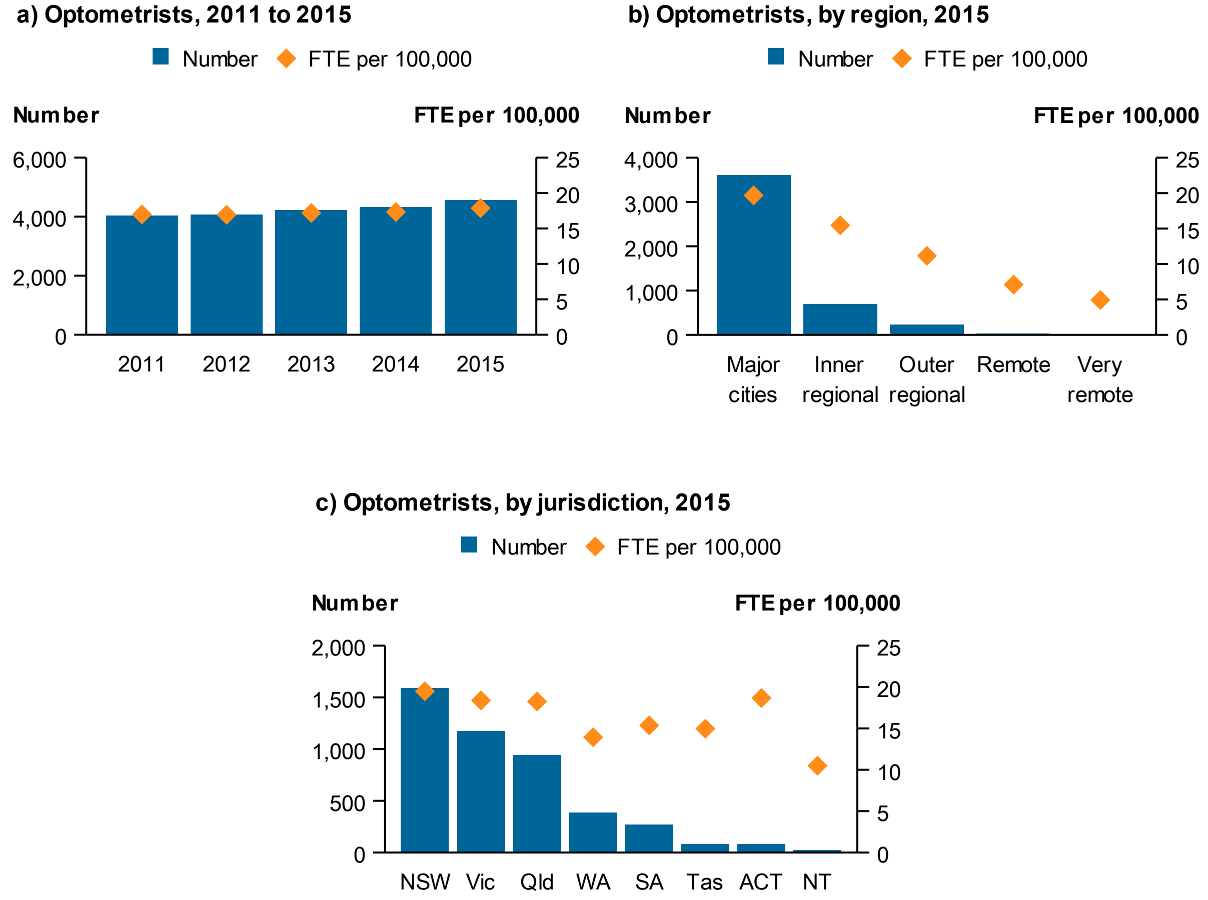
**Remoteness:** In 2015, *Major cities* had the highest number (3,602) and rate (20 FTE per 100,000) of employed optometrists. This was followed by *Inner regional* areas (690, or 15 FTE per 100,000) and *Outer regional* areas (234, or 11 FTE per 100,000). The numbers and rates of optometrists were lowest in *Remote* and *Very remote* areas (Figure 3.4.1b).

**Jurisdiction:** The Northern Territory had the lowest number (25) of employed optometrists. New South Wales had the highest number (1,592) and rate (20 FTE per 100,000) of employed optometrists (Figure 3.4.1c).

**PHN:** The highest numbers and rates of optometrists were in the metropolitan areas. The PHN with the highest number and rate of employed optometrists was Central and Eastern Sydney (491, or 30 FTE per 100,000). Country Western Australia had the lowest rate of optometrists (9.5 FTE per 100,000). Western Queensland had fewer than 10 optometrists, so FTE rates were not be calculated (Figure 3.4.2; Map 3.4.1).

### Things to consider

- The data comes from the Department of Health's NHWDS. It includes optometrists who register with their respective health practitioner board via the National Registration and Accreditation Scheme and are employed in Australia.
- Optometrists can only include details of 1 site in their registration, so multiple sites are not captured in the data.
- FTE is a measure calculated by dividing an estimate of the total hours worked by employees in an occupation in a week by an estimate of the standard hours worked for optometrists (38 hours per week). The number of FTE is then compared with the size of relevant population to get the FTE 100,000 population.

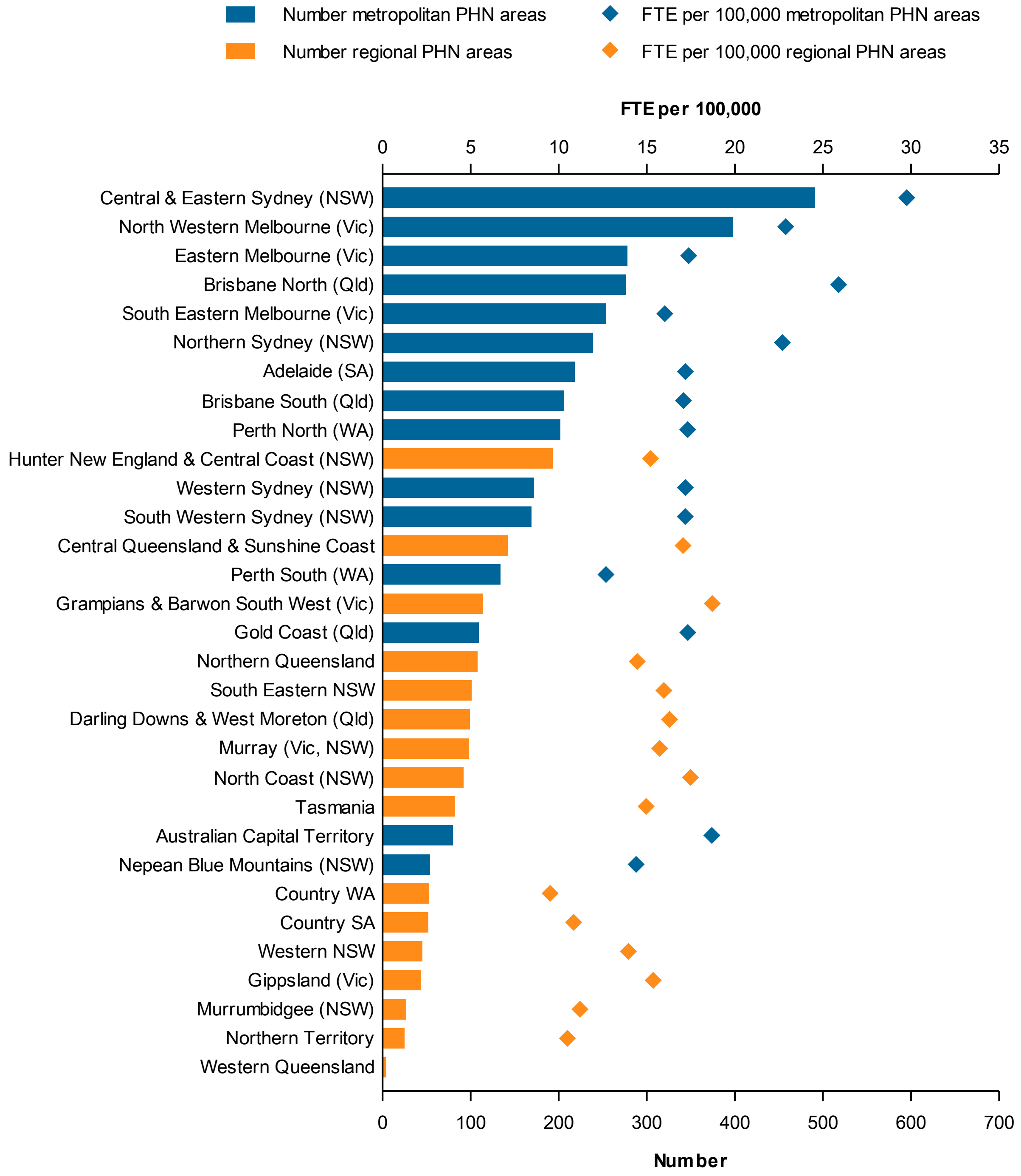


*Notes*

1. Data are based on optometrists employed in Australia working in their registered profession.
2. Rates have not been published where the number employed for any occupation is fewer than 10 people.
3. FTE per 100,000 population are based on a 38-hour work week.
4. Data for these figures are available in the online supplementary tables.

*Source:* AIHW analysis of NHWDS.

**Figure 3.4.1: Optometrists, by various characteristics**

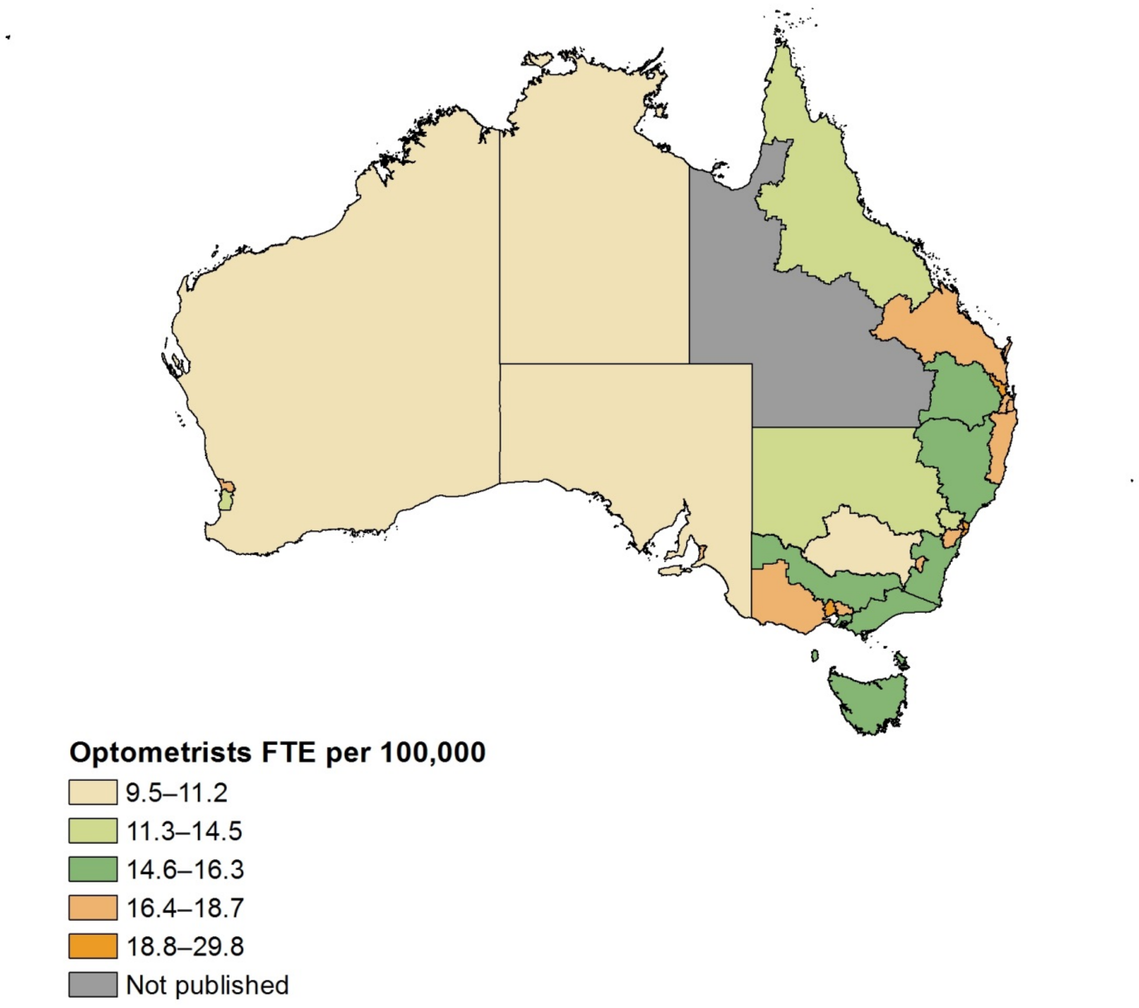


*Notes*

1. Data are based on optometrists employed in Australia working in their registered profession.
2. FTE per 100,000 population are based on a 38-hour work week.
3. Rates have not been published where the number employed for any occupation is fewer than 10 people.
4. Data for this figure are available in the online supplementary tables.

*Source:* AIHW analysis of NHWDS.

**Figure 3.4.2: Optometrists, by PHN, 2015**



*Notes*

1. The PHN data for this map are available in the online supplementary tables.
2. Data were not published where the number of optometrists employed in a PHN was less than 10.

*Source:* AIHW analysis of NHWDS.

**Map 3.4.1: Optometrists, by PHN, 2014**

## Measure 4.2: Number and rate of ophthalmologists

**Measure:** The number of employed ophthalmologists, full-time equivalent (FTE) per 100,000 Australian population.

### Results

**Overall:** In 2015, there were around 896 ophthalmologists employed in Australia (4.0 FTE per 100,000).

**Time trend:** Between 2012 and 2015, the number and rate of ophthalmologists remained fairly constant. In 2012 there were 836 employed ophthalmologists (3.9 FTE per 100,000). By 2015, the number and rate of employed ophthalmologists had increased to 896 (4.0 FTE per 100,000) (Figure 3.4.3a).

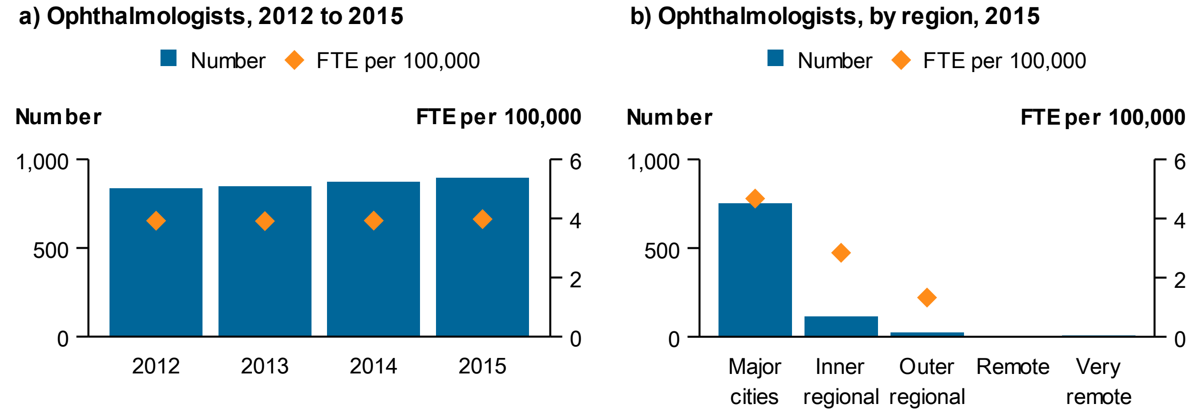
**Remoteness:** *Major cities* had the highest number (752) and rate (4.7 FTE per 100,000) of employed ophthalmologists, followed by *Inner regional* areas (114, 2.8 FTE per 100,000) and *Outer regional* areas (23, or 1.3 FTE per 100,000). There were insufficient numbers of ophthalmologists to calculate rates in other areas (Figure 3.4.3b).

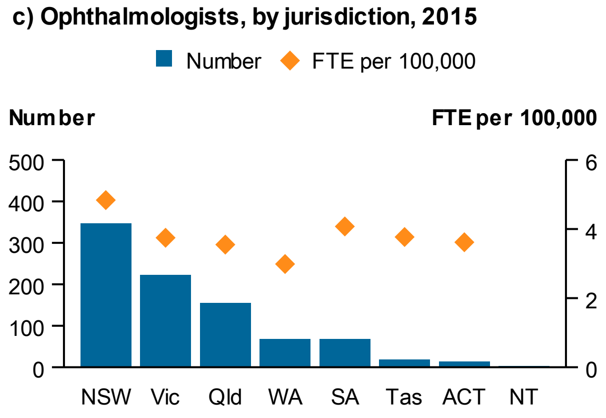
**Jurisdiction:** New South Wales had the highest number (347) and rate (4.8 FTE per 100,000) of employed ophthalmologists followed by Victoria (222, or 3.7 FTE per 100,000). Western Australian had the lowest rate (3.0 FTE per 100,000). There were insufficient numbers of ophthalmologists in the Northern Territory to report rates (Figure 3.4.3c).

**PHN:** Central and Eastern Sydney had the highest number (133) and rate (9.0 FTE per 100,000) of employed ophthalmologists. This was followed by North Western Melbourne (100, or 6.2 FTE per 100,000) and Northern Sydney (63, or 7.4 FTE per 100,000). The number of ophthalmologists was too low to calculate FTE rates in 9 PHNs, but of those areas where rates could be published, they were lowest in South Eastern New South Wales (2.1 FTE per 100,000 and Murray (1.6 FTE per 100,000) (Figure 3.4.4; Map 3.4.2).

### Things to consider

- The data comes from the Department of Health's NHWDS. It includes ophthalmologists who register with their respective health practitioner board via the National Registration and Accreditation Scheme and are employed in Australia.
- Optometrists can only include details of 1 site in their registration, so multiple sites are not captured in the data.
- FTE is a measure calculated by dividing an estimate of the total hours worked by employees in an occupation in a week by an estimate of the standard hours worked for ophthalmologists (40 hours per week). The number of FTE is then compared with the size of relevant population to get the FTE per 100,000 population.



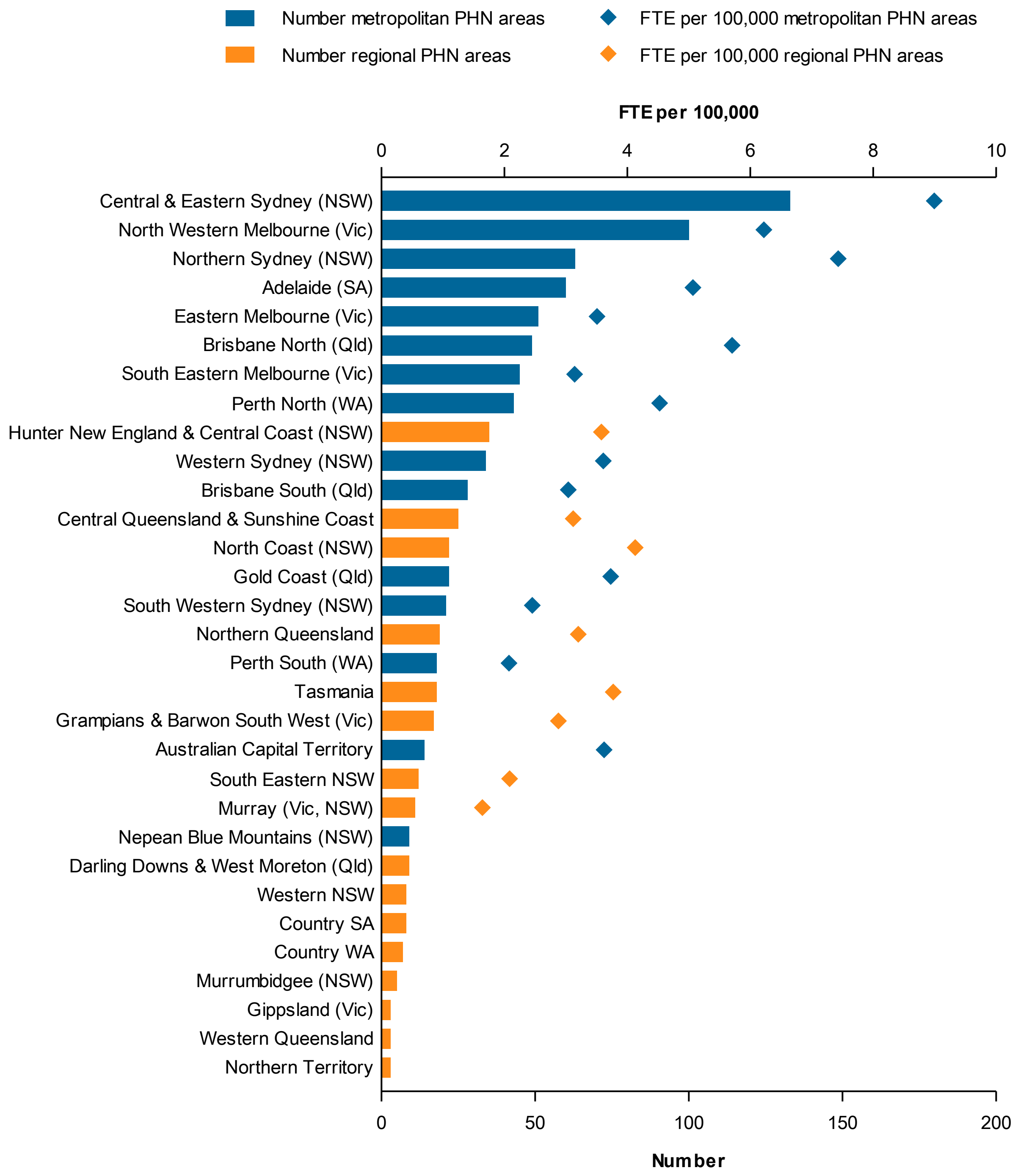


*Notes*

1. Data are based on ophthalmologists employed in Australia working in their registered profession.
2. FTE per 100,000 population are based on a 40-hour work week.
3. Rates have not been published where the number employed for any occupation is fewer than 10 people.
4. Data for these figures are available in the online supplementary tables.

*Source:* AIHW analysis of NHWDS.

**Figure 3.4.3: Ophthalmologists, by various characteristics**

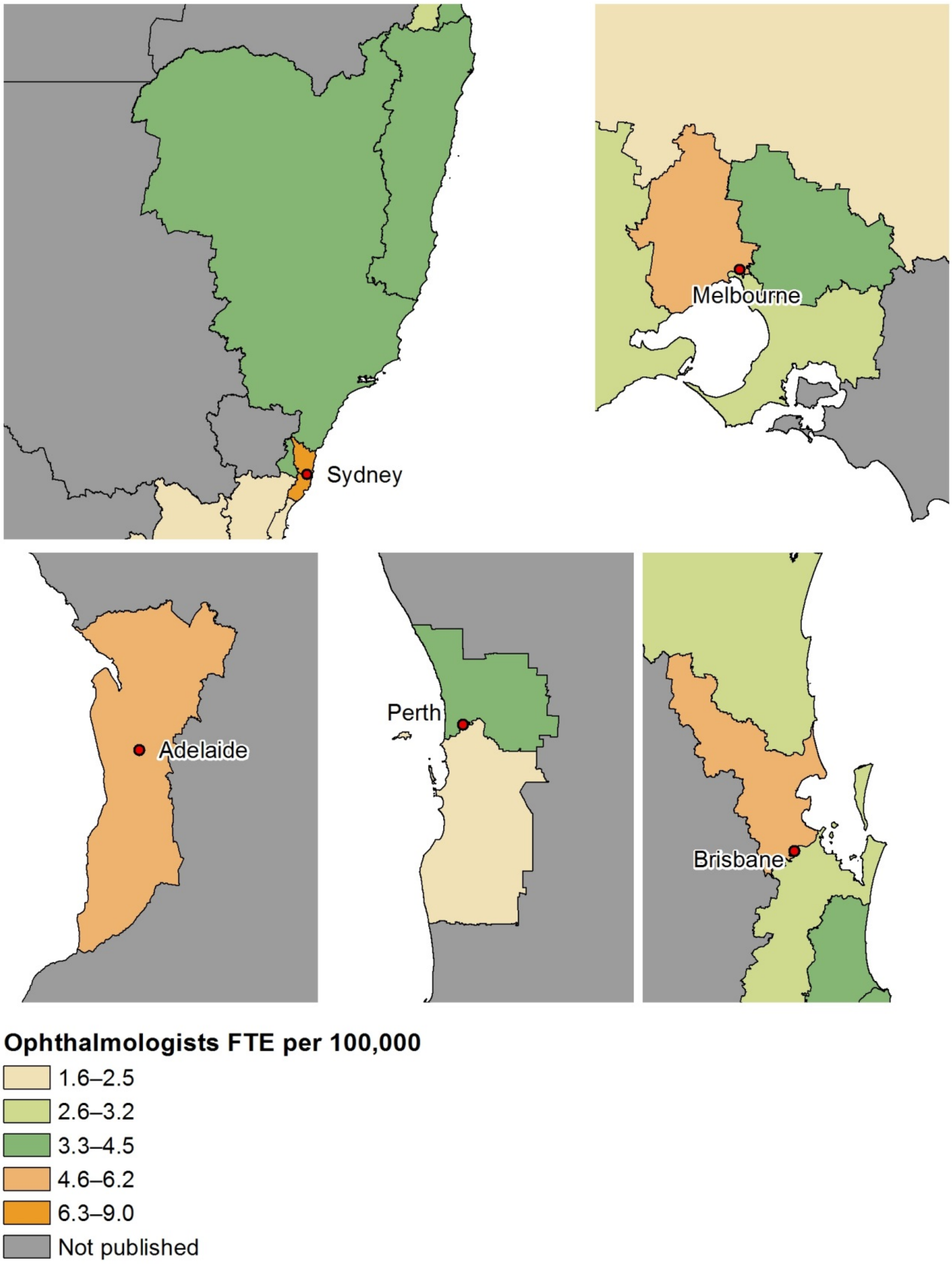


*Notes*

1. Data are based on ophthalmologists employed in Australia working in their registered profession.
2. FTE per 100,000 population are based on a 40-hour work week.
3. Rates have not been published where the number of ophthalmologists was fewer than 10.
4. Data for this figure are available in the online supplementary tables.

*Source:* AIHW analysis of NHWDS.

**Figure 3.4.4: Ophthalmologists, by PHN, 2015**



*Notes*

1. FTE per 100,000 are based on a 40-hour week.
2. Maps include all those PHNs where FTE rates were published (that is, there were 10 or more ophthalmologists employed).
3. The PHN data for this map are available in the online supplementary tables.

*Source:* AIHW analysis of National Health Workforce Dataset.

**Map 3.4.2: FTE rates for ophthalmologists, by PHN, 2015**

## Measure 4.3: Number and rate of allied ophthalmic personnel

**Measure:** The number and rate of allied ophthalmic personnel, full-time equivalent (FTE), per 100,000 Australian population.

### Results

**Overall:** The biggest category of allied ophthalmic personnel in Australia is optical dispensers. In 2010, there were around 4,239 optical dispensers (19 FTE per 100,000), 720 optical mechanics (3.3 FTE per 100,000) and 643 orthoptists (2.9 FTE per 100,000) in Australia (Figure 3.4.5a).

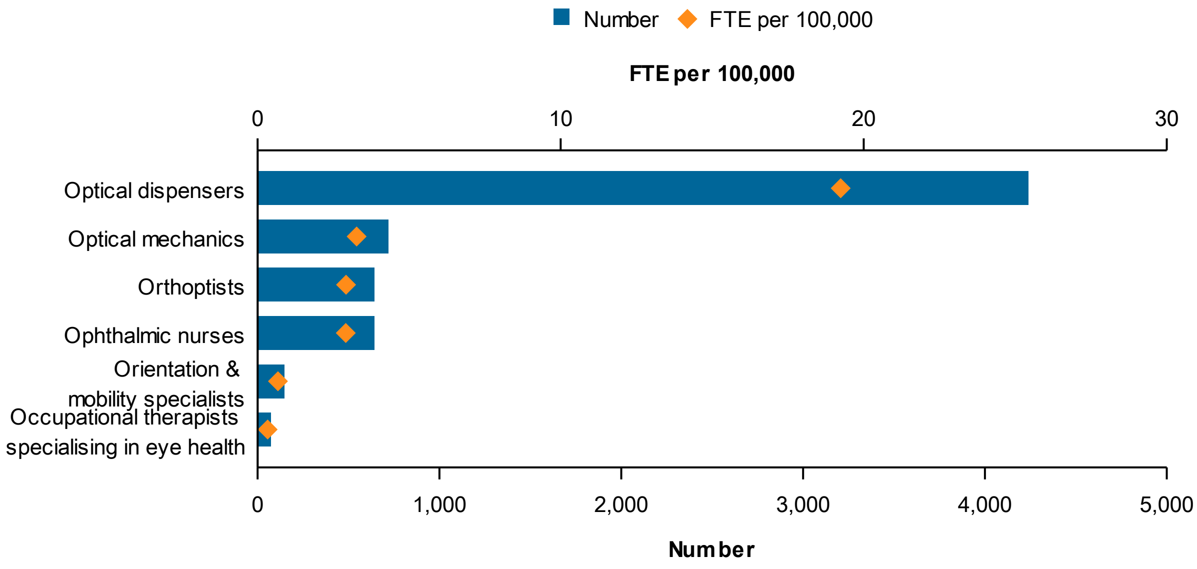
**Remoteness:** *Major cities* had the highest number (3,346) and rate (18 FTE per 100,000) of optical dispensers and other allied ophthalmic personnel (1,168, or 6.7 FTE per 100,000). This was followed by *Inner regional* areas with 836 optical dispensers (17 FTE per 100,000) and 118 other allied ophthalmic personnel (2.6 FTE per 100,000). There were insufficient numbers of optical dispensers and other allied ophthalmic personnel in *Remote* and *Very remote* areas to calculate rates (Figure 3.4.5b).

**Jurisdiction:** New South Wales had the highest number (1,389) and rate (17 FTE per 100,000) of optical dispensers and of other allied ophthalmic personnel (491, or 6.1 FTE per 100,000). This was followed by Victoria, with 1,021 optical dispensers (16 FTE per 100,000) and 445 other allied ophthalmic personnel (7.1 FTE per 100,000) (Figure 3.4.5c). There were insufficient numbers of optical dispensers and other allied ophthalmic personnel in the Northern Territory and the Australian Capital Territory to report rates.

### Things to consider

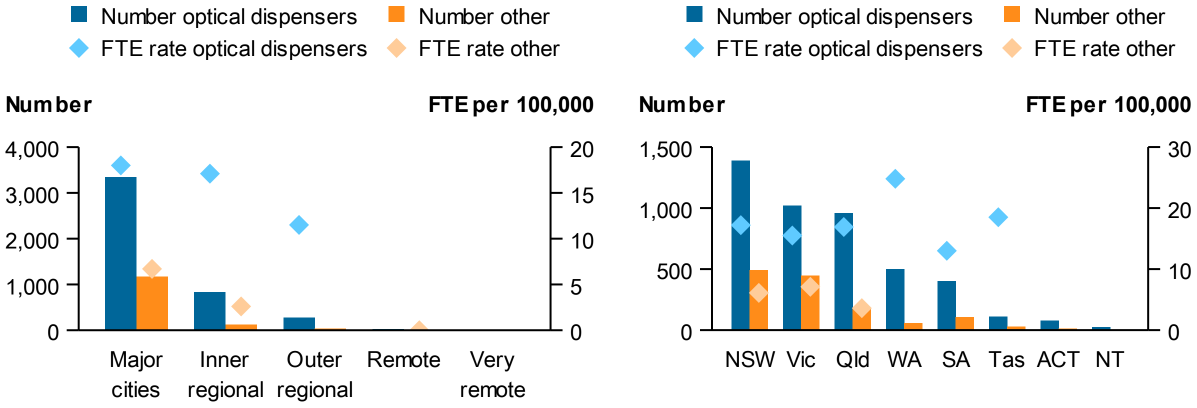
- These data were drawn from a number of different sources and may not be directly comparable (see *Eye health workforce in Australia* (AIHW 2016c) for more details).
- See Box 1.2 for information on the eye health workforce and the roles of various allied ophthalmic personnel.

**a) By profession, 2010**



**b) By profession, by region, 2011**

**c) By profession, by jurisdiction, 2011**



*Notes*

1. ‘Other’ includes Orthoptists and Optical mechanics.
2. FTE per 100,000 population are based on a 38-hour work week.
3. Rates have not been published where the number employed for any occupation is fewer than 30 people.
4. Data for these figures are available in the online supplementary tables.

*Sources:* AIHW analysis of Census 2011 data on optical dispensers, orthoptists and optical mechanics; and from professional associations and employer organisations for data on orientation and mobility specialists, occupational therapists specialising in eye health, and ophthalmic nurses; AIHW 2016c.

**Figure 3.4.5: Allied ophthalmic personnel, by various characteristics**

## Measure 4.4: Occasions of eye health services provided under outreach programs

**Measure:** The number of occasions of service for Indigenous Australians with eye health professionals, per 1,000 population, under the:

1) Visiting Optometrists Scheme (VOS)
2) Rural Health Outreach Fund (RHOF)
3) Medical Outreach Indigenous Chronic Disease Program (MOICDP).

### Results

**4.4.1 Visiting Optometrists Scheme (VOS)**

**Overall:** In 2014–15, there were 18,890 occasions of service for Indigenous patients and 20,045 for non-Indigenous patients under the VOS.

**Time trend:** In 2009–10, there were around 6,975 occasions of service for Indigenous patients under the VOS. This increased to 20,151 in 2013–14 before declining to 18,890 in 2014–15 (Figure 3.4.6a). The number of occasions of service for other Australians declined over this period, so that in 2014–15 almost half of VOS occasions of service were for Indigenous Australian patients.

**Remoteness:** Reflecting the nature of the scheme, the rate of Indigenous occasions of service under the VOS was highest in *Very remote* areas (94 per 1,000) followed by *Remote* areas (92 per 1,000) (Figure 3.4.6b).

**Jurisdiction:** The number of Indigenous occasions of service under the VOS was lowest in Tasmania (38), followed by South Australia (916), while the highest number was seen in Queensland (6,498), followed by the Northern Territory (5,069) (Figure 3.4.6c). The rate of Indigenous occasions of service was highest in the Northern Territory (70 per 1,000), followed by Queensland (32 per 1,000) (Figure 3.4.6d).

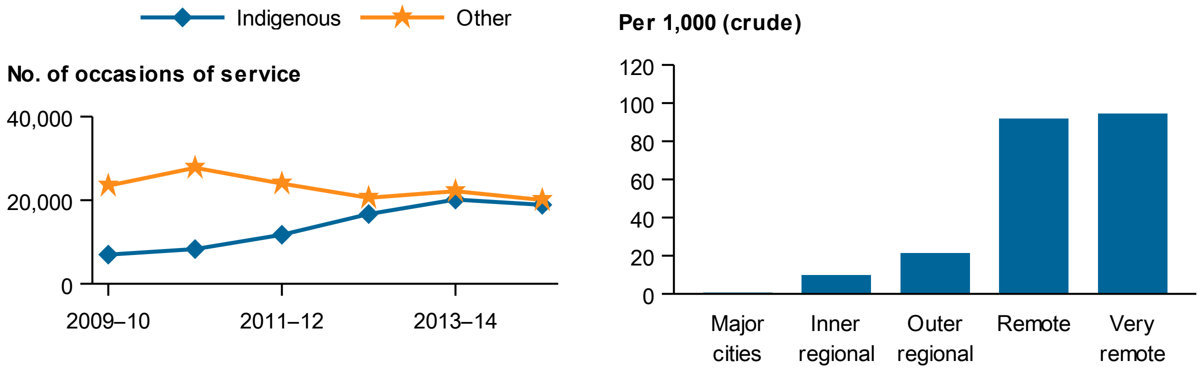
**PHN:** The PHN with the highest reported number of occasions of service for Indigenous patients under the VOS was the Northern Territory (5,069) followed by Northern Queensland (4,261). The rate of Indigenous occasions of service was highest in Western Queensland (99 per 1,000), the Northern Territory (70 per 1,000) and Gippsland (69 per 1,000) (Figure 3.4.7; Map 3.4.3).

### Things to consider

- Patients may have more than 1 occasion of service.
- The identification of Indigenous patients varies between practitioners, so the number of occasions of service for Indigenous patients may be understated.
- The rates by PHN should be interpreted with caution as these services are predominantly provided in non-metropolitan areas. Rates were calculated for some metropolitan areas for comparison purposes, as these areas were only included in the program from 2014–15, and only a small number of services were provided there.
- These data include Australian Government-funded outreach services and not those funded by state governments or other providers.

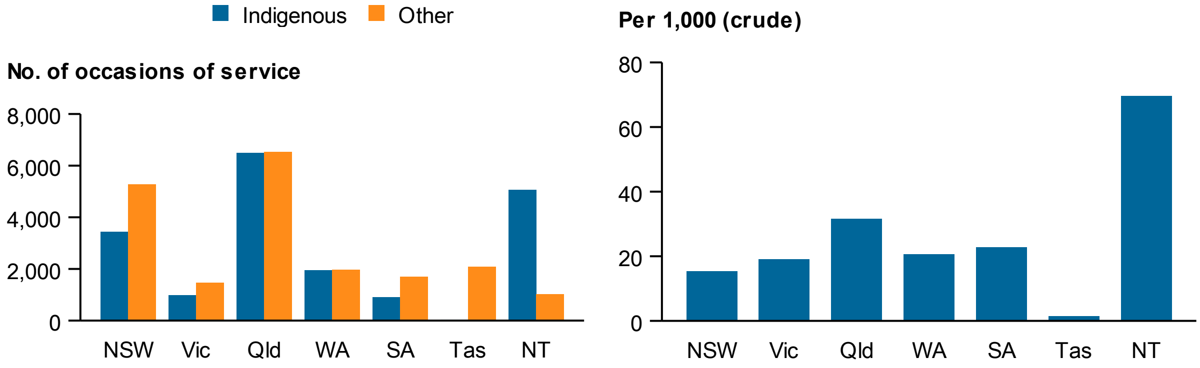
**a) Time trend, 2009–10 to 2014–15**

**b) Indigenous, by region, 2014–15**



**c) By jurisdiction, 2014–15**

**d) Indigenous, by jurisdiction, 2014–15**

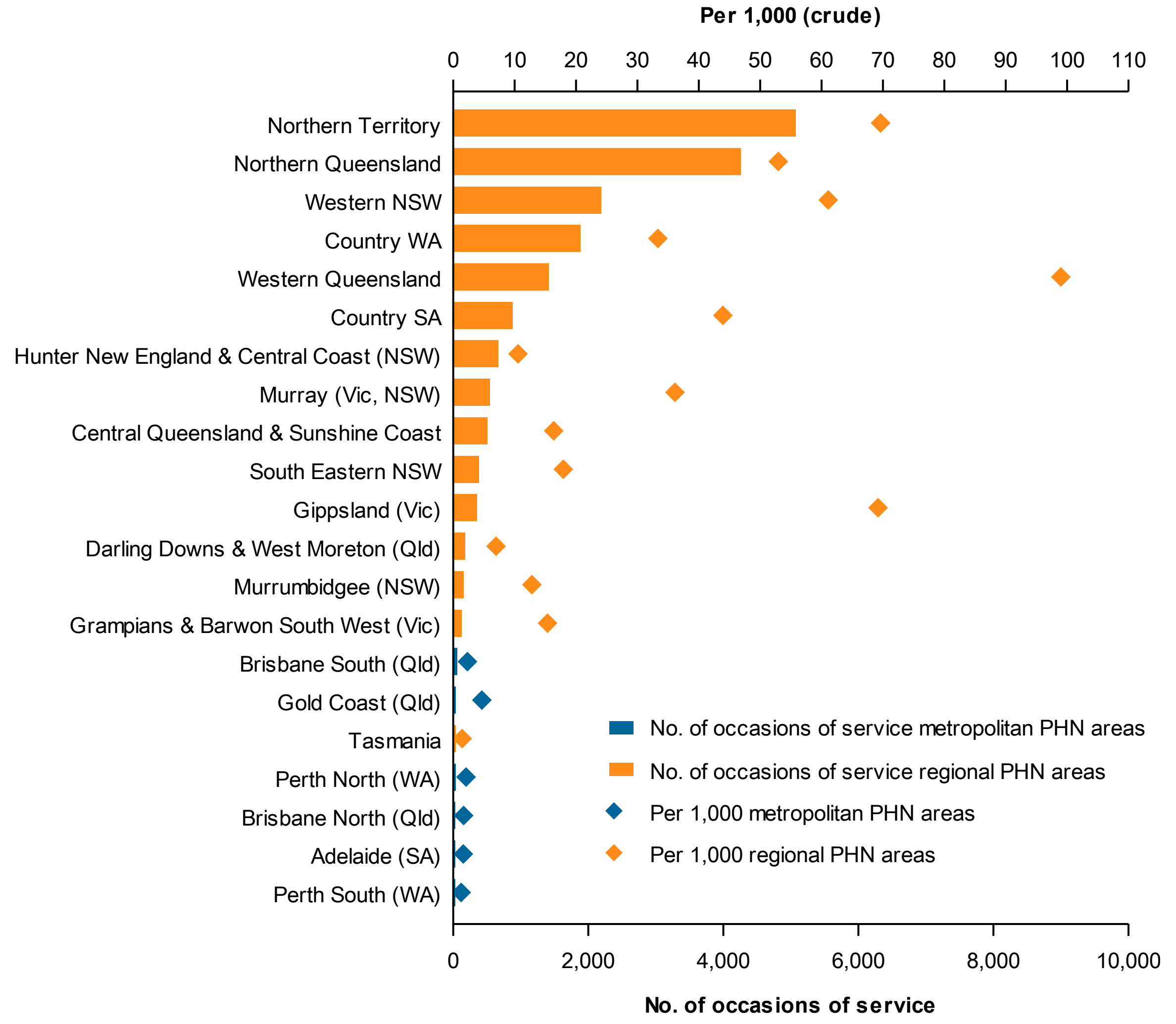


*Notes*

1. 2014–15 data for Queensland were estimated from 2013–14 data (1 January to 30 June) and actual 6 monthly data to 31 December 2014.
2. All figures show number of occasions of service, except figures b) and d) which show crude rates.
3. 'Other' includes occasions of service for non-Indigenous patients and patients with 'not stated' Indigenous status.

*Source:* AIHW analysis of Department of Health data (unpublished).

**Figure 3.4.6: VOS occasions of service, by various characteristics**

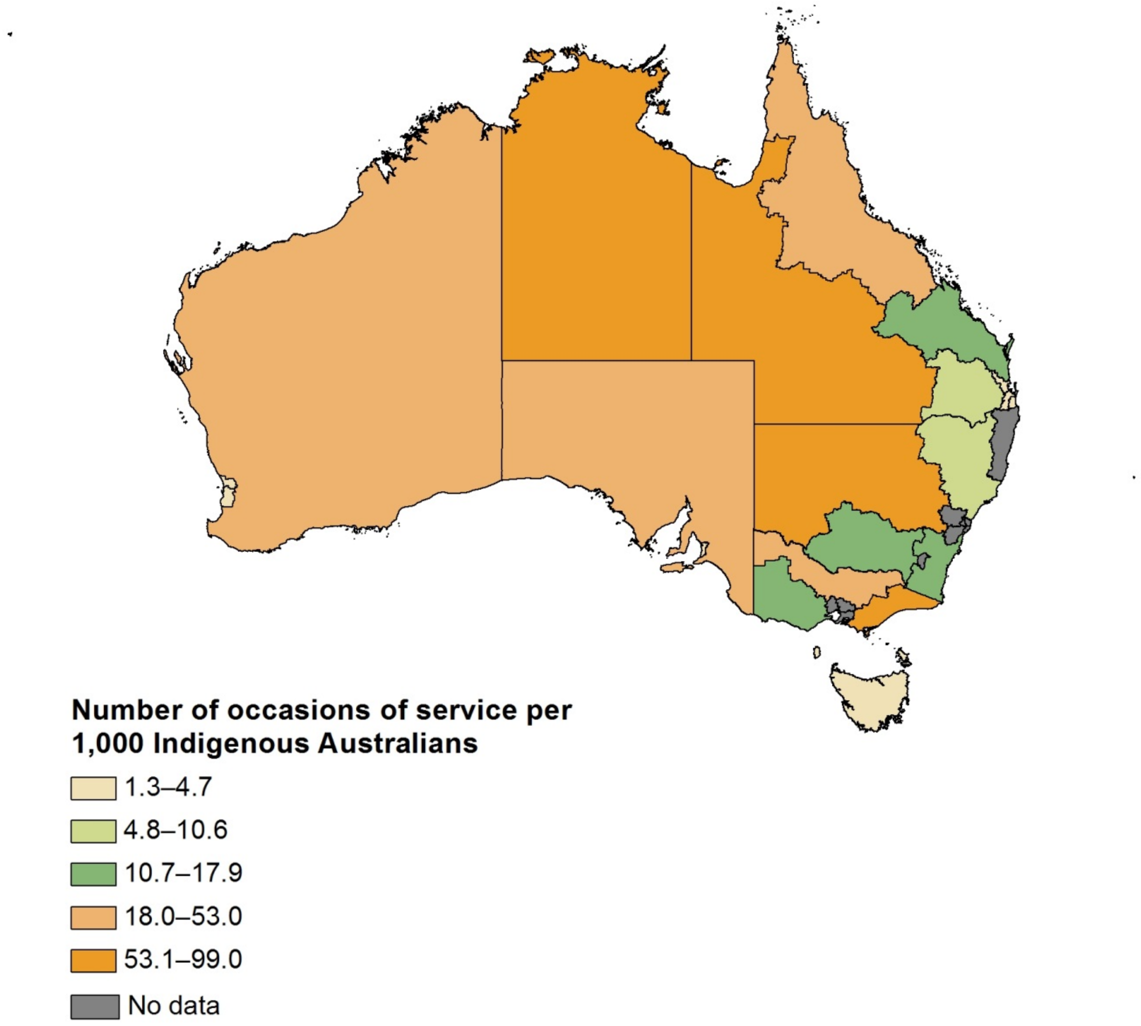


*Notes*

1. 2014–15 data for Queensland were estimated from 2013–14 data (1 January to 30 June) and actual 6 monthly data to 31 December 2014.
2. This figure shows number of occasions of service and crude rates.

*Source:* AIHW analysis of Department of Health data (unpublished).

**Figure 3.4.7: VOS occasions of service, by PHN, 2014–15**



*Notes*

1. The PHN data for this map are available in the online supplementary tables.
2. PHN's with no data had no VOS patients.

*Source:* AIHW analysis of Department of Health data (unpublished).

**Map 3.4.3: VOS occasions of service for Indigenous patients, by PHN, 2014–15**

### 4.4.2 Rural Health Outreach Fund (RHOF)

**Overall:** In 2014–15, a total of 7,829 occasions of eye health services for Indigenous patients were provided under the RHOF.

**Time trend:** In 2011–12, there were around 4,977 Indigenous eye health occasions of service under the RHOF. This number increased each year to reach 7,829 in 2014–15 (Figure 3.4.8a).

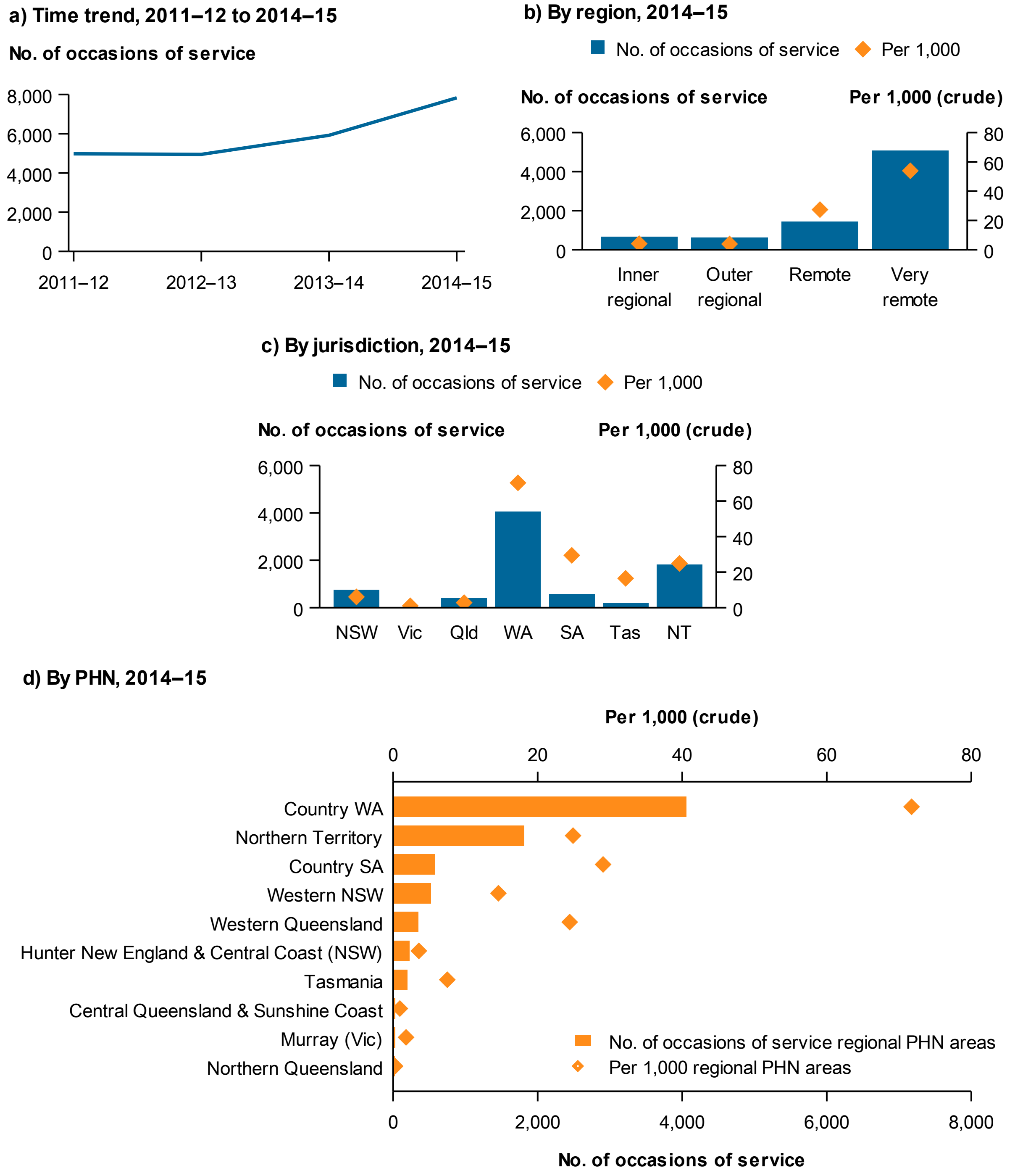
**Remoteness:** The number of Indigenous occasions of eye health services under the RHOF was highest in *Very remote* areas (5,089) and lowest in *Inner regional* areas (664). The rate was highest in *Very remote* areas (54 per 1,000) followed by *Remote* areas (27 per 1,000), and was lowest in *Inner regional* areas (4.1 per 1,000) (Figure 3.4.8b).

**Jurisdiction:** The number of Indigenous eye health occasions of service under the RHOF was highest in Western Australia (4,060), followed by the Northern Territory (1,813) (Figure 3.4.8c). The rate of Indigenous patients seen was highest in Western Australia (70 per 1,000), followed by South Australia (29 per 1,000).

**PHN:** The PHN with the highest number of occasions of service for Indigenous patients under the RHOF was Country WA (4,060), followed by Northern Territory (1,813). The rate of Indigenous occasions of service was highest in Country WA (72 per 1,000), followed by Country SA (29 per 1,000) (Figure 3.4.8d; Map 3.4.4).

## Things to consider

- Patients may have more than 1 occasion of service.
- Numbers reflect Indigenous RHOF patient contacts with all health professionals in relation to their eye health and include those seen by ophthalmologists, optometrists, orthoptists, retinal photographers, ophthalmic assistants, ophthalmic nurses and Aboriginal Health Workers.
- RHOF services are only provided in non-metropolitan areas.
- These data include Australian Government-funded outreach services and not those funded by state governments or other providers.

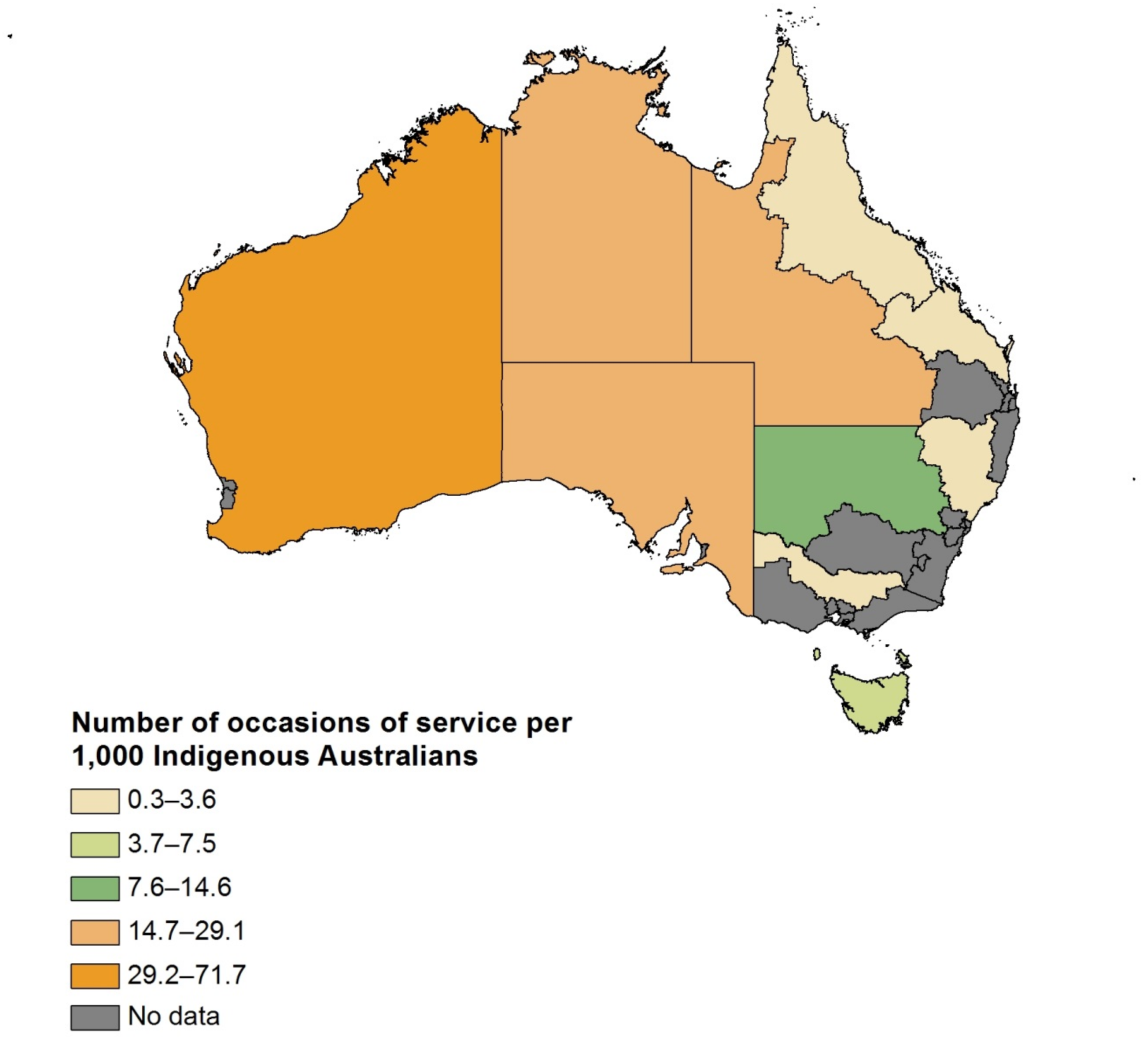


*Notes*

1. Prior to 2013–14, eye health services were delivered through 2 programs—the Medical Specialist Outreach Assistance Program (MSOAP) and a specific eye health expansion—that were moved into the RHOF. The data in Figure a) for 2011–12 and 2012–13 represent the Indigenous patients seen under these 2 programs.
2. All figures show numbers of occasions of service and crude rates, except for Figure a), which shows number of occasions of service only.
3. RHOF services are provided in *Inner regional*, *Outer regional*, *Remote* and *Very remote* areas only; populations used to calculate the rates did not include *Major cities*.
4. Data for these figures are available in the online supplementary tables.

*Source:* AIHW analysis of Department of Health data (unpublished).

**Figure 3.4.8: RHOF occasions of eye health services for Indigenous patients, by various characteristics**



*Notes*

1. The PHN data for this map are available in the online supplementary tables.
2. PHN's with no data had no RHOF patients.

*Source:* AIHW analysis of Department of Health data (unpublished).

**Map 3.4.4: RHOF occasions of eye health services for Indigenous patients, by PHN, 2014–15**

### 4.4.3 Medical Outreach Indigenous Chronic Disease Program (MOICDP)

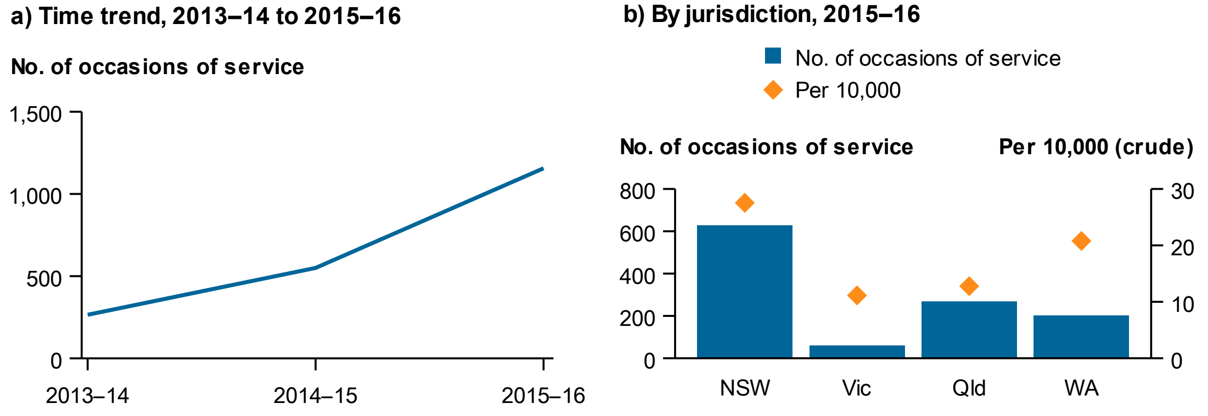
**Overall:** In 2015–16, a total of 1,156 occasions of service for Indigenous patients were provided by eye health professionals under the MOICDP.

**Time trend:** In 2013–14, there were around 265 Indigenous occasions of services provided by health professionals in relation to eye health under the MOICDP. This number increased to 1,156 patients in 2015–16 (Figure 3.4.9a).

**Jurisdiction:** Services were provided to Indigenous patients in 4 jurisdictions. The highest number and rate of Indigenous occasions of service provided by an eye health professional under the MOICDP was in New South Wales (627 and 28 per 10,000, respectively) (Figure 3.4.9b).

## Things to consider

- Patients may have more than 1 occasion of service.
- The numbers show occasions of service provided to Indigenous patients by all health professionals in relation to eye health, including ophthalmologists, ophthalmic assistants, ophthalmic nurses and Aboriginal health workers.
- These data include Australian Government-funded outreach services and not those funded by state governments or other providers.



*Notes*

1. Data include patients seen by the following types of health professionals: Aboriginal Health Worker—Eye Health, Optometry, Physician—Ophthalmology and Surgery—retinal.
2. Figure a) shows the number of occasions of service and Figure b) shows both the number of occasions of service and the crude rate.
3. Data for these figures are available in the online supplementary tables.

*Source:* AIHW analysis of Department of Health data (unpublished).

**Figure 3.4.9: MOICDP, occasions of eye health services for Indigenous patients, by various characteristics**

# Appendix A: Technical specifications

**Table A1: Technical specifications for the Indigenous eye health measures**

| Measure | Description | Calculation | Numerator | Denominator | Notes and definitions | Data sources |
|---|---|---|---|---|---|---|
| 1.1 | Prevalence of vision impairment and blindness | Crude rate: Numerator ÷ denominator x 100<br>Age-standardised rate (ASR): $ASR = \sum_i N_i p_i / \sum_i N_i$<br>where:<br>$p_i$ is the age-specific rate for age group *i* in the population being studied<br>$N_i$ is the population of age group *i* in the standard population | Number of participants with:<br>i) bilateral vision impairment (<6/12–6/60)<br>ii) bilateral blindness (<6/60) | Number of participants responding to NEHS | | NEHS |
| | | | Number of participants who reported that they had an eye or sight problem | Number of participants responding to AATSIHS | | AATSIHS |
| 1.2 | Main cause of vision impairment and blindness | Numerator ÷ denominator x 100 | Number of participants with bilateral vision impairment caused by:<br>a) refractive error<br>b) cataract<br>c) age-related macular degeneration<br>d) diabetic retinopathy<br>e) glaucoma<br>f) combined mechanisms<br>g) other<br>h) not determinable | Number of participants with bilateral vision impairment (<6/12–6/60) | Numbers were too small to present for main causes of blindness | NEHS |

*(continued)*

**Table A1 (continued): Technical specifications for Indigenous eye health measures**

| Measure | Description | Calculation | Numerator | Denominator | Notes and definitions | Data sources |
|---|---|---|---|---|---|---|
| | Main cause of vision impairment and blindness (continued) | Numerator ÷ denominator x 100 | Number of participants who reported that they had an eye or sight problem caused by:<br>a) cataract<br>b) short-sighted/myopia<br>c) long-sighted/hyperopia<br>d) blindness (complete and partial)<br>e) glaucoma<br>f) macular degeneration<br>g) other | Number of participants who reported that they had an eye or sight problem | | AATSIHS |
| 1.3 | Prevalence of: | | | | Screening is performed in Indigenous communities designated by jurisdictional authorities as being at risk of endemic trachoma in 2015 | Trachoma Surveillance Report |
| | i) trachoma | Numerator ÷ denominator x 100 | Number of children aged 5–9 with active trachoma | Number of children aged 5–9 screened for trachoma | Target age group is children aged 5–9, but data for children aged 0–14 are shown by age group | |
| | ii) trichiasis | Numerator ÷ denominator x 100 | Number of adults aged 40 and over with trichiasis | Number of adults aged 40 and over screened for trichiasis | Target age group is those aged 40 and over, but data for those aged 15 and over are shown by age group | |

*(continued)*

**Table A1 (continued): Technical specifications for Indigenous eye health measures**

| Measure | Description | Calculation | Numerator | Denominator | Notes and definitions | Data sources |
|---|---|---|---|---|---|---|
| 2.1 | Eye health problems managed by GPs | Numerator ÷ denominator x 1,000<br>See calculation for measure 1.1 for age-standardised rate | Number of eye health problems managed by general practitioners (International Classification of Primary Care (ICPC-2) chapter codes F01–99) | Number of encounters with GPs | | BEACH |
| 2.2 | Annual health assessments | Numerator ÷ denominator x 100<br>See calculation for measure 1.1 for age-standardised rate | Number of Indigenous people who had an MBS item 715 health assessment claimed in the financial year | Indigenous population at the middle of the financial year, calculated from the average of the populations at 30 June, at the beginning and end of the financial year | | MBS and ABS population data |
| 2.3 | Proportion of the population that had an eye examination by an eye care professional | Numerator ÷ denominator x 100<br>See calculation for measure 1.1 for age-standardised rate | Number of people who had an eye examination (MBS items 11215, 11218, 10910–10916 or 10918 within the reference period) claimed in the financial year | Population at the middle of the financial year, calculated from the average of the populations at 30 June, at the beginning and end of the financial year | | MBS and ABS population data |
| 2.4 | Proportion of the target population screened for diabetic retinopathy | Numerator ÷ denominator x 100 | Number of participants responding to the NEHS with diabetes mellitus who have had a diabetic eye examination within the specified time categories | Number of participants responding to NEHS with diabetes mellitus | | NEHS |
| | | Numerator ÷ denominator x 100 | Number of people who claimed MBS item 66551 in the financial year and who had an eye examination within the last 3 financial years:<br>i) MBS group A10, Optometrical Services (except items 10921–10930) and/or<br>ii) MBS group D1 subgroup 2, Miscellaneous Diagnostic Procedures and Investigations, Ophthalmology | Number of people who claimed MBS item 66551 (Quantitation of glycosylated haemoglobin performed in the management of established diabetes) in the financial year | | MBS |

*(continued)*

**Table A1 (continued): Technical specifications for Indigenous eye health measures**

| Measure | Description | Calculation | Numerator | Denominator | Notes and definitions | Data sources |
|---|---|---|---|---|---|---|
| 2.5 | Screening coverage for: | | | | Screening is performed in Indigenous communities designated by jurisdictional authorities as being at risk of endemic trachoma in 2015 | Trachoma Surveillance Report |
| | i) trachoma | Numerator ÷ denominator x 100 | Number of children aged 5–9 screened for trachoma | Estimated number of Indigenous children aged 5–9 in communities that were screened for trachoma | Target age group is children aged 5–9, but data for children aged 0–14 are shown by age group | |
| | ii) trichiasis | Numerator ÷ denominator x 100 | Number of adults aged 40 and over screened for trichiasis | Estimated number of adults aged 40 and over in trachoma endemic region | Target age group is those aged 40 and over, but data for those aged 15 and over are shown by age group | |
| 2.6 | Undiagnosed eye conditions | Numerator ÷ denominator x 100 | Number of participants with vision impairment or blindness attributed to each main cause who self-reported ‘No’ or ‘Unsure’ to the question ‘have you ever been told by a doctor that you have the following condition?’ for that condition | Number of participants with vision impairment or blindness attributed to each main cause | | |
| 3.1 | Hospitalisation rates for diseases of the eye | Numerator ÷ denominator x 1,000<br>(See calculation for Measure 1.1 for ASR) | Number of hospitalisations with a principal diagnosis of diseases of the eye and adnexa (International Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification (ICD-10-AM) codes H00–H59) and care type not ‘new born—unqualified days only’ or ‘organ procurement—posthumous’ or ‘hospital boarder’ | Population at the middle of the financial year, calculated from the average of the populations at 30 June, at the beginning and end of the financial year | | NHMD and ABS population data |

*(continued)*

**Table A1 (continued): Technical specifications for Indigenous eye health measures**

| Measure | Description | Calculation | Numerator | Denominator | Notes and definitions | Data sources |
|---|---|---|---|---|---|---|
| 3.2 | Hospitalisation rates for injuries to the eye | Numerator ÷ denominator x 1,000<br>(See calculation for Measure 1.1 for ASR) | Number of hospitalisations with a principal diagnosis of injuries to the eye and adnexa (ICD-10-AM codes S001, S002, S011, S021, S023, S028, S040–S042, S044, S050–S059, T150, T151, T158, T159, T260–T264, T495, T904) and care type not 'new born—unqualified days only' or 'organ procurement—posthumous' or 'hospital boarder' | Population at the middle of the financial year, calculated from the average of the populations at 30 June, at the beginning and end of the financial year | | NHMD and ABS population data |
| 3.3 | Hospitalisation rates for eye procedures | Numerator ÷ denominator x 1,000<br>(See calculation for Measure 1.1 for ASR) | Number of hospitalisations that had a procedure on the eye or adnexa (Australian Classification of Health Interventions (ACHI) block codes 160–256) and care type not 'new born—unqualified days only' or 'organ procurement—posthumous' or 'hospital boarder'<br>(For some analysis, the numerator is disaggregated by AR-DRG version 7.0) | Population at the middle of the financial year, calculated from the average of the populations at 30 June, at the beginning and end of the financial year | | NHMD and ABS population data |
| 3.4 | Cataract surgery rate | Numerator ÷ denominator x 1,000,000<br>(See calculation for Measure 1.1 for ASR) | Number of hospitalisations that had a procedure related to cataract surgery (ACHI codes 42698–00 to 42698–05, 42702–00 to 42702–11, 42716–00, 42719–00, 42719–02, 42722–00, 42731–00, 42731–01, 42734–00, 42788–00) and care type not 'new born—unqualified days only' or 'organ procurement—posthumous' or 'hospital boarder' | Population at the middle of the financial year, calculated from the average of the populations at 30 June, at the beginning and end of the financial year | | NHMD and ABS population data |

*(continued)*

Table A1 (continued): Technical specifications for Indigenous eye health measures

| Measure | Description | Calculation | Numerator | Denominator | Notes and definitions | Data sources |
|---|---|---|---|---|---|---|
| 3.5 | Cataract surgical coverage rate | Numerator ÷ denominator x 100 | Number of participants in the NEHS who have had cataract surgery | Number of participants in the NEHS who have cataracts and vision impairment or blindness + number of participants who have had cataract surgery | | NEHS |
| 3.6 | Waiting times for elective cataract surgery | i) 50th and 90th percentile: The 50th percentile (median waiting time) represents the number of days within which 50% of patients were admitted for elective cataract surgery<br>(The 90th percentile data represent the number of days within which 90% of patients were admitted for elective cataract surgery) | The time elapsed in days for a patient on the public hospital elective surgery waiting list from the date they were added to the waiting list for the procedure to the date they were removed from the waiting list for hospitalisations that had a procedure related to cataract surgery (indicator procedure ‘01’) and care type not ‘new born—unqualified days only’ or ‘organ procurement—posthumous’ or ‘hospital boarder’<br>(Based on first indicator procedure waiting time) | | | NHMD |

*(continued)*

**Table A1 (continued): Technical specifications for Indigenous eye health measures**

| Measure | Description | Calculation | Numerator | Denominator | Notes and definitions | Data sources |
|---|---|---|---|---|---|---|
| | Waiting times for elective cataract surgery (continued) | ii) The proportion of patients:<br>a) treated within 90 days<br>b) waiting more than 365 days<br>for elective cataract surgery:<br>Numerator ÷ denominator x 100 | Number of hospitalisations for a patient on the public hospital elective surgery waiting list that had a procedure related to cataract surgery (indicator procedure '01') and care type not 'new born—unqualified days only' or 'organ procurement—posthumous' or 'hospital boarder' for which the waiting time was:<br>a) less than 90 days<br>b) more than 365 days<br>(Based on first indicator procedure waiting time) | Number of hospitalisations for a patient on the public hospital elective surgery waiting list that had a procedure related to cataract surgery (indicator procedure '01') and care type not 'new born—unqualified days only' or 'organ procurement—posthumous' or 'hospital boarder' | | |
| 3.7 | Trachoma and trichiasis treatment coverage | | | | Screening and treatment is performed in Indigenous communities designated by jurisdictional authorities as being at risk of endemic trachoma in 2015 | Trachoma Surveillance Report |
| | i) trachoma | Numerator ÷ denominator x 100 | Number of community members where active trachoma was identified who were treated for trachoma | Estimated number of community members requiring treatment | | |
| | ii) trichiasis | | Number of adults aged 40 and over:<br>a) offered ophthalmic consultation<br>b) who had surgery in the past 12 months | | | |

*(continued)*

**Table A1 (continued): Technical specifications for Indigenous eye health measures**

| Measure | Description | Calculation | Numerator | Denominator | Notes and definitions | Data sources |
|---|---|---|---|---|---|---|
| 3.8 | Treatment of refractory error | Numerator ÷ denominator x 100 | Number of participants who reported distance spectacle or contact lens correction and had visual acuity (VA)≥6/12 | Number of participants who reported distance spectacle or contact lens correction and had VA≥6/12 + participants who had refractive error as their main cause of vision impairment or blindness | | |
| 3.9 | Number and rate of glasses dispensed under state spectacle schemes | Numerator ÷ denominator x 1,000 | Data for New South Wales and Queensland are the number of persons receiving spectacles, while data for Victoria are number of spectacles provided | For New South Wales and Queensland, population at the middle of the financial year, calculated from the average of the populations at 30 June, at the beginning and end of the financial year<br>For Victoria, population at 30 June | | NSW Department of Family and Community Services; Australian College of Optometry Victorian; Queensland Health and ABS population data |
| 4.1 | Number and rate of optometrists | Number | Number of registered optometrists employed in Australia working in registered profession | | | NHWDS and ABS population data |
| | | FTE rate: Numerator ÷ denominator x 100,000 | FTE of registered optometrists employed in Australia working in registered profession | Population at 30 June | FTE based on a 38-hour work week | |
| 4.2 | Number and rate of ophthalmologists | Number | Number of registered ophthalmologists employed in Australia working in registered profession | | | NHWDS and ABS population data |
| | | FTE rate: Numerator ÷ denominator x 100,000 | FTE of registered ophthalmologists employed in Australia working in registered profession | Population at 30 June | FTE based on a 40-hour work week | |

*(continued)*

**Table A1 (continued): Technical specifications for Indigenous eye health measures**

| Measure | Description | Calculation | Numerator | Denominator | Notes and definitions | Data sources |
|---|---|---|---|---|---|---|
| 4.3 | Number and rate of allied ophthalmic personnel | Number | Number of allied ophthalmic personnel employed in the workforce | | | Census; professional associations and employer organisations; and ABS population data |
| | | FTE rate: Numerator ÷ denominator x 100,000 | FTE of allied ophthalmic personnel employed in the workforce | Population at 30 June | FTE based on a 38-hour work week | |
| 4.4 | Occasions of eye health services provided under outreach programs | Crude rate: Numerator ÷ denominator x 1,000 | The number of Indigenous people seen by eye health professionals under the:<br>a) VOS<br>b) RHOF<br>c) MOICDP | Population at the middle of the financial year, calculated from the average of the populations at 30 June, at the beginning and end of the financial year<br>(Note that RHOF services are provided in *Inner regional, Outer regional, Remote* and *Very remote* areas only. Therefore populations used to calculate the rates for RHOF did not include *Major cities*) | | Department of Health and ABS population data |

# Appendix B: Data sources

## ABS population data

The rates in this report were calculated using ABS estimates and projections of the population, based on the 2011 Census (ABS 2013b, 2014, 2015).

The size of the Indigenous population varies substantially by state and territory. In 2014, the Indigenous population ranged from about 6,700 in the Australian Capital Territory to 222,900 in New South Wales. The proportion of the total population who are Indigenous also varies by state and territory. In 2014, this proportion ranged from less than 1% in Victoria to nearly 30% in the Northern Territory.

## Bettering the Evaluation and Care of Health survey

The BEACH survey collects information about encounters with general practitioners (GPs), including GP and patient characteristics; patient reasons for the visit; problems managed; and treatments provided. Information is collected from a random sample of approximately 1,000 GPs from across Australia each year. Each participating GP provides details of 100 consecutive patient encounters. Although the questionnaire contains an Indigenous identifier, it is unknown whether all GPs ask their patients this question.

In a sub-study of approximately 9,000 patients, Supplementary Analysis of Nominated Data, it was found that if the question on Indigenous status was asked within the context of a series of questions about origin and cultural background, 1.3% identified as Aboriginal and Torres Strait Islander. This is twice the rate routinely recorded in BEACH, indicating that BEACH may underestimate the number of encounters with Indigenous Australians (AIHW 2015a).

## Medicare Benefits Schedule data

The MBS is a listing of Medicare services that are subsidised by the Australian Government. It is part of the Medicare program, managed by the Department of Health and administered by the Department of Human Services. Through the Medicare program, all Australian residents and certain categories of visitors to Australia are entitled to benefits for medical and hospital services. 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 when benefits are claimed.

The MBS data presented in this report were provided by the Department of Health, with the AIHW further analysing those data (for example, deriving rates).

MBS data reflect MBS claims and not necessarily all the services that are received. A person may be provided with equivalent care from a health-care provider who is not eligible to bill Medicare. The data are based on the date of processing of claims. While the data have been used to measure the level of specific activities, changes in the use of an MBS item over time can reflect changes in billing and claiming practices or the introduction of new items, and not necessarily changes in the health care provided.

Data presented by state and territory and remoteness area are based on the address information recorded in the patient's Medicare record. Data presented by remoteness area were classified according to the Australian Standard Geographical Classification.

### Indigenous identification

The identification of Indigenous Australians in Medicare data is not complete. Since 2002, individuals who choose to identify as being of Aboriginal and/or Torres Strait Islander descent have been able to have this information recorded on the Medicare database through the Voluntary Indigenous Identifier (VII). VII enrolment is through either a VII enrolment form or a tick-box on a Medicare Australia enrolment form. Both methods of enrolment indicate that identifying as Indigenous is optional.

As at March 2016, an estimated 65% of the Indigenous population had identified as being of Aboriginal and/or Torres Strait Islander origin through the VII process. VII coverage varies by age group and state and territory. The MBS data presented in this report have been adjusted for under-identification, except for data about MBS item 715 health assessments. As only Indigenous Australians are eligible to receive such health assessments, it is assumed that all people who receive an MBS item 715 are Indigenous.

## National Eye Health Survey

The 2016 NEHS was a nationwide population-based study designed to provide estimates of the prevalence and causes of vision impairment and blindness in Indigenous and non-Indigenous Australians by gender, age, and geographical area; and to measure the treatment and coverage rate of major conditions and diseases. It used a multi-stage, random-cluster sampling methodology to select 30 geographic areas stratified by remoteness, to provide a representative target population of 3,000 non-Indigenous Australians aged 50 and older and 1,400 Indigenous Australians aged 40 and older. Participants were primarily recruited by door-to-door knocking, with adjustments as required to adapt to local circumstances within diverse Indigenous communities.

Over 85% of those eligible to enrol in the study did so. In total, the NEHS examined 3,098 non-Indigenous Australians aged 50 or older, and 1,738 Indigenous Australians aged 40 or older. The survey achieved a positive response rate of 85% and an examination rate of 72%. The testing protocol involved a general questionnaire, vision testing, anterior segment examination, visual field testing, fundus photography and intraocular pressure testing. The 95% confidence intervals were provided to indicate the reliability of all estimates reported. Some of the estimates should be treated with caution due to large confidence intervals.

Comparative 2008 data are from the National Indigenous Eye Health survey conducted by the Indigenous Eye Health Unit at the University of Melbourne, in collaboration with the Centre for Eye Research Australia and the Vision Cooperative Research Centre. This survey used a multi-staged random-cluster sample, selected after consultation with the ABS using data from the 2006 Census. Thirty clusters containing 300–400 people were selected. In each cluster, all children aged 5–15 and all adults over 40 were examined. Standardised demographic data were collected, and a standardised eye examination was done on all participants. Overall, 1,694 children aged 5 to 15 (84% of those eligible) and 1,189 adults aged 40 and above (72% of those eligible) were examined (AIHW 2015a).

# National Health Workforce Dataset

The Australian Health Practitioner Regulation Agency (AHPRA), in conjunction with the national health professional registration boards, is responsible for the national registration process for 14 health professions. The data from the annual registration process, together with data from a workforce survey that is voluntarily completed at the time of registration, forms the Department of Health's National Health Workforce Dataset (NHWDS). Data in the NHWDS includes demographic and employment information (for example, labour force status, location of main job, area of practice, work setting) for registered health professionals. In this report, the data on optometrists and ophthalmologists comes from the NHWDS as reported by AIHW.

# National Hospital Morbidity Database

Data about hospitalisations were extracted from the AIHW NHMD, which is a compilation of episode-level records from admitted patient care data collection systems in Australian hospitals in each state and territory. Information on the characteristics, diagnoses and care of admitted patients in public and private hospitals is provided annually to the AIHW by state and territory health departments. Data are based on financial years.

Data are a count of hospital separations (episodes of admitted patient care, which can be a total hospital stay, or a portion of a hospital stay that begins or ends in a change of type of care) and not patients. Patients who separated from hospital more than once in the year will be counted more than once in the data set. The number and pattern of hospitalisations can be affected by differing admission practices among the jurisdictions and from year to year, and differing levels and patterns of service delivery.

Data on diagnoses are recorded using the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification (ICD-10-AM, 8th edition). Information on procedures was recorded using the Australian Classification of Health Interventions. The relevant diagnosis and procedure codes used in this report are outlined in the Supplementary Tables Group 3.

NHMD data presented by state and territory and remoteness area in this report are based on the patient's place of usual residence. For some analyses by state and territory, data for the Australian Capital Territory were combined with those for New South Wales, and data for Tasmania were combined with those for Victoria, due to small numbers.

For analyses by remoteness area, the NHMD data for 2012–13 onwards were classified according to the Australian Statistical Geography Standard; earlier years were classified according to the Australian Standard Geographical Classification.

A data quality statement for the NHMD is available at
<http://meteor.aihw.gov.au/content/index.phtml/itemId/611030>.

### Indigenous identification

There is some under-identification of Indigenous Australians in the NHMD, but NHMD data for all states and territories are considered to have adequate Indigenous identification from 2010–11 onwards (AIHW 2013). An AIHW study found that, in 2011–12, the true number of hospitalisations nationally for Indigenous Australians was about 9% higher than reported (AIHW 2013). In 2013–14, about 408,000 hospitalisations were recorded as being for Indigenous Australians. Based on the level of under-identification suggested by the AIHW study, the true number of hospitalisations for Indigenous Australians in 2013–14 is estimated to have been about 445,000 (AIHW 2015a). NHMD data presented in this report have not been adjusted for under-identification, so are likely to underestimate the true level of Indigenous hospitalisations.

Changes in the accuracy of Indigenous identification in hospital records will result in changes in the reported number of hospitalisations for Indigenous Australians. Caution should be used when interpreting changes over time, as it is not possible to ascertain whether a change in reported hospitalisations is due to changes in the accuracy of Indigenous identification and/or real changes in the rates at which Indigenous Australians were hospitalised. An increase in hospitalisation rates for a particular population might also reflect higher use of admitted patient hospital services—as opposed to other forms of health care—rather than a worsening of health. Likewise, a decrease in hospitalisation rates might not necessarily indicate better health. It should also be noted that the levels of under-identification vary with state and remoteness and it is not known whether they vary by reason for hospitalisation.

With the exception of data from hospitals in Western Australia, hospitalisations where the person's Indigenous status was not stated were excluded from analyses that compare Indigenous and non-Indigenous rates. In 2011–14, there were about 618,000 hospitalisations for which Indigenous status was not stated, representing 2% of all hospitalisations in that period. For hospitals in Western Australia, records with an unknown Indigenous status are reported as non-Indigenous, so are included in the 'non-Indigenous' data in these analyses.

# Trachoma Surveillance Reports

The National Trachoma Surveillance and Reporting Unit (NTSRU) of the Kirby Institute is funded by the Department of Health for data collation, analysis and reporting related to the ongoing evaluation of trachoma control strategies in Australia. The Australian Trachoma Surveillance Reports (ATSR) are released annually (Kirby Institute 2015).

The primary focus of reporting by the NTSRU from 2006–2011 was on trachoma levels and trends in the 3 jurisdictions funded by the Australian Government to undertake trachoma control activities. In 2013, 2014 and 2015, the NSW Ministry of Health was funded to undertake a baseline screening of selected remote communities to establish whether trachoma was a public health concern in NSW. These data are included in the 2013, 2014 and 2015 reports, along with data from the Northern Territory, Western Australia and South Australia (Kirby Institute 2015).

Each jurisdiction undertakes their own screening and treatment for trachoma according to their respective protocols, and in the context of the CDNA National Guidelines for the Public Health Management of Trachoma in Australia. Prior to January 2014, these recommended that screening for trachoma be undertaken for all communities designated as being 'at-risk', or where there was anecdotal information suggesting the presence of active trachoma.

The revised guidelines state that not all 'at-risk' communities are required to screen for trachoma each year, as prevalence levels don't vary greatly from year to year. Instead, if trachoma is present in the community, communities are to focus their efforts on treatment. The frequency of screening recommended varies according to the prevalence and spread of active trachoma in the community. For example, where prevalence is over 20% it is recommended that screening be undertaken every 3 years, but where it is between 5% and 20%, it should be undertaken each year (CNDA 2014).

The Northern Territory introduced this new approach in 2014 and the other jurisdictions in 2015. This means that, in order to calculate prevalence rates for communities that did not screen in the current year, the most recent prevalence data for that community is carried forward and added to the current year data. This is likely to over-estimate current levels of trachoma.

WHO trachoma grading criteria were used to diagnose and classify individual cases of trachoma in all jurisdictions. The forms for data collection at the community level were developed by the National Trachoma Surveillance and Control Reference Group, based on the CDNA guidelines. Completed forms are provided by jurisdictional coordinators to the NTSRU for checking and analysis. While data may be collected for Aboriginal children aged 0–14, the focus age group in all regions is those aged 5–9 years, as required by state and territory project agreements (Kirby Institute 2016).

Interpretation of coverage data is limited by the accuracy of community population estimates, the school-based approach to screening and the designation of communities as at-risk. Community population estimates are based upon projections from the Census data. Although this approach is current best practice, the estimates may not accurately reflect populations at the time of screening, given the small size and mobility of some communities. Caution must be taken when quoting trachoma prevalence, as screening took place in predominantly *Remote* and *Very remote* communities designated as being at-risk of endemic trachoma. Designation of at-risk status does not appear to have been systematically reviewed in any jurisdiction (AIHW 2015a).

# Appendix C: Summary results by measure

**Table C1: Summary of results for the eye health measures**

| Measure | Number Indigenous | Crude rate Indigenous | Indigenous change over time | Age-standardised rate(a) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Indigenous | Non-Indigenous | Rate ratio | Rate difference |
| 1.1 Prevalence of: | | | | | | | |
| (i) vision impairment (%, aged 40 and over) (n=1,738) | 183 | 10.5 | ↔ | 13.6 | 4.6 | 3.0 | 9.0 |
| (ii) blindness (%, aged 40 and over) (n=1,738) | 5 | 0.3 | ↓ | 0.4 | 0.1 | 3.0 | 0.2 |
| 1.2 Main causes of vision impairment and blindness | | | | | | | |
| —Refractive error (% of those with vision impairment) (n=183) | 116 | 63.4 | n.a. | 63.4 | 61.7 | n.a. | n.a. |
| —Cataract (% of those with vision impairment) (n=183) | 37 | 20.2 | n.a. | 20.2 | 13.9 | n.a. | n.a. |
| 1.3 Prevalence of: | | | | | | | |
| (i) trachoma (%, aged 5–9, NSW, WA, SA and NT) | 118 | 3.7 | ↓ | n.a. | n.a. | n.a. | n.a. |
| (ii) trichiasis (%, aged 40 and over, WA, SA and NT) | 41 | 0.9 | ↓ | n.a. | n.a. | n.a. | n.a. |
| 2.1 Eye health problems managed by GPs (no. per 1,000 encounters) (n=13,821) | 155 | 18.3 | n.a. | 23.8 | 23.3 | 1.0 | 0.5 |
| 2.2 Annual health assessments (%) | 167,221 | 23.2 | ↑ | . . | . . | . . | . . |
| 2.3 Eye examinations by an eye care professional (%) | 83,689 | 11.6 | ↑ | 15.0 | 20.3 | 0.7 | –5.4 |
| 2.4 Target population screened for diabetic retinopathy (%) (n=645) | 341 | 52.9 | n.a. | 52.9 | 65.4 | n.a. | n.a. |
| 2.5 Screening coverage of: | | | | | | | |
| (i) trachoma (%, aged 5–9, NSW, WA, SA and NT) | 3,173 | 89.1 | ↑ | n.a. | n.a. | n.a. | n.a. |
| (ii) trichiasis (%, aged 40 and over, WA, SA and NT) | 4,544 | 33.2 | ↑ | n.a. | n.a. | n.a. | n.a. |
| 2.6 Undiagnosed eye conditions | | | | | | | |
| —Refractive error (% of those with refractive error) (n=116) | 64 | 55.2 | n.a. | 55.2 | 63.7 | n.a. | n.a. |
| —Cataract (% of those with cataract) (n=39) | 27 | 69.2 | n.a. | 69.2 | 35.7 | n.a. | n.a. |
| 3.1 Hospitalisations for diseases of the eye (no. per 1,000) | 6,523 | 4.6 | ↑ | 9.9 | 13.1 | 0.8 | –3.3 |
| 3.2 Hospitalisations for injuries to the eye (no. per 1,000) | 1,658 | 1.2 | ↔ | 1.3 | 0.4 | 3.1 | 0.9 |
| 3.3 Hospitalisations for eye procedures (no. per 1,000) | 6,404 | 4.5 | ↑ | 9.7 | 12.9 | 0.8 | –3.2 |
| 3.4 Cataract surgery rate (no. per 1,000,000) | 4,043 | 2,832 | ↑ | 7,044 | 8,415 | 0.8 | –1,371 |

*(continued)*

## Table C1 (continued): Summary of results for the eye health measures

| Measure | Number Indigenous | Crude rate Indigenous | Indigenous change over time | Age-standardised rate[(a)] Indigenous | Non-Indigenous | Rate ratio | Rate difference |
|---|---|---|---|---|---|---|---|
| 3.5 Cataract surgical coverage rate (n=231) | 142 | 61.5 | n.a. | 61.5 | 87.6 | n.a. | n.a. |
| 3.6 Waiting times for elective cataract surgery (median waiting time in days) | . . | 142 | ↔ | 142 | 84 | . . | . . |
| 3.7 Treatment coverage of: | | | | | | | |
| (i) trachoma (%, community members, all ages, WA, SA and NT) | 8,720 | 87 | ↑ | n.a. | n.a. | n.a. | n.a. |
| (ii) trichiasis (number who had surgery in past 12 months, aged 40 and over, WA, SA and NT) | 13 | n.a. | ↑ | n.a. | n.a. | n.a. | n.a. |
| 3.8 Treatment of refractive error (n=694) | 578 | 83.3 | n.a. | 83.3 | 93.7 | n.a. | n.a. |
| 3.9 Spectacles dispensed under state schemes (no. per 1,000) (NSW, Vic and Qld) | 10,810 | 22.4 | n.a. | n.a. | n.a. | n.a. | n.a. |
| 4.1 Number and rate of optometrists (FTE per 100,000) | 4,559 | 17.9 | ↑ | . . | . . | . . | . . |
| 4.2 Number and rate of ophthalmologists (FTE per 100,000) | 896 | 4.0 | ↔ | . . | . . | . . | . . |
| 4.3 Number and rate of optical dispensers (FTE per 100,000) | 4,239 | 19.2 | n.a. | . . | . . | . . | . . |
| 4.4 Occasions of eye health services provided under outreach programs | | | | | | | |
| (i) Visiting Optometrists Scheme (VOS) (no. per 1,000) | 18,890 | 26.2 | ↑ | n.a. | n.a. | n.a. | n.a. |
| (ii) Rural Health Outreach Fund (RHOF) (no. per 1,000) | 7,829 | 16.7 | ↑ | n.a. | n.a. | n.a. | n.a. |
| (iii) Medical Outreach Indigenous Chronic Disease Program (MOICDP) (no. per 10,000) | 1,156 | 19.7 | ↑ | n.a. | n.a. | n.a. | n.a. |

↑ = increased over time for Indigenous Australians; ↓ = decreased over time for Indigenous Australians; ↔ = no change over time or no clear trend for Indigenous Australians.

(a) Data for measures: 1.2 (Main causes of vision impairment and blindness); 2.4 (Target population screened for diabetic retinopathy); 2.6 (Undiagnosed eye conditions); 3.5 (Cataract surgical coverage rate); 3.6 (Waiting times for elective cataract surgery); and 3.8 (Treatment of refractive error) are not age-standardised.

*Sources:* 2016 NEHS; AIHW analysis of BEACH survey of general practice, AGPSCC; AIHW analysis of MBS data; AIHW NHMD; AIHW analysis of Department of Health data (unpublished); AIHW analysis of NSW Department of Family and Community Services data (unpublished); Australian College of Optometry Victorian data (unpublished); Queensland Health data (unpublished); AIHW analysis of Health Workforce Dataset; and AIHW analysis of Census 2011 data on optical dispensers.

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# Glossary

**Aboriginal and Torres Strait Islander:** People who identified themselves, or were identified by another household member, as being of Aboriginal and/or Torres Strait Islander origin. See also **Indigenous**.

**admitted patient:** A patient who undergoes a hospital's admission process to receive treatment and/or care. This treatment and/or care can occur in hospital and/or in the person's home (for hospital-in-the-home patients). METeOR identifier: 268957.

**age-standardisation:** A set of statistical techniques used to remove, as far as possible, the effects of differences in age when comparing 2 or more populations.

**Australian Refined Diagnosis Related Groups (AR-DRGs):** An Australian system of diagnosis related groups (DRGs). DRGs provide a clinically meaningful way of relating the number and type of patients treated in a hospital (that is, its casemix) to the resources required by the hospital. Each AR-DRG represents a class of patients with similar clinical conditions requiring similar hospital services.

**blindness:** presenting visual acuity of <6/60 in the better eye.

**hospitalisation (separation):** An episode of care for an **admitted patient** that can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of care type (for example, from acute care to palliative care).

**Indigenous:** Used interchangeably with **Aboriginal and Torres Strait Islander** in this report.

**non-Indigenous:** People who indicated they are not of Aboriginal and/or Torres Strait Islander origin. Compare with **other Australians**.

**other Australians:** Includes people who did not identify as being of Aboriginal and/or Torres Strait Islander origin, and people for whom information on their Indigenous status was not available. Compare with **non-Indigenous**.

**principal diagnosis:** The diagnosis established after study to be chiefly responsible for occasioning an episode of **admitted patient** care, an episode of residential care or an attendance at the health-care establishment. METeOR identifier: 514273.

**procedure:** A clinical intervention that is surgical in nature, carries a procedural risk, carries an anaesthetic risk, requires specialised training and/or requires special facilities or equipment available only in an acute care setting. METeOR identifier: 514040.

**rate difference:** The literal, or absolute, gap between 2 population rates; for this report, it was calculated as the rate for Indigenous Australians minus the rate for non-Indigenous Australians.

**rate ratio:** The relative difference between populations taking scale into account; for this report, it was calculated as the rate for Indigenous Australians divided by the rate for non-Indigenous Australians, and is interpreted as follows:

- a rate ratio of 1 indicates there is no difference between the rates
- a ratio less than 1 indicates the rate is lower in the Indigenous population
- a ratio greater than 1 indicates the rate is higher in the Indigenous population.

**separation:** See **hospitalisation**.

**vision impairment:** presenting distance visual acuity of <6/12 in the better eye.

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This is the first national report on 22 newly developed Indigenous eye health measures. The measures cover the prevalence of eye health conditions, diagnosis and treatment services for Aboriginal and Torres Strait Islander Australians, the eye health workforce and outreach services. Subject to data availability, the report examines differences between Indigenous and non-Indigenous Australians, as well as differences by factors such as age, sex, remoteness, jurisdiction and Primary Health Network.